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

State Forest: **Yellowwood** Compartment: **03** Tract: **01**
Tract Acreage: **143** Commercial Forest Acreage: **142**
Forester: **Amanda Smith (for Laurie Burgess)** Date: **September 11, 2013**
Management Cycle End Year: **2028** Management Cycle Length: **15 years**

Location
Y0301 is located in Sections 3, 4, 9, and 10 of Township 8N, Range 2E of Brown County. It is located approximately 4.75 miles southwest of Nashville and 2.1 miles east of Belmont (see Figure 1). The tract is directly accessible from off Crooked Creek Road.

General Description
Y0301 consists of a total of 143 acres of which 115 acres are in Oak-Hickory forest, 16 acres are in Mixed Hardwood forest, 11 acres are in planted Pine, and 1 acre buffers land adjacent to Crooked Creek Road. Approximately 142 acres are considered commercial forest acreage. Y0301'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 Y0301 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Y0301 in August of 2013

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
White Oak	**Sugar Maple**	**American Beech**
Scarlet Oak	**White Oak**	**Red Maple**
Chestnut Oak	**Pignut Hickory**	**Sassafras**
Eastern White Pine	**Chestnut Oak**	**Sugar Maple**
Black Oak	**American Beech**	*Blackgum*
Northern Red Oak	**Sassafras**	*Dogwood*
American Sycamore	*Black Walnut*	*Bluebeech*
Bitternut Hickory	*Red Maple*	*Ironwood*
Loblolly Pine	*Black Cherry*	*Black Cherry*
Pignut Hickory	*American Elm*	*Shagbark Hickory*
Sugar Maple	*Ironwood*	*White Ash*
Yellow Poplar	*Shagbark Hickory*	*American Elm*
Black Walnut	*Bitternut Hickory*	*Black Walnut*
American Beech	*Blackgum*	*Pignut Hickory*
Red Maple	*American Sycamore*	*Red Elm*
Blackgum	*Northern Red Oak*	*Black Oak*
Shagbark Hickory	*Scarlet Oak*	*Northern Red Oak*
Red Elm	*Basswood*	*White Oak*
	Red Elm	**Chestnut Oak*
	Yellow Poplar	**Scarlet Oak*

Bold – Species that comprise ≥ 10% of the total BA in each structural class
Italicized - Species that comprise ≤ 10% of the total BA in each structural class
* Species not captured in Prism Plots but present within the tract.

History

The land area that includes Y0301 (see Figure 1) was deeded to the State of Indiana in three parcels between 1951 and 1967; William H. Smith deeded a portion of the land area on July 10, 1951, the United States Department of Agriculture deeded a large area of land on October 30, 1956, and the estate of Montana Grinstead deeded an area of land on April 17, 1967. Historical aerial photography suggests that prior to government acquisition the valleys and ridgetops were farmed and the sideslopes likely to have been grazed.

The current 143 acre tract of Y0301 (see Figure 1) was created in 2013 when old tracts Y0301 and Y0304 were combined. The current tract's forest resource inventory was completed on August 27, 2013 by Intermittent Forester Amanda Smith. Two histories are noted below to preserve the unique records of management within each of the previous tracts.

Past History of Old Y0301

- A CETA Forester planted 1,362 autumn olive plants in April, 1975.
- TSI was completed on 53 acres of the tract by the CETA Forester in February, 1977.
- The forest area was reconned on May 15, 1981 by Forester Sieg and again on May 20, 1982 by Forester Gray.
- The boundary line was reviewed on November 11, 1984 by Forester Duncan and again on May 7, 1986 by Forester Eckart.
- Forester Eckart set barrier posts to block an illegal access trail on July 29, 1993.

Past History of Old Y0304

- TSI was conducted by the CETA Forester on 17 acres of Y0304 in February of 1977.
- Y0304 was subdivided into Y0304 and Y0309 in December of 1984.

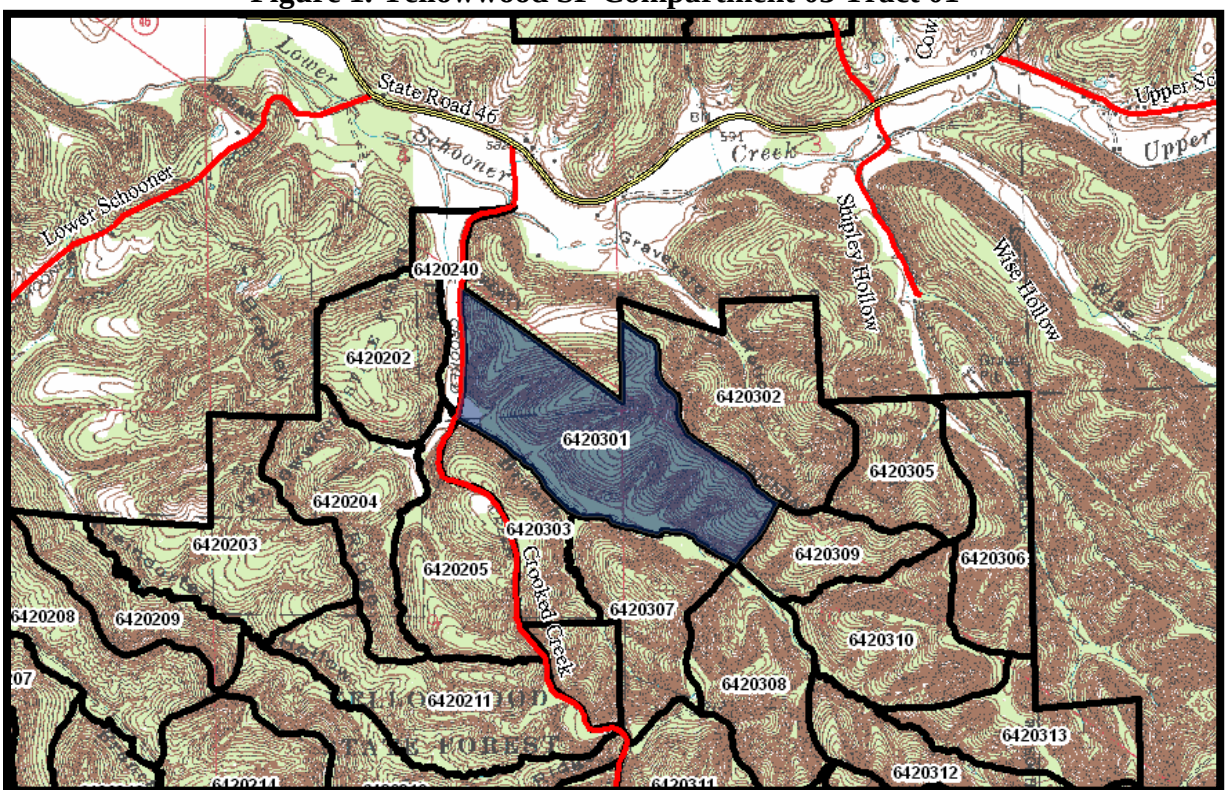
Landscape Context

The ridgetops are mostly comprised of Mixed Hardwoods and Oak-Hickory species known to occur in the Brown County Hills Natural Region. The sideslopes are mostly comprised of Oak-Hickory species whereas the floodplain area is comprised of mostly planted Pine plantations with intermixed Mixed Hardwoods. The tract is completely surrounded by a dominantly closed canopy of hardwood forest however some agriculture fields lie to the north of the tract along the Lower Schooner Creek floodplain. Private forested property borders the northwest portion of the tract while other Yellowwood State Forest tracts border the northeast, south, east, and west portions of the tract. Nashville lies approximately 4.75 miles northeast and Belmont lies approximately 2.1 miles west of Y0301. The northern headwaters and intermittently flooded marshes of Monroe Reservoir lie approximately 3 miles southwest of the tract providing habitat for migrating waterfowl as well as habitat for lowland mammals, herptiles and birds.

Topography, Geology and Hydrology

Y0301 has predominantly south and southwest facing slopes that drain into Crooked Creek. Crooked Creek feeds into Lower Schooner Creek which flows into the North Fork of Salt Creek which eventually supplies Lake Monroe. In general, these upland soils were formed in residuum from sandstone, siltstone, and shale. The tract's topography ranges from 0 - 30% slopes with general south, east, and west aspects.

Figure 1. Yellowwood SF Compartment 03 Tract 01



Soils

Be- Beanblossom Channery Silt Loam, 1-3% slopes, occasionally flooded

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 can contribute to equipment limitations. Rooting depth is somewhat restricted for some trees, i.e. Black Walnut, due to the presence of coarse fragments in the subsoil. This soil has a site index of 95 for Yellow Poplar.

BgF- Berks-Trevlac-Wellston Complex, 20 to 70 percent slopes

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 the main management concerns due to slope. Slope considerations are needed 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.

SxD2- Stonehead-Trevlac Silt Loams, 10 to 20 percent slopes, eroded

These moderately sloping to moderately steep soils are on sideslopes and narrow ridgetops in the uplands. They are fairly well suited to trees. Erosion hazards and equipment limitations are the management concerns that should be considered when planning sale layout and implementing Best Management Practices for Water Quality. This Complex has a site index of 90 on Stonehead and 70 on Trevlac for northern Red Oak.

WaD- Wellston-Berks-Trevlac Complex, 6 to 20 percent slopes
These moderately sloping to moderately steep, well drained soils are on sideslopes and narrow ridgetops in the uplands. They are well suited to trees. Seedling mortality can be an issue on the south facing Berks soils due to droughty conditions. This Complex has a site index of about 70 for northern Red Oak.

Access
Y0301 is directly accessible off of Crooked Creek Road. There is a small public parking lot available on the east side of Crooked Creek Road. 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
Y0301 is bordered on all sides by Yellowwood State Forest (YSF) except for a portion of private property along the old Indian Treaty Boundary. This line forms the NE boundary of the tract. The southern boundary runs along Crooked Creek and the western boundary is defined as Crooked Creek Road. The eastern boundary is delineated by a ridgetop that is shared with Y0302. The tract's private ownership boundaries have been marked by orange paint along the line and are currently up to date.

Wildlife
Wildlife resources in Y0301 appear abundant. This tract contains habitat suitable for a wide variety of wildlife species. Forested habitats include a modest portion of mixed Pines and Mixed Hardwoods. These areas often are valuable resources for wildlife especially in winter seasons as they provide excellent cover. Large areas of contiguous Oak-Hickory and Mixed Hardwoods timberlands make up YSF tracts that lie immediately adjacent to Y0301. In combination, these forest resources provide excellent habitat diversity which is attractive to many wildlife species. Y0301 has an abundant supply of food resources such as soft and hard mast. Crooked Creek, which runs along the southern boundary of the Tract, provides an ephemeral water source for wildlife during nondroughty periods of the year.

A Natural Heritage Database Review was completed for Y0301 in 2013. If Rare, Threatened or Endangered species (RTE's) were identified for 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 level basis in order to maintain long-term and quality forest habitats. Crown release performed during the planned timber harvest 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 Y0301 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Communities
Y0301 is composed of mesic upland hardwoods dominated by Mixed Oaks and Mixed Hardwoods. The dominant overstory timber species include White Oak, Scarlet Oak, Chestnut Oak, and Black Oak with some planted Eastern White Pine in the lowland areas near Crooked Creek. The understory consists mainly of Sugar Maple, White Oak, Pignut Hickory, Chestnut Oak, and American Beech. The ground cover of Y0301 consists of mainly mesic to dry mesic species.

Exotic Species
Autumn Olive, Common Periwinkle, Japanese Honeysuckle, Japanese Stiltgrass, and Multiflora Rose were observed during the resource inventory. The A. olive is planned to be treated in a postharvest TSI operation. Control measures are warranted for the other species if populations are located in planned regeneration openings. Eradication of Japanese Stiltgrass is unlikely; however, treatment to accessible areas prior to harvest operations should be considered to reduce viable seed in conjunction with reseeding of disturbed areas following the tract harvest.

Recreation
Activities on this tract include hiking, bird watching, wildlife viewing, hunting, and mushrooming. A small parking area is located along Crooked Creek Road for public use.

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.

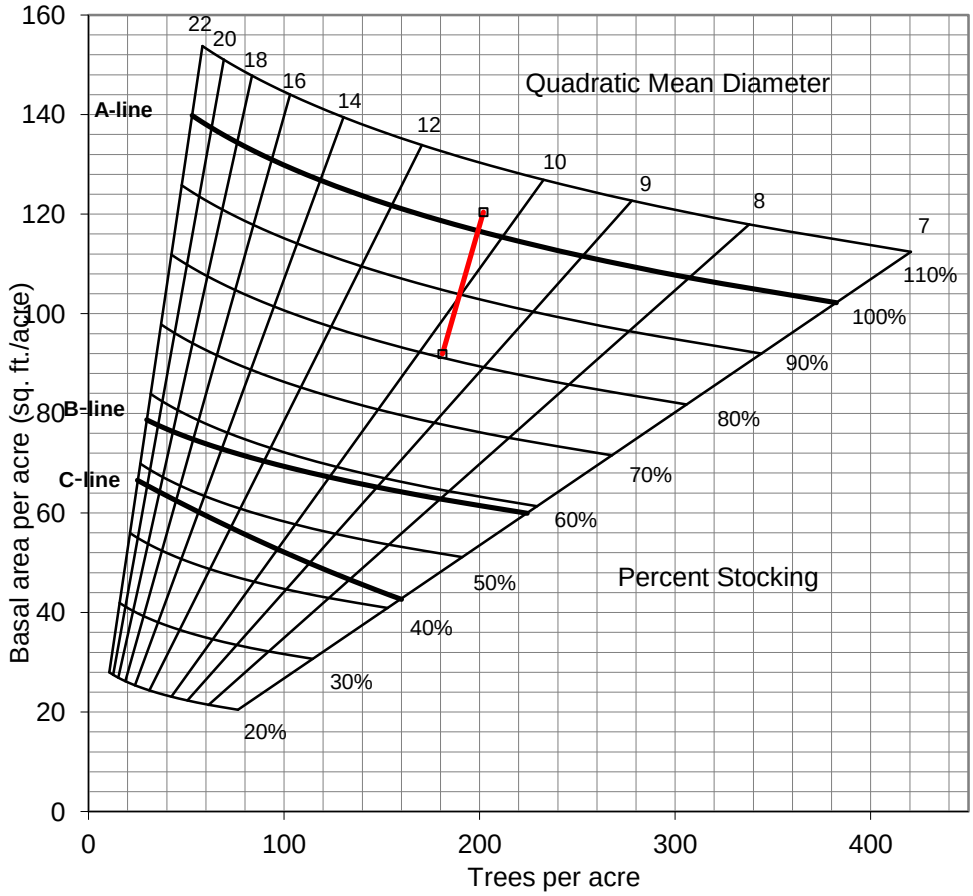
Tract Subdivision Description and Silvicultural Prescription

The overall stand structure for Y0301 is represented in the following Gingrich Stand and Stock Table (Table 2) that follows the individual Tract Summary.

Tract Summary Data

Total Trees/Ac. = **202 Trees/Ac.**
Overall % Stocking = **103%** (Over Stocked)
BA/A = **120.4 Sq. Ft./Ac.**
Sawtimber & Quality Trees/Ac. = **62 Trees/Ac.**
Present Volume = **8,903 Bd. Ft./Ac.**

Table 2. Gingrich Stand and Stock Table for Y0301 in August 2013



Summary Tract Silvicultural Prescription and Proposed Activities

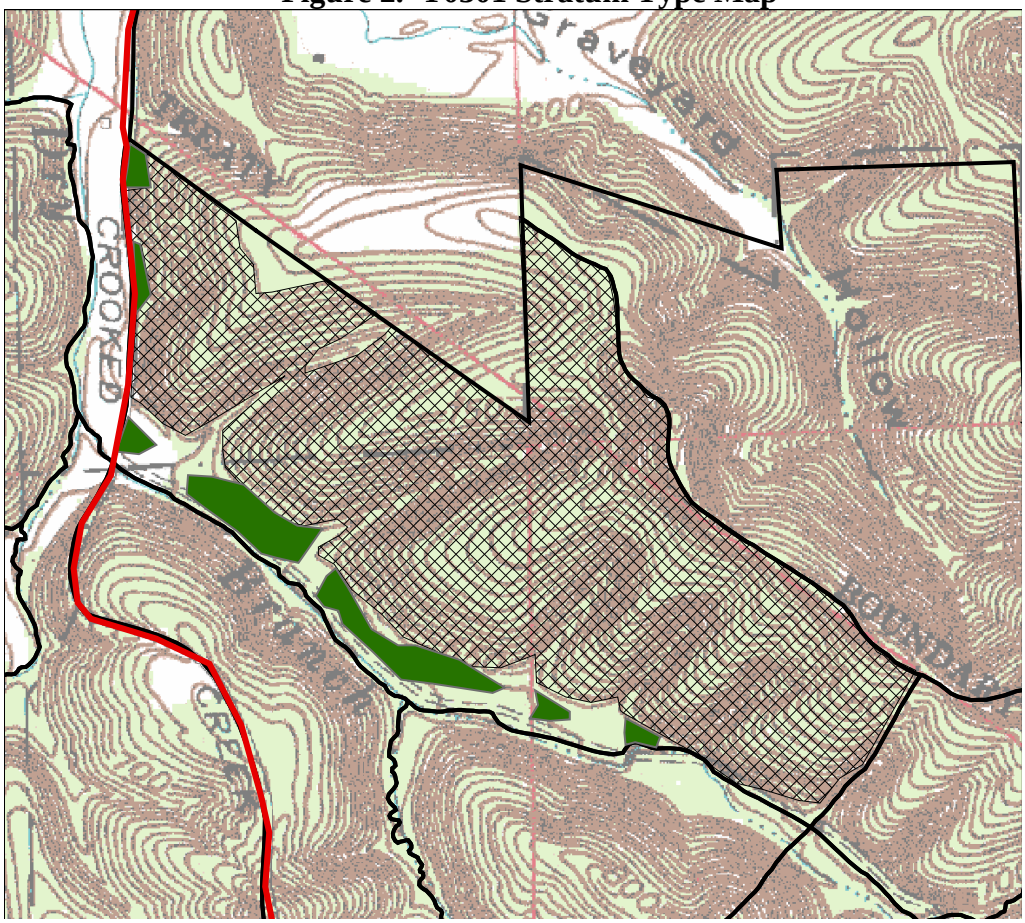
The current forest resource inventory was completed on August 27, 2013 by Intermittent Forester Amanda Smith. 39 prism points were sampled over 143 acres (1 point for every 3.67 acres). A tract summary of the forest resource inventory is given above and a present volume by species breakdown of the summary is given in Table 3 below. Y0301 is currently overstocked and a managed timber harvest over the entire area is prescribed. The tract's forest resource is composed of 3 Stratums based on the 3 major timber types and size classes mentioned below.

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

In 2007 the Hardwood Ecosystem Experiment at Yellowwood and Morgan-Monroe State Forests was initiated. An evenaged Experimental Core area (Management Unit #9) was established in 3 tracts to the south that border Y0301. The primary research goal/objective is to answer "What are the ecological and social impacts of long-term forest management on public and private lands

in Indiana and the Central Hardwoods Region?" While this tract does not directly influence the management activities within M.U. #9, it does provide a buffer area for that unit and has some special guidelines in terms of forest management to preserve the integrity of that Research Core.

Figure 2. Y0301 Stratum Type Map



Oak-Hickory Stratum

The Oak-Hickory timber type provides significant wildlife and timber resource values. The promotion of this Stratum is important in the Division's longterm forest management objectives. The Oak-Hickory type covers approximately 80.4% of Y0301's forest acreage or about 115 acres. The overstory is dominated by WHO, SCO, CHO, BLO, and NRO with an average basal area of 124.8 square feet per acre. The understory layer consists of mainly SUM, WHO, PIH, CHO, REM, SHH, and AMB. The regeneration layer consists of mainly REM, AMB, SAS, BLG, SUM, PIH, and DOG. Areas dominated by CHO tend to be more heavily stocked with a higher average basal area. The OH Stratum consists of mainly small to medium sized sawtimber trees with some large sawtimber trees sporadically dispersed throughout the tract's acreage. There was a high level of

mortality noted in this Stratum especially within the SCO, BLO, and WHO species groups. The prescription of a timber harvest followed up with TSI work would benefit the future growth, development and quality of this Stratum. Singletree and selection cuttings are prescribed to remove lower quality stems and declining vigor trees to release a growing stock of high quality, more vigorous stems. Likewise, careful selection by free thinning of co-dominant stems will help to improve overall croptree spacing. Lower quality trees that include low-forking, leaning, overtopped and suppressed intermediates, epicormically sprouting, and deformed trees are planned to be marked for removal in an improvement cutting. Group selections may be prescribed in areas where low quality stems, disease/damaged stems, low basal area, or declining trees are aggregated.

Mixed Hardwoods Stratum

The Mixed Hardwoods timber type can be very variable in their composition and thereby have more complicated prescriptions. The Mixed Hardwoods type covers approximately 10.8% of Y0301 or about 16 acres. The overstory is dominated by SYC, intermixed WHP, WHO, AMB, and SUM with an average basal area of 84.6 square feet per acre. The understory layer consists of mainly SAS, IRO, SUM, SYC, YEP, REE, AMB, and BLW. The regeneration layer consists of mainly BLB, AMB, BLG, SUM, WHA, IRO, and SAS.

YEP are not a dominant species within Y0301 however over the past few years the Property's YEP have experienced modest declines in vigor as a result of drought and the Tulip Poplar Scale insect infestation that occurred in the late spring of 2012. Affected YEP will need careful review when the tract is marked as additional 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.

Singletree selection cuttings are prescribed to remove lower quality stems and declining vigor trees which will help to improve croptree spacing. An improvement cutting is prescribed to release quality Oaks, Hickories and other valued trees from crown competition by low value timber species. This is an important change in the Mixed Hardwood Stratum as most of this group's timber species tend not to be heavy mast producers nor tend to provide valuable timber resources. Overall, marking objectives within this Stratum should consider Oak, Hickories and other species of significant timber and wildlife value as the preferred croptrees for release. Improvement cuttings in this Stratum will also be applied to remove low-forking, leaning, overtopped/suppressed intermediates, epicormically sprouting, and deformed trees. The longterm result of these prescribed cuttings will be to increase timber and wildlife habitat diversity. Group selections may be prescribed in areas where concentrations of low quality, disease/damaged stems, low basal area, or poor vigor are found. Planned regeneration openings are expected to return to mostly Mixed Hardwoods with a strong component of YEP however some increase in the Oak-Hickory component is expected.

Pine Plantation Stratum w/intermixed Mixed Hardwoods

Eastern White Pine and Loblolly Pine were planted for erosion control purposes during the early management history of YSF. As this Stratum has matured and declined other native

hardwoods have become established especially in the Stratum's understory and canopy gaps. This timber type covers approximately 7.7% of Y0301 or about 11 acres with an average basal area of 138.9 square feet per acre. The overstory is dominated by Eastern White Pine and Loblolly Pine with some SYC, BIH, SUM, REM, BAS, and AMB intermixed. Group selections would be appropriate to regenerate the Pine into native hardwoods in those areas where seedling Oaks, Hickories and other valued hardwoods have become established. Areas where poletimber Oaks, Hickories have already emerged and entered the Stratum's canopy should be prescribed TSI for croptree release. Planned regeneration openings will most likely return to Mixed Hardwoods with a strong component of YEP however a presence of Oak on the drier aspects is expected. Singletree selection is prescribed in areas that contain quality WHP to thin them especially where the removal of lower quality stems release valued hardwoods that have good vigor. The enhancement of this Stratum by releasing high vigor Oaks and Hickories is valuable in establishing new areas with Oak-Hickory components within the tract. Overall, marking objectives within this Stratum should consider Oak and other valued species of significant wildlife value as the best croptrees for future conservation. Quality and vigorous White and Loblolly Pine may be retained as they do provide significant wildlife habitat diversity and winter cover.

Given the recent inventory and growth of Y0301's forest resources, this tract is suitable for a 15 year management cycle wherein growth and development of the tract's forest resource is evaluated by a forest inventory every 15 years. A managed timber harvest over the entire tract area is prescribed for FY2013-14. The anticipated harvest level is 175-350MBF with the residual stand remaining in the fully stocked range.

Table 3. Overview of Sawtimber Volume Estimates in Y0301 in August of 2013

Species	Total
White Oak	526,340
Scarlet Oak	166,810
Chestnut Oak	147,160
Eastern White Pine	107,070
Black Oak	101,000
Northern Red Oak	56,340
American Sycamore	46,870
Bitternut Hickory	30,890
Loblolly Pine	22,640
Pignut Hickory	21,930
Sugar Maple	9,400
Yellow Poplar	9,320
Black Walnut	8,320
American Beech	7,750
Red Maple	3,990
Blackgum	3,110
Shagbark Hickory	2,470
Red Elm	1,750
Tract Totals (Bd. Ft.)	**1,273,160**
Per Acre Totals (Bd. Ft./Ac.)	**8,903**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
DHPA Timber Sale Project Review	CY2013-2014
Roadwork Rehabilitation	CY2013-2014
Timber Marking & Invasive Evaluation	CY2013-2014
Timber Sale	FY2013-2014
Postharvest TSI & Invasives Follow-up	Within 2 years of harvest
Regeneration Opening Review	Within 3-4 years of Postharvest TSI
Reinventory and Management Guide	CY2028

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