PHARSALIA WOODS
UNIT MANAGEMENT PLAN

Towns of Pharsalia, Plymouth, Pitcher and Otselic, Chenango County

February 2013

NYS Department of Environmental Conservation
Region 7 Sherburne Office
2715 State Hwy. 80
Sherburne, NY 13460
Telephone (607) 674-4017
MEMORANDUM

TO: The Record
FROM: Joseph J. Martens
DATE: 2/14/13
SUBJECT: Final Pharsalia Woods UMP

The Unit Management Plan for Pharsalia Woods Unit has been completed. The Plan is consistent with Department policy and procedure, involved public participation and is consistent with the Environmental Conservation Law, Rules and Regulations. The plan includes management objectives for a ten year period and is hereby approved and adopted.
PHARSALIA WOODS
UNIT MANAGEMENT PLAN

A Management Unit
Consisting of Five State Forests
in Central Chenango County

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PREFACE

It is the policy of the Department to manage State forests for multiple uses to serve the People of New York State. The Pharsalia Woods Unit Management Plan is the basis for supporting a multiple use* goal through the implementation of specific objectives and management strategies. This management will be carried out to ensure the sustainability, biological improvement and protection of the Unit’s ecosystems and to optimize the many benefits to the public that these State Forests provide. The multiple use goal will be accomplished through the applied integration of compatible and sound land management practices.

The Pharsalia Woods Unit Management Plan is based on a long-range vision for the management area. Specific goals and objectives to support that vision have been developed to implement management activities on the Unit for the next 20 years with a review in five years and an update due in 10 years. It should be noted that factors such as wood product markets, changing social mores, budget and staffing constraints and forest health conditions may, at the judgment of the Regional Forester, necessitate deviations from the schedule.

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

Pharsalia Woods Unit Management Area
Chenango County, New York

Unit Overview Map: Forest Boundaries and Roads

[Map image of Pharsalia Woods Unit Management Area]
I. Information on the Unit

A. State Forest History

Up until the latter part of the 1920s, the primary focus of the Division Lands and Forest was acquiring land in the Adirondack and Catskill Forest Preserves. The forest preserve was in the forefront of the State’s environmental policy at the turn of the century and great emphasis was placed on the protection of the State’s water resources, suppressing wildfires, controlling forest insect and disease breakouts, and developing recreational facilities on the newly acquired “forever wild” lands.

The forests outside the Adirondack and Catskill regions owe their present character, in large part, to the impact of pioneer settlement. Following the close of the Civil War in 1865, increased pressure for land encouraged westward expansion. By the 1890s, as much as 80% of the State had been cleared by settlers for cultivation and pasture land (DEC 2006). However, the success of many of these early farming efforts was short lived. As the less fertile soils proved unproductive, they were abandoned and settlement was attempted elsewhere.

By the time the country had plunged into the Great Depression, a mass exodus from the rural hilltop farms of Chenango County was already underway, and had been for decades. According to U.S. Census records, the population of the County reached a peak of 40,934 residents in 1860. The population of Chenango County steadily decreased every decade into the 1930s, hitting a low of 34,665 residents. It would take until the 1960s for the population of the County to rebound and surpass the 1860s mark (Census July 2000). This pattern of population decline mirrors what was happening with land abandonment across the State.

“From 1880 to 1910 abandonment averaged 60,000 acres per year. It averaged 140,000 acres per year between 1910 and 1920, and during the period of 1920-1925 abandonment took place at the rate of 270,000 acres per year—bringing the average for 1880-1925 up to 100,000 acres per year.” (Baker, 1953)

The railroads had opened up the west to expansion and advertisements of fertile farmland and a new beginning lured many families away from their hardscrabble existence. Other families had no choice but to abandon their unproductive farms in hope of a fresh start on the western frontier. Perhaps more importantly, the industrial age was changing the face of the nation. People could leave their meager existence in rural America for hopes of a good paying job at an office or factory in the city. A victorious effort in the Great War (World War I) had energized the country. The economy was booming and the country was in the midst of a golden age of movies, jazz, and art. But when the roaring twenties came to a grinding halt on Black Tuesday, October 29, 1929, all the signs of an imminent depression were already visible in the rural countryside of Chenango County.
The State College of Agriculture was aware of the developing problem as early as 1901 when it began conducting soil surveys in the State. An orchard survey started in 1903 and farm business surveys started in 1907 added to the mounting evidence that certain lands cleared for agriculture were not suitable for that purpose. Perhaps nobody was more painfully aware of that fact than the families who attempted to farm these lands. Between 1900 and 1935, approximately 75,000 acres, or 14 percent, of the agricultural land in Chenango County were abandoned (Tyler, 1936). The Executive Committee of the Chenango County Farm Bureau found the problem of farm abandonment so severe that the State College of Agriculture, Ithaca, was asked to study the situation in Chenango County to determine the best use for the idle land.

Nowhere was the problem of land abandonment more apparent than in the town of Pharsalia, where “uninhabited houses in various stages of disintegration [were] seen from all roads” (Allen, 1929). So, in 1923, the first intensive study in New York State of land not suitable for agriculture began there. The county Extension Service met with the local Pharsalia residents in May of 1923, conducted a preliminary survey of the town during the summer of 1923, and then undertook a more detailed investigation in 1924 (Tyler 1936). A report of the findings was presented by William Allen as his thesis for a doctorate in philosophy at Cornell University in 1925 and is the primary source of the information in the discussion below, except where noted.

The value of land in Pharsalia was far below the statewide average. In 1924 the average value per acre of all land including improvements in the town of Pharsalia was $13 per acre, and much of this was “considerably overvalued.” The value of land in Pharsalia had long since peaked back around 1875 when it reached $24 per acre; in 2008 dollars these values would be $162 and $465, respectively (Friedman, 2009). In 1924, the average value per acre of operational farms in Pharsalia was $16. Less desirable farmland in Pharsalia was valued at an average of $8 per acre. To put this in perspective, in 1924, the statewide average value per acre of poor quality plowed land was $33 versus $75 for good quality land. The statewide average per acre of all farmland was $44 without improvements or $74 with improvements (Allen, 1929).

The study of marginal lands in Pharsalia brought to light many other issues. The study revealed that local residents working unproductive farmland could not afford the labor and services available to the more productive farms or the prospering industries of the time. The realization of the relationship of unproductive farmland to increased costs of living and running a farm did not go unnoticed:

“Utility companies became interested, because they were finding it unprofitable to extend service into these areas. The occupants of the land could not afford to buy sufficient electricity to pay for the construction of electric lines. Insurance companies were interested because their fire losses were running five times as great on poorer farms as on good farms, and bankers were finding that losses on first mortgage loans on this poor type of farm were running twenty-eight times their losses on good farms. Here was a millstone around the neck of the rural economy of New York (Baker, 1962).”
The primary conclusion of the study was that the hilltop land of Pharsalia was best adapted for forestry. Because losses on these lands are high, reforestation would reduce costs and provide benefits to all. The towns would not need to improve or maintain abandoned roads in reforestation areas; fire related insurance claims and defaults on mortgages would decrease, and utility companies would not lose money providing services in areas that could not support the cost. All this money saved could be better spent improving roads and providing services in areas with more fertile soil. Reforestation, on the other hand, would provide watershed protection, decrease soil erosion, provide recreational areas, create a future supply of timber, and “beautify the State” (Tyler, 1939).

Two possible forest areas were proposed: one to the north of present day County Route 23, and one to the south. These areas represented approximately 60% of the town area, but only 47% of the town real estate value and only 33% of the farm income. The vast majority of all of the dilapidated and abandoned dwellings and barns within the town were located in these areas. Of the 98 farm operators in Pharsalia in 1924, 46 of them desired to sell the farm (Allen, 1929).

As a direct result of this study, approximately 4,500 acres were identified for purchase by the State on the north side of Route 23. (Much of the proposed area on the south side of Route 23 would later become Chenango Reforestation Area #5.) In 1926 and 1927, under the purview of State Forester Clifford Pettis, the State purchased nearly 4,000 of these acres, paying a premium of $6.00 per acre (~$70 in 2008 dollars) to establish the Pharsalia Game Refuge, the first of its kind in New York, known today as the Pharsalia Wildlife Management Area (Tyler, 1936). Tree planting began almost as fast as the titles for the land cleared. By the end of 1928, the reforestation of the Pharsalia Game Refuge was underway. Of the 3,977 acres initially acquired, 1,351 acres were planted with 1,521,400 trees. More than half of the trees planted were Norway spruce and another one third were white pine (Conservation Department, 1928). The Refuge was quickly expanded to 4,333 acres and today totals 4,692 acres.

The problem of land abandonment was clear, and it was significant enough that it could not be ignored. Across the State, planting trees, or perhaps more importantly, reforestation, was steadily gaining in popularity on public and private land. Since the turn of the century, the State had been reforesting “denuded” portions of the Adirondacks as well as providing seedlings to individual landowners from the statewide network of nurseries. In 1925 the Conservation Fund was established using fees from game licenses for the cost of purchasing and reforesting areas such as the Pharsalia Game Refuge.

In 1927 and 1928 State Senator Charles J. Hewitt from Locke, New York, introduced into the State Legislature a bond issue for the purchase and reforestation of abandoned farm lands to be administered by the Conservation Department (Conservation Department, 1962). Senator Hewitt’s first attempts at passing the bill failed, but in 1928, the growing perception that additional methods and resources would be necessary to reforest an estimated 4 million acres of abandoned agricultural land finally caught the attention of the legislature.
The State Reforestation Commission was formed to study the matter. Within a year’s time, with numerous studies by the State College of Agriculture and assistance from the State College of Forestry and the Conservation Department, the Reforestation Commission made recommendations to the State legislature to establish a statewide reforestation project. The Commission’s report indicated that one million acres of abandoned farmland could be acquired in areas of 500 acres or more and at a price that would justify reforestation (DEC 2006).

“The year 1929 marks an epoch in the history of reforestation in New York State” (Conservation Department 1929). In the spring of 1929, the State Legislature passed the State Reforestation Law (Hewitt Reforestation Bill, Chapter 195 of the Laws of 1929). This bill provided an initial allocation for the acquisition and reforestation of idle and abandoned lands outside of the Adirondack and Forest Preserve Counties, up to one million acres. The primary requirements were simple: the properties must be in contiguous blocks of 500 acres or more, adjacent properties may be added at any time, and the lands that were acquired would be forever devoted to “reforestation and the establishment and maintenance thereon of forests for watershed protection, the production of timber and other forest products, and for recreation and kindred purposes.” The Conservation Department also had a policy of purchasing properties that required at least 50% of the acreage to be reforested.

The law became effective on March 26, 1929, and by the end of September that same year, the State acquired 561.73 acres in the Town of McDonough, Chenango County’s first State Forest, and Chenango Reforestation Area No. 1. State Reforestation Areas were also established in Cortland and Otsego counties, totaling 1,951.57 acres at an average price of $3.08 per acre. That same year, the ceremonial first trees were planted in Cortland County on October 3, with hundreds of millions of trees to follow over the course of the coming decade.

In 1930, an additional allocation was made to maintain the reforestation program until a constitutional amendment could be approved by the public. It had been introduced in 1929 and successfully passed by the required two consecutive terms of legislature. Subsequently, the reforestation effort was expanded when the “Hewitt Amendment” (Amendment, Section 16 of Article VII of the State Constitution) became effective after the constitutional amendment passed by popular vote in 1931. The Hewitt Amendment established the “Enlarged Reforestation Program” to include land in Forest Preserve counties that was not within boundaries of the Forest Preserve. This broad program is presently authorized under Article 9, Title 5 of the Environmental Conservation Law.

The Hewitt Amendment mandated an annual schedule of appropriations for the acquisition and reforestation of a million or more acres of idle land within 15 years, at a total cost not to exceed $20 million. However, only one year into the program, the appropriation could not be maintained due to a shortage of funds resulting from the Great Depression. But help would come from a familiar face in the federal government. As luck would have it, the newly elected president, and former New York Governor, Franklin Delano Roosevelt, was making good on his
promise of a New Deal for the country. Roosevelt’s New Deal was making its way through Congress and the Emergency Conservation Work program was created by executive order on April 5, 1933 under the authority of an emergency employment act passed on March 31. Roosevelt, having learned from his experience as New York’s governor, saw the opportunity for employment that reforestation presented.

Later in that same year, the first of two Civilian Conservation Corps (CCC) work camps in the Town of Pharsalia was established. On November 5, 1933, a camp at the Pharsalia Game Refuge began operating. This camp was assigned project number S-80 by the State and employed three companies of African Americans over the duration of its existence. At its height, 200 men were employed at the camp. Two years later, on October 29, 1935, a second camp was established near the intersection of Brackel Creek Road and Center Road in the same location occupied by Camp Pharsalia, formerly a minimum security Department of Corrections facility. This camp was assigned project number S-132, and it employed companies of African American Veterans from World War I (CCC Alumni, 2007).

The CCC funds rescued the reforestation program. Not only did it allow for tree planting to resume, but the money saved in tree planting costs was applied to the purchase of land. However, the acquisition of new lands was restricted to within 15 miles of a CCC camp. This limitation on land purchasing partly explains the current distribution of State forest land in Chenango County.

By January 1, 1936, 49,195 acres, or almost two thirds of the 75,000 acres of abandoned farmland in Chenango County, had been purchased or was under contract for purchase by the State for reforestation (Tyler, 1936). Seventy-two percent of the sellers reported that their primary motivation to sell to the State rather than individuals was because the State was the only market available, and sixteen percent said that they sold because “the State pays cash” (LaMont, 1939). As of the preparation of this document, there are 73,235.82 acres of State forest land in Chenango County. This is not to say that nearly all the abandoned farmland was eventually purchased by the State. The lack of funds and the restriction placed on the location of new acquisitions during the CCC days prevented many areas from consideration until decades later.

Soon after acquisition by the State, the abandoned fields were planted with millions upon millions of red pine and Norway spruce seedlings by CCC crews “to prevent the loss of time, money and courage in trying to farm land not adapted to agriculture” (LaMont, 1939). Today, the capacity of these poorly drained, infertile, and rocky soils continues to be best suited for forest land. The maturing pine and spruce plantations are a significant component of the State

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1Under the authority of an emergency employment act of March 31st, 1933(48 Stat. 22), President Franklin Delano Roosevelt established the ECW by Executive Order 6101 on April 5th, 1933. The Civilian Conservation Corps (CCC) was created by an act of Congress on June 28th, 1937 (50 Stat. 319), as successor to the Emergency Conservation Work (ECW). The President's Reorganization Plan No. 1, April 25th, 1939 (53 Stat. 1424), placed the CCC under the newly created Federal Security Agency (DEC, 2006).
forests; however, second growth, northern hardwood deciduous forests with species such as sugar maple, red maple, black cherry, and white ash, are the primary land cover in the Unit and throughout the Pharsalia Woods landscape. The initial acquisitions for the five forests in the Unit were purchased between 1931 and 1940. The dates in the table below reflect land for which the title had cleared by the end of the fiscal year. See Table 1.

Table 1. Year and acres of first acquisition, and present total acres, for each forest in the Pharsalia Woods Unit.

<table>
<thead>
<tr>
<th>State Reforestation Area</th>
<th>Year of First Acquisition</th>
<th>Acres of First Acquisition</th>
<th>Present Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango 5</td>
<td>Sept. 30, 1931</td>
<td>686.85</td>
<td>6,192.03</td>
</tr>
<tr>
<td>Chenango 16</td>
<td>Sept. 30, 1932</td>
<td>1,176.26</td>
<td>1,835.56</td>
</tr>
<tr>
<td>Chenango 22</td>
<td>Sept. 30, 1934</td>
<td>1,133.295</td>
<td>1,895.05</td>
</tr>
<tr>
<td>Chenango 24</td>
<td>Sept. 30, 1933</td>
<td>532.45</td>
<td>2,971.47</td>
</tr>
<tr>
<td>Chenango 36</td>
<td>Sept. 30, 1940</td>
<td>507.18</td>
<td>736.34</td>
</tr>
<tr>
<td>Totals</td>
<td></td>
<td>4,036.035</td>
<td>13,630.45</td>
</tr>
</tbody>
</table>

The CCC workers in Chenango County are often remembered for their most visible and lasting accomplishment, the trees they planted. However, the CCC workers at the camps in Pharsalia were employed in many tasks. After the tree planting was completed, the camp at the Pharsalia Game Refuge focused its efforts on projects at the Refuge, the Sherburne Game Farm, and the Otselic Fish Hatchery. Meanwhile, at the camp at Brackel Creek the workers were employed on a wide variety of tasks in the nearby reforestation areas including: constructing and maintaining truck trails, bridges, dams, and fences; fighting forest fires and clearing and maintaining fire breaks and water holes; and conducting timber stand improvement, seed collection, and insect and disease control. (Conservation Department, 1936-42).

Across the State, the CCC camps were a boon to the reforestation efforts, the fish and game programs, and parks and recreation. However, as the worst of the Great Depression passed, camps were gradually closed as projects were completed or funding ran dry. Camp S-80 at the Pharsalia Game Refuge closed on June 6, 1941, only six months before America would be thrust into World War II with the attack on Pearl Harbor. Camp S-132 at Brackel Creek stayed open longer than all but one of the other CCC camps in New York State; however, the end of the CCC was inevitable. With the country at war, all programs not essential to the war effort came under scrutiny and a Congressional committee recommended that the CCC be abolished by July 1, 1942. In June 1942, after close votes in the House and Senate, Congress failed to fund the CCC and agreed to liquidate the agency. Finally, with all funds exhausted, the camp at Brackel Creek ceased operation on July 25, 1942, nearly seven years after it opened (CCC Alumni, 2007). Indeed, it was the end of an era in the history of the State forests. All operating equipment was turned over to the Army for the war effort. The focus of the country had changed abruptly, but
the Civilian Conservation Corps would take its place in history as one of the best known and most successful public endeavors of the time. It only takes a short drive down the Nine Mile Trail through Chenango RA # 5 and 24 to see that the CCC played an invaluable role in shaping the face of the State forest land that we enjoy today.

Very little forestry work was carried on by the Conservation Department out during World War II and many of the buildings and facilities fell into disrepair due to the shortage of funding and labor. However, an 11 million dollar “Post War” program was established which allowed work to resume shortly thereafter. The funding allocated to this program enabled the Department to:

1. Construct the needed additional fire protection facilities.
2. Maintain and rehabilitate existing facilities.
3. Reforest a considerable acreage of plantable land.
4. Start plantation operations to prevent stagnation in the plantations approaching the age for cultural treatment.
5. Treat natural stands of hardwood.
6. Carry on necessary projects like fencing and posting, pest control, and seed collection (Conservation Department, 1962).

Work did not begin again in earnest until the second half of 1946. Land acquisitions resumed and a plantation thinning and pruning program was undertaken. These treatments were necessary to maintain acceptable growing rates in the newly planted forests and prevent them from stagnation. The program also served to provide hunters with better access by establishing trails and to increase edge habitat and provide more food for game species. Since the construction of truck trails in the CCC days, hunting pressure on the Reforestation Areas had been on the rise. This increase in public uses coincided with an increasing deer herd, an active grouse and pheasant release program, and improving forest habitat conditions, both through natural processes and management practices. The concept of managing reforestation areas for multiple uses had been a management objective of the Department since the late 1930s and with each passing decade this concept would continue to expand and develop.

In 1947 the perception of the Reforestation Areas was beginning to change. No longer were these areas seen as submarginal, abandoned lands reclaimed with planted tree seedlings. So successful was the planting program of the previous 18 years that the reforestation areas were beginning to resemble forests again. Tree planting would still be an important objective for at least the next decade, but the additional silvicultural responsibilities emphasized with the Post War program represented an expanded role that went beyond the primary object of reforestation. As a result, in 1948 the Bureau of Reforestation was renamed the Bureau of State Forests.

The end of the 1953-1954 fiscal years marked the end of another era in State forest history. Capital Construction funds for the Post War program were exhausted, and while the Bureau only spent approximately 6 million of the 11 million dollars it originally requested, its accomplishments were impressive. Over the previous 8 years, nearly 50,000 acres of State forest were planted statewide. Almost 61,000 acres of plantations were thinned, 41,000 acres of plantations were pruned, and over 56,000 acres of natural forests received treatment. Additionally, new fire lines, water holes and truck trails were constructed and existing facilities were rehabilitated.
But 1954 also marked the beginning of an ambitious new era. A 20 year forest management plan was adopted and money was allocated to continue the plantation thinning program. A committee of District Foresters was assigned with the task of developing a statewide comprehensive forest inventory system. And a study into the feasibility of using prison labor to assist in completing the much needed silvicultural practices to help alleviate the expense of these pre-commercial thinnings was already underway. State forests had always generated income, but the cost of tree planting and pre-commercial thinnings had always far surpassed the revenue generated from the sale of forest products. Experiments were undertaken to find less expensive means of thinning plantations, including the use of chemicals and new tools and techniques for girdling cull trees.

In 1956 the first statewide forest inventory began. For the first time forest stands were mapped on aerial photography and data on individual stands were collected and compiled to provide meaningful statistics concerning the composition of the State Forests. In the fall of 1956, under a memorandum of understanding between the present day Department of Environmental Conservation and the Division of Youth in the Department of Corrections (DOCS), a minimum security prison facility was opened on State forest land in the town of Pharsalia.2 The camp was located on the former Brackel Creek CCC camp site. This facility was called Camp Pharsalia and was initially intended to employ young “boys” under the age of 21 in various conservation practices on the surrounding State forest land.

Delinquency in youth was a growing problem at the time and it was believed that the program would teach the boys, most of whom had never held a job, the value of a good days work, in healthful outdoor surroundings. Boys 16 to 21 years old convicted of minor crimes, with good records while in State institutions, and within one year of parole were given a chance to volunteer for the camp (Baker, c.1960). The value of this program was quickly realized and it was soon expanded. Three more camps were opened over the next four years, based on the Pharsalia model, including the nearby camp in Georgetown (NYS DOC, 2000).

In the early days, Camp Pharsalia was said to have taken on the look and appearance of a lumber camp (NYS DOC, 2000). This was probably not far from the truth, because with a new workforce at hand, forestry work on the surrounding State forest lands was actively renewed. In addition to continuing much of the same work done by the CCC camp, Camp Pharsalia also became an active sawmill and timber treatment facility for timber harvested from the State forests for use in the construction and maintenance of Conservation and Corrections’ facilities. (A temporary sawmill was replaced with a permanent structure built at the camp in 1964. The timber treatment facility was constructed earlier, circa 1960.) The Camp also harvested and burned firewood to heat the facilities at the camp, and continues to do so today. Over time, the facility grew from 50 inmates when it was established to a peak of 258 inmates in the year 2000. Additionally, the age restriction of 21 was eventually increased to 25, then 35, and finally removed altogether. Naturally, with these types of changes to the system, the purpose of Camp Pharsalia had to evolve. With the increase in the camp size, extra crews became

2 The property is owned by the NYSDEC, but operated by NYSDOC. The program is authorized by ECL 9-0105(14).
available to take on new roles and responsibilities. As a result, community service projects became an equally important role of the Camp.

Camp Pharsalia came along at a time in history when interest in the multiple use of State owned lands was undergoing a revival, and camp inmates played a large role in making some of these projects a reality. In the late 1950s and early 1960s various programs were undertaken to improve recreation, hunting and wildlife habitat on the State Forests. In 1957 a pilot program was begun “to demonstrate the practical and highly desirable application of wildlife habitat improvement on Reforestation Areas” (Conservation Department, 1957). Chenango RA # 24 was the focus of projects that included the impoundment of 5 wildlife ponds, reconstruction of a town road to improve access for hunters, clear cutting quarter- and half-acre blocks of inferior hardwoods to provide sprout growth and herbaceous ground cover, and specialized improvement cuts in 50 acres of hardwoods to create additional browse for wildlife.

Most notable of the multiple use programs, perhaps, was the establishment of the Bowman Lake campsite project which originally began as a Bureau of State Forest project in 1958. Camp Pharsalia, once again, played an important role in the construction of this facility. After having been expanded to an 80-man capacity in 1960, the Camp contributed 11,360 man days of labor from 1960-1961 towards the completion of the campground. Although originally intended to provide “multiple use” opportunities on State Forest lands, the campsite and a considerable amount of State Forest land, 631 acres in all, was transferred from the Bureau of State Forests to the New York State Parks and Recreation Commission to create Bowman Lake State Park.

Another significant multiple use project undertaken on New Michigan State Forest in the mid-1960s was the development of a horse trail system. The trail was developed in 1967, shortly after the trail system in Brookfield was established. Located primarily on Chenango RA # 24 on the eastern side of the forest, the loop trail followed an approximately 20 mile circuit from Coy Street in Pharsalia to Blackman Road in Plymouth. However, unlike the 100 mile trail system constructed in Brookfield, this trail met with limited success and it was not in service very long due to lack of interest from equestrians. As early as 1976 the trail was converted into a snowmobile trail.

In the early 1980s a new motorized user group emerged and the abandoned horse trail was transformed into an ATV and motocross trail, circa 1982. But just like the horse trail, motorized use of the trail was short-lived, and the trail was closed to off-road vehicles in 1988 due to excessive mud holes, erosion, lack of funds for trail maintenance, and its general inability to satisfy the user’s demands of a longer trail system. The trail continued on as a snowmobile trail until its catastrophic closure in 1998 when a natural disaster struck the forest.

In the late 1980s the evolution of the multiple use philosophy led to a statewide planning initiative. All State land would be divided into management units and each unit would have a management plan reviewed by the public to guide all management activities. The sixty-seven
forests managed by the Sherburne sub-office of Lands and Forests were divided into 15 management units. Work began on the first plan in 1987 and it was completed in 1990. The Pharsalia Woods Unit Management Plan is the last of the management plans in the Sherburne district to be completed and revisions of some of the earliest plans are now underway.

In addition to the many multiple use projects that began in the 1960s, commercial pulpwood from the plantations on local State Forests was being harvested for the first time. Until this time, all of the work in the plantations had been pre-commercial improvement thinnings to increase the growth rate of the trees or pruning trees to improve quality. However, by 1960 the first of the plantations were turning 30 years old and ready for thinning again. Fortunately, the paper industry in the North Country was in search of pulpwood to feed its mills and a new local mill was planning to build log homes from red pine trees. One thing was certain; there would be no shortage of trees. By 1965, the State had planted 343,600,000 seedlings on 303,295 acres of State forest land since the reforestation effort began in 1929 (Conservation Department, 1965).

The pulp market developed slowly at first, and in the beginning, a pulpwood buyer could even pay for Camp Pharsalia inmates to fell trees or to haul and stack the wood roadside, or both. But by the end of the decade pulpwood harvesting was in full swing. A new industry had been born and the local economy soon benefitted from the new source of employment and income. Pulpwood buyers and local loggers organized logging crews and bought wood in 50, 100, 1000 cord lots, or whatever they could manage, for as little as $1 per cord. Firewood, fence posts, hardwood and hemlock sawtimber, and even the occasional Christmas tree were also being sold at this time.

By the beginning of the 1970s the pulpwood market was booming with no end in sight. There was a job in the woods for any man that wanted it. This of course would change with time, but not before a couple decades would pass. In the meantime, with the value of pulp and timber ever increasing, a new statewide system was adopted for selling timber sales. Larger, more valuable sawtimber revenue timber sales were competitively bid to ensure that the State was receiving fair market value for its timber.

Technological advances in the forest industry and changes in industry regulations eventually led to the closure of the timber treatment facility at Camp Pharsalia in 1977. The use of sawmill came to a close in the late 1990's due to safety issues with the old circular headsaw. Maturing plantations and restrictions on the type of tools that the inmates were allowed to use for safety reasons also changed the camp inmates’ responsibilities in the woods. While crews still worked on timber stand improvement thinnings using crosscut saws and axes during the winter months, they spend most of the rest of the year maintaining Department facilities, roads and trails on State forests throughout the county. At the time of the camps closure, two crews were responsible for the maintenance and operation of Camp Pharsalia and the rest were split between community service projects and Department projects.
Pulpwood sales continued to be sold at fixed prices until 1984 when, despite the complaints of most of the loggers involved, public auctions for pulpwood were held for the first time. The auction system came about because the demand for pulp had outpaced the rate at which the foresters could mark the woodlots and competition in the industry was driving up the price. Eventually the public auctions were replaced with sealed written bids, in the same manner as the hardwood timber sales are sold. The softwood pulp market continued on strong until the mid-1990s when, in 1996, the first of the paper mills closed. The paper industry in upstate New York collapsed quickly and by 2001 the local softwood pulp industry had seen its last day. Today, local pulpwood is still purchased in limited quantities by select mills in New York, Pennsylvania, and Vermont.

During the pulpwood days, the forestry industry underwent significant change. Forestry work became an increasingly specialized and mechanized profession carried out by fewer and fewer individuals. Technological improvements have increased the productivity and safety of the loggers while decreasing the number of loggers needed per crew. What used to take a crew of five loggers with chainsaws and tractors to do in a month, a crew of two can accomplish in a week with cut-to-length feller-bunchers, forwarders and skidders.

While the forestry industry was changing, the forest itself also underwent a dramatic change. On May 31, 1998 a supercell thunderstorm passed over the towns of Pharsalia and Plymouth, spawning a very powerful EF2 tornado which carved a swath of destruction on Pharsalia Woods State Forest from Fred Stewart Road to Plymouth Reservoir. Just as a short drive down the Nine Mile Trail can provide an appreciation of the conservation work accomplished by the CCC and Camp Pharsalia work crews, it also provides an excellent example of the awe, power, and resilience of nature.

After cresting the hill heading east from Fred Steward Road, the EF2 tornado followed a path seemingly down the middle of Nine Mile Trail until it reached Plymouth Reservoir where it veered off onto private land and sputtered out shortly thereafter, narrowly missing the homes surrounding the reservoir. Nearly 700 acres of State forest were impacted by the tornado and supercell thunderstorm, with most of that area completely flattened. Trees were uprooted, snapped in half, twisted, torn, shattered, and splintered. Nine Mile Trail was completely blocked and almost unidentifiable in places. Trees were strewn upon each other in matchstick piles over 10 feet high.

Cleanup and salvage cutting began almost immediately. Salvage harvesting of varying intensities were conducted within much of the blowdown areas. Whenever possible, trees that survived the storm as well as standing dead trees, known as snags, were left behind for the value they provide as wildlife habitat. Approximately 100 acres were not salvaged due to sensitive wetland soils, low value timber, and for the purpose of retaining controls for comparative studies in the future. Salvage operations generated approximately one million dollars in timber sales revenue for New York State and were completed in October 1999.
More than a decade later, a new forest is beginning to take shape. Where once there was vast destruction, the next generation of forest is now growing. While some of the forest was replanted, less than 50 acres in all, the majority of the area disturbed by the tornado was left for nature to reclaim on its own. Sun loving early successional species, especially pin cherry, aspen, and blackberries and raspberries grow abundantly. Gradually, as natural forest succession progresses, trees such as black cherry, red maple, and sugar maple will take over the forest canopy. Eventually, foresters will decide to step in and manage the forest, but for now, nature will guide the way.

But just as one wound had begun to heal, another scar on the landscape took shape during the middle of the night on April 28, 2011. At 3am a tornado touched down on county Route 7 in the town of Pharsalia. The storm intensified as it moved northeast, crossing county Route 10 and heading into the heart of Pharsalia Woods State Forest. The EF2 tornado reached maximum intensity as it approached North Road, crossing Nine Mile truck trail, and headed towards Fred Stewart and Center Roads. After demolishing a two story barn and a house trailer and ripping the siding off the side of a house on Center Road, the tornado began to slacken as it went down the hill towards State Hwy 23. Here another house received significant damage before the tornado continued up the next hill to Pigeon Hill Road where it finally dissipated at 3:15am after having travelled a distance of nearly 8 miles (NOAA, 2011).

This tornado was 1 of 5 tornados on April 28th in NY and the strongest of 3 in Chenango County. Between April 26th and April 29th there were 9 tornados in NY, a small part of a larger outbreak that produced 353 tornados in 22 states (Wikipedia, 2011). In its wake, the tornado left behind sea of broken trees up to a quarter mile wide. Approximately 250 acres of State forest were damaged by the storm. Some of the forest’s signature spruce stands along North Road were leveled as well as large blocks of interior hardwood forest.

Once again work began immediately to assess the damage and develop a plan to salvage the timber. Sale of the storm damaged timber generated nearly five hundred thousand dollars for the State Forest program. However, the focus of the salvage effort would not only be on recovering the monetary value of the timber, but also on the retention of snags and woody debris for wildlife habitat and establishing buffers from harvesting to protect water quality for wetlands and riparian areas, which included headwaters tributaries of Genegantslet Creek. The majority of the salvage harvesting was completed by winter, with the rest of the cleanup wrapping up the following spring. And while some areas have been replanted (less than 10 acres in all), primarily for aesthetic reasons, the majority of the area will be left to follow the path of natural forest succession.

The tornado was only on the ground for 15 minutes, but in that time it made dramatic changes to the forested landscape of Pharsalia Woods. The dark shade of the deep woods was abruptly replaced by the warmth of life giving sunlight. This sudden burst of light has awakened seeds stored in the soil, some of which may have been waiting for a hundred years or more. From
these small seeds new life will emerge, and along with the surviving seedlings and saplings, a new forest will grow. What we commonly refer to as devastation and destruction is merely an unexpected opportunity for renewal. Much like the 1998 tornado, watching the re-growth of this forest will serve as reminder of the resiliency of nature for years to come. See the Appendix for a map depicting the impact areas for each of these tornadoes.

With the completion of the second tornado salvage operation, forest management returns to the management recommendations set forth in this plan. The completion of this plan will mark the beginning of a new era of forest management on the Unit. It will be an era of transition and change within the forest. Many of the aging plantations will be replaced with the native hardwoods or second generation spruce seedlings growing beneath them. Meanwhile, hardwood stands will continue to mature, growing some of highest quality sawtimber available in the area. Some of these stands will be actively managed while others will be set aside to provide undisturbed mature forest habitat which is largely missing from the landscape.

And while a new era of forest management is set to begin, it is the end of an era at Camp Pharsalia. The Camp was finally closed in 2009. Several attempts in prior years to close the facility were successfully abandoned due to the overwhelming outcry and support from the local community. The positive social and economic impacts that the Camp provided the community over the years had a key role in keeping the facility operational. However, the State budget crisis and a changing philosophy at the Department of Corrections combined with the current trends in declining inmate populations across the State ultimately brought closure to the aging facility. At present, the Department of Corrections has vacated and winterized the facility and turned it over to the Department of Environmental Conservation. The Department plans to surplus the Camp and the 20 acres that it occupies and the State will seek new occupants for the facility.

From the very beginning, the site of Camp Pharsalia has been used to promote and advance forest conservation for the betterment of the surrounding community. Throughout the years the Norway spruce trees that surround Camp Pharsalia have been carefully tended into a magnificent mature plantation. Today there is much uncertainty surrounding the future of the Camp, but perhaps the tradition of conservation will again find new purpose in the shadow of the spruce trees that stand as a symbol of the hard work and accomplishments of this country’s earliest conservationists.

The heyday of large conservation projects has long since passed, but the legacy of the CCC and the New Deal are not forgotten. Today there are over 770,000 acres of State Forest land throughout the State. The use of these lands for a variety of purposes such as timber production, hiking, skiing, fishing, trapping and hunting is of tremendous importance economically and to the health and well-being of the people of the State. The Pharsalia Woods is a small, but important piece of the puzzle that will continue to serve as a model for sustainable forest management and conservation in New York State.


**B. Geography**

The Pharsalia Woods Unit Management Area is located in northwestern Chenango County, New York. The topography of the Unit and the surrounding area is one of rolling hills, broad flat hilltops, and ridges with narrow valleys and small creeks and streams. The landscape is dotted with dairy farms, pasture land, and hay fields. The predominant feature of the landscape is the forest land. This quickly becomes apparent when looking at aerial photography or driving on some of the town roads. Stretching out east-west across the hilltops and plateau, from the Otselic River Valley to the Chenango River Valley, State forest land is never far from one's view.

The Pharsalia Woods Unit sits atop the Allegheny plateau at the upper reaches of the Chesapeake Bay Watershed. The origin of many of the numerous tributaries on the Unit can be traced to springs on or near State forest land, including Fly Meadow Creek and Genegantslet Creek, a renowned trout stream. These two creeks are just a small part of the greater watershed system that collects and drains water from the Unit. Different areas within the Unit contribute to the Otselic River watershed, the Canasawacta Creek Watershed, and the Genegantslet Creek Watershed. All of these watersheds contribute to the Chenango River watershed, which of course, is also part of a much larger system. The Chenango River joins the Susquehanna River, which in turn flows into the Chesapeake Bay, where ultimately all the water drains into the Atlantic Ocean. More information about the Chenango River Watershed or any other watershed can be obtained from the EPA [http://www.epa.gov/surf](http://www.epa.gov/surf).

The town of Pharsalia lies at the heart of the Unit, containing a majority of the State forest land holdings of the Unit. Pharsalia is also home to the Pharsalia Wildlife Management Area (WMA) which is not included in this State forest management plan, but plays an important role in the landscape of the “Pharsalia Woods.” The towns of Plymouth and Pitcher also have a significant amount of State forest land within the Unit. Only a small area of this Unit is within the Town of Otselic. The rest of the State forest land in Otselic is part of the Northern Chenango Highlands Management Unit. The distribution of State forest acres in the Unit is listed in Table 2.
Table 2. List of State forest lands in the Unit by towns and acres.

<table>
<thead>
<tr>
<th>State Forest Name</th>
<th>State Reforestation Number</th>
<th>Town(s)</th>
<th>Total Number of Acres</th>
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<td>Chenango 5</td>
<td>Pharsalia</td>
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<td></td>
<td></td>
<td>Plymouth</td>
<td>165.3</td>
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<td>Pitcher Springs State Forest</td>
<td>Chenango 16</td>
<td>Pitcher</td>
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<tr>
<td></td>
<td></td>
<td>Pharsalia</td>
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<td>Chenango 22</td>
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<td></td>
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<td>Total</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>13,630.45</td>
</tr>
</tbody>
</table>

The landscape did not always appear as it does today. When the first European settlers began immigrating into Chenango County in the latter part of the 18th century, they relied on the forest as their source of income. Whether milled into lumber or burned for potash, forests far and wide were chopped to the ground. The settlers soon turned to agriculture and raising livestock to make a living, but many found farming a formidable task. By the turn of the 20th century, agriculture and dairy farming had already peaked, and industrialization was beginning to take hold. Unproductive farms were soon abandoned as more fertile land became available on the western frontier and more prosperous jobs became available in towns and cities across the county and state.

The rate of land abandonment accelerated during the Great Depression when many farms went bankrupt. It is no coincidence that the northwestern corner of Chenango County has one of the highest concentrations of State land outside of the Adirondacks and the Catskills. The town of Pharsalia had one of the highest rates of land abandonment in the county, was the focus of early land abandonment studies, and later the location of two CCC camps. Numerous local and state agencies and town officials saw a need to address the issue of land abandonment and eventually reforestation was determined to be the most appropriate solution.

Prior to the beginning of land abandonment, the 1845 Census shows the population of Pharsalia at 1,209 residents, Pitcher at 1,501, Plymouth 1,476, and Otselic at 1,483 residents. The population of the County at that time was 39,900. By contrast, the 2000 Census figures shows the town of Pharsalia had 542 residents, 8 fewer residents than it had in 1814, only eight years after the town was founded (Allen, 1929). Also in the 2000 Census, Pitcher had 848 residents, Plymouth had 2,049, and Otselic had 1,001 residents. The population of the county in 2000 was 51,401 residents. Although the population of Chenango County has increased every decade since the Second World War, the populations of Pharsalia, Pitcher, and Otselic have decreased precipitously over that same time period. In other words, even though the population of Chenango County has grown by approximately 29% since 1845, the towns of Pharsalia, Pitcher,
and Otselic have shown population decreases of 55.2%, 43.5%, and 32.5%, respectively. Of the four towns in the Unit, only the town of Plymouth has grown since 1845, up 28% to 2,049 residents in 2000. This population growth is certainly related to its proximity to Norwich.

The City of Norwich resides less than a mile from the eastern-most section of the Unit. While Norwich is a small city by any comparison, it is the economic and population center of Chenango County, as well as the county seat. In the 2000 census, the city of Norwich accounted for 7,355 residents and the town of Norwich accounts for another 3,836 residents. Together they account for almost 22% of the county’s population. Nonetheless, with few influences from urban areas outside of the county, Chenango County remains largely rural.

Small hamlets and crossroad communities with a strong agricultural heritage such as Plymouth and South Plymouth, Beaver Meadow, East Pharsalia, South Otselic, and Pitcher are the types of communities located near the Unit. State Highways 23 and 26 and County Routes 10, 16, and 42 are the primary travel corridors in the Unit. Numerous paved and unpaved town roads connect the state and county routes. Many of the town roads which pass through the Unit are seasonal roads which are not maintained during the winter months.

There are signs that some of the rural character of the area is beginning to change. Commercial development near Norwich is expanding and interest in living in the Chenango County area has noticeably increased since the September 11, 2001 attack on the World Trade Center. The desire to escape the hustle and bustle of urban life combined with the ever increasing cost of living downstate makes it is easy to understand why many would choose to move to more affordable communities upstate. As a result, land values have increased and subdivision of farms and woodlots for new homes, vacation homes, and hunting camps, has become worrisome to many local people. This type of new development is often seen near State forests and is nearly always advertised as such.

C. Cultural Resources

A search of the State and National Registers of Historic Places GIS Database revealed that there are no properties ‘significant in the history, architecture and archeology of the state and nation’ present on State forest land within the Unit. Additionally, a search of the Archeological Sensitivity GIS Database, which defines areas within the state where the discovery of archeological sites is predicted, did not produce any sites known to be on State forest land; however, a number of archaeological sites were found near or adjacent to State land. More information about these databases can be obtained from the New York State Historic Preservation Office at http://www.oprhp.state.ny.us/nr.

Although there are no documented archaeological sites on the State forest land, there are many other cultural features to be found. One of the most visible signs of the region’s pioneering ancestors is the cemeteries where they remain. There are six abandoned family cemeteries
documented on State forest land in the Unit. They are: Bosworth, Brown, Neff, Perry, Vroman, and White.³ These cemeteries are in various state of repair, and some of them are cared for by an unknown number of anonymous volunteers.

Walking through State land, it is hard to find a place where signs of human disturbance cannot be witnessed: old foundation sites, junk piles, rusted-out sugar maple buckets and milk pails, stone walls, and hedgerows with broken barbed-wire fences. All these features provide us clues to the past use of the land. Indeed, artifacts like these represent a direct and important cultural link to our ancestors. As part of the forest inventory process, foresters record and map the presence of features such as old foundations to ensure that they will not be disturbed by management activities. To date, seventy-three sites with varying degrees of historical significance have been identified on State forest land in the Unit.

Recently, the existence of a nearly forgotten, long abandoned community located on what is now State land was brought to light by local historian Donald Windsor. This short-lived settlement, known as Perrytown, was never documented on any map of its time. The town was located about one-half mile south of Plymouth Reservoir along an unnamed creek next to a hemlock swamp. According to Windsor’s research, Perrytown was established circa 1859 and persisted until 1921 when last remaining resident died. All of the surrounding land was eventually sold to the State during the Great Depression.

Perrytown was named for the owner of a steam powered sawmill, one of at least a half dozen buildings located there. There was also a blacksmith’s shop near the sawmill. From information obtained in interviews with ancestors of residents, Windsor believes that there were between two and four dozen residents living in Perrytown at its height. Residents of Perrytown likely associated with the residents of Reservoir Hill Road as well as the numerous residents who lived on the now abandoned Frenchman’s Road to the south of Perrytown. At the time there was likely a road that traveled south from Cottage Lane to Perrytown, possibly connecting with Frenchman’s Road. This is in the same area that was devastated by the 1998 tornado and today the path is blocked with fallen trees and the nearly impenetrable growth of blackberry briars, making Perrytown a difficult place to find, let alone visit.

Another historical feature that is more easily visible to most visitors of the forest is the fire wells, or water holes, that were built by the CCC alongside the Nine Mile Trail running through New Michigan State Forest. The fire wells also are present on other forests, but are most easily observed on New Michigan. As their name implies, these water holes were constructed to help fight any fires that might start on the forest and were an integral part of the fire control program at the time.

³ Much more detailed information is available on these cemeteries and can be easily researched in the History Room at the Guernsey Memorial Library in Norwich. An excellent way to begin your research is with the publication Chenango County Cemeteries, compiled by Nelson B. Tiffany in 1991.
When the fire wells were constructed, the forests were newly planted and probably more closely resembled overgrown pastures or enormous Christmas tree plantations. Because of this, there was great fear that a fire would sweep across the forest and destroy the millions of seedlings that were planted. As a result fire wells were constructed at somewhat regular intervals along the road where small streams crossed. The holes and diversion ditches were dug by hand and carefully lined with stones by CCC workers. When completed the stream flowed both in its natural course and through the water hole, maintaining a constant source of water for buckets or pumps that was easily accessible from the road.

Luckily, the fire wells were never needed for any large conflagrations, but they did serve at least one other purpose. In the mid-1960s, long after the threat of devastating fires had passed, the fire wells became “water holes” on the 20 mile horse-trail system that was developed in New Michigan State Forest. Some of the water holes became rest stops along the horse trail for the riders to bring their horses. The horse trail was short lived, however, and today the fire wells remain as an artifact of our heritage.

But perhaps the most important artifact of our heritage is the forest itself. Not only is it one of the area’s most important natural resources, it is also a viable cultural resource. The forest we see today is a result of human interaction with nature. The present forest conditions directly reflect the dynamic influence humans have had and continue to have on the natural ecological and biological processes.

Recognizing the interactions humans have had with the land, understanding their effects on individual forest stands, and identifying the pattern in which they emerge on the landscape, reveals a forest that has changed and adapted according to the demands placed on it by society. In many ways, understanding the history of land use on a particular property is a valuable guide for managing its current use.

While less experienced eyes may look into the woods and see a pristine, natural forest, an experienced forester, biologist, or local historian may see something very different. Is the woodlot a plantation or is it natural hardwoods? If it is hardwoods, what types of trees are present? Are they early successional species or late successional species? How big are the trees? How old are the trees? Is the stand even-aged or uneven-aged? Has the woodlot been harvested before? Was the ground ever cultivated or pastured? Or has it always been forested? If so, what type of shrubs and wildflowers are in the understory? Or, have the deer eaten everything?

These are the types of questions that foresters seek to answer when managing a woodlot, or in this case, thousands of acres of State forest. On a larger scale, what demands are users placing on State forests? How is the use of State forests being constrained? And by whom or by what?
What is the vision for the future of these lands? What goals and objectives are necessary to uphold this vision? Later sections of this management plan will address questions like these and set forth specific management actions to guide the future use of State land in the Pharsalia Woods Unit.

D. Geology

Surface Geology

Most surface geology in the region covering Chenango County 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 years ago, leaving behind numerous sedimentary deposits and surficial features. Perhaps the most recognizable of these surficial features are the elongate scours that are now filled with water and known to us as the Finger Lakes.

Most soils and sediments in the region are related to past glacial activity and subsequent weathering and erosion processes over the last 20,000 years. The underlying parent rocks (rocks that were subjected to the processes of glaciation, weathering and erosion) of this region are sedimentary rocks; specifically shale, sandstone and minor limestone that were deposited in shallow seas that existed in this region during the Devonian Period of the Paleozoic Era, approximately 370 million years ago. Any post Devonian rocks have been eroded from the region. In addition, the presence of rounded igneous and metamorphic clasts is indicative of past glacial activity transporting material into the region from the Canadian Shield to the north.

The resulting surface geology of the Pharsalia Woods Management Unit includes glacial till as the dominant deposit in the area. It is located extensively throughout the area, with exceptions being topographically low areas and escarpments subjected to erosion. Devonian age bedrock outcrops and subcrops of Devonian shale, siltstones, sandstones and minor limestones from the Geneses, Sonya, and West Falls Groups were deposited during the Upper Devonian Period (approximately 350 - 400 million years ago). Most likely due to the erosion of overlying glacial till, causing the exposure of the bedrock, these outcrops are located intermittently on the flanks and crests of ridges and hills in a general east-west trend across Chenango County. Kame and moraine deposits of sand and gravel are located intermittently in topographically low areas, and are the result of glacial meltwater fluvial systems. Lacustrine sediments have filled the low areas of the valley areas and recent alluvium deposits and swamp deposits have accumulated in recent topographical depressions.
Bedrock Geology

The surficial geology of Chenango County is underlain by bedrock that includes igneous and metamorphic Pre-Cambrian Era rocks. These rocks are generally referred to as basement rocks and are found at depths greater than 5,000 feet. Overlying these igneous and metamorphic rocks are sedimentary rocks deposited during the Cambrian Period over 500 million years ago, and are comprised of primarily sandstones and shales.

Following the Cambrian Period was the Ordovician Period, and deposition of limestones, dolomites and shales in warm, shallow, and relatively open marine seas that occupied this region 435 - 500 million years ago. Pre Cambrian, Cambrian and Ordovician rocks are only located in the subsurface of Chenango County, that is, they never are exposed at the ground’s surface in the county. There has been recent interest in the Ordovician limestones and dolomites, due to significant natural gas production from similar age rocks in various counties to the north and southwest of the Pharsalia Woods Unit.

Overlying the Ordovician age sedimentary rocks are sedimentary rocks deposited during the Silurian Period. The Silurian age rocks are comprised of primarily evaporites (gypsum, anhydrite and salt) and shales with some limestones and dolomites. These rocks are considered to have been deposited 400 to 435 million years ago in more restrictive marine seas than the overlying Ordovician age rocks. Following the Silurian Period, the Devonian Period (from 345 to 435 million years ago) resulted in the deposition of sedimentary rocks comprised primarily of shales with some limestones and dolomites interbedded. Devonian age rocks are the youngest bedrock located in the Pharsalia Woods area. Younger rocks such as Mississippian and Pennsylvanian age rocks were either not deposited in the area or were subsequently eroded by other natural events such as glaciations and/or erosion.

Further geological information of the region is provided by:


There are three general soils map units found on State forest land in the Pharsalia Woods Unit. The two most widespread map units, Volusia-Mardin-Lordstown and Mardin-Lordstown-Volusia, are uplands soils and are similar in composition. The third general soil map unit is Bath-Valois-Chenango. This soil unit is typically found on valley sides and valley floors and is less common on State forest land.

General soil map units, as opposed to individual soil series, represent broad areas of land with similar features in the landscape. These mapping units are meant to compare large areas of land for general uses and are not designed for making decisions about specific management activities. Specific management activities on State forest land will be evaluated on a case by case basis using the detailed soil series maps. The general soil map units are named for the three major soil series found within that mapping unit.

The Volusia-Mardin-Lordstown soil map unit is the most common found in the management unit. Nearly all of the State forest land south of State Highway 23 in the Pharsalia Woods management area falls within this soil unit and, not surprisingly, most areas of this soil map unit are forested. Volusia-Mardin-Lordstown is found in a landscape of rolling ridges, hills, and hilltops and is comprised of soils formed in glacial till over a bed of sandstone, siltstone, and shale. Volusia soils are generally found on the hilltops and lower slopes of ridges and hills and are somewhat poorly drained and deep. These soils are characterized by a fragipan, or a firm layer of subsoil also known as a hardpan, that results in a seasonally high water table. These soils are susceptible to damage from vehicle and equipment use during wet periods and are unsuitable for many management activities. Mardin soils are typically found on the mid- and upper slopes of ridges and hilltops and are moderately well drained and deep. Mardin soils are usually adjacent to Volusia soils and also have a fragipan, but are higher on the slope than Volusia soils and receive fewer run-offs and therefore have fewer limitations. Lordstown soils are generally found on upper slopes and hilltops and are moderately deep and well drained. Lordstown soils do not have the fragipan found in the Volusia and Mardin soils and, as a result, these soils have the least severe management restrictions.

The Mardin-Lordstown-Volusia general soil map unit is the second most common soil unit in the management area. The majority of State forest land north of State Highway 23 in the Pharsalia Woods management area can be classified in this Unit. The landscape here is a rolling upland intersected by narrow valleys and is comprised of soils formed in glacial till derived from brown or gray shale and sandstone. The major soils in this unit are the same as in the unit described above, but occur in different proportions and in slightly different positions in the landscape. Most of the land area in this soil unit is used for dairy farming except the steep or poorly drained areas are typically forested.

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The Bath-Valois-Chenango general soil map unit represents a minor component of State forest land area in the Pharsalia Woods Unit. This soil unit is found in the Canasawacta Creek valley floor, generally following the State Highway 23 and County Route 16 corridors and is limited to the undulating valley floor, valley sides, and its foot slopes. These soils were formed in glacial till and glacial outwash deposits from siltstone, sandstone, and shale, and are generally well drained. Most of the land area in this soil unit is used for dairy farming, though this soil is also well suited for development and recreation. Only the steeper upland areas of this soil unit are typically wooded.

Understanding the capabilities and limitations of different soil types is an important aspect of making many natural resources management decisions. The soils in the Pharsalia Woods Unit can be characterized by their common limitations, including: low fertility, high acidity, and risk of erosion, especially in steep areas. Other widespread limitations include: high water table, shallow depth to bedrock, and the presence of a fragipan. Knowledge of these limitations provides insight into the history of land use in this area and provides reasoning behind the current land use patterns. Likewise, knowledge of these limitations will provide the foundation for many of the management decisions made on State forest land in this Unit.

**F. Land Classification And Stages Within The Unit**

The following table describes the current land on the Unit.

**Table 3. Present Land Classification, Acreage and Size Class Distribution**

<table>
<thead>
<tr>
<th>Land Class *</th>
<th>Acres</th>
<th>Acres by DBH Class</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1&quot;-5&quot;</td>
<td>6&quot;-11&quot;</td>
</tr>
<tr>
<td>Roads &amp; Developed Areas</td>
<td>236</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quarries</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Land</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shrub Land</td>
<td>58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open/Shrub Wetlands</td>
<td>348</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forest Wetlands</td>
<td>1581</td>
<td>57</td>
<td>931</td>
</tr>
<tr>
<td>Mixed Hdwd/Natural Conifer</td>
<td>852</td>
<td>100</td>
<td>137</td>
</tr>
<tr>
<td>Natural Hardwood</td>
<td>5593</td>
<td>833</td>
<td>1269</td>
</tr>
<tr>
<td>Conifer Plantation</td>
<td>4946</td>
<td>113</td>
<td>1170</td>
</tr>
<tr>
<td>Total Acres</td>
<td>13,630</td>
<td>1103</td>
<td>3507</td>
</tr>
<tr>
<td>% of Total Forested Area</td>
<td>9%</td>
<td>27%</td>
<td>64%</td>
</tr>
</tbody>
</table>
The data in the table above was compiled from State forest inventory records. Summed figures may not equal listed totals due to rounding of digits.

The Land Class categories listed in Table 3 are described below:

Roads & developed areas include the Nine Mile Trail on Chenango RA # 5 & 24 and portions of town roads owned by the State (198 acres) and the non-forested, developed areas on Chenango RA # 5 currently occupied by the Department of Corrections Camp Pharsalia and the Department's Division of Operations.

Quarries include an old historic shale pit on Chenango RA # 22, the gravel pit on Chenango RA # 5 and a shale pit on Chenango RA # 24.

**Open lands** are essentially treeless and contain a mix of grasses and **forbes** growing on **sites** that are not wetlands. These open lands are small areas, generally less than two acres in size, and are scattered across the Unit. Most of them have been created as a result of heavy human disturbance, e.g.: **log landings**, old shale or gravel pits and road shoulders, etc.

**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.

**Open/shrub wetlands** include open wet meadows, areas dominated by alders or other shrub species on wetland sites and two beaver ponds. Scattered trees may be mixed with the shrubs.

**Forest wetlands** typically consist of eastern hemlock, red maple, and yellow birch along with a varying mix of other tree species. They are commonly found in shallow depressions on the landscape and often contain **vernal pools**.

**Mixed natural hardwood/natural conifer** stands are comprised of at least 10% native conifers (eastern white pine, eastern hemlock, balsam fir, or red spruce) in a mixture with hardwoods.

**Natural hardwoods** consist of areas comprised entirely or nearly entirely of hardwood tree species. Typical hardwoods found on the Unit include red maple, sugar maple, American beech, white ash, black cherry, and aspen species.

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

As the above table shows, the forests on the Unit are dominated by pole (6"-11") and saw timber (12"+) size trees. In comparison, only 1,103 acres (9%) of the forested area on the Unit are in
seedling/sapling sized trees, 1"-5" in diameter. Over half (62%) of the seedling/sapling acres are from the 1998 and 2011 tornadoes on Chenango RA # 5 & 24 which resulted in 460 acres and 225 acres respectively of young seedling or sapling size forest cover. The table also indicates the relatively high percentage (15%) of wetlands and the scarcity of open land (<1%) within the forests on the Unit. Early-successional habitat consisting of open or shrub lands combined with seedling or sapling size forested areas comprise 1,518 acres or 11% of the unit.

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

### G. Forest resources

The forests on the Unit have been shaped by a number of influences. One of the most significant was the initial agricultural land clearing, farming, and subsequent tree planting on open lands following State acquisition. This established a landscape pattern of plantations and natural forest areas. The soils on these plantation areas were also altered and often diminished as a result of the farming activities. Beech-bark disease and Dutch Elm disease have greatly reduced the proportion of large beech and elm on the Unit. Seven decades of State ownership has influenced the sizes of trees on the Unit as well as their species composition. For example, short-lived pioneer species such as aspen have declined and been replaced by maples. White-tail deer also shape the species composition of the forest. Current white-tail deer populations are at high enough levels to significantly limit the ability of maple and ash seedlings to grow in some areas due to repeated heavy browsing. Forest thinning, tending and harvesting activities by the Department have also shaped the species composition and quality of the forests.

Nearly all (95%) of the Unit is in forested with trees ranging from seedling/sapling to large, mature sawtimber. These forested areas consist of a mix of native hardwoods and softwoods and conifer plantations. Conifer plantations comprise 4,946 acres (36%) of the Unit. About 67% of these plantations were established in the 1930s. These plantations consist primarily of red pine, Norway spruce and white spruce with many plantations containing mixed species. Based upon the primary species in the stand, there are approximately 1,511 acres of red pine, 2,558 acres of Norway spruce and 505 acres of white spruce. Other conifers planted in lesser quantities include European larch, Japanese larch, white pine, scotch pine, Austrian pine, jack pine and pitch pine.

The conifer plantations were established on former agricultural lands having varying soil conditions. Norway spruce has proven to be very adaptable and grows well on the Mardin-Volusia-Lordstown soils found on most of the Unit. Norway spruce also has demonstrated the ability to naturally regenerate following thinning as carpets of spruce seedlings develop from the previous year’s seed cone crop.
Red pine is less well adapted to these soils and grows best on better drained Lordstown soils. When planted on shallow soils, red pine is vulnerable to blowdown during wind storms. While red pine has grown well on many sites for several decades, the plantations have mostly reached maturity as the growth rate has become minimal and the trees show little increased growth response after repeated thinnings. In addition, red pine requires exposed mineral soil and full sunlight to regenerate. Therefore, it rarely regenerates except in occasional spots after a complete removal of the overstory trees.

The Unit contains over 4,400 acres of plantations established in the 1930s (3,288 acres) or 1940s (1,118 acres). These plantations, composed mostly of Norway spruce or red pine, are now at or near maturity. At this point, the Norway spruce plantations have not declined in growth rate. The red pine stands are becoming increasingly vulnerable to collapse from wind, ice and/or heavy snow storms. As these trees continue to age, their vigor is declining and they are approaching the limits of their biological growth as allowed by their site locations. Trees with low vigor can become stressed and increasingly vulnerable to dying from insect, disease, drought or other mortality agents. Furthermore, many of the plantations are monocultures which are very vulnerable to widespread attack from invasive insects and diseases. Given the current trends of growing numbers of damaging invasive species coming to the United States and the frequency of severe storms, the plantations on the Unit are becoming increasingly vulnerable to wide scale mortality.

The native forests on the Unit are of primarily the northern hardwood forest type composed of varying mixtures of red maple, hard maple, black cherry, white ash, and American beech. Native species that are less common include aspen (quaking and big-tooth), basswood, yellow birch, balsam fir, white pine, red oak, red spruce and white cedar. Some tree species never attain a size large enough to occupy the main overstory canopy or become merchantable. These include serviceberry, eastern hop hornbeam, striped maple and hornbeam.

The native conifers on the Unit including eastern hemlock, white pine, balsam fir and red spruce are often found on the wetter sites. Hemlock frequently grows in poorly drained depressions or along stream corridors. Red spruce and balsam fir occur in scattered locations. Large diameter white pine can be found growing along the perimeter of sizeable wetlands.

A unique feature on the Unit is the large swath of forest on Pharsalia Woods State Forest, Chenango RA # 5 & 24 which was impacted by a tornado on May 31st, 1998. The tornado impacted approximately 700 acres of the 9,155 acre forest. The tornado originated near the intersection of Stewart Road and Swartz Road and proceeded east, generally following the Nine Mile Trail, for a distance of 3.5 miles across the forest to Plymouth Reservoir. The impacted area was 0.4 miles in width at its widest point. Nearly all of the trees in the impacted area were uprooted, shattered or broken along the main stem. The damaged timber was sold and salvaged within much of the blowdown area. Standing snags and varying amounts of coarse woody debris were left in the cut areas. Approximately 100 acres of the impacted area was not salvaged.
due to sensitive soils, low value timber and for the purpose of future comparative studies or observations between the cut and uncut areas. About one quarter of the impacted area consisted of 70 year old conifer plantations. About 19,000 trees were replanted in these areas of salvaged conifer plantations. Planted species included Norway spruce, white spruce, white pine, tamarack, red spruce, red oak and black cherry.

Incredibly, a second large tornado hit Chenango RA #5, Pharsalia Woods State Forest, on April 28, 2011. This tornado impacted a swath nearly 3.5 miles in length across the forest, up to 0.25 mile wide, consisting of about 250 acres. The tornado impact began near county Route 7 in Pharsalia and extended northeast across county Route 10, to the North Road and across Nine Mile Truck Trail to where it finally exited the forest on Center Road, east of Fred Stewart Road. The tornado impacted about 147 acres of plantations including some of the highest quality Norway spruce plantations in the region. The remaining 103 acres consisted of native hardwood and conifer stands. Most of the trees damaged from this tornado were salvage harvested during 2011. Hundreds of snags and downed trees near streams were intentionally retained across the harvest areas to provide wildlife habitat for decades to come.

As with the 1998 tornado, the areas impacted by this storm will go through the stages of natural forest succession to eventually become a forest again in the future. Until then, the open areas will provide a new habitat opportunity for wildlife species dependent upon open/shrub or young forest habitat conditions. The broken snags will serve as a future reminder of the incredible forces of nature that have impacted forests for centuries and will continue to do so in the future. Additional information about both of these tornadoes may be found in the State Forest History portion of this plan. See the Appendix for a map depicting the impact areas for each of these tornadoes.

There are a number of differences between areas that are plantations and areas that are native forests. Plantations were established on former open agricultural land that had either been plowed or pastured. The history of agriculture on these areas has resulted in simplified forest conditions compared to areas that have always been forested. Plantations generally have fewer tree species than native forest areas and they may often be nearly pure monocultures. Plantations are also comprised of trees that are all the same age with few if any cavity trees or standing dead snag trees. Plantations also have less large coarse woody debris on the forest floor than natural forests. Coarse woody debris provides structural complexity on the forest floor and is habitat for insects, fungi, small mammals and other organisms. Decayed, downed trees also serve as seed germination sites for tree species such as hemlock and yellow birch. Coarse woody debris also contributes to nutrient cycling (the moving of nutrients from wood to the soil) and, with its ability to store large amounts of water, acts as a reservoir during periods of drought.

Native forests have adapted to and evolved in response to natural disturbances. Typical natural disturbances in this region include tree death from insects, disease and drought, beaver activities,
ice storms and wind storms. These natural disturbances greatly contribute to the diversity of habitats and conditions found in the forest landscape.

Many of the forest stands, comprising several hundreds of acres on the Unit, have understory vegetation dominated by species that interfere with the establishment and growth of desirable native hardwood tree species such as sugar maple, black cherry, white ash and red maple. These interfering species include New York and hay-scented fern, American beech, striped maple and hophornbeam. These species interfere with the growth and development of desirable species by casting dark shade on the forest floor to create conditions that prevent desirable maple, cherry and ash seedlings from developing.

All of the interfering species are undesired by deer for browsing. Repeated browsing of desired species of tree seedlings by deer can prevent them from becoming established in the forest understory. Excessive browsing by deer can also eliminate or severely deplete many historically common herbaceous plants from the forest. It is thought that the current prevalence of interfering vegetation in many of these stands is the result of beech decline, repeated deer browsing, harvesting practices that create minimal openings in the forest canopy and lack of agricultural crop land in the area. Successful establishment of desirable regeneration will be important in the future to maintain species diversity and a sustainable forest resource.

**H. Forest Insects and Diseases**

Insects and diseases that affect trees are constant natural forces that shape the forest. While many native insects and diseases have negligible or beneficial impacts to forest health, invasive exotic species are often especially damaging. Invasive exotic insects and diseases are a very serious threat to New York’s biodiversity. The insects and diseases addressed below are those that currently or potentially could have significant impacts to forest health on the Unit.

**Existing Insects and Diseases of Concern**

*Annosum Root and Butt Rot Disease* - This disease is a complex fungus that is among the most damaging tree pathogens in the northern hemisphere and has been identified in plantations on State forests in the Unit. In the eastern United States, pine and spruce species are highly susceptible to the disease. This is particularly problematic in softwood plantations where frequent thinnings facilitate the spread of the disease leading to increased volume loss. Additionally, the fungus can persist on stumps long after a stand has been harvested. The proliferation of this pathogen has implications for future species composition and management objectives of stands, especially the Norway spruce and red pine plantations, where this disease is present.
Beech Bark Disease - This disease is a fungus spread by the beech scale insect from Europe. It has been established for several decades on the Unit. Its impact has resulted in the decline and death of most mature beech trees. Although small beeches are still common in some areas, they usually are not able to grow to their full maturity before dying prematurely from the disease.

Dutch Elm Disease - This disease is a non-native fungus that is spread by both the European and native elm bark beetles. It was first detected in central New York in 1946 and has since spread throughout New York State. Although elm has historically been a minor component of the forests on the Unit, the disease has killed most of what was there. The disease continues to kill mature trees that had escaped previous infection.

Butternut Canker - This disease, of unknown origin, has infected nearly all the butternut in New York State. The disease is fatal.

Peach Bark Beetle - This native insect historically impacted peach trees. It has recently been discovered in black cherry trees. The beetle bores into the trunk of the tree forcing the trees to exude gum in an attempt to expel the insect. Although the insect does not kill the tree, its’ boring and resulting gum production by the tree can significantly reduce the economic timber value of this species.

European Pine Shoot Beetle - This is a non-native beetle that is present and has the potential to impact red pine plantation on the Unit. Chenango County is also in a Federal quarantine area which regulates and limits the transportation of pine logs to sawmills out of the area.

Gypsy Moth - Although present, this moth from Europe has not had significant outbreaks on the Unit. This may be due to the scarcity of oak species on the Unit.

Potential Insects or Diseases of Concern

Hemlock Wooly Adelgid - This insect from Asia is the most imminent threat to the forests on the Unit. It has been devastating to eastern hemlock in the lower Delaware and Hudson River valleys. The adelgid attacks and kills all sizes of hemlock. In 2002, it infected Delaware County. As of 2004, it had spread as far north as Albany County and in 2009 it was discovered in Tompkins County. It has not yet been discovered in Chenango County. Although hemlocks have little timber value, it is a highly valued species for its aesthetic, recreational and ecological qualities. Hemlock is the most common native conifer on the Unit. Hemlock trees stabilize the soil on steep slopes and their shade often keeps streams cool in the heat of summer. During winter, hemlocks provide thermal cover for deer and other wildlife. Many wildlife species such as fisher, red squirrels and black-throated green warblers are strongly associated with hemlock.
There are no known natural factors which will limit the spread of this insect. Current control efforts focus on the release of tiny Japanese lady beetles (*Pseudoscymnus tsugae*) into infected areas. The beetle is a natural predator of the adelgid in Japan. If this biological control measure does not succeed, the long-term consequence may likely be the elimination of eastern hemlock from the landscape.

*Asian Long-horned Beetle* - This insect from Asia was first detected in New York City in 1996. Potential impacts from it could be devastating since it prefers to eat and kill maple trees. As of 2003, over 6,000 infested trees have been found in New York, all in the New York City - Long Island area. There are no known natural factors which will limit the spread of this insect.

*Emerald Ash Borer* (EAB) - This beetle from Asia was first identified in southeastern Michigan and neighboring Windsor, Ontario, Canada in 2002. It has since spread to Ohio, Indiana, Illinois, Maryland, western Pennsylvania and was discovered in Randolph, NY (Cattaraugus County) in 2009. By the end of 2011, extensive trapping for this insect has discovered multiple infestations in Ulster and Green Counties, in the Hudson Valley region, as well as to the west in Monroe and Livingston Counties. A single infestation was also discovered in Steuben County. EAB has killed over 25 million ash trees in the United States. The EAB larvae feed beneath the bark on all native ash species and kill the trees by eventually girdling their branches. There are no known natural factors which will limit the spread of this insect.

*European Woodwasp* - This woodwasp was discovered near Fulton, New York in 2004. It has since been found in many counties throughout central and western New York State but has not yet been confirmed in Chenango County. It is native to Europe, Asia and North Africa and arrived in New York State in solid wood packing material used in cargo ships. At low populations, the woodwasp attacks stressed trees for egg laying and the trees are killed by a fungus that is injected with the eggs. Where it is an exotic invasive species elsewhere in the world, this woodwasp attacks pine plantations and can cause up to 80% tree mortality.

Forest health problems caused by exotic insects or diseases will likely be an increasing problem in the future. The future challenge will be to monitor the forests so that if invasive insects become established, they can be detected at an early enough stage so that eradication or containment measures can be effective. In addition, management strategies should be implemented that will minimize the future negative impacts of these invasive species if or when they arrive on the Unit.

**I. Wetlands and Water Resources**

The entire Unit is a part of the upper Susquehanna River watershed. The Unit is located on an upland plateau which forms the headwaters of Genegantslet Creek, Fly Meadow Creek, the East Branch of the Canasawacta Creek and the Canasawacta Creek.
These watercourses eventually discharge at various points into the Chenango River. Other streams on the Unit are tributaries of the Brackel Creek or the Otselic River and flow into the Tioughnioga River before meeting the Chenango River at Chenango Forks. The Chenango River then flows into the Susquehanna River where it continues its southward journey to the Chesapeake Bay and the Atlantic Ocean.

The watercourses on the Unit are designated as having either water quality classes AA, C, C(T) or D. The classification system, regulations and accompanying authority are described in ECL Sections 15-0313 and 17-0301. The unnamed stream that is the outlet of Perkins Pond is the only stream designated as Class AA on the Unit. The most prominent classified trout (C(T)) streams on the Unit are the headwaters of the Genegantslet Creek on Chenango RA # 5 and the East Branch of the Canasawacta Creek on Chenango RA # 36. Chenango RA # 36 also contains a portion of Hawley Brook which is also a C(T) stream. It is important to note that other streams on the Unit, while not having C(T) classification, may indeed contain trout.

See Appendix XI for maps of the Wetlands, Streams and Riparian Zones on the Unit.

Wetlands qualify as legally protected if they meet the criteria found in Section 14-0107 of the Freshwater Wetlands Act and are at least 12.4 acres in size. The gentle topography on the Unit results in numerous wetlands where the flow of water is restricted. A total of 204 wetlands comprising 1,950 acres are on the Unit. Nine legally protected wetlands are in part or wholly on the Unit. Appendix I lists the wetlands on the Unit by forest and size.

J. Fisheries Resources

The fishery waters on the Unit consist of primarily small upland headwater streams which likely support a minimal level of sport fishing. Although no formal fisheries assessments have been conducted since the 1930s on any of the streams, it is likely that the fish communities are composed of the simple fish communities associated with headwater streams in the Susquehanna River drainage. Species typically found include slimy sculpin, longnose dace, blacknose dace, and common shiner.

Several of the streams on the Unit; Brackel Creek, Genegantslet Creek and one tributary, and Canasawacta Creek and five of its tributaries are designated trout streams which likely support modest numbers of native brook trout. Based on their size, several other streams on the Unit may also be capable of supporting wild trout. Although none of these streams likely support many large fish it is probable that they are important spawning and nursery areas for trout.

There are no permanent ponds capable of sustaining a recreational fishery on the Unit.
K. Wildlife

The State land in the Town of Pharsalia has been recognized as being a regionally significant area for birds. The National Audubon Society has identified this area as the Pharsalia Woods Important Bird Area. Important Bird Areas are sites that meet specific criteria as set forth by the National Audubon Society which provide essential habitat to one or more species of birds. This area includes the Pharsalia Wildlife Management Area and the adjacent State Forests of Chenango RA # 22, 5 & 24.

In 2002, the Department also identified this area as an important area for birds by the designation of the Pharsalia Bird Conservation Area. Bird Conservation Areas are State-owned lands and waters that meet the criteria of the National Audubon Society, Important Bird Area program. However, the Pharsalia Bird Conservation Area consists only of the Pharsalia Wildlife Management Area.

The State lands in Pharsalia have been recognized as important for birds due to their abundance of forest breeding species. This is one of the few areas outside of the Adirondack and Catskill Forest Preserves that has a breeding population of Swainson’s thrush. Another unique feature of the Unit is the abundance of spruce plantations, especially on Chenango RA # 5, that provide breeding habitat for conifer dependent species such as red crossbills, white-winged crossbills and pine siskins. See Appendix II for a list of other breeding birds found on or in the vicinity of the Unit.

The Nature Conservancy has also given special recognition to the forests on the Unit. The Nature Conservancy has identified this area of western Chenango County as the Chenango Highlands Priority Forest Block. As a Priority Forest Block, it is a site that represents one of the best forest matrix blocks remaining in New York and the largest forest block found between the Catskills and Allegany State Park. Outside of this area, the forest land becomes increasingly fragmented and interrupted by agricultural lands, communities and major highways. This large, remote and mostly forested block of land provides habitat for a great diversity of species including those that are sensitive to human disturbance and associated fragmented forests. Examples of such species include the Northern goshawk, red-shouldered hawk, fisher and bobcat.

One of the principal reasons that the State lands in the Town of Pharsalia are important for birds is that they consist of large unfragmented blocks of forest surrounded by active or abandoned agricultural open lands. The presence and abundance of wildlife species depends upon the availability and quality of suitable habitat. The Towns of Pitcher, Pharsalia and Plymouth are now over 70% forested. As abandoned agricultural fields grow into forest, it is expected there will be an increasing amount of forested land in the future. While the factors which affect individual wildlife species populations are many and varied, the general trend in this area of
Chenango County is for the growth of woodland wildlife populations and the decline of those species associated with open land.

Current knowledge of many wildlife species is limited. The first statewide survey of reptiles and amphibians was recently completed to create the New York State Amphibian and Reptile Atlas. A statewide survey of birds was first completed in 1980-1985 for the production of the New York State Breeding Bird Atlas. The second survey of breeding birds was completed in 2000 - 2005.

An estimated 132 species of birds, 50 species of mammals, 12 species of reptiles and 17 species of amphibians may be found on or in the vicinity of the Unit. A description of many of these wildlife species are described below. Rather than list every species, species are described for those “species of general interest,” “species of greatest conservation need,” and “special concern, threatened or endangered” species. For a complete list of the species expected to be found on or in the vicinity of the Unit, see Appendix II.

Species of General Interest

Backyard song birds - Northern cardinals, blue jays, black-capped chickadees, tufted titmouse, dark-eyed juncos and mourning doves are expected to remain stable or increase slightly.

Bear - In recent years bear have been moving into Chenango County from their Catskill range. They are currently on the Unit in a low population density. Their numbers are expected to increase as more open land becomes forested.

Beaver - Beaver are important for their ability to create wetland habitat for other animal species. Beaver numbers are expected to be stable in the future.

Bobcat - Bobcat are present in low numbers. Their population is expected to remain stable.

Deer - The Department manages deer populations through input from the deer management task force for each Deer Management Unit (DMU). The Pharsalia Woods Unit is within DMU number 7M. The present deer population is approximately 23 deer /square mile including approximately 3.3 bucks/square mile. Deer populations at this level impact forest vegetation by restricting the growth and development of hardwood seedlings. The Department expects the deer population to increase slightly.

Eastern Cottontail Rabbit - Population has been decreasing as former agricultural lands have become forested.

Eastern Coyote - Coyote are present throughout the Unit. Recent DNA research suggests that the eastern coyote is a genetic mix of Algonquin wolf of Canada and the western coyote. Their population is expected to increase slightly.

Fisher - Fisher use hemlock woods in large forested areas for their habitat. They are one of the few species that prey on porcupine. Their numbers are expected to increase.
Red Fox - They are present on the Unit. However, like the Cottontail, their numbers are declining as open lands increasingly grow back into forest.

Turkey - Turkey are common on the Unit. They have a high productivity potential as one hen can produce 10 or more chicks per year. Their numbers are expected to increase.

Woodpeckers - Pileated, hairy and downy woodpecker populations are expected to increase as the forests mature. They are important for their ability to create tree cavities that are needed by other bird and mammal species.

Species of Greatest Conservation Need

In 2005, the Department released New York State’s Comprehensive Wildlife Conservation Strategy. It can be found at:  [http://www.dec.ny.gov/animals/30483.html](http://www.dec.ny.gov/animals/30483.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 Pharsalia Woods Unit is in the Susquehannah Basin portion of the plan. Table 4 lists those SGCN species known to be on or in the vicinity of the Unit and their population trends.

Table 4. 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.**

<table>
<thead>
<tr>
<th>Species Group</th>
<th>Population Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early successional forest/shrubland birds</td>
<td></td>
</tr>
<tr>
<td>American woodcock</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Black-billed cuckoo</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Blue-winged warbler</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Brown thrasher</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Canada warbler</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Ruffed grouse</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Willow flycatcher</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Deciduous/mixed forest breeding birds</td>
<td></td>
</tr>
<tr>
<td>Black-throated blue warbler</td>
<td>Stable</td>
</tr>
<tr>
<td>Cerulean warbler</td>
<td>Increasing</td>
</tr>
<tr>
<td>Wood thrush</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Forest breeding raptors</td>
<td></td>
</tr>
<tr>
<td>Cooper’s hawk</td>
<td>Stable</td>
</tr>
<tr>
<td>Northern goshawk</td>
<td>Increasing</td>
</tr>
<tr>
<td>Red-shouldered hawk</td>
<td>Increasing</td>
</tr>
<tr>
<td>Sharp-shinned hawk</td>
<td>Increasing</td>
</tr>
</tbody>
</table>
Grassland birds
Bobolink* Decreasing
Eastern meadowlark* Decreasing
Vesper sparrow* Decreasing
Horned lark* Decreasing

* These are upland grass dependent species that were likely found outside the Unit.

Note: American bittern, pied-billed grebe, golden-winged warbler, prairie warbler, red-headed woodpecker, northern harrier and sedge wren are SGCN species that were reported on or in the vicinity of the Unit in the 1980-1985 Breeding Bird Atlas survey but not in the 2000-2005 survey.

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

<table>
<thead>
<tr>
<th>Species Group</th>
<th>Population Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vernal pool salamanders</td>
<td></td>
</tr>
<tr>
<td>Blue-spotted salamander</td>
<td>Unknown</td>
</tr>
<tr>
<td>Lake/river reptiles</td>
<td></td>
</tr>
<tr>
<td>Eastern ribbonsnake</td>
<td>Unknown</td>
</tr>
<tr>
<td>Woodland grassland snakes</td>
<td></td>
</tr>
<tr>
<td>Smooth greensnake</td>
<td>Unknown</td>
</tr>
<tr>
<td>Snapping turtle</td>
<td></td>
</tr>
<tr>
<td>Snapping turtle</td>
<td>Unknown</td>
</tr>
<tr>
<td>Uncommon turtles of wetlands</td>
<td></td>
</tr>
<tr>
<td>Spotted turtle</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**SGCN Mammals: Species Likely to be on or in the Vicinity of the Unit, NYS DEC Bureau of Wildlife**

<table>
<thead>
<tr>
<th>Species Group</th>
<th>Population Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tree Bats</td>
<td></td>
</tr>
<tr>
<td>Eastern red bat</td>
<td>Unknown</td>
</tr>
<tr>
<td>Hoary bat</td>
<td>Unknown</td>
</tr>
<tr>
<td>Silver-haired bat</td>
<td>Unknown</td>
</tr>
<tr>
<td>Furbearer</td>
<td></td>
</tr>
<tr>
<td>River otter</td>
<td>Stable</td>
</tr>
</tbody>
</table>
As shown in the table above, the majority of 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 back 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 are 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.

Special Concern, Threatened or Endangered Species

New York State also has a classification system for rare species. In order of increasing rarity, the classes are Special Concern, Threatened and Endangered. The following list contains the rare species on or in the vicinity of the Unit. The breeding status is listed for birds.

Endangered Species

Indiana Bat - The Unit is within the breeding range of the Indiana bat. For breeding and roosting habitat, the bat requires large trees exposed to the sun having shaggy bark or vertical cracks usable for hiding. It prefers large shagbark hickory or black locust, but it also uses dead snags having loose bark. The population of this bat has been increasing in New York State. Mist netting surveys have been conducted by Natural Heritage staff for this species at potential breeding sites in Region 7. As of 2006, none have been found.

Species of Special Concern

Small-footed Bat
Osprey - Possible breeder
Cooper’s Hawk - Possible breeder
Northern Goshawk – Confirmed Breeder
Red-shouldered Hawk - Probable breeder
Sharp-shinned Hawk - Possible breeder
Cerulean Warbler – Probable breeder
Vesper Sparrow - Confirmed breeder *
Horned Lark - Probable breeder *
Spotted Salamander
Blue Spotted Salamander
Red Spotted Newt
Spotted Turtle
Wood Turtle

* This is a grassland species. Its likely breeding habitat is on private land
L. Significant Plants and Plant Communities

A review of New York Natural Heritage data indicates that no significant plants or plant communities have been identified on the Unit.

M. Invasive Exotic Plants

Invasive species are non-native species that can cause harm to the environment or to human health. Many of New York’s plant species are not native. However, only some of these cause enough harm to be considered invasive. The status of invasive plant species on the Unit is somewhat unknown at this time. The forest inventory system used to collect data for this plan did not collect information on these species. Tartarian honeysuckle is likely present in some stands, especially near private lands. Other invasive species are likely present on the Unit. Invasive plants are a threat to New York’s biological diversity. In the future, the challenge will be to prevent the establishment of new exotic invasive plants and identify and control any existing invasive species on the Unit.

One significant non-native species on the Unit is Norway spruce. This species was brought to New York from Europe, and has the ability to naturally regenerate. However, it is not considered a significant invasive species due to its relatively minimal impact on the environment or human health. The Norway spruce plantations have provided the benefits of soil stability and erosion control, conifer cover on the landscape and a source of softwood forest products for the timber industry. Some species, such as red cross-bills, are primarily found on State lands in central New York because of the presence of these plantations.

N. Recreation

New York’s State forests offer a variety of outdoor recreational opportunities for the public. Activities associated with State forests include hiking, camping, hunting, fishing, cross country skiing, mountain biking, horseback riding and snowmobiling. Recreation management on State Forests is guided by the Strategic Plan for State forest Management adopted in 2010.

As stated in the plan, facilities on State forests such as recreational trails, camping sites, or parking areas are primitive in design. Day use areas on State forests may have limited conveniences such as a fireplace, picnic table and an outhouse but amenities typically found in State parks such as paved access roads, plumbing and electricity are not provided.
The remote character of many areas on the Unit provide ideal conditions for recreational activities such as wildlife observation, pleasure driving, hiking, hunting, trapping and snowmobiling. The Nine Mile Trail is a public forest access road on Chenango RA # 5 and 24 which provides easy access through a variety of forest conditions for pleasure driving, birding, nature observation and snowmobiling.

The tornado that impacted this area in 1998 created approximately 1,000 acres of disturbed shrub/young-forest (early successional) land with hundreds of standing snag trees. This area has attracted interest from the public for nature observation since it is remarkably different from much of the surrounding area.

Snowmobiling is one of the most popular activities available on the Unit. The Nine Mile Trail on Chenango RA # 5 and 24 is part of Corridor Trail 7 and is a popular regional destination for snowmobiling. This snowmobile trail proceeds north, across State Route 23, to the Pharsalia Wildlife Management Area where it meets Corridor Trail C7A which then heads west onto Chenango RA # 22 and down the Gorge Road to South Otselic. A secondary snowmobile trail of 2.7 miles in length is located on Chenango RA # 16. A total of 17.7 miles of snowmobile trails are located on the Unit. In addition to the designated trails, snowmobilers also use many of the unplowed roads within the Unit.

Many snowmobilers begin their excursion at the North Road on Chenango RA # 5. There is currently no designated parking area at this location, so snowmobilers park their vehicles and trailers on the side of North Road. The roadside is currently used as a staging area which results in the vehicles, trailers or snowmobiles partially blocking the traveled portion of the road. Town snow plows must then maneuver around the vehicles and trailers resulting in potentially unsafe conditions. Occasional conflicts also occur between snowmobilers and residents living near State forests due to snowmobile noise or unauthorized snowmobiling on private land near homes.

Hunting, fishing and trapping are permitted anywhere on the Unit, except where prohibited by regulation, law or sign. Hunting occurs throughout the Unit and is most prevalent during the fall big game season.

The Unit does not contain any bodies of open water, so activities such as fishing are limited. Angling opportunities are limited to small stream trout fishing on the East Branch of the Canasawacta Creek on Chenango RA # 36 and the very headwaters of the Genegantslet Creek on Chenango RA # 5.

The Finger Lakes Trail (FLT) system is a hiking path extending from the Niagara River to the Allegheny Mountains and across remote areas of the Southern Tier of New York State to the Catskill Mountains where it joins other long-distance trails. The trail system is approximately 800 miles in length and is maintained by the Finger Lakes Trail Conference. Mountain bikes are
not allowed on the Finger Lakes Trail since the club’s agreements with private land owners only includes the provision for people to walk on the trail.

The FLT enters into the northwest corner of Chenango County and extends southeast across the county. The trail system traverses through the Unit on Chenango RA # 22 for 0.9 miles and Chenango RA # 5 for 4.0 miles. A secondary trail off of the FLT leads to a lean-to located east of Coy Street on Chenango RA # 5. A second lean-to has recently been constructed on Chenango RA # 22 between Clarence Church Road and the Gorge Road. This lean-to can also be accessed from the FLT by an approximately 0.5 mile spur trail.

There are currently no designated trails for mountain bikes, horses, all-terrain vehicles or people with mobility impairments on the unit. A horse trail was on the Unit back in the 1960s and ‘70s (as discussed in the State Forest History part of this plan) but was closed due to lack of interest from equestrians. The trail was subsequently converted to an ATV trail in the 1980s but was closed due to unsuitable soils and unacceptable impacts.

0. Property Use Agreements

Concurrent Use Agreements

<table>
<thead>
<tr>
<th>State Forest</th>
<th>Location</th>
<th>Purpose</th>
<th>Agreement Holder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 22</td>
<td>West half of Beardsley Road</td>
<td>Road maintenance</td>
<td>Town of Pharsalia</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Cottage Lane</td>
<td>Road maintenance</td>
<td>Town of Plymouth</td>
</tr>
</tbody>
</table>

Deeded Easements

The following list is a compilation of exceptions and reservations gathered only from those rights called for in the deeds to the State and/or shown on the survey maps. Research of the abstract of title was not conducted, nor was any investigation into the private adjoining deeds done to attempt to find other valid rights which the State’s ownership may be subject to.

<table>
<thead>
<tr>
<th>State Forest</th>
<th>Location</th>
<th>Purpose</th>
<th>Type</th>
<th>Easement Holder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal G</td>
<td>Spring and water</td>
<td>Reservation</td>
<td>Grantor of Proposal G</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal H</td>
<td>Cemetery</td>
<td>Reservation</td>
<td>Grantor of Proposal H</td>
</tr>
<tr>
<td>State Forest</td>
<td>Location</td>
<td>Purpose</td>
<td>Type</td>
<td>Easement Holder</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>---------------</td>
<td>--------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal OO</td>
<td>Cemetery</td>
<td>Exception</td>
<td>Unknown</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal SS</td>
<td>Highway</td>
<td>Reservation</td>
<td>Chenango County</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal CCC</td>
<td>Right of Way</td>
<td>Reservation</td>
<td>Grantor of Proposal CCC</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal CCC</td>
<td>Cemetery</td>
<td>Reservation</td>
<td>Grantor of Proposal CCC</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal EEE</td>
<td>Right of Way</td>
<td>Reservation</td>
<td>Grantor of Proposal EEE</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal FFF</td>
<td>Right of Way</td>
<td>Reservation</td>
<td>Grantor of Proposal FFF</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal MMM</td>
<td>Right of Way</td>
<td>Reservation</td>
<td>Grantor of Proposal MMM</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal NNN</td>
<td>Spring and Water</td>
<td>Reservation</td>
<td>Grantor of Proposal NNN</td>
</tr>
<tr>
<td>Chenango RA # 22</td>
<td>Proposal R</td>
<td>Highway</td>
<td>Exception</td>
<td>Chenango County</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Proposal G</td>
<td>Telephone</td>
<td>Reservation-Expired?</td>
<td>Grantor of Proposal G</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Proposal V</td>
<td>Spring and Water</td>
<td>Reservation</td>
<td>Grantor of Proposal V</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Proposal X</td>
<td>Spring and Water</td>
<td>Reservation</td>
<td>Grantor of Proposal X</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Proposal Z</td>
<td>Spring and Water</td>
<td>Reservation in Fee</td>
<td>Grantor of Proposal Z</td>
</tr>
</tbody>
</table>

**P. Temporary Revocable Permits**

The following **Temporary Revocable Permits** (TRPs) related to utility lines have been issued for ongoing use of State land:

<table>
<thead>
<tr>
<th>TRP Number</th>
<th>State Forest</th>
<th>Permitee</th>
<th>Purpose</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/29/1968</td>
<td>Chenango RA # 5</td>
<td>NYSEG</td>
<td>Relocate power line</td>
<td>Along County Route 23</td>
</tr>
<tr>
<td>4/25/1972</td>
<td>Chenango RA # 5</td>
<td>NYSEG</td>
<td>Rebuild primary service power line</td>
<td>Along County Route 7</td>
</tr>
<tr>
<td>#91-7-3</td>
<td>Chenango RA # 5</td>
<td>John D’Agnese</td>
<td>Connect power line between existing poles</td>
<td>Unknown</td>
</tr>
<tr>
<td>TRP Number</td>
<td>State Forest</td>
<td>Permitee</td>
<td>Purpose</td>
<td>Location</td>
</tr>
<tr>
<td>------------</td>
<td>------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>4/15/83</td>
<td>Chenango RA # 5</td>
<td>Chenango and Unadilla Telephone Corporation 5</td>
<td>Buried telephone cable service to Camp Pharsalia</td>
<td>Along Rt. 23 to the Camp</td>
</tr>
<tr>
<td>#90-4-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#89-4-4</td>
<td>Chenango RA # 24</td>
<td>Contel of New York, Inc. 1</td>
<td>Install buried telephone cable</td>
<td>Along Hoag-Childes Road</td>
</tr>
<tr>
<td>3/21/83</td>
<td>Chenango RA # 36</td>
<td>Chenango and Unadilla Telephone Corporation 1</td>
<td>Install buried telephone cable</td>
<td>Along County Route 16</td>
</tr>
<tr>
<td>#90-4-2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Q. **Uses Without Known Permits or Unknown Legal Status**

The following parcels of State land have ongoing uses without clear legal status. Land surveys and deed research will be needed to resolve these cases.

<table>
<thead>
<tr>
<th>State Forest</th>
<th>Location</th>
<th>Current Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 5</td>
<td>Proposals A and F</td>
<td>Access road to private property</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal N</td>
<td>Access road to private property</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal DD</td>
<td>Access road to private property</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Proposal LL</td>
<td>Driveway and yard infringement</td>
</tr>
</tbody>
</table>

R. **Unresolved Trespasses**

There are currently no known trespasses on the Unit.

5 Chenango and Unadilla and Contel facilities are now operated by Frontier Communication
**S. Roads**

A network of State highways, County highways, and town roads provide access to State forest land throughout the Unit. Additionally, the Department owns and maintains one public forest access road through State forest land. Nine Mile Trail, formerly known as the Old CCC Truck Trail, is 8.8 miles in length and runs east-west from Camp Pharsalia to Blackman Road. Not only is this road integral to forest management activities in Chenango RA # 5 and Chenango RA # 24, but it also receives significant use by the public for recreation activities during the spring, summer and fall months and is used by snowmobilers in the winter.

The Department also maintains several dead-end haul roads to provide limited access for logging activities. On Chenango RA # 5 there are two dead end haul roads. The first is a 0.1 mile road leading south from Nine Mile Trail and is located with the Restricted Zone surrounding Camp Pharsalia. The second haul road runs northeast from County Route 10 approximately 0.2 miles to an internal log deck. On Chenango RA # 16 there is one haul road approximately 1 mile in length leading south off of Hakes-Calhoun Road. This road currently is barricaded with an earthen mound. Public use of motorized vehicles is prohibited on these haul roads.

The Department has concurrent use agreements for two town roads in the Unit. These are: the westernmost mile of Beardsley Road, sometimes referred to as CCC Road, which was built on State forest land by the CCC in the town of Pharsalia; and a short section of Cottage Lane in the town of Plymouth. In both of these cases, the town has the responsibility of maintaining the road in exchange for public use of the right of way.

There is only one abandoned road for which documentation has been found in the Unit. The town of Plymouth has declared the western section of Reservoir Hill Road Spur as abandoned. From the intersection with Reservoir Hill Road, the first 1,000 feet is still maintained. West of that point, approximately one half mile westerly to the town line has been abandoned since sometime before 1979. The Department considers this to be a qualified abandonment because the road provides the only reasonable access to State forest land in that section of Chenango RA # 24.

There are many other roads on the Unit with unknown status. These roads are not maintained and/or are abandoned without any documented evidence available. These roads include:

<table>
<thead>
<tr>
<th>State Forest</th>
<th>Road</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 16</td>
<td>Ralph Brown Road</td>
<td>North of Center Road</td>
</tr>
<tr>
<td>Chenango RA # 22</td>
<td>Gorge Road</td>
<td>Between South Otselic and Purse Rd.</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Frenchman’s Road</td>
<td>South of Nine Mile Trail</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Hugaboom Road</td>
<td>Near Plymouth Reservoir</td>
</tr>
</tbody>
</table>
**T. State Forest Facilities**

1. **Trails**

There are two primary recreation facilities on this Unit - the Corridor 7 snowmobile trail on Chenango RA # 5 and 24, and section 7a on Chenango RA # 22. A total of 17.7 miles of snowmobile trails are on the Unit. The Finger Lakes Trail (FLT) crosses north/south through Chenango RA # 5 and cuts through the northeast corner of Chenango RA # 22. A total of 4.9 miles of Finger Lakes Trail are located on the Unit. These trails are discussed further in the recreation section of this plan.

2. **Lean-to’s and Camp sites**

Department designated and traditional, undesignated camping locations on the Unit.

<table>
<thead>
<tr>
<th>Type</th>
<th>Forest</th>
<th>Stand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lean-to on FLT</td>
<td>Chenango RA # 5</td>
<td>C-7</td>
</tr>
<tr>
<td>Lean-to on FLT</td>
<td>Chenango RA # 22</td>
<td>A-9</td>
</tr>
<tr>
<td>Primitive, undesignated campsite</td>
<td>Chenango RA # 24</td>
<td>A-87</td>
</tr>
</tbody>
</table>

3. **Boundary Lines**

Length of State boundary lines on the Unit.

<table>
<thead>
<tr>
<th>State Forest</th>
<th>Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 5</td>
<td>33.79</td>
</tr>
<tr>
<td>Chenango RA # 16</td>
<td>15.61</td>
</tr>
<tr>
<td>Chenango RA # 22</td>
<td>17.41</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>29.27</td>
</tr>
<tr>
<td>Chenango RA # 36</td>
<td>6.46</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>102.54</strong></td>
</tr>
</tbody>
</table>
4. Signs
State forest identification signs on the Unit.

<table>
<thead>
<tr>
<th>State Forest</th>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 5</td>
<td>Forest ID</td>
<td>North Road at Nine Mile Trail</td>
</tr>
<tr>
<td>Chenango RA # 5</td>
<td>Forest ID</td>
<td>Nine Mile Trail near Coy St</td>
</tr>
<tr>
<td>Chenango RA # 16</td>
<td>Forest ID</td>
<td>Kinney Rd and Hakes-Calhoun Rd.</td>
</tr>
<tr>
<td>Chenango RA # 22</td>
<td>Forest ID</td>
<td>County Route 42</td>
</tr>
<tr>
<td>Chenango RA # 36</td>
<td>Forest ID</td>
<td>County Route 16</td>
</tr>
</tbody>
</table>

5. Parking Areas

There are no designated parking areas or parking lots on the Unit. However, numerous unpaved roadside pull-offs are available for public use.

6. Vehicle Barriers
Barriers restricting vehicle access on the Unit.

<table>
<thead>
<tr>
<th>State Forest</th>
<th>Type</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 5</td>
<td>Metal Gate</td>
<td>Nine Mile Trail at the rear entrance to Camp Pharsalia</td>
</tr>
<tr>
<td>Chenango RA # 16</td>
<td>Metal Gate</td>
<td>Haul road/ snowmobile trail south of Hakes-Calhoun Road</td>
</tr>
<tr>
<td>Chenango RA # 16</td>
<td>Metal Gate</td>
<td>Snowmobile trail south of Hakes-Calhoun Road, east of Kostenko Road</td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>Metal Gate</td>
<td>Snowmobile Trail near the intersection of Doing Road</td>
</tr>
</tbody>
</table>

7. Stone Quarries

There are four stone quarries on State forest land in the Unit. The largest quarry is a five acres gravel pit located in Chenango RA # 5, Stand E-2, on the south side of Nine Mile Trail, approximately one half mile east of Fred Stewart Road. In conjunction with this, a small one acre shale pit is located at the west end of Nine Mile Trail on Blackman Road, designated Stand A-97. These two stone quarries were used by the CCC in the construction of the truck trail running through Chenango RA # 5 and Chenango RA # 24. Today, the larger quarry is still used on an irregular basis for road maintenance, while the quarry on Blackman Road has not been used in recent years.
The third stone quarry is west of the North Road near the intersection of Swartz Road on Chenango RA # 5 and is designated stand D-111. This quarry has not been used in many years and is considered to be reclaimed. No future use of this quarry is planned or anticipated.

The fourth quarry is a shale pit located in Stand B-8 on Chenango RA # 22. This two acre quarry was created by the CCC to construct the one mile Truck Trail now maintained as part of Beardsley Road in the Town of Pharsalia. Material extracted from these pits will be utilized exclusively for State land construction projects and will not be made available for commercial use.

8. Pit Privies

Currently there are two pit privies on the Unit. One is located northeast of the intersection of North Road and Nine Mile Trail on the snowmobile trail. The other pit privy is located on Chenango RA # 22 at the lean-to located along the Finger Lakes Trail.

9. Water Holes

One of the many projects accomplished by the CCC was the construction of water holes (also known as fire wells) for use in the event of a forest fire. According to a memo dated April 1st, 1954, a total of nineteen (19) water holes were constructed on the Unit. Ten of these water holes have been located and mapped on Chenango RA #5 & 24. The locations of the remaining water holes are currently unknown. The water holes noted in the 1954 memo are distributed as follows:

<table>
<thead>
<tr>
<th>Number of Water Holes</th>
<th>Chenango RA # 5</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA # 16</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Chenango RA # 22</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Chenango RA # 24</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Chenango RA # 36</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
**U. Other Facilities**

**Camp Pharsalia**

The former Camp Pharsalia Correctional Facility, previously operated by the New York State Department of Corrections is located on State forest property. The Camp was established within the agreement of a Memorandum of Understanding and the Department of Environmental Conservation still maintains the fee title to the land. The Department of Corrections has vacated the site and the State is currently pursuing the sale of 20 +/- acres at the facility as surplus property.

**DEC Facilities at Camp Pharsalia**

1. **Buildings**

<table>
<thead>
<tr>
<th>Building Name</th>
<th>Building Type</th>
<th>Square Footage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headquarters</td>
<td>Maintenance Garage</td>
<td>2,735</td>
</tr>
<tr>
<td>Sawmill</td>
<td>Sawmill</td>
<td>5565</td>
</tr>
<tr>
<td>Planer Mill</td>
<td>Storage Building</td>
<td>6889</td>
</tr>
<tr>
<td>Oil Storage Building</td>
<td>Storage Building</td>
<td>192</td>
</tr>
<tr>
<td>Gas Pump House</td>
<td>Gas Station</td>
<td>165</td>
</tr>
</tbody>
</table>

2. **Infrastructure**

<table>
<thead>
<tr>
<th>Facility Category</th>
<th>Type</th>
<th>Description/Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary</td>
<td>Property Line</td>
<td>Designates DOC/DEC maintenance property within State Forest</td>
</tr>
<tr>
<td>Dam</td>
<td>Earth Dam</td>
<td>Walleye Rearing Pond. Cooperative venture with Chenango County Sportsman Federation</td>
</tr>
<tr>
<td>Field</td>
<td>Lumber Yard</td>
<td>Mill Yard</td>
</tr>
<tr>
<td>Fuel Pumping Station</td>
<td>Fuel Dispensing Pumps</td>
<td>Two pumps</td>
</tr>
<tr>
<td>Fuel Storage Tank</td>
<td>Above Ground Diesel Tank</td>
<td>Fuel Pumping Station</td>
</tr>
<tr>
<td>Fuel Storage Tank</td>
<td>Above Ground Diesel Tank</td>
<td>Fuel source for sawmill engine</td>
</tr>
<tr>
<td>Facility Category</td>
<td>Type</td>
<td>Description/Location</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------</td>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>Fuel Storage Tank</td>
<td>Above Ground Fuel Oil Tank</td>
<td>275 gallon. Tool Maintenance Building</td>
</tr>
<tr>
<td>Fuel Storage Tank</td>
<td>Above Ground Fuel Oil Tank</td>
<td>275 gallon. Planing Mill</td>
</tr>
<tr>
<td>Fuel Storage Tank</td>
<td>Below Ground Gasoline Tank</td>
<td>550 gallons. Fuel Pumping Station</td>
</tr>
<tr>
<td>Grounds</td>
<td>Lawn</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>Storage</td>
<td>49 12' x 8' Lumber Storage Racks</td>
</tr>
<tr>
<td>Parking Lot</td>
<td>Paved Lot</td>
<td>Front and Side of Tool Maintenance Building</td>
</tr>
<tr>
<td>Road</td>
<td>Paved Road</td>
<td>Access road</td>
</tr>
<tr>
<td>Road</td>
<td>Unpaved Road</td>
<td>Sawmill Road</td>
</tr>
<tr>
<td>Sign</td>
<td>Facility ID Sign</td>
<td>Camp Pharsalia Field Operations Sawmill</td>
</tr>
<tr>
<td>Sign</td>
<td>Facility ID Sign</td>
<td>Camp Pharsalia Field Operations Maintenance Center</td>
</tr>
<tr>
<td>Waste Water System</td>
<td>Septic Tank</td>
<td>Planing Mill</td>
</tr>
<tr>
<td>Waste Water System</td>
<td>Septic Tank</td>
<td>Tool Maintenance Building</td>
</tr>
<tr>
<td>Water Body</td>
<td>Pond</td>
<td>Walleye Retaining Pond; see dam above</td>
</tr>
<tr>
<td>Water Supply System</td>
<td>Drilled Well</td>
<td>Department of Corrections System</td>
</tr>
</tbody>
</table>

**State Superfund Site at Camp Pharsalia**

An inactive hazardous waste disposal site, known as a superfund site, is located at the Camp Pharsalia Correctional Facility. This superfund site is the result of the operation of the timber treatment facility located there from approximately 1960 to 1977. Wood was treated in a large dip tank using a pentachlorophenol (PCP) solution consisting of approximately one part PCP to eleven parts fuel oil. The primary contaminants at the site include PCP, **poly-aromatic hydrocarbons**, and **dioxins/furans**.

In 1997 the Division of Operations requested the Division of Environmental Remediation to perform a formal investigation at the site. After the completion of the Preliminary Investigation in 1999, the quarter acre site at Camp Pharsalia was listed as a Class 3 hazardous waste site. According to the Hazardous Waste Site Classification System, a Class 3 superfund site is one that “Does not present a significant threat to the public health or the environment - action may be deferred.” More information from the Superfund Program can be obtained at the Department’s website at: [http://www.dec.state.ny.us/website/der/ihws/](http://www.dec.state.ny.us/website/der/ihws/).

In 2001 a Remedial Investigation/Feasibility Study was initiated, and in March 2003 the Record of Decision for the site was issued. The original decision was to contain the site using the Low Permeability Cover System. Since that time, however, remediation work at a similar site has
shown that excavation and disposal costs were not as high as originally estimated. Therefore, in April 2007, the Department issued a Record of Decision Amendment to change the remedy for the Camp Pharsalia site to “Excavation and Off-Site Disposal” and to begin remediation work. The remediation work has since been completed.

V. Landscape Conditions & Trends

Current Landscape Conditions

To determine the current landscape conditions, an area three miles from the Unit boundary was selected for analysis. The Unit comprises 11% of the total area inside the three mile boundary of the landscape. The analysis was conducted using a computer mapping program and a data set from the United States Environmental Protection Agency region II Multi-Resolution Landscape Characteristics (MRLC) last revised in January 1997. This data set consists of 30 by 30 meter cells covering the earth’s surface. Each cell is assigned one of fifteen land cover types based upon interpretation of satellite photography images.

Observations from the landscape analysis are as follows:

A. This is a rural, heavily forested (76%) area.

B. The large blocks of contiguous forest containing extensive interior forest conditions are primarily the areas with State land. The consistent, stable ownership of State lands provides the “anchors” for large blocks of contiguous forest on the landscape composed mostly of private lands with frequently changing ownership and management objectives. Outside of the State lands in the landscape area, the forested blocks are fragmented by intermixed open lands. The consequences of this are that area-sensitive, forest interior wildlife species are likely to be dependent upon the State lands for their habitat.

C. The conifer forests are located primarily on the Unit and other State lands nearby. Hence, conifer dependent wildlife species tend to use State lands for their habitat.

D. Open lands comprising 21% of the area are located nearly entirely on private ownerships. Much of the open land tends to be along the major streams in the landscape area with scattered areas interrupting forest cover in upland areas. Conservation of open land dependent species will depend primarily upon the actions of private land owners since these species are generally not found on State forests in the Unit.

E. Chenango RA # 16 has more open land in close proximity to it than other forests on the Unit.

F. The east edge of the landscape area has a concentration of population and development. This is where many of the people who enjoy the forests on the Unit live.
Landscape Trends

Urban population growth in the lower 48 states is expected to nearly triple by the year 2050 (Nowak and Walton, 2005). In the East, most of this growth is expected to occur from expansion of existing urban areas. This projected growth in urban areas will likely continue to fuel the demand for parcelization as urban residents continue to seek places to “escape to” in rural areas. Between 1987 and 2006, the number of parcels in the towns within the Unit increased by 81% for Pitcher, 107% for Pharsalia and 57% for Plymouth (see Table 5). The subdivision of lands frequently occurs adjacent to or near State lands and such location is often touted in advertising of the properties for sale. Observation of tax maps reveals that parcelization near State forests often results in long narrow lots or parcels of irregular shapes to maximize the number of lots that are adjacent to the State land. Much of the parcelization near State lands leads to the construction of camps or second homes for recreational use or permanent residential occupancy. Owners of these lots are often from distant urban areas.

Table 5. Number of Parcels in Towns of Pitcher, Pharsalia and Plymouth, Chenango County, NY

<table>
<thead>
<tr>
<th>Town</th>
<th>1987</th>
<th>1998</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitcher</td>
<td>351</td>
<td>502</td>
<td>635</td>
</tr>
<tr>
<td>Pharsalia</td>
<td>371</td>
<td>519</td>
<td>770</td>
</tr>
<tr>
<td>Plymouth</td>
<td>897</td>
<td>1,140</td>
<td>1,405</td>
</tr>
</tbody>
</table>

The trend of parcelization and residential building construction are often associated with negative impacts to nearby forests. Such impacts include a greater probability for the introduction of invasive plants and damaging exotic insects or diseases. Seemingly benign human activities such as moving firewood from far away sources or planting vegetation from commercial nurseries can transport invasive exotic insects, plants or diseases into forest areas leading to new infestations. When people move into a new home, they often bring a common invasive species with them - the domestic cat. Experts estimate that cats kill hundreds of millions of birds and even more small mammals each year. While many people think the impact of their pet cat is minor, the cumulative effect on native animal species is significant.

Other impacts of parcelization and subsequent building construction include land clearing and road development resulting in increased fragmentation and edge impacts on the adjacent forest. The resulting forest fragmentation and edge effects negatively impact breeding forest birds and other species. Continued parcelization also leads to the reduced economic viability of timber harvesting on private lands due to the reduced scale of operations and the constraints of boundary lines.

The general trend in the area surrounding the Unit and in the western portion of Chenango County is the increasing simplification of the landscape. The landscape is generally forest, active agriculture or areas developed for residential or commercial use. Areas of early successional vegetation are declining as abandoned farm lands are maturing into forest cover. When evaluating the suitability of this landscape for a diversity of wildlife species, there is a relative
lack of shrub land and areas of young seedling-sapling forest conditions compared to mature forest areas. Consequently, the availability of suitable habitat is declining for the large number of bird species dependent upon early successional habitat conditions (See SGCN bird species in the Wildlife section).

Private forest lands are typically treated with partial harvests leaving roughly similar residual stand structures of mid-aged forests after the harvest. These privately owned forests are 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 100 - 200+ years old. Forests in this age are beginning to develop old-growth characteristics such as large size, large cavities, rough bark and large dead trees and fallen logs. There is very little late successional forest in this landscape due to the prevalence of timber harvesting on private lands. 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 even though they are found in other forest conditions.

II. Resource Demands on the Unit

A. Timber Resources

Timber resources 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), Standard 2005 – 2009 and the Forest Stewardship Council (FSC), US Forest Management Standard. 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.

For information about the SFI Standard, see:


For more information about the FSC US Forest Management Standard, see:

http://fscus.org/standards_criteria/forest_management.php

At the regional scale, there is a strong demand for hardwood sawtimber from regional sawmills. Appendix VI illustrates the change in price for black cherry, white ash, hard maple and red maple based upon figures from the DEC Stumpage Price Report for Reporting Area “C,” which includes Chenango County.

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. These Canadian mills also purchase red pine logs. The Canadian demand for spruce and pine 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 housing market since spruce lumber is primarily used for wood framing construction.

There has been a steady demand for red pine from regional industries which manufacture it into log cabins, landscaping wood 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.

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 100 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.

As the stumpage price chart in Appendix VI indicates, prices for the hardwood species rose steadily during the 1990s through 2001 and have fluctuated since then. The rise in hardwood values 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 will increase as those high quality trees become increasingly scarce on private lands.

**B. Biological Resources**

Conservation of biological resources is increasingly a societal demand. Biological resources have long been a public demand of 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, species diversity or old-growth forests.

One expression of the demand for biological resources on the Unit is the designation of a portion of the Unit as an Audubon Society Important Bird Area and of the adjacent Pharsalia Wildlife Management Area as a NYS Bird Conservation Area. These designations serve to highlight this area and publicize it throughout New York State to those interested in birding, creating further interest in the biological-based values of these lands.

During the scoping process, many people concerned about wildlife expressed their wish for future management of the State forests to minimize forest fragmentation. Birders expressed their desire for future conifer cover on the Unit to provide continuous habitat for the present conifer-dependent bird species.

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.
C. Recreational Resources

A public survey was conducted as part of the scoping process for development of the draft plan. Results of the survey revealed that the top five most popular activities pursued on the State forests listed in order of popularity, are wildlife/nature observation, hiking, hunting and pleasure driving (tied), and snowmobiling. See Appendix VIII for the survey and a summary of the results.

In the public scoping process, many people requested a variety of different types of trails. Several all terrain vehicle (ATV) riders requested the signing of Nine Mile Trail on Chenango RA # 5 & 24 for ATV use. Other riders desire the development of off road trails for ATV use. Many other people expressed their opposition to motorized recreation and their desire to keep State forests for quiet recreation activities. 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. Other demands for trails included accessible trails, birding trails, mountain bike trails and hiking trails. Many people expressed a need for improved parking areas near the snowmobile trail and at access locations to the FLT.

State snowmobile registration and hunting and license sales are other indicators of regional demand for recreation. Between 1997 and 2002 snowmobile registrations in New York State increased 30% from 103,000 to more than 150,000 snowmobiles; however in 2009 snowmobile registrations dipped to 136,500. These numbers may suggest that changes in snowmobile registrations are linked with economic trends.

Big game deer hunting is the most popular form of hunting on the Unit. The demand for hunting as measured by license sales has declined significantly since 1985. Between 2002 and 2008 big game license sales in New York State decreased 6.6% with 717,696 licenses sold in 2008. Hunting to control deer populations received strong support in the survey and public scoping meetings. Most people supported increasing deer harvests and the use of special permits to reduce deer populations for forestry purposes. Other hunting opportunities available on the Unit include turkey, grouse and coyote. During the same period, small game license sales decreased 11.9% with 276,531 licenses sold in 2009.

Local demand for cross-country skiing on State forest trails is relatively constant and satisfied by existing ski trail areas in the region.

There are no statewide assessments of birding demand, however, among the survey respondents, wildlife/nature observation (including birding) was the most popular activity on the Unit.
D. Mineral Resources

There is currently a broad societal demand for energy since the United States is the largest consumer of energy in the world. The 2002 New York State Energy Plan, by New York State Energy Research and Development Authority examines the State’s energy consumption and projected needs to year 2021. As reported in the plan, about 62% of New York’s current natural gas demand comes from the Gulf Coast region and most of the remainder comes from Canada. Gas production in New York is growing and currently meets about 2% of the annual demand.

According to the plan, statewide demand for natural gas is expected to increase at a rate of +/- 1.5% per year until 2021. Most of the projected increase in gas use is expected to be for electric power generation. There is some uncertainty about this projection however, since the number of new power plants that will actually be built is unknown.
Natural gas wells were drilled in Chenango County during the mid 1960s through the mid 1970s. Department records indicate that eleven wells were drilled in the Towns of Smithville and Greene in Chenango County. The Department recognizes this area as the Genegantslet natural gas field. All eleven wells are no longer producing gas.

In recent years, over forty natural gas wells have been drilled on private lands in the Beaver Meadow and Hawley Brook Fields located near Chenango RA # 36 in the towns of Smyrna and Plymouth. Most of the gas wells drilled in this area have been to depths between approximately 3,500 to 4,500 feet targeting the Oneida and Herkimer Sandstones. These gas wells are intended to be connected to a pipeline that will run north-south through Chenango County. Gas wells have also recently been drilled in the towns of Preston, Oxford and Coventry in Chenango County. North of the Unit, the Bradley Brook Field is located in southern Madison County. The Bradley Brook Field was discovered in 1999 and produces natural gas from more than fifty wells on private lands. These wells extract gas from bedrock formations at depths ranging from 2,200 to 3,000 feet. These fields are shown on the New York State Gas Field Map - Department of Environmental Conservation - Division of Mineral Resources, 1986.

Recently, the new technologies of horizontal drilling and high volume hydraulic fracturing have moved gas corporations to lease thousands of acres as they seek to extract gas from the Marcellus Shale formation. Industry demand for access to the Marcellus shale formation as well as the development of gas fields in the vicinity of the Unit are the result of increased global demand for energy. This demand is expected to increase in the future, with periodic fluctuations depending upon the market price of this commodity.

The public scoping survey (See Appendix VIII) included a question about the potential development of infrastructure for the extraction of natural gas. The majority of people felt that development of infrastructure for gas extraction was not an appropriate use of the State forests. If gas were to be extracted from State forests, most people want the wells and other infrastructure to be located on adjacent private lands or near existing roads to protect interior forest areas.
There is currently no public demand for sand, gravel or other hard rock mineral resources on the Unit. The gravel pit on Chenango RA # 5 and the shale pit on Chenango RA # 24 are occasionally used for State forest projects.

III. Constraints on the Unit

The following factors pose limitations to activities or management decisions on the Unit.

A. Physical Constraints

Steep slopes - Areas of steep topography impede the location and development of roads, trails and facilities.

Geologic properties - Geologic properties such as the depth to and type of bedrock, rock outcropping, and the presence and location of natural gas resources influence management actions on the surface.

Soil characteristics - Soil properties such as drainage, depth, fertility and type have a large part in determining the vegetation characteristics of a site. They also determine the sensitivity of a site to erosion or other soil impacts caused by human use.

Density and placement of recreational trails or facilities - Recreational trails or facilities occupy their immediate ground space and influence the management of the surrounding areas of land. The areas of land occupied by these facilities also may restrict other purposes.

Potential insect and disease infestations - Forest insect or disease concerns may restrict the manner in which trees may be harvested or planted.

Limited access - Some portions of State forests are remote or may only be accessed by foot due to steep slopes, ravines, etc. In areas having limited access, it may not be possible to harvest timber, develop recreational trails or extract mineral resources.

Presence of cultural resources - Cultural resources such as sites having old foundations or cemeteries are important resources which are protected on State forests. Therefore, activities which may disturb or damage these sites cannot occur on the land they occupy.

Presence of County, Town and State roads - The presence and condition of public roads determine the quality of access to State forests. Roads in poor condition restrict access. Highways restrict access due to safety concerns with vehicles traveling at high speeds.

Electrical transmission and telephone lines - Utility line corridors are maintained in an open condition and prevent the management of these areas for tree cover. Furthermore, the land
occupied by these corridors is not available for many other uses. Depending upon one’s viewpoint, these open areas may be viewed as an asset since they provide relatively scarce grassland conditions for species requiring such habitat.

Deeded rights-of-way - Deeded rights-of-way restrict activities on State land because the State does not have exclusive control over these areas of land.

Buried telecommunication lines - Buried utility cables restrict activities where soil must be excavated such as access construction.

Lack of contiguous arrangement of State land - Some areas of State forests are inaccessible due to common corners. In other cases, a State forest may be isolated and not linked to other areas of State land. In these cases, the arrangement of the State forests constrains long distance trail development.

B. Administrative Constraints

Inadequate budgets - Insufficient budgets may constrain any activity which requires the expenditure of funds.

Staffing shortages - During periods of staffing shortages, management activities that are not essential to the Department’s mission are not pursued.

Fluctuations in wood markets - The demand for wood products usually fluctuates over time. It may not be possible to commercially treat some forest stands during times when there is little demand for the product.

C. Societal Influences

Management decisions are grounded in human values. The strength of any plan is measured by the degree to which an informed public is willing and able to participate in the planning process. Efforts have been made to engage people in a dialogue about the future of the Pharsalia Woods Unit. Citizens, local government, recreationists, sportsmen and many others have contributed input about forest management on the Pharsalia Woods Unit. While all comments and recommendations were considered, the degree to which they can be satisfied will vary.

D. Department Rules, Regulations and Laws

Appendix IV lists Department Rules, Regulation and Laws governing State forest management activities.
IV. Vision Statement

In the future, the Pharsalia Woods Unit will continue to be recognized for its outstanding diversity of forest bird species and large blocks of forest that are distinct from the surrounding landscape. As the private lands surrounding the Unit continue to be subdivided and developed for residential or recreational use, these public forests will be increasingly valued by society for open space, water quality, nature-based recreation and species diversity.

Management actions on these forests will integrate the habitat requirements of those species in greatest need of conservation with sustainable forestry practices. Management actions will strive to minimize impacts from invasive species, forest fragmentation, climate change or other future threats to a healthy forest resource. Additionally, the public will have the opportunity to see and learn about sustainable forest management practices. The Pharsalia Woods Unit will provide resources for the future needs of society and opportunities for coming generations to explore healthy, diverse forests and discover the extraordinary wonders of nature.

V. Goals & Objectives

A. Land Management

Land Management Goal

Integrate the conservation of biodiversity on the Pharsalia Woods Unit with ecologically sound resource management strategies.

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.

Land management on the Unit will strive to integrate practices for conserving biodiversity with the production of timber and other natural resources. The Pharsalia Woods Unit offers a unique opportunity to blend conservation of biodiversity with commodity production because it includes both large areas of relatively unfragmented forests with an exceptional diversity of bird species. Furthermore, these forests are under the single, stable ownership of New York State so that long-term conservation practices can be implemented.
Principles for maintaining biodiversity in working forests have emerged in the fields of conservation biology and landscape ecology and provide guidance for land management on the Pharsalia Woods Unit. Following Hunter (1999) and Lindenmayer & Franklin (2002), conserving biodiversity on the Unit will be guided by five principles:

1. Maintenance of landscape connectivity - An example of this is the protection of undisturbed riparian zones and maintenance of areas of continuous forest cover.

2. Maintenance of landscape diversity - This is the diversity, size and spatial arrangement of habitat conditions.

3. Maintenance of stand structural complexity - This refers to the provision of and spatial arrangement of multiple forest age classes, sizes of live trees, snags, cavity trees and downed wood.

4. Maintenance of the integrity of aquatic ecosystems - There is a direct association between forest conditions and water quality. In addition to providing clean drinking water, wetlands, lakes, ponds, and riparian zones provide habitat for diversity of aquatic and terrestrial species.

5. Implement multiple management strategies at the stand, forest and landscape level - This is necessary because conservation of biodiversity requires providing suitable habitat for a wide variety of species, each of which has unique habitat requirements. In addition, if one strategy fails, there will likely be others that may provide the necessary conditions for sensitive species.

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 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.

**LAND MANAGEMENT OBJECTIVES**

1. Manage 78 acres in an open or shrub condition to provide habitat for the species dependent upon these vegetative conditions.

There is very little open or shrub land on the Unit as shown in Table 3: Present Land Classification, Acreage and Size Class Distribution. Open and shrub lands will be maintained, where feasible. The current and future extent of upland grasslands is insufficient to support grassland dependent species. Grasses and forbes are typically a minor component of areas dominated by shrubs. The maintenance of shrub dominated sites provides habitat for SGCN early successional species such as brown thrasher, black-billed cuckoo and benefits other species such as
as Eastern towhee. Shrub lands on the Unit are often small areas near former home sites. Typical species include: apple trees, hawthorn, viburnum, blueberry, sumac and other shrub species. Shrub lands and old orchards will be maintained by removing trees that compete with the apple and shrub species.

2. Manage 6,930 acres in an even-aged forest condition

Even-aged silviculture is a system for maintaining and regenerating forest stands in which the trees are approximately the same age. Conifer plantations and reestablished natural forests are typical examples of even-aged stands.

Intermediate harvests, such as thinnings and improvement cuts, will favor the retention of robust trees to support stand regeneration.

Application of even-age silviculture will focus on the conversion of red pine plantations to native hardwood species, regeneration of Norway spruce and regeneration of shade intolerant hardwood species such as white ash and black cherry. Since red pine is poorly adapted to regeneration on the Unit’s soils, these plantations will most often be converted to native hardwood species. Norway spruce is adaptable to a wider range of soil conditions than red pine and therefore efforts will be made to perpetuate this species.

Even-aged silviculture uses regeneration methods including clear cutting, shelterwood and seed tree to establish a new age class of trees on the harvested site. Even-aged silvicultural practices are beneficial to SGCN early successional birds such as American woodcock, black-billed cuckoo, Canada warbler, prairie warbler, ruffed grouse and willow flycatcher as well as a wide variety of other species. Regenerating clearcuts and shelterwoods are quickly occupied by early successional bird species that require this type of habitat for breeding and feeding. Each species has specific habitat requirements which occur during the development of the new age class of trees. After a period of 10-15 years, the new forest has become established and canopy closure has occurred. At this point, many early successional species no longer use the site and species numbers continue to decline until about the 25th year after the timber harvest. After this point, mature forest bird species gradually increase in abundance as the even-aged stand develops into a mature forest.

Recent research has also shown that these early successional habitat conditions are heavily used by a wide variety of mature forest songbirds (Vitz and Rodewald, 2006). Specifically, mature forest songbirds were found to use the interior of small clearcuts (10-23 acres) during the 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.

2a. **Manage 2,449 acres of predominately spruce plantations on a 75 - 140 year rotation.**

**Rotation** age is the time between stand establishment and final harvest. It occurs when mature trees are cut to establish growing conditions for a new stand. At this harvest rate, approximately 30 acres of stands composed primarily of spruce will be converted to a new age class each year. The new stands will be composed of a varying mix of Norway spruce regeneration with other native hardwood or conifer species.

2b. **Manage 1,751 acres of predominately pine or larch plantations on a maximum of a 100-year rotation.**

At this harvest rate, an average of 40 acres of predominately pines or larch plantations will be converted to a new age class each year. The new, early successional stands will be composed of a varying mix of native hardwoods and conifers. Where natural regeneration is inadequate, mixed species of trees will be planted, including native species.

2c. **Manage 2,649 acres of native hardwoods on 100 - 160 year rotation.**

These are currently even-aged stands, mostly with black cherry and red maple as the dominant tree species. Currently, these stands are approximately 75 years old. Future stand treatments identified in this plan will primarily be thinnings done to establish desirable advance regeneration in preparation for future shelterwood harvests.

2d. **Manage 81 acres for pioneer hardwoods on a 60-year rotation.**

These stands are typically on somewhat poorly drained soils and currently have a mix of tree species with a significant component of pioneer hardwoods such as aspen and red maple. The management intent is to increase the proportion of pioneer hardwoods on these sites. The resulting early successional conditions will favor SGCN species such as woodcock and ruffed grouse.
3. Manage 2,691 acres using the uneven-aged system.

**Uneven-aged silviculture** is a system for maintaining and regenerating forest stands with at least three distinct age classes. This system favors shade tolerant species such as sugar maple, eastern hemlock and American beech and creates a stratified stand structure with trees of different heights represented in all levels of the forest canopy. Regeneration and control of uneven-age stand structure will be accomplished using the individual tree and/or group selection system with periodic harvests using a 20-30 year cutting interval.

As most stands on the Unit are currently even-aged, conversion to uneven-aged conditions will require a long term commitment to regenerating at least two new age classes through controlled cutting of mature trees. This will require the use of group selection where patches of trees approximately 0.3 - 0.6 acre in size are harvested in conjunction with individual tree selection. Where conditions allow, crop trees will be grown to a maximum diameter of 26". Other trees may be selected as recruitment trees to be retained permanently within the stand for wildlife habitat or their unique features on the landscape.

3a. Manage 2,375 acres of native hardwoods and conifers using the uneven-aged system.

3b. Manage 315 acres of existing plantations using the uneven-aged system.

**Variable density thinning** will be used to regenerate distinct patches of regeneration at regular intervals while maintaining an overstory component of mature conifer trees at varying densities. Over the course of several cutting intervals, these stands will develop uneven-aged characteristics. This technique will be applied to a large block of Norway spruce plantations along the North Road on Chenango RA # 5.

4. Harvest 1,572 acres using the variable retention system.

**Variable retention** is an experimental harvest system for increasing biodiversity in stands managed for timber production (Franklin et. al., 1997, Lindenmayer & Franklin, 2002). It will be applied in both even- and uneven-aged stands to increase structural complexity by permanently retaining trees, uncut patches and coarse woody debris.

Variable retention will be applied in 719 acres of uneven-aged stands and 853 acres of even-aged stands. Retention patches will be no larger than one acre and represent no more than 50% of the stand area. In stands with native conifers, eastern hemlock and eastern white pine will be favored for retention. Riparian zones, wet seeps and poorly drained sites within the stand will be favored for retention. Sites with snags, decaying logs and existing or potential cavity trees will be favored for retention. Sites with vernal pools, hedgerows, rock outcrops, abrupt pit and mound topography, steep slopes and other unique features will be favored for retention. Rotation in
even-aged stands will be 160 years. Utilization of harvested trees will be restricted to a 10" top diameter, and individual wind thrown trees will not be salvaged.

The precise quantity and distribution of retention features will vary depending on analysis prior to stand treatments. Retention trees and patches will be identified during current stand treatments and paint marked at d.b.h. or otherwise designated through notes in office inventory records. The result of these practices will be increased structural complexity providing features such as large snags, cavity trees and coarse woody debris on the forest floor. This increased structural complexity should benefit a wide array of species ranging from birds and mammals using the snags and cavity trees to woodland salamanders that need decaying logs for habitat.

5. Maintain a variety of conifer species and at least 5% of existing red pine for wildlife species conservation.

Conifer trees are an important habitat feature used by a wide variety of wildlife species for shelter and cover, however one unique species dependent upon conifers is located on this Unit. According to the 2000 New York State Breeding Bird Survey published in *The Second Atlas of Breeding Birds in New York State*, a population of breeding red crossbills is located in western Chenango County. The survey found that red crossbills are a confirmed breeding species on the Unit. As a species, they are unique because they are specially adapted to feed on conifer seeds and it is thought that they exist in this portion of the State due to the large amount of conifer plantations, located predominately on the State forests.

Ornithologists have identified nine different “vocal types” of red crossbills, across their North American range, based upon distinct differences in flight calls. It is thought that these different types may be evolving into separate species. The various different “vocal types” are also associated with specific conifer species for which that “type” is best adapted to extract the seed from the conifer cones. Red crossbills will feed on the seed of many different conifer species depending upon which species is producing seed that year. Type 1 red crossbills (the only endemic type to the east) use red pine seed as a food source.

This plan proposes the long term maintenance of over 2,000 acres of plantation conifer species such as Norway spruce, larch and red pine. In addition, the plan proposes maintaining over 2,200 additional acres of native conifer species consisting of primarily hemlock but also including some white pine and red spruce. These acres include stands to be managed and regenerated into conifers as well as those designated for protection.

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, they are now at or near maturity. The Unit contains approximately 1,540 acres of red pine plantations. Many sites have trees with declining vigor as indicated by thin crowns. 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.

Over the 20 year span of this plan, it is expected that up to approximately half of the red pine on the Unit will be removed through harvesting, converting these stands to mostly native hardwoods. It is expected that 8-10% (+/- 140 acres) of existing mature red pine will be retained in perpetuity in stands designated for protection. Additional acres of red pine will likely be retained in scattered locations throughout the unit as a result of compliance with the Department’s Forest Retention policy and in buffers along wetlands, streams and water bodies. Although the presence of red pine on the landscape can be prolonged by retention, they will eventually succumb to damaging high winds, ice storms, or inevitable death due to age related declining vigor.

6. 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.

In 2006, the Department conducted a study to evaluate the growth and development of forest regeneration after thinnings in hardwood stands on State forests in Madison, Chenango and Broome Counties. The 2006 Regeneration Study showed that traditional individual tree selection and small group selection silvicultural practices in native hardwood stands have failed to regenerate adequate quantities of desirable species. Achieving successful regeneration is an essential component of sustainable timber harvesting. The study showed that repeated browsing by white-tailed deer is limiting the growth and establishment of species such as hard maple, white ash, and red maple as well as other native tree species. 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). Unfortunately, the study on the State forests showed that interfering vegetation is proliferating in the understory of hardwood stands.

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:
6a. 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 more species diversity in the 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.

6b. Schedule hardwood stand thinnings after nearby plantation conversion cuts.

Most red pine plantations on the Unit will be converted to native hardwoods by conversion cutting. Removal of the plantation overstory produces a flush of fast-growing hardwood regeneration that may attract deer away from hardwood stands where tree seedlings are more vulnerable to deer browsing.

6c. Increase the deer harvest on selected State forests to temporarily reduce the deer population.

The Department will seek to develop a focused hunting program, open to the public, on selected State forests through the Deer Management Area Assistance Program or other population reduction program administered by the Bureau of Wildlife. Temporarily reducing the deer population for a period of several years on select forests could provide a “window of opportunity” to allow regeneration to become established and grow above the deer browse level. This period of lower deer populations will also allow herbaceous understory species that are sensitive to deer browsing a period of recovery for growth and development.

6d. Remove interfering vegetation at select locations where it dominates the forest understory.

Where interfering vegetation exceeds threshold levels and limits 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.
6e. Fence post-harvest regeneration areas.

Experimental deer exclosures may be established on the Unit to monitor deer impact on regeneration. If other methods of establishing regeneration prove ineffective, timber harvest areas will be fenced to exclude deer and allow a diversity of species to develop. Once the regeneration has grown above 6’ in height, the fence will be removed from the area.

6f. Improve availability of alternate deer food to reduce browsing pressure on forest vegetation.

Log landings and open skid trails will be seeded with a mix of non-invasive herbaceous species such as orchard grass, red and/or white clover.

7. Protect forest interior areas by prohibiting future development of new surfaced roads, interior log landings or similar openings beyond 250 feet from existing Town or State roads on the Unit.

A large and growing body of research shows that roads, including unpaved roads, have persistent, long-term negative impacts on the biodiversity of forest ecosystems. The development of forest roads is inconsistent with the goals of this plan. Researchers have documented a multitude of negative impacts of forest roads on biodiversity. Some of these impacts include:

Invasive plants are one of the greatest threats to the conservation of biological diversity, and are a significant problem for land managers in New York State. Forest road development encourages the colonization and spread of invasive exotic plant species. Road development causes a decrease in native plant species diversity and an increase in the presence of exotic species within a zone of up to 50’ from the road edge (Watkins, et al. 2003). Roadside areas then become seed sources for the spread of exotic species into interior forest areas. For instance, roadside ditches can provide locations for exotic wetland species to become established and then invade otherwise isolated wetlands. Once established, eradication of exotic species is extremely difficult.

Unpaved forest roads are a common source of chronic stream sedimentation with resultant negative impacts on aquatic vertebrate and invertebrate species’ abundance and diversity (Trombulak & Frissell, 2000).

Roads are one of the most common forms of forest fragmentation. Roads dissect large patches of habitat into smaller fragments. Forest road corridors have been shown to encourage the spread of cowbirds into forested areas resulting in nest parasitism of neotropical migrant bird species (Rich & Dobkin, 1994). Nest parasitism is thought to be an important cause of decline in the populations of neotropical migratory bird species. As previously noted, State forests on the Unit have been recognized as an Important Bird Area by The Audubon Society due to the outstanding diversity of forest breeding species and the presence of large, unfragmented blocks of forest. Limiting road development to protect forest interior will help to maintain the great diversity of bird species present on the Unit.
The full impact of forest roads on wetland biodiversity is often delayed as road development can lead to the loss of wetland plant and animal species over a period of many years or decades (Findlay & Bourdages, 2000).

Construction of forest roads results in swaths of over 260' wide of permanently unsuitable (fragmented) habitat for woodland salamanders. Furthermore, forest roads have been shown to have persistent impacts by acting as a significant barrier to their movement and thus fragmenting their habitat. In addition, the habitat in the vicinity of abandoned roads may continue to remain unsuitable for decades after abandonment (Semlitsch, et al. 2007). Minimizing future road development is consistent with the protection of rare species such as the spotted salamander and blue spotted salamander, both of which are Species of Special Concern.

Development of forest roads leads to reduced leaf-litter depth for a distance over 300' into the forest from the road edge. The reduced litter depth causes reductions in soil macro-invertebrate species’ abundance and diversity (Haskell, 2000). These macro-invertebrates are prey for vertebrates such as salamanders and ground-foraging birds. Haskell concludes “If a goal of forest management is to maintain the function and diversity of forest ecosystems . . . managers should minimize both the density of roads and the extent to which roads sprawl across the landscape.”

This objective of protecting interior forest is consistent with the Nature Conservancy’s designation of this area as part of the Chenango Highlands Priority Forest Block and the National Audubon Society’s designation of these forests as an Important Bird Area.

8. 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.

The recent media reports and public meetings addressing gas well development in New York State have focused on the current Draft Supplemental Generic Environmental Impact Statement (DSGEIS) on the Oil, Gas and Solution Mining Regulatory Program. This is a complicated issue and there is much confusion and misinformation about this topic. The DSGEIS only addresses activities associated with well pad development for wells using high-volume hydraulic fracturing (HVHF) to target the Marcellus or Utica Shale or other rock formations.

The Revised DSGEIS, 2011, states:

“Surface disturbance associated with high-volume hydraulic fracturing would not be allowed on State-owned lands administered by the Department, including but not limited to State Forests and State Wildlife Management Areas, because it is inconsistent with the suite of purposes for which those lands have been acquired.” (DSGEIS p.1-17)

However, surface disturbance from other forms of gas or oil extraction that do not involve high-volume hydraulic fracturing may occur on State Forests if they are leased under the current leasing process. This form of gas extraction has historically taken place in the nearby Beaver
Meadow and Hawley Brook gas fields in the towns of Plymouth and Smyrna.

The following information addresses the process of gas leasing and associated development on State lands:

**Leasing of State Lands**

Article 23, Title 11, Section 23-1101 of the Environmental Conservation Law and State Finance Law authorizes the Department to make leases on behalf of the State for exploration, production and development of oil and gas on State lands. Proposals to lease parcels of Department regulated State lands for this purpose will be considered following public notice in the Environmental Notice Bulletin (ENB), and in local newspapers.

Initial title review indicates that the State owns the mineral estate under all State forests within the Unit, with the qualification that the mineral reservation may exist and no expressed or implied warranty of title is being offered in this Plan.

Prior to leasing any land in the Unit, the Department will initiate the SEQR review process for this specific action. A public meeting will be held to provide information about natural gas development specific to the Unit and receive comments. A 30-day public comment period will follow and the Department will consider all comments prior to making a decision.

If the Department decides to pursue leasing, a no-surface occupancy lease is preferred to avoid potential conflicts with biodiversity conservation, public recreation, cultural resource preservation and protection of water quality. The site specific conditions for limiting impacts on natural resources encompassed in this plan will be drafted by land managers in coordination with Mineral Resource staff and incorporated into contract documents. These conditions will include but not be limited to criteria for site selection, mitigation of impacts and land reclamation upon completion of drilling. If the Department pursues a surface occupancy lease, according to the New York State Strategic Plan for State Forests: “DEC may consider well pad densities of greater than one well pad in 320 acres only when the additional impact can be managed with heightened mitigation measures and well location restrictions.”

All gas exploration and development will be in full compliance with the New York State Supplemental Generic Environmental Impact Statement and the Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program as well as all applicable laws.
A number of factors are considered to determine the compatibility of surface disturbance associated with natural gas development including, but not limited to, proximity to wetlands, riparian areas, slope steepness, recreation trails, rare, threatened or endangered species, and other unique ecological communities. Compatibility will be determined during field inspection and the tract assessment process on a case by case basis. Individual tract proposal reviews for each forest within this Unit will be completed with determinations made regarding exclusion zones prior to awarding a lease. Exceptions to the tract assessments are possible if additional analysis, protective measures, new technology, or other issues warrant a change in compatibility status of an area.

**Sampling, Surveys or Testing for Gas**
Requests to use State land to conduct geophysical (such as seismic survey), geochemical and/or surface sampling procedures will require an approved lease and a Temporary Revocable Permit. These procedures are necessary to determine the extent and distribution of natural gas fields. Sampling procedures are less invasive than development operations and will be subject to the Department's seismic testing guidelines. If the property is subject to lease agreement, only the lessee, or parties authorized by the lessee, can be issued a TRP for these purposes. Seismic testing will not be permitted prior to leasing.

**Roads**
Access roads associated with well sites will not exceed 14' in width between ditches. On turns and intersections roads will not exceed a total cleared width of 36'. Roads will be constructed with gravel over filter fabric to minimize soil disturbance. Upon completion of drilling, access roads will be closed to the public and reclaimed to a condition capable of supporting both vegetation and periodic access to maintain the well site. Site restoration and long term access will be authorized by a Temporary Revocable Permit (TRP).

**Well Pads**
The siting of any well pads on the Unit shall comply with the process described in the NYS Strategic Plan for State Forest Management and the Generic Environmental Impact Statement and Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program.

**Pipelines**

Pipelines may be constructed on State Forest lands only if a portion of the mineral resources to be transported was extracted from these State lands. Pipeline and road development must be in compliance with State Forest tract assessments, the Strategic Plan for State Forest Management, and the Generic Environmental Impact Statement and Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program.
Pipelines will be located immediately adjacent to Public Forest Access Roads. The location of the roads and pipelines will be in compliance with tract assessments. Pipelines may be located in stands managed for closed canopy conditions only along pre-existing roads that intersect such area. Additional surface disturbance associated with such construction will be considered only in areas other than stands which are managed for relatively unbroken canopy conditions. Areas managed for unbroken canopy conditions may be referred to using various terms such as “uneven-aged,” “uneven-aged variable retention,” “all aged,” “high canopy,” “closed canopy” or others.

Pipeline development on State land will not be permitted if the Department determines that it creates a significant long-term conflict with any management activities or public use of the State Forests, or with other management objectives in this plan. All pipelines will be gated to restrict motorized access, and if necessary hardened crossings or bridges will be installed, to allow heavy equipment access across pipelines. These requirements will be satisfied by the Lessee.

Exceptions to the above guidance must be approved by the Division of Lands and Forests, in consultation with the Division of Mineral Resources.

Gas Storage
The Unit is not being considered for underground gas storage. However, if a proposal for gas storage is submitted to the Department, it may be considered as a separate lease. It will require a change to the Plan, and will precipitate the UMP amendment process, including additional public meetings and full compliance with SEQR. Any proposal for gas storage development must be consistent with the objectives of this Plan. Once wells are played out, they will be plugged and abandoned.

Site Restoration
Upon completion of drilling, well sites will be reclaimed with native vegetation to a condition consistent with the surrounding stand management objectives as determined by Division of Lands and Forests staff.

For additional information about the exploration and development of oil and natural gas resources on State forests, see the New York State Strategic Plan for State Forest Management, Chapter 5, pp.225-238 at: http://www.dec.ny.gov/lands/64567.html.

9. Prohibit the commercial sale of gravel or hard rock resources.

Gravel and hard rock resources in the areas surrounding and including the Pharsalia Woods Unit are limited. There are no mining contracts, permits, or operations on any areas in this Unit. Under Article 7 of the New York Consolidated Laws / Public Lands, any citizen of the United States may apply for permission to explore and/or extract any mineral on State lands. However, current Department policy is to decline any commercial mining application(s) pertaining to any
lands in this Unit. The Department will occasionally mine small quantities of shale or gravel for use on State facilities such as access roads or parking lots.

10. **Maintain two pits to provide resources for maintenance of Department facilities.**

A gravel pit on Chenango RA # 5 and a shale pit on Chenango RA # 24 provide surface material necessary for roads, trails, parking areas, and camp sites. 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, then a mined land reclamation and recovery plan will be required. Regional staff from the Division of Minerals will be consulted at that time.

11. **Manage 587 acres as natural areas.**

**Natural areas** are forests withdrawn from 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, stands will develop late successional characteristics with old trees, structural complexity and a seemingly chaotic appearance.

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. The natural area consists of a large area of mature, interior forest on Chenango RA # 5 that contains many streams and associated wetland complexes that form the headwaters of the Genegantslet Creek.

In the absence of logging and gas drilling, natural areas will develop **old growth** forest characteristics, conditions that are relatively scarce within the larger rural landscape of Chenango, Cortland and Broome Counties. 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.

12. **Protect 2,635 acres of wetlands 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).
The management objective will ensure a clean supply of water and protect the habitat of those 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.

13. **Protect water quantity and quality on the Unit.**

The waters on the Unit are the headwaters for Brackel Creek, Genegantslet Creek, Fly Meadow Creek, Canasawacta Creek, East Branch Canasawacta Creek and the Otselic River. Protecting headwater creeks is important for aquatic habitat and because headwater streams establish the water quality for larger downstream rivers.

Waters on the Unit will be protected by following the Management Rules for Special Management Zones on State Forests (see Appendix IX). These rules are designed to minimize impacts to aquatic habitats from actions associated with gas and mineral extraction or forest management.

Log landings and clearings for other management activities will not be constructed on slopes exceeding 10%. Significant slope modification is necessary to establish landings on these sites and there is the potential of impacting drainage patterns and creating abrupt and permanent contrasts in landscape patterns. In addition, all timber harvesting, gas drilling and development, and other management activities on the Unit will comply with the NYS publication **Best Management Practices for Water Quality** to prevent soil erosion and protect water quality.

Commercial use of water on the Unit will only be allowed through appropriate permits or contract. Wells will not be allowed to be drilled for water extraction.

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

The development of gas drilling in Chenango County 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 Department’s Division of Solid & Hazardous Materials. 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 pot holes with standing water.

The application of brine will not be allowed on the portions of the following town roads and Public Forest Access Roads that are on State land:

<table>
<thead>
<tr>
<th>State Forest #</th>
<th>Town(s)</th>
<th>Road Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chenango RA #5</td>
<td>Pharsalia</td>
<td>Nine Mile Truck Trail</td>
</tr>
<tr>
<td>Pharsalia</td>
<td>Fred Stewart Rd.</td>
<td></td>
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<tr>
<td>Pharsalia</td>
<td>Coy St.</td>
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<td>Pharsalia</td>
<td>Swartz Rd.</td>
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<td>Chenango RA #22</td>
<td>Pharsalia</td>
<td>C.C.C. Rd.</td>
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<td>Pharsalia &amp; Otselic</td>
<td>Gorge Rd.</td>
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<td>Chenango RA #24</td>
<td>Pharsalia</td>
<td>Nine Mile Truck Trail</td>
</tr>
<tr>
<td>Plymouth</td>
<td>Blackman Rd.</td>
<td></td>
</tr>
<tr>
<td>Plymouth</td>
<td>Brooking Rd.</td>
<td></td>
</tr>
<tr>
<td>Plymouth</td>
<td>Reservoir Hill Rd. Extension</td>
<td></td>
</tr>
<tr>
<td>Chenango RA #36</td>
<td>Plymouth</td>
<td>Cookhouse Rd.</td>
</tr>
</tbody>
</table>

15. **Protect 414 acres of steep slopes and inaccessible sites by restricting 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.

16. **Protect 52 acres for visual quality or historic resources.**

Timber harvesting, gas drilling and other planned disturbances are inconsistent with the protection of visual or historic resources and these areas will be excluded from such activities.
17. **Protect cultural resources.**

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.

Seventy-three sites of cultural significance have been identified. Cultural resources will be protected from disturbances associated with timber harvesting, well site construction and recreational activities. 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 and efforts will be made to sustain non-invasive vegetation through thinning and pruning.

18. **Increase the presence of native oak and hickory species on the Unit.**

In the future, climate change is expected to cause northward or altitudinal shifts in the suitable climate for tree species ranges. Climate scientists predict that New York’s climate will be comparable to present day Virginia - South Carolina by 2070 - 2090. This warmer climate in the future will favor the development of an oak-hickory forest type instead of the current species mix of northern hardwoods that dominate the natural forests on the Unit. The warming is expected to exceed historic rates of change and consequently occur at a pace that will likely exceed the natural migration rate of native tree species. As the climate warms, it is anticipated that species such as eastern hemlock, hard maple and red maple will be stressed and increasingly vulnerable to mortality from other factors such as drought and insect or disease attack.

The Unit is within the existing range of native red and white oaks and shagbark hickory; however, these species are currently absent on the State forests. Groups or patches of oaks and/or hickories will be planted on selected sites where existing pine plantations are harvested at the end of their rotation. Establishing oak and/or hickory in scattered locations on the forests will provide a future seed source for natural regeneration and may mitigate the severity of future impacts associated with climate change. In addition, increasing the presence of these species will increase forest diversity as well as provide a valuable food source (nuts) for a variety of wildlife species.

19. **Evaluate current stream conditions and revise classifications.**

DEC Bureau of Fisheries will, as time and staffing allow, review the stream classification of waters in the vicinity of the Unit and upgrade designation based upon new field data collected.
Current stream classifications are outdated and stream quality has changed since the original designation. Updated stream classification based upon current data will improve the protection of waters on and in the vicinity of the Unit.

20. Manage invasive exotic plants to protect native biodiversity.

The Department will manage occurrences of invasive species according to the Invasive Species Management Principles and Control Methods outlined in the Strategic Plan for State Forest Management. Any future discoveries of invasive plants will be documented and mapped. Appropriate management strategies will be developed and implemented specific to each instance as funding and resources are made available. Possible actions used to control or eliminate invasive plant species will include cutting, pulling, burning and possibly herbicide application where other methods will not be effective. Any use of herbicides to manage invasive exotic plants will be applied using targeted application methods with the least toxic chemicals possible. Appropriate guidelines will be followed such as those in The Nature Conservancy Weed Control Methods Handbook: Tools and Techniques for Use in Natural Areas.

21. 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, Goshawk and Red-shouldered Hawk. Each species has specific habitat requirements when nesting. Birds may occupy territory seasonally, or return to the same location yearly. During breeding season, usually between April and July, human activity near nests may disrupt breeding or cause the adult birds to abandon their young. 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.

21a. Prohibit the removal of raptors on the Unit.

The Department has a process whereby licensed falconers can obtain a permit to remove raptors from nests for the purposes of falconry, as specified in ECL Article 11 and 6 NYCRR Part 173. Permits for this activity will not be issued on this Unit due to its inclusion of the Audubon Important Bird Area and plans to monitor raptor nesting activities.
21b. The Department will encourage monitoring and research on the status of northern goshawks to ensure sustainable populations, and to ensure that our knowledge of the natural history and ecology of these raptors continues to increase.

Regional Forestry staff will continue to work with Bureau of Wildlife staff when raptor nest sites are discovered in the process of planning conducting activities on State forests. The wildlife staff will be consulted to determine appropriate measures to protect the site.


Currently, only the Pharsalia Wildlife Management Area is in the Pharsalia Woods Bird Conservation Area. The National Audubon Society recognizes Chenango RA # 5 & 24, 22 and the Pharsalia Wildlife Management Area as the Pharsalia Woods Important Bird Area. New York State’s Bird Conservation Area (BCA) Program is authorized in legislation that seeks to “safeguard and enhance populations of wild birds native to New York State and the habitats therein that birds are dependent upon for breeding, migration, shelter, and sustenance.” The BCA program applies only to State-owned properties and seeks to protect birds and their habitats by integrating bird conservation practices into agency planning and management within the context of agency missions. Once approved as a BCA, this designation will be included on the State forest identification signs.

23. Retain woody habitat structures to maintain species diversity at the stand level.

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. The following practices will be done on managed stands capable of producing them as required in Department policy ONR-DLF-2, Retention on State Forests.

23a. Retain snag and cavity trees in a variety of sizes.

Snag and cavity trees provide a number of habitat functions for animal species. Snags provide perching sites for raptors and flycatchers and feeding sites for woodpeckers and sapsuckers among other species. Snags with loose, hanging bark provide roosting sites for forest bats.

Cavity trees provide shelter and nest sites for a wide variety of bird and mammal species ranging from chickadees, sapsuckers and owls to porcupines, southern flying squirrels and fisher. The retention of snag and cavity trees will be applied to both even and uneven-aged systems where it does not create hazardous conditions. In hardwood and native conifer stands that lack sufficient snag or cavity trees, low vigor trees will be retained at the time of silvicultural activities to provide for future snags and cavities.
23b. Provide downed woody debris.

Downed woody debris is an important component of the forest ecosystem. Downed wood provides habitat for a variety of species such as small mammals, salamanders, and invertebrates. In addition, downed wood provides favorable sites for the growth of plants and fungi, and cycles nutrients as it decays.

Downed wood will be maintained on managed forest stands by:

- Retaining the tops of felled trees on site.
- Retaining noncommercial logs on site during harvesting operations.
- Prohibiting whole tree harvesting.

23c. Retain 10 to 40 square feet of basal area/acre in live overstory trees during the final regeneration cut in even-aged management stands where feasible.

Retaining live overstory trees provides structural and habitat diversity while moderating the microclimate for seedling establishment. Trees retained at the time of the final cut will provide a future source of snags, cavity trees and downed woody debris extending into the new rotation of forest trees. Retention trees also provide feeding and perching sites for many mature forest bird species on sites that would otherwise support only early successional species.

24. Conduct periodic forest inventory data and support volunteer research projects.

The forests on the Unit will be inventoried on a 10-15 year cycle. A Re-inventory will be completed on any stand with inventory data older than ten years, before a timber harvest will occur in that stand. Timber Harvests may occur on stands where the inventory is up to date. A post-harvest inventory will additionally be conducted in these stands at the end of each harvest operation.

Periodic assessments of regeneration and deer population levels will also be conducted. Volunteer research efforts will be supported, provided they do not conflict with this plan’s goals or objectives.

25. Maintain 102.54 miles of boundary lines.

25a. Periodically repaint boundary lines on an eight-year cycle.

25b. The Department will seek ways to complete boundary surveys in a timely manner.

Establishing boundary lines is an important part of resource management and protection. Part G. in the Management Action Schedules lists the boundary surveys needed on the Unit. Various options, including contracting, may be attempted to complete the survey needs on the Unit.
**B. Public Use and Recreation**

**Public Use & Recreation Goal:**

Provide quality recreational opportunities compatible with the Unit and improve public access and awareness of State forest features while protecting the natural resources.

State forests within the Pharsalia Woods Unit are part of the Region 7 Recreation Master Plan. The Recreation Master Plan conveys guidelines for recreational development on State forests throughout the region. In general, 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 lands do not pay admission fees, and limited facility development and associated construction and maintenance costs are consistent with this principle.

There are three components to the public use and recreation section of this plan:

- Maintaining and enhancing public access
- Maintaining and enhancing recreational opportunities and facilities
- Providing educational opportunities

The above guidelines and principle will be used to determine the extent of development and type of facilities.

Numerous other factors affect the placement or expansion of facilities on this Unit. These factors include public safety issues, accessibility, local government influence, aesthetics, fiscal constraints and recreational opportunities beyond the boundaries of the Unit.

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 the use of public accommodations. Title II of the ADA applies to the Department and requires, in part, that reasonable modifications must be made to its services and programs, so that when those services and programs are viewed in their entirety, they are readily accessible to and usable by people with disabilities. This must be accomplished 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 to the Department. Since recreation is an acknowledged program of the Department, and there are services and activities associated with that program, the Department has the mandated obligation to comply with the ADA, Title II and ADA Accessibility
Guidelines, as well as Section 504 of the Rehabilitation Act. See Appendix VII for additional information on ADA.

The Pharsalia Woods Unit provides the opportunity to enjoy a variety of dispersed low-impact forms of recreational activities including snowmobiling, hunting, hiking, birding, pleasure driving, camping, nature observation and mountain biking on dirt roads. Future management actions supporting these forms of recreation include the following management objectives:

1. **Increase hunting opportunities on selected State forests.**
   The Department will seek to develop a focused hunting program, open to the public, on selected State forests. Additional hunting opportunities will be sought by the Division of Lands and Forests seeking additional hunting permits or extended seasons from the Bureau of Wildlife.

2. **Improve hunter and non-hunter awareness of forests on the Unit by producing a map brochure.**
   Improving public awareness about the history, features and location of the forests on the Unit with a map will encourage hunters and non-hunters to explore areas of the forests away from roads. This may increase hunter success rates and enhance opportunities for nature appreciation and wildlife observation. The brochure will include a map illustrating trails, parking areas, kiosk locations, lean-tos and other public use facilities along with text describing features of the Unit. The brochure will also be available on the Department’s web site.

3. **Retain DEC authority over a portion of the former Camp Pharsalia grounds for the benefit of public use and Department management activities.**
   Authority over the Camp Pharsalia facility has been transferred to NYS Office of General Services as surplus property to offer for sale to the public. In the log yard behind Camp Pharsalia, the sawmill, planer building and pole barn will be sold or razed if no suitable buyer is found and this land will be retained by the Department.

3a. **Retain the recreation area and ball field on the east side of the access road.**
   The recreation area, ball field and the accompanying pavilion east of the access road along Center Road will be retained for public use as snowmobile parking and staging area and day use area. This area is not included with the surplus property.

3b. **Develop and maintain a parking area on Chenango RA # 5, at the site of the ball field on the former Camp Pharsalia.**
   The parking area will have a capacity for approximately 30 vehicles and snowmobile trailers. The Department will seek partnerships with the Town of Pharsalia and/or snowmobile clubs (through an Adopt-A-Natural Resource Agreement) to assist with the snow plowing of the
parking area in the winter. Development of this parking area will serve as a safe off-road assembly area for snowmobilers and other people coming to enjoy activities on the forest.

3c. Connect the snowmobile trail to the parking area and move/open the gate at the west end of Nine Mile Trail during snowmobile season.

Upon completion of the snowmobile parking area, a short trail will be developed to connect to the nearby Nine Mile Trail. This will extend the snowmobile trail from North Road west to Camp Pharsalia. The gate on the truck trail will be moved from the old restricted area boundary to the west end of the truck trail or simply opened during snowmobile season depending on the final configuration of the snowmobile trail.

4. Consider maintaining the existing pavilion near the proposed parking area on Chenango RA # 5. Picnic tables, a fire ring and a cleanable pit privy may also be provided at this site. All features provided at the site will be accessible to those with mobility impairment disabilities.

The Department will consider providing these amenities if a club or organization is willing to assist with maintenance through a partnership in the Adopt-A-Natural Resource program. This site could provide a meeting and day-use picnic location for people using the forest in all seasons. If development of this site is accomplished, the pit privy located on the snowmobile trail at the intersection of North Road and Nine Mile Trail will be removed.

5. Develop an interpretive auto tour on Chenango RA # 5 & 24.

The tour will guide visitors through the diverse habitat types and conditions on the forest with numbered stops at interpretive sites. A brochure will be provided explaining a variety of topics on the forest such as forest management, deer impacts on forests, the impact of the tornado and the influence of forest structure/type on birds in the Pharsalia Woods Bird Conservation Area.

6. Improve awareness and availability of parking on the Unit.

Signed parking areas will be developed at the locations described below. Each parking area will have at least one designated spot for people with disabilities. In addition, unsigned, informal pull-offs will be constructed along roads with limited areas for parking.

Signed parking areas will be developed and maintained at the following locations:

Chenango RA # 5, stand C-26.2: A parking area will be developed where the proposed Finger Lakes Trail loop trail meets Nine Mile trail near Coy Street. Parking capacity will be for 3 - 5 vehicles.

Chenango RA # 5, stand D-95: Develop a designated parking area suitable for at least three vehicles at the junction of the haul road and the County highway.
Chenango RA # 22, stand B-34: An existing pull-off will be upgraded to a parking area at this location along County Route 42. Vehicles travel this road at high speeds and there are currently no pull-offs along this road to access the forest.
Chenango RA # 22, stand C-31: A small parking area will be constructed for the motorized access route described below.
Chenango RA # 36, stand A-4.1: An existing drive-through pull-off, along County Route 16, will be upgraded to a designated parking area.

7. Develop and maintain an approximately 0.4 mile route on Chenango RA # 22, stands C-6.1 and C-31, for motorized access by permitted individuals having mobility impairment disabilities.

The route will begin on Center Road, west of the intersection with the George White Road. The route will extend north for approximately 0.4 miles to its end point. This is an existing route that will be signed for motorized access by individuals with disabilities having a Department issued CP-3 permit. A parking area will be constructed at the Center Road access point.

8. Provide the opportunity for people with mobility impairment disabilities to camp at the lean-to on Chenango RA # 22.

Providing accessibility to this lean-to will offer the opportunity for camping at an interior forest location to people with disabilities. Providing an accessible camping experience at this site will require:

8a. Development of an accessible route, approximately 0.28 miles in length, to the lean-to.

8b. Construction of a small parking area at the access point.

8c. Maintenance of an accessible route, pit privy, fire ring and lean-to.

9. Reroute the Finger Lakes Trail (FLT) on Chenango RA # 5 to improve trail quality and provide a loop for day hikes.

The trail currently enters Chenango RA # 5 from the north via State Highway 23 and Stewart Road. Approximately 1.7 miles of the trail currently located on these roads will be rerouted onto the portion of the State forest located east of North Road and north of State Highway 23. The proposed trail will exit the Pharsalia Wildlife Management Area and enter Chenango RA #5, then cross the Canasawacta Creek and State Highway 23. The proposed trail will proceed south to meet the snowmobile trail which it will follow for a distance of approximately 0.2 miles to Center Road. At this point, the trail will cross Center Road and traverse south and east to the existing FLT located west of Stewart Road.
One new segment of FLT trail will be developed to establish a loop trail of about 4.5 miles in length. The new segment will extend for a distance of approximately 0.4 miles west of Stewart Road to the existing FLT. See map Appendix XI, Chenango RA # 5-Existing and Proposed Facilities map.

Construction and maintenance of the trail will be in partnership with the Finger Lakes Trail Conference through their Adopt-A-Natural Resource Agreement with the Department.

**9a. Remove the existing lean-to east of Coy Street in 2014.**

The Coy Street lean-to is slated to be removed upon completion of the new lean-to. The fireplace will be retained and the site may be designated a primitive campsite. This lean-to is dilapidated and the Department does not have the resources to renovate it. However, the Department is willing to discuss the possibility of retaining this lean-to and spur trail if a volunteer group expresses interest in adopting this facility prior to May 2014. This must be done through the Department’s Adopt-A-Natural Resource (AANR) program. Any costs and materials to maintain the lean-to would be the responsibility of the volunteer group.

**9b. Install a gate across the trail leading to the existing lean-to from Coy Street.**

The trail leading to this lean-to invites illegal off-road vehicle access and dumping.

**9c. Construct a new lean-to along the FLT on Chenango R.A. # 5 south of Nine Mile trail and west of Stewart Road to replace the existing lean-to and spur trail east of Coy Street.**

The proposed reroute of the FLT described above will make the current lean-to and spur trail east of Coy Street obsolete. Developing a new lean-to west of Stewart Road will locate it on the main branch of the FLT at a more convenient location for trail hikers. A pit privy and fire ring will also be provided at the lean-to site.

**10. Designate a site for primitive camping on Chenango RA # 24, stand A-87, just off the west side of the Blackman Road.**

This location has historically been an informal camping site. Designation by signing and mapping will improve public awareness of this site.

**11. 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 stated in the Strategic Plan for State Forest Management:

“…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

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• on those specific routes designated for use by DEC-issued Motorized Access Permit for People with Disabilities (MAPPWD).”

“It is the policy of the Department of Environmental Conservation to: (1) prohibit ATV use on public lands managed by the Department; (2) allow ATV use by persons with disabilities pursuant to the terms of a CP-3 permit or Non-Ambulatory Hunting permit; and (3) continue to consider the suitability of roads and trails for public ATV use to access recreational programs on conservation easements managed by the Department in accordance with the criteria set forth herein.”

12. Construct and maintain five information kiosks.

The kiosks will include a map and information about the available recreational opportunities on the forest. The kiosks will be placed at the following locations:

- Chenango RA # 5: Near the intersection of North Road and Nine Mile Trail.
- Chenango RA # 16: Intersection of Hakes-Calhoun Road and Kenny Road.
- Chenango RA # 22: Intersection of Gorge Road and County Route 42.
- Chenango RA # 24: Intersection of Nine Mile Trail and Blackman Road.
- Chenango RA # 36: At parking area on County Route 16.

13. Install and maintain one new wooden State Forest identification sign and maintain six existing signs on a three-year cycle.

Existing signs will be maintained and a new sign will be installed on Chenango RA # 24 at the east end of the Nine Mile Trail forest access road.


This road provides the primary means of access for these forests. Routine upkeep includes ditch and culvert maintenance. Periodic maintenance includes grading, crowning and resurfacing the road with gravel and culvert replacement.

15. Monitor the concurrent use agreement on Chenango RA # 22, Beardsley Road.

The west half of this road was constructed by the Department as a forest access road. The Department has a concurrent use agreement with the Town of Pharsalia for the maintenance of this road.

16. Acquire appropriate parcels from willing sellers.

Forty parcels comprising 1,199 acres have been identified as potentially desirable acquisitions if donated or offered for sale and if funding is available. Acquisition of these parcels will consolidate the State forests, protect natural resources and improve opportunities for public
access and recreation. Future land acquisitions must contribute to or enhance program objectives and be guided by provisions in the State’s Open Space Plan. Purchases may include in-holdings, unique features, and water resources adjacent to the Unit and parcels which consolidate boundary lines or provide needed access. All purchases will be acquired from willing sellers and must have the consent of the local town governments.

17. **Install motor vehicle barriers to prevent illegal off-road motor vehicle use and trash dumping.**

Remote trails and roads accessible by vehicles are often sites chosen for illegal dumping of trash or are used for illegal bon fires and beer parties. Blocking vehicle access at or to these sites will mitigate this problem and reduce costs for maintenance and law enforcement.

Boulders or gates will be installed at the following locations:

Chenango RA # 5, stand B-38.2: Boulders will be installed to prevent vehicles from leaving the road and going onto the Finger Lakes Trail off the north side of Nine Mile Trail.

Chenango RA # 5, stand C-7.1: Install boulders or gate on east side of Coy Street to prevent off road vehicle access.

Chenango RA # 5, stand D-95: Install gate on haul road located off the north side of County Route 10. A designated parking area will be developed before the gate, next to the county highway.

Chenango RA # 5, stand D-154: Install gate on the north side of County Route 10 to prevent illegal off-road vehicle use.

Chenango RA # 5, stand E-2: Install gate at entrance to the gravel pit to prevent illegal dumping.

Chenango RA # 24, stand A-26.1: The trail leading from Nine Mile Trail to private parcel will be blocked with boulders.

Chenango RA #24, stand B-39: Install boulders at the northwest corner to prevent illegal vehicle use.

18. **Maintain selected cultural resources on the Unit including six cemeteries and nine CCC water holes along Nine Mile Trail and one water hole on Moon Hill Road.**

The cemeteries are currently being maintained by unknown people. Additional maintenance provided by the Department will include periodic evaluation and removal of hazard trees that are a threat to fall on headstones. The 10 water holes identified above have been located and mapped by the Department. Records indicate nine additional water holes are located on the Unit but their locations are currently unknown. If any additional water holes are located, they will be mapped and considered for maintenance. The water holes are legacies from the CCC work crews that continue to provide a source of water that can be used to extinguish wild fire. They also act as breeding pools for amphibians. Maintenance of these water holes had historically been done by inmate work crews from Camp Pharsalia and involves clearing the inflow and outflow areas and doing repairs on the stone walls and log railings.
19. Encourage volunteer participation in activities on the Unit.

Volunteer participation can range from leading public group activities to assisting the Department in maintenance through the Adopt-A-Natural Resource program. Public group activities may include group hikes, historic tours, birding walks or surveys, organized group snowmobile events and other Department approved group activities. Maintenance activities suitable for volunteer participation include upkeep of trails, lean-tos, parking areas, camping sites, cultural resources and wildlife habitat. Group activities involving 10 or more people may require a special permit. Applications and information are available through the Sherburne Lands & Forests office.

20. Change the name of Chenango RA # 5 & 24 from New Michigan State Forest to Pharsalia Woods State Forest.

This will require changing the current forest identification sign on North Road. The new name better describes this area of State forest, reflecting the name of the local township the forest primarily occupies and acknowledging and aligning it with the National Audubon Society’s designation of the ‘Pharsalia Woods’ IBA. The present name of New Michigan has no historical significance to the forest or local connection to the area.

VI. Management Action Schedules

Land Management Actions Code Definitions

The following table presents a 20-year schedule of planned management actions referenced by stand number and year of management. Maps showing the specific stand locations are available for viewing at the Sherburne Office. Abbreviations or codes for the following tables are listed below:

<table>
<thead>
<tr>
<th>CODE</th>
<th>MANAGEMENT DIRECTION</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EVEN</td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>Normal Rotation</td>
<td>100-160 year rotation for natural stands; variable rotation age up to 140 years for plantations.</td>
</tr>
<tr>
<td>ES</td>
<td>Short Rotation</td>
<td>Approximately 60 year rotations of pioneer. hardwoods.</td>
</tr>
<tr>
<td>EVR</td>
<td>Variable Retention</td>
<td>Principles of even-aged silviculture applied while retaining individuals or groups of trees in the harvested stand for the next rotation.</td>
</tr>
</tbody>
</table>
UNEVEN

U Normal interval 20 year cutting interval
UVR Variable Retention Principles of uneven aged silviculture applied while retaining individual or groups of trees in the harvested stand. Retained trees will be allowed to grow to their full biological maturity.

OTHER

RZ Restricted Zone Non-forested areas adjacent to and including Department of Corrections, Camp Pharsalia.

PROTECTION AREAS

ZA Inaccessible
ZH Historical
ZR Riparian
ZS Steep
ZV Visual Aesthetics
ZW Wetland

MISCELLANEOUS

AP Apple Apple trees
BR Brush Shrub species other than apple
GR Grass Non-woody species-burnable/mowable
FNA Future Natural Area Existing plantation - plantation species will be harvested to eventually convert stand to native species. After full conversion to native species, stand will be managed as a Natural Area.
NA Natural Area Forest area managed to grow to attain and sustain a climax condition.
PD Pond Constructed and natural occurring ponds
<table>
<thead>
<tr>
<th>CODE</th>
<th>VEGETATION/OBJECTIVE TYPES</th>
</tr>
</thead>
<tbody>
<tr>
<td>APP</td>
<td>Apple</td>
</tr>
<tr>
<td>BF</td>
<td>Balsam Fir</td>
</tr>
<tr>
<td>BL</td>
<td>Black Locust</td>
</tr>
<tr>
<td>BW</td>
<td>Black Walnut</td>
</tr>
<tr>
<td>Bucket</td>
<td>A variety of plantation species</td>
</tr>
<tr>
<td>BR</td>
<td>Shrub Land</td>
</tr>
<tr>
<td>GR</td>
<td>Grass, including other non-woody species</td>
</tr>
<tr>
<td>HEM</td>
<td>Hemlock</td>
</tr>
<tr>
<td>JP</td>
<td>Jack Pine</td>
</tr>
<tr>
<td>LA</td>
<td>Larch - Japanese or European</td>
</tr>
<tr>
<td>NH</td>
<td>Northern Hardwoods</td>
</tr>
<tr>
<td>NS</td>
<td>Norway Spruce</td>
</tr>
<tr>
<td>PD</td>
<td>Pond</td>
</tr>
<tr>
<td>PH</td>
<td>Pioneer Hardwoods, with aspen as the dominant species</td>
</tr>
<tr>
<td>PP</td>
<td>Pitch Pine</td>
</tr>
<tr>
<td>RO</td>
<td>Red Oak</td>
</tr>
<tr>
<td>RP</td>
<td>Red Pine</td>
</tr>
<tr>
<td>RS</td>
<td>Red Spruce</td>
</tr>
<tr>
<td>SP</td>
<td>Scotch Pine</td>
</tr>
<tr>
<td>TAM</td>
<td>Tamarack</td>
</tr>
<tr>
<td>WC</td>
<td>White Cedar</td>
</tr>
<tr>
<td>Wet-A</td>
<td>Wetland-Alder</td>
</tr>
<tr>
<td>Wet-O</td>
<td>Wetland-Open</td>
</tr>
<tr>
<td>WP</td>
<td>White Pine</td>
</tr>
<tr>
<td>WS</td>
<td>White Spruce</td>
</tr>
<tr>
<td>CODE</td>
<td>TREATMENT</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------------</td>
</tr>
<tr>
<td>FW</td>
<td>Firewood Thinning</td>
</tr>
<tr>
<td>GC</td>
<td>Grouse Cut</td>
</tr>
<tr>
<td>GT</td>
<td>Green Tree Retention</td>
</tr>
<tr>
<td>IN</td>
<td>Integrated Treatment</td>
</tr>
<tr>
<td>PC</td>
<td>Plantation Clearcut</td>
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<tr>
<td>PT</td>
<td>Plant Trees</td>
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<td>PU</td>
<td>Spruce Thinning</td>
</tr>
<tr>
<td>RA</td>
<td>Release Apple</td>
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<tr>
<td>RC</td>
<td>Pine Conversion</td>
</tr>
<tr>
<td>RE</td>
<td>Remove trees</td>
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<tr>
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<tr>
<td>SC</td>
<td>Spruce Conversion</td>
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<tr>
<td>SR</td>
<td>Spruce release</td>
</tr>
<tr>
<td>ST</td>
<td>Sawtimber Harvest</td>
</tr>
<tr>
<td>TR</td>
<td>Pine Thin/Conversion</td>
</tr>
<tr>
<td>CODE</td>
<td>TREATMENT</td>
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<td>Less than 40 acres</td>
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**SIZE CLASSES**

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</tr>
<tr>
<td>SAP</td>
<td>2&quot; - &lt;6&quot;</td>
<td>dbh in size</td>
</tr>
<tr>
<td>PT</td>
<td>6&quot; - &lt;12&quot;</td>
<td>dbh in size</td>
</tr>
<tr>
<td>ST</td>
<td>12&quot; dbh or greater</td>
<td>in size</td>
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