

**Indiana Department of Natural Resources
Division of Forestry
DRAFT
RESOURCE MANAGEMENT GUIDE**

State Forest: **Ferdinand**
Tract Acreage: **127**
Forester: **Evan McDivitt and Sabrina Schuler**

Compartment: **06** Tract: **05**
Commercial Forest Acreage: **106**
Date: **7/22/2017**

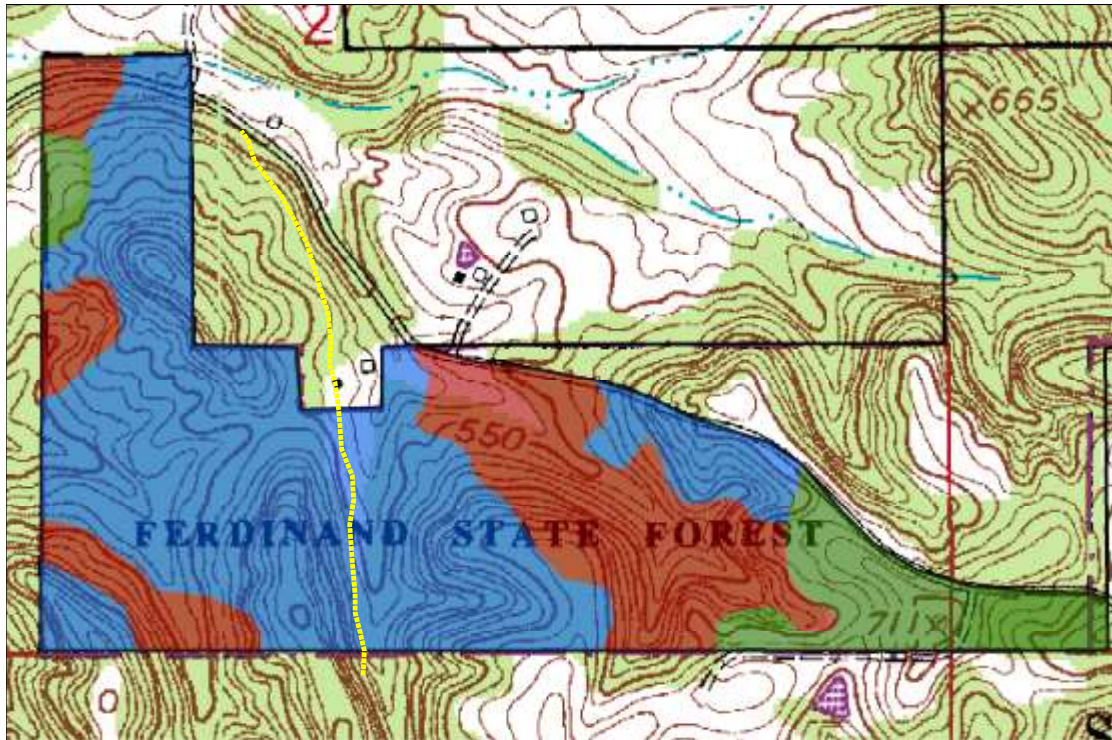
Location

Tract 0605 is located in Perry County, Sections 1 and 2, T4S, R3W, in Clark Township. The nearest town of Siberia is located approximately 3.5 miles NW of this tract. The property is 126 acres in total, of which 106 are commercial forest acreage.

General Description

Tract 0605 consists of 127 acres of mixed pine and hardwood forest. The pine is located on the east portion of the tract with a cluster also located in the northwest. A powerline right of way cuts through the center of the tract. The tract is mainly composed of oak-hickory overstory with an advanced understory of beech-maple.

Figure 1. Ferdinand SF Compartment 06, Tract 05.








- Legend**
-  Tract Boundary
 -  Powerline
 -  Oak Hickory
 -  Mixed Hardwood
 -  Pine

Table 1. Overview of Tree Species in Tract 0605.

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
American Beech	American Beech	American Beech
American Sycamore	American Elm	American Elm
Bitternut Hickory	Bitternut Hickory	Bitternut Hickory
Black Cherry	Blackgum	Black Cherry
Blackgum	Black Oak	Blackgum
Black Oak	Black Walnut	Black Oak
Black Walnut	Eastern Red-Cedar	Dogwood
Eastern White Pine	Eastern White Pine	Eastern White Pine
Northern Red Oak	Northern Red Oak	Ironwood
Pignut Hickory	Persimmon	Northern Red Oak
Post Oak	Pignut Hickory	Pignut Hickory
Red Maple	Post Oak	Red Maple
Shagbark Hickory	Red Maple	Shagbark Hickory
Shortleaf Pine	Red Pine	Sugar Maple
Sugar Maple	Scotch Pine	White Ash
White Ash	Shagbark Hickory	White Oak
White Oak	Shortleaf Pine	Yellow Poplar
Yellow Poplar	Sugar Maple	
	Virginia Pine	
	White Ash	
	White Oak	
	Yellow Poplar	

Oak-Hickory: This tract contains about 70 acres of oak-hickory. It is the most abundant stratum of the three forest types. Oak-hickory occurs in all elevations of the tract: along slopes, ridgetops, and bottomlands. Primary species that dominate are white oak, bitternut hickory, and black oak. Post oak occurs in the western part of the tract. Most understory includes new generation of beech-maple. Other vegetation includes maple-leaf viburnum, greenbrier, blackberry, and various forbs.

Mixed Hardwoods: This tract contains 37 acres of mixed hardwood. This stratum is found primarily in the eastern and central parts, neighboring the larger pine plantation. There is a section where pines are in the process of conversion, suggesting this stratum will expand in time. Dominant species in this area are sugar maple, yellow-poplar, and white oak. Understory is diverse with competing shade-tolerant and shade-intolerant species.

Pine: This tract contains 17.5 acres of planted pines. They are located in the eastern corner of the tract, while a small cluster is also found in the northwestern part of the tract. Most pines are larger white pines surpassing 20" DBH, pole-sized red pines, and a few scattered Virginia, shortleaf, and Scotch pine.

Open: This tract contains 2.5 acres of permanent opening due to the powerline running north-south.

History

This tract was acquired from three separate purchases over a nine-year period. The northwest 19 acres were purchased in September 1951 from William and Susan Merckley of Perry County (book 6, page 217, deed #62-30-0025). The southwest block consisted of 77.95 acres and was purchased from Henry and Ella Hudson of Perry County in April 1960. This acreage included a 2.05-acre exclusion including a 30' wide, 300-yard long road on the west side of SE ¼, SW ¼, as well as a small area of buildings (book 6, page 566, deed #62-30-0049). The southeast block was purchased as two parts, one 40-acre tract and one 60-acre tract. These tracts were purchased from Ollie and Joseph Hudson on September 10, 1958. The 60-acre tract also makes up part of neighboring Tract 0606.

Resource Management History

This tract was initially inventoried in 1973 by S. Brandsasse. The silvicultural prescription suggested leaving the stand for 8-10 years and conducting a re-evaluation when trees had matured more. Estimated total volume on this tract was 46,688 board feet, the small volume perhaps due to agricultural conversion to woodlands. In 1984, Janet Eger re-inventoried the tract and provided no recommendation of cutting. She recommended boundaries be marked as soon as possible. In 2000, Gretchen Herbaugh inventoried the site again and found a total volume of 463,737 board feet. She prescribed an improvement harvest to remove undesirable or poor quality trees, and over-mature oaks. Within 66 acres of harvestable area, a timber harvest was conducted in March 2003, removing 115,500 board feet total. This was sold to Rasche Brothers.

Landscape Context

Most mixed hardwoods are located on tops of ridges, while most oak-hickory is located along slopes and bottomlands, with exception of ridges bordering the powerline. Planted pines are mainly on gentle slopes in the west and on rough patches in the eastern area. Within 1 mile of this tract approximately 11-50% is closed-canopy deciduous forest; 1-10% pine plantation; 11-50% cropland; and less than 1% in open water, riparian areas, and developed areas.

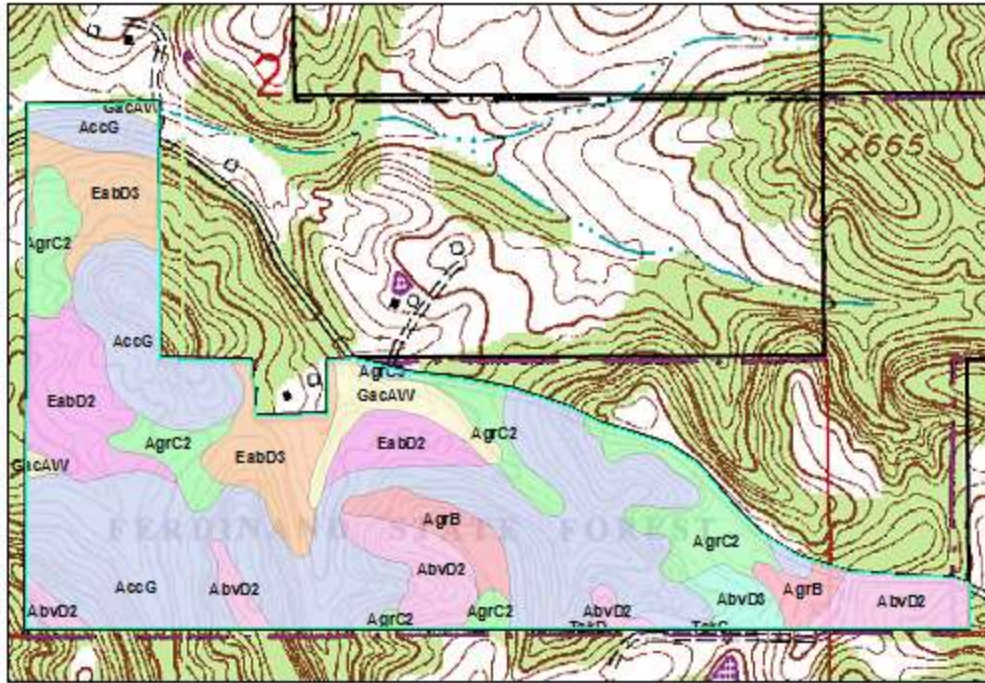
Topography, Geology, and Hydrology

Terrain is variable with some steep slopes and flat ridgetops. Most slopes are east and west-facing. There is no mapped intermittent stream located within this tract, however one flows along the northern-most border in the western portion of the tract in a small section to the north of Sinai road. Soils formed from bedrock of interbedded sandstone, siltstone, and shale being dominantly moderately or less cemented. However in some portions, soils formed from a mixture of colluvium from siltstone overlying the bedrock. Still in other portions, soils formed from a mix of loess or silty slope alluvium over top the bedrock.

Soils

This tract is made up of 9 different soil types. Most of these soils are slope soils varying from 2-35% slopes. All are either characteristically designated as eroded or severely eroded.

Figure 2. Compartment 06, Tract 05 Soils.



Adyeville-Tipsaw-Ebal complex (AccG); (59.9 acres) is a somewhat excessively drained to moderately drained, eroded soil that covers most of the tract. It occurs on 20-50% slopes, and has been found along the major ridgetop dips within the tract. Permeability is moderate and surface runoff is low or medium. Site index is 64 for northern red oak. Equipment limitation is severe.

Adyeville-Wellson-Deuchars silt loams (AbvD2); (12.1 acres) is somewhat excessively drained to moderately drained, eroded soil that occurs on 8-20% slopes. This soil type is very deep and occurs on back-slopes of hills, especially in the southeast corner. Permeability is moderate and water runoff capabilities are very high. Site index is 64 for northern red oak. Equipment limitation is moderate.

Adyeville-Wellson-Deuchars silt loams (AbvD3); (2.4 acres) is similar to AbvD2 except it is severely eroded. It also occurs in the southeast corner of the tract. Site index is 64 for northern red oak. Equipment limitation is moderate.

Apalone silt loam (AgrB); (5.7 acres) is a moderately well-drained soil occurring on 2-6% slopes. It occurs in the southeast corner of the tract where the pine stand is located. Permeability is moderate and surface runoff is high. Site index is 60 for black oak, 60 for white oak, and 80 for yellow poplar. Equipment limitation is slight.

Apalone silt loam (AgrC2); (16.5 acres) is similar to AgrB, except eroded slopes occur around 6-12%. Being a very deep soil, it contains a fragipan extending far into the soil. This soil type occurs on east- and west-facing slopes typically within the tract in the northern, northwestern,

and eastern portions along benches of hills. Site index is 60 for black oak, 60 for white oak, and 80 for yellow poplar. Equipment limitation is slight.

Apalone silt loam (AgrC3); (.4 acre) is similar to AgrC2, except slopes are severely eroded. This soil type can be found in the north-central part of the tract. It is the smallest soil type within the tract. Site index is 60 for black oak, 60 for white oak, and 80 for yellow poplar. Equipment limitation is slight.

Ebal-Deuchars-Kitterman complex (EabD2); (12.2 acres) is a deep, moderately well-drained soil found on the central north-facing slope and to the west on a west slope. It is eroded and has 12-24% slopes. Permeability is moderate and water runoff is rapid to medium. Site index is 72 for black oak, and 90 for yellow poplar. Equipment limitation is moderate.

Ebal-Deuchars-Kitterman complex (EabD3); (12.5 acres) is similar to EabD2, except it is severely eroded. It occurs along the powerline right-of-way. Site index is 72 for black oak. Equipment limitation is moderate.

Gatchel loam (GacAW); (5.3 acres) is a deep, excessively drained soil with 0-2% slopes. This soil type usually occurs in floodplains and is found along the central drainages and at the very northern tip of the tract along the stream. This soil is subject to brief, occasional flooding periods. Permeability is moderate and runoff is typically low. Site index is 95 for yellow poplar. Equipment limitation is slight.

Roads and Access

This tract has excellent access from the north and east. Going south along 145 toward Bristow, turn right onto CR 158 (Sinai Road). Upon encountering a firelane to the right and private property driveway to the left, the tract begins to the south. There are many pullouts that can be utilized to gain access into the tract. Coming from the west, turn onto Capers Road from 62, which eventually turns into Sinai Road.

Boundary

County Road 158, also known as Sinai Road, forms the northern boundary of the eastern section. The remainder of the northern boundary follows private property in-holdings below the road. The western and southern borders are also surrounded by private property. There is no obvious evidence of assigned boundary signs on any of the corners surrounding the acreage.

During the inventory, there was no indication of flagged boundaries or posts assigning property boundaries. Tree lines were primarily used as indicators for boundaries. In the past inventory conducted in 2000, G. Herbaugh mentioned T-posts and a PK-nail found along the south line between the SE corner and the county road. There was also evidence of two stones placed along the southern border as boundary markers that were marked with carsonite posts and T-posts. Pink flagging had been tied to these. All of the boundary lines were marked with pink flagging as well, but have since been lost.

Wildlife

A Natural Heritage Database Review was completed for tract 0605. If rare, threatened or endangered species were identified for this area, activities prescribed in this guide will be conducted in a manner that will not threaten viability of those species.

This tract contains abundant wildlife populations, determined by observation during inventory. Hunting pressure exists on this tract evidenced by presence of five tree stands scattered throughout. These tree stands are beyond the hunting regulation requirement which requires owner to remove the stands 30 days after deer season ends. Hunting must have been prevalent for some time because two of the deer stands were old, wooden ones, one of which had fallen over. There were three newer ones probably still being used. With so many bordering neighbors and multiple deer trails within the tract, it is not surprising hunting occurs here. Deer browsing of greenbrier was heavy, especially along deer trails. Signs of other common wildlife were also observed (squirrels, turkey, chipmunks, frogs, etc.) Gray tree frogs were heard singing often throughout the forest in the early morning and later afternoon. Northern leopard and green frogs were also spotted in the creek bed. Observed bird species consisted of the following: American Crow, Blue Jay, Red-eyed Vireo, Yellow-throated Vireo, Common Yellowthroat, Orchard Oriole, Northern Parula, Tufted Titmouse, Mourning Dove, Northern Cardinal, Carolina Chickadee, Red-tailed Hawk, Eastern Phoebe, Eastern Wood Pewee, Downy Woodpecker, Wood Thrush, and Red-bellied Woodpecker.

The Division of Forestry has instituted procedures for conducting forest resource inventories so documentation and analysis of live tree and snag tree densities are examined on a compartment level basis in order to maintain long-term and quality forest habitats. The number of snags and Legacy trees in the tract is greater than the maintenance level in all size classes. The management practices conducted in Tract 0605 will be conducted in a manner that will not jeopardize quality habitat types for wildlife populations, while also promoting snag retention.

Table 1. Live Legacy Trees and Snags Inventoried July, 2016 on 0605.

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance
Legacy Trees				
11"+ DBH	1143		11755	10612
20"+ DBH	381		1883	1502
Snags (all species)				
5"+ DBH	508	889	5733	5225
9"+ DBH	381	762	2472	2091
19"+ DBH	64	127	125	61

Communities

Tract 0605 contains dry to moderately dry slopes, mesic slopes, and moist-mesic bottomland ecosystem types. The drier sites usually occur on south-facing aspects with slopes ranging up to 23%. Overstory mixture contains mostly white oak, black oak, northern red oak, pignut, and bitternut hickory. Understory associates are typically beech-maple with a few oaks and hickories scattered. Moderately dry slopes usually occur on southwestern-facing aspects with slopes ranging up to 11%. The overstory is usually dominated by white and post oaks, with an understory composition consisting of mainly white ash with a beech-maple emphasis. Other species include eastern red-cedar, persimmon, and blackgum. Mesic slopes occur on northern back-slopes with inclines reaching up to 25%. The understory resembles the other two ecosystem types, with the addition of sassafras, but the overstory is dominated by white oak, yellow-poplar, shagbark hickory, and sugar maple. Moist-mesic bottomlands occur where slopes are nonexistent (< 2%) and perennial streams flow vigorously. The overstory is diverse with mainly sugar maple, yellow-poplar, and American beech. Overall, the regeneration at these sites typically contain traces of poison ivy, greenbrier, Virginia creeper, as well as various other forbs and fruit-bearing shrubs, such as spicebush and blackberry.

Exotic Species

This tract contains relatively few invasives overall throughout the majority of the tract. Most invasive pop-ups were noted along edges and wherever gaps prevailed. There were a variety of species identified: mainly multiflora rose, but sparse appearances of Japanese honeysuckle, Japanese stilt grass, mimosa, and autumn olive. Multiflora rose was most prevalent along the edges of the tract boundary, with occurrences originating in gaps made within the eastern part of the tract. Japanese stilt grass was also seen around these areas and near previous skid and ATV trails. Mimosa was seen along the north boundary line near the road. Autumn olive was scattered throughout at random. These species are common throughout the County.

Recreation

This tract contains no designated recreation trails. However, there are many entry points into the tract which may provide for such recreational activities as hiking, wildlife viewing, bird watching, hunting, and mushroom hunting.

Cultural

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

Special Features

A powerline right-of-way runs through the middle of the tract. A few driveways cut straight into the tract along the northern border coming off of Sinai Road.

Tract Description and Silvicultural Prescription

The current forest resource inventory was completed by Sabrina Schuler and Evan McDivitt. Forty-nine prism points were sampled over 127 acres (1 point for every 2.57 acres). A tract summary of the inventory is given below and species breakdown of the summary is given in Table 3 below. The forest resource is composed of 3 different strata based on the two major timber types and size classes mentioned below.

Tract Summary Data

Total Trees/Ac. = **139**

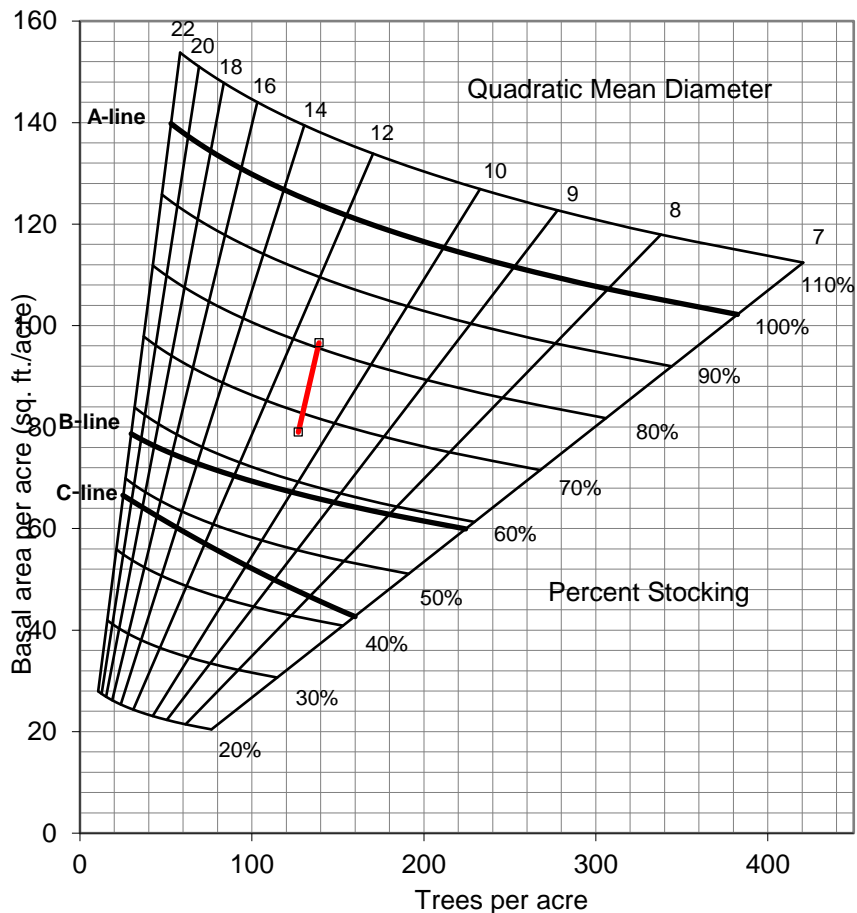
Basal Area = **96.6 Sq. Ft./Ac.**

Present Volume = **4,566 Bd. Ft./Ac.**

Overall % Stocking Hardwoods = **81%** (Fully Stocked)

Harvestable Trees = **12 Trees/Ac.**

Table 2. Gingrich Stand and Stock Table for Hardwoods for 0605.



Oak-Hickory Stratum

The Oak-Hickory timber type provides very significant wildlife and timber resource values. The retention of species in this stratum is important in the Division's long-term timber management objectives. The Oak-Hickory type covers roughly 53% of the tract or about 70 acres and has basal area of 98.5 square feet per acre. The overstory is dominated by white oak, black oak, and yellow-poplar. Understory regeneration consists primarily of beech-maple with white oak and bitternut hickory also present.

For the purpose of an improvement harvest, single tree selection is prescribed to remove poor quality and poorly formed oaks, especially black oak, while also targeting yellow-poplar and over-mature stems. Many of the black oaks are surpassing maturity. Most individuals range

from 20" to 25" and up to 30" DBH with deformities, scars, or are declining. There is a large growing stock underneath this canopy layer, containing mostly white oaks, hickories, and sugar maple. Removing these more mature, declining trees will enable understory trees to be released, white reducing deformities and suppression. Regeneration in these areas will primarily consist of beech-maple with a component of oak as long as TSI takes place in the understory on the beech-maple. Where oak regeneration is greatest, it may be wise to take out more mature trees to open up more light to the ground floor and combine with understory TSI or fire.

Mixed Hardwoods Stratum

The mixed hardwoods type covers roughly 28% of the tract or about 37 acres with basal area of 94.7 square feet per acre. The overstory is dominated by yellow-poplar, white oak, sugar maple, and bitternut hickory, with much of the understory growth being beech-maple. Regeneration consists mainly of hickory and maple, with a few other various trees scattered.

Single tree selection harvesting is prescribed to remove lower quality stems and mature to overmature trees which will help to improve crop tree spacing. An improvement cut is recommended to release quality oaks and hickories from crown competition of lesser-valued timber species. Overall, marking objectives within this component should consider oak, hickory, and other species of significant timber and wildlife value as the preferred crop trees to release. The improvement cutting in this area will also be applied to remove low-forking, overtopped/suppressed intermediates, epicormically sprouting, declining, and deformed trees. The long-term result of these prescribed cuttings should increase timber and wildlife habitat diversity. Group selection is a possibility in areas having low quality, disease/damaged stems, low basal area, or maturity to help maintain long-term forest regeneration and sustainability. Following the commercial harvest, post-harvest TSI is recommended to lower beech-maple stocking in areas where more desirable regeneration is present and to promote yellow-poplar and oaks.

Pine Stratum

Pines were typically planted for erosion control purposes during the first half of the 20th century. As these pines have matured and slowly declined, native hardwoods have become established in canopy gaps and have to an extent reached the overstory. Pine covers roughly 14% of the tract or about 17.5 acres with basal area of 106.1 square feet per acre. The overstory is composed of larger white pine. There are traces of Scotch, shortleaf, and Virginia pine found throughout the stratum. The understory is sparse with a few scattered tulip tree and maple saplings where mixed hardwoods intermix with pine, and various forbs.

Harvesting goals in the pine area would be to accelerate conversion to mixed hardwoods. Pine sawtimber should be cut in group selections.

Summary Tract Silvicultural Prescription and Proposed Activities

An improvement cut and harvest is recommended. Overall, the tract has a mixture of overmature trees, mature and younger growing stock. Single-tree removals will help the stand develop higher quality desirable species. Species to harvest include oaks, hickories, maple, ash, and pines. Some areas have been previously opened up and should be avoided, such as in the center of the tract on the east side of the powerline along the ridge. Harvesting in most areas will

need to be light to ensure an oak component is maintained. Understory TSI and prescribed fire are options to consider in areas with oak regeneration potential. TSI should be performed after harvest targeting areas with poor species composition and quality. The limited component of invasive species should be treated to prevent further spread before harvesting if practicable, where gaps prevail and along boundaries.

Table 3. Overview of Sawtimber Volume Estimates in 0605 in July of 2016

Species	Harvest	Leave	Total
American Beech	9,730	1,150	10,880
American Sycamore	3,140	1,800	4,940
Bitternut Hickory	2,990	48,510	51,500
Black Cherry	0	1,690	1,690
Blackgum	0	2,580	2,580
Black Oak	34,130	75,760	109,790
Black Walnut	0	1,990	1,990
Eastern White Pine	25,760	34,630	60,390
Northern Red Oak	7,680	8,440	16,120
Pignut Hickory	10,530	29,940	40,470
Post Oak	4,000	4,980	8,990
Red Maple	2,880	12,490	15,370
Shagbark Hickory	0	14,500	14,500
Shortleaf Pine	5,320	0	5,320
Sugar Maple	5,910	22,050	27,960
White Ash	8,100	5,620	13,710
White Oak	31,930	101,690	133,620
Yellow Poplar	25,440	34,560	60,000
Tract Totals (Bd. Ft.)	177,550	402,310	579,850
Per Acre Totals (Bd. Ft./Ac.)	1,400	3,170	4,570

Proposed Activities Listing

Proposed Management Activity

Vine / Invasives TSI
DHPA timber sale project review
Timber Marking
Timber Sale
Postharvest TSI
Reinventory and Management Guide

Proposed Period

CY2018-2020
CY2018-2020
CY2018-2020
CY2018-2020
Following Sale
CY2035

To submit a comment on this document, go to: www.in.gov/dnr/forestry/8122.htm

You must indicate the State Forest Name, Compartment Number and Tract Number in the “Subject or file reference” line to ensure that your comment receives appropriate consideration. Comments received within 30 days of posting will be considered and posted at

<http://www.in.gov/dnr/forestry/3634.htm>. Note: Some graphics may distort due to compression.