

**Indiana Department of Natural Resources  
Division of Forestry**

**DRAFT**

**RESOURCE MANAGEMENT GUIDE**

State Forest: **Yellowwood**

Compartment: **10** Tract: **19**

Tract Acreage: **78**

Commercial Forest Acreage: **76**

Forester: **Amanda Smith (for Sean Sheldon)**

Date: **July 19, 2013**

Management Cycle End Year: **2028**

Management Cycle Length: **15 years**

**Location**

Yellowwood Compartment 10 Tract 19 is located in Section 4 of Township 9N, Range 2E of Brown County. It is located approximately 4.0 miles northwest of Nashville and 3.2 miles east of Lake Lemon. The tract is accessible for the public from the north side of Plum Creek Road. A small parking area is available for the public to use.

**General Description**

Y1019 consists of a total of 76 forested acres of which 13 acres are in Oak-Hickory forest, 28 acres are in Mixed Hardwood forest, and 35 acres are in old field regenerated forest. There is a power line right-of-way that covers approximately 2.0 acres along the southwestern border of the tract. Y1019's timber resource ranges from small to large sawtimber in size. The overall timber quality of this tract ranges widely from fair to above average. A summary of the forest resources in Y1019 in relation to species dominance is noted below in Table 1.

**Table 1. Overview of Forest Resources in Y1019 in June of 2013**

<b>Overstory Sawtimber Layer</b>	<b>Understory Poletimber Layer</b>	<b>Regeneration Layer</b>
<b>Yellow Poplar</b>	<b>Sassafras</b>	<b>Sugar Maple</b>
<b>Northern Red Oak</b>	<b>Sugar Maple</b>	<b>American Beech</b>
<b>American Beech</b>	<b>American Beech</b>	<b>Blackgum</b>
<b>Sugar Maple</b>	<i>Yellow Poplar</i>	<b>Ironwood</b>
<b>White Oak</b>	<i>White Ash</i>	<b>Sassafras</b>
<i>White Ash</i>	<i>Black Walnut</i>	<i>Bluebeech</i>
<i>Black Oak</i>	<i>Blackgum</i>	<i>Eastern Red Bud</i>
<i>Shagbark Hickory</i>	<i>Pignut Hickory</i>	<i>Basswood</i>
<i>Pignut Hickory</i>	<i>Ironwood</i>	<i>Pawpaw</i>
<i>American Sycamore</i>	<i>Red Maple</i>	<i>Red Elm</i>
<i>Blackgum</i>	<i>Persimmon</i>	<i>Red Maple</i>
<i>Bitternut Hickory</i>	<i>Shagbark Hickory</i>	<i>Yellow Poplar</i>
<i>Sassafras</i>	<i>Basswood</i>	<i>*White Ash</i>
<i>Black Cherry</i>	<i>Bitternut Hickory</i>	<i>*Black Cherry</i>
<i>Basswood</i>	<i>White Oak</i>	<i>*Black Oak</i>
<i>Scarlet Oak</i>	<i>Red Elm</i>	<i>*Northern Red Oak</i>
<i>Black Walnut</i>	<i>Dogwood</i>	<i>*White Oak</i>

**Bold** – Species that comprise  $\geq 10\%$  of the total TPA and/or BA in each structural class

*Italicized* - Species that comprise  $\leq 10\%$  of the total TPA and/or BA in each structural class

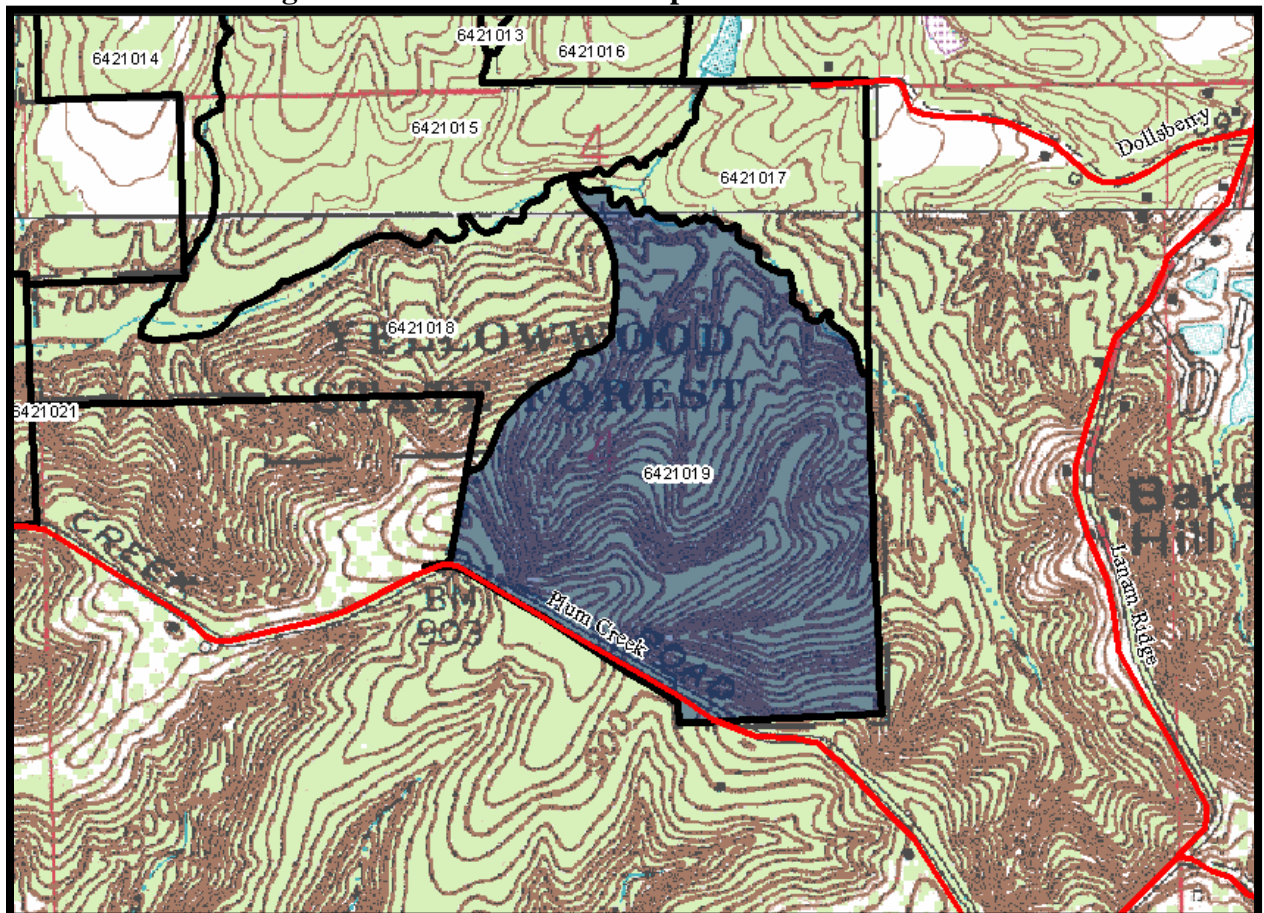
\* Species not captured in Prism Plots but present within the tract.

## History

- State Acquisition of land in 1956.
- TSI by CETA crew in September 1975.
- First tract resource inventory completed by Forester Williams on March 16, 1976.
- Timber sale by Forester Bill Fischer on May 24, 1979.
- TSI completed by YACC crew in March 1980.
- Waterline R-O-W sale marked by Forester Duncan on April 14, 1982.
- DHPA review in November 22, 1996.
- 2<sup>nd</sup> tract resource inventory completed by Forester Amanda Smith on June 20, 2013.

The land area that includes Y1019 was deeded to the State of Indiana on October 30, 1956 by the United States Department of Agriculture. Historical aerial photography suggests that prior to government acquisition the valleys and ridgetops were farmed and the sideslopes likely to have been grazed. Tract Y1019 has had 2 tract resource inventories completed; one in 1976 and the second in 2013. The 1976 inventory data noted 3,438 BF/A leave & 3,180 BF/A harvest for a total volume per acre in that year of 6,618 BF. Y1019 has had 2 previous timber sales, the first being a regular tract harvest in 1979 that was sold to David R. Webb for \$225/MBF (351 trees, 2,105 BF/A) whereas the 2<sup>nd</sup> was a salvage sale along a waterline improvement project. The current inventory upon which this management guide is based was completed on June 20, 2013 by Intermittent Forester Amanda Smith.

**Figure 1. Yellowwood SF Compartment 10 Tract 19**



## **Landscape Context**

The ridgetops of Y1019 are mostly comprised of an oldfield species mix and quality while the sideslopes are composed of Mixed Hardwoods and the Oak-Hickory species known to occur in the Brown County Hills Natural Region. The tract is bordered to the north by the dominantly closed forest canopy of Yellowwood State Forest. Private forested property with dispersed residential buildings borders Y1019 on the south, east, and west. The Beanblossom Creek bottomland riparian area is approximately 1 mile to the north of the tract.

## **Topography, Geology and Hydrology**

Y1019 consists of predominantly north, east, and west facing slopes that drain into two mapped intermittent streams, one on each side of the tract. The ephemeral drainages feed into a mapped intermittent stream running along the northern boundary of the tract which eventually drains into Plum Creek and then into Lake Lemon. In general, these upland soils were formed in residuum from sandstone, siltstone, and shale. The tract's topography ranges from 0 - 35% slopes with general north, east, and west aspects.

## **Soils**

### 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 covers approximately 48.7% of Y1019 or 38 acres.

### CnC2- Cincinnati Silt Loam, 6 to 12 percent slopes, eroded

This moderately sloping, deep, well drained soil is on ridgetops and sideslopes in the uplands. It is fairly well suited to trees. This soil has a site index of 80 for northern Red Oak. This soil type covers approximately 7.1% of Y1019 or 5.5 acres.

### HkF- Hickory Silt Loam, 20 to 70 percent slopes

This moderately steep to very steep, deep, well drained soil is on sideslopes in the uplands. It is well suited to trees. Erosion hazards and equipment limitations are main management concerns due to slopes. Consideration should be given during sale planning and implementation of Best Management Practices for Water Quality. This soil has a site index of 85 for White Oak and 95 for Yellow Poplar. This soil type covers approximately 14.1% of Y1019 or 11 acres.

### Sf- Steff Silt Loam, frequently flooded

This nearly level, deep, moderately well drained soil is in bottomlands. It is well suited to trees. Due to flooding concerns, equipment operation activities may be limited during some portions of the year. This soil has a site index of 88 for Black Oak and 107 for Yellow Poplar. This soil type covers approximately 5.8% of Y1019 or 4.5 acres.

### TlB- Tilsit Silt Loam, 2 to 6 percent slopes

This gently sloping, deep, moderately well drained soil is on ridgetops in the uplands. It is well suited to trees. The rooting depth is limited by a fragipan that is present at a depth of 30

inches. This soil has a site index of 68 for White Oak and 90 for Yellow Poplar. This soil type covers approximately 3.8% of Y1019 or 3.0 acres.

#### WeC2- Wellston-Gilpin Silt Loams, 6 to 20 percent slopes, eroded

These moderately sloping to moderately steep, well drained soils are on sideslopes and ridgetops in the uplands. They are well suited to trees. This Complex has a site index for northern Red Oak of 71 in the Wellston and 80 in the Gilpin. This soil type covers approximately 20.5% of Y1019 or 16 acres.

#### **Access**

Y1019 is easily accessible by the public from off the north side of Plum Creek Road. A small parking area is available at the southwest corner of the tract. A 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**

Y1019 is bordered to the north by other forested tracts of Yellowwood State Forest. Private forested property with dispersed residential buildings borders Y1019 on the south, east, and west. The tract's private ownership boundaries have been marked and repainted by orange paint along the line for many years and are currently up to date. The remarking of these lines are planned prior to any construction or harvest activities.

#### **Wildlife**

Wildlife resources are abundant within the tract. Being mostly northerly aspects with mesic sites, Y1019 contains a diverse vegetation structure that is conducive to providing habitat for a variety of wildlife species. Habitat includes a fair amount of Oak-Hickory species amongst a mosaic of Mixed Hardwood areas, upland oldfield areas and a modest northern riparian area. Other forest habitat structures are present that favors 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 source to Squirrels, Wild Turkey, and White-tailed Deer. Downed woody debris provides habitat and protection for many wildlife species as well as herptiles.

A Natural Heritage Database review was completed for Y1019 in July of 2013. If Rare, Threatened or Endangered species (RTE's) 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.

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 Y1019 will be conducted in a manner that will maintain long-term and quality forest habitats for wildlife populations.

## **Communities**

Y1019 is composed of mostly dry to mesic upland hardwoods. From the current inventory the dominant overstory timber species include Yellow Poplar, Northern Red Oak, American Beech, Sugar Maple, and White Oak. The understory contains some Oaks and Hickories but consists mainly of Sugar Maple, Beech, and Sassafras. The ground cover of this tract consisted of mainly mesic to dry mesic species.

Dry-mesic upland forests are found on the tract's cove like areas or northerly facing slopes. Dry-mesic upland forests are one of the most prevalent forest communities in Indiana. This community is in an intermediate position along a soil moisture gradient. Trees grow well, but the canopy is usually more open than in mesic forests. The dominant trees found are White Oak, Red Oak, and Black Oaks. Other plants and animals characteristic of this community are Shagbark Hickory, Mockernut Hickory, Flowering Dogwood, Hop Hornbeam (Ironwood), Blackhaw, Broad-headed Skink, White-footed Mouse, and Eastern Chipmunks.

## **Exotic Species**

Autumn Olive, Japanese Stiltgrass, and Multiflora Rose were observed during the inventory. Autumn Olive populations will be reviewed prior to any harvest activities: small populations will be treated by the forester otherwise the treatment will occur in a postharvest TSI operation. Eradication of the Japanese Stiltgrass population is unlikely; however, treatment to accessible areas prior to harvest operations should be considered to reduce viable seed in conjunction with prompt reseeding of disturbed areas. As Brown County is a known location of the plant "virus" rose rosette disease, the populations of MF Rose are relatively stable. Control measures may be warranted if large populations are located in or surrounding planned regeneration openings.

## **Recreation**

This tract does not contain any established recreational facilities. Given its proximity to Plum Creek Road it is generally well used by the public for hunting, gathering, off trail hiking, and wildlife viewing.

## **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 from June 2013 Inventory

Total Trees/Ac. = **171 Trees/Ac.**

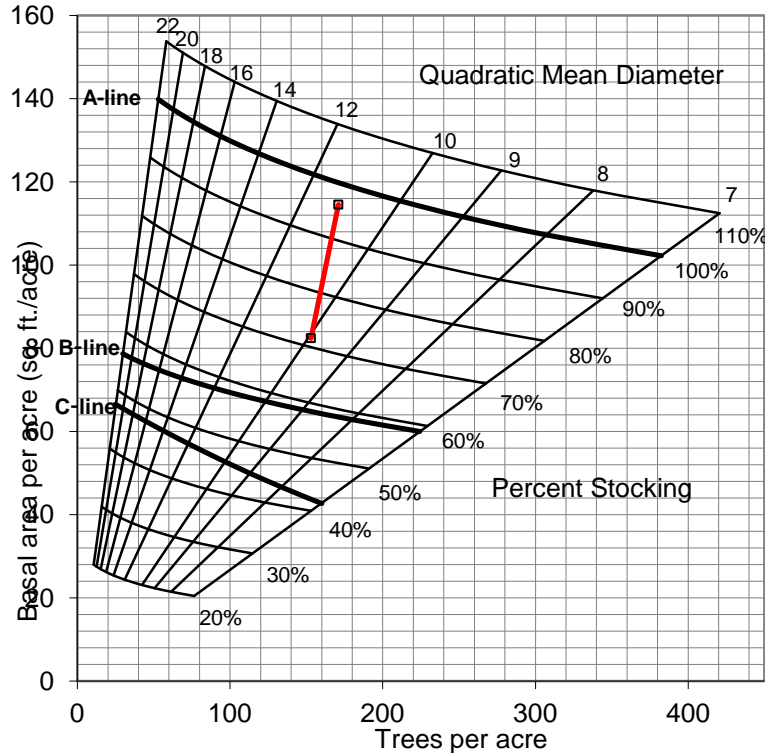
Overall % Stocking = **96%** (Fully Stocked)

BA/A = **114.5 Sq. Ft./Ac.**

Sawtimber & Quality Trees/Ac. = **45 Trees/Ac.**

Present Volume = **10,557 Bd. Ft./Ac.**

**Table 2. Gingrich Stand and Stock Table for Y1019 for June 2013**



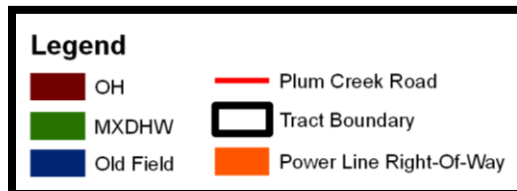
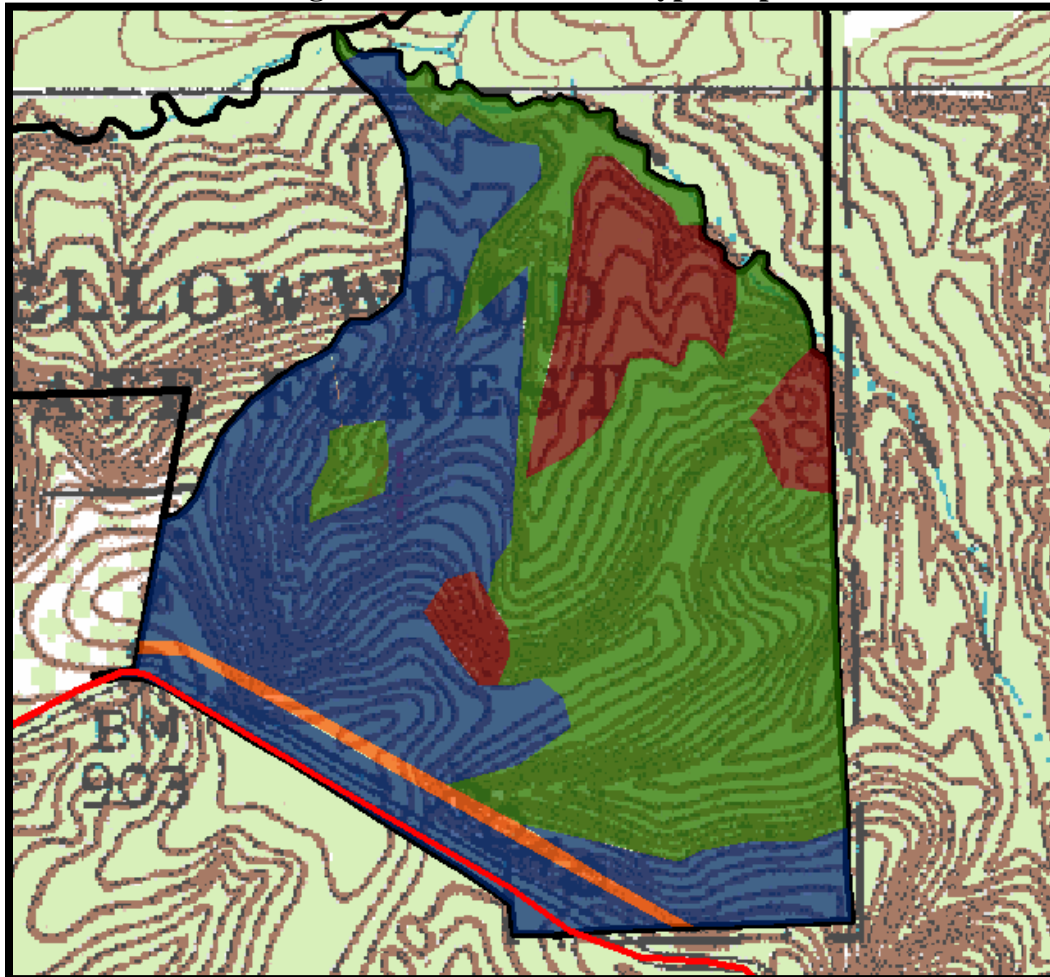
### Summary Tract Silvicultural Prescription and Proposed Activities

The current forest resource inventory was completed on June 20, 2013 by Intermittent Forester Amanda Smith. 31 prism points were sampled over 78 acres (1 point for every 2.52 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. This tract is fully stocked and a timber harvest is prescribed. Y1019's forest resource is composed of 3 Stratum based on the 2 major timber cover types and the oldfield successional areas mentioned below (see Figure 2).

The Indiana guidelines for Best Management Practices (BMP's) will be followed during timber harvest closeout activities to maintain the area's 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 successful regeneration of regeneration openings is planned 3-4 years after opening TSI completion.



**Figure 2. Y1019 Stratum Type Map**



**Oak-Hickory Stratum**

As the Oak-Hickory component of the Eastern Hardwood Ecosystem provides significant wildlife, timber resource, and value. The retention of this Stratum is important to the Property’s longterm timber management objectives. The Oak-Hickory timber type covers approximately 16.7% of Y1019 or about 13.0 acres. The overstory is dominated by NRO, AMB, WHO, PIH, SHH, and SUM with an average basal area of 121.5 square feet per acre. The understory layer consists of mainly SUM, PIH, SHH, and WHO. The regeneration layer consists of mainly SUM, AMB, PAP, REM, BAS, SAS, and IRO. Singletree and selection cuttings are prescribed to remove lower quality stems and low vigor canopy 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 where concentrations of low quality stems, disease/damaged stems, windblown and/or understocked areas occur.

### **Mixed Hardwoods Stratum**

The Mixed Hardwoods component of the Eastern Hardwoods Ecosystem can be very variable in their composition and thereby have more complicated prescriptions. The Mixed Hardwoods timber type covers approximately 38.5% of Y1019 or about 30.0 acres. The overstory is dominated by YEP, SUM, AMB, NRO, WHA, WHO, SHH, and BLG with an average basal area of 119.6 square feet per acre. The understory layer consists of mainly AMB, SUM, YEP, WHA, BAS, and BIH. The regeneration layer consists of mainly AMB, SUM, BLB, BLG, SAS, IRO, REE, and WHA.

A fair amount of Y1019'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. As YEP is the dominant timber resource in this tract a modest amount of these affected YEP will need careful review when the tract is marked as mortality has occurred and is expected to continue over the next few years.

Sugar Maple borer damage was noted in understory SUM 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 low vigor canopy trees to release a growing stock of high quality, more vigorous stems. As this Stratum covers a large portion of the tract, free thinning is also prescribed to improve croptree spacing and improve stand vigor. An improvement cutting is also prescribed to release individual Oaks, Hickories and Walnuts from crown competition. The longterm result of these prescribed cuttings will increase timber and wildlife habitat diversity. This is an important change in the Mixed Hardwood component as the Mixed Hardwood timber species tend not to be heavy mast producers nor provide valuable timber resources. Overall, marking objectives within this Stratum should consider Oak and other species of significant wildlife value as preferred croptrees for future conservation. Group selections may be prescribed in areas where concentrations of low quality stems, disease/damaged stems, windblown and/or understocked areas occur. Planned regeneration openings in this Stratum will most likely return to Mixed Hardwoods with a strong component of YEP however some Oak and Hickory regeneration is expected on the drier sites.

### **Oldfield Successional Stratum**

This timber type covers approximately 42.3% or about 33.0 acres of Y1019 with an average basal area of 115.1 square feet per acre. The overstory is dominated by YEP, BLO, WHA, SAS, SYC, and SUM. The understory layer consists of mainly SAS, SUM, BLW, YEP, IRO, BLG, AMB, and WHA. The regeneration layer consists of mainly SUM, AMB, BLG, IRO, SAS, REE, and BAS.



The timber quality of this Stratum tends to be low as natural succession from oldfields often contains open grown, large canopy individual trees. However the longterm management of this Stratum is very important. These stratum are derived from abandoned croplands or pastured fields wherein there is usually some modest Oak regeneration present. Singletree and group selection cuttings are prescribed to remove poor form, lower quality, overmature trees to release higher quality, more vigorous stems. Group selections are often prescribed in areas where concentrations of low quality, disease/damaged stems, and poorly stocked areas occur. The creation of group selection openings can utilize this declining timber and increase the Y1019's horizontal heterogeneity by creating early successional habitat. 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. Overall, marking objectives within this Stratum should consider Oak and other species of significant wildlife value as preferred croptrees for future conservation. Areas where higher quality hardwood poletimber have emerged and entered the Stratum's canopy may be prescribed TSI for croptree release and grapevine removal in the planned postharvest timber stand improvement project.

Given the recent inventory and growth of Y1019'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. The current inventory indicates a possible harvest of between 100-300 MBF. A timber sale is proposed for Y1019 in CY 2014.

**Table 3. Overview of Sawtimber Volume Estimates in Y1019 in June of 2013**

<b>Species</b>	<b>Total</b>
Yellow Poplar	285,470
Northern Red Oak	76,990
American Beech	73,500
Sugar Maple	65,570
White Oak	52,230
White Ash	45,330
Black Oak	43,550
Shagbark Hickory	42,700
Pignut Hickory	25,150
American Sycamore	23,650
Blackgum	20,080
Bitternut Hickory	17,180
Sassafras	12,460
Black Cherry	11,620
Basswood	9,730
Scarlet Oak	4,780
Black Walnut	3,470
<b>Tract Totals (Bd. Ft.)</b>	<b>813,460</b>
<b>Per Acre Totals (Bd. Ft./Ac.)</b>	<b>10,429</b>

## **Proposed Activities Listing**

<b><u>Proposed Management Activity</u></b>	<b><u>Proposed Period</u></b>
DHPA timber sale project review	CY2013-2014
Roadwork Rehabilitation	CY2014
Timber Marking & Invasive Evaluation	CY2014
Timber Sale	CY2014
Postharvest TSI & Invasives Follow-up	CY2015-2018
Regeneration Opening Review	CY2020-2021
Reinventory and Management Guide	CY2028

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