Indiana Department of Natural Resources – Division of Forestry

Draft

Resource Management Guide

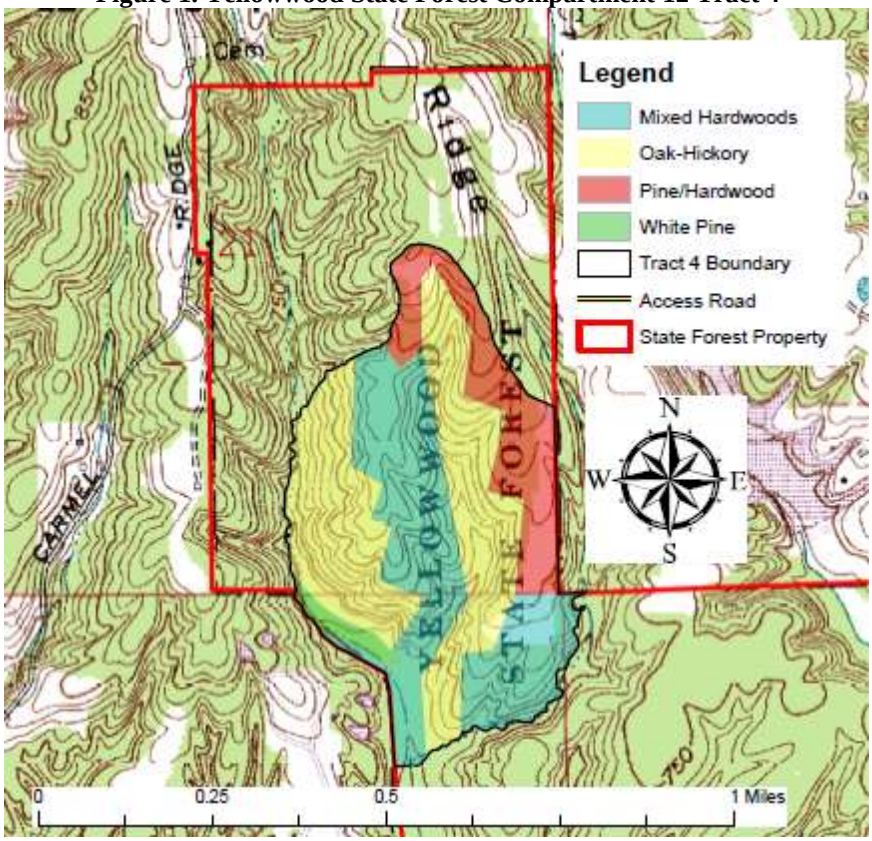
State Forest: Yellowwood
Tract Acreage: 133
Forester: Michael Spalding
Management Cycle End Year: 2033

Compartment 12 **Tract** 4
Commercial Acreage: 133
Date: November 24, 2014
Management Cycle Length: 15 years

Location

This tract is located in Sections 21, 27, and 28 of Township 10 North, Range 2 East in Jackson Township of Brown County.

Figure 1. Yellowwood State Forest Compartment 12 Tract 4



General Description

This tract contains approximately 133 acres of hardwood and pine forest. Most of the acreage contains Mixed Hardwoods and Oak-Hickory cover types that are interspersed; however, delineations on the map show where the particular types tend to dominate. The remaining portion of the tract consists of two patches of pine. The small stand of eastern white pine is very dense. The other pine contains shortleaf and Virginia pines as well as early successional hardwood species such as yellow-poplar and red maple. The timber is this tract is predominantly small to large sawtimber in size with the exception being some old regeneration openings

containing pole trees. The overall timber quality of Y1204 is excellent; however, many low quality and high quality stems are both present. The forest resource species composition is listed below in Table 1 according to their dominance.

Table 1. Species composition from the September 2014 inventory in Y1204

Overstory Trees	Pole Trees	Saplings
Sugar Maple	**Sugar Maple**	**American Beech**
Yellow-poplar	**Red Maple**	**Sugar Maple**
White Oak	**American Beech**	**Red Maple**
Eastern White Pine	*Yellow-poplar*	*Sassafras*
American Beech	*Virginia Pine*	*American Elm*
Black Oak	*Shagbark Hickory*	*Blackgum*
Pignut Hickory	*White Oak*	*Hackberry*
Northern Red Oak	*Black Walnut*	*Shagbark Hickory*
Virginia Pine	*Pignut Hickory*	*White Ash*
Shagbark Hickory	*Northern Red Oak*	
White Ash	*Sassafras*	
Shortleaf Pine	*White Ash*	
American Sycamore	*American Sycamore*	
Red Maple	*White Pine*	
Black Cherry	*Shortleaf Pine*	
Blackgum	*Bitternut Hickory*	
Bitternut Hickory		

History

October 30, 1956 - State of Indiana acquired this land from the US Forest Service

December 21, 1979 - Timber marked by forester Bill Fischer sold to David R. Webb Company of Edinburgh. The sale sold for $46,500.00 ($373.18/MBF) and included 124,604 board feet in 354 trees, with the top three species by volume being black oak, red oak, and white oak.

March 2, 1995 - Inventory completed by forester Lee Eckart. 7,335 board feet per acre total, with 2,182 board feet harvest and 5,176 board feet leave.

March 17, 1995 - Management guide completed by forester Lee Eckart.

August 16, 1995 - Timber marked by forester Lee Eckart sold to Foley Hardwoods Inc of Bargersville. The sale sold for $37,037.00 ($331.25/MBF) and included 111,809 board feet in 412 trees with an additional 79 culls. The top three species by volume were black oak, American beech, and white oak.

February 6, 2014 - Tract 4 boundary was updated to include the area on the south end down to the intermittent stream. This corrected the layout of this tract and increased the acreage from 100 to 133 acres.

Landscape Context
The landscape surrounding Y1204 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 ½ miles 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 Y1204 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 ten acres in size is present in the southwest 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. All of the water from this tract drains into two intermittent streams, one on the eastern boundary and one on the western boundary. These two streams converge on the south end of the tract and then continue for ¾ mile as an intermittent stream until emptying into Beanblossom Creek.

Soils

Beanblossom Channery Silt Loam, occasionally flooded (Be) (15.1 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) (58.2)
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 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.

Cincinnati Silt Loam, 6 to 12 percent slopes, eroded (CnC2) (6.6 acres)
This moderately sloping, deep, well drained soil is on ridgetops and sideslopes 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) (9.5 acres)
This moderately steep to very steep, deep, well drained soil is on sideslopes 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.

Tilsit silt loam, 2 to 6 percent slopes (TlB) (3.3 acres)
This gently sloping, deep, moderately well drained soil is on the tops of ridges in the uplands. It is well suited to trees. The rooting depth is limited by a fragipan present at a depth of 30 inches. This soil has a site index of 68 for white oak and 90 for yellow poplar.

Wellston-Gilpin silt loams, 6 to 20 percent slopes, eroded (WeC2) (40.5)
These moderately sloping to moderately steep, well drained soils are on side slopes and ridgetops in the uplands. They are well suited to trees. This complex has a site index for northern red oak of 71 in the Wellston and 80 in the Gilpin.

Access
From the intersection of State Road 45 and Carmel Ridge Road, travel north on Carmel Ridge Road 1.4 miles to a gravel lane on the east (right) side of the road. There is a locked gate shortly after entering this gravel lane. It is approximately .4 mile on this gravel lane from Carmel Ridge Road to the log yard at the north end of this tract. Carmel Ridge Road is 1.3 miles west of Helmsburg.

Boundary
The northern boundary of this tract follows a ridgetop. The eastern boundary is a property line shared with a private landowner and is marked with three orange blazes on each tree. The center orange blaze on the trees faces state ownership, while the other two face the directions of the property line. The southern boundary is a mapped intermittent stream. The western boundary is an ephemeral stream that becomes an intermittent stream as it travels from north to south.

Wildlife
This tract has an excellent stocking of Oak and Hickory trees which provide reliable mast crops. Most of these stems will be retained after timber harvest. Some regeneration openings will be created and will provide benefit to wildlife species requiring that specialized type of habitat.

A Natural Heritage Database Review was completed for Y1204 on November 26, 2014. If Rare, Threatened or Endangered species (RTE's) were identified near or within 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 and quality forest habitats. Crown release performed during timber harvests will stimulate the growth of the selected residual trees and will enhance the vigor of these trees. Snag levels currently meet or exceed recommended maintenance levels for all diameter classes. Timber Stand Improvement (TSI) following the harvest is planned which will further increase standing snag counts and provide habitat benefits. Management

practices conducted on Y1204 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Communities
Y1204 contains several communities. There are examples of bottomland forest, mesic Mixed Hardwoods, mesic Oaks, and an old field that contains a mixture of older, early successional tree species. There are also non-native planted shortleaf, Virginia, and eastern white pines.

Exotic Species
Multiflora Rose is present in some areas of Y1204, but usually as scattered bushes. As Brown County is a known location of the plant virus rose rosette disease, populations of Multiflora Rose are relatively stable. Management efforts at this time are only monitoring its spread. Japanese barberry was also noted as scattered bushes only in some areas of this tract. Management efforts at this time are only monitoring its spread; however, control measures may be warranted if its populations are located in planned regeneration openings. Control may also be prescribed as part of a post-harvest Timber Stand Improvement if deemed necessary at that time. Stilt grass is somewhat confined to the intermittent stream bottoms and some places on the ridgetops. Hikers have inadvertently spread it to the most central part of the tract along the Tecumseh Trail. The stilt grass along the haul road, accessible ridgetop and Tecumseh Trail should be sprayed with either glyphosate or a grass-specific herbicide beginning in 2015-16.

Recreation
Public access is easily available to this tract. There is a parking lot by the gate on the haul road off of Carmel Ridge Road. Many hunters use this tract due to its easy access. Hiking is another very popular activity in this tract due to the Tecumseh Trail. The hiking trail will need to be rerouted during harvesting operations for public safety.

Cultural
All portions of Y1204 were reviewed for cultural sites during the forest resource inventory. Cultural resources may be present on Y1204 but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or road construction activities.

Y1204 Tract Summary Data from the September 2014 Inventory

Total Trees per Acre = **187**
Overall Percent Stocking = **107%**
Basal Area per Acre = **126.4 Square Feet**
Sawtimber & Quality Trees per Acre = **42**
Present Volume = **11,523 Board Feet per Acre**

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	106.6	Basal Area Sawtimber:	63.2
Pine Commercial Forest:	2.9	Basal Area Quality:	14.7
Pine/Hardwood Commercial Forest:	23.8	Basal Area Prime:	6.8
Noncommercial Forest:	0	Basal Area Poles:	37.4
		Basal Area Culls:	2.9
		Sub-merchantable:	1.4
Total:	133.3	Total Basal Area:	126.4

Tract Subdivision Description and Silvicultural Prescription

The latest inventory in Y1204 was completed on September 19, 2014 by forester Michael Spalding. 38 prism points were completed over 133 acres (1 point per 3.5 acres). A summary of the forest resource inventory is provided above and a Stock table is provided below in Table 2. Currently Y1204 is overstocked and a timber harvest is prescribed. Singletree selection to thin and release desirable residual trees and to remove suppressed and poorly formed individual trees are prescribed in an improvement cutting. Group selections will be prescribed to regenerate areas where aggregations of poor stocking, excessive damage, or over maturity are found. For the purpose of this guide Y1204 was subdivided into four management subdivisions based on the tract's four general cover types.

Oak-Hickory Subdivision (57.3 acres)

This subdivision is fully-stocked with medium to large sawtimber white oak, northern red oak, scarlet oak, black oak, pignut, and shagbark hickories. Some mixed hardwoods are present throughout as well. The understory is dominated by pole to small sawtimber sugar maple, many of which have maple borer damage. The quality of the timber is excellent as well. Most of this area should receive single-tree selection to favor retention of the healthiest and highest quality oak and hickory trees. Trees targeted for removal should include mixed hardwoods as well as drought-stressed, fire damaged, suppressed, defective, poorly-formed, over-mature and some mature oaks and hickories.

Mixed Hardwood Subdivision (49.3 acres)

This cover type is quite variable within this tract depending on the past history, aspect, and soils that are present. Yellow-Poplar, White Oak, Northern Red Oak, Black Oak, Sugar Maple, Pignut and Shagbark Hickories, American Beech, and White Ash are the primary overstory species. Sugar maple in a wide array of pole tree sizes dominates this subdivision's understory. Some small pockets of Oak-Hickory are present throughout this subdivision but are not large enough to map as a separate cover type. The size of the timber in this subdivision ranges from pole to very large sawtimber. The quality, especially of many of the Oak species, is quite good as well. This Subdivision would greatly benefit from primarily singletree selection harvesting along with some small group selection openings. Areas of mature, over-mature, damaged, and declining trees should be marked for group selection regeneration. It is expected that these openings will provide some early successional habitat benefits and regenerate to Mixed Hardwoods dominated in the future by Yellow-Poplar due to the mesic site and favorable soils. Other portions of this Subdivision should be marked for single-tree harvesting to favor the retention of the Oak and Hickory trees within this Mixed Hardwoods cover type. Trees targeted for removal should include the following: all merchantable, accessible Ash; 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. The presence and noted movements of the Emerald Ash borer in nearby sections warrants a sanitation harvest ahead of full infestation and widespread tree mortality..

Old Field Pine Plantation/Hardwood Subdivision (23.8 acres)

Shortleaf and Virginia Pines are the most common species in this Subdivision. Hardwood species inventoried in this Subdivision are those that naturally succeed into old field forested areas such as Yellow-Poplar, Red Maple, Black Cherry, Sugar Maple, and White Ash. American Beech dominates in this Subdivision's the understory. This area contains mostly pole to medium sawtimber sized trees, with some large trees scattered in as well. Some of the trees, especially the Shortleaf Pine, are very good quality, while many others are not. The droughts of recent years and Tuliptree scale epidemic of 2012 have led to decline in many of the Yellow-Poplar trees. Emerald Ash Borers are present in land nearby to this tract and this species should be marked in the proposed harvest. Land with timber features such as these are ideal for large regeneration openings due to the non-native Shortleaf and Virginia Pines, mature and declining Yellow-Poplar, and White Ash, and this area is no exception. This subdivision is a great opportunity to begin a new part of the forest and create early successional habitat at the same time. Expected species to regenerate include mixed hardwoods dominated by yellow-poplar and black cherry. One large regeneration opening of 10 to 20 acres anticipated to be marked as well as one to two other smaller openings.

Eastern White Pine Subdivision (2.9 acres)

This subdivision is a planting of eastern white pine in the southwest corner of the tract. It appears this planting has never been thinned and is currently extremely overstocked. One inventory plot fell entirely within this stand and had a basal area of 310 square feet. This is likely the reason for the very high volume estimate of white pine. The trees range in size from large pole to large sawtimber and are good quality for white pine. The understory is dominated by American beech and red maple. Because this area has never been thinned, the trees are likely very dependent on each other for support against high winds. This area should either be entirely marked for harvest as a regeneration opening or be left for one more rotation and then be harvest.

Table 3. Volume estimates from September 2014 inventory on Y1204

Species	Total
yellow-poplar	242,150
white oak	233,650
eastern white pine	199,120
black oak	192,090
sugar maple	188,620
northern red oak	126,530
pignut hickory	79,000
American beech	63,400
shagbark hickory	45,660
shortleaf pine	37,950
white ash	33,320
Virginia pine	32,880
American sycamore	31,650
black cherry	11,530
red maple	7,990
bitternut hickory	4,080

blackgum	2,990
Total	1,532,610

Summary Tract Silvicultural Prescription and Proposed Activities
The overall silvicultural prescription for Y1204 is a combined improvement cutting and group selection harvest. The use of the Division of Forestry's BMP regulations will minimize soil erosion and protect water quality. Prompt installation of water diversions in conjunction with seed and straw following harvesting will be employed to minimize any effects to neighboring water resources. The harvest will entail both singletree and group selection cutting methods. Singletree selection will remove poorly formed, mature stems, and improve spacing of residual trees to increase the growth of the residual stand. Group selections may be prescribed in aggregations of inadequate stocking, poor quality, pine, or mature timber.

Prior to the harvest, grapevine control is prescribed. Vines in the old regeneration openings are very dense, and there are moderately heavy patches of vines throughout the rest of the tract as well. Stilt grass will also be treated on the haul road and Tecumseh Trail.

Portions of or all of Y1204 will be submitted for a postharvest Timber Stand Improvement (TSI) project to ensure opening completion and crop tree release in other portions of the tract as well as in older openings. Invasive work will also be prescribed if deemed appropriate by the administering forester. A field review for regeneration opening success is planned 3-4 years after opening TSI completion.

Due to the excellent soils, tree inventory data and scale of proposed actions, a 15 year harvest re-entry cycle is suggested and should be reassessed at that time. The current inventory indicates a possible harvest of between 400 to 600 MBF. A timber sale is proposed for FY2016-17.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Arch Clearance	FY 2015
Preharvest TSI	FY 2015-16
Roadwork Improvement	FY 2016-17
Timber Marking	FY 2016
Timber Sale	FY 2017
Postharvest TSI	FY 2018-2019
Regeneration Opening Review	Within 3-4 years of Postharvest TSI
Inventory and Management Guide	FY 2033

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