Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Yellowwood** Compartment: **7** Tract: **02**
Tract Acreage: **100** Commercial Forest Acreage: **95**
Forester: **Amanda Smith (for Laurie Burgess)** Date: **7/10/2013**

Location

Tract Y0702 is located in Sections 7, 8, and 17 of Township 9N, Range 2E of Brown County. It is located roughly 3 miles southeast of Lake Lemon and 2.5 miles northeast of Yellowwood Lake. The tract is accessible off of Dubois Ridge Road and the ridgetop is locally known as Patty's Garden Ridge.

General Description

Y0702 consists of a total of 100 forested acres within Yellowwood State Forest of which 43.4 acres are in Oak-Hickory forest and 16.6 acres are in Mixed Hardwood forest, 8.3 acres are in mature and declining Pine plantations with intermixed mixed hardwood growth, and 5 acres are in oldfield successional forest. Y0702's timber resource ranges from small to large sawtimber in size. The overall timber quality of this tract is fair to average. A summary of the forest resources in Y0702 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Y0702 in May 2013

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

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

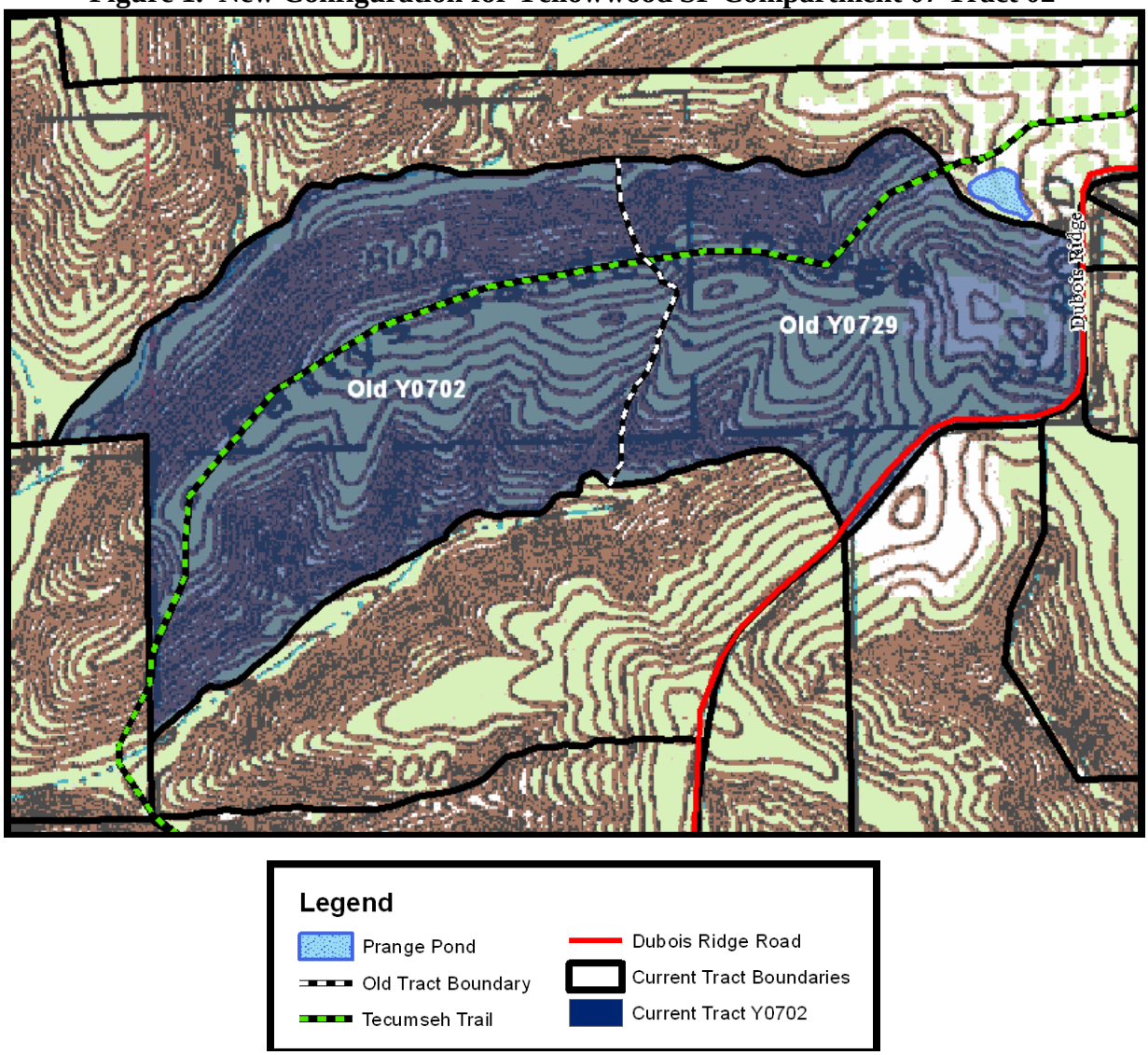
History
The current 100 acre Tract Y0702 was created in 2013 when old Tract Y0702 and Y0729 were combined. Two histories are noted below to preserve the unique histories of each of the previous tracts.

Past History of Old Y0702
The land area that includes the original 60 acres of Tract Y0702 (see Figure 1) was deeded to the State of Indiana in 1940 by the United States Department of Agriculture. Historical aerial photography suggests that prior to government acquisition the ridgetops were farmed and the sideslopes likely to have been grazed. Signs of past timber harvest activities were noted during the recent inventory. In 1995, Yellowwood State Forest reconstructed tract boundaries for Compartment 7, Tracts 1, 2, 5, and 29 due to the purchase of the Prange property and the access it provided off of Dubious Ridge Road. Prior to the tract boundary reconstruction, the original Tract Y0702 was inventoried in January of 1974 by Forester Akard (110,832 BF leave and 110,077 BF harvest). Forester Akard marked a timber harvest in Tract 2 in March of 1974 (76,551 BF) which was sold to Harry Moore for $4,360.89. A brief recon of the area was completed in June of 1982 by Forester Gray during which it was determined that the area had good stocking. Forester Kaina inventoried the Tract in October of 2004 (2,090 BF/A harvest, 3,268 BF/A leave). The most current resource inventory was completed on May 16, 2013 by Intermittent Foresters Amanda Smith and Allison Rubeck. The results of that inventory combined with that of old Y0729 are highlighted in the report below.

Past History of Old Y0729
The land area that includes the original 40 acres of old Tract Y0729 (see Figure 1) was deeded to the State of Indiana in 1940 by the United States Department of Agriculture and in two land acquisitions from Henry C. Prange in 1992 and 1995. Historical aerial photography suggests that prior to government acquisition the valleys and ridgetops were farmed and the sideslopes likely to have been grazed. Signs of past timber harvest activities were noted during the recent inventory. Past timber harvest activities on Y0729 would have been conducted under the private ownership. In 1995, Yellowwood State Forest reconstructed tract boundaries for Compartment 7, Tracts 1, 2, 5, and 29 due to the purchase of the Prange property and the access it provided off of Dubious Ridge Road. The current and first tract resource inventory was completed on November 21, 2012 by Intermittent Forester Amanda Smith. The results of that inventory were merged into the present Y0702 inventory noted below.

Landscape Context
The ridgetop and sideslopes of Y0702 are mostly comprised of the dominant Oak-Hickory species known to occur in the Yellowwood/Morgan-Monroe State Forest ecosystem. The tract is bordered by the dominantly closed forest canopy of Yellowwood State Forest except for the southwestern boundary which is bordered by private forest land and the southeastern boundary is bordered by forested private property with a house and a small open yard. Private property in the area is dominated by forested land with scattered open agriculture land and buildings. Prange Pond is located on adjacent Y0701 while Lake Lemon lies approximately 3 miles northwest and Yellowwood Lake is approximately 2.5 miles southwest. These open water habitats provide areas for migrating waterfowl in this predominantly forested area of southern Indiana. Mapped intermittent streams run along the northern and southern boundaries of Y0702.

Figure 1. New Configuration for Yellowwood SF Compartment 07 Tract 02



Topography, Geology and Hydrology

Y0702 consists of predominantly northern and southern facing slopes that drain into ephemeral streams that eventually merge into the two mapped intermittent streams along the northern and southern boundaries of the tract. These intermittents flow into Jackson Creek and eventually into Yellowwood Lake. There is a large pond (locally known as Prange Pond) that lies just northeast of the tract in Y0701 (see Figure 1). The tract's topography ranges from 0 - 40% slopes with general north and south aspects. The soils in this tract are derived from a loamy residuum over sandstone and shale bedrock.

Soils

Be- Beanblossom Channery Silt Loam, 1 to 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 can 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 covers roughly 4.5% of the Tract or 4.5 acres.

BgF- Berks-Trevlac-Wellston Complex, 20 to 70% 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 roughly 64 % of the Tract or 64 acres.

WaD- Wellston-Berks-Trevlac Complex, 6 to 20% 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 south facing Berks soils due to droughty conditions. This Complex has a site index of about 70 for Northern Red Oak. This soil type covers roughly 17.5% of the Tract or 17.5 acres.

WeC2- Wellston-Gilpin Silt Loams, 6 to 20% 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 roughly 14% of the Tract or 14 acres.

Access

Y0702 is accessible by Dubois Ridge Road which runs along the Tract's eastern boundary. There is a small public parking area at the head of the ridgetop firetrail leading into the tract from Dubois Ridge 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.

Boundary

Y0702 is bordered on all sides by State Forest except for along the western boundary and the southeastern boundary which are bordered by private forest land. The north and south boundaries are denoted by ephemeral drainages that form into mapped intermittent streams. 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.

Wildlife

A Natural Heritage Database Review was completed for this tract in 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 Indiana Division of Forestry recognizes the potential to improve habitat on its lands by implementing comprehensive management practices. These management practices include snag tree management. Tract inventories indicate the levels of snags and legacy trees met or exceeded recommended maintenance levels.

Communities
Y0702 is composed of mostly dry-mesic upland hardwoods. The dominant overstory timber species include White Oak, Yellow Poplar, Black Oak, Red Oak and Sugar Maple. The understory contains some Oaks but consists mainly of Sugar Maple, Beech, and Sassafras. The ground cover consists of mainly mesic to dry mesic species.

Exotic Species
Autumn Olive, Japanese Honeysuckle, Multiflora Rose, and Oriental Bittersweet were observed during the resource inventory mainly in the pine plantations, the old pasture land, along the old haul road, and dispersed sporadically throughout Tract Y0702. Autumn Olive has the potential to increase its population in short periods of time. Japanese Honeysuckle and Oriental Bittersweet can girdle small trees and shrubs when the vines twist tightly around stems and trunks cutting off the water flow through the plant. Populations of Autumn Olive, Japanese Honeysuckle, and Oriental Bittersweet will be monitored and treated as warranted. 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.

Recreation
Activities on Y0702 include hiking, bird watching, wildlife viewing, hunting, and mushrooming. The adjacent Prange Pond area to the northeast of Tract 02 provides some additional recreational values such as picnicking and fishing. The Tecumseh Trail runs through the central portion of the Tract and along Prange Pond in Y0701. A temporary trail reroute of the Tecumseh Trail, in the event of a future timber harvest, is planned to reduce interaction with timber harvest operations and recreational values.

Cultural
Cultural resources may be present on this tract and their location(s) protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities as prescribed by the Division of Forestry Archaeologist.

Tract Subdivision Description and Silvicultural Prescription

The overall stand structure for Y0702 is represented in the following Gingrich Stand and Stock Table (See Figure 2.)

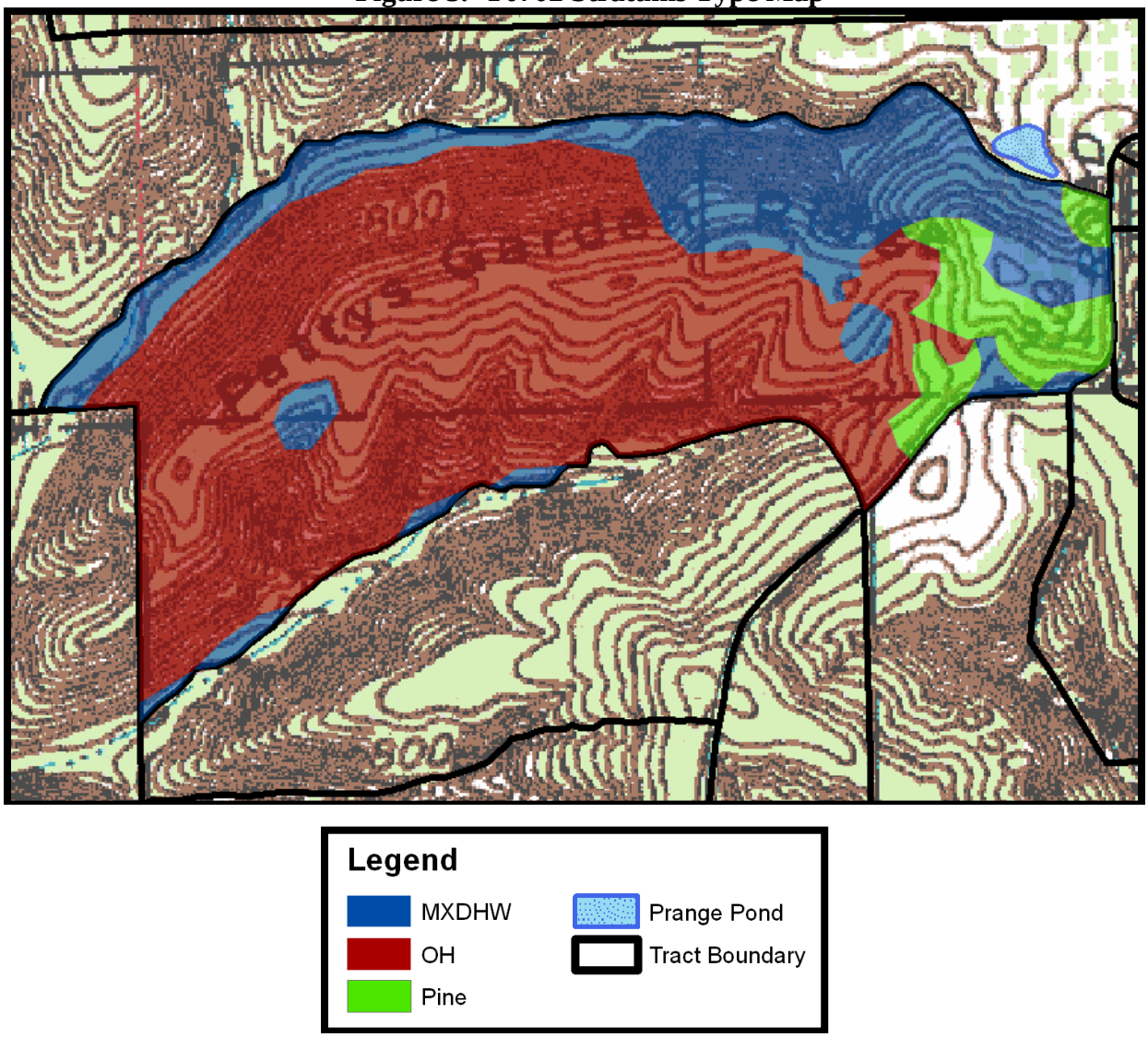
Total Trees/Ac. = **175 Trees/Ac.**
BA/A = **137.8 Sq. Ft./Ac.**
Present Volume = **8,323 Bd. Ft./Ac.**
Overall % Stocking = **114%** (Fully Stocked)
Sawtimber & Quality Trees/Ac. = **61 Trees/Ac.**

Summary Tract Silvicultural Prescription and Proposed Activities for Y0702

The inventory for Old Y0702 was completed on May 16, 2013; 29 prism points were completed over 60 acres (1 point for every 2.07 acres). The inventory for Old Y0729 was completed on November 21, 2012; 24 prism points were sampled over 40 acres (1 point for every 1.67 acres). Summaries of the combined prior tracts are given above and a species breakdown of the new configuration of Y0702 is given in Table 3 below. The inventories for the old tracts were completed by Intermittent Foresters Amanda Smith and Allison Rubeck. Both tracts are fully stocked and a timber harvest is prescribed with harvest estimated at 200-350 mbf.

The forest resources of the Tract are composed of 3 different Stratums based on the major timber types and past history of the Tract as described below in Figure 3.

Figure 3. Y0702 Stratums Type Map



Oak Hickory Stratum

As the Oak-Hickory component of the Eastern Hardwood Ecosystem provides the most significant wildlife, timber resource, and value the retention of this stratum is important in the Property's long-term timber management program. The Oak-Hickory timber type covers roughly 58.4% of the Tract or about 58.4 acres. The overstory is dominated mostly by WHO, BLO, SUM, NRO, SCO, REO, and BIH with an average basal area of 133.6 square feet per acre. Single tree 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 to create regeneration openings where there is an abundance of advanced regeneration of Oak and Hickory seedlings or where the overstory is modestly understocked to help maintain long-term forest regeneration and sustainability.

Mixed Hardwoods & Old Field 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 in this Stratum covers approximately 33.3% of the Tract or about 33.3 acres. The overstory is dominated mostly by WHO, YEP, LAA, NRO, AMB, SUM, BIH, and WHA with an average basal area of 135.4 square feet per acre. An old field site at the eastern end of the Tract constitutes about 5.0 acres of these 33.3 acres. The overstory in this old field is dominated by YEP, REM, WHP, and LAA. This portion of the Stratum is heavily infested with Japanese Honeysuckle, Multiflora Rose, Autumn Olive, and Oriental Bittersweet and may warrant treatment.

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 increase timber value and wildlife habitat diversity. 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 Oaks, Persimmons and other tree species of significant wildlife value as preferred crop trees 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 selections may be prescribed to create regeneration openings within this Stratum to maintain long-term forest regeneration and sustainability. Planned regeneration openings will most likely return to Mixed Hardwoods with a strong component of YEP. A field review for successful regeneration is planned 3-4 years after opening TSI completion.

A fair amount of the tract's Yellow Poplar stocking 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 modest mortality has already occurred and is expected to continue.

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.

There is a man-made pond on adjacent tract Y0701 to the northeast of Tract 02. A buffer of at least 50 feet is planned along with the implementation of BMP's during any management activity to lessen impacts to the pond's forested edges and recreational values.

The old field portion of this Stratum has an average basal area of 73.3 square feet per acre. The timber quality here tends to be low; however, the longterm management can be very important. Oldfields are generally derived from forest succession of abandoned croplands or pastured fields. Normally some modest advance Oak regeneration is present. Singletree and selection cuttings are prescribed to remove lower quality stems and mature to overmature trees to release a growing stock of higher quality, more vigorous stems. Group selections may be appropriate here to regenerate poor quality hardwoods and the WHP into better quality native hardwoods in those portions where superior quality hardwood seedlings have already become established. The creation of group selection regeneration openings may convert some of these areas to early successional habitat to help promote long-term forest regeneration and sustainability. 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 crop trees for future conservation. Quality and vigorous Pine may be retained as they provide valuable wildlife habitat diversity and cover. Areas where quality hardwood poletimber have emerged and entered the canopy should be prescribed TSI for croptree release and grapevine removal in the planned post harvest Timber Stand Improvement(TSI) project.

Mature Pine Plantation Stratum w/intermixed Mixed Hardwoods

Eastern White Pine and Virginia Pine plantations were established for erosion control purposes during the early management history of YSF. As these plantations have matured and individual trees have declined native hardwoods have become established in the understory and canopy gaps. This timber type covers roughly 8.3% or about 8.3 acres of Y0702 with an average basal area of 172 square feet per acre. The overstory is dominated by WHP, YEP, REM, BLO, VIP, and REO. Singletree selection is prescribed in vigorous and quality VIP and WHP stands to thin, remove lower quality stems and to release occasional hardwoods that have good vigor. Management within these Pine stands by releasing Oaks and Hickories is valuable in retaining and enhancing the Oak-Hickory component within the Tract. Group selections may be appropriate to regenerate portions of these Pine areas into native hardwoods in those areas where seedling Oaks, Hickories and Yellow Poplar have become established. Areas where poletimber Oaks, Hickories and Yellow Poplar have emerged and entered the forest 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. Overall, marking objectives within this Stratum should consider Oak and other valuable hardwood species of significant wildlife value as the best croptrees for future conservation. Retaining portions of the Stratum in quality and vigorous Pine will provide wildlife habitat diversity and cover.

Given the recent inventory, Y0702 is suitable for a 15 year management cycle wherein growth and development of the tract is reevaluated by a forest inventory every 15 years. At present a tract timber sale is proposed in FY13-14 followed by a Timber Stand Improvement (TSI) project. A field review for successful regeneration is planned 3-4 years after opening TSI is completed.

Table 3. Overview of Sawtimber Volume Estimates in Y0702 in May of 2013

Species	Total
White Oak	218,520
Yellow Poplar	119,170
Black Oak	106,150
Northern Red Oak	69,050
Sugar Maple	65,370
Bitternut Hickory	41,690
Scarlet Oak	33,880
American Sycamore	27,820
Shagbark Hickory	23,710
Eastern White Pine	22,460
American Beech	20,860
Pignut Hickory	20,800
White Ash	14,170
Largetooth Aspen	13,910
Red Maple	9,730
Chestnut Oak	8,480
Blackgum	4,710
Black Cherry	2,720
Sassafras	2,640
Virginia Pine	2,550
Basswood	2,260
Red Elm	1,690
Tract Totals (Bd. Ft.)	**832,340**
Per Acre Totals (Bd. Ft./Ac.)	**8,323**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
DHPA timber sale project review	CY2013
Roadwork Rehabilitation	CY2013
Timber Marking & Invasive Evaluation	CY2013
Timber Sale	CY2013-2014
Postharvest TSI & Invasives Follow-up	CY2014-2018
Regeneration Opening Review	CY2018-2020
Reinventory and Management Guide	CY2027

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