

Otsego County Forest #10

Charles H. Bingham Memorial Forest

Forest Management Plan



Daniel Zimmerman
March 2022

Table of Contents

Introduction-----	4
Forester Biography	
Property Attributes	
Location Maps-----	5
Overview Map-----	6
Forest Stand Map-----	7
USGS Soils Map-----	8
USGS Soils Map Legend-----	9
Topographic Map-----	10
Desired Future Conditions-----	11
Goals and Objectives, Forest Inventory, Problem Identification	
Trail Maintenance, Recommendations-----	12
Inventory Methodology-----	13
Forest Stand Plots and Acreage-----	14
Property Lines, Culvert-----	15
Forest Stand B1-----	16
Forest Stands B2, B3-----	19
Forest Stand B4-----	22
Forest Stand B5-----	24
Forest Stand B6, B9-----	26
Forest Stand B7-----	28
Forest Stand B8-----	30
Forest Stand B10-----	32
Forest Stand B11-----	34
Forest Stand B12-----	37
Forest Stand B13-----	39
Forest Stand B14-----	41

Forest Stand B15-----	44
Forest Stand B14-----	43
Forest Stand B15-----	45
Forest Stand B16-----	47
Tree Species Common and Latin Names-----	49

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

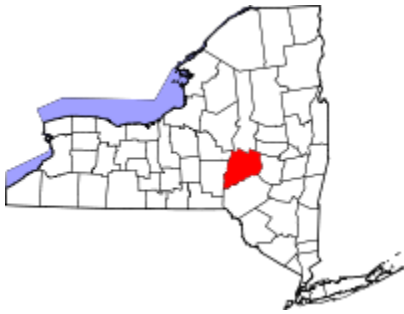
Dan Zimmerman's experience revolves around procurement and consulting Forestry having worked extensively with landowners, timber harvesters, Foresters both public and private, trucking and construction firms, and the forest industry with over 35 years of experience. Presently, chapter chair of The New 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 #10 is essentially a 243 acre +- forest located on Bourne Hill Road in the Town of Morris, Otsego County. Public parking is on Bourne Hill Road, mostly roadside. The main access point is a forest access road located on the south side of Bourne Hill Road on Forest Stand B1 That leads to an old logging landing area. Another access point is also located on the south side of Bourne Hill Road on Forest Stand B5. Located on Forest Stand B14, north of Bourne Hill road is the third access point for the northern section of Otsego #10. This access site has an unimproved parking area that needs finishing.

Location Map

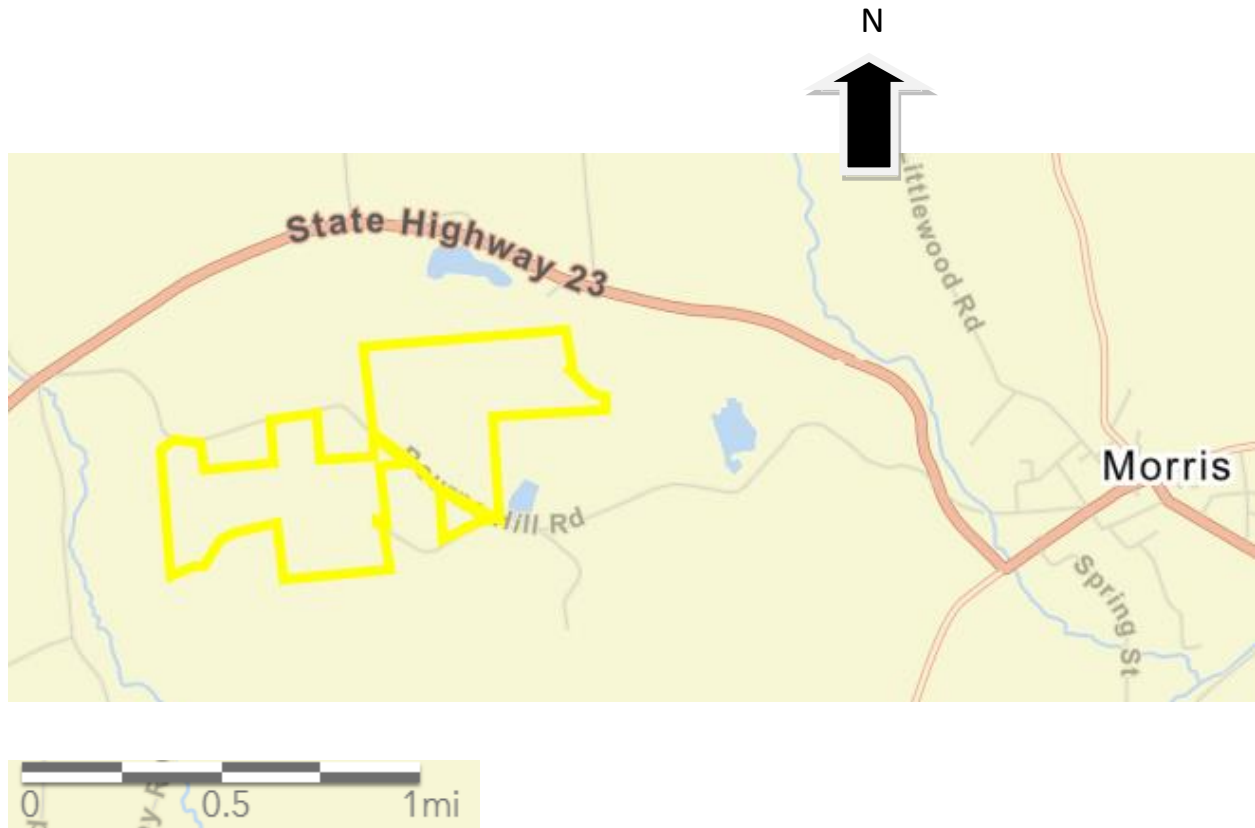
Otsego County, New York



Town of Morris, New York



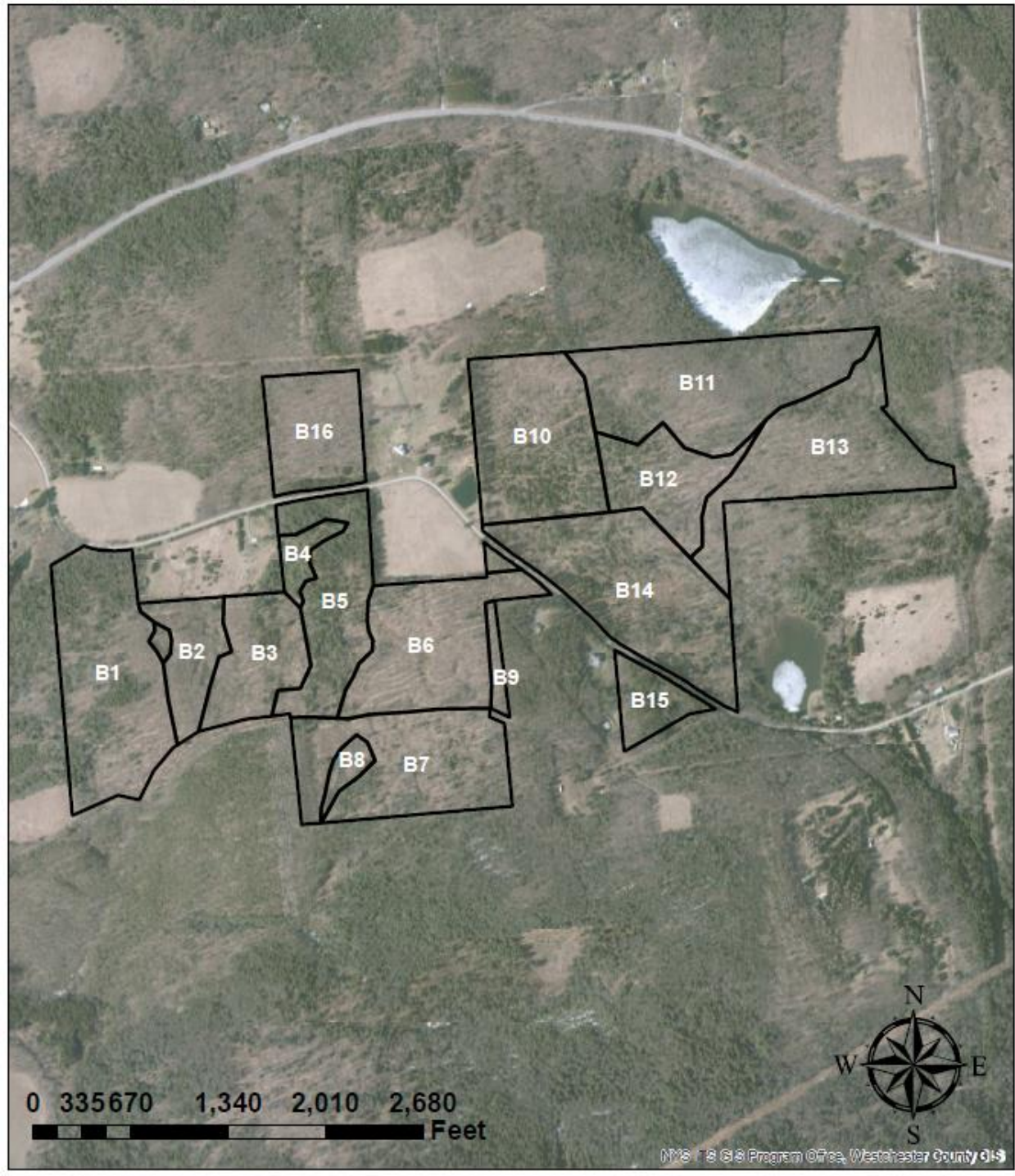
Otsego #10
Charles H. Bingham Memorial Forest
Overview Map
Bourne Hill Road
Morris, NY.
243 acres





Otsego #10
Charles H. Bingham Memorial Forest
Forest Stand Soils Map
Tax Parcel #220.00-1-42.00
243 acres

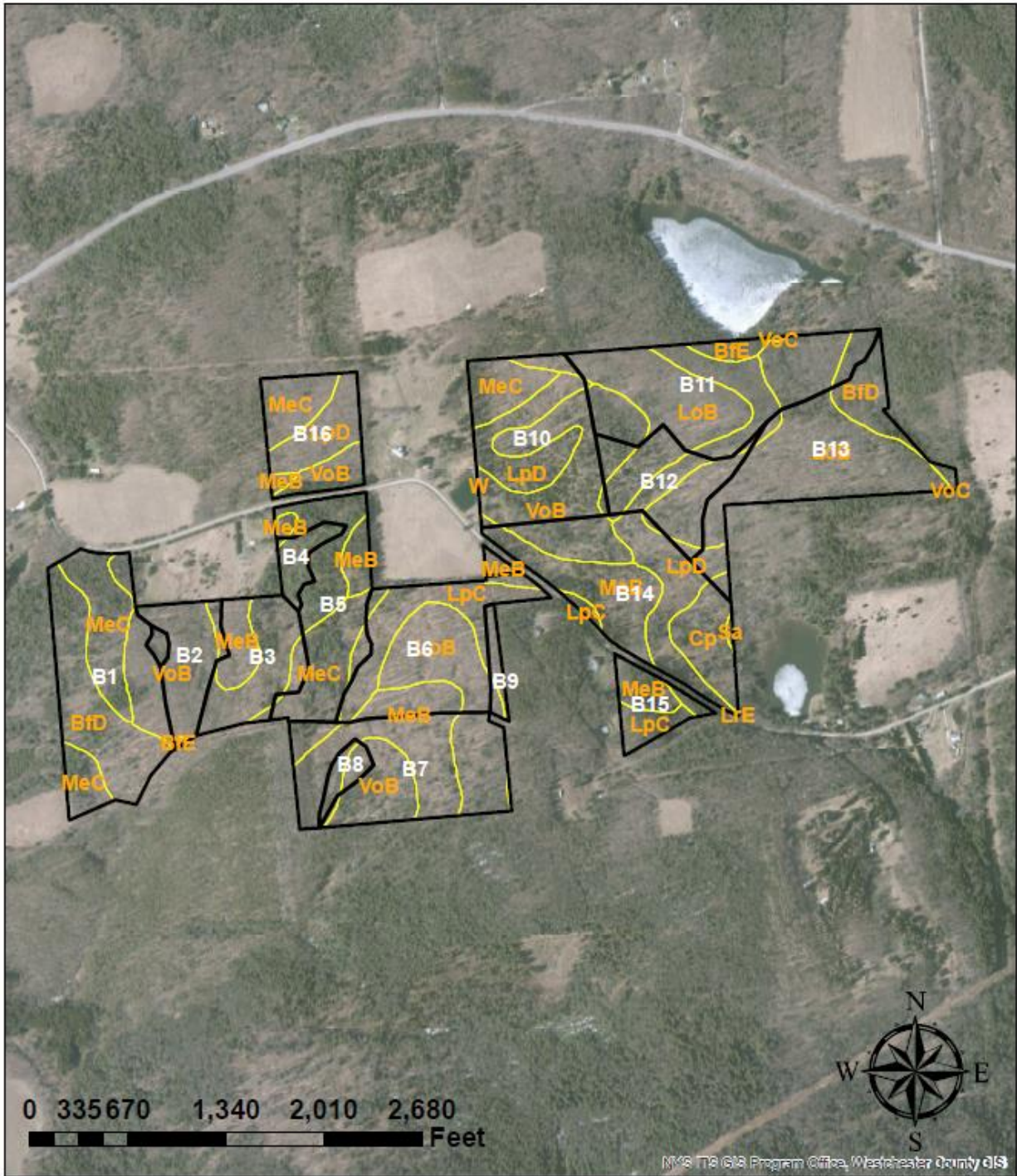
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Conservation District
12/08/2021
Assisted by: Dan Zimmerman





Otsego #10
Charles H. Bingham Memorial Forest
Forest Stand Soils Map
Tax Parcel #220.00-1-42.00
243 acres

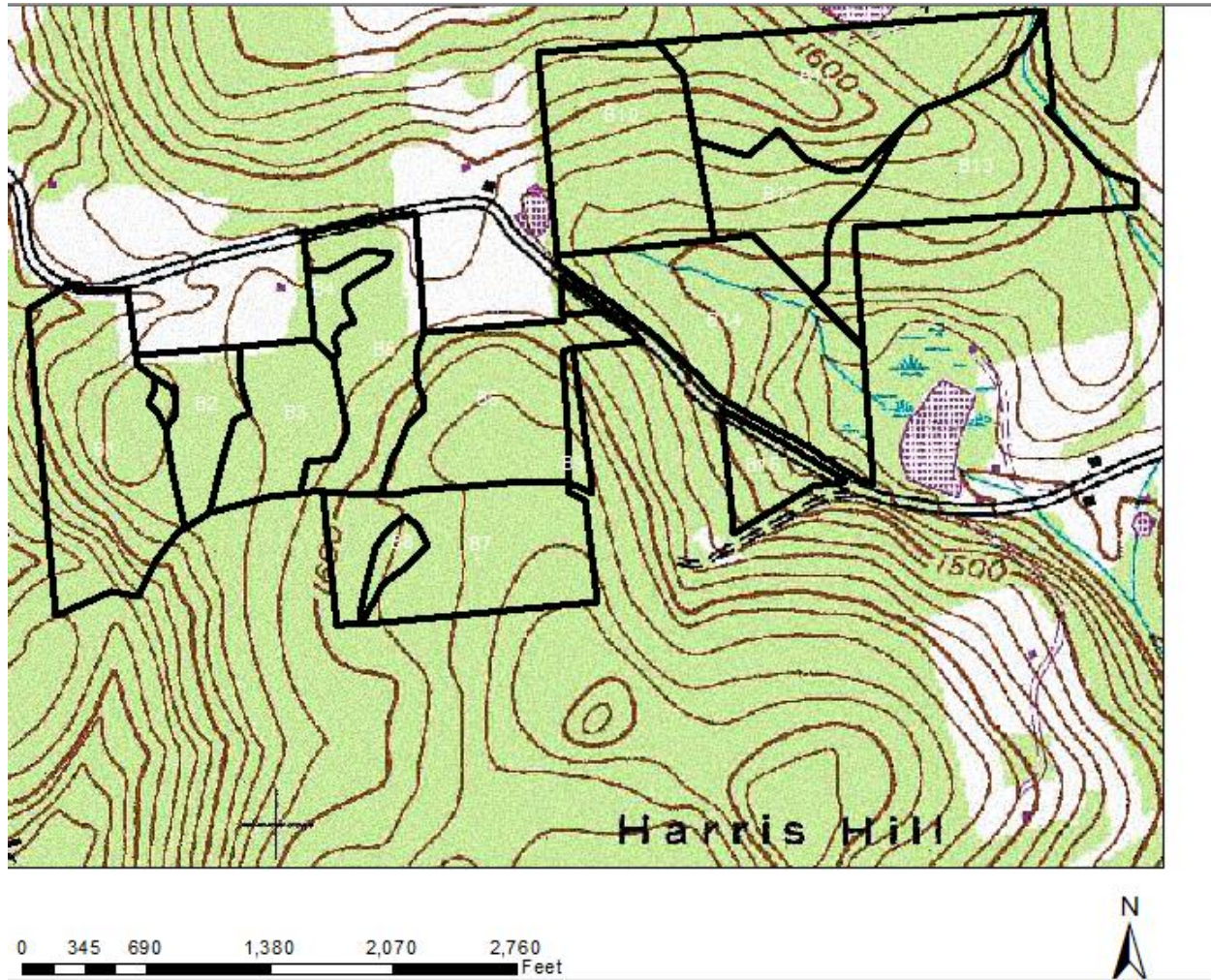
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USGS
Soils Map Unit Legend

Map unit symbol	Map unit name
Bfd	Bath channery silt loam, 15 to 25 percent slopes, Well Drained
Bfe	Bath channery silt loam, 25 to 45 percent slopes, Well 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, Well Drained
MeC	Mardin channery silt loam, 8 to 15 percent slopes, Moderately Well Drained
VoB	Volusia silt loam, 3 to 8 percent slopes, Somewhat poorly drained

Otsego #10
Charles H. Bingham Memorial Forest
Topographic Map
Tax Parcel # 220.00-1-42.00
243 acres



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 hardwood species. Substantial amount of merchantable high quality and low value hardwood and softwood 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, especially targeting stands containing White Ash. Control of interfering vegetation: mainly American Beech, Hop Hornbeam, and Multifloral Rose to be instituted prior to commencement of harvesting. Significant acreage is recommended to be managed for wildlife. 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.

Goals and Objectives

Forest Inventory

Complete a comprehensive inventory of sixteen forest stands. Inventory was completed March 2022 that included assessment of commercially important timber species, acceptable growing stock (AGS), 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 will be identified in each individual forest stand write up. 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 partly in good condition and some that are wet and rutted. A goal would be to continue the present condition or upgrade where needed and maybe mark possible hiking trails. Overall access is attained through Bourne Hill Road, a town maintained road.

Recommendations

Prescriptions on individual forest stand to be outlined and aligned with future desired conditions. Recommendations to include implementation and alignment with desired future parcel conditions with the individual forest stand. 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 sixteen forest stands that compromise Otsego County Forest #10. 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 was determined by the judgment of the Forester. Species of every tree in the data plot was 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
31-40+	15

Otsego #10
Stand Acreage & Plot Table

Forest Stand	Acres	# of Plots
B1	26.4	14
B2	7.8	5
B3	11.5	7
B4	2.8	3
B5	15.9	10
B6	19.6	10
B7	21.1	10

B8	1.9	3
B9	2.2	3
B10	21.8	10
B11	25.7	14
B12	10.7	7
B13	21.8	10
B14	28.9	14
B15	5.4	4

B16	13.20	7
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Property Lines

The main discrepancy found on the property lines of Otsego #10, Charles H. Bingham forest lies in the south western section south of Bourne hill road bordering New York State parcel # 235.00-2-14.02 containing 1158 acres. The common property line is a woods road (dirt) and has been marked by New York State with typical yellow blaze marks bordering and on the south side of said road. Otsego has Blue Blazes on the north side of said road, infrequent, and haphazardly “put in” on very old markings. New York State markings are put in by licensed land surveyors and are more recent. The question to be resolved possibly through deed research is who owns the road? Both State and County property lines should coincide.

Property Line bordering Forest Stand B10 on the west, north of Bourne Hill and in the central section of Otsego #10 in common with Theresa Sorensen of 287 Bourne Hill Road, Morris, NY. 13808 is not marked with blue blazes. It is surmised that the county saw no need as Sorensen’s property is a cleared field with old wire present compared to the county Norway Spruce plantation that over time was harvested. Some Posted signs exist on this line also.

Varying degrees of property line blazing exist on the majority of the lines existing on Otsego #10: from very sparse to blazes every 40 to 50 yards. All blazes have been refreshed with blue paint.

Culvert

A very large culvert has been washed out due to heavy rains where Forest Stand B1 borders Bourne Hill Road on the south. The repositioning of this culvert together with gravel is recommended upon future timber harvest as this is a “gateway” to access the south western section of Otsego #10.

Forest Stand B1

Predominate soil types found within the 26.4 acres more or less within this stand are Mardin channery silt loam, 8 to 15 percent slopes, Moderately Well Drained, and Bath channery silt loam, 15 to 25 percent slopes, Well Drained . Located to the furthest westerly section of Bingham Memorial Forest south of Bourne Hill road this stand borders private and New York State property to the west and south. Comprised of two very distinct subcomponents, this stand requires very different prescriptions for each. The first component is a mature northern Hardwood/Hemlock stand and the second subcomponent is an old Red Pine clear cut.

Forest Diversity and Composition

Species diversity is good to excellent in both subcomponents with ten species tallied in plot forest measurements. Species suitability to the growing sites is good with good to excellent growth characteristics present. General tree health is good also. No insect or disease issues were observed upon stand inspection.

Forest Structure

Multiple vertical layers exist together with a fair preponderance of different tree sizes in the first component. In addition, a noticeable amount of high quality hardwood and softwood timber class dominates. In the second subcomponent, structural diversity is lacking with an even aged hardwood stand in the seedling, sapling, and AGS (acceptable growing stock) stage, profuse in nature. Standing dead trees and down dead wood exists minimally in the first component, lacking in the second. Tree crowns exhibit mature size with full occupation of growing space in the first component and developing crowns and crowding in the second subcomponent.

Regeneration

First component has minimal regeneration chiefly Sugar Maple due to maturity of the stand with little sunlight reaching the forest floor. Second component has profuse regeneration chiefly in the following species: Red Maple Beech and Birch. Both components regeneration shows good suitability to the Growing site with good growth characteristics. Interfering plant American Beech is present in the second component and is exerting some influence on neighboring trees. However, no beech bark disease was observed. Deer browse was observed to be average in the second component and not a factor in the first.

Site Level Risks

Moisture stress or drought conditions could have an adverse effect on both subcomponents with the second experiencing the greatest impact. Blow down could be of higher risk for the first component due to maturity and large crowns. Shorter and milder winters would have negligible effects due to soil types and proximity to road.

Stand Prescription

The first subcomponent is carrying a high basal area due to stand maturity in the timber class in both the hardwoods and Hemlocks and needs harvesting. Recommendation is to harvest approximately 40 or more square feet concentrating on white Ash harvesting (due to Emerald Ash Borer) and careful removal of Eastern Hemlock mature trees where maturity and sunlight is needed. Removal of pulp is also recommended especially where impacts are strongest on AGS but allowing for wildlife considerations where ever possible. Single tree selection silvical methodology is recommended.

The second subcomponent is an early even age hardwoods developing stand that should be allowed to develop through typical succession forces. Some significant beech is present in spots, herbicidal, girdling, or removal may be instituted at the same time harvesting of the first component.

Stand Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern Hemlock	13.09	42.48	2228
White Ash	9.37	25.01	1528
Sugar Maple	14.23	28.34	1522
Red Maple	14.73	29.95	1751
Yellow/White Birch	3.94	8.29	367
Black Cherry	2.79	5.16	234
Popple	.40	1.77	96

Red Oak	1.31	.55	52
Red Pine	1.32	4.94	448
Total	61.18	146.49	8226
AGS	25.26	3.03	1.05 cords
Pulp	30.98	26.46	2.37 cords

Forest Stands B2, B3

Volusia silt loam, 3 to 8 percent slopes, somewhat poorly drained is the soil type found within stand B2 and B3. B3 also contains a small amount of Mardin channery silt loam, 3 to 8 percent slopes, Well Drained. Approximately 7.8 acres are found in B2 with 11.5 acres within B3. Correlation with field inspection, the main soil type makes for poor working conditions for forest management equipment. These stands are found in the most westerly portion of Otsego #10, south of Bourne Hill Road. Both stands are a result of an old red Pine clear Cut.

Forest Diversity and Composition

Tree species diversity in the timber class is low with basically three hardwood species sampled with three trees or more in the trees per acre category in both stands. A developing forest stand, B2 and B3 have much more pronounced forest diversity in the AGS and regeneration classes. Species suitability to the growing site and general tree health is good with good growth characteristics. No insect or disease issues were noted upon field inspection.

Forest Structure

Fair overall structure is found within these stands due largely to the young age of the developing stand. Over time with forest succession; both stands should exhibit good structure in the future. Occasional Standing dead trees were found with a more pronounced amount of down dead wood present within the stands. Tree crowns are developing but crowded due to the nature of these young, developing stands.

Regeneration

Desirable hardwood regeneration is present in large amounts with AGS, Sapling, and seedling showing the following species: Black Birch, Red Maple, and

Sugar Maple and Red Oak. Regenerative species suitability to the growing site is fair with Sugar Maple and Red Oak having the poorest conditions for optimal growth (wet). Some American Beech is present (counted as pulp) within the stands and qualifies as interfering. Deer browsing was judged as average but not overly high impact.

Site Level Risks

Highest risk to this stands is excessive rainfall due to the soil type and the topography. Shorter and milder winters would affect the ability to work within these stands negatively.

Stand Prescription

Let both stands continue to develop through forest succession. In the future, reduction of the amount of pulp to encourage growth of nearby valuable crop trees would be recommended if feasible.

Stand Data B2

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Black Birch	18.35	2.73	661
Red Maple	8.04	7.10	1075
Red Pine	1.43	1.40	345
Black Cherry	3.98	2.19	295
Total	31.80	13.42	2376

Pulp	18.00	14.59	2.99 cords
AGS	43.40	1.79	1.76 cords

Stand Data B3

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	6.56	5.05	414
Black Birch	6.79	2.01	293
Red Oak	4.44	1.34	196
Total	17.79	8.40	903
Pulp	12.53	4.98	.96 cords
AGS	56.91	2.73	2.11 cords

Forest Stand B4

Volusia silt loam, 3 to 8 percent slopes, somewhat poorly drained is the soil type found within the approximate 2.8 acres of stand B4. Located south of Bourne Hill Road, bordering private property, B4 is in the western section of Otsego #10. This stand is a naturally occurring Eastern White Pine and Red Maple stand that has seen no forest management activity. Very wet conditions within the confines of the stand, B4 also borders private wet lands.

Forest Diversity and Composition

Two species of trees basically make up this stand thus registering low species diversity. The major species: White Pine and Red Maple are well suited to the growing site and exhibit good tree general health with the exception of a few White Pine that are very over mature. No insect or disease vectors were observed.

Forest Structure

Structural diversity within stand B4 is poor with only two prominent vertical layers; primarily within the timber class- larger white Pine and somewhat smaller red maple. AGS and seedlings/saplings are sparse. Spacing of trees is wide affording for relatively large crowns. Few Standing dead trees and down dead wood were observed.

Regeneration

Sparse regeneration is present with mostly White Pine seedlings/saplings and infrequent Red Maple present. AGS is very sparse also. Regeneration suitability to the growing site is good with no interfering plants present. Deer browsing is deemed relatively low.

Site Level Risks

Due to the wet conditions the highest risk factor to the stand would be excessive rainfall. Secondly, wind throw due to the large crown size of many of the White Pine. Shorter and milder winters would shorten the time frame for workability of this stand and also the accessibility.

Stand Prescription

This stand stands out in relationship of proximity to neighboring stands through species content – the White Pine in comparison to the predominant hardwood mix of surrounding forest stands. Biodiversity benefits in conjuncture with wildlife habitat and wet lands make this small stand to continue in its present form. Mature Pine timber is overshadowed by the preceding benefits listed.

Stand Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Eastern White Pine	34.86	46.06	7680
Red Maple	13.82	9.68	2068
Norway Spruce	7.86	1.71	481
Black Cherry	2.39	1.40	253
Total	58.93	58.85	10,482
AGS	9.55	.35	.06 cords

Forest Stand B5

15.9 acres more or less make up this stand located south of Bourne Hill Road in the easterly section of Otsego #10. USGS soil survey lists the following two soil types found within this stand as: Mardin channery silt loam, 3 to 8 percent slopes, Well Drained and Mardin channery silt loam, 8 to 15 percent slopes, Moderately Well Drained. The first 2 to 300 yards extending southerly from Bourne Hill Road is exceedingly wet and should be taken into account in any forest management activities. This stand is the result of a long ago Red Pine clear cut.

Forest Diversity and Composition

Seven tree species were recorded upon stand plot measurements with good distribution of trees per acre and basal area for most of the species. Species suitability to the growing site and resulting general tree health was judged to be good even though the species mix is that of differentiating silvical and tree growth preferences. No insect or diseases were noted upon stand appraisal.

Forest Structure

Overall forest structure can best be described as good and also developing. Multiple vertical layering exists with an established seedling/sapling, AGS, and timber layering. The timber class is consists of smaller diameter at breast height (DBH) specimens that are just entering the classification and have much growth ahead until maturity. Lower amounts of standing dead trees and down dead wood were observed, typical of a stand that is developing. Tree crowns are narrow due to limited, crowded spacing but are developing as tree stem density decreases with time.

Regeneration

Profuse regeneration exists throughout this stand with some pockets with limited amounts. Species mix in the AGS and seedling/sapling stages is Red Maple, Birch, White Pine, Norway Spruce, and American Beech. Regeneration species suitability to the growing site is good. American Beech is found in high amounts in the seedling/sapling stage of stand development and constitutes interference for other more commercially important species. Deer browsing is judged to be high and a causal agent for beech proliferation.

Site Level Risks

Extreme rainfall was judged to be of highest risk to this stand due to soil types and flat topography. Shorter and milder winters would have an adverse effect of working times for forest management.

Stand Prescription

Recommendation is to allow this stand approximately ten more years of growth to allow the smaller timber to increase in diameter to more valuable size. Reevaluation of this stand in ten more years for possible commercial timber harvest/thinning together with a reduction in pulp basal area; not to constitute a final timber harvest but a thinning.

Stand Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
White Pine	8.66	25.98	1471
Red Maple	19.45	13.84	1163
Red Oak	7.88	12.58	897
Norway Spruce	9.93	7.33	777
Hemlock	1.52	6.49	397
W Ash	1.10	4.04	186
Black Cherry	.82	1.23	75

Total	49.36	71.49	4966
Pulp	15.68	18.18	.94 cords
AGS	39.21	2.23	.29 cords

Forest Stand B6, B9

Located south of Bourne Hill Road and in the central portion of Otsego #10, these two stands are comprised of 22.60 acres more or less. B6, B9 have three soil types: Lordstown-Arnot complex, 1 to 8 percent slopes, rocky, Well Drained; Mardin channery silt loam, 3 to 8 percent slopes, Well Drained, and Lordstown-Chadakoin complex, 8 to 15 percent slopes, Well Drained. The ability to work these stands with forest management equipment is good. There is no discernible difference between B6 and B9, as such; both are combined into one stand. This stand is the residual stand of a Red Pine clear cut many years ago.

Forest Diversity and Composition

Six commercially important species make up this stand thus making a good case for excellent species diversity. Species suitability to the growing site is good along with general tree health – growth characteristics for each species sampled is good. No insect or disease was observed upon stand inspection.

Forest Structure

Structural diversity is developing– typical of early succession ally developing stands. Three layers: early small diameter timber class, seedlings/saplings, and AGS (pole sized trees). Little standing dead wood and little down dead wood were observed within the confines of this stand. Tree crowns and tree spacing is crowded and slowly increasing due to natural succession.

Regeneration

Profuse regeneration exists within this stand and consists mainly of Red Maple and Black Birch. These two species are well suited to the growing site exhibiting good growth characteristics. Interfering plant American Beech is very pronounced within the developing seedling/sapling vertical layer and is substantially competing with the commercial tree species. Deer browsing is prevalent within this stand, offering the beech a competitive advantage.

Site Level Risk

Being well drained with all three different soil types it is judged that moisture stress to be the highest risk to this stand along with other extreme weather ice storm. Extreme rainfall risk is judged to be of lesser value. Shorter and milder winters would have a more negligible effect on this stands viability to be worked within.

Stand Prescription

It is recommended to allow this stand to develop naturally into a basic northern hardwood stand. Good species mix, diversity with good growth characteristics , and three vertical layer developing make for a candidacy for natural stand development. Keep a good eye on the beech component of this stand as this may need future correction.

Stand Data

Species	Trees per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	10.59	10.62	772
Red Pine	2.56	3.96	489
Red Oak	2.18	4.96	343
Black Cherry	1.13	3.53	274
White Ash	3.86	2.54	217
Black Birch	3.11	1.34	142
Total	23.43	26.95	2237

Pulp	16.29	9.67	1.29 cords
AGS	40.46	3.22	1.62 cords

Forest Stand B7

21.1 acres more or less make up this northern hardwood stand that has partially seen forest management activity on approximately fifty percent of its acreage. Located south of Bourne hill Road, centrally positioned, B7 is the most southerly stand in Otsego #10. Three soil types are found here: Volusia silt loam, 3 to 8 percent slopes, Somewhat poorly drained; Mardin channery silt loam, 3 to 8 percent slopes, Well Drained; and Lordstown-Arnot complex, 1 to 8 percent slopes, rocky, Well Drained. The positioning of the three soil types makes for challenging planning for forest management equipment usage.

Forest Diversity and Composition

Species diversity within this stand is average, five commercial tallied, three statistically important: Red Maple, Eastern Hemlock, and White Ash. General tree health is good with all species exhibiting good form and growth characteristics. No insect or disease manifestations were observed.

Forest Structure

Good structure in the not cut portion of this stand with trees of many sizes and multiple vertical layering. In the cut over section, structure is lacking due the removal of the timber class and the resulting stand development of smaller trees. Little to no standing dead trees or down dead wood was found in either subcomponents. Tree crowns and spacing are increasing within the uncut subcomponent with the dominant specie Red Maple showing a fifty percent stem diameter variance between small and larger (mature) timber class. In the cut over section tree crowns tend smaller and spacing is more crowded as this part of the stand develops succession ally.

Regeneration

In both subcomponents of this stand, the main commercial reproduction is Red Maple and secondly Black Birch. Specie suitability to the growing site is good with a good meeting of tree silvics and soil types and characteristics for the maple. Interfering plant American Beech is very prevalent in the seedling stage and deer browsing is prevalent also

Site Level Risks

Extreme rainfall due to the Volusia soils and wind throw due to heavy past cutting (in the cut over section) are judged to be the highest risks to stand B7. Shorter and milder winters will negatively affect harvesting time viability and also access.

Stand Prescription

Diameter distribution of fifty percent between larger and smaller timber class Red Maple and to an extent Eastern Hemlock; together with lower volume board footage in the uncut portion of this stand do not support harvesting or commercial thinning of stand B7 at this time. It is recommended that in ten years time a reexamination of this stand take place and together with Forest Stand B5 a possible commercial thinning take place with a notable reduction of the basal area of the pulp class.

Stand Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	40.17	47.36	3544
Eastern Hemlock	5.91	8.20	427
White Ash	3.00	6.48	241
Black Birch	4.75	2.02	205
Black Cherry	.38	2.64	80
Total	54.21	66.70	4497

Pulp	31.17	20.40	2.32 cords
AGS	29.63	2.34	.87 cords

Forest Stand B8

1.9 acres more or less make up this stand located south of Bourne Hill Road and in the south central portion of Otsego #10. Volusia silt loam, 3 to 8 percent slopes, somewhat poorly drained and Mardin channery silt loam, 3 to 8 percent slopes, Well Drained are the two contrasting soil types found in stand B. This stand is a naturally occurring Hemlock – Hardwood stand that is largely wet in nature and has seen little to no forest management activity.

Forest Diversity and Composition

Species diversity is good with five species present with one (White Oak) being a rare or exception species that does not really belong to the present ecosystem and silvical attributes. Species suitability to the growing site is good with Hemlock occurring in the Mardin soils and Red Maple in the Volusia soil type. General tree health is judged to be good also with vibrant growth characteristics present. No insect or disease factors were observed upon stand inspection.

Forest Structure

Diversity of forest structure is good with the stand exhibiting good representation of seedling/saplings, AGS, Pulp, and timber classes of tree size and commercial viability. Still a developing stand, B8 has little standing dead trees or down dead wood limiting wildlife to the live growth aspects of the tree covers. Tree crowns and spacing are typical of developing stands in this succession stage with crown size increasing (especially evident in the Hemlock) and spacing increasing also.

Regeneration

Most of the desirable regeneration is in the Red Maple with hemlock showing few seedlings or saplings. The Red Maple reproduction shows good suitability to the wetter Volusia soils. Interfering plant American Beech is present and makes up a significant part of the overall regeneration within this stand. The Beech together with average White tailed Deer browsing constitute a significant influence on the overall regeneration capacity of this stand.

Site Level Risks

Forest Stand B8 highest threat is from extreme rainfall with soil type Volusia significantly present, excess rainfall could impact the Hemlock viability significantly. Shorter and milder winters will negatively affect both accessibility and the time window of opportunity to work this stand.

Stand Prescription

This small stand offers good biodiversity aspects in relation to surrounding developing hardwood stands in relationship with the Hemlock and White Pine present. The Hemlock in the present stage of development/growth offers excellent cover for many wildlife species, especially deer. Pulp or poorly developing, rotted trees also offer good cover. The amount of commercial timber present (30.60 square feet) does not lend itself to harvesting; the stand is developing and growing. Recommendation is to allow this stand to continue on its present track for the foreseeable future.

Stand Data

Species	Trees Per Acre (TPA)	Basal Area per acre (sq.Feet)	Volume Int. 1/4 " Rule
Eastern Hemlock	20.91	11.07	1861
Red Maple	39.77	10.03	2754
White Oak	1.23	2.64	464
Eastern White Pine	6.80	5.46	1035
Black Birch	2.39	1.40	253
Total	71.10	30.60	6367

Pulp	12.25	3.14	1.27 cords
AGS	34.01	.39	1.02 cords

Forest Stand B10

21.8 acres more or less are found within the confines of stand B10. This stand is a fairly recent Red Pine and Norway Spruce clear cut. The sparse residual stand is made up basically of hardwood tree species that grew up among the conifers and left for seed and some shade similar to a last cutting in a shelter wood silvical system. Soil types: Mardin channery silt loam, 8 to 15 percent slopes, Moderately Well Drained, Lordstown-Chadakoin complex, 15 to 25 percent slopes, Well Drained, and Volusia silt loam, 3 to 8 percent slopes, Somewhat poorly drained. The Volusia soil type is found in the southern most part of this stand. Stand location: in the north central section of Otsego #10 north of Bourne Hill Road.

Forest Diversity and Composition

Five commercial species were tallied upon field inspection. Species diversity is judged good with species suitability and general tree health also good: the Red Maple is found in the southern portion (wetter) and the Sugar Maple is found in the Northern higher (drier) section with all species showing acceptable growing characteristics. No insect or disease vectors were observed.

Forest Structure

Due to the recent history of this stands heavy cut, Structural diversity is lacking but in many years to come will slowly develop. A few scattered timber class trees, little to no AGS, and profuse regeneration basically make up the structure. Some standing dead trees (mainly reaction to sun scalding) and some down dead wood (logging residue) were found within this stand. Tree crowns are mainly in the regeneration class and developing with tree spacing within that class is crowded (typical).

Regeneration

Profuse regeneration – a reaction to sudden sunlight reaching the forest floor after a clear cut largely makes up stand B10. Species making up the abundant seedlings and saplings are Sugar Maple, Red Maple, Norway Spruce, and American Beech. Species suitability to this site is good with good growing characteristics found per species. Interfering plants found are American Beech and Multiflora Rose: both are significant in stocking within this stand. Deer browsing was judged to be of average severity.

Site Level Risks

Moisture stress or drought could be a risk to the north portion of this stand while extreme rainfall to the southern part of B10. Blow down and ice damage risk is high for the scattered timber sized trees. Shorter and milder winters would negatively impact both the working window and accessibility of the stand.

Stand Prescription

Allow this stand to continue its natural development into a mixed hardwood and Norway Spruce stand. Revisit in ten years time to appraise the Beech and Multiflora Rose densities and stocking percentages.

Stand Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Sugar Maple	6.65	9.21	765
Red Maple	5.33	7.96	405
White Ash	1.44	6.68	412
Norway Spruce	2.33	4.32	380
Black Cherry	2.77	1.62	141
Total	18.52	29.79	2103

Pulp	5.70	7.29	.75 cords
AGS	2.87	.35	.14 cords

Forest Stand B11

27.5 acres more or less of northern hardwoods are found within this stand. No management activity has occurred within this mature timber stand that presents a park like appearance. Located in the north central section of Otsego #10 north of Bourne Hill Road, B11 has the following soil types: Lordstown-Chadakoin complex, 15 to 25 percent slopes, Well Drained, Lordstown-Arnot complex, 1 to 8 percent slopes, rocky, Well Drained, Bath channery silt loam, 25 to 45 percent slopes, Well Drained, and Volusia silt loam, Somewhat poorly drained. Most of this stand is well drained and will support heavy equipment.

Forest Diversity and Composition

Excellent species diversity with eight commercial species recorded with five statistically important. Species suitability to the growing site and general tree health is judged to be excellent with excellent growth characteristics prevalent. No insect or disease manifestations were observed.

Forest Structure

A mature northern hardwood timber stand, B11 has relatively above average to good structural diversity. Acceptable Growing Stock density of 5.65 square feet and 60.55 trees per acre together with a mature timber class of 157 square feet with some timber size diversification make for fairly good structure. The exception within this stand is the seedling – sapling stage that is missing. Tree crowns are well developed and spacing is good with that typically found within a mature stand. Some standing dead trees and some down dead wood exist within this stand but their occurrence is infrequent.

Regeneration

Desirable regeneration of commercially important tree species is very low to nonexistent. Mature timber class, AGS, and Pulp occupy all of the growing space and have formed a dense canopy that does not allow for sunlight penetration to the forest floor, hence no to little regeneration. Interfering plant American Beech is present in infrequent amounts.

Site Level Risks

Highest risk level is assigned to other extreme weather: Blow down (due to larger developed crowns) and ice storm damage due to stocking densities. Moisture stress or drought could manifest due to soils but is judged to be of lower risk. Well drained soils should handle extreme rainfall. Shorter and milder winters would affect this stands accessibility

Stand Prescription

With the threat of the Emerald Ash Borer looming and the White Ash stocking densities it is recommended that a timber harvest utilizing the silvical system of individual tree selection method be employed. Liquidation of the White Ash is recommended. Removal of Ash with a density of 58.4 square feet per acre along with projected 3287 board feet per acre will allow for overall stand basal area to reside at approximate 100 square feet after harvest. In the tree marking regimen, marking of some of the other mature species and pulp where it promotes good growth on AGS is also recommended with wildlife considerations also applicable. Another result will be more sunlight reaching the forest floor and hopefully establish a good regeneration layer of seedlings and saplings not withstanding deer impacts.

B11 Stand Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
White Ash	17.82	58.34	3287
Black Cherry	11.30	28.28	1745
Red Maple	19.17	31.96	1800
Sugar Maple	22.20	32.50	1562
Yellow Birch	3.00	4.04	246
American Basswood	1.31	.55	77
Bitternut Hickory	1.03	.55	47

B11 Stand Data continued

Eastern Hemlock	.91	.79	61
Total	76.74	157.01	8825
Pulp	27.91	12.09	1.47 cods
AGS	60.55	5.65	2.22 cords

Forest Stand B12

Lordstown-Arnot complex, 1 to 8 percent slopes, rocky, Well Drained and Bath channery silt loam, 25 to 45 percent slopes, Well Drained are the two soil types that make up stand B12. These soil types will support forest management equipment should managerial activity occur. 10.7 acres more or less are found within this stand. Stand location is north of Bourne Hill Road in the east central section of Otsego #10. This is a mixed species (Norway Spruce, White Pine, and Red Pine) plantation that was patch – group cut fairly recently (within the last ten years or so).

Forest Diversity and Composition

Five tree species are present within this cut over stand with poor stocking densities making for average species composition. Species suitability to the growing site is relatively poor with the exception of the Red Maple and some of the Norway Spruce (about 50/50 spread between suitability and no suitability). General tree Health is poor and is/has reacted to greater sunlight as a result of the more or less larger patch cuts near the fewer residual stand trees. The Popple in particular are showing die off. No insect or tree diseases were observed upon stand inspection other than those insects commonly found infecting dead/dying trees.

Forest Structure

Some structure exists within the few clumps of trees that were not cut in the patch cuttings. Overall poor structure exists throughout the remnants' of this stand. Standing dead trees are sparsely dispersed throughout the stand as these trees have reacted to the heavy cutting. Some dead down wood is present and increasing. Tree crowns are overall poorly developed and tree spacing within some of the clumps is decreasing due to slow growth.

Regeneration

Norway Spruce has/is regenerating fairly well with seedling and AGS present in good amounts. This regeneration through natural seeding is well suited to the growing site. American Beech is present but not a factor affecting reproduction. Deer Browsing is average.

Site Level Risks

Wind throws and secondly ice storm damage is the greatest risk factors due to the heavy patch cutting and hillside location. Moisture stress and extreme rainfall do not constitute a viable risk to this stand. Shorter and milder winters would affect the accessibility of this stand.

Stand Prescription

Good Norway Spruce Regeneration exists within this stand thus the recommendation is to allow the stand regeneration to develop. The value of the residual “clump” stand is poor and contains small volumes of merchantable material thus making the economics poor for harvesting/removal. This stand has good wildlife qualities in both cover and food.

Stand Data

Species	Trees per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Popple*	3.92	2.90	749
White Pine	3.73	5.87	563
Red Maple	7.07	3.89	506
White Ash	3.87	3.59	395
Norway Spruce	1.83	3.17	378
Total	20.47	19.42	2591

*Popple could be saw timber or can be Pulp depending on markets

Pulp	6.59	6.11	.99 cords
AGS	20.46	1.75	1.02 cords

Forest Stand B13

Lordstown-Arnot complex, 1 to 8 percent slopes, rocky, Well Drained is the soil type that is found in the 21.8 approximate acres that make up stand B13. The ability to use forest management equipment within this stand is good. Located north of Bourne Hill Road, B13 is in the most north eastern section of Otsego #10. The history of B13 is that of an old pasture that has grown into a developing northern hardwood forest. One exception is the southwestern section of this stand that contains an old Red Pine Plantation that is reverting to hardwoods.

Forest Diversity and Composition

Species diversity is excellent with eight species tallied, six statistically significant. Good growth characteristics allow for good species suitability to the growing site and good general tree health. No insect or disease factors were observed upon stand inspection.

Forest Structure

The forest includes multiple vertical layers of trees of different sizes and ages. Few standing dead trees and also few down dead wood were noted during field stand measurements. Tree crowns are well developed especially within the mature timber class with continuing development within the AGS, sapling, and seedling classes. Spacing is crowded due to high stacking as this stand slowly develops.

Regeneration

Profuse regeneration in the seedling and sapling stages in desirable species Sugar and Red Maples, Yellow Birch, and White Ash. Regeneration species suitability to the growing site is good. Interfering plants American Beech and Eastern Hophornbeam are fairly common and present average interference of growth on desirable tree species. Deer browse is of average nature also.

Site Level Risks

Other extreme weather presents the greatest risk to this stand – primarily ice storm damage. Moisture stress could also present a lesser risk and extreme rainfall even lesser risk. Milder and shorter winters would affect accessibility of this stand and not the window for workability.

Stand Prescription

The White Ash that is present within this stand is economically mature but scattered throughout this developing northern hardwood stand. Because of the Emerald Ash Borer it is recommended that wherever feasible the ash be harvested. Nearby Forest Stand B11 will support a timber harvest and the Ash in this stand B13 should be harvested also being careful not to damage the developing residual stand present. Some of the Red Oak is nearing over maturity in the southwestern section should be harvested also; but leaving some for seed trees. Reduction of the basal area of the pulp is also recommended by 4 to 5 square feet of sound pulp per acre. Excellent amounts of Acceptable Growing Stock (AGS) exists within this stand together with profuse regeneration and it is further recommended that timber marking employ not only economical regimen but also marking regimen that takes into account nearby AGS. This should be a strategy of thinning and also protection of the profuse AGS present. The Red Pine can be harvested also, by 7 to eight square feet.

Stand B13 Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Pine	13.73	14.89	1513
White Ash	8.88	19.34	1303
Red Oak	3.11	11.08	739
Red Maple	10.79	10.44	652
Yellow Birch	10.04	5.39	487
Sugar Maple	3.63	5.72	383
Black Cherry	.46	2.18	78

Norway Spruce	.46	2.18	78
Total	51.00	71.22	5233

Pulp	45.34	10.40	1.94 cords
AGS	114.40	8.08	4.29 cords

Forest Stand B14

28.9 acres more or less are found within the confines of this stand. Stand location is in the easterly section of Otsego #10 bordering and north of Bourne Hill Road. Volusia silt loam, 3 to 8 percent slopes, Somewhat poorly drained, Mardin channery silt loam, 3 to 8 percent slopes, Well Drained, Lordstown-Chadakoin complex, 15 to 25 percent slopes, Well Drained, and Sapristis and Aquents, inundated, Very Poorly Drained are the soil types that make up stand B14. Originally, this stand was a mixed species plantation of Norway Spruce and Red Pine that was heavily cut not too long ago. The silvical system employed is at best a guess: last stage shelter wood, seed tree, or poorly instituted clear cut. Best guess is a seed tree cut that looked to favor Norway Spruce. The regeneration favors the Norway's with fairly profuse stocking in the seedling stage present.

Forest Diversity and Composition

Eight commercial species were tallied upon plot measurements and therefore constitute species diversity but most do not represent statistically important trees per acre or basal area with the exception of Norway Spruce and Black cherry. With wide ranging soil types and wide ranging tree species, species suitability looks to be average – occurring in particular soils and growing sites that favor each species. General tree health looks to be average to below average with growth and health characteristics heavily influenced by high sunlight exposure. No insect or disease factors were observed.

Forest Structure

Forest stand B14 includes trees of varying sizes found throughout the stand but the stocking is low per acre as found in heavily cut over stands that are now recovering/developing. Little dead wood and down dead wood were observed with the exception of the Popple or Trembling Aspen that is experiencing some die back. Tree crowns are developing maybe too wide due to abundant sunlight and wide spacing epicormic branching was observed also.

Forest Stand B14

Regeneration

Desirable regeneration of commercial species is occurring primarily in the seedling stage in the Norway Spruce and somewhat in the Red Maple tree species. These two species present the best specie suitability to the myriad of growing sites found within this stand. Interfering plants black berry and multifloral rose constitute the main native and invasive plant impediments for commercial, natural propagated regeneration. Deer browse was judged to be on average with other adjacent stands.

Site Level Risks

Highest risk level is assigned to blow down due to the wide spacing of the residual stand. Excessive rainfall can be a factor also, especially in the southern, south eastern section with wet soils. Shorter and milder winters also present planning problems with workability due to the varying soil types.

Stand Prescription

Allow this stand to develop naturally into a future Black Cherry, Norway Spruce, and Red Maple stand. It will take a long time but this stand will also provide substantial wildlife benefits through its succession development. Site development costs for reforestation is judged to be too high with return on investment of planted crop tree development representing a gamble on too many differing growing sites. It is recommended that future stand evaluations center in on the interfering plants occupation of growing area and impediments if any on regeneration.

Forest Stand B14 Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Black Cherry	6.97	27.93	1382
Norway Spruce	8.33	16.88	945
Popple	.91	3.93	191
Red Maple	1.54	3.69	105
White Ash	.73	3.95	195
Red Oak	.40	1.77	96
Red Pine	.67	1.07	73

Black Birch	1.31	.55	47
Total	20.86	59.77	3034
Pulp	10.61	6.56	.50 cords
AGS	12.98	.94	.43 cords

Forest Stand B15

5.4 acres more or less make up this stand located in the most southeasterly section of stand B15 south of Bourne Hill Road. Mardin channery silt loam, 3 to 8 percent slopes, Well Drained; Lordstown-Chadakoin complex, 8 to 15 percent slopes, Well Drained; and Lordstown, Chadakoin, and Manlius soils, 25 to 50 percent slopes, very rocky, Well Drained are the soil types that make up this forest stand. The ability to work this stand with forest management equipment is good. This stand shows no forest management activity, is essentially a mixed conifer plantation that has seen significant loss of stocking of said conifers through natural attrition as a result of Red Maple encroachment and die off due to lack of thinning.

Forest Diversity and Composition

Species diversity can be described as average overall with three species dominating but consideration to the concept of diversity has to take into account this stand is a mixed conifer plantation. The suitability of the conifer species of Red Pine, Norway Spruce, and Eastern White Pine can be described as marginal with poorer growth characteristics in evidence. General tree health is the same for the conifers but good for the hardwoods – Red Maple in particular. No insects or diseases were observed upon stand inspection.

Forest Structure

Structural diversity is poor with a lack of diversity in tree size and vertical layering due to both plantation status and lack of thinning. Little standing dead trees was observed but an occasional down dead wood was noticed, Tree crowns within the plantation remnants were largely undeveloped and not vibrant due to denser spacing. The hardwoods were the opposite with relatively good spacing and good, developing crowns.

Regeneration

Desirable regeneration within forest stand B15 is sparse and consists of mostly Red Maple and some Norway Spruce mostly in the seedling stage. A lack of Acceptable Growing stock (AGS) and saplings was evident throughout the stand. Red Maple regeneration was judged to be suitable to the growing site while the Norway Spruce was not. No interfering plants were observed and Deer browsing was limited to lack of browsing material.

Site Level Risks

Blow down is assigned highest risk to this stand with ice storm damage a close second due to the atrophy of the conifers. Soil types reduce the likelihood of extreme rainfall and moisture stress being a high risk. Shorter and milder winters do not pose a significant problem for working within this stands boundaries.

Stand Prescription

The liquidation or harvesting of the conifers within this stand and allowing the stand to evolve into a northern hardwood stand are recommended. The impediment to this undertaking is the quantity and quality of the forest products that the conifers would produce – lower value. If viable, the best way to overcome would be harvesting in conjuncture with other more valuable stands that are outlined in this management plan. Care to be undertaken due to proximity to the road and private property.

Forest Stand B15 Data

Species	Tree Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Pine	44.74	35.95	10,346
Norway Spruce	17.32	8.77	2231
Red Maple	25.78	13.94	1976
Black Cherry	5.54	1.86	378
White Pine	2.21	4.91	203
White Ash	.95	2.64	200
Total	96.54	69.07	15,334

Pulp	3.20	3.17	.59 cords
AGS (Acceptable Growing Stock)	7.16	.35	.36 cords

Forest Stand B16

Volusia silt loam, 3 to 8 percent slopes, somewhat poorly drained, Mardin channery silt loam, 8 to 15 percent slopes, Moderately Well Drained, and Lordstown-Chadakoin complex, 15 to 25 percent slopes, Well Drained are the three soil types that make up stand B16. The ability to operate forest management equipment on this stand will require relatively dry or frozen ground conditions. This stand is basically a northern hardwood stand that contains 13.2 acres more or less. Forest stand B16 is located north of Bourne Hill Road in the western section of Otsego #10.

Forest Diversity and Composition

Comprised of six commercial tree species, three significant, species diversity is deemed average at best with Red Maple being the dominate species in trees per acre, basal area, and board feet per acre. White Ash shows good size, less trees per acre and somewhat scattered frequency of occurrence. Species suitability and general tree health are good to excellent with good growth characteristics present. No insect or disease vectors are present but the Ash has a looming threat from the emerald Ash Borer.

Forest Structure

Good structure exists within forest Stand B16 with all forest tree classes well represented. Seedling abundance is lower but balanced by a good representation of saplings, AGS, and timber class trees. Occasional standing dead trees and down dead wood are found throughout this stand giving certain wildlife average cover and nesting opportunities. Timber class stocking is light and increasing with tree crowns developed and increasing, tree spacing slowly increasing as well.

Regeneration

Desirable Regeneration is mostly found in the sapling stage with the following species: Red Maple, Yellow and Black Birch, and Red Oak. These commercial tree species saplings exhibit good suitability to the growing site. Interfering plant species American Beech is also significantly present. Deer browsing is judged to be significant resulting in lower seedling stocking throughout this stand.

Site Level Risks

Highest risk is assigned to other extreme weather primarily ice storm damage followed by wind throw on the mature Ash and Red Maple. Shorter and milder winters would affect the amount of time and conditions for working within this stand.

Stand Prescription

Harvest the White Ash as it is mature and threatened by EAB. Some of the Red maple can go also but due to scattered nature and lower overall basal area, harvesting should be done in conjuncture with other stand harvesting in Otsego #10. This will also serve as a thinning for the abundant AGS.

Stand Data

Species	Trees Per Acre (TPA)	Basal area/acre (Sq. Ft.)	Volume/acre (int.1/4) BdFt F.C. 78
Red Maple	30.36	24.27	2698
White Ash	8.66	20.26	1349
Red Oak	2.53	4.65	306
Norway Spruce	1.55	1.57	204
Red Pine	1.55	.92	174
Black Birch	2.62	1.57	94
Total	49.36	53.24	4825

Pulp	31.91	11.76	1.92 cords
AGS	66.89	4.43	2.91 cords

Tree Species Common and Latin Names

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

Northern Red Oak	Quercus rubra
Norway Spruce	Picea abies
Red Maple	Acer rubrum
Red Pine	Pinus resinosa
Sugar Maple	Acer saccharum
White Ash	Fraxinus americana

Yellow Birch	Betula alleghaniensis
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