Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Yellowwood** Compartment: **16** Tract: **05**
Tract Acreage: **89** Commercial Forest Acreage: **86**
Forester: **Amanda Smith (for Amy Spalding)** Date: **August 30, 2013**

Location

Y1605 is located in Sections 7 and 18 of Township 9N, Range 4E of Brown County. It is located roughly 1.6 miles north of State Road 46 and roughly 6.4 miles east of Nashville, Indiana. Y1605 is accessible by Pumpkin Ridge Road off of Hoover Road.

General Description

Y1605 consists of a total of 89 acres of which 29 acres are in Oak-Hickory forest, 40 acres are in Mixed Hardwood forest, 17 acres are in old field forestland, and 3 acres are in maintained grasslands within a power line of Yellowwood State Forest. Overall, there are 86 acres of commercial forest acreage due to the power line right-of-way. Y1605'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 Y1605 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Y1605 in August 2013

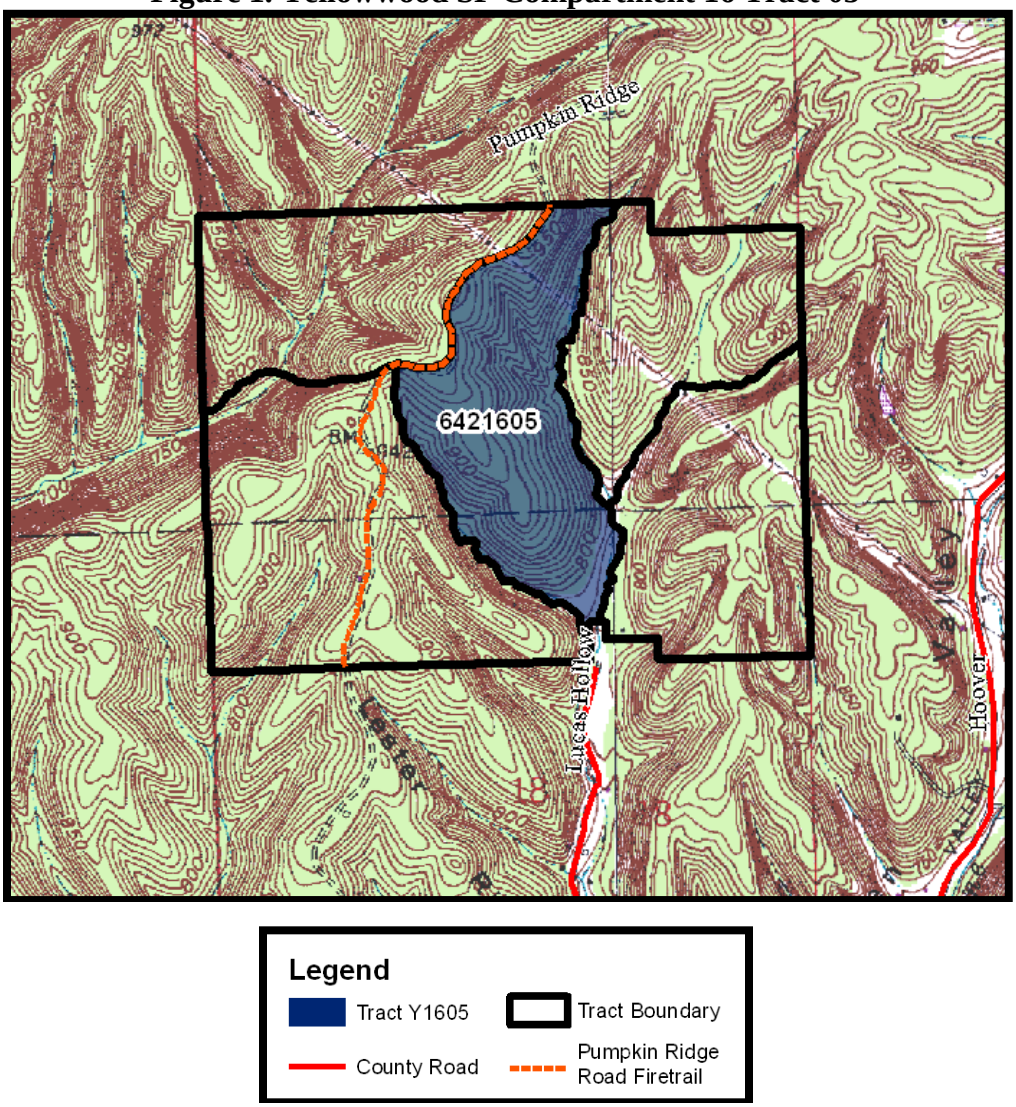
Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Chestnut Oak	Sugar Maple	American Beech
Black Oak	Chestnut Oak	Sugar Maple
Yellow Poplar	Pignut Hickory	Bluebeech
Sugar Maple	Red Maple	Ironwood
Northern Red Oak	Sassafras	Sassafras
White Oak	Yellow Poplar	Red Maple
Scarlet Oak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

History
The land area that includes Y1605 (see Figure 1) was deeded to the State of Indiana on October 2, 2009 by Donald Foley and was locally known as a part of the Mountain Tea property. This area was acquired by the State of Indiana with the assistance of the U.S. Forest Service through the Food, Agriculture Conservation and Trade Act of 1990 also known as the "Forest Legacy Program." The Forest Legacy Program was developed to help protect intact forest lands from conversion to non-forest uses while still allowing for sustainable timber management and recreational use of the property.

Historical aerial photography suggests that prior to government acquisition the valleys and ridgetops were farmed and the sideslopes likely to have been grazed. The Mountain Tea area was managed by Timberland Incorporated prior to State ownership. The area had been divided into 10 management units. The current Tract Y1605 is made up of portions of two of the old Timberland Inc. management units (Units 8 and 9). Prior to State acquisition, forest resource inventories were completed for Units 8 and 9 by Forester Duncan in the spring of 1996 (Unit 8: 7,568.7 BF/A present volume and Unit 9: 6,162.8 BF/A present volume). The Mountain Tea area had been harvested by Timberland Inc. prior to State ownership however the data for the volume removed is unavailable. The current and first forest resource inventory for Y1605 was completed on August 6, 2013 by Intermittent Forester Amanda Smith.

Landscape Context
The ridgetops of Y1605 are comprised of old field Mixed Hardwoods whereas its sideslopes are mostly comprised of the general Mixed Hardwoods and Oak-Hickory species known to occur within the Brown County Hills Natural Region. Y1605 is completely surrounded by forestland with a closed forest canopy. Private forest property borders the southern boundary whereas other Yellowwood State Forest tracts border the north, east, and the west. The city of Nashville lies roughly 6.4 miles west and Columbus lies roughly 10 miles east. The landscape area contains some dispersed residential areas and agriculture fields.

Figure 1. Yellowwood SF Compartment 16 Tract 05



Topography, Geology and Hydrology

Y1605 consists of predominantly south, east, and west facing slopes. The ephemeral drainages drain into two mapped intermittent streams, one on each side of the Tract. These eventually feed into the North Fork of Salt Creek. In general, these upland soils were formed in residuum from sandstone, siltstone, and shale. Y1605's topography ranges from 0 - 30% slopes with general east and west aspects.

Soils

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

This nearly level and gentle sloping, deep, moderately well drained soil is on flood plains, alluvial fans, and colluvial benches. It is fairly well suited to trees. Wet periods contribute to equipment limitations. Rooting depth is somewhat restricted for some trees, i.e. Black Walnut, due to coarse fragments in its subsoil. This soil type has a site index of 95 for Yellow Poplar. This soil type comprises approximately 3.0 acres or 3.4% of the Tract acreage.

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 their slopes. Consideration should be given 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. This soil type comprises approximately 68 acres or 76.4% of the Tract acreage.

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. This soil type comprises approximately 18 acres or 20.2% of the Tract acreage.

Access
Y1605 is easily accessible via the Pumpkin Ridge Road Firetrail off of Hoover Road. The Pumpkin Ridge Road Firetrail is currently in poor condition due to a lack of maintenance, ATV use, and horseback riding prior to State acquisition. A proposed DHPA roadwork project will need to be reviewed by the Division of Forestry Archaeologist prior to completing any timber sale roadwork improvements, log yard rehabilitation and construction.

Boundary
Y1605 is bordered on three sides by Yellowwood State Forest (YSF) and on one side by federal property. The eastern and western boundaries run along ephemeral drainages that flow into mapped intermittent streams. The south boundary runs along federally owned property that is used by the Brown County Sherriff's Department. The southern boundary line has been marked by orange paint and is currently up to date.

Wildlife
Wildlife resources in Y1605 appear abundant. Y1605 contains habitat for a variety of wildlife species. Forested habitat includes old field regeneration areas on the ridgetop, a large amount of contiguous Oak-Hickory and Mixed Hardwoods along the sideslopes, riparian areas along streams, and a permanent grassland habitat along the powerline right of way that is routinely maintained by mowing. Sassafras, grapevines, and other early successional shrubs are among those present that provide modest wildlife food resources. Other habitat structures that favor wildlife include snags (standing dead trees) and cavity trees. Snags and cavity trees provide habitat for birds, bats, and other small mammals to feed, roost, and nest. Hard mast trees such as Oaks, Hickories, and Beech provide food resources for Squirrels, Wild Turkey, and White-tailed deer. Downed woody debris provides habitat and protection for forest floor wildlife and herptile species. Overall, Y1605 has an abundant supply of soft and hard mast. The mapped intermittent streams that run through the west and east boundaries of the Tract provide ephemeral water sources for local wildlife during nondroughty periods of the year.

A Natural Heritage Database Review was completed for Y1605 in 2013. If Rare, Threatened or Endangered species (RTE's) were identified for Y1605, 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 special 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 Y1605 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Communities
Y1605 is composed of mesic upland hardwoods dominated by Mixed Oaks and Mixed Hardwoods. The dominant overstory timber species include Chestnut Oak, Black Oak, Yellow Poplar, Sugar Maple, Northern Red Oak, and White Oak. The understory contains a mixture of Oaks and Mixed Hardwoods but consists mainly of Sugar Maple, Chestnut Oak, Pignut Hickory, Red Maple, and Sassafras. The regeneration layer is dominated by Mixed Hardwood species but does contain a component of Oak. The ground cover of Y1605 consists of mainly mesic to dry mesic species.

Exotic Species
Japanese Stiltgrass, Multiflora Rose, and Japanese Honeysuckle were observed during the inventory. As Brown County is a known location of the plant "virus" rose rosette disease, populations of Multiflora Rose are relatively stable. Control measures may be warranted 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.

Recreation
Y1605 is accessible via a long firetrail known as Pumpkin Ridge Road off of Hoover Road. This access road is in a planning and review stage for road improvements as the roadway has been degraded by unauthorized vehicular, off road vehicles and horseback riding users. Although no permanently established recreation areas are present in Y1605, there are still several recreational opportunities. Hunting is permitted on State Forest property and this Tract also offers opportunities for off-trail hiking, hunting, mushrooming, and wildlife viewing.

Cultural
Cultural resources may be present on Y1605 but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

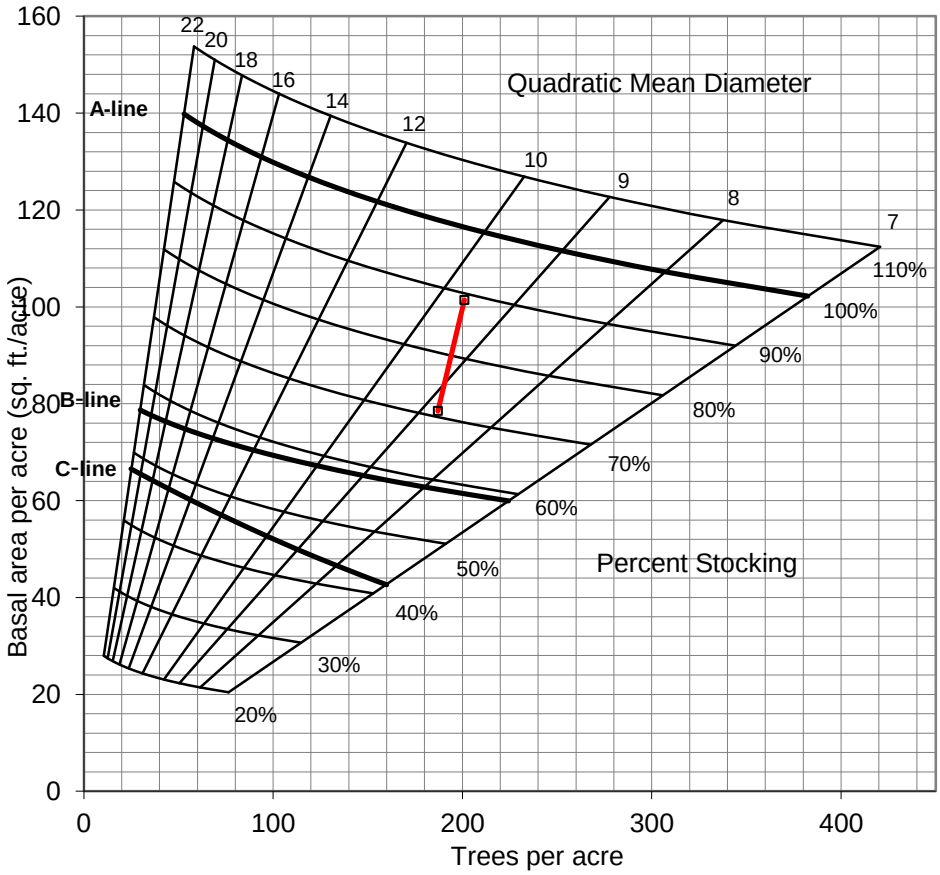
Tract Subdivision and Silvicultural Prescription

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. = **201 Trees/Ac.** Overall % Stocking = **89%** (Fully Stocked)
BA/A = **101.4 Sq. Ft./Ac.** Sawtimber & Quality Trees/Ac. = **41 Trees/Ac.**
Present Volume = **7,663 Bd. Ft./Ac.**

Table 3. Gingrich Stand and Stock Table for Y1605



Summary Tract Silvicultural Prescription and Proposed Activities

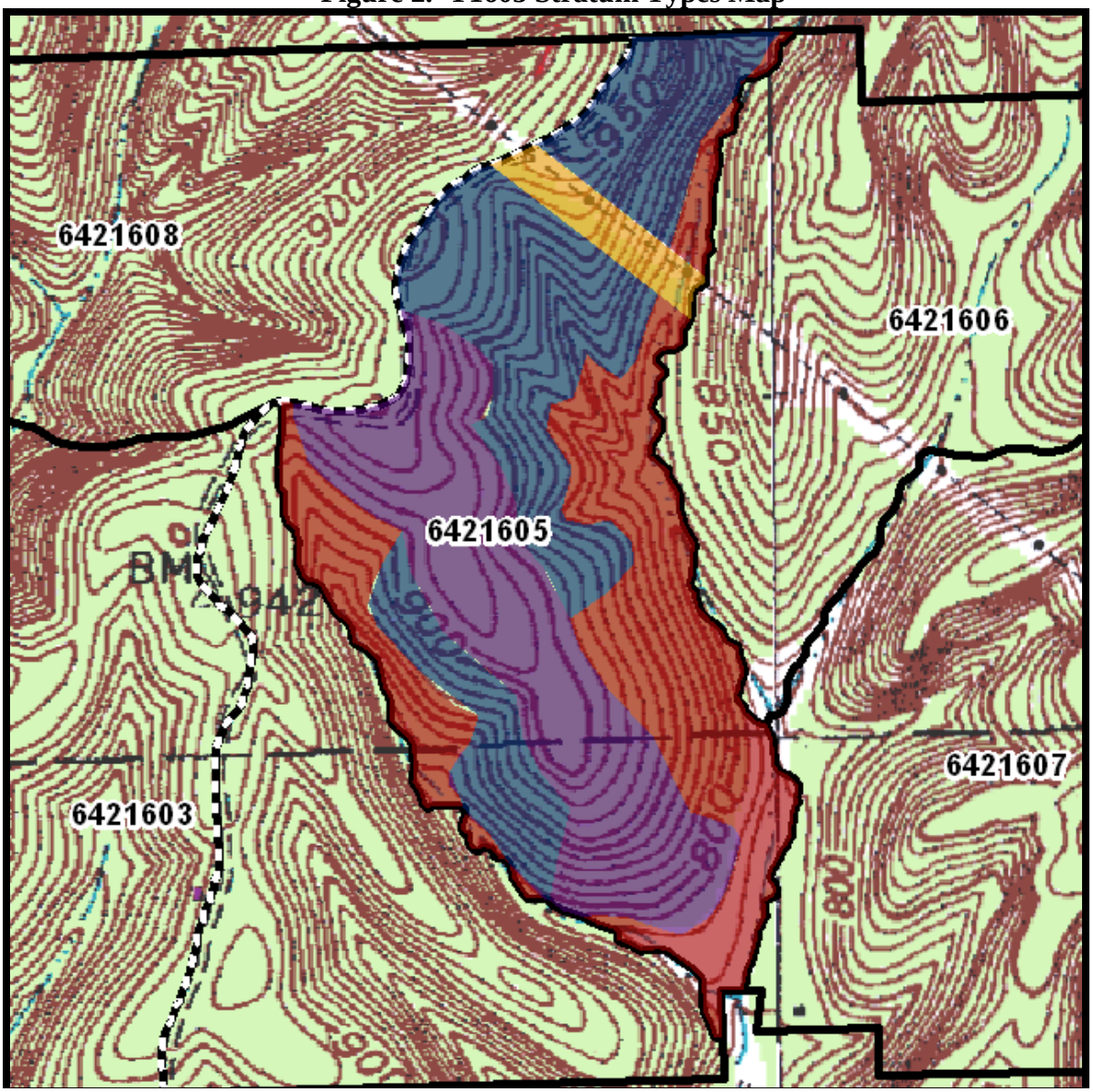
The current forest resource inventory was completed on August 6, 2013 by Intermittent Forester Amanda Smith. 32 prism points were sampled over 89 acres (1 point for every 2.78 acres). A Tract summary of the forest resource inventory is given above and a species breakdown of the summary is given in Table 3 below. Y1605 is fully stocked and a managed timber harvest over the entire area is prescribed. The Tract's forest resource is composed of 3 different Stratums based on the 2 major timber types and size classes mentioned below.

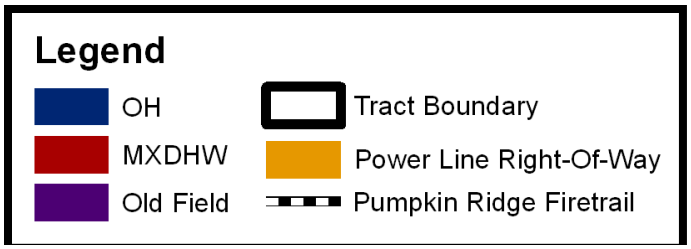
The Mountain Tea area was actively managed prior to State acquisition. The proposed timber harvest will help to improve the residual stand by improving the spacing between desired

croptrees and by removing damaged, overmature, suppressed, and poorly formed trees. This type of harvest will improve growing conditions for the remaining tree stocking.

The Indiana guidelines for Best Management Practices (BMP's) will be followed during timber harvest closeout 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.

Figure 2. Y1605 Stratum Types 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 objective. The Oak-Hickory type covers roughly 31.3% of Y1605 or about 29 acres. The overstory is dominated by CHO, BLO, WHO, YEP, and NRO with an average basal area of 125.3 square feet per acre. The understory layer consists of mainly SUM, REM, SHH, CHO, and WHO. The regeneration layer consists of mainly AMB, SUM, REM, IRO, PIH, and SHH. Portions of this Stratum that are dominated by CHO tend to be more crowded with an average basal area around 140.0 square feet per acre.

Singletree and selection cuttings are prescribed to remove lower quality stems and mature to overmature 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/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 that contain concentrations of low quality stems, diseased and fire damaged stems, areas of low basal area stocking & tree maturity to help maintain long-term forest regeneration and sustainability.

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 roughly 43.8% of Y1605 or about 40 acres. The overstory is dominated by YEP, SUM, NRO, WHO, and AMB with an average basal area of 89.3 square feet per acre. The understory layer consists of mainly SUM, YEP, BLW, AMB, and NRO. The regeneration layer consists of mainly AMB, SUM, BLB, and YEP.

A fair amount of Y1605's YEP 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 YEP will need careful review when the tract is marked as continued 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 is prescribed in a combination improvement and sanitation cutting.

Singletree selection cuttings are prescribed to remove lower quality stems and mature to overmature trees which will help to improve croptree spacing. Improvement cuttings in this Stratum will also be applied to remove low-forking, leaning, overtopped/suppressed

intermediates, epicormically sprouting, and deformed trees. An improvement cutting is also prescribed to release quality Oaks, Hickories and Black Walnuts from crown competition of lesser-valued timber species. The enhancement of these species within the Mixed Hardwood Stratum is important as the Mixed Hardwood 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, Hickory, Black Walnut, and other species of significant timber and wildlife value as the preferred croptrees to be retained. The longterm result of these prescribed cuttings will increase timber and wildlife habitat diversity. Group selections may be prescribed in areas of low quality, diseased and fire damaged stems, areas of low basal area stocking and maturity to help maintain long-term forest regeneration and sustainability. Planned regeneration openings are expected to return to a Mixed Hardwood composition with a strong component of YEP.

Old Field Successional Stratum

Generally the management of old field areas are contained within the Mixed Hardwood or Oak Hickory Stratums however the old fields in Y1605 are of significant size to be managed separately. This Stratum covers roughly 18.8% or about 17.0 acres of Y1605 with an average basal area of 107.1 square feet per acre. The overstory is dominated by BLO, SCO, NRO, CHO, YEP, and SUM. The understory layer consists of mainly SAS, SUM, BLG, BLO, PIH, and NRO. The regeneration layer consists of mainly SUM, AMB, SAS, IRO, BIH, and BLG.

The timber quality within this Stratum tends to be low; however its longterm management is very important. This Stratum is generally derived from abandoned croplands or pastured fields that have naturally succeeded to hardwoods. Generally there is some modest oak regeneration present. Singletree and group selection cuttings are prescribed to remove poor form, lower quality, individually mature to overmature trees to release higher quality and more vigorous stems. Group selections may be prescribed in areas that contain low quality, disease and damaged stems or in areas with low basal area stocking. The creation of group selection openings will utilize declining timber resources and increase Y1605's horizontal heterogeneity by creating early successional habitat. Planned regeneration openings will most likely return to Mixed Hardwoods containing a strong component of YEP, however a presence of Oak on the drier aspects is expected. Overall, the marking objectives within this Stratum should consider Oak and other species of significant wildlife value as the best croptrees for future conservation. Where quality hardwood poletimber have emerged and entered the Stratum's canopy, TSI is prescribed for croptree release along with Grapevine removal in the planned postharvest Timber Stand Improvement project.

Given the recent inventory and growth of the forest resources observed within Y1605, this Tract is suitable for a 15 year management cycle wherein growth and development of the forest resources are reevaluated by a forest inventory every 15 years. A timber sale is proposed for Y1605 in FY2013-14 in combination with adjacent tract Y1603.

Table 3. Estimated Tract Volumes in Y1605 in August of 2013

Species	Total
Chestnut Oak	169,320
Black Oak	123,140
Yellow Poplar	105,710
Sugar Maple	69,090
Northern Red Oak	59,860
White Oak	48,800
Scarlet Oak	23,320
Bitternut Hickory	21,430
Pignut Hickory	19,420
American Beech	17,340
American Sycamore	8,140
White Ash	4,910
Shagbark Hickory	4,900
Blackgum	3,010
Sassafras	1,950
Red Maple	1,670
Tract Totals (Bd. Ft.)	**682,010**
Per Acre Totals (Bd. Ft./Ac.)	**7,663**

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	CY2014-2018
Regeneration Opening Review	CY2018-2020
Reinventory and Management Guide	CY2027

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