

# Otsego County Forest #4 Chapin Memorial Forest Management Plan



Daniel Zimmerman  
July 2020

## Table of Contents

Introduction	4
Forester Biography	
Property Attributes	
County and Town Map	5
Desired Future Conditions	6
Proposed Timber Stands For Harvesting	
Forest and Ferns	7
Goals and Objectives	9
Forest Inventory	
Problem Identification	
Trail Maintenance	
Unique Areas	
Recommendations, Inventory Methodology	10
Otsego #4 Stand Map	11
USDA Soils Map	12
USDA Soils Unit Legend	13
Forest Stand 4.1	15
Forest Stand 4.2, 4.3, 4.4	17
Forest Stand 4.5	19
Forest Stand 4.6	21
Forest Stand 4.7	23
Forest Stand 4.8	26
Forest Stand 4.9	28
Forest Stand 4.10	30
Forest Stand 4.11	31
Forest Stand 4.12	34
Forest Stand 4.13	37
Forest Stand 4.14	38
Forest Stand 4.15	41
Forest Stand 4.16	43

## Table of Contents Continued

Forest Stand 4.17-----	44
Forest Stand 4.18-----	46
Forest Stand 4.19-----	48
Forest Stand 4.20-----	50
Tree Species Common and Latin Names-----	51
Chapin Memorial Forest Topographic Map-----	52

## **Introduction**

Forest Management is a comprehensive science that allows for the maintenance of ecosystem health, sustainable growth and harvest of forest products, administration, aesthetics, and resource protection. Otsego County is dedicated to applying the principles of Silviculture to balance timber harvesting and forest growth to ensure the future viability of our forests. Otsego County forests are a public resource that is managed for timber production, outdoor recreation, wildlife, water, and natural resource conservation. By taking this multipurpose management approach we will be able to benefit the natural resources on county land and give residents the opportunity to enjoy their public land.

## **Forester Biography**

Dan Zimmerman's experience revolves around procurement and consulting Forestry having worked extensively with landowners, timber harvesters, Foresters both public and private, trucking and construction firms, and the forest industry with over 35 years of experience. Presently, chapter chair of The New York Forest Owners Association's Central New York Chapter and past chapter chair of the Society of American Foresters Iroquois Chapter. Dan's education: Graduate of Morrisville State College, SUNY Polytechnic Institute, the University of Phoenix, and Leadership Mohawk Valley.

## **Property Attributes**

Otsego County Forest #4 is essentially a 314 acre+- hard and softwood forest located on Gill Hill Road in the Town of Pittsfield, Otsego County, New York. There are no improvements to the property with access primarily through Gill Hill Road that runs the full length of Otsego #4. Several old log landings exist along this road that provides very limited parking. Gill Hill Road is a dirt road not maintained in winter that has alternating pockets of wet/soft areas and hard areas throughout its distance within Chapin Forest. This road has multiple old skid trails from previous logging largely emanating in a North – Southerly direction that facilitate access to the majority acreage of Otsego #4.

## **Otsego County, New York**



## **Town of Pittsfield, Otsego County**



## **Desired Future Conditions**

The overall future condition of this property should focus on the continuous production of high quality forest products from commercially important softwood and some hardwood species. Substantial amount of merchantable high quality, low value softwood (heavy to White Pine and Spruce) is present in this parcel in varying degrees of density in many of the forest stands. It is envisioned that a harvesting program be instituted for the whole parcel. Control of interfering vegetation: mainly ferns to be instituted prior to commencement of harvesting. Future end state would be: completed harvesting for the parcel as a whole, on a twenty year rotation before any additional substantial forest management activities. Encouraging and promoting biodiversity helps overall forest and ecosystem health. Resiliency of the forest through diversity is another future benefit in the face of possible threats from invasive species, native pathogens, and possible climate change. It is envisioned a future forest with three or more succession stages of forest stands.

## **Proposed Forest Stands for Timber Harvesting**

4.06, 4.07, 4.11, 4.12, 4.13, 4.14, 4.15, 4.17, 4.18, 4.19

## **Otsego #4 Chapin Memorial: Forest and Ferns**

Chapin Memorial Forest has a fern problem! Throughout the course of inventorying the forest resources, ferns were noted in most of the forest stands. Ranging from domination of the forest site to a “light” presence in the understory, ferns are a problem or will be a problem presently or to the future. Recognition of this problem should be undertaken before timber harvesting or forest canopy disturbance that is proposed within some of the forest stand prescriptions found in this forest management plan.

Ferns are indicative of another problem – White tailed Deer. Deer populations and their resulting impact on the ecosystem rests on selective browsing – browsing or consuming native valuable hardwood tree seedlings, blackberry plants, and some other woody and herbaceous plants (hobblebush, lady slippers, etcetera) and not feeding on ferns.

This gives ferns an important competitive advantage allowing for less competition for sunlight, moisture, and nutrients. Ferns are usually indicative of out of balance deer populations with their habitat over time. Ferns also have the ability to reproduce, grow, and become established under intense shade – another competitive advantage.

Dense fern communities as exist or will exist (after timber harvest produces increased light and releases understory fern) producing near biological deserts – severely decreasing plant and wildlife diversity through lack of cover and food. The sustainability of our important forest resource – future timber production of commercially important hardwoods and softwoods is severely limited by ferns.

Considered to be an interfering plant, ferns form a dense, sunlight eliminating sub canopy that inhibits the establishment and growth of desirable tree seedlings. In addition, ferns form a matt that inhibits tree seeds from reaching the forest floor and germinating. Thus, ferns can dominate forest landscapes for decades into the future.

Studies have shown that herbicidal treatment of fern under stories before timber harvest or forest canopy disturbance with glyphosate herbicide (e.g., Roundup) at the rate of 1 quart per acre. Optimal dates for best control were from early July until mid-September. It is also recommended that sulfometuron-methyl herbicide (e.g., Oust) a soil-active herbicide that is readily taken up by fern rhizomes. It also has pre emergent activity, which prevents undesirable grass and sedge seed from germinating. A licensed pesticide/herbicide applicator is required to apply the above within New York State.

Consideration of Chapin Memorial deer herd density and its effects on the forest ecosystem and regeneration should be undertaken before undergoing any herbicidal treatment of ferns. Higher deer densities could negate any benefits of application. Failure to control ferns can negate forest regeneration and the future forest tree species constituencies.



## **Goals and Objectives**

### **Forest Inventory**

Complete a comprehensive inventory of the twenty forest stands found in this parcel. Inventory was completed July 2020 that included assessment of commercially important timber species and also low grade or pulpwood that also includes interfering vegetation.

### **Problem identification**

Results of the inventory, together with observations of the Forester on any threats or impediments that would mitigate the overall effort to achieve the desired future condition of the parcel or stand. The “Keep Forests Healthy” scorecard by The Nature Conservancy, Cornell Cooperative Extension of Onondaga County will be implemented also.

### **Trail Maintenance**

There is a good set of skid roads on the property that are in excellent condition. A goal would be to continue the present condition and maybe mark Possible hiking trails. Overall access is attained through Gill Hill Road, a seasonal dirt road that can prove to be challenging for passenger cars due to the steepness of the road and muddy conditions on top of the hill. Limited area for parking due to seasonal considerations and wet conditions. A snowmobile trail exists on the property. Many old skid roads in Chapin forest being used for all terrain vehicle recreation.

### **Unique areas**

In stand 4.10 is found approximately 5.9 acres of wetlands that offer unique remoteness, flora, and fauna not found in the remainder of parcel #4. In addition, forest stand 4.05 contains a forest meadow with excellent opportunities to view wildlife and a forest open area.

## Recommendations

Prescriptions on individual forest stand to be outlined and aligned with future desired conditions. Recommendations to include implementation and alignment with the desired future forest condition. Prescriptions will include considerations for basal area and trees per acre (TPA), volume (board feet and cords), Acceptable Growing Stock (A.G.S.), pulpwood, but also for species, vigor, invasive species, wildlife, ecology, and Forester experience.

### Inventory Methodology

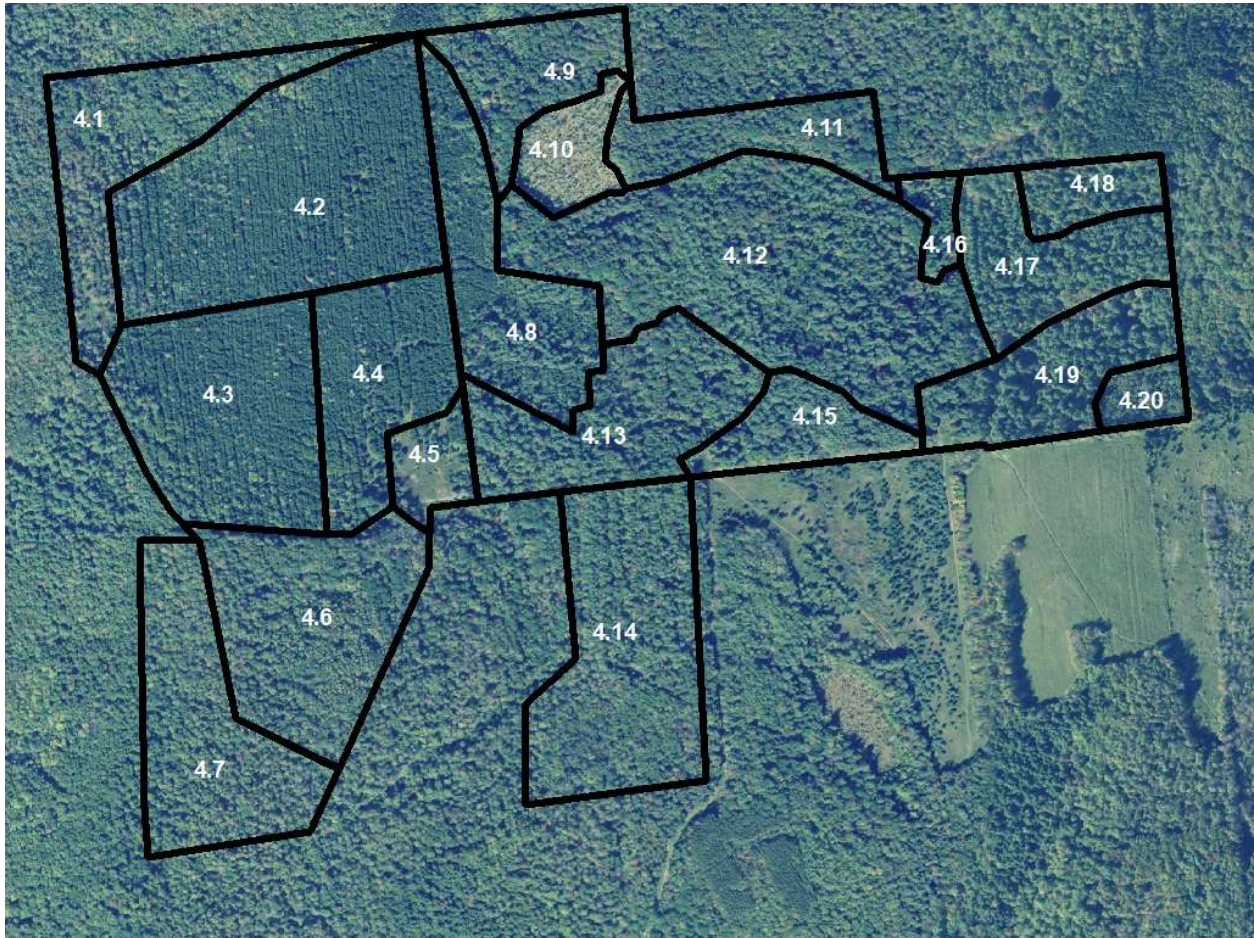
Forest inventory was conducted on the twenty forest stands that compromise Otsego County Forest #4. Forest Stands were constructed based on species composition, basal area, forest cover type, geological considerations, and past cutting history.

Each stand was inventoried by using variable plot radius data points with a 10 Basal Area Factor (**BAF**) wedge prism. Trees that fall into each data plot was measured for Diameter at Breast Height (**DBH**) with a Biltmore stick and their height will be determined by the judgment of the Forester. Species of every tree in the data plot will also be recorded. Recorded data will be averaged throughout the stand to determine the stand's basal area, trees per acre, species composition, product classification, and overall health. Each stand will have a different number of data plots based on their area measured in acres. The chart used to determine the number of data plots for each stand can be seen in **Table 1**.

**Table 1** Ratio chart of plots in a stand

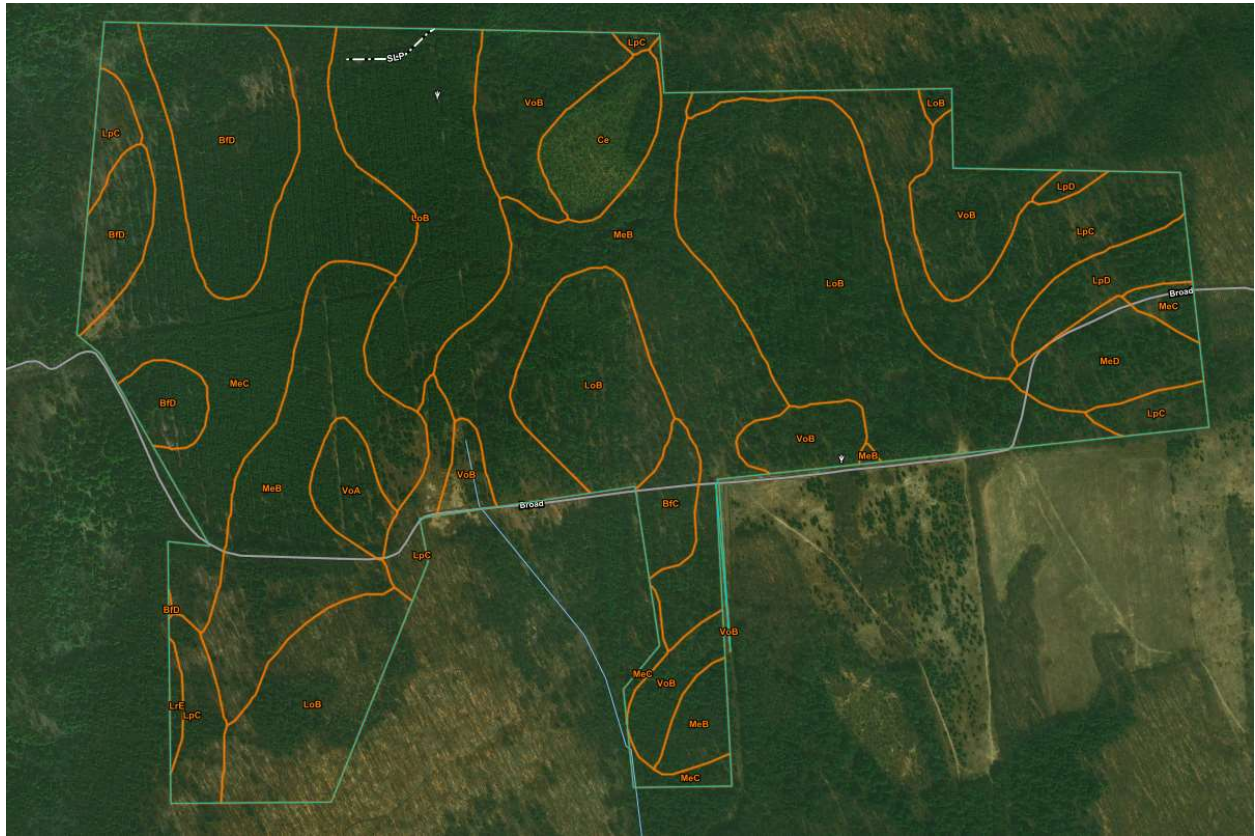
Acres	# of Plots
0 - 4	3
5 - 7	4
7 - 10	5
10 - 15	7
15 -25	10
26 - 30	14
40	15

**Otsego Forest #4**  
**Chapin Memorial Forest**





## USDA Soils Map



## USDA Map Unit Legend

Map Unit Symbol	Map Unit Name	Drainage Class
BfC	Bath channery silt loam, 8 to 15 percent slope	Well Drained
BfD	Bath channery silt loam, 15 to 25 percent slopes	Well Drained
Ce	Carlisle muck	Very Poorly Drained
LoB	Lordstown-Arnot complex, 1 to 8 percent slopes, rocky	Well Drained
LpC	Lordstown-Chadakoin complex, 8 to 15 percent slopes	Well Drained
LpD	Lordstown-Chadakoin complex, 15 to 25 percent slopes	Well Drained
LrE	Lordstown, Chadakoin, and Manlius soils, 25 to 50 percent slopes, very rocky	Well Drained

MeB	Mardin channery silt loam, 3 to 8 percent slopes	Moderately Well Drained
MeC	Mardin channery silt loam, 8 to 15 percent slopes	Moderately Well Drained
MeD	Mardin channery silt loam, 15 to 25 percent slopes	Moderately Well Drained
VoA	Volusia silt loam, 0 to 3 percent slopes	Somewhat Poorly Drained
VoB	Volusia silt loam, 3 to 8 percent slopes	Somewhat Poorly Drained

## **Forest Stand 4.1**

Stand #1 of Otsego #4 Chapin forest consists of 17.3 acres more or less. Located in the most north western corner, this acreage is primarily a hardwood stand/site, was logged rather heavily long ago and has not recovered with much of any viable seedling regeneration of any tree species. The most easterly portion of this stand contains the most acceptable growing stock. Primary soil types are: Lordstown-Chadakoin complex, 8 to 15 percent slopes – well drained, Bath channery silt loam, 15 to 25 percent slopes – well drained, and Mardin channery silt loam, 8 to 15 percent slopes – moderately well drained. With these soil types, the ability to work the site with forest machinery is good.

## **Forest Diversity and Composition**

Six commercial tree species are found in this stand with Red Maple most prevalent. The other five species inventoried do not have substantial trees per acre or basal area amounts or really noticeable percentages of density. General tree health was judged to be good with individual tree quality poor to fair with the primary reason being growth in less dense, open conditions. No insect or disease issues were noted within this stand.

## **Forest Structure**

Structure was judged to be average to poor with trees of varying sizes chiefly in the timber class but lacking an adequate understory of poles, saplings, and seedlings. Little to no standing dead trees or down dead wood was noted, thus limiting some wildlife habitat. Trees within this stand exhibit wide spacing, inadequate spacing, and low stand density.

## **Stand Regeneration**

Desirable regeneration is severely limited with little seedling, sapling, and pole timber found. Interfering plant ferns have practically stopped stand regeneration. Ferns dominate the landscape. Ferns usually are indicative of heavy deer browsing in the past. No seedlings present for present white tailed deer browsing.

## Site Level Risks

With soils that are well drained to moderately well drained, stand 1 has a lower risk assessment to moisture stress, drought, and extreme rainfall. Most risk goes to ice storm damage and some wind throw damage. Shorter and milder winters will affect stand 1 accessibility adversely. Access is chiefly through a dirt road that is at least several miles from a paved road and can be considered remote.

## Stand #1 Prescription

Regeneration, stocking, and density are the main concerns for this stand. A heavy harvest years ago has resulted in high sun light availability but the interfering ferns have impeded tree and stand regeneration. If deer density in this area is acceptable, herbicidal treatment of the ferns would be recommended. It is further recommended that this stand be reevaluated in ten years before any harvesting is to be initiated.

## Stand Data

Species	TPA (Trees Per Acre)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	13.67	31.42	1718
Black Cherry	4.45	11.00	673
Eastern Hemlock	3.55	9.74	644
White Spruce	4.56	5.19	542
Eastern White Pine	.61	5.87	273
Northern Red Oak	.27	3.14	119
Total	27.11	66.36	3969

Hardwood Pulp	21.08	8.60	1.24 cords
Acceptable growing stock	43.50	2.97	.44 cords



## **Forest Stands 4.2, 4.3, and 4.4**

Stand 2 has 36 acres, stand 3: 24 acres, and stand 4: 15.3 acres; more or less. These three stands are found in the central part of the most north western section of Otsego #4 Chapin Forest. Dominate soil types found in these three stands are: Mardin channery silt loam, 3 to 8 percent slopes – moderately well drained, Mardin channery silt loam, 8 to 15 percent slopes – moderately well drained, Volusia silt loam, 0 to 3 percent slopes – somewhat poorly drained, Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – well drained, and Bath channery silt loam, 15 to 25 percent slopes – well drained. Volusia soil type is found in stand 4 and only consists of a few acres. The ability to work the ground through most of the year with forest management equipment is good.

These stands consist mainly of White Spruce plantation that has naturally seeded into itself creating slow growth to stagnation. These stands are very dense, limiting the ability to walk and appraise due to significant branching. No forest/inventory measurements were taken as the diameter of the trees is significantly small, no forest products exist presently.

### **Forest Diversity and Composition**

Plantation spruce is a high risk in species diversity. No other species are found thus severely limiting a set of diverse tree species. General tree health is poor due to high density and occupation of growing space. Poor growth characteristics present uniformly throughout the three stands with significant stagnation and mortality. Insect and disease issues were not observed except on some dying individuals.

### **Forest Structure**

A simple forest canopy exists with trees (spruce) of the same age and size (three to four inches being the most common). Standing dead trees are found throughout this stand with little to no down dead wood due mostly to stand density/stocking. Extensive crowding due to close initial tree planting spacing and the natural seeding within these stands has lead to significant stagnation.

## **Regeneration**

The natural regeneration of this stand within itself can be considered unusual and the primary problem for these three stands. White Spruce prefers well drained, somewhat moist soils that are slightly acidic. It appears the growing site for these stands to be adequate for the species. There are no interfering plants within the stands and little to no deer browsing. Wildlife habitat found in these stands is primarily cover. Cover is the shelter animals need to escape the elements and predators. This shelter must protect the animal in both the growing season and during the winter.

## **Site Level Risks**

The highest risk to the three stands is wind throw and ice storm damage due to density and stagnation of the growing stock. Due to the nature of the soils, moisture stress and extreme rainfall risk to the stands is judged to be low. Drought conditions could manifest into a concern. Shorter and milder winters would affect the accessibility of the stands due to their location and the dirt road that provides the access.

## **Three Stand Prescriptions**

Wide row mechanical thinning would significantly help accessibility and light penetration of these stands. It is debatable if the residual spruce would respond favorably to employ row thinning due to the amount of time the stands have been stagnating. Furthermore, the lack of any merchantable forest product might cause a cost to be rendered for row thinning. Chipping of the thinned biomass would be the best option.

Another option would be to allow succession to take place with an eventual outcome of some of the spruce reaching merchantability. This would entail a very long amount of time and be questionable as to just how much quantity would be obtained. Apparently the option selected by previous management.

Third option would be to start over with stand conversion to another conifer species.

Recommendation is to employ wide row mechanical thinning depending on county finances and then in the future appraise the spruce residual response.

## **Forest Stand 4.5**

Located adjacent to forest stands 4 and 6, stand 5 is essentially a forest open meadow undergoing a very gradual succession conversion to a forest stand. Whitetailed deer have a pronounced impact on this converting and slowly developing stand by influencing through browsing the establishment of a naturally seeded Spruce stand. Heavy deer presence and feeding within the confines of this stands 4.4 acres more or less has reduced hardwood regeneration to nonexistent. Lordstown-Chadakoin complex, 8 to 15 percent slopes – well drained and Volusia silt loam, 3 to 8 percent slopes – somewhat poorly drained make up the soil types of stand 5. No forest measurements taken.

### **Forest Diversity and Composition**

Primarily a single specie developing stand, tree species diversity does not exist. White Spruce tree health is excellent with good growth form exhibited with open field characteristics. No insect or disease issues were noted.

### **Forest Structure**

This developing forest stand exhibiting encroachment by spruce from the sides has yet to show discernible forest structure. Standing dead trees and down dead wood do not exist within stand 5. Tree crowns exhibit open field growth patterns leading to very large, healthy crowns.

### **Regeneration**

Spruce regeneration is occurring at a slow pace emanating from the sides of stand 5, chiefly from the west, north, and east. Largely a result of preferential deer browsing, the spruce regeneration shows good species suitability to the growing site. Exception would be to the couple of acres comprised of wet conditions with soil type Volusia silt loam, it is judged to be continued as an open meadow. No interfering plants were noted.

**Site Level Risks**

Moisture stress and extreme rainfall are judged to be the highest risk to forest stand 5. Excessive water over periods of time could well expand the forest meadow conditions at the expense of the developing spruce stand. Shorter and milder winters would have a pronounced affect on the ability to work this stand.

**Stand Prescription**

Recommendation is no forest management action to be undertaken. Let the stand develop naturally. The highest value of stand 5 is for wildlife: cover, food, space, and water are all present here. Diversification within the forest landscape with open meadow conditions should be maintained where possible.

## **Forest Stand 4. 6**

21.4 acres more or less make up this stand. Major soil types and drainage classifications: Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – well drained, and Mardin channery silt loam, 3 to 8 percent slopes – moderately well drained. The ability to work this site with forest management equipment is excellent. Forest stand 6 is located in the south western section of Otsego #4 Chapin Forest. Essentially a mixed wood stand comprised of significant quantities of both softwoods/conifers and hardwoods. The section containing Larch/Tamarack is partly an old Red Pine clear cut that released the Larch.

### **Forest Diversity and Composition**

Many tree species are present within this stand in significant stocking levels that no single species is dominant. Species diversity is excellent. Species suitability to the growing site and tree health is good with good growth characteristics found throughout the specie mix. No insect or disease issues were observed.

### **Forest Structure**

Structural diversity is excellent with variance found in tree size, age, species, and density. Average amounts of standing dead trees and down dead wood. Tree crowns and spacing are good and healthy but are exhibiting crown narrowing due to density factors as measured by basal area.

### **Regeneration**

Higher density/basal area and stocking percents (trees per acre) are having an effect on desirable regeneration chiefly in seedling production. Adequate to marginal sapling production of desirable species was noted. Acceptable growing stock (AGS) of 21 trees per acre with .19 cords per acre indicate more sunlight needs to reach the forest floor with tree canopy closure occurring. Interfering plant Striped Maple (*Acer pensylvanicum*) was observed in significant quantities that impede regeneration. Deer browsing was noted to be a factor with feeding on beech seedlings – usually an indicator since beech is usually a food source of last resort.

### Site Level Risk

Stand 6 highest risk factor is judged to be ice storm damage and to a lesser extent blow down due to the maturity of this forest. Soil typing is well drained and lessens the threat of extreme rainfall and moisture stress. Shorter and milder winters would affect accessibility to the stand by the dirt access road.

### Stand Prescription

Reduction of stand density through a commercial timber harvest to promote: 1) increased residual tree growth and health maintenance, and 2) to foster greater AGS – seedling establishment through increased sunlight to the forest floor. Reduction of basal area by one third throughout the stand, taking into account stand 6 mixed wood species dynamics. Individual tree selection silvicultural system implementation is recommended. Striped maple control.

### Forest Stand 6 Data

Species	TPA	Basal Area/Acre (Sq.Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	18.17	36.25	2464
Eastern Hemlock	21.33	32.65	2378
Larch/Tamarack	20.46	28.64	2977
Northern Red Oak	5.80	33.29	1601
Sugar Maple	3.14	12.79	810
White Ash	3.51	5.22	407
Black Cherry	.78	5.60	277

Black Birch	.72	1.40	76
Total	73.91	155.84	109,990

Hardwood Pulpwood	9.87	10.37	.70 cords/acre
----------------------	------	-------	----------------

AGS	21	1.29	.19cords/acre
-----	----	------	---------------

#### **Forest Stand 4.7**

20 acres more or less make up Otsego #4 stand 7 located in the extreme south western portion of Chapin Forest. Predominate soil types and drainage classifications found within forest stand 7 Lordstown, Chadakoin, and Manlius soils, 25 to 50 percent slopes, very rocky – well drained, Lordstown-Chadakoin complex, 8 to 15 percent slopes – well drained, Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – well drained, and Mardin channery silt loam, 8 to 15 percent slopes – moderately well drained. The ability to work this forest stand site with forestry equipment is good to excellent. This stand boasts some very good quality Sugar Maple and Eastern Hemlock timber.

#### **Forest Diversity and Composition**

Species diversity is excellent, primarily a hardwood growing site, this stand exemplifies good diversity with five hardwood species and one conifer. Good growth characteristics were found throughout this stand indicating excellent general tree health. No disease or insect issues were noted when this stand was inventoried.

#### **Forest Structure**

Multiple vertical layers of trees of differentiating sizes, ages, and acreage stocking were observed. Average amounts of standing dead trees and down dead wood were noted and constitute good wildlife habitat. Tree crowns and spacing were noted to be closing and fairly dense respectfully. Tree crowns were noted to be well developed and healthy but crown closure was also evident that was beginning to make effects known. Sunlight was limited upon the forest floor. Density as measured by basal area and trees per acre indicate crowding within the stand.

## **Regeneration**

Regeneration of commercially important tree species is limited by the following three considerations: 1) lack of sunlight on the forest floor, 2) interfering plants – striped maple and beech, 3) significant deer browsing. Tree seedlings were largely absent with saplings limited. In addition, fern regeneration is present and awaiting sunlight to become pronounced within the stand. Species suitability to the growing site is excellent.

## **Site Level Risks**

Shorter and milder winters would impact stand 7 negatively chiefly in access by the dirt road leading to the stand. Main site risk is judged to be ice storm damage. Extreme rainfall and moisture stress were judged to be lesser risk due to soil types and topography.

## **Stand 7 Prescription**

Due to good mature timber quality, stand density of 120.75 square feet, and lack of regeneration, it is recommended that a timber harvest removing 30 to 40 square feet of basal area be instituted. Silvicultural regime should be individual tree selection method. At the same time, herbicidal treatment of striped maple, beech, and ferns be instituted. Additionally, removal of some of the hardwood pulp is instituted in a way that favors the residual stands crop trees and acceptable growing stock (AGS). Stand to be harvested in conjunction with stand 6.



## Stand 7 Data

Species	TPA Trees Per Acre	Basal Area/Acre (Sq.Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Sugar Maple	26.41	60.13	3670
Eastern Hemlock	16.00	31.14	3393
Red Maple	5.50	13.00	995
White Ash	5.00	8.72	714
Black Cherry	1.57	7.10	389
Yellow Birch	1.51	.66	70
Total	55.99	120.75	9231

Hardwood Pulp	20.80	14.15	1.6 cords
A.G.S.	26.13	1.45	.90 cords

#### **Forest Stand 4. 8**

Lordstown-Arnot complex, 1 to 8 percent slopes, rocky, well drained and Mardin channery silt loam, 3 to 8 percent slopes – moderately well drained soil types dominate stand #8. These soil types lend themselves well to forest management activities. Located near the central midpoint of Otsego County parcel #4 Chapin forest, forest stand #8 is composed of approximately 17 acres+ or -. This stand is comprised of two distinct subcomponents. The northerly portion is primarily a White Spruce plantation identical to those found in stands 2, 3, and 4. The southern subcomponent consists of mature, sparse Eastern White Pine; and less dense scattered open areas with natural seeded White Spruce that is developing into a viable forest stand. No forest measurements were undertaken within this stand due to the lack of measurable forest products.

#### **Forest Diversity and Composition**

Primarily a two species forest stand, diversity is lacking, with White Spruce dominating the forest landscape and growing space. General tree health in the north is poor with plantation and natural seeding existing together forming dense almost impregnable vegetation with extensive crowding comparable to stands 2, 3, and 4. Tree health is much better to the southern component with the spruce not as dense and succession influences forming viable saplings and seedlings. Scattered merchantable White Pine exists here also. No insect or disease vectors were observed.

#### **Forest Structure**

No structural diversity exists within the northerly component of Forest Stand 8. Plantation and natural seeding within the plantation have produced trees of the same size and age. Southerly component does have good structural diversity with spruce seedlings and saplings showing good rates of growth, sizes, and age. Northerly component shows some standing dead trees and little to no down dead wood. Southerly component shows some standing dead trees and down dead wood. Tree crowns in the northerly component are way too crowded and are stagnating. To the south, the component exhibits healthier crowns and tree spacing due to more adequate spacing.

## **Regeneration**

Natural spruce regeneration within the plantation is the main problem in the northerly part of Forest Stand 8 just like that found in neighboring stands 2, 3, and 4. Adequate and average tree spacing is found to the south. Species suitability to the growing site is judged to be good for both Spruce and Pine. No interfering plants were noted and deer browsing not a factor.

## **Site Level Risks**

Highest risk level is judged to be blow down and ice damage due to tree crowded conditions, poorer health, and stagnation. Extreme rainfall, moisture stress or drought was judged not to be a significant risk due in part to the soil types in the stand. Shorter and milder winters would affect accessibility through the dirt woods access road.

## **Forest Stand 8 Prescription**

Mechanical wide row thinning as discussed in forest stands 2, 3, and 4 to be employed in conjuncture with the foregoing neighboring stands in the northerly component. The southerly component of stand 8 to be allowed to continue to evolve into a viable forest stand with no action recommended.

## **Forest Stand 4.9**

10.2 acres more or less make up stand 9 in Otsego #4. Located in the northerly part of the central section of Chapin Memorial forest, this stand serves as a buffer or protective ring for the wetlands found in stand #10. Primary soil type is Volusia silt loam, 3 to 8 percent slopes - Somewhat Poorly Drained.

### **Forest Diversity and Composition**

Low species diversity is found in this stand. Hemlock with a TPA of 59 out of 77 and Basal Area per acre of 43 out of 58 thoroughly dominates this stand. General tree health is judged to be below average due to no forest management activity has occurred in the stand. No insect or disease vectors were noted at this time.

### **Forest Structure**

Park like setting that produces trees of similar size and to an extent, age that results in a simplistic canopy. Little dead standing trees and down dead wood. Tree crowns and spacing are crowded and competing for growing space, approaching stand stagnation.

### **Regeneration**

No seedlings, saplings were observed upon inventory due to crown closure long ago. No interfering plants were found and deer browse was not a factor.

### **Site Level Risks**

Due to possible stand stagnation and over maturity, similar age and size, it is judged that the highest site risk is wind throw and ice storm damage. Due to soils, extreme rainfall and moisture stress are almost equal in risk magnitude. Shorter and milder winters would affect the ability to work this stand significantly together with negative effects on the ability to access the stand.

### **Stand Prescription**

Leave as is; continue its purpose of protecting the wetlands and as a buffer.

## Stand 4.9 Data

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern Hemlock	59.71	42.89	7891
Red Maple	7.24	5.31	818
Black Cherry	7.41	7.06	1372
Yellow Birch	1.87	1.07	146
American Basswood	1.13	1.77	263
Total	77.36	58.10	10,490

Hard Wood Pulp	18.64	10.56	2.33 cords
A.G.S. (Hemlock)	65.75	1.62	.58 cords

**Forest Stand 4.10**

Stand 10 located in the north central section of Otsego #4, consists of 5.9 acres + or -. The main soil type is Carlisle muck and is Very Poorly Drained. Essentially wetlands and not a forest stand. The main benefits of #10 are: wildlife habitat, water control, and habitat diversity. There is no write up for 10 or data collected. Due to the soil conditions and standing water, no forest management or wildlife management activities should be undertaken. The wetlands ecosystem is unique and at the same time very sensitive to disruption.

#### **Forest Stand 4.11**

11.4 acres more or less make up forest stand 11. Located in the north central section of Otsego #4 Chapin forest, stand 11 major soil types and drainage classification are: Mardin channery silt loam, 3 to 8 percent slopes - Moderately Well Drained, Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – Well drained, and Lordstown-Chadakoin complex, 8 to 15 percent slopes – Well drained. Mixed wood characterization describes this stand well with hardwood species, Hemlock, Spruce, and White Pine all occupying significant growing space and contributing to stocking levels. Hardwood dominates the easterly section, while Hemlock dominates westerly section. In between and somewhat mixed in are patches of Norway Spruce, White Pine, and White Spruce natural regeneration patches. Approximately 30 to 40 years ago, a timber harvest was conducted in this stand cutting all species.

#### **Forest diversity and Composition**

At least six different merchantable or commercial tree species were found in this stand lending credence to the judgment of high species diversity. General tree health was found to be good with good growth characteristics throughout the specie mix. No insect or disease problems were observed.

#### **Forest Structure**

Complexity is the best description for this stand with varying tree sizes, species, and stocking levels throughout this stand. Multiple vertical layers exist within stand 11. Timber class, Pole Class (A.G.S.), saplings, and seedlings. Tree crowns and spacing are good contributing to good tree form and healthy crowns. Standing dead trees and down dead wood exists in this stand in average or common levels thus benefitting some forms of wildlife.

## **Regeneration**

Reproduction is the future forest and stand 4.11 is good with seedling and sapling species diversity very pronounced. Red Maple, Hemlock, Yellow and Black Birch, American Beech, Red Oak, and Black Cherry are found in seedling and sapling populations. Naturally seeded White Spruce also is present in varying patches mostly as seedlings and saplings in sometimes dense monocultures. Species suitability to the growing site is good also. Interfering plants found within stand 11 were Striped Maple and American Beech, but not in substantial amounts to pose a threat to regeneration. Deer browsing was deemed to be significant.

## **Site Level Risks**

Highest risk level to stand 4.11 was wind throw and ice storm damage due to the soil types found within this stand. Shorter and milder winters would affect the accessibility of this stand but the ability to work within the stand appears to be good.

## **Stand Prescription**

Depending on forest management activity on neighboring stands, it is recommended that timber stand improvement (TSI) be instituted focusing on reducing hardwood pulp quantity and influencing positive growth on residual crop trees and increasing light penetration to the forest floor. Again depending on neighboring stand activity, some of the larger Red Maple and Red Oak could be harvested.



#### Stand 4.11 Data

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	20.03	18.24	2326
Northern Red Oak	7.85	27.66	1966
Mixed Spruces	11.11	7.79	1279
Eastern Hemlock	15.50	10.37	1609
Eastern White Pine	2.20	4.48	450
Black Cherry	2.36	2.47	361
Total	59.89	71.01	7991

Hardwood pulp	33	9.44	4.72 cords
A.G.S *	81.14	3.86	2.96 cords

\*Mostly Hemlock, Birch, and Spruce

## **Forest Stand 4.12**

Located in the central section of Otsego Chapin Forest #4, stand 12 consists of mixed wood – White Pine, White Spruce, Norway Spruce, Hemlock, and hardwoods. Heavy to conifers, this stand slowly transitions to Hemlock/hardwoods to the most westerly quarter acreage. The coniferous section was commercially row thinned twenty or more years ago with the opened thinned areas populated mostly by ferns. 43.7 acres more or less comprise this forest stand. Main soil types and drainage class: Mardin channery silt loam, 3 to 8 percent slopes – moderately well drained, Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – well drained, Volusia silt loam, 3 to 8 percent slopes - Somewhat Poorly Drained, and Lordstown-Chadakoin complex, 8 to 15 percent slopes – well drained. The majority of the soil types in this stand will support harvesting equipment.

### **Forest Diversity and Composition**

Many tree species are present within the confines of stand 12 with seven commercially important species inventoried. Good growth characteristics in the majority of tree species indicate good overall tree health with the exception of the White Spruce regeneration. No insect or disease vectors were noted.

### **Forest Structure**

In the non thinned areas of tree growth, structural diversity is good with multiple vertical layers of understory and over story. Standing dead trees and dead down wood exist within stand 4.12 but at low levels. Tree crowns on the dominant Eastern White Pine are large and healthy due to their dominance within the stand tree canopy. The remaining tree species crowns are showing crowding and resulting narrowing.

### **Regeneration**

Acceptable growing stock (A.G.S.) stocking level of 49 trees per acre and a basal area of 4.75 square feet (trees inventoried at 6 inches diameter at breast height (DBH) to 9 inches DBH) are judged to be about average to lower than average levels. The vast majority is White Spruce natural seeding and Red maple. These constitute the pole size timber. Seedling and saplings specie mix was the same with the White Spruce regeneration extremely dense - stagnating and with

**Regeneration Continued**

Frequent patches found through the majority of the acreage of this stand. Species suitability to the growing site is judged to be good. Interfering plants found largely in the old, open wide row thinning are ferns. They dominate and few tree seedlings exist in these areas. Deer browse was significant especially in the more westerly hardwood dominant section of stand 12.

**Site Level Risks**

Soil types mostly well drained lower the risk level for moisture stress and extreme rainfall to this stand. Wind throw and ice storm damage constitute higher risk. Shorter and milder winters would affect the accessibility of this stand.

**Stand Prescription**

The Eastern White Pine resource is of excellent timber quality and in a dominant class in the stand tree canopy. White Pine regeneration is mostly nonexistent on a site judged to be good for pine. Recent research on White Pine management leans heavily to low density for both regeneration purposes and timber growth. It is proposed that a modified shelter wood cut be instituted with overall stand reduction of 45 square feet in the timber class with a possibility of more. Pine approaching mill limits of size and pine too concentrated or dense to be targeted for removal.

In addition, the removal or reduction of the dense, stagnating White Spruce natural seeding should be undertaken at the same time as harvesting. Herbicidal treatment of the interfering ferns to be undertaken before completion of harvesting. Hardwood section to include TSI of hardwood pulp and some Hemlock reduction.

### Stand Data 4.12

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern White Pine	10.73	59.71	2710
Mixed Spruce*	13.27	15.61	1213
Red Maple	13.85	24.04	1117
Eastern Hemlock	8.12	16.29	843
Black Cherry	4.42	11.36	434
White Ash	2.07	6.77	264
Total	52.46	133.78	6581

Hard wood Pulp	9.28	12.79	.43 cords
A.G.S.	49.23	4.75	.2 cords

\*Norway and White Spruce

### Forest Stand 4.13

Stand 13 contains approximately 17.9 acres and is located in the central section of Chapin Forest Otsego #4. Main soil types and drainage classifications: Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – well drained, and Mardin channery silt loam, 3 to 8 percent slopes - Moderately Well Drained. This stand is essentially very similar to forest stand 4.12 and could be merged to form one stand. Since both stands are almost identical, only the small differences will be found in this stand write up. Stand prescription for stand 12 will be the prescription for this stand also. The stand data will be included within this write up.

### Differences

Red oak of excellent quality is found in the most easterly part of this stand and should be included in a timber harvest centering on the most mature individuals. Parts of this stand experienced a long ago blow down.

### Stand 4.13 data

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern White Pine	21.4	57.18	4669
Mixed Spruce*	16.86	16.30	1857
Red Maple	16.05	18.11	1422
Red Oak	3.45	24.87	1330
White Ash	.32	3,14	141
Black cherry	.57	1.77	78
Red Pine	.28	.79	71

Eastern Hemlock	1.84	.55	66
Total	60.77	122.77	0634

Hard wood pulp	5.63	7.19	.74 cords
A.G.S.	61.20	2.35	1.84 cords

\*Norway and White Spruce

#### **Forest Stand 4.14**

Approximately 24.8 acres more or less are found within Otsego #4 Chapin Forest. Soil types according to the USDA and drainage class are: Bath channery silt loam, 8 to 15 percent slope – well drained, Mardin channery silt loam, 3 to 8 percent slopes – moderately well drained, Mardin channery silt loam, 8 to 15 percent slopes – moderately well drained, Volusia silt loam, 3 to 8 percent slopes – somewhat poorly drained. Located in the southern most central section of Otsego #4, this stand consists of approximately 60 % mixed wood, 40% Hemlock/hardwoods. The mixed wood portion was logged 30 to 40 years ago and harvested the Red Pine. This portion of the stand has very high quality Norway Spruce and White Pine. The stand as a whole exhibits excellent growth throughout and has exceptional tree growth capabilities, good site.

#### **Forest Diversity and Composition**

Ten tree species of commercial value were inventoried within stand 14 lending credence to excellent species diversity. General tree health is excellent throughout inventoried tree species and no disease or insect infestations were noted.

#### **Forest Structure**

Forest Stand complexity is excellent with varying tree species, sizes, stocking density per acre, and a well developed multiple vertical layering primarily in the Hemlock component. Vertical layering within the mixed wood component was very limited with park like conditions – lacking a well developed understory due to crown closure. Standing dead trees and down dead wood were very evident, especially down dead wood due to long ago blow down. Tree crowns are judged to be very healthy due to an excellent stand site but are narrower in mixed wood due to crown closure and also occupation of growing space as evidenced by high basal area. Hemlock component exhibits larger, more dominant crowns and older age due to natural propagation. Spacing, stocking levels, and basal area showing hemlock component maturing with increasing crown closure.

## **Regeneration**

Desirable tree seedlings and saplings are largely absent in the mixed wood subcomponent of stand 14 due to crown closure making for a park like appearance. Commercial tree saplings and seedling are much more prevalent in the hemlock component. Regeneration within this area is highly suitable to the growing site and is completely natural seeding. A.G.S. represents mostly a future pole stand that is comprised of many species both hardwood and softwoods found in the timber classification. Interfering plants are found throughout stand 14 with the hemlock component having the greater density or stocking of beech and hophornbeam, mainly as smaller seedlings. These two species and ferns (found throughout the stand) are present enough for significant release & subsequent growth after timber harvesting. Deer browsing was observed heavy in the hemlock subcomponent.

## **Site Level Risks**

Blow down has already occurred in stand 14 history and as such is judged to be the highest risk to this stand. Most of the soils present would degrade the risks of excessive rainfall and moisture stress. Shorter and milder winters would affect accessibility through the dirt road that exists and serves as the only access to this stand.

## **Stand prescription**

High basal area, an excellent growing site, and mature high quality though low value softwood/coniferous timber with little regeneration in one component necessitates a timber harvest when markets will support it. A reduction of at least 60 square feet is proposed centering on individual trees that are economically mature (value will decrease with time), inhibit growth and vitality of adjacent crop trees, and with White Pine are approaching maximum mill size utility. In the hemlock component, emphasis should be reduction of hemlock basal area/stocking to encourage greater hardwood utilization of growing space and release of A.G.S. and regeneration. Before harvesting this stand, herbicidal treatment of fern undergrowth, hophornbeam, and beech saplings to limit their rapid response to the increased sunlight levels to the forest floor.

### Stand 4.14 Data

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern White Pine	25.43	58.02	5010
Eastern Hemlock	20.45	55.29	3616
Norway Spruce	14.11	21.89	2345
Red Maple	18.89	23.13	2200
Black Cherry	9.14	6.51	651
Red Oak	1.85	9.65	575
White Ash	1.50	2.84	303

Sugar Maple	1.50	2.84	252
Red Pine	.51	1.97	183
Yellow Birch	1.27	.79	71
Total	94.65	180.09	15,206

Hard wood Pulp	15.94	8.38	1.04 cords
A.G.S.	42.18	1.38	1.34 cords



#### **Forest Stand 4.15**

7.6 acres more or less are found within the confines of stand 15. Located in the south central section of Otsego #4, stand 15 has a large old log landing and also feature the remnants of a long ago blow down. Soil types and drainage class found in stand 15 are: Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – well drained, and Volusia silt loam, 3 to 8 percent slopes - Somewhat Poorly Drained. The ability to work this stand has its limitations concerning wet conditions. Essentially this stand is a mixed wood stand. White Pine, Norway Spruce, and Black Cherry are of good quality.

#### **Forest Diversity and Composition**

Species diversity within this stand is excellent with six commercial; tree species inventoried. Good growth characteristics translate to good general tree health. No insect or disease vectors were observed.

#### **Forest Structure**

Multiple vertical layering exists within this stand with trees of varying size and age. Some standing dead trees with dead down wood from a long ago blow down form good wildlife habitat. Crown closure is happening within stand 15 but trees have had adequate growing space but it is now diminishing.

#### **Regeneration**

Average amounts of Red Maple and Sugar Maple seedlings and saplings exist within the stand. This stand is slowly tending to a hardwood future stand. Beech and ferns exist within the understory. These interfering plants await release with additional sunlight. Deer browsing is a factor.

#### **Site Level Risks**

Moisture and extreme rainfall constitute the greatest risk to the stand due to soil type. Blow down is close in risk also, having already occurred in the past. Shorter and milder winters would affect the ability to operate harvesting equipment.

## Stand Prescription

Timber harvest reducing stand density by 30 square feet both in softwoods and hardwoods in conjuncture with neighboring stands harvesting activity.  
Herbicidal treatment pre harvest of ferns and beech within this stand.

### Stand Data 4.15

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Norway Spruce	24.25	20.72	4457
Eastern White Pine	16.70	33.21	4202
Black Cherry	22.36	22.76	2801
Red Maple	19.41	12.72	1745
Sugar Maple	1.13	1.77	263
White Ash	2.55	.79	143
Total	86.40	91.97	13,611

Hardwood pulp	6.60	5.15	.98 cords
A.G. S.	30.60	.59	.92 cords

**Forest Stand 4.16**

2.4 acres reside within forest stand 16. Main soil type is Volusia silt loam, 3 to 8 percent slopes - Somewhat Poorly Drained. Located in the northern portion of the eastern section, stand 16 is largely a wet site with some dense White Spruce natural regeneration seedlings and some saplings encroaching on open area. No forest measurements were taken as this is mainly a very slowly developing stand that will feature open areas for quite some time. This developing "stand" most useful attributes are for wildlife habitat/cover and also some water runoff control.

#### **Forest Stand 4.17**

Stand 17 has 13.3 acres + or – and is located in the center of the most easterly section of Otsego #4 Chapin forest. Soil types found within this stand are: Lordstown-Chadakoin complex, 15 to 25 percent slopes – well drained, Lordstown-Chadakoin complex, 8 to 15 percent slopes – well drained, and Volusia silt loam, 3 to 8 percent slopes – somewhat poorly drained (small acreage). This mixed wood stand is heavy to Eastern White Pine that was wide row thinned (2 to 3 rows) long ago and the rows that were thinned are now dominated with ferns and little to no tree reproduction.

#### **Forest Diversity and Composition**

Five merchantable tree species were inventoried in this stand with Eastern White Pine dominating (plantation), species diversity is judged to be below average to poor. General tree health is good with White Pine and Norway spruce timber quality good. White Pine shows excellent tree height and diameter. Norway spruce has good tree height. No insect or disease infestations were observed.

#### **Forest Structure**

This mixed wood stand exhibits average to poor structural diversity due to plantation trees White Pine and Norway spruce being the same age, five species present, some size differentiation (diameter), and no pole timber (A.G.S.), and little seedlings and saplings. Tree crowns are healthy with well developed branching and overall crown development due to long ago row thinning. Crowding exists within the no thinned row space. Average amounts of dead standing trees and down dead wood

#### **Regeneration**

Little regeneration was noted within the no thinned row space due to crown closure and domination of growing space by crop – timber class trees. Within the thinned rows, no reproduction, fern domination. Deer browsing not a present factor due to lack of regeneration to provide available browse.

### Site Level Risks

Blow down was assessed the highest risk factor due to species and tree height (White Pine). Soils were judged to handle extreme rainfall and moisture stress better than most thus Lessing those risk assessments.

### Stand 14.17 Prescription

Two courses of action are envisioned with the ultimate decision to be rendered depending on markets and field visit. 1) A simplistic, new row thinning that would feature new growing space, light to the forest floor, and less damage to the residual stand. 2) Individual tree selection silvical method with the White Pine bearing the most removal, Basal area reduction by 50 to 60 square feet. The goal would be to try to encourage pine regeneration.

In both courses of action it would be imperative that pre harvest herbicidal treatment of the ferns be undertaken and also during the harvesting – scarification of the present fern areas.

### Stand 4.17 Data

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern White Pine	25.00	102.27	9398
Norway Spruce	14.90	24.41	3552
Black Cherry	13.37	18.29	1515
Red Maple	8.10	7.60	866
Sugar Maple	1.99	3.25	218
Total	63.36	155.82	15,549

Hardwood pulp	13.43	9.99	.91 cords
---------------	-------	------	-----------

### **Forest Stand 4.18**

Located in the most north eastern section of Chapin forest, stand 18 contains approximately 5 acres. Hardwood stand, 18 was cut long ago and boasts some very impressive Red Oak specimens. Main soil type is Lordstown-Chadakoin complex, 8 to 15 percent slopes and is well drained.

### **Forest Diversity and Composition**

Species diversity is excellent with eight commercial tree species inventoried. General tree health is good with no disease or insect problems observed.

### **Forest Structure**

Good is a description for the overall structure found within stand 18. Several vertical layers exist with seedlings, saplings, poles (A.G.S), and timber class. Varying tree size, age, and stocking levels contribute to good forest structure. Good crown development and health are contributed by good tree spacing. Normal dead tree and down dead wood are found here also contributing to wildlife habitat.

### **Regeneration**

Seedlings and saplings are widely dispersed within stand 4.18 and are of commercially important species of hardwood. The pole class (A.G.S) with TPA of 19.92 and .03 cords per acre is low stocking level. Seedlings and saplings are well suited to the growing site and show good growth characteristics. Interfering plants are Ironwood – Hop hornbeam, and beech is judged to be a lesser factor of influence on regeneration.

### **Site Level Risks**

Well drained soils lessen the threats to stand 18 of excessive rainfall and moisture stress. Highest ranking of risk is imparted to blow down due to some of the large tops present; ice storm damage is a possibility also. Shorter and milder winters would most likely negatively affect accessibility to the stand.

## Stand Prescription

TSI or Timber stand improvement cuttings are recommended for the purpose of 1) improve the overall quality of the stand, 2) improve the spacing/growth of the stand, and 3) foster more sunlight onto seedlings and saplings in a matter not polarized to their shade tolerances and preferences. Harvesting of the mature to over mature Red Oak is recommended also.

### Stand 4.18 Data

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	21.22	20.22	3376
Red Oak	3.65	17.40	1969
White Ash	12.38	7.84	1647
Eastern Hemlock	7.34	6.38	1245
Sugar Maple	13.54	5.81	1043
Eastern White Pine	1.94	5.32	945
Black Cherry	4.75	2.15	500

Norway Spruce	1.59	1.58	323
Total	66.41	67.20	10,005

Hardwood Pulp	3.65	1.12	.74 cords
A.G.S.	19.92	.55	.03 cords

#### **Forest Stand 4.19**

This stand contains 13.9 acres more or less. Stand 19 is located in the south east portion of the easterly section of Otsego #4 Chapin Forest. Main soil types existing within stand 19 are Mardin channery silt loam, 15 to 25 percent slopes - Moderately Well Drained, Mardin channery silt loam, 8 to 15 percent slopes - Moderately Well Drained, and Lordstown-Arnot complex, 1 to 8 percent slopes, rocky – Well Drained. This stand was logged/thinned many years ago and the remaining White Pine and Mixed Spruce are mature. Pioneering hardwoods are now firmly established in the understory; there is no pine or spruce regeneration.

#### **Forest Diversity and Composition**

Not many tree species are present within stand 19, even in the pioneering hardwood species that will succeed the present stand. Species diversity is below average. General tree health is judged to be excellent with no insect or disease manifestations.

#### **Forest structure**

Stand 4.19 contains multiple vertical layers of trees of varying sizes and ages. Very mature Eastern White Pine and mixed spruce (White and Norway) form the over story with hardwood seedlings, saplings, and poles (A.G.S) forming several layers of the understory. Tree crowns of the mature timber are well developed and tree spacing is adequate for that observation. Standing dead trees and down dead wood are present within this stand but not to a high degree.

#### **Regeneration**

Desirable regeneration is in the understory pioneering hardwoods that form the seedlings, saplings, and poles. Chiefly Red Maple, Birch, and Cherry are the main species found in the understory that will form the future forest stand. Regeneration is well suited to the growing site. Little to no interfering plants was noted. Deer browse was judged to be present and average in comparison to other like stands.



## Site Level Risks

Ice storm damage and wind throw was judged to be of highest risk when consideration was given to soils drainage classes, age and maturity of the over story. Moisture stress and extreme rainfall were of lesser consideration for risk. Shorter and milder winters would affect accessibility the most for this stand.

## Stand Prescription

Stand conversion to hardwood. Harvest all White Pine and mixed spruce within stand 4.19. These species are the residual stand left from previous logging long ago and are fully mature and near or at their economic and biologic peak value. The hardwood understory is fully developed and ready to become the next forest stand – all it needs is release.

## Stand Data for 4.19

Species	TPA	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern White Pine	17.45	79.01	7575
Mixed Spruce*	12.35	14.19	2196
Black Cherry	4.62	5.80	661
Red Maple	1.02	1.40	184
Total	35.44	100.40	10,616

Hardwood Pulp	13.41	2.47	.77 cords
A.G.S.	51.92	1.53	.43 cords

\*White and Norway Spruce

**Forest Stand 4.20**

2.8 acres make up stand 20 in Otsego #4 Chapin Forest. Soil type found here is Lordstown-Chadakoin complex, 8 to 15 percent slopes – Well drained. Stand 4.20 is essentially a developing mixed wood, naturally seeded stand that features pioneering hardwoods and White Spruce seedlings/saplings. An old softwood stand clear cut many years ago, it is felt this stand will evolve through succession process into Red Maple and White Spruce dominant forest stand. No forest measurements were undertaken due to the stage of stand development.

**Stand Prescription**

Take no action, let the stand develop and grow.

### Tree Species Common and Latin Names

Common Name	Latin Name
American Basswood	Tilia americana
American Beech	Prunus serotina
American Beech	Fagus Grandifolia
Black Birch	Betula lenta
Black Cherry	Prunus serotina
Eastern Hemlock	Tsuga canadensis
Eastern White Pine	Pinus Strobus

Eastern Larch, Tamarack	Larix laricina
Northern Red Oak	Quercus rubra
Norway Spruce	Picea abies
Red Maple	Acer rubrum
Red Pine	Pinus resinosa
Striped Maple	Acer pensylvanicum
Sugar Maple	Acer saccharum
White Ash	Fraxinus americana

Yellow Birch	Betula alleghaniensis

## Chapin Memorial Forest Topography Map

