Indiana Department of Natural Resources – Division of Forestry

Draft

Resource Management Guide

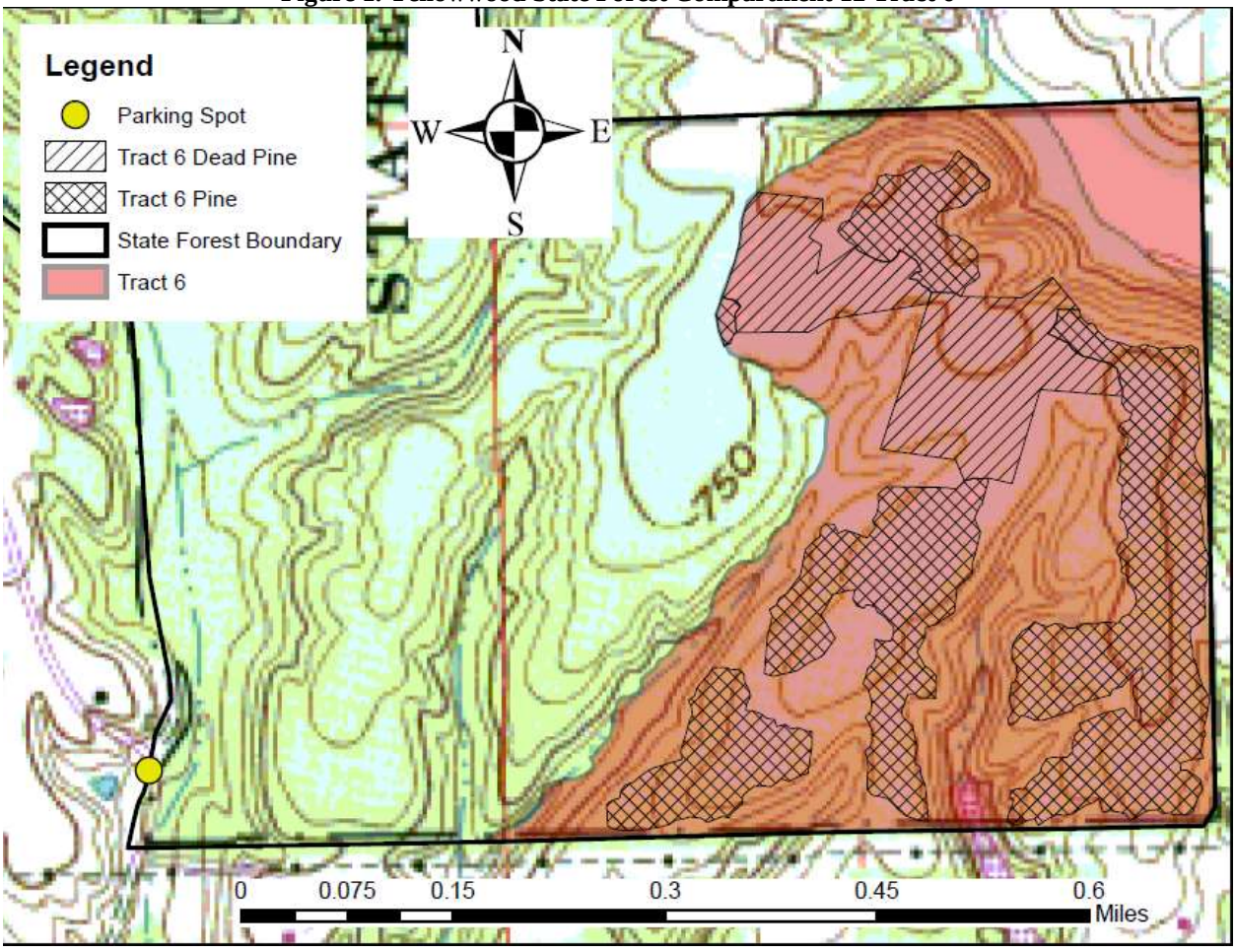
State Forest: Yellowwood
Tract Acreage: 112.6
Forester: Michael Spalding
Management Cycle End Year: 2035

Compartment 12 **Tract** 6
Commercial Acreage: 112.6
Date: December 29, 2015
Management Cycle Length: 20 years

Location

This tract is located in Section 27 of Township 10N, Range 2E in Jackson Township of Brown County. It is approximately 1 mile northwest of the town of Helmsburg. Public access is from a parking lot on East Lost Branch Road.

Figure 1. Yellowwood State Forest Compartment 12 Tract 6



General Description

Y1206 contains 112.6 forested acres. Of this, 36.4 acres are pine and 76.2 acres are hardwoods. The hardwoods contain areas of bottomland hardwoods, mixed hardwoods, and oak-hickory cover types. The hardwood timber is predominantly medium to large sawtimber while the pine is mostly large pole to medium sawtimber. The 14 acres shown as dead pine on the map was

part of the pine plantations where nearly all of the pine has already died. In these areas, mixed hardwoods are now the dominant tree species cover, thus the inclusion of these areas into the mixed hardwoods cover type. The dead pine area is dominated by mostly sapling and pole sized trees. Overall, the quality of timber in the tract is good to excellent in the hardwoods and poor to good in the pine. The tract inventory species composition is listed below in Table 1 according to their dominance.

Table 1. Relative Abundance by Number of Trees Per Acre in Hardwoods.

Overstory Trees (13.5" DBH and larger)	Pole Trees (5.5 to 13.4" DBH)	Saplings (.5 to 5.4" DBH)
yellow-poplar 27%	**sugar maple 28%**	**American beech 58%**
black oak 15%	**American elm 16%**	**sugar maple 12%**
white oak 9%	**red maple 10%**	**American elm 8%**
American sycamore 8%	*sassafras*	*red maple*
red pine	*American beech*	*white ash*
pignut hickory	*white ash*	*sassafras*
black cherry	*yellow-poplar*	*blackgum*
white ash	*shagbark hickory*	*black oak*
shagbark hickory	*black cherry*	*bitternut hickory*
sugar maple	*blackgum*	*red elm*
red maple	*Virginia pine*	*shagbark hickory*
sassafras	*red pine*	*yellow-poplar*
American beech	*pignut hickory*	
northern red oak	*black walnut*	
largetooth aspen	*red elm*	
eastern cottonwood	*American sycamore*	
	white oak	

Table 2. Relative Abundance by Number of Trees Per Acre in Pine.

Overstory Trees (13.5" DBH and larger)	Pole Trees (5.5 to 13.4" DBH)	Saplings (.5 to 5.4" DBH)
red pine 55%	**red pine 53%**	**American beech 63%**
yellow-poplar 18%	**Virginia pine 13%**	**red maple 15%**
red maple 12%	**red maple 10%**	**white ash 11%**
Virginia pine	**yellow-poplar 9%**	*sugar maple*
black cherry	*American elm*	*sassafras*
white ash	*sassafras*	*red pine*
eastern white pine	*sugar maple*	*American elm*
black oak	*white ash*	*yellow-poplar*
largetooth aspen	*black cherry*	*black cherry*
	blackgum	*blackgum*
	eastern white pine	*northern red oak*
	red elm	*shagbark hickory*
	largetooth aspen	*white oak*

History

October 30, 1956 - State of Indiana acquired this land from the US Forest Service
December 3, 1980 – Inventory. Estimated 5,817 board feet per acre.
December 17, 1980 – Veneer sale of 15,596 board feet in 31 trees. Twelve of the trees were north of the intermittent stream, which is now part of Tract 4.
April 22, 1981 – Timber sale of 122,641 board feet in 339 trees. Some of this was north of the intermittent stream, which is now part of Tract 4.
March 17, 1982 – Timber Stand Improvement was completed.
February 6, 2014 – Tract boundaries were changed to better follow drainages.
April 22, 2015 – Inventory.

Landscape Context

The landscape surrounding Y1206 contains some variability due to this tract located in a 500 acre block of Yellowwood State Forest that is separated from most of the larger landholdings. There are numerous residences in the immediate landscape, and Helmsburg just outside of that area at only 1 mile away. Due to the close proximity of this tract to State Road 45 and nearby State Road 135, development pressure of single-family residences is higher than in other areas of Yellowwood State Forest. Also due to the large amount of private ownership, there are many small private ponds and lakes. Farther west of this block of Yellowwood are several private church camps that have larger, contiguous tracts of forest. The greatest threats to forestland in this landscape will continue to be loss of forest due to clearing for residential home construction and the invasive plants that are routinely introduced during home landscaping efforts. Another major threat will also continue to be unmanaged high-grade harvesting on some of the private lands.

Topography, Geology and Hydrology
Most of Y1206 features gentle topography, including two large, flat ridgetops; however, some very short, but steep, sideslopes are present as well. A small flat bottomland area of approximately 6 acres in size is present in the northeastern corner of the tract. The underlying bedrock in this tract is made up of sandstone, siltstone, and shale. Some glacial influence is present in here as well, and can be verified by the presence of glacially-deposited granite boulders in the intermittent streams. The water from this tract drains primarily into two intermittent and one perennial streams. One of the intermittent streams eventually drains into Beanblossom Creek. The perennial stream and other intermittent stream flow into Lick Creek, which flows into Beanblossom Creek.

Soils
Avonburg silt loam, 0 to 2 percent slopes (AvA) (14.4 acres)
This nearly level, deep, somewhat poorly drained soil is on ridgetops in the uplands. It is fairly well suited to trees. There is a fragipan at about 23 inches which restricts drainage and rooting depth. Windthrow hazards and seedling mortality are management concerns to consider. This soil has a site index of 70 for white oak and 85 for yellow-poplar.

Beanblossom Channery Silt Loam, occasionally flooded (Be) (5.1 acres)
This nearly level and gentle sloping, deep, moderately well drained soil is on floodplains, alluvial fans, and colluvial benches. It is fairly well suited to trees. Wet periods contribute to equipment limitations. Rooting depth is restricted for some trees, i.e. black walnut, due to coarse fragments in its subsoil. This soil has a site index of 95 for yellow-poplar.

Berks-Trevlac-Wellston Complex, 20 to 70 percent slopes (BgF) (7.8 acres)
These moderately steep to very steep well drained soils are on hillsides in the uplands. They are fairly well suited to trees. Erosion hazards and equipment limitations are the main management concerns due to slope. Consideration should be given during sale planning and implementation of Best Management Practices for Water Quality. This Complex has a site index of about 70 for northern red oak.

Chetwynd loam, (CdF) (CdD2) (2.6 acres)
This moderately steep to very steep, deep, well-drained soil is on narrow ridgetops and side slopes on outwash terraces. It is well suited to trees. Erosion hazards and equipment limitations are the main management concerns due to slope and should be considered when planning management activities. This soil has a site index of 88 for northern red oak and 99 for yellow-poplar.

Cincinnati Silt Loam, 6 to 12 percent slopes, eroded (CnC2) (20.7 acres)
This moderately sloping, deep, well-drained soil is on ridgetops and side slopes in the uplands. It is fairly well suited to trees. This soil has a site index of 80 for northern red oak.

Hickory Silt Loam, 20 to 70 percent slopes (HkF) (22.1 acres)
This moderately steep to very steep, deep, well-drained soil is on side slopes in the uplands. It is well suited to trees. Erosion hazards and equipment limitations are the main management concerns due to slopes. Consideration should be given during sale planning and implementation

of Best Management Practices for Water Quality. This soil has a site index of 85 for White Oak and 95 for Yellow-Poplar.

Pekin silt loam, 2 to 6 percent slopes (PeB) (7.0 acres)
This gently sloping, deep, moderately well drained soil is on alluvial terraces. It is well suited to trees and has a site index of 70 for white oak and 85 for yellow-poplar.

Rossmoyne silt loam, 2 to 6 percent slopes, eroded (RoB2) (32.5 acres)
This gently sloping, deep, moderately well drained soil is on narrow ridgetops and short, convex side slopes in the uplands. It is fairly well suited to trees. A fragipan is present at 22 inches that restricts rooting depth. Windthrow hazards and seedling mortality are main management concerns to be considered when planning management activity. This soil has a site index of 61 for white oak and 80 for northern red oak.

Wilbur silt loam, frequently flooded (Wt) (.4 acre)
This nearly level, deep, moderately well drained soil is on floodplains. It is well suited to trees. Timing of management activities should consider wet times of year. This soil has a site index of 100 for yellow-poplar.

Access
Public access to Y1206 is through a roadside pull off for the Tecumseh Trail on East Lost Branch Road. This parking area is ¼ mile west of the southwest corner of the tract. From the intersection of Helmsburg Road and State Road 45 in Helmsburg, travel west on SR 45 approximately 1.1 miles to East Lost Branch Road. Turn right (north) onto East Lost Branch Road and travel approximately .5 mile to the parking spot.

Boundary
The northern, eastern and, southern boundaries of Y1206 are private property lines shared with the State. These lines are marked with orange blazes. The western boundary of Y1206 is shared with another YSF tract. From the north to the south this western boundary follows a ridge top and then an ephemeral stream that transitions into an intermittent stream.

Wildlife
Y1206 has an excellent stocking of wildlife resources in the form of mast producing oak and hickory trees. There is a dearth of early successional wildlife habitat. The non-native pine plantation areas and other mixed hardwood areas in need of regeneration could be managed to create early successional forest habitats that benefit wildlife as well as promote native hardwood regeneration.

A Natural Heritage Database Review was completed for Y1206. If Rare, Threatened or Endangered species (RTE's) were identified for this tract, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

The Division of Forestry has instituted procedures for conducting forest resource inventories so that the documentation and analysis of live tree and snag tree densities are examined on a compartment and tract level basis in order to maintain long-term Indiana bat habitat. Crown release performed

during timber harvests will stimulate the growth of the selected residual trees and will enhance their vigor. Timber Stand Improvement (TSI) following the harvest is planned which will increase standing snag counts. Management practices conducted on Y1206 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations. Current snag tree densities are above recommended maintenance levels for all diameter classes.

Communities

Y1206 contains several communities. The glacial influence of this area along with seven different soil types make for a large diversity of communities in this tract. The northeastern corner of the tract contains bottomland forest. Other areas of the tract are dominated by oak-hickory forest with a carpet of painted sedge. However these areas are being taken over mostly by a very dense sapling and pole layer of American beech and sugar maple. Yet other areas are dominated by mixed hardwood stands with large yellow-poplar and beech trees and a dense understory of American beech and spicebush. The non-native pine stands are present as well and contain a mix of mostly red and Virginia pines.

Exotic Species

The following three exotic invasive species were noted during this inventory: Japanese stiltgrass, multiflora rose, and Japanese barberry. Stiltgrass is present in this tract as it is throughout the landscape. People, animals (both domestic and wild), equipment, and water are all major seed dispersers for this persistent invasive exotic plant. Management in some limited areas is an option. This includes treating with either non-selective herbicides such as glyphosate or grass specific herbicides. Management on a small scale will not eliminate this species from the landscape. Multiflora rose is quite common in the old field and pasture areas of the tract. As Brown County is a known location of the plant virus Rose Rosette disease, populations of Multiflora Rose are relatively stable being contained by this disease. Control measures for multiflora rose may be warranted if populations are located in planned regeneration openings. Japanese barberry is present in the form of scattered bushes. Oftentimes these can be pulled up by hand during other resource management activities. If larger populations of barberry are found they should be treated with herbicide by either foliar or basal bark applications.

Recreation

Public access is not easily available to this tract, and is limited due to the very small parking area that will only accommodate one to two vehicles. Hunting for spring morel mushrooms, wild turkey, and white-tailed deer are all popular activities within Y1206. Gold panning is another recreational use of this tract.

Cultural

All portions of Y1206 were reviewed for cultural sites during the forest resource inventory. Cultural resources may be present on Y1206 however their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Y1206 Tract Summary Data from the April 2015 Inventory

Total Trees per Acre in Hardwoods = **228** Hardwoods Percent Stocking = **107%**
Basal Area per Acre in Hardwoods = **122.8 Square Feet**
Present Volume in Hardwoods = **10,490 Board Feet per Acre**

	Acres	Mixed Hardwoods	Sq. Ft. per Acre

Hardwood Commercial Forest:	76.2	Basal Area Sawtimber:	72.4
Pine Commercial Forest:	36.4	Basal Area Quality:	10.0
Noncommercial Forest:	0	Basal Area Prime:	4.8
		Basal Area Poles:	31.0
		Basal Area Culls:	1.9
		Basal Area Sub-merchantable:	2.7
Total:	112.6	Total Basal Area:	122.8

Pine	Sq. Ft. per Acre
Basal Area Sawtimber:	64.7
Basal Area Quality:	.6
Basal Area Poles:	87.6
Basal Area Culls:	2.6
Basal Area Sub-merchantable:	3.3
Total Basal Area:	158.8

Tract Subdivision Description and Silvicultural Prescription

Y1206's current forest resource inventory was completed in April 2015 by forester Michael Spalding. A summary of the inventory results are given above and a compilation of the total volume by species is presented in Table 3 below. Y1206 is currently fully stocked and a managed timber harvest is prescribed. Singletree and group selection cuttings are prescribed to thin and release desirable residual trees, remove suppressed and poorly formed trees and to regenerate areas that contain aggregations of low stocking, excessive fire or windthrow damage, or overmature trees. For the purpose of this report Y1206 was segregated into two cover type based on their general forested cover types (see Figure 1.).

1) Mixed Hardwoods (76.2 Acres)

This cover type has great variability from one location to the next depending on the past history, aspect, and soils that are present. Overall, yellow-poplar is the most dominant overstory timber species whereas American beech is most dominant in the understory. While the area as a whole is mixed hardwoods, pockets of oak-hickory are mixed in and bottomland hardwoods are present along the streams. Approximately 14 acres of this area consists of an overstory of mostly dead pine. The remaining trees are nearly all mixed hardwoods, thus the inclusion in this area. The live trees present are primarily beech in the saplings and yellow-poplar in the overstory. This portion of the mixed hardwoods will not contribute much to the harvest volume with primarily ash and some of the remaining live red pine being harvested. All of the overstory species in Table 1 can be found within this cover type. The size of the timber in this Stratum ranges from pole to large sawtimber. The quality within this Stratum is overall quite good. Singletree selection is generally prescribed for this entire area. While there are certainly areas that would benefit from group selection openings, the focus of openings in this tract should be on the pine for this harvest entry. This harvest will favor retention of oak and hickory timber that reside within this mixed hardwoods cover type. Emerald Ash Borer infestation is evident within this tract. Ash utilization will be incorporated into the tree selection strategies. Individual trees targeted for removal should also include the following: sugar maple with

evidence of maple borer damage; declining, drought-stressed, mature, and over-mature yellow-poplar, and any other stems needed to release higher quality, vigorous residual trees. Approximately 6 acres in the northeast corner will not be harvested due to the perennial stream preventing access.

2) Pine Plantations (36.4 acres)

This area was planted to non-native Virginia, red, and eastern white pines. Red and Virginia pines are by far the most common that were planted. Some native hardwoods came in naturally into the plantings, and yellow-poplar is the most dominant hardwood species present. Some old stumps were still present, indicating these areas have been thinned in the past. This area should be prescribed group selection cuttings to harvest the non-native pine and the few native hardwoods. The regeneration of the this area is expected to be composed of native mixed hardwoods becoming established from the existing seed bank, seedlings, seedling sprouts, and stump sprouts.

Tables 3 and 4. Volume estimates from the April 2015 inventory on Y1206

Mixed Hardwoods	
Species	Board Feet Volume
yellow-poplar	255,020
black oak	138,080
white oak	109,680
American sycamore	76,570
red pine	35,160
pignut hickory	34,590
black cherry	29,400
shagbark hickory	27,930
northern red oak	23,560
white ash	22,110
sugar maple	10,570
red maple	7,350
eastern cottonwood	7,050
American beech	5,010
sassafras	4,360
largetooth aspen	2,860
TOTALS	789,300

Pine	
Species	Board Feet Volume
red pine	146,410
yellow-poplar	78,530
Virginia pine	16,490
eastern white pine	9,990
black cherry	5,870

black oak	3,160
white ash	2,730
red maple	2,580
largetooth aspen	830
TOTALS	266,590

Summary Tract Silvicultural Prescription and Proposed Activities

The prescription for Y1206 combines primarily singletree selection in the hardwoods and group selection in the pines. Group selections will primarily occur in the pine plantations. The Indiana guidelines for Best Management Practices (BMP's) will be followed during the timber harvest and closeout activities to maintain water quality. The prompt installation of water diversions following harvesting will be employed to minimize any effects to neighboring water resources. Singletree selection will remove low grade, poorly formed, and declining overstory individuals so that spacing of croptrees is improved to increase the growth of the residual stand. Accessible merchantable ash will be harvested as emerald ash borer is already present. This harvest should be combined with a harvest in the adjacent Tract 6.

Portions of or all of Y1206 will be submitted for a postharvest Timber Stand Improvement (TSI) project along with any invasive work if deemed appropriate by the administering forester. A field review for regeneration opening success is planned 3-4 years after opening TSI completion.

Given the recent inventory and projected growth of Y1206's forest resources, this tract is suitable for a 15 year management cycle wherein growth and development of the tract's forest resource is evaluated by a forest inventory every 15 years. The current inventory indicates a possible harvest of between 450 to 500 MBF. Much of this volume is anticipated to come off of regeneration openings prescribed for the above reasons. A timber sale is proposed for FY2016-17.

Proposed Activities Listing

Proposed Management Activity	*Proposed Period*
Archeological Review & Clearance	CY 2016
Roadwork Improvement	CY 2015
Timber Marking/Spot invasive treatment/vines	CY 2015-16
Timber Sale with Adjacent Tract 6	FY2016-17
TSI and Invasives Retreatment (if needed)	CY 2017-18
Reinventory and Management Guide	CY 2030

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