Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Ferdinand** Compartment: **01** Tract: **05**
Tract Acreage: **133** Commercial Forest Acreage: **133**
Forester: **M. Vogel & A. Smith** Date: **12/22/2013**

Location

Tract 0105 is located in Dubois County, Sections 5 and 6, T3S, R3W in Jefferson Township. It is located roughly 4.4 miles southwest of Birdseye and 5.6 miles east northeast of Ferdinand. The tract is accessible by Firelane 6 off of County Road 700 South.

General Description

Tract 0105 consists of approximately 133 acres with roughly 5 acres of planted eastern white pine intermixed with yellow poplar and roughly 128 acres of mixed hardwoods and oak-hickory forest. The eastern white pine and yellow poplar stratum is located on the eastern side of the tract. The mixed hardwood stratums occur mostly on the eastern half of the tract and along the mapped intermittent stream in the western half of the tract. The oak-hickory stratums occur in the western half of the tract. The northeast corner appears to be developing well after the 2000 harvest, where saplings and pole-sized mixed hardwood species are regenerating. Regeneration is sparser in the rest of the tract. Many dead down trees are scattered throughout the tract and the canopy is fairly open on the ridge tops and upper parts of the slopes. The canopy is more closed and the understory more sparse down in the drainages, where sites are very damp and rich. Large sawtimber-sized yellow poplar and hickory species make up the overstory with pole-sized elm, sugar maple, American beech, and scattered black walnut grow underneath in the drainages. Thick patches of spicebush, pawpaw, and sapling-sized yellow poplar grow under gaps in the canopy. Large sawtimber-sized white, black, and northern red oaks, ranging from poor to very good quality, can be found in the north finger of the tract. The overall timber quality of this tract is average and ranges from small to large sawtimber in size. A summary of the forest resources in tract 0105 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Tract 0105 in June 2013

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer

Yellow Poplar White Oak Black Oak Northern Red Oak Eastern White Pine Bitternut Hickory Pignut Hickory Sugar Maple Scarlet Oak American Sycamore Black Cherry White Ash Blackgum Red Maple Chestnut Oak American Beech Shagbark Hickory Sweetgum Black Walnut Sassafras	Sugar Maple White Oak Red Maple Blackgum American Beech Eastern White Pine Yellow Poplar Pignut Hickory Sassafras Persimmon Sweetgum White Ash Chestnut Oak	Sugar Maple Yellow Poplar Dogwood Blackgum American Beech Black Cherry Sweetgum Eastern Red Bud Pignut Hickory Red Elm Red Maple Shagbark Hickory

History

The land area that includes tract 0105 (see Figure 1) was deeded to the State of Indiana through three separate deeds. Sixty acres were deeded to the State of Indiana by Jacob Drach in 1939 for the price of $1.00. William and Mary Bowman Smith contributed 79.2 acres towards tracts 0105 and 0106 in 1939 for $1.00. Susan Horney contributed 108.01 acres towards tracts 0105 and 0106 in 1940 also for the price of $1.00.

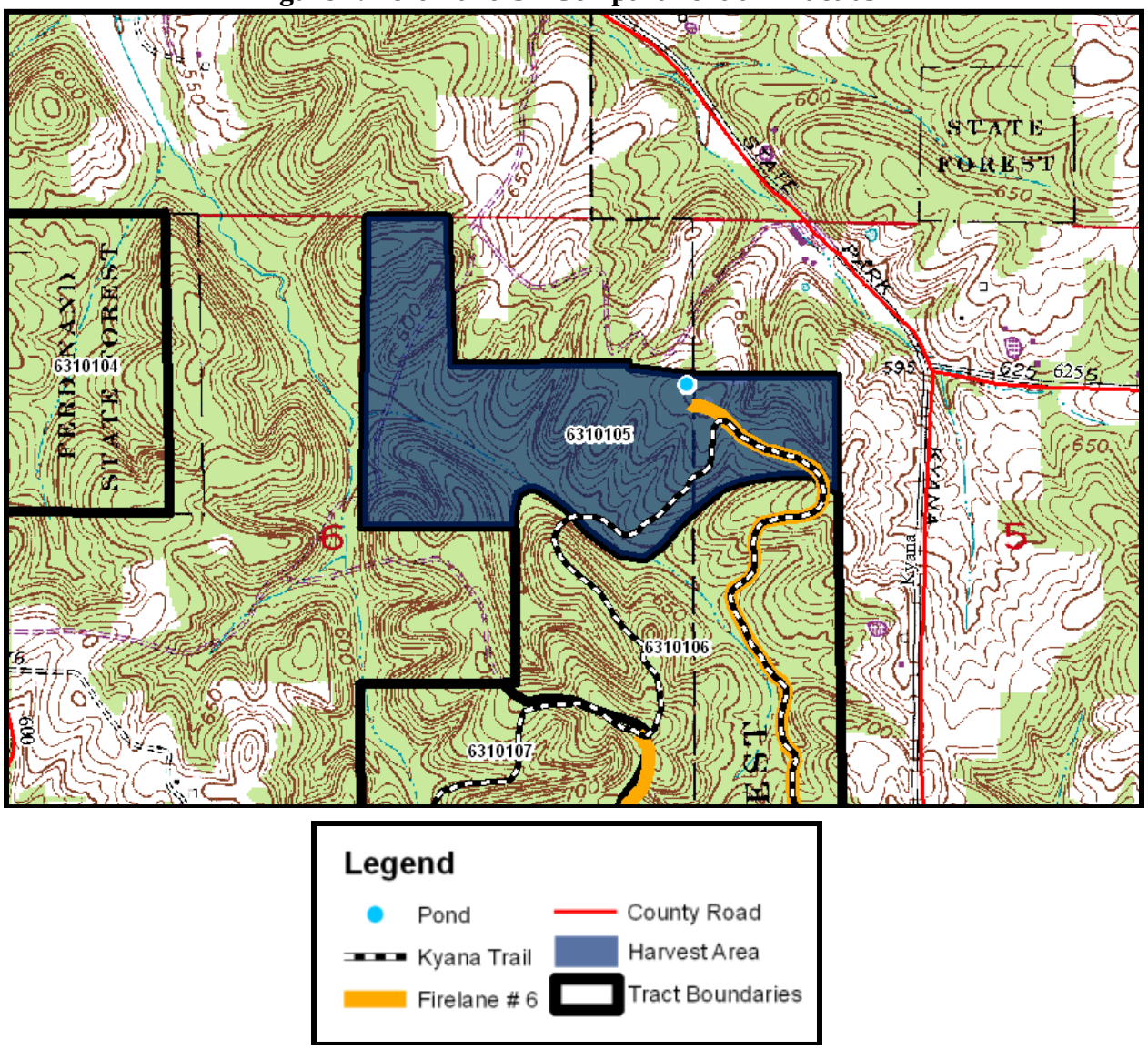
Records indicate that eastern white pine and Jack pine were planted in 1950 on a portion of the Susan Horney acreage. A wildlife pond was created by the Division of Fish and Wildlife in the 1960's using Pittman-Robertson funds. The first resource inventory was performed by forester Ben Hubbard in 1977 (estimated 3,500 BdFt/Acre). In 1982, foresters Ben Hubbard and Janet Eger sold 160,526 board feet from 70 acres of tract 0105 to W. H. Worle for $20,175.00. Portions of the northern line and the eastern line were surveyed in 1986. Foresters Doug Brown and Nate Osburn sold 190,885 board feet in 783 trees from 69 acres of tract 0105 to DMI Furniture Company for $78,750.00 in 1999. This timber harvest was completed on July 26, 2000. The current tract resource inventory was completed on June 28, 2013 by Miranda Vogel.

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 with a dominate oak presence.

State forest surrounds the south east end of the tract while private forest land and agricultural land lies around the north, south east, east, and west boundaries. Water sources on the tract include small and large ephemeral drainages, a mapped intermittent stream, and a man-made wildlife pond.

Figure 1. Ferdinand SF Compartment 01 Tract 05



Topography, Geology and Hydrology

North, south, and west-facing slopes varying from long and gentle to abrupt and steep characterize tract 0105. The eastern white pine and yellow poplar stand on the ridgetop on the east side of the tract is relatively flat. Signs of decades old past soil erosion exist under the eastern white pines. The tract contains a few small rock outcrops, particularly in the northeast corner and in the south-central part of the tract near the boundary.

Soils

Gilpin-Berks complex (GoF) makes up the greatest area of this tract. The Gilpin-Berks complex contains Gilpin and Berks soils. They are well-drained with a depth of more than 40 inches to the water table. They occur on 20-50% side slopes in upland areas. The Gilpin surface layer is silt loam and the Berks surface layer is channery silt loam. Organic matter content is moderately low and permeability is moderate. Available water capacity is 3.7 inches above 60 inches in Gilpin soils and 2.6 inches above 60 inches in Berks soils. The pH range and depth to bedrock are the same as the previously listed Gilpin soils. The site index for Gilpin soils is 95 and the site index for Berks soils is 70.

Gilpin silt loam (GID2) is a well-drained soil with a depth of more than 40 inches to the water table occurring on 12-18% side slopes in upland areas. It is eroded. It contains 1-3% organic matter. It is moderately permeable at 0.6 to 2 inches per hour above 60 inches and available water capacity is low at 3.9 inches above 60 inches. The pH ranges from 3.6 to 5.5. Bedrock begins at a depth of 20-40 inches. This soil type can be found in the center of tract 0105.

Gilpin silt loam (GID3) is similar to Gilpin silt loam (GID2). Gilpin silt loam (GID3) differs only in that it is severely eroded and contains less organic matter at 1-2%. Both soils have a site index of 95. Both can be subject to drought. This soil type is located in the southeastern part of the tract.

Gilpin silt loam (GIE) occupies a very small area in the northeast corner of this tract. It is a well-drained soil with a depth of more than 40 inches to the water table occurring on 18-25% side slopes in upland areas. It contains 1-3% organic matter and is moderately permeable. Available water capacity is low, 3.7 inches in the upper 60 inches. The site index is 95.

Wellston silt loam (WeC2) is a well-drained soil with a depth of more than 40 inches to the water table occurring on 6-12% side slopes in upland areas. It is eroded. It has a silt loam surface layer, contains moderately low organic matter, and has moderate permeability. Available water capacity is 7.8 inches above 60 inches. The pH ranges from 4.5 to 6.0. Bedrock begins at 40 to 72 inches. This soil has a site index range of 81-90.

Zanesville silt loam (ZnC2) is a moderately well-drained soil with a depth of 2-3 feet to the water table, seasonally. It occurs on 6-12% side slopes in upland areas. Organic matter content is moderately low at 1-2% and permeability is very slow. Available water capacity is 8.2 inches above 60 inches. The pH ranges from 4.5 to 6.0. Bedrock begins at a depth of 50-90 inches. This soil has a site index range of 69-90. This soil type can be found in the north-central part of the tract and in a few other small areas throughout the tract.

Access

Tract 0105 is easily accessible off of County Road 700 South by Firelane 6. Firelane 6 provides access to the east side of the tract and Firelane 5 approaches the southwest portion of the tract. Firelane 5 crosses through private property, so permission would need to be obtained to use it for management activities. The Kyana Trail also cuts through the eastern half of tract 0105.

Boundary
Most of the tract's boundaries are indicated in the field; however, the flagging will need to be updated prior to any future harvest activities. The southeast corner is marked by a post. Yellow signs and orange flagging indicate the private property line of the north boundary, which lies 25 feet or so inside the boundary shown in the state forest tract files. There are a few girdled trees on the state forest side along that border. A surveyor's sign can be found at the inside northwest corner and a private inholding is located in the northeast part of the tract.

Wildlife
A Natural Heritage Database Review was completed for tract 0105 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 0105 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. Management practices conducted on 0105 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Live Legacy Trees* and Snags inventoried June, 2013 on F0105

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	1,197		2,415	1,218	
20"+ DBH	399		885	486	
Snags (all species)					
5"+ DBH	532	931	1,043	511	112
9"+ DBH	399	798	596	197	-202
19"+ DBH	66.5	133	108	42	-25

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

Communities
Tract 0105 is composed of mesic to dry-mesic upland hardwoods dominated by oak-hickory, mixed hardwoods, and pine plantings. The dominant overstory timber species include yellow poplar, white oak, black oak, and northern red oak. Planted eastern white pine also contributes to a portion of tract 0105's ridgetop habitat. The understory contains mainly sugar maple, white

oak, red maple, blackgum, American beech, and eastern white pine. The ground cover of tract 0105 consists of mainly mesic to dry mesic species.

Exotic Species
Amur honeysuckle, Japanese honeysuckle, and multiflora rose were observed during the inventory. Significant patches of these invasive exotic species are scattered throughout the tract, and are more prevalent where deteriorating pine is giving way to medium and large sawtimber-size hardwood species and in the presence of dead down debris. Control measures may be needed if populations are located in future regeneration openings. Otherwise the extent and severity of infestation should be mapped for future treatment. Ailanthus was identified in a regeneration opening on tract 0106 just across the mapped intermittent stream from tract 0105. The Ailanthus and Amur honeysuckle should be treated prior to a timber harvest on tract 0105 in order to prevent its spread into tract 0105.

Recreation
Likely recreational activities on this tract include hiking, bird watching, wildlife viewing, hunting, and mushrooming. The Kyana Trail runs through the eastern and southern parts of the tract. The trailhead is located in the white pine/yellow-poplar stand and several bicyclists could be seen using it over the course of the inventory. An old deer stand has been identified; as well as a well-maintained deer stand and recently discarded shotgun shells suggest this tract is used extensively by hunters. Relatively recent trash has been spotted in flat areas near the drainages and on gently rolling hills in the oak-hickory areas.

The Kyana Trail is used regularly by recreationalists and it is recommended that it should be kept in good condition. The aesthetic value of the stream in the main drainage, which lends scenic quality and character to the tract, is also recommended for consideration during management activities.

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.

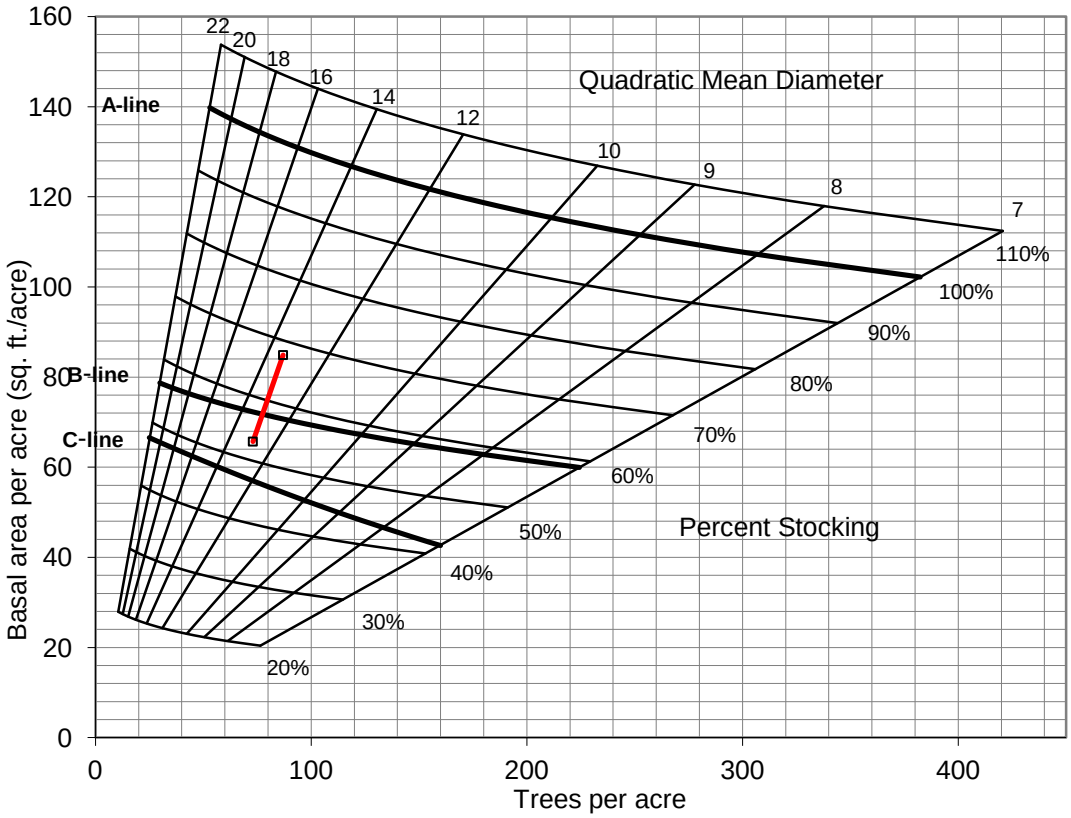
Tract Subdivision Description and Silvicultural Prescription

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

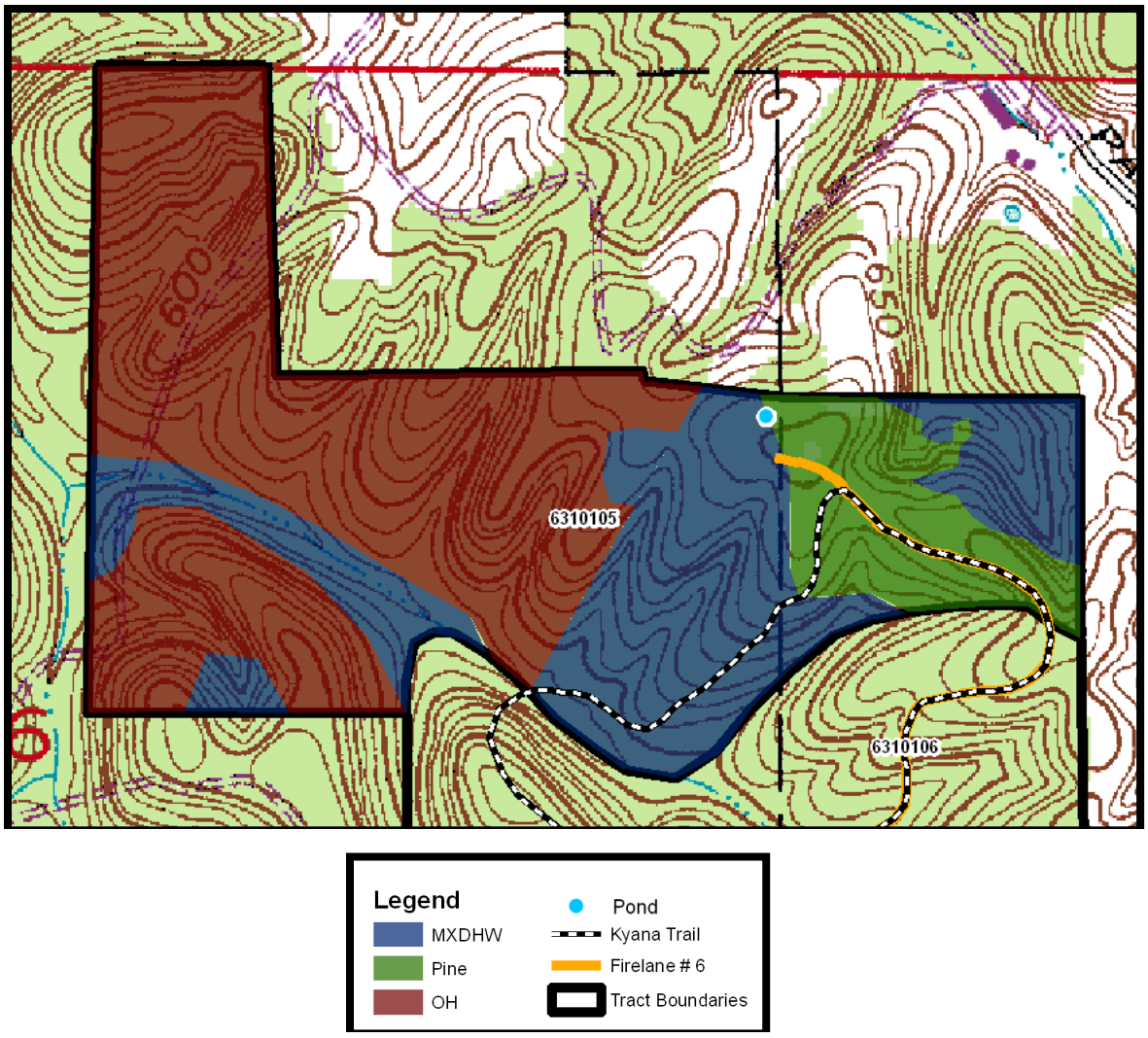
Total Trees/Ac. = **86 Trees/Ac.** Overall % Stocking Hardwoods = **68%** (Fully Stocked)
BA/A = **85.2 Sq. Ft./Ac.** Sawtimber & Quality Trees/Ac. = **32 Trees/Ac.**
Present Volume = **8,853 Bd. Ft./Ac.**

Table 2. Gingrich Stand and Stock Table for Hardwoods for 0105 in June, 2013



The current forest resource inventory was completed on June 28, 2013 by Miranda Vogel. Fifty-four prism points were sampled over 133 acres (1 point for every 2.46 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 tract's forest resource is composed of 3 different stratums based on the 3 major timber types and size classes mentioned below.

Figure 2. Tract 0105 Stratum Types Map



Mixed Hardwoods & Oak Stratum

This inventory has combined the oak-hickory stratum and the mixed hardwood stratum in TCruise. The mixed hardwoods timber type can be very variable in composition and thereby have more complicated prescriptions. The mixed hardwoods type covers roughly 96.2% of the tract or about 128 acres with an average basal area of 84.9 square feet per acre. This stratum type is considered fully stocked at approximately 68%, with a mean tree diameter of 11.6 inches and 87 trees per acre. The overstory is dominated by white oak, yellow poplar, black oak, northern red oak, bitternut hickory, sugar maple, and scarlet oak. The understory layer consists of mainly sugar maple, white oak, red maple, blackgum, and American beech. The regeneration layer consists of mainly sugar maple, yellow poplar, dogwood, blackgum, and American beech. The mixed hardwood stratum occur mostly on the eastern half of the tract and along the mapped intermittent stream in the western half of the tract, while the oak-hickory stratum occur in the western half of the tract.

A fair amount the tract's yellow poplar appeared to be in modest decline as a result of the past three years of drought and the Tulip Poplar Scale insect infestation that occurred in the late

spring of 2012. Affected yellow poplar will need careful review when the tract is marked as mortality is expected.

Sugar maple borer damage was noted in understory SUM throughout both the Mixed Hardwoods and Oak-Hickory stratum. In time this pest girdles the bole of the tree that results in the stem breaking apart during moderate and severe windstorms. Removal of affected trees will be classified as a combination improvement and sanitation cutting.

Single tree selection cuttings are prescribed to remove lower quality stems and mature to overmature trees which will help to improve croptree spacing. An improvement cutting is prescribed to release quality oaks, hickories and walnuts from crown competition of lesser-valued timber species. This is an important change in the Mixed Hardwood component as these timber species tend not to be heavy mast producers nor tend to provide valuable timber resources. Overall, marking objectives within this component should consider oak, hickory, walnut, and other species of significant timber and wildlife value as the preferred croptrees to release. Improvement cuttings in this area will also be applied to remove low-forking, leaning, overtopped/suppressed intermediates, epicormically sprouting, and deformed trees. The long term result of these prescribed cuttings will increase timber and wildlife habitat diversity. 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. Planned regeneration openings are expected to return to mixed hardwoods with a strong component of YEP.

Old Pine Plantation Stratum

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 3.8% of the tract or about 5.0 acres of the tract with an average basal area of 100 square feet per acre. The eastern white pine and yellow poplar stratum is located on the eastern side of the tract. The overstory is dominated by eastern white pine, yellow poplar, black cherry, and white oak. The understory layer consists of mainly yellow poplar, black cherry, red maple, blackgum, black walnut, white oak, black oak, dogwood, and redbud. The regeneration layer consists of mainly yellow poplar, red maple, American beech, redbud, and dogwood. The average sawtimber size eastern white pine has a DBH of 17.7 inches while, the average sawtimber sized yellow-poplar has a DBH of 20.7 inches. A dense layer of shrubs and vines including poison ivy, spicebush, multiflora rose, greenbrier, and Amur honeysuckle occur throughout the pine stratum wherever the overstory canopy is thin or open due to blowdown or mortality. Invasive exotics located in or near a prescribed group selection opening may need to be treated either prior to harvest or during the post-harvest TSI operation.

The medium to large sawtimber size white pine and yellow-poplar are mostly in fair condition. The yellow-poplar is heavily stocked and some large stressed sawtimber sized trees could be removed in order to capture mortality. Group selections are options for management 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.

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

Summary Tract Silvicultural Prescription and Proposed Activities
Given the recent inventory and growth of tract 0105's forest resources, a managed timber harvest over the entire tract area is prescribed within the next five years and will yield an estimated 275 MBF. Prior to harvest operations problem occurrences of invasive species are prescribed for treatment. Following the prescribed harvest operation TSI to be undertaken along with assessment of invasive species for follow-up treatment.

Table 3. Overview of Sawtimber Volume Estimates in F0105 in June of 2013

Species	Harvest	Leave	Total
Yellow Poplar	120,750	256,300	377,050
White Oak	28,950	327,290	356,240
Black Oak	40,140	77,580	117,720
Northern Red Oak	1,520	60,170	61,690
Eastern White Pine	46,540	6,930	53,470
Bitternut Hickory	6,380	41,280	47,660
Pignut Hickory	3,030	28,940	31,970
Sugar Maple	6,800	19,690	26,490
Scarlet Oak	3,460	20,090	23,550
American Sycamore	0	16,510	16,510
Black Cherry	0	11,890	11,890
White Ash	5,270	4,770	10,040
Blackgum	3,910	4,210	8,120
Red Maple	1,940	6,000	7,940
Chestnut Oak	5,070	2,760	7,830
American Beech	940	6,720	7,660
Shagbark Hickory	0	4,080	4,080
Sweetgum	0	3,240	3,240
Black Walnut	0	3,030	3,030
Sassafras	1,260	0	1,260
Tract Totals (Bd. Ft.)	**275,960**	**901,480**	**1,177,440**
Per Acre Totals (Bd. Ft./Ac.)	**2,075**	**6,778**	**8,853**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
Ailanthus and Amur Honey Suckle Treatment	CY2014-2016
DHPA timber sale project review	CY2014-2019
Timber Marking & Invasives Evaluation	CY2014-2019
Timber Sale	CY2014-2019
Postharvest TSI & Invasives Follow-up	CY2015-2020
Regeneration Opening Review	CY2018-2023
Reinventory and Management Guide	CY2028

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