Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Ferdinand** Compartment: **04** Tract: **12**
Tract Acreage: **66** Commercial Forest Acreage: **66**
Forester: **S. Mallone & A. Smith** Date: **12/22/2013**

Location

Tract 0412 is located in Perry County, Sec. 24, T3S, R3W, off of State Road 145, just north of interstate 64. From SR 145 take Sigler Creek Road (just south of the IDOT facility) until you see Compton Road. Compton Road (also known as County Road 271) runs along the west side of the tract, until you reach Kellem Cemetery. After Kellem Cemetery, Compton Rd. turns into a private road. The Perry County-Dubois County line runs along the northern boundary of tract 12.

General Description

Tract 0412 consists of a total of 66 forested acres of which approximately 13.0 acres are of planted pine and 53.0 acres are of Mixed Hardwood forest type. Dry Branch Creek runs through the tract and evidence of a previous log yard and old skid trails can be seen. Kellem Cemetery is located on the northeast corner of the tract. Patches of pine can be found along the east side of the tract that includes shortleaf pine, eastern white pine, and Virginia pine. Flat, hilltop areas located in the northeast part of the tract used for pasture have reverted back to forest. This area is mainly comprised of sassafras and is thick with greenbriar. There is a heavy presence of greenbriar throughout the tract which could indicate past fire damage to the area. Hardwoods can be found along the slopes and intermixed with some of the pine. Several areas throughout the hardwood timber type have developed into a natural shelterwood like system with a thin overstory with abundant regeneration underneath. These areas were possibly caused by past grazing during which the animals ate the regeneration and caused an age gap to form in the forest. Tract 0412's timber resource ranges from small to large sawtimber in size. The overall timber quality of this tract is average. A summary of the forest resources in tract 0412 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Tract 0412 in August 2013

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Yellow Poplar	Black Oak	Red Maple
Black Oak	Sassafras	Sassafras
White Oak	Red Maple	Dogwood
Pignut Hickory	Virginia Pine	Sugar Maple
Eastern White Pine	Shagbark Hickory	American Beech
Northern Red Oak	Eastern White Pine	American Elm
Shortleaf Pine	Sugar Maple	Black Oak
Virginia Pine	Pignut Hickory	Bluebeech
Shagbark Hickory	Shortleaf Pine	Shagbark Hickory
Blackgum	White Oak	White Ash
Red Maple	Dogwood	*Paw Paw
Sugar Maple	Black Cherry	
Bitternut Hickory	Blackgum	
American Sycamore	American Elm	
Scots Pine	Yellow Poplar	
Black Cherry	Bitternut Hickory	
Red Pine	Red Pine	
White Ash	American Sycamore	
Black Walnut		
American Beech		

History

The land area that includes Tract 0412 (see Figure 1) was deeded to the State of Indiana through three separate deeds. The 1947 deed from Anthony and Iva Main conveys 69 acres in Compartment 4, tracts 11 and 12 and describes the 10 acre Critchfield exception and the 1.0 acre Kellem Cemetery exception. The description in this warranty deed is duplicated in 1947 quit claim deed from John Choat. In 1956, a 40 foot ROW was granted by the Deptartment of Conservation to construct the county road from Sigler Creek Road to Kellem Cemetery through State Forest property.

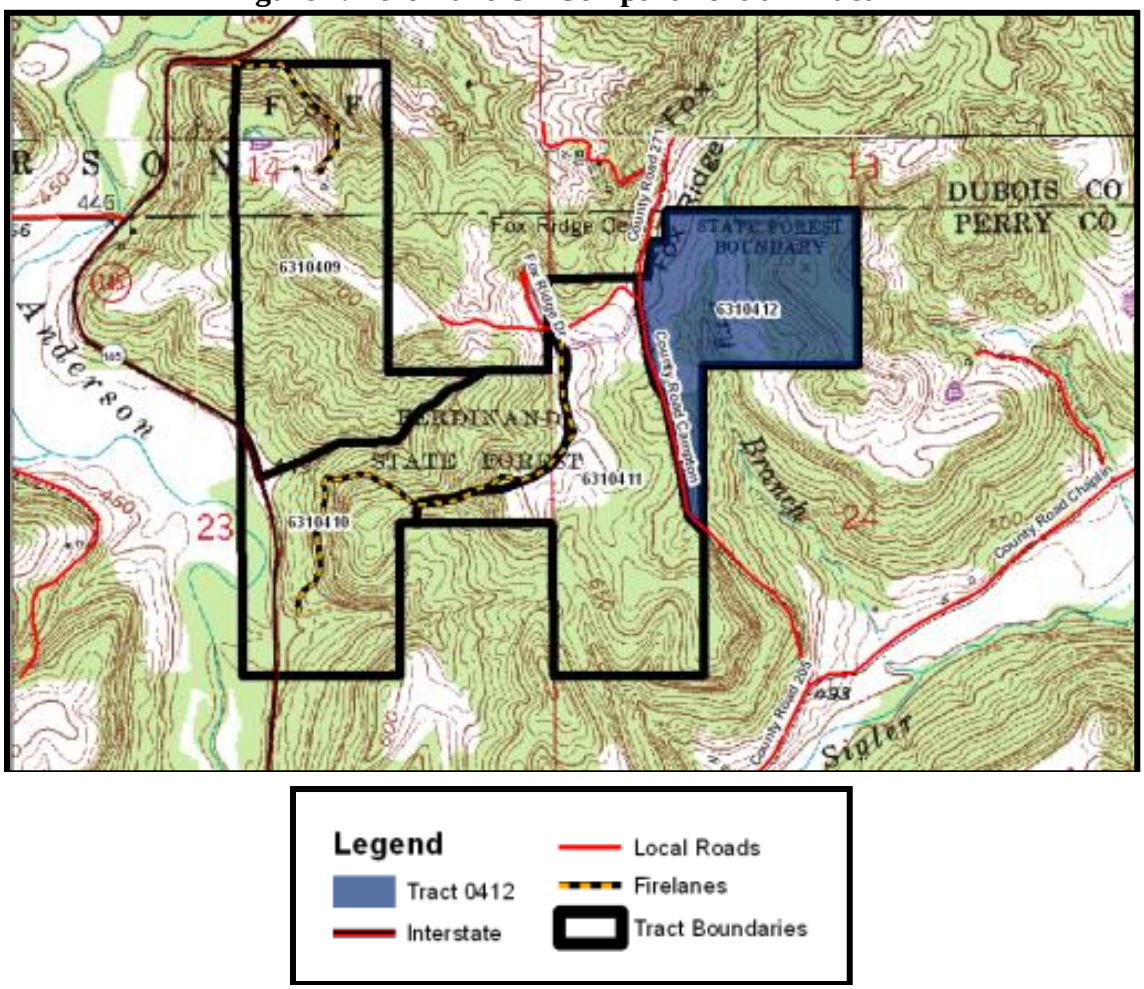
Plantation records show that shortleaf, Virginia pine, and red pine were planted in 1952 on 26 acres of the "Anthony Main Place" in an 8x8 spacing by hand and machine. This area covers both tracts 11 and 12. There are no planting records for the 2 acre eastern white pine stand. A "waterhole" was constructed in 1965 with Pittman-Robertson funds (Waterhole #24) just off the County Road.

The first recorded resource inventory was conducted in June, 1982 by forester Janet Eger (2,453.4 BdFt/A total volume). A resource inventory was conducted on tract 12 in June, 1997 by forester Zvirblis (5,719.4 BdFt/A total volume). Forester Gretchen Herbaugh sold 207 trees from 14 acres of tract 12 on March 25, 2004 to Indiana Hardwoods (42,500 BdFt estimated volume). Harvest was completed on August 20, 2004 and TSI was completed on January 16, 2007. The current tract resource inventory was completed on August 27, 2013 by forester Sally Malone.

Landscape Context

The ridgetops are mostly comprised of old field mixed hardwoods and planted pine plantations while, the sideslopes are mostly comprised of mixed hardwoods. The tract is completely surrounded by the dominantly closed forest canopy, however, a small pasture is located south of the tract approximately 1,000ft. State forest is to the west of the tract, and private ground to the north, east, and south. There is a private residence to the north and a private camping area to the west off of the county road, north of tract 11. The Kellem Cemetery lies at the northwest edge of the tract. The general area consists of closed canopy forest with dispersed residential areas and agriculture fields.

Figure 1. Ferdinand SF Compartment 04 Tract 12



Topography, Geology and Hydrology

The Tract's topography is made up of slight slopes (10-25%), a main draw, and a few small drainages. This area is part of the Anderson River watershed. The main drainage, Dry Branch Creek, is a mapped intermittent stream which drains to the south into Sigler Creek which drains into the Anderson River just west of Kitterman Corners (Possum Junction).

Soils

Adyeville-Wellston-Deuchars Silt Loam (AbvD2). The Adyeville soils are somewhat excessively drained, have a watertable at a depth greater than 40 inches and are on sideslopes on uplands. Slopes are 8 to 20 percent. The native vegetation is hardwoods. The surface layer is silt loam and has moderately low or moderate organic matter content. Permeability is moderate in the restrictive layer above the bedrock. Available water capacity is low. Bedrock is at a depth of 20-40 inches. The Adyeville soil portion has no site indexes listed. The Wellston soils of this category are well drained, have a watertable at a depth greater than 40 inches and are on sideslopes and uplands. Slopes are 8 to 20 percent. The native vegetation is hardwoods. The surface layer is silt loam and has moderately low or moderate organic matter content. Permeability is moderate in the most restrictive layer above 60 inches. Available water capacity is moderate. The Wellston has a site index of 81 for northern red oak. The Deuchars soils are moderately well drained, have a seasonal high water table at 2 to 3 feet and are on sideslopes on uplands. Slopes are 8-20 percent. The native vegetation is hardwoods. The surface layer is silt loam and has moderately low or moderate organic matter content. Permeability is slow and available water capacity is moderate. Bedrock is at a depth of 60-80 inches. Deuchars has a site index of 90 for northern red oak.

Adyeville-Wellston-Deuchars Silt Loams (AbvD3), 8 to 20 percent slopes – Composition: Adyeville and similar soils: 29 percent; Wellston and similar soils: 25 percent; Deuchars and similar soils: 18 percent; Dissimilar components: 28 percent Adyeville-Wellston-Deuchars stony silt loams intermixed throughout the unit. This association occurs on backslopes on hills and structural benches underlain with interbedded sandstone, shale, and siltstone. Properties and qualities of the Adyeville Soil: residuum derived from interbedded sandstone, shale, and siltstone. Slope is 8 to 20 percent. The depth to bedrock is 20 to 40 inches. This is a somewhat excessively drained soil. No site index was given for the Adyeville soil type. Properties and qualities of the Wellston Soil parent material for this soil is loess over residuum derived from interbedded sandstone, siltstone, and shale with a slope of 8 to 20 percent. Depth to bedrock is 40 to 60 inches. This is a well drained soil. The site index for Wellston is 81 for northern red oak. Properties and qualities of the Deuchars Soil: parent material is loess or silty colluvium over residuum derived from shale interbedded with thin beds of sandstone with a slope of 8 to 20 percent. Depth to bedrock is 60 to more than 80 inches. This soil is moderately well drained. Site index is 90 for northern red oak.

Adyeville-Tipsaw-Ebal complex (AccG) is found on 20-50 percent slopes and is very rocky. Adyeville-Wellston-Deuchars Silt Loam (AbvD2). The Adyeville soils are somewhat excessively drained, have a watertable at a depth greater than 40 inches and are on sideslopes on uplands. Slopes are 8 to 20 percent. The native vegetation is hardwoods. The surface layer is silt loam and has moderately low or moderate organic matter content. Permeability is moderate in the restrictive layer above the bedrock. Available water capacity is low. Bedrock is at a depth of 20-40 inches. The Adyeville soil portion has no site indexes listed. The Tipsaw soils are somewhat excessively drained, have a watertable at a depth greater than 40 inches and are on sideslopes on uplands. Slopes are 20-50 percent. The native vegetation is hardwoods. The surface layer is silt loam and has moderate or high organic matter content. Permeability is very slow in the most restrictive layer above bedrock. Available water capacity is moderate. Bedrock is at a depth of 50-80 inches. The Tipsaw portion has a site index of 70 for Black oak. The Ebal

soils are moderately well drained with a seasonally high water table at 2-3 feet and are on sideslopes and uplands with slopes of 20 to 30 percent. In terms of forestland productivity, the Ebal portion has a site index of 80 for black oak.

Apalonia silt loam (AgrB) is moderately well drained on 2 to 6 percent slopes with a depth to water table of about 24 to 36 inches. This soil is moderately suited for haul roads, log landings, and the use of harvesting equipment. Site index is 60 for black oak and white oak.

Apalonia silt loam (AgrC2) is somewhat moderately well drained on 6 to 12 percent slopes with a depth to water table of 24 to 36 inches. This soil is eroded and has a farmland classification of not prime farmland. It is classified as suitable for trees/timber and woody vegetation. Site index is 60 for black oak and white oak.

Access
Tract 0412 is easily accessible off of Compton Road. There is public parking area available by the Kellem Cemetery. A proposed DHPA roadwork project will need to be reviewed by the Division of Forestry Archaeologist prior to completing any timber sale roadwork improvements or log yard construction.

Boundary
The tract is bordered to the west by State Forest with the western boundary running along Campton Road. The north, south and east boundaries run along privately owned property. The tract's private ownership boundaries need to be marked better before a timber harvest is conducted. Corner evidence was identified in the field for all but one corner. Boundary lines around Kellem Cemetery are indicated by a line of redcedar trees.

Wildlife
A Natural Heritage Database Review was completed for tract 0412 in 2013. If rare, threatened or endangered species 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. Songbirds, crows, chipmunks, squirrels, box turtles, toads, and a garter snake were observed in the tract during the inventory. Deer stands and shotgun shells have been found in the tract. Tract 01412 has an abundant supply of food resources such as soft and hard mast. The wildlife pond and the mapped intermittent stream provide ephemeral water sources for wildlife during non-droughty periods of the year.

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 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 croptrees and will enhance the vigor of these sawtimber trees. Timber Stand Improvement (TSI) and crop tree release following the harvest is planned which will increase standing snag counts. Crop tree release work will focus on legacy tree species increasing the number of legacy trees in the larger diameter ranges over the long term management of the tract. Management practices conducted on 0412 will be conducted in a manner that will maintain the long-term and quality forest

habitats for wildlife populations. This tract is located outside of any known IN Bat management buffers.

Live Legacy Trees* and Snags inventoried August 2013 on F0412

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	594		522	-72	
20"+ DBH	198		113	-85	
Snags (all species)					
5"+ DBH	264	462	1,956	1,692	1,494
9"+ DBH	198	396	375	177	-21
19"+ DBH	33	66	31	-2	-35

*** Species Include:** AME, BIH, BLL, COT, GRA, REO, POO, REE, SHH, ZSH, SIM, SUM, WHA, WHO

Communities

Tract 0412 is composed of mesic upland hardwoods dominated by Mixed Hardwoods and pine plantings. The dominant overstory timber species include black oak, yellow poplar, white oak, pignut hickory, and northern red oak. Planted shortleaf pine, Virginia pine, red pine, and eastern white pine also contributes a significant portion of tract 12's ridgetop and lowland habitat. The understory contains some oak but consists mainly of black oak, sassafras, red maple, Virginia pine, and shagbark hickory. The ground cover of tract 0412 consists of mainly mesic to dry mesic species.

Exotic Species

Amur honeysuckle, Autumn olive, periwinkle, Japanese stiltgrass, Japanese honeysuckle, and multiflora rose were observed during the inventory. Control measures may be warranted if populations are located in planned regeneration openings. The prompt reseeding of exposed surface roads and yarding areas during timber sale closeout can help reduce the spread and extent of exotic species into the tract.

Recreation

Likely recreational activities on this tract include hiking, bird watching, wildlife viewing, hunting, and mushrooming.

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.

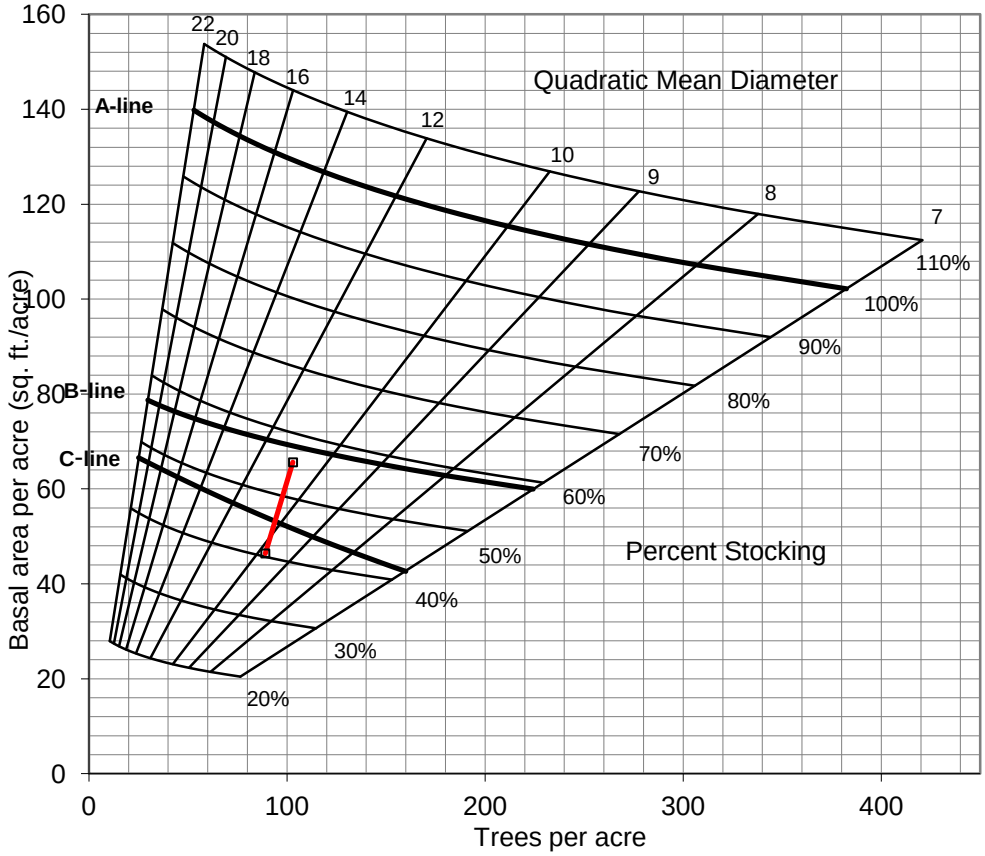
Tract Subdivision Description and Silvicultural Prescription

The overall stand structure for this tract is represented in the following Gingrich Stand and stock table that follows the individual stand summary.

Tract Summary Data

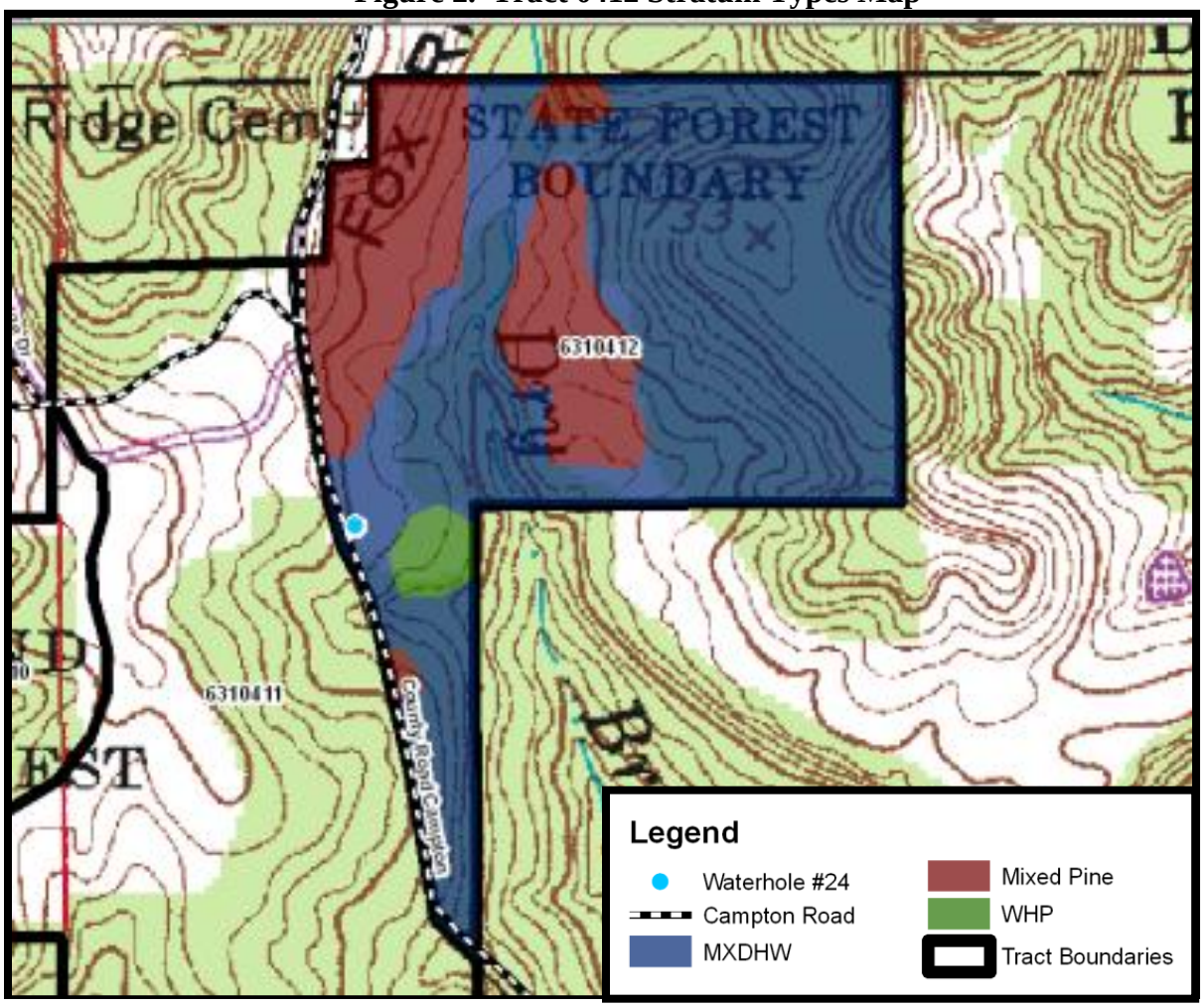
Total Trees/Ac. = **108 Trees/Ac.** Hardwoods Overall % Stocking = **57%** (Understocked)
BA/A = **70.8 Sq. Ft./Ac.** Sawtimber & Quality Trees/Ac. = **57 Trees/Ac.**
Present Volume = **4,359 Bd. Ft./Ac.**

Table 2. Gingrich Stand and Stock Table for Hardwoods for 0412 in August 2013



The current forest resource inventory was completed on August 27, 2013 by forester Sally Mallone. 30 prism points were sampled over 66 acres (1 point for every 2.2 acres). A tract summary of the forest resource inventory is given above and a species breakdown of the summary is given in Table 3 below. The hardwoods portion of this stand is considered understocked overall. The tract's forest resource is composed of 2 different stratums based on the 2 major timber types and size classes mentioned below.

Figure 2. Tract 0412 Stratum Types Map



Mixed Hardwoods Stratum

The Mixed Hardwoods timber type can be very variable in composition and thereby have more complicated prescriptions. The mixed hardwoods timber type covers roughly 80.3% of the tract or about 53 acres with an average basal area of 65.6 square feet per acre. This stand type is considered under stocked at approximately 57%, with a mean tree diameter of 11 inches and 103 trees per acre. There are average quality yellow poplar, oaks, and hickories in the stand. Some of the black oak is of above average quality. There are a lot of quality trees of 15-19 inches DBH that would benefit from an improvement harvest, especially the black oak in the tract.

Several areas throughout the hardwood timber type have developed into a natural shelterwood like system with a thin overstory with abundant oak regeneration underneath, some over 10ft tall. These areas were possibly caused by past grazing during which the animals ate the regeneration and caused an age gap to form in the forest. The removal of these thin overstory areas through group selection openings would allow for the nicer oak regeneration to flourish and replace the poor formed and possibly fire damaged overstory trees. Single tree selections should only be made in limited circumstances during this harvest, such as to allow for the implementation of skid trails from the group selection openings out to the log yard. While the original inventory

shows a harvest volume greater than 50% of the total hardwood volume, the described limited opening prescription would remove less than this original estimation.

Waterhole #24
The waterhole will be retained and Indiana guidelines for Best Management Practices (BMP's) will be followed during management activities near permanent wildlife ponds.

Old Pine Plantation Stratums
Pines were commonly planted for erosion control purposes during the first half of the 20th century. As these pines have matured and individual trees have declined native hardwoods have become established especially in the stratum's understory and canopy gaps. This timber type covers roughly 19.7% or about 13 acres of the tract with an average basal area of 91.8 square feet per acre. The overstory is dominated by shortleaf pine, Virginia pine, eastern white pine, Scotch pine, with a few random red pines intermixed. The pine has a mean tree diameter of 11 inches and 127 trees per acre.

The Virginia pine is of pole and small sawlog size and is gradually declining and falling out. Evidence of some wind damage can be seen. Patches of the Virginia pine can be found near the center of the tract east of Dry Branch Creek. There is decent hardwood regeneration in these small stands.

There is a 2 acre patch of eastern white pine near the south boundary line that is made up of smaller trees 10-15 inches in diameter that were planted in the mid 30's. There is not much hardwood regeneration in the understory of this 2 acre patch and therefore could be left due to its wildlife value and re-evaluated in the next inventory. Near Compton Road there is another white pine patch that would be more accessible to harvest. This smaller stand of white pine is heavily stocked and has a good amount of hardwood regeneration in the understory.

The shortleaf pine is of sawlog size and has pole size and sawlog sized mixed hardwoods mixed in. The shortleaf is fairly scattered and not heavily stocked near the northwest portion of the tract. An opening should be considered with the pine located on the west half of the tract near the road. This would benefit the hardwood regeneration growing in the stand.

Group selection is a possibility in areas of low quality, disease/damaged stems, low basal area, or maturity to help maintain long-term forest regeneration and sustainability. Group selections may be appropriate to regenerate the pine into native hardwoods. Areas where poletimber hardwoods have emerged and entered the stratum canopy should be prescribed TSI for croptree release if not adequately released during the prescribed timber harvest. Overall, marking objectives within this component should consider oak and other species of significant wildlife value as the best croptrees for future conservation. Some quality and vigorous pine may be retained as they provide wildlife habitat diversity and cover.

Summary Tract Silvicultural Prescription and Proposed Activities
A nice balance of pine openings and group selection openings in the mixed hardwoods would benefit this tract greatly. TSI of understory beech and sassafras would need to occur with-in 1 to 2 years after the harvest to give the oak regeneration a better chance at survival. Pre-harvest invasive control should also be considered if near a planned regeneration opening.

Boundary lines should be remarked along the north, east, and south lines prior to a timber harvest.

Dry Branch Creek will be impacted slightly by a creek crossing during timber operations. This is a rock bottom creek with possible places to cross located on the northern end of the tract. Conditions will have to be dry in order to log in some areas.

Old skid trails and log yard will be reused for the prescribed harvest.

Given the recent inventory and growth of tract 0412's forest resources, a managed timber harvest to release areas of good oak and hickory regeneration is prescribed within the next five years.

The Indiana guidelines for Best Management Practices (BMP's) will be followed during management activities. Portions, or all, of the tract will be submitted for postharvest TSI and/or invasives work if deemed appropriate by the administering forester. A field review for regeneration opening success is planned 3-4 years after opening TSI completion.

Table 3. Overview of Sawtimber Volume Estimates in F0412 in August of 2013

Species	Harvest	Leave	Total
Yellow Poplar	36,570	27,370	63,940
Black Oak	24,240	32,540	56,780
White Oak	17,100	19,580	36,680
Pignut Hickory	7,790	13,970	21,760
Eastern White Pine	21,380	0	21,380
Northern Red Oak	0	18,280	18,280
Shortleaf Pine	13,460	0	13,460
Virginia Pine	9,140	0	9,140
Shagbark Hickory	1,360	7,720	9,080
Blackgum	0	6,850	6,850
Red Maple	6,580	0	6,580
Sugar Maple	2,690	2,400	5,090
Bitternut Hickory	1,940	1,730	3,670
American Sycamore	0	3,350	3,350
Scots Pine	2,580	0	2,580
Black Cherry	0	2,490	2,490
Red Pine	2,300	0	2,300
White Ash	2,030	0	2,030
Black Walnut	0	1,610	1,610
American Beech	640	0	640
Tract Totals (Bd. Ft.)	**149,800**	**137,890**	**287,690**
Per Acre Totals (Bd. Ft./Ac.)	**2,270**	**2,089**	**4,359**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
Evaluate stand for opening locations	CY2014-2015
DHPA timber sale project review	CY2014-2015
Timber Marking & Invasive Evaluation	CY2014-2015
Timber Sale	CY2014-2015
Postharvest TSI & Invasives Follow-up	CY2015-2019
Regeneration Opening Review	CY2019-2021
Reinventory and Management Guide	CY2028

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