Otsego County Forest #12
Soil and Water Conservation Office, Forestry Parks Office
Forest Management Plan

Daniel Zimmerman
May 2020

Table of Contents

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.

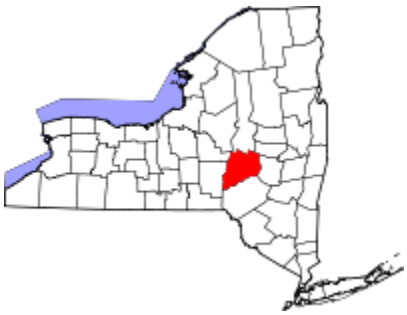
Forester Biography

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, and the University of Phoenix.

Property Attributes

Otsego County Forest #12 is essentially a 51 acre+- hard and softwood forest located on County Route 33 in the Town of Middlefield, Otsego County, New York. This parcel contains the Forestry and Parks headquarters (two buildings: cabin and barn/equipment building), a pole building used for storage with adjoining old equipment and refuse. In addition, the Otsego County Soil and Water Conservation District Office and the offices two stands are included in this plan. A good quality dirt access road leads to the center of the main property on the east. There is no access road for the stands to the west. An old, overgrown pond exists in the eastern section of the property with a drainage/overflow stream.

Otsego County



Town of Middlefield

Desired Future Conditions

This plan will entail two differing visions for the future of this property with analysis of each stand within this parcel detailing options for both.

The first: The overall future condition of this property should focus on the continuous production of high quality forest products from commercially important softwood and hardwood species. 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.

The second vision for future desired conditions encompasses a nature, conservation, and/or forestry educational interpretative center for the benefit of the citizens of Otsego County and New York State. Stewardship of our natural resources through demonstrative, educational programs would be enhanced greatly. The infrastructure already exists on site with ample parking, access road, buildings and other amenities. It is envisioned beginning small and developing the "nature center" slowly with efforts being directed to gradual funding through grants and other means with a formal development plan. Generating public support would enhance the project as seen in other nature centers.

Goals and Objectives

Forest Inventory

Complete a comprehensive inventory of the nine forest stands found in this parcel. Inventory was completed May2020 that included assessment of commercially important timber species and also low grade or pulpwood that also includes any 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.

Recommendations

Prescriptions on individual forest stands 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 but also for species, vigor, invasive species, wildlife, ecology, and Forester experience.

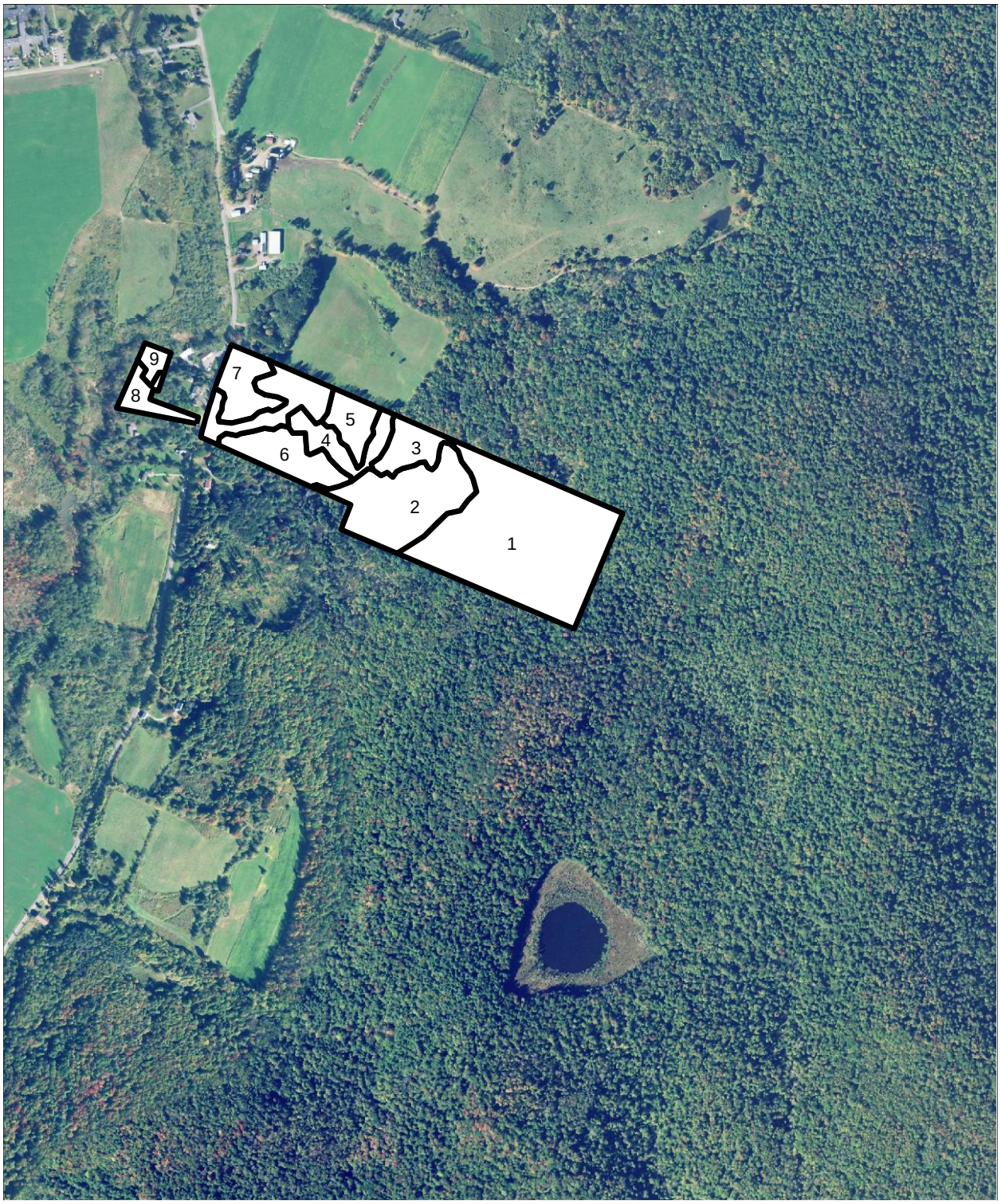
Inventory Methodology

Forest inventory was conducted on the eight stands that compromise Otsego County Forest #12. 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 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


9
8
7
5
4
6
3
2
1

USDA Soils Map

USDA Soils Legend

BfD	Bath channery silt loam, 15 to 25 percent slopes	Well Drained
Cb	Canandaigua silt loam	Poorly Drained
ChB	Chenango gravelly silt loam, 3 to 8 percent slopes	Well Drained
Fg	Fluvaquents-Udifluvents complex, frequently flooded	Poorly Drained
LrE	Lordstown, Chadakoin, and Manlius soils, 25 to 50 percent slopes, very rocky	Well Drained
MnE	Mongaup-Hawksnest complex, 25 to 50 percent slopes, rocky	Well Drained
Ra	Raynham silt loam	Somewhat Poorly Drained
ScB	Scio silt loam, 2 to 6 percent slopes	Moderately Well Drained

UnB	Unadilla silt load, 2 to 6 percent slopes	Well Drained
VaC	Valois gravelly loam, 8 to 15 percent slopes	Well Drained
VaD	Valois gravelly 15 to 25 percent slopes	Well Drained

Forest Stand #1

This stand is located in the farthest east section of Otsego parcel #12 and is comprised of approximately 21 acres more or less. Essentially a Hemlock/hardwood forest with a few old skid roads existing within the confines of the stand. Forest management activities within this stand have not taken place for a very long period of time. Stand #1 is heavy to Eastern Hemlock merchantable timber that in many instances is over mature. Soils in this stand are Bath channery silt loam, 15 to 25% slopes and as such would support forest management activity and machinery.

Forest Diversity and Composition

Species diversity in representative species is good with 8 merchantable species represented throughout the stand. In considering density as measured by basal area, Eastern Hemlock dominates this stand with 111 square feet per acre compared to the overall merchantable stand density of 160. Dominance of one tree species in density and trees per acre (48 out of 89) is of higher risk for forest pathogens and other negative vectors. General tree health was judged to be good with all species exhibiting good growth characteristics. Of concern is the health of Eastern Hemlock due to advanced age of a significant portion of the population. These trees are at risk not only for negative forest vectors but have a considerable amount of ring shake that is common within advanced size and aged Hemlock. Cruising methodology included volume deductions for this factor. No insect or disease factors were noted at the time of inventory.

This stand would among other aspects, be an example of an overage, one specie dominate forest stand that would be an excellent forestry interpretative lesson. Discussion of lack of forest management and silvicultural applications with resulting ramifications on biodiversity, forest ecology, and forest economics could be demonstrated effectively.

Forest Structure

Structure within stand #1 varies with sections of Hemlock exhibiting poor structural diversity with the specie showing age and size dominance creating a simplistic canopy. Smaller sections containing hardwood species shows much better forest structure with trees of different sizes and age generating multiple vertical layering including some sapling, pole, and mature timber classes. Black Birch did show some unusual high quality and size within the patchy hardwood sectors. Average amounts of standing dead trees and down dead wood were observed with some large individual trees in both categories. Both standing dead trees and down dead wood offer significant advantages and support for a plethora of forest fauna thus enhancing the overall forest ecosystem. Tree crowns and spacing are at a critical phase with high density Hemlock dominance. Competition for sunlight is intense and stand growth is slowed.

Nature interpretive trail through this stand would also entail discussions highlighting forest structure effects on wildlife with differences between the Hemlock stand and smaller patchy hardwood subsections. Absence of sunlight reaching the forest floor is another factor to be discussed.

Regeneration

Tree seedlings within forest stand #1 are not present and as such present concern for the future forest. Directly a result of lack of sunlight reaching the forest floor, seedling propagation is a goal that if achieved would set the stage for the future forest. Saplings as measured as acceptable growing stock (AGS) were measured at 23.9 /acre for Hemlock, and 18.8/acre for hardwood which is a concern for the future forest also. Species suitability to the growing site is judged to be good with most saplings occurring naturally. No interfering plant species were observed within this stand. Deer browse mainly not existent due to the maturity of this stand and lack of seedling. Interpretative aspects of stand dynamics, over maturity, lack of regeneration, and specie addictiveness and silvical requirements would be excellent topics for public learning.

Site Level Risks

Forest stand #1 moisture stress is judged to be low, with the same for extreme rainfall due to the hillside slope aspects and soil type. With the stands aspect facing westerly, it is perceived the highest risk to the stand would be wind throw or ice damage storm damage. Shorter and milder winters would have the greatest effect on accessibility with some limitation on operative available time windows.

Interpretative aspects of weather and climate change on our forests would be additional excellent subject matter for learning and could be demonstrated with hands on observations and computer generations of future forest change.

Forest Stand 1 Prescription

Due to the high stand density and occupation of growing space, it is recommended that a timber harvest be implemented centering on Eastern Hemlock basal area reduction of 60 square feet more or less and at the same time to a light timber stand improvement cutting of pulpwood classification to enhance the growth and quality of the acceptable growing stock. A goal of 1) establishing commercially viable seedlings by increasing the amount of sunlight reaching the forest floor and 2) putting the stand net growth on better quality commercial species of trees. It is recognized that the value of Eastern Hemlock is low and therefore may present difficulties in bidding/selling the timber and probably is the reason for lack of forest management activities on this stand.

If the proceeding was to be obtained, the interpretative/leaning aspects of forest management/silvicultral implementation would be excellent and could be taught and observed for many years to come. In addition, some, if not all of the proceeds could be used to help develop the nature center.

Forest Stand #1 Data

Species	TPA (trees per acre)	Basal Area/acre (sqft)	Volume per acre (Bdft, Int.1/4) F.C. 78
Eastern Hemlock (Tsuga Canadensis)	48.53	111.44	8848
Black Birch (Betula lenta)	6.27	15.51	1014
Red Maple (Acer rubra)	9.57	13.38	889
Yellow Birch (Betila Alleganiensis)	5.74	5.97	488
White Ash (Fracinus Americana)	9.62	5.29	465
Sugar Maple (Acer saccharum)	7.70	3.31	393
Northern Red Oak (Quercus rubra)	.98	4.18	269
American Basswood (Tilia Americana)	.82	1.23	128
Total	89.23	160.31	12,494

Classification	TPA	Basal area/acre	Cords/acre
Hardwood pulp	18.14	16.28	1.91
A.G.S. (acceptable growing stock)	18.80	.89	.43
A.G.S. (Hemlock)	23.90	.24	.89
Total	60.84	17.41	3.23

Forest Stand #2

This stand is located in the central portion of Otsego Parcel #12. Soils in this stand are Valois gravelly loam, 8 to 15 percent slopes and are well drained. 8.7 aces more or less are found in this stand. Essentially, stand number 2 an old Red Pine clear cut –stand conversion.

Forest Diversity and Composition

Species diversity within stand 2 is good with many tree species present without one specie dominating this stand. Species observed in abundance were White/Grey Birch, Sugar Maple, Red Maple, Northern Red Oak, White Ash, and American Beech. General tree health was observed to be excellent with excellent growth characteristics across the specie spectrum. No insect or disease factors were observed

Forest Structure

This stand is a developing hardwood stand following a clear cut – stand conversion. There is a lack of structural diversity as the stand that is developing is even aged with all of the trees in the seedling and sapling developmental stage. Standing dead and down dead wood are not found in this stand thus limiting wildlife preferring these habitats. Typical young forest conditions exist within the stand with tree crowding evident and spacing limited. Succession factors will over time decrease the tree count and density now found among the seedlings and saplings.

Regeneration

Specie mix within this stand is excellent with many commercially valuable species found. The future forest stand is now developing with a good base. Species suitability to the growing site is excellent with the stand naturally seeded and healthy. Honey Suckle was found in the westerly portion /edge of stand two. Observation of deer browsing yield negligible effects on this developing stand at the present time due to the high number of seedlings and saplings found in this stand.

Since **the** soils found in this stand are well drained and found on a westerly facing slope, extreme rainfall and moisture stress are judged to be of lesser risk. Blow down and ice storm risks are higher. Shorter and milder winters will affect the accessibility of the stand for forest management activities.

Stand Prescription

Recommendation is to let this stand develop naturally. Herbicidal treatment of Honey Suckle found to the western portion/edge is proposed so as to limit any effects on the developing stand. Some timber stand improvement should be undertaken to remove/eliminate poor form residual trees left from the stand conversion years ago.

Interpretive aspects

An excellent example of a young forest showing how early succession within a stand occurs after forest stand conversion and the effects of the silvicultural implementation of clear cutting. Present wildlife benefits and ecosystem enhancement compared to the previous Red Pine stand situation.

Stand Data

No forest measurements were undertaken as the stand is in the early developmental stage.

Forest Stand 3

2.5 acres more or less occupy forest stand 3. Located in the north central portion of Otsego #12, the main soil type is Bath channery silt loam, 15 to 25 percent slopes, well drained. This stand is an old pasture that has become a forest stand.

Forest Diversity and Composition

Pioneer deciduous species dominate this developing stand with species diversity judged to be good. Significant Popple (Populus tremuloides) also known as Trembling Aspen and Staghorn Sumac (Rhus typhina) populations exist within forest stand 3. General tree health is judged average with several pioneer tree species present. No insect or disease vectors were observed.

Forest Structure

Higher risk is found to the stand due to les structure. Primarily a naturally seeded, developing deciduous stand emanating from an abandoned farm pasture, the stand is even aged and forms a simple canopy. No standing dead trees or down dead wood was found in stand 3. Tree crowns and spacing was observed to be adequate for stand development.

Regeneration

Desirable regeneration is judged acceptable given forest succession of cleared space. Specie suitability to the growing site is judged good with native, naturally seeded in species. No interfering plants were noted and deer browse was average given the high seedling count per acre.

Site Level Risks

Moisture stress and extreme rainfall were judged as low risk to this developing stand. Ice storm and blow down were appraised at higher risk to stand 3. Shorter and milder winters were judged to be of low impact on forest management activity.

Forest Stand 3 Prescription

Essentially, let this stand develop naturally with forest succession factors at play.

Interpretative Aspects

Forest succession, biodiversity, young forest habit, and early succession wildlife (especially song birds) are very demonstrative in this stand that is not a far walk from parking.

Stand Data

No stand data collected as this developing stand is in the seedling/sapling stage.

Forest Stand #4

2.7 aces more or less comprise forest stand 4 found in the central, west central portion of Otsego #12. Valois gravelly loam, 8 to 15 percent slopes, well drained is the soil type found on stand 4. This stand can easily be described as a non forest stand with portions containing old access road, hedge rows, and clear cut areas. A grown over shallow pond is found on this site also.

Prescription

Where the hedge rows exist, clear cut and remove. Allow present clear cut areas to develop into forest stands with natural seeding or planted stock in conjuncture with neighboring stands.

Interpretative aspects

Development of the pond for learning aspects in wet land and forest pond ecosystems. Demonstrative importance of forest roads and their development and maintenance. Clear cutting and planting for forest stands and/or wildlife and erosion applications.

Forest Stand #5

2.4 acres + or – make up forest stand #5. Main soil type is Valois gravelly loam, 8 to 15 percent slopes and is well drained. Location: west central portion of Otsego #12. This stand is a abandoned Christmas tree plantation that is now overgrown.

Forest Diversity and Composition

Species diversity is in the process of diversification and succession. Coniferous planted specie is White Spruce (Pieca glauca) with some seeded in Eastern White Pine (Pinus strobes) and Red Pine (Pinus resinosa). Pioneering deciduous species are seeding in also. General tree health appears to be good with typical growth patterns seen in openly grown conifers. No insects or disease were observed.

Forest Structure

This stand contains two age or size classes: 1) White Spruce and other conifers about same age and size dominating the canopy and 2) pioneering hardwoods in the seedling class. The conifers do not dominate the canopy to effectively minimize sunlight penetration to the forest floor. Conifers are haphazardly distributed throughout the stand due to Christmas tree cutting in the past. Significant crowding exists especially in the deciduous seedlings and in certain areas – the conifers. No standing dead trees or dead down wood was found within this stand.

Regeneration

Primarily scattered and dense pioneering hardwood species comprise most of the regeneration aspects of stand #5. Mostly naturally seeded in, these pioneering hardwood species are suitable to the growing site. Some Honey Suckle interfering plants were observed within the stand but were judged to be not a large factor in stand development. Deer browse not a significant factor.

Site Level Risks

Highest risk factors to stand 5 appears to be wind throw and some excessive moisture, Shorter and milder winters would not have a significant effect on this stand due to proximity to road and soil type.

Stand Prescription

Stand 5 would be a good candidate for stand conversion to a confer specie (Norway Spruce, Red Pine, or White pine) for timber stand development or replanting with a Christmas tree species either White Spruce or Douglas Fir. This would require site preparation.

Another option would be to allow the present stand to go forward. The forest product produced would be pulp due to open nature growth. Eventual hardwoods stand succession way into the future.

Stand Data

Due to the nature of this developing stand, no forest measurements were undertaken.

Interpretative Aspects

An excellent tool for learning about Christmas tree management, forest succession, and plantation management and establishment.

Forest Stand #6

This stand is located in the extreme South West portion of the main parcel of Otsego #12 and borders the main access road on the East. Also on the East, Stand #6 borders the pond and the ponds drainage stream. #6 is comprised of 4 acres more or less. Main soil type is Valois gravelly loam, 8 to 15 percent slopes and is considered by USDA to be well drained. #6 is a Red Pine plantation.

Forest Diversity and Composition

One specie plantation, Forest Stand #6 has low species diversity making this stand highly susceptible to forest pathogens and invasive species. General tree health is average with a trend of this stand to poor with tree crowns exhibiting considerable declining percentage of usable tree length. Poor tree growth characteristics are evident as are tree crowding with a TPA of 230/acre.

Forest Structure

Stand #6 consists of Red Pine trees that form a simplistic canopy, even age and similar in size. No vertical layering of this stand. Little standing dead trees were observed. Dead down trees were found with most of advance age due to a long ago blow down. Tree crowns are declining, spacing is very crowded due to no thinning of this stand.

Regeneration

No regeneration was observed or measured in this plantation stand. Red Pine suitability to the growing site is evidentially poor with growth characteristics showing low diameter growth and poor tree quality. Large diameter branching and dead stubs within a high preponderance of whorls are found on a majority of stems/boles. Honey suckle is dominating the understory of this stand and is considered invasive. Little sunlight is entering the stand and reaching the forest floor. Deer browsing is not a factor.

Site Level Risks

Moisture stress and extreme rainfall are considered low risk to this stand. Highest risk is blow down. Stand #6 experienced significant blow down long ago and with declining overall forest health is considered to be a prime candidate for another blow down. Shorter and milder winters are judged to have minimal affect on #6 to support forest management activity.

Stand #6 Prescription

Due to declining stand health, high tree count per acre, low diameter growth, it is proposed that stand conversion be instituted to a plantation coniferous specie more suited to the growing site. Christmas tree plantation is another option. Challenges would be marketing the Red Pine primarily to the log cabin market with little to no utility poles present. Low market pricing typifies this market. Other markets may be pulp. Consideration of clear cutting this stand while very close to paved road and building resulting in poor aesthetics should be undertaken before selection of course of action. Herbicidal treatment of invasive Honey Suckle should be undertaken at time of harvest or presently if no conversion is undertaken.

Interpretative Aspects

Lack of forest management repercussions, matching tree species to silvics and growing site characteristics, Red Pine forest products, stand conversion and clear cutting as a silvicultural tool for forest management. Ecosystem health and biodiversity, invasive species are some other topics that would be exemplified by this stand in a nature conservancy.

Stand Data

Species	TPA (Trees per acre)	Basal Area/acre (Sq. Ft.)	BdFt/acre Int. ¼" F.C. 78
Red Pine	230.73	59.19	19,786

Forest Stand #7

#7 is located in the North Western portion of Otsego #12 and borders County Route 33, maintenance pole barn/parking area, pole barn and refuse, and a private residence. 3.1 acres + or – make up this forest stand with USDA soil classification of Valois gravelly 15 to 25 percent slopes, well drained. Forest stand 7 is a White Spruce plantation.

Forest Diversity and Composition

Low species diversity typical of plantations, White Spruce dominates. General tree health is poor with stagnation dominating tree growth and producing poor quality crop trees. Pulp production on some of the trees. No insect or forest diseases were noted.

Forest Structure

7 is characterized by a simplistic canopy produced by even aged and sized White Spruce. This stand has some dead standing trees and down dead woods but not a lot. Tree crowns and spacing are limited with little growth occurring and crowding in evidence. No thinning has occurred within this stand.

Regeneration

Tree seedlings and saplings are absent, little to no regeneration is occurring within this stand. White Spruce is exhibiting average but not good growth characteristics leading to average specie suitability to this growing site. No or little interfering plants were observed. Deer browsing not a factor within this stand.

Site Level Risks

Well drained site, moisture and excessive rainfall were judged to be of low risk. Higher risk due to stagnation is wind throw and ice storm damage. Shorter and milder winters not a significant factor.

Stand 7Prescription

Due to the proximity to County Route 33, buildings, and private residence, it is recommended that no forest management activity take place let the stand proceed in natural course. Over time this stand will convert/succeed to a hardwood stand, but will take a long time.

Stand Data

No stand data or forest measurements were undertaken due to the nature of this stand.

Interpretative Aspects

Building of a short trail within the confines of stand #7 would show case lack of forest management activity and its effects on White Spruce plantation. When and when not to practice silviculture and considerations for courses of action in stands that are close to the public eye. Stagnation and effects on wildlife and the eco system are among several educational opportunities this stand would exemplify.

Forest Stand 8

1.7 aces more or less make up stand #8. Soil type is Chenango gravelly silt loam, 3 to 8 percent slopes –well drained – near County Route 33 and Raynham silt loam – somewhat poorly drained. Located on the westerly smaller parcel of county owned land, west of County Route 33. This stand contains a Black Walnut plantation that has not been thinned, property line is difficult to ascertain and may require a survey or working with neighbor. The remainder of this stand contains some Black Cherry and is primarily a flood plain for stream of which it borders.

Forest Diversity and Composition

Approximately one acre of this stand contains Black Walnut plantation about 30 to 40 years old and borders County Route #33 and also a private residence on the North. No species diversity, one specie plantation. General tree health is good with good growth characteristics. No insect or diseases were observed.

Forest Structure

Walnut plantation and Cherry/flood plain contain a simple canopy with even aged trees and similar sizes with no vertical layering. No standing dead trees or down dead wood was observed. Tree crowns were exhibiting closure within the plantation and low stand stocking in the flood plain.

Regeneration

Acceptable growing stock was not present within each part of stand # 8. No interfering plants were observed with a small exception of a few Honey Suckle plants. Deer browse was not a large factor.

Site Level Risks

Highest risk to stand #8 is moisture stress and extreme rainfall due to the flood plain and proximity to the stream. Shorter and milder winters would affect both the accessibility and workability of this sensitive stand.

Stand #8 Prescription

Very light thinning of Walnut stand within the next 5 to 10 years with property line surveyed or agreed to. Rest of this stand should be devoted to flood plain management and wildlife considerations.

Interpretative Aspects

Stand #8 would present classic forest management of a hardwood plantation that is not commonly found, excellent accessibility, and a good discussion of wet land ecosystems, flood plains, and wildlife habitat. Close to the road, this stand has good nature development possibilities.

Forest Stand #9

This "stand" really is not a forest stand at all, no trees, and a flood plain. Located to the north of stand 8, West of County Route 33, #9 consists of approximately .9 acre. Stand 9 is mainly wetlands, flood plain ecosystem that consists mostly of hydrophilic plant species and is good wildlife habitat. Bordering on a stream, this "stand" offers good nature trail and interpretative wetlands ecosystem "development" possibilities.