Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Ferdinand** Compartment: **03** Tract: **06**
Tract Acreage: **177** Commercial Forest Acreage: **174**
Forester: **M. Vogel & A. Smith** Date: **12/22/2013**

Location

Tract 0306 is located in Dubois County, Sections 9 and 10, T3S, R3W in Jefferson Township. It is located roughly 4.0 miles southwest of Birdseye and 12.0 miles east northeast of Ferdinand. The tract is accessible by Firelane 37 off of Taylor Hollow Road.

General Description

Tract 0306 consists of approximately 177 acres with roughly 77 acres of planted pine, 97 acres of mixed hardwoods, and about a 3.0 acre cleared right-of-way near the northern end of the tract. Mature mixed Virginia and red pine stands exhibiting poor vigor are found throughout the tract, concentrated most heavily in the north end, the south-central area, and southeastern parts of the tract. There are two eastern white pine stands, one in the south-central part of the tract and one on the east side. Oak-hickory and mixed hardwood stands absent of pine are found along the very south edge, along the northern edge of the east side, and in the L-corner of the tract. Small to large openings within the canopy of the pine plantings have been created by dead down Virginia pines, allowing those areas to be slowly overtaken by yellow poplar, maple, and oak species. Evidence of girdling was observed. The harvest areas from the 1999 sale show ample oak-hickory and mixed hardwood regeneration and they look like they are developing well. 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 0306 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Tract 0306 in June 2013

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Yellow Poplar	Virginia Pine	American Beech
Virginia Pine	Sugar Maple	Sugar Maple
White Oak	Red Pine	Dogwood
Chestnut Oak	Yellow Poplar	Yellow Poplar
Eastern White Pine	Chestnut Oak	Red Maple
Red Pine	White Oak	American Elm
Black Oak	Pitch Pine	Blackgum
Northern Red Oak	Eastern White Pine	Northern Red Oak
White Ash	Sassafras	White Ash
Sugar Maple	Bitternut Hickory	Chestnut Oak
Pignut Hickory	Blackgum	Red Elm
Bitternut Hickory	Red Maple	
Blackgum	White Ash	
Scarlet Oak	Pignut Hickory	
Pitch Pine	Dogwood	
Red Maple	Persimmon	
Black Cherry	American Beech	
American Beech	Black Cherry	
Shagbark Hickory	American Elm	
American Elm	Northern Red Oak	
	Red Mulberry	
	Post Oak	

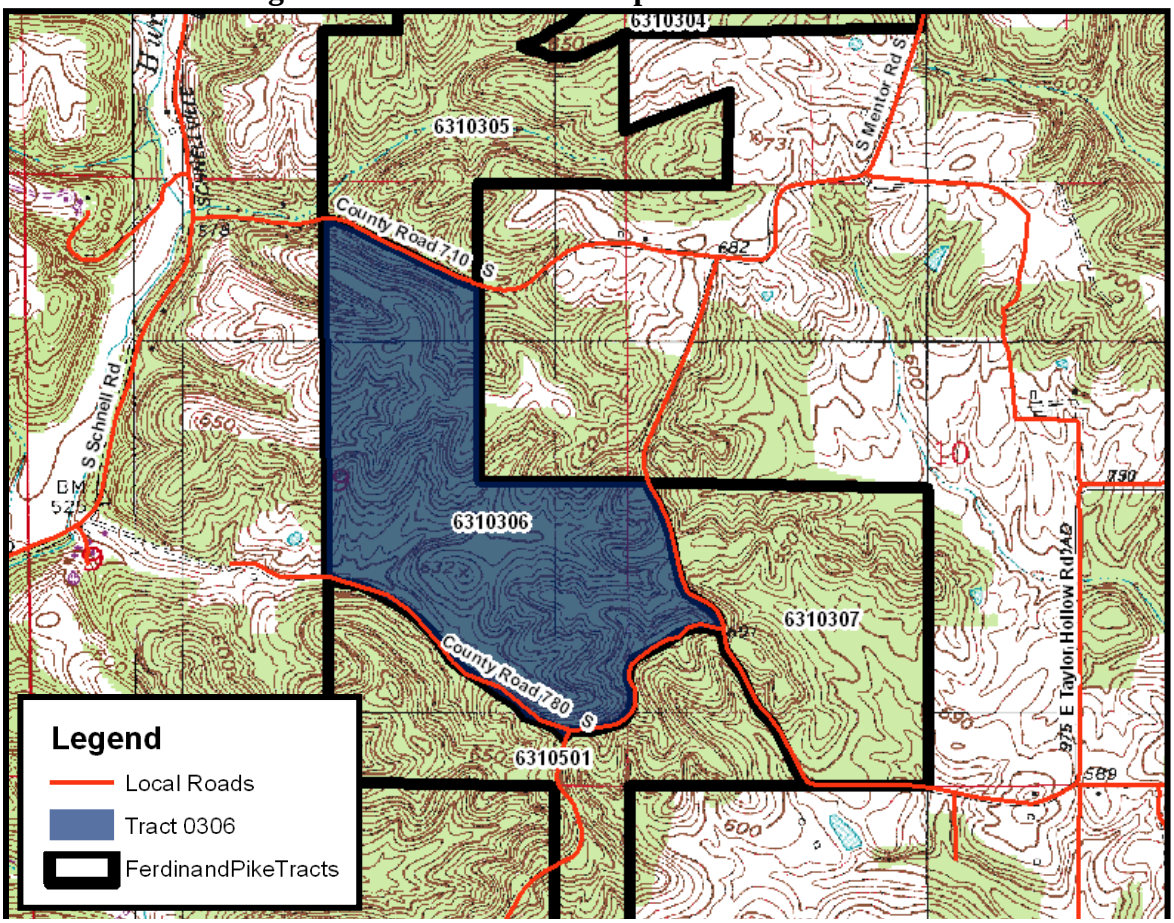
History

The land area that includes tract 0306 (see Figure 1) was deeded to the State of Indiana through three separate deeds. A 12-acre portion of tract 06 was purchased in 1941 as part of 160 acres sold by Samuel and Mary Newton. The entire Newton purchase included part of Compartment 5, Tract 1, Compartment 3, Tract 7, and the 12-acre portion of tract 06. In 1945 the 120-acre Wilfong place, which contained part of Compartment 5, Tract 1, and the 60-acre Gunselman place were purchased.

Records indicate that 91,000 pines and 3,600 ash and yellow poplar trees were planted on 138 acres across tracts 0306, 0307, and 0501 between 1948 and 1953. A timber sale of 67 trees (estimated 14,740 BdFt) took place in the northern part of the tract in 1952. Two wildlife ponds were created by the Division of Fish and Wildlife in 1965 using the Pittman-Roberston funds. Inventories were performed by forester Russ Dotzauer in 1978 (estimated 137,744 total BdFt on 78 acres) and by forester Doug Brown in 1995 (estimated 5,741.6 BdFt per acre). In 1999, Doug Brown and forester Nate Orsburn sold 137,360 board feet consisting primarily of black oak, chestnut oak, yellow poplar, and white oak timber, on 52 acres of the tract to DMI Furniture Company in Ferdinand for $32,000.00. Firelane 37, which runs through the center of the tract from Taylor Hollow Road, was constructed in 1998 to provide access for this sale. Post-harvest TSI was completed in 2002 on the 52 acre sale area. The current tract resource inventory was completed on June 12, 2013 by Miranda Vogel.

Landscape Context
The ridgetops are mostly comprised of old field mixed hardwoods and pine plantations while, the sideslopes are mostly comprised of mixed hardwoods with a dominate oak presence. State forest surrounds the far north end, part of the east side, and the entire south end of the tract. Agricultural land lies on the west side and beyond the northeast corner where Mentor Road intersects with Taylor Hollow Road. Water sources on the tract include small and large ephemeral drainages and the two man-made wildlife ponds.

Figure 1. Ferdinand SF Compartment 03 Tract 06



Topography, Geology and Hydrology
The tract consists of predominantly north, south, and west facing slopes that drain into multiple ephemeral drainages flowing west. The ephemeral drainages flow into Hurricane Creek just west of the property. The tract's topography is made up of slight slopes (0-20%).

Soils
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.

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.

Gilpin-Berks complex (GoF) 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.

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.

Access

Tract 0306 is easily accessible off of Taylor Hollow Road by Firelane 37. Firelane 37, constructed in 1998, runs in an L-shape between the northeast corner of the tract at Taylor Hollow Road and the middle of the northern portion of the tract.

Boundary

Most of the tract's boundaries are indicated in the field; however, the flagging will need to be updated prior to any harvest activities. The south edge is separated from tract 0501 by County Road 880. Part of the east edge is separated from tract 0307 by Taylor Hollow Road. The far north edge is separated from tract 0305 by Mentor Road. The inside northeast corner bears a cornerstone and a wire fence lying on the ground that marks the east-west line of that corner. The west line is delineated by some fencing and an open field.

Wildlife

A Natural Heritage Database Review was completed for tract 0306 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. Tract 0306 has an abundant supply of food resources such as soft and hard mast. The two wildlife ponds provide an ephemeral water source for wildlife during nondroughty 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) following the harvest is planned which will increase standing snag counts. Management practices conducted on 0306 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations. Songbirds, hummingbirds, crows, turkey vultures, squirrels, box turtles, toads, lizards, rabbits, and white-tailed deer have been observed in the tract. Several large den trees and abundant snags have been identified in the area.

Communities
Tract 0306 is composed of mesic upland hardwoods dominated by mixed hardwoods and pine plantings. The dominant overstory timber species include yellow poplar, white oak, chestnut oak, black oak, and northern red oak. Planted Virginia pine, eastern white pine, red pine, and pitch pine also contributes a significant portion of tract 06's ridgetop and lowland habitat. The understory contains mainly Virginia pine, sugar maple, red pine, yellow poplar, chestnut oak, white oak, and pitch pine. The ground cover of Tract 0306 consists of mainly mesic to dry mesic species.

Exotic Species
Ailanthus, Amur honeysuckle, Autumn olive, privet, Japanese honeysuckle, and multiflora rose were observed during the inventory. Multiflora rose, privet, Japanese honeysuckle, and Amur (bush) honeysuckle are scattered throughout the tract, and 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 planned regeneration openings. Otherwise the extent and severity of infestation should be mapped for future treatment. 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. Ailanthus was identified in one of the dead pine areas near Taylor Hollow Road. The Ailanthus and Amur honeysuckle should be treated prior to the start of a timber harvest and will be included in the post-harvest TSI prescription.

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.

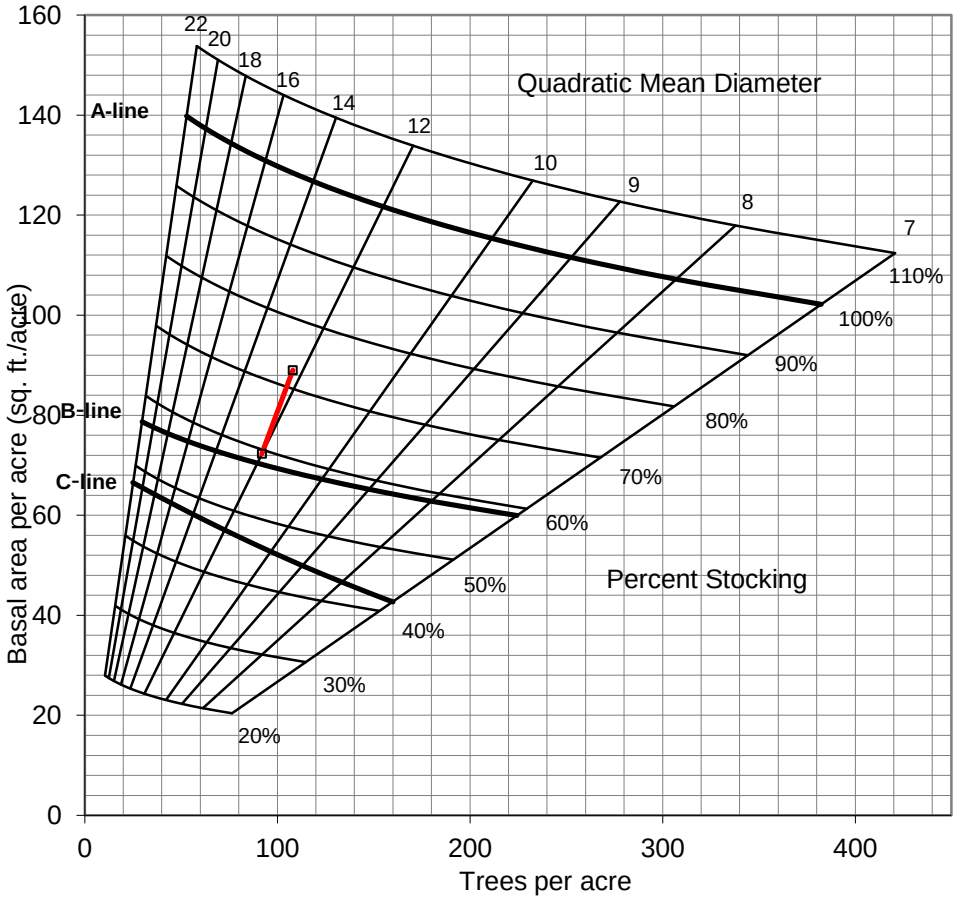
Tract Subdivision Description and Silvicultural Prescription

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

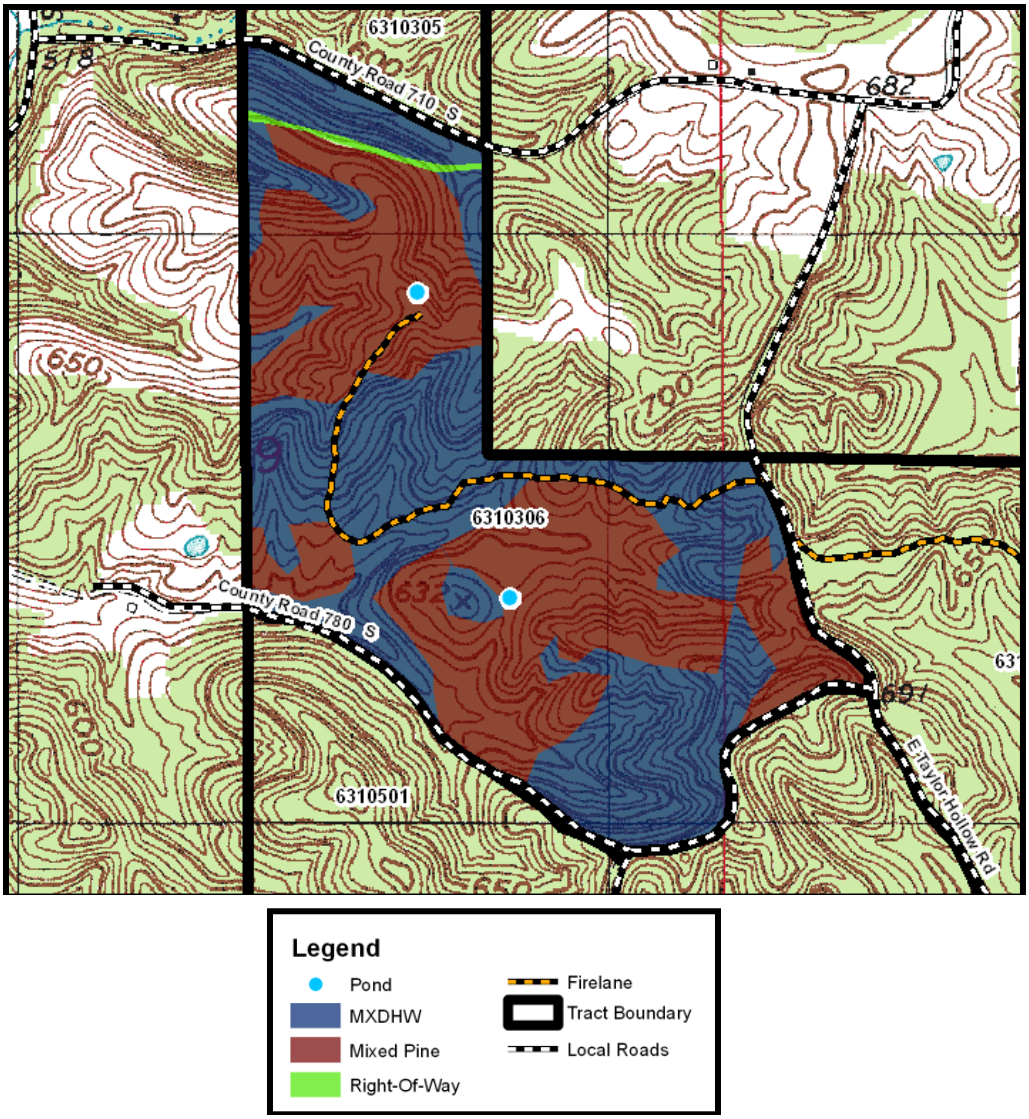
Total Trees/Ac. = **133 Trees/Ac.** Overall % Stocking Hardwoods = **73%** (Fully Stocked)
BA/A = **95.8 Sq. Ft./Ac.** Sawtimber & Quality Trees/Ac. = **57 Trees/Ac.**
Present Volume = **6,824 Bd. Ft./Ac.**

Table 2. Gingrich Stand and Stock Table for Hardwoods for 0306 in June, 2013



The current forest resource inventory was completed on June 12, 2013 by Miranda Vogel. Fifty-five prism points were sampled over 177 acres (1 point for every 3.2 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 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 0306 Stratum Types Map



Mixed Hardwoods Stratum

The mixed hardwoods timber type can be very variable in composition and thereby have more complicated prescriptions. This inventory has combined oak-hickory stratum and mixed hardwood stratum in the mixed hardwoods cover type in TCruise. The mixed hardwoods type covers roughly 54.9% of the tract or about 97 acres with an average basal area of 89.0 square feet per acre. This stratum type is considered fully stocked at approximately 73%, with a mean tree diameter of 17.1 inches and 108 trees per acre. The overstory is dominated by white oak, yellow poplar, chestnut oak, black oak, Virginia pine, and white ash. The understory layer consists of mainly sugar maple, chestnut oak, white oak, red pine, yellow poplar, and sassafras. The regeneration layer consists of mainly sugar maple, red maple, chestnut oak, yellow poplar, American beech, and American elm. Chestnut oak regeneration is particularly strong in the openings created by the 1999 harvest on the east side of the tract. The north end of the tract could benefit from an improvement thinning but the need is not urgent. Large sawtimber sized yellow poplar, which are starting to degrade, and medium to large sawtimber sized white ash,

which are still sound and merchantable, in the northern and eastern parts of the tract could be harvested to capture mortality.

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.

Mixed 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 43.5% of the tract or about 77 acres of the tract with an average basal area of 107.5 square feet per acre. The overstory is dominated by Virginia pine, yellow poplar, eastern white pine, red pine, and northern red oak. The understory layer consists of mainly Virginia pine, sugar maple, red pine, yellow poplar, red maple, sassafras, eastern white pine, and American beech. The regeneration layer consists of mainly American beech, sugar maple, red maple, yellow poplar, and dogwood. Average DBH for pole size Virginia pine and red pine is 9.1-10.3", and approximately 15.5" for sawtimber.

Pole to large sawtimber sized mixed hardwood and oak species have established a foothold in many areas where the pine, mostly Virginia and red pine, is in decline. Forester Doug Brown's 1995 management guide took note of the slow deterioration of these persistent species in the landscape and recommended a pine harvest where ease of conversion from pine to mixed hardwoods would be greatest; however, there was no pine sale at that time. Conversion from Virginia and red pine to mixed hardwood and oak composition is recommended in the near future for the east side of the tract. Dead down and degraded standing pines are ubiquitous here.

Oak and mixed hardwoods regeneration is patchy but consistent, ranging from mildly to severely suppressed. The two small eastern white pine stands seem to be in fair condition at this time.

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
A nice balance of pine openings and a selective improvement harvest in the hardwoods would benefit this tract greatly. The ailanthus and Amur (bush) honeysuckle needs to be treated prior to harvest activities with follow-up work conducted with the post-harvest TSI prescription. Old skid trails and log yard will have to be opened back up, most likely by logging crew.

Given the recent inventory and growth of tract 0306's forest resources, a managed timber harvest over the entire tract area is prescribed within the next five years and will yield an estimated 397 MBF.

The Indiana guidelines for Best Management Practices (BMP's) will be followed during timber harvest activities to maintain water quality. 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 F0306 in June of 2013

Species	Harvest	Leave	Total
Yellow Poplar	76,080	196,020	272,100
Virginia Pine	195,260	31,020	226,280
White Oak	2,730	215,230	217,960
Chestnut Oak	10,270	75,150	85,420
Eastern White Pine	0	78,160	78,160
Red Pine	60,610	6,370	66,980
Black Oak	4,570	59,210	63,780
Northern Red Oak	11,070	41,300	52,370
White Ash	21,110	7,950	29,060
Sugar Maple	0	23,870	23,870
Pignut Hickory	0	21,280	21,280
Bitternut Hickory	0	20,460	20,460
Blackgum	7,130	2,650	9,780
Scarlet Oak	0	9,280	9,280
Pitch Pine	5,450	1,920	7,370
Red Maple	0	6,960	6,960

Black Cherry	3,010	3,610	6,620
American Beech	0	5,940	5,940
Shagbark Hickory	0	2,970	2,970
American Elm	0	1,860	1,860
Tract Totals (Bd. Ft.)	**397,290**	**811,210**	**1,208,500**
Per Acre Totals (Bd. Ft./Ac.)	**2,245**	**4,583**	**6,828**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
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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