Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Yellowwood** Compartment: **16** Tract: **03**
Tract Acreage: **128** Commercial Forest Acreage: **128**
Forester: **Amanda Smith (for Amy Spalding)** Date: **July 9, 2013**

Location

Y1603 is located in Sections 7 and 18 of Township 9N, Range 4E of Brown County. It is located roughly 1.5 miles north of State Road 46 and roughly 6.0 miles east of Nashville, Indiana. The tract is accessible by Pumpkin Ridge Road off of Hoover Road.

General Description

Y1603 consists of a total of 128 forested acres of which 27.7 acres are Oak-Hickory forest, 51.9 acres are mixed hardwood forest, 45.0 acres are old field, and 3.5 acres are planted white pine in Yellowwood State Forest. 128 acres are considered commercial forest acreage. Y1603'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 Y1603 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Y1603 in June 2013

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

* Species not captured in Prism Plots but present within the tract.

History

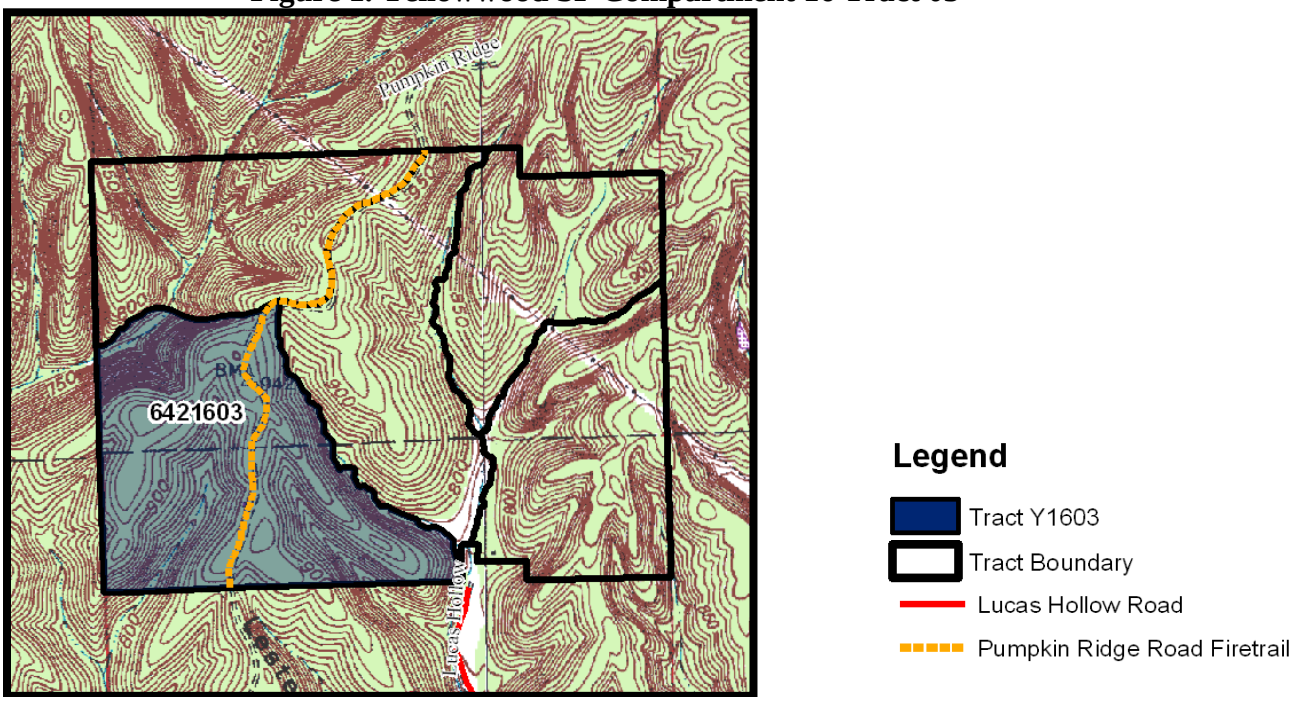
The land area that includes Y1603 (see Figure 1) was deeded to the State of Indiana on October 2, 2009 by Donald Foley as the Mountain Tea Ridge Forest Legacy. The area was acquired by the State of Indiana, with the assistance of the U.S. Forest Service, through the Food, Agriculture Conservation and 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 Ridge area was managed by Timberland Incorporated prior to State ownership. The area was divided into 10 management units in the past and the current tract Y1603 is made up of a portion of two of the old Timberland Inc. management units (Units 7 and 8). Inventories were completed for Units 7 and 8 by Consulting Forester Duncan in the spring of 1996 (Unit 7: 6,814.5 BF/A and Unit 8: 7,568.7 BF/A). The Mountain Tea area was harvested by Timberland Inc. prior to State ownership. The current tract resource inventory was completed on June 14, 2013 by Intermittent Forester Amanda Smith. The results of that inventory are highlighted in the report below.

Landscape Context

The ridgetops of this area are mostly comprised of old field mixed hardwoods and planted pine plantations whereas the sideslopes are mostly comprised of mixed hardwoods and oak-hickory species known to occur in the Brown County Hills Natural Region. Y1603 is completely surrounded a closed forest canopy. Private forest property borders the south and west, while other Yellowwood State Forest tracts border to the north and the east. Nashville lies approximately 6.0 miles west and Columbus lies approximately 10 miles east of Y1603. The general area consists of closed canopy forest with dispersed residential areas and agriculture fields.

Figure 1. Yellowwood SF Compartment 16 Tract 03



Topography, Geology and Hydrology
Y1603 consists of predominantly east and west facing slopes that drain into two mapped intermittent streams on each side of the tract. The ephemeral drainages flow into two mapped intermittent streams and eventually drain into the North Fork of Salt Creek. In general, these upland soils were formed in residuum from sandstone, siltstone, and shale. The tract's topography ranges from 0 - 40% 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 floodplains, 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 subsoil. This soil has a site index of 95 for Yellow Poplar. This soil type comprises approximately 3 acres or 2.3% 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 slope. 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 81.5 acres or 63.7% of the Tract acreage.

WaD- Wellston-Berks-Trevlac Complex, 6 to 20 percent slopes
These 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 43.5 acres or 34.0% of the tract acreage.

Access
Y1603 is easily accessible by the Pumpkin Ridge Road firetrail off of Hoover Road. The Pumpkin Ridge Road Firetrail is currently in poor condition due to lack of maintenance and unauthorized ATV use. A proposed roadwork project will need to be reviewed by the Division of Forestry Archaeologist prior to completing any timber sale roadwork improvements, log yard rehabilitation, or construction.

Boundary
Y1603 is bordered on two sides by state forest and on two sides by private property. The north and the east boundaries are ephemeral drainages that flow into mapped intermittent streams. The south and the west boundaries border privately owned property. The tract's private ownership boundaries have been marked by orange paint along the line and are currently up to date.

Wildlife
A Natural Heritage Database Review was completed for Y1603 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 3 has an abundant supply of food resources such as soft and hard mast. The mapped intermittent streams that run along the northwest and eastern boundaries of the tract 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 Y1603 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Communities
Y1603 is composed of mesic upland hardwoods dominated by mixed oaks and mixed hardwoods. The dominant overstory timber species include Yellow Poplar, Chestnut Oak, Black Oak, White Oak, Sugar Maple and American Beech. Planted Eastern White Pine also contributes a significant portion of Y1603's ridgetop habitat. The understory contains some Oak but consists mainly of Sugar Maple, Yellow Poplar, and American Beech. The ground cover of Y1603 consists of mainly mesic to dry mesic species.

Exotic Species
Japanese Stiltgrass and Multiflora Rose were observed during the inventory. 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.

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

Cultural
Cultural resources may be present on Y1603 but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

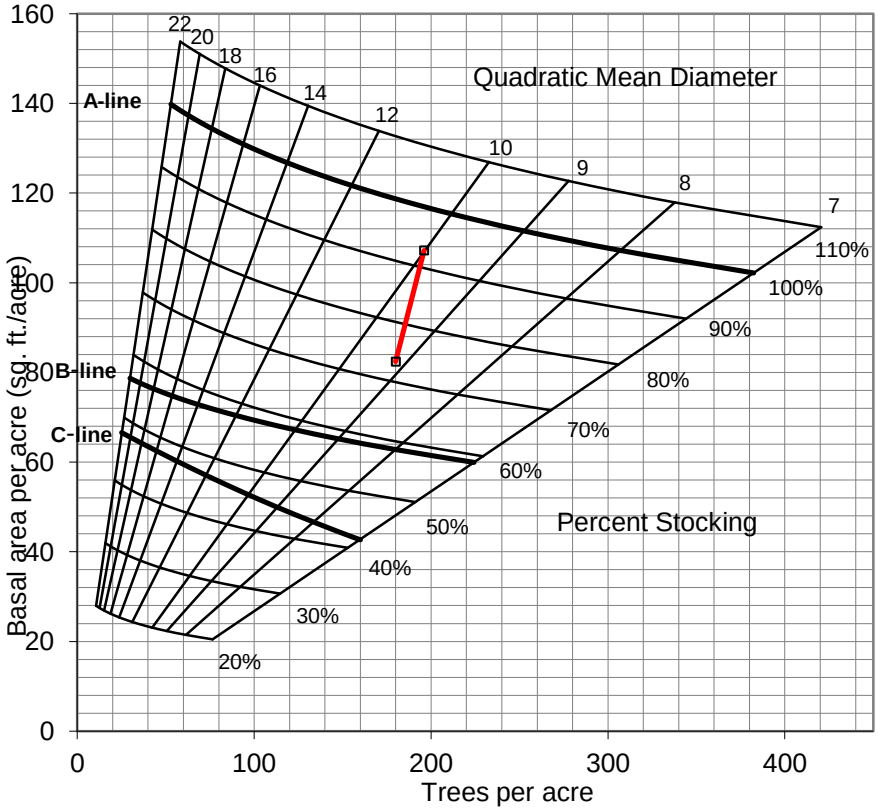
Tract Subdivision and Silvicultural Prescription

The overall stand structure for this tract is represented in the following Gingrich Stand and Stock Table (Table 2.) that follows the individual stand summary.

Tract Summary Data

Total Trees/Ac. = **197 Trees/Ac.**
BA/A = **107.0 Sq. Ft./Ac.**
Present Volume = **8,524 Bd. Ft./Ac.**
Overall % Stocking = **93%** (Fully Stocked)
Sawtimber & Quality Trees/Ac. = **51 Trees/Ac.**

Table 2. Gingrich Stand and Stock Table for Y1603 in June 2013



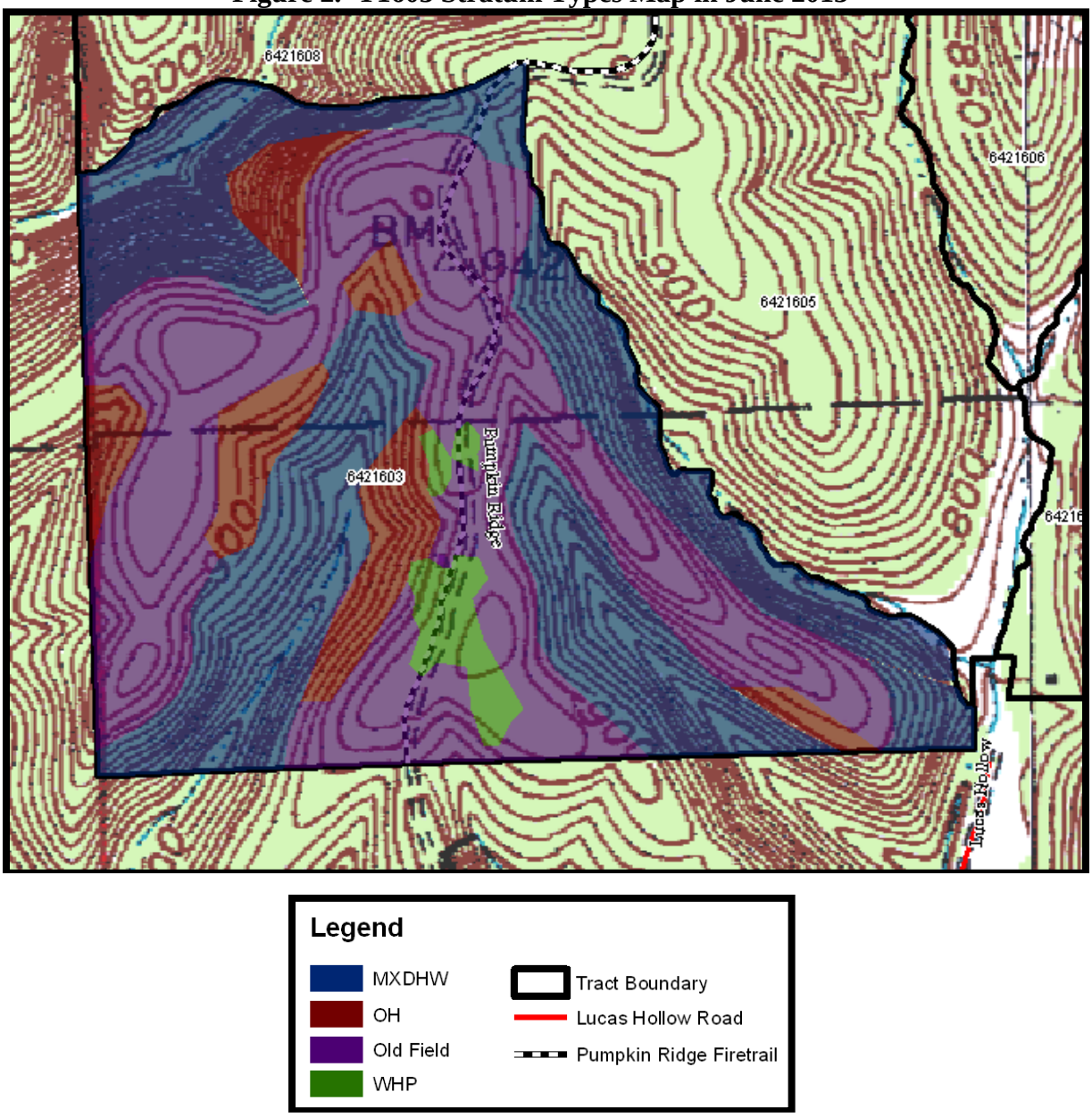
Summary Tract Silvicultural Prescription and Proposed Activities

The current forest resource inventory was completed on June 14, 2013 by Intermittent Forester Amanda Smith. 37 prism points were sampled over 128 acres (1 point for every 3.46 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. Y1603 is fully stocked and a timber harvest is prescribed. Y1603's forest resource is composed of 4 different Stratums based on 2 major timber types and site history (See Figure 2.).

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 mainly 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. Y1603 Stratum Types Map in June 2013



Oak-Hickory Stratum

As the oak-hickory component of the Central Hardwoods provides the most significant wildlife, timber resource, and value the promotion of this stratum is important in the Division's longterm resource management objectives. The oak-hickory timber type covers roughly 21.6% of Y1603 or about 27.7 acres. The overstory is dominated by Chestnut, Black and White Oaks with an average basal area of 107.0 square feet per acre. The understory layer consists of mainly Sugar Maple, Pignut Hickory, Black Oak, White Oak, American Beech, Sugar Maple, Chestnut Oak and Blackgum. The regeneration layer consists of mainly American Beech, Sugar Maple, Chestnut

Oak, White Oak, Pignut Hickory and Red Maple. Areas dominated by Chestnut Oak tend to be overstocked 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 improve 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 selection(s) may be prescribed in areas that contain low quality stems, disease/damaged stems, low tree stocking of basal area, or areas of maturity.

Mixed Hardwoods Stratum

The mixed hardwoods component of the Central Hardwoods can be very variable in their composition and thereby have more complicated prescriptions. The mixed hardwoods timber type covers roughly 40.5% of Y1603 or about 51.9 acres. The overstory is dominated by Yellow Poplar, Red Oak, American Beech, Chestnut Oak and Black Oak with an average basal area of 99.8 square feet per acre. The understory layer consists of mainly Sugar Maple, Yellow Poplar, American Beech, Red Maple, Chestnut Oak and Black Oak. The regeneration layer consists of mainly Sugar Maple, American Beech, White Ash, Black Cherry, Sassafras and Chestnut Oak.

A fair amount Y1603'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 maples throughout both the Mixed Hardwoods Stratum and the 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. The removal of these stems would be classified as a combination improvement and sanitation cutting.

Singletree and 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 Black Walnuts from crown competition of lesser-valued timber species. The longterm result of these prescribed cuttings will be to increase timber and wildlife habitat diversity. This is an important change in the mixed hardwood component as timber species that constitute this Stratum tend not to be heavy mast producers nor tend to provide valuable timber resources. Overall, marking objectives within this stratum should consider retaining oak and other species of significant wildlife value as the best croptrees for future conservation. Improvement cuttings in this area will also be applied to remove low-forking, leaning, overtopped/suppressed intermediates, epicormically sprouting, and deformed trees. Group selection(s) may be prescribed in areas that contain low quality stems, disease/damaged stems, low tree stocking of basal area, or areas of maturity. Planned regeneration openings will most likely return to mixed hardwoods with a strong component of Yellow Poplar.

Old Field Successional Stratum
This timber type covers roughly 35.1% or about 45.0 acres of Y1603 with an average basal area of 109.4 square feet per acre. The overstory is dominated by Yellow Poplar, Black Oak and Chestnut Oak. The understory layer consists of mainly Sugar Maple, Yellow Poplar, Sassafras, Red Oak, Black Oak, White Ash, Largetooth Aspen and Bitternut Hickory. The regeneration layer consists of mainly American Beech, White Ash, Sugar Maple, Sassafras, Black Oak and Yellow Poplar.

The timber quality of this stratum tends to be low at this point in its development; however, their longterm management can be very important. This stratum is derived from abandoned croplands or pastured fields wherein some modest oak regeneration is present. Singletree and group selection cuttings are prescribed to remove poor form, lower quality, mature to overmature trees to release of higher quality, more vigorous stems. Group selection(s) may be prescribed in areas that contain low quality stems, disease/damaged stems, low tree stocking of basal area. The creation of group selection openings in these areas can increase Y1603's horizontal heterogeneity by creating early successional wildlife habitat. Planned regeneration openings will most likely return to mixed hardwoods with a strong component of Yellow Poplar however a presence of oak on the drier aspects is expected. Overall, marking objectives within this Stratum should consider oak and other species of significant wildlife value as the best croptrees for future conservation. Areas where better quality hardwood poletimber have emerged and entered the forest canopy should be prescribed TSI for croptree release and grapevine removal in the planned postharvest Timber Stand Improvement project.

White Pine Plantation Stratum w/intermixed Mixed Hardwoods
White Pine was commonly planted on private property 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 slowly become established especially in the stratum's understory and canopy gaps. This timber type covers roughly 2.7% of the tract or about 3.5 acres of Y1603 with an average basal area of 180.0 square feet per acre. The overstory is dominated by Eastern White Pine with some Yellow Poplar, Red Maple and Sassafras intermixed. The understory layer consists of mainly Red Maple, Yellow Poplar, Sassafras, Red Oak and Black Oak. The regeneration layer consists of mainly Red Maple, American Beech, Yellow Poplar, White Ash, Sugar Maple, Sassafras, Black Oak and Red Oak.

Group selection(s) may be prescribed in areas that contain low quality stems, disease /damaged stems or areas with low tree stocking of basal area. Group selections may be appropriate to regenerate the Pine into native hardwoods. Areas where poletimber hardwoods have emerged and entered the forest canopy should be prescribed TSI for croptree release if not adequately released during the prescribed timber harvest. Overall, marking objectives within this stratum should consider oak and other species of significant wildlife value as the best croptrees for future conservation. Quality and vigorous Eastern White Pine may be retained as they provide wildlife habitat diversity and cover.

Given the recent inventory and growth of Y1603's forest resources, this Tract is suitable for a 15 year management cycle wherein growth and development of the tract is reevaluated by a forest inventory every 15 years. The current inventory projects harvest volumes between 150-350 MBF. A timber sale is proposed for Y1603 in FY2013-14.

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

Attachments (Included in Tract File)

- Tract Soils Map
- Aerial Photo of Tract
- INHD Review Map
- Printed TCruise Reports
- Sawtimber Volume Estimates in Y1603
- Wildlife Legacy and Snag Summaries
- Old Growth and Representative Stand Area Analysis

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You must indicate the State Forest Name, Compartment Number and Tract Number in the "Subject or file reference" line to ensure that your comment receives appropriate consideration. Comments received within 30 days of posting will be considered. Note: Some graphics may distort due to compression.