

Indiana Department of Natural Resources
Division of Forestry
Draft
RESOURCE MANAGEMENT GUIDE

State Forest: Greene-Sullivan Compartment: 1 Tract: 5
Forester: Tom Tompkins Date: 5/3/13
Management Cycle End Year: 2033 Management Cycle Length: 20 Years

Location

Compartment 1, Tract 5 is located in the SW ¼ of Section 12 and the N ½ of Section 13 T7N R8W Sullivan County. The tract is approximately 1.5 Miles south of Dugger

General Description

This tract is approximately 133 acres. The various land use components can be delineated as follows:

- Closed Canopy Forest – 103ac
- Water/Riparian Areas – 23ac
- Open Canopy Forest – 6 ac
- Wildlife opening/fire Trail – 1ac

Gambill Lake and two small unnamed lakes make up the 23 acres of water within this tract. The west side of Gambill lake was not strip mined and consists of gently sloping mixed hardwood and white pine stands. East of Gambill are strip mine spoil banks that run NW-SE that have been planted to pine. Reforestation in this area has been highly successful. The mixed overburden consisting of mineral rich coarse fragments from lower in the overburden and fine textured soil from the top-dress material has resulted in a suitable growing medium with good soil drainage, nutrient retention, and productive biotic interactions.

History

This tract was deeded to the state forest in May of 1964 from Sentry Royalty Company. Prior to that the entire area east of Gambill Lake was strip mined.

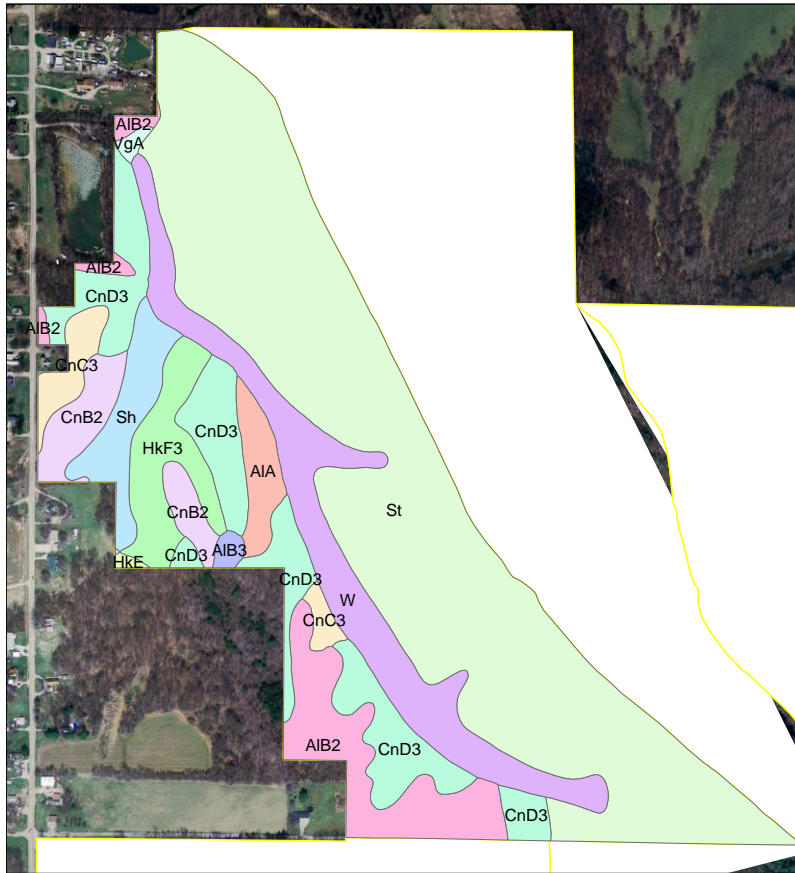
Boundary and Landscape Context

The tract is bordered by State Forest property on the east and along a portion of its southern boundary. The east boundary is a fire trail and the south boundary bordering state land is County Road 250 S. The remaining boundary is made up of small private property parcels along State Road 159 and County Road 250 S. The tract is surrounded by forested area to the east and south. Homes and agricultural fields are located to the north and west. **There is a possible .2 acre area of encroachment that should be investigated. A survey may be needed to determine the exact line location.**

Topography, Geology and Hydrology

Spoil banks run northwest to southeast throughout the eastern portion of the tract. The western portion was not mined and has gentle slopes and drainages. Gambill Lake lies in the center of the tract; there is also another small lake in the southeast corner of the tract and a very shallow small pond in the western portion of the tract. Two small streams flow into the shallow pond in the west, the water then flows along the southern edge of Gambill Lake, separated from the lake by a spoil bank.

Soils



Map Unit and Soil Name	Common Trees	Site Index	Volume of wood Fiber cu ft/ac	Trees to Manage
AIA – Ava silt loam 0 to 2 percent slopes	N. Red Oak Tuliptree White Oak	80 90 75	57 86 57	Baldcypress, black oak, blackgum, bur oak, chestnut oak, common persimmon, eastern white pine, scarlet oak, southern red oak, Virginia pine, white oak
AIB2 – Ava silt loam 2 to 6 percent slopes, eroded	N. Red Oak Tuliptree White Oak	80 90 75	57 86 57	Baldcypress, black oak, blackgum, bur oak, chestnut oak, common persimmon, eastern white pine, scarlet oak, southern red oak, Virginia pine, white oak
AIB3 – Ava silt loam 2 to 6 percent slopes,	N. Red Oak Tuliptree	80 90	57 86	black oak, blackgum, bur oak, chinkapin oak, eastern white pine, northern red oak, shagbark

severely eroded	White Oak	75	57	hickory, shingle oak, tuliptree, white oak
CnB2 – Cincinnati silt loam 2 to 6 percent slopes, eroded	N. Red Oak	80	57	Baldcypress, black oak, blackgum, bur oak, chestnut oak, common persimmon, eastern white pine, scarlet oak, southern red oak, Virginia pine, white oak
CnC3 – Cincinnati silt loam 6 to 12 percent slopes, severely eroded	N. Red Oak	80	57	Baldcypress, black oak, blackgum, bur oak, chestnut oak, common persimmon, eastern white pine, scarlet oak, southern red oak, Virginia pine, white oak
CnD3 – Cincinnati silt loam 12 to 18 percent slopes, severely eroded	N. Red Oak	80	57	Baldcypress, black oak, blackgum, bur oak, chestnut oak, common persimmon, eastern white pine, scarlet oak, southern red oak, Virginia pine, white oak
HkE – Hickory silt loam 18 to 25 percent slopes	N. Red Oak Tuliptree White Oak	85 95 85	72 100 72	American beech, black cherry, black oak, black walnut, bur oak, chinkapin oak, eastern white pine, Kentucky coffee tree, northern red oak, Norway spruce, pecan, pignut hickory, shagbark hickory, shumards oak, sugar maple, tuliptree, white oak
HkF3 Hickory silt loam 18 to 35 percent slopes severely eroded	N. Red Oak Tuliptree White Oak	85 95 85	72 100 72	American beech, black cherry, black oak, black walnut, bur oak, chinkapin oak, eastern white pine, Kentucky coffee tree, northern red oak, Norway spruce, pecan, pignut hickory, shagbark hickory, shumards oak, sugar maple, tuliptree, white oak
Sh – shadeland loam	Sweetgum Tuliptree White Oak	80 85 75	86 86 57	American beech, Baldcypress, Bitternut hickory, Bur oak, Cherrybark oak, Eastern white pine, Kentucky coffeetree, Northern red oak, Norway spruce, Pecan, Pin oak, Shingle oak, Shumard's oak, Silver maple, Sugar maple, Swamp chestnut oak, Swamp white oak, Sweetgum, Tuliptree, White oak
St – Strip Mines				Black locust, blue spruce, eastern white pine, tuliptree

Access

This tract can be accessed off of county road 250 south and the road running to the Gambill lake boat launch. It also touches State Road 159 in two locations. In the strip mined areas all of the spoil banks were flattened on top before they were planted with trees. Therefore, forest access and skid trail construction will be limited to a few trails running between stripper hills.

Wildlife Habitat Features & Ecological Resource Review

Wildlife habitat suitable for a wide variety of native species should be optimized throughout the tract in order to promote and maintain a high level faunal diversity.

Cover/Habitat Overview

TABLE 1

Habitat/cover type	0%	0 < 1%	1-10%	11-50%	51-90%	>90%	Unknown
Closed-canopy deciduous/mixed forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pine/conifer plantations or natural stands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Early successional forest (≤ 20 years old)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shrub-scrub or old field	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grasslands/hayfield	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cropland, pastures, feedlots	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open water (lakes, ponds, rivers, streams, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Riparian areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Developed areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Reclaimed Mine Land	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 1 shows the estimated proportion of each cover/habitat type within 1 mile of tract center. The majority of the area is closed canopy deciduous/mixed forest and agricultural fields. Virtually every habitat type is represented to some extent in the sample area. This diverse landscape has resulted in a large amount of maintained forest edge. The proposed management activities will not significantly alter the relative proportion and availability of habitat/cover types in the assessment area.

Structural Habitat Features

TABLE 2

Diameter (DBH) Distribution	Target Snag Density	
	Goal	C1T5
<i>Including</i> at least this many snags per acre $\geq 5''$:	4	19.9
<i>Including</i> at least this many snags per acre $\geq 9''$:	3	8.4
<i>Including</i> at least this many snags per acre $\geq 19''$:	0.5	0.3

Table 2 shows how this tract compares with the DoF guidelines for forest stand snag density. The data suggests that the tract greatly exceeds target goals in the maintenance level for snags 0-18" but does not meet the goals for snags over 19". This is mostly due to the fact that the strip mined area is a suppressed Virginia pine stand with a small average diameter thus trees over 20" are not to be expected in this area besides a few intermixed cottonwood and sycamore for some time. In the near future, a post harvest TSI treatment could increase the number of standing, large diameter snags by girdling some of the larger cottonwood and sycamore.

TABLE 3

Diameter (DBH) Distribution	Preferred Roost Trees per Acre	
	Goal	C1T5
TOTAL minimum roost trees per acre $\geq 11''$:	9	17.6
<i>Including</i> at least this many roost trees $\geq 20''$:	3	3.2

Table 3 shows how this tract compares to the Indiana Bat guidelines for live roost trees. The inventory data suggests that the stand is sufficient in all size classes for live roost trees.

IDNR Natural Heritage Database Review

A Natural Heritage Database review was completed for the tract. If Rare, Threatened or Endangered species (RTE's) were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Exotic/Invasive Species

Species	Management Actions (check all that apply)		Addressed in Management Guide?	Mapped?
	Immediate Management Required	Monitoring/ Re-evaluation Recommended		
Multiflora Rose	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Japanese Honeysuckle	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Autumn Olive	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bush Honeysuckle	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ailanthus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Privet	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The entire tract is very heavily infested with multiflora rose, and autumn olive. Honeysuckle and Privet are present throughout the tract as well. Ailanthus was found in five locations within the tract four are along the access to Gambill Lake and a fire lane and one is along the shoreline of Gambill Lake. Ailanthus should be controlled as soon as possible to prevent its spread. Problem occurrences of the other species should be controlled prior to harvest activities occurring in the tract.

Recreation

Opportunities for recreation in this area include hunting, fishing, hiking and bird watching. There are no recreation trails in the tract. Forest management activity will increase area accessibility for recreation use.

Cultural

Cultural resources may be present on this tract but their location is protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Stand Descriptions and Silvicultural Prescriptions

C1T5 Mixed Hardwood/Pine – 46 ac (Harvest Ac – 46)

Current Condition

This stand was inventoried in April of 2013. The topography, soil map, GIS data, and old aerial photography for this area indicates that the stand was not mined. The dominate trees in this stand vary in age by area. Listed below is a table showing size classes and

the percentage by volume and basal area (BA) of the major sawtimber species present in the harvest area.

SPECIES	% VOL.	% BA	Size Class
Cottonwood	27%	15%	M - L
White Pine	20%	11%	M
Shingle Oak	14%	11%	M
Red Maple	12%	11%	M
Pin Oak	9%	4%	L
Black oak	8%	3%	L
Black Cherry	5%	4%	S - M
Sycamore	2%	1%	M

S = Small Sawtimber

M = Medium Sawtimber, L = Large Sawtimber

The canopy is dominated by cottonwood, white pine, shingle oak and red maple. Mid story trees consist of black cherry, red maple, and oaks. Regeneration is mostly elm, red maple, shingle oak and cherry. The species composition is very good, except for the cottonwood. Most species have good form and height but appear to be growing slowly due to closed canopy and overstocked conditions. The shingle oak may be dying due to infection by a gall wasp.

Figure 1

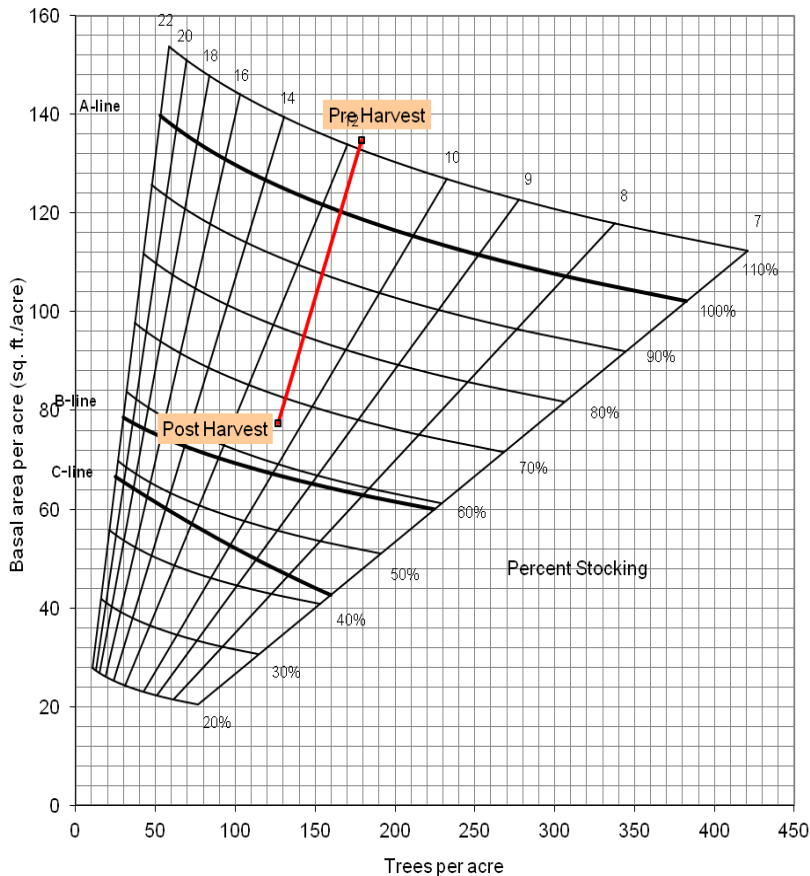


Figure 1 shows the stocking level of this stand both before and after the proposed timber harvest. The stand has a current stocking of 112%, with a BA of 134.8sq.ft. and 179 trees/acre. The volume of this stand is 8,468 bdf/acre. After the harvest the stand will remain in the fully stocked range with a BA of 77.5 sq.ft. and 127 trees/acre.

Prescription

The main objective in this stand should be to remove poor form and undesirable species to release crop trees expected to maintain good growth for the next 25 years. This can be accomplished by selectively marking throughout the 46 acres. In areas with large amounts of poor quality or undesirable trees group selection openings can be created to regenerate the areas.

The inventory suggests that at least 169,970 bd.ft. could be harvested from this stand. Overall, the majority of the sawtimber volume would be comprised of cottonwood (45%), shingle oak (23%), white pine (14%), red maple (7%), black cherry (4%) and pin oak (4%). The remainder of the volume would be comprised of American elm and sassafras. Primary crop trees include black oak, white oak, shingle oak, red maple and black cherry. The harvest should result in a residual stocking of 77.5 ft² BA, 127TPA, and 4,773 bd.ft./ac. Because of the difficult access within a small portion of this tract some areas may not be able to be harvested which would lower the harvest volume.

Pre harvest TSI should consist of targeted invasive species control throughout all portions of the tract. Post harvest TSI may consist of crop tree release, cull removal, vine control, and follow up invasive control.

C1T5 Virginia Pine – 49 ac (Harvest Ac – 49)

Current Condition

This stand was inventoried in April of 2013. The topography, soil map, GIS data, and old aerial photography for this area indicates that the entire stand was strip mined in the past. The dominant trees in this stand are approximately 50 years old. Listed below is a table showing size classes and the percentage by volume and basal area (BA) of the major sawtimber species present in the harvest area.

SPECIES	% VOL.	% BA	Size Class
Virginia Pine	34%	20%	S -M
Cottonwood	32%	15%	M
Short Leaf Pine	19%	11%	S - M
Sycamore	13%	5%	M
Red Maple	1%	1%	S
Yellow Poplar	1%	1%	S
White Ash	1%	1%	S

S = Small Sawtimber

M = Medium Sawtimber, L = Large Sawtimber

The canopy is dominated by Virginia pine, cottonwood and short leaf pine. Mid story trees consist of Virginia pine, short leaf pine and sycamore. Regeneration is mostly elm, red maple, and sycamore. The species composition is very poor. Most species have acceptable form and height but appear to be growing slowly due to closed canopy and overstocked conditions. The majority of the Virginia pine is mature and should be considered for removal.

Figure 2

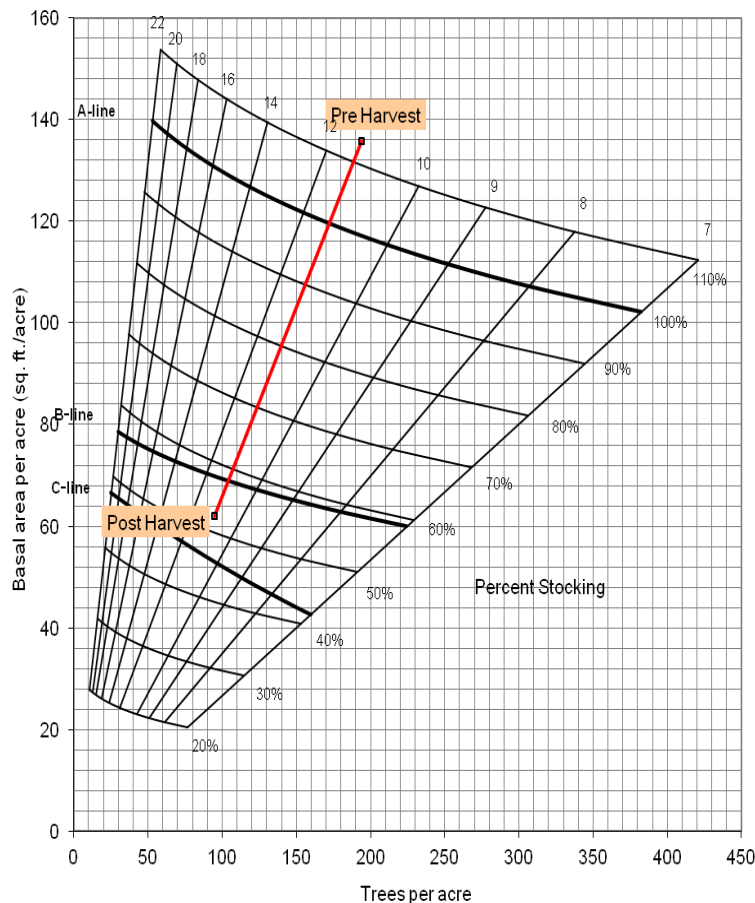


Figure 2 shows the stocking level of this stand both before and after the proposed timber harvest. The stand has a current stocking of 115%, with a BA of 135.8sq.ft. and 194 trees/acre. The volume of this stand is 5,620 bdf/acre. After the harvest the stand will have a stocking of 52% with a BA of 62.1 sq.ft. and 95 trees/acre.

Prescription

The main objective in this stand should be to remove poor form and undesirable species to release crop trees expected to maintain good growth for the next 25 years. This can be accomplished by selectively marking throughout much of the 49 acres. Areas with large amounts of poor quality or undesirable trees are prescribed for regeneration. Strip mine spoil areas selected for regeneration may be re-contoured after harvest and prepped for planting with native hardwoods. Emphasis will be put on encouraging desirable regeneration through residual trees, replanting and actions to discourage invasive species. Harvest layout would buffer water bodies as needed to protect water quality and important attributes.

The inventory suggests that at least 126,100 bd.ft. could be harvested from this stand. Overall, the majority of the sawtimber volume would be comprised of Virginia pine (43%), cottonwood (43%), short leaf pine (12%), and white ash (1%). There will also be a significant amount of virginia pine pole timber. Primary crop trees include sycamore, loblolly pine, tulip poplar and oaks. The harvest should result in a residual stocking of 52%, 62.1 ft² BA, 95TPA, and 3,041 bd.ft./ac. Because of the difficult access within a small portion of this tract some areas may not be able to be harvested which would lower the harvest volume.

Pre harvest TSI should consist of targeted invasive species control Post harvest TSI may consist of crop tree release, cull removal, vine control, and follow up invasive control.

C1T5 White Pine – 8 ac (Harvest Ac – 8)

Current Condition

This stand was inventoried in April of 2013. The topography, soil map, GIS data, and old aerial photography for this area indicates that the stand was strip mined in the past. The dominate trees in this stand are approximately 50 years old. Listed below is a table showing size classes and the percentage by volume and basal area (BA) of the major sawtimber species present in the harvest area.

SPECIES	% VOL.	% BA	Size Class
White Pine	43%	28%	M - L
Cottonwood	17%	14%	M
Red Oak	14%	9%	M
Yellow Poplar	8%	5%	M
Red Maple	8%	9%	S - M
Black oak	6%	5%	M
Black Cherry	3%	5%	S - M

S = Small Sawtimber

M = Medium Sawtimber, L = Large Sawtimber

The canopy is dominated by white pine, cottonwood and red oak. Mid story trees consist of red oak, red maple and black cherry. Regeneration is mostly red maple, and shingle oak. The species composition is very good, except for the cottonwood. Most species have good form and height but appear to be growing slowly due to closed canopy and overstocked conditions. The red oak seems to be doing very well.

Figure 3

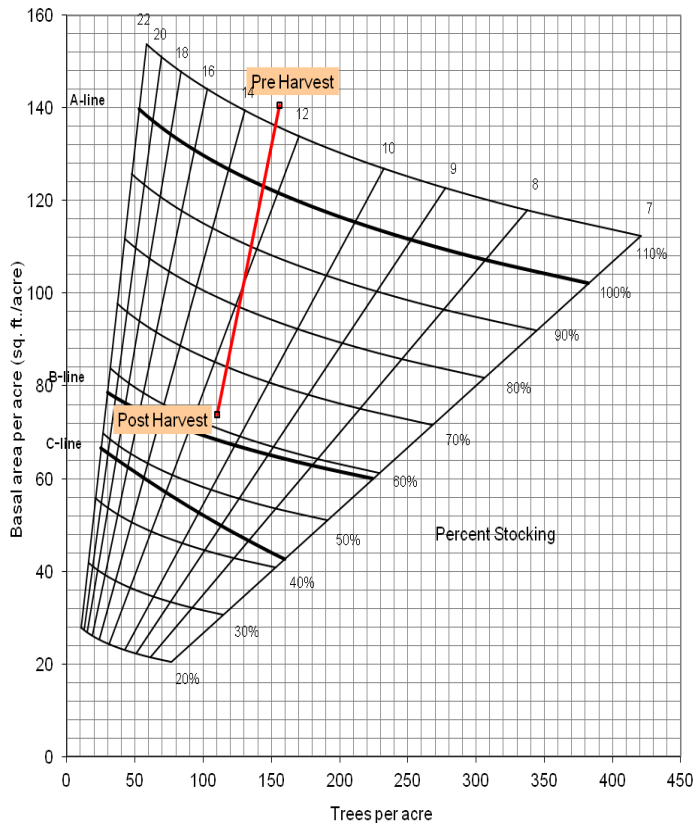


Figure 3 shows the stocking level of this stand both before and after the proposed timber harvest. The stand has a current stocking of 115%, with a BA of 140.6 sq.ft. and 156 trees/acre. The volume of this stand is 9,729 bdf/acre. After the harvest the stand will remain in the fully stocked range with a BA of 73.9 sq.ft. and 110 trees/acre.

Prescription

The main objective in this stand should be to remove poor form and undesirable species to release crop trees expected to maintain good growth for the next 25 years. This can be accomplished by selectively marking throughout the 8 acres. In areas with large amounts of poor quality or undesirable trees group selection openings can be created to regenerate the areas.

The inventory suggests that at least 39,800 bd.ft. could be harvested from this stand. Overall, the majority of the sawtimber volume would be comprised of white pine (38%), cottonwood (34%), Black oak (11%), Red Maple (10%), and black cherry (6%). Primary crop trees include red oak, poplar, white pine, and black cherry. The harvest should result in a residual stocking of 73.9 ft² BA, 110TPA, and 4,754 bd.ft./ac. Because of the difficult access within a small portion of this tract some areas may not be able to be harvested which would lower the harvest volume.

Pre harvest TSI should consist of targeted invasive species control throughout all portions of the tract. Post harvest TSI may consist of crop tree release, cull removal, vine control, and follow up invasive control.

C1T5 Young Hardwood – 6 ac (Harvest Ac – 0)

Current Condition

This stand was inventoried in April of 2013. The topography, soil map, GIS data, and old aerial photography for this area indicates that the stand was mined in the past. This stand has scattered older trees and many pole sized trees growing between them. Listed below is a table showing size classes and the percentage by volume and basal area (BA) of the major species present in the tract area.

SPECIES	% VOL.	% BA	Size Class
Black Cherry	29%	28%	P
Pin Oak	22%	14%	M
Cottonwood	18%	14%	M
White Ash	17%	14%	P
Shingle Oak	14%	14%	P

S = Small Sawtimber P = Pole

M = Medium Sawtimber, L = Large Sawtimber

The canopy is dominated by cottonwood, pin oak and black cherry. Mid story trees consist of black cherry, white ash and shingle oak. Regeneration is mostly shingle oak, black cherry, and tulip poplar. The species composition is ok. Most species have good form and height.

Figure 4

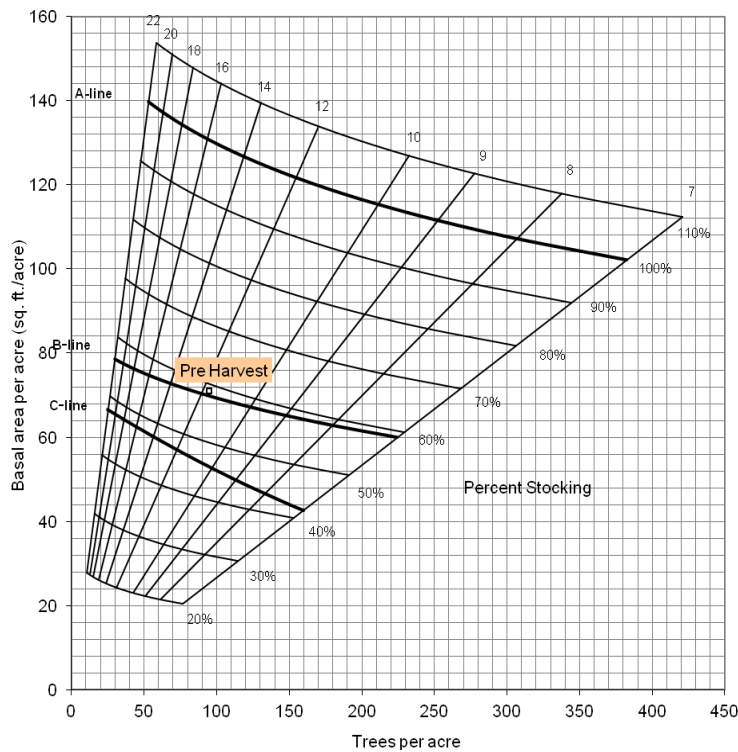


Figure 4 shows the stocking level of this stand, the stand has a current stocking of 61%, with a BA of 71 sq.ft. and 95 trees/acre. The volume of this stand is 1,149 bdf/acre.

Prescription

The main objective in this stand should be to control invasive species to allow the trees to maintain good form and growth. The stand is currently adequately stocked to continue growing at a high rate.

TSI should consist of targeted invasive species control throughout all portions of the tract. Other TSI may consist of crop tree release, cull removal, vine control, and follow up invasive control.

Tract Summary

Control of ailanthus should be conducted as soon as possible as one of targeted species.

As long as harvesting operations are not conducted during wet periods and skidding and hauling equipment remain in designated areas, there should not be any long lasting negative impacts to the soil. Wildlife habitat, timber quality, and biodiversity should be enhanced as a result of the proposed harvesting and TSI operations.

The tract would need to be closed to the public during harvesting operations. Therefore, hunting and fishing activities would be adversely affected during this period. However, there are numerous locations in the surrounding property that offer the same opportunities.

Proposed Activities Listing

<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Ailanthus control	2013 - 2014
Skid Trail / Log Yard Construction	2019 - 2020
Pre-Sale TSI	2019 - 2020
Timber Marking	2020- 2021
Harvest	2021 - 2023
Close Out	2022 - 2023
Site prep, Tree planting and post harvest TSI	2023 - 2024
Re-Inventory	2033

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