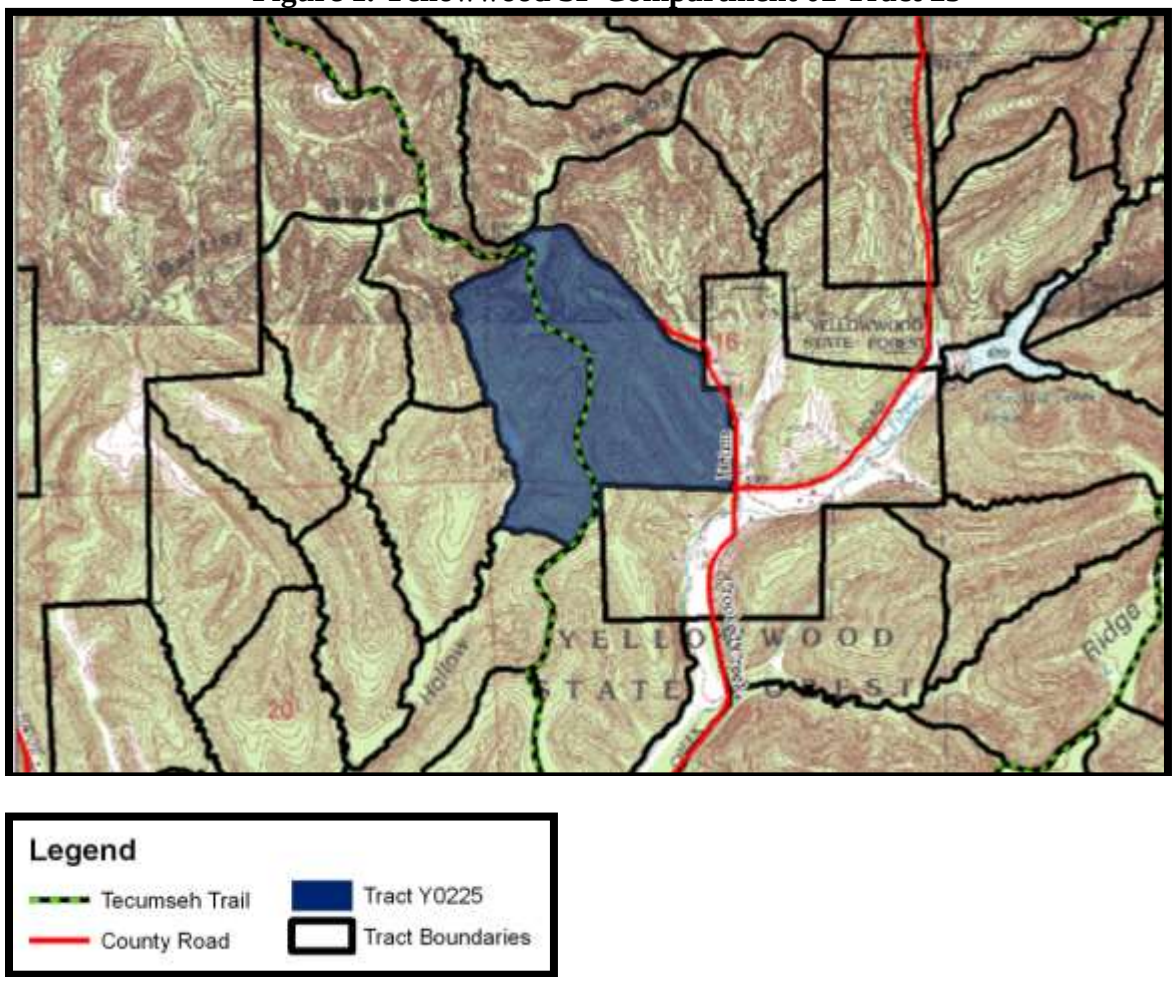
Indiana Department of Natural Resources
Division of Forestry
DRAFT
RESOURCE MANAGEMENT GUIDE

State Forest: **Yellowwood** Compartment: **02** Tract: **25**
Tract Acreage: **164** Commercial Forest Acreage: **164**
Forester: **Amanda Smith (for Amy Spalding)** Date: **September 25, 2013**

Location
Y0225 is located in Sections 16, 17, and 21 of Township 8N, Range 2E of Brown County. It lies approximately 6.3 miles southwest of Nashville and 2.3 miles southeast of Belmont. The tract is accessible by a firetrail off of Crooked Creek Road or from the northeast via the Mossop Ridge Firetrail. There is public parking available at the head of the Crooked Creek firetrail and cable gate.

Figure 1. Yellowwood SF Compartment 02 Tract 25



General Description
Y0225 contains a total of 164 forested acres of which 92.0 acres are Oak-Hickory forest, 20.0 acres are in Mixed Hardwood forest, and 52.0 acres are of an Oldfield composition. A portion

of the Tecumseh Trail runs through the center of the tract. This tract also serves as a buffer tract for the adjacent Hardwood Ecosystem Experiment's Unevenaged Forest Research Core known as Management Unit #8. All 164 acres are considered commercial forest acreage. Y0225'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 Y0225 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Y0225 in September of 2013*

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

*Trees listed in order of most total stems to least based on inventory estimates.
**Tree species not located in prism plots but witnessed within tract during inventory.

History

- 1939 – Aerial photo indicated that most of tract was open ground
- 1949 – Aerial photo indicated that most of tract was open ground
- 1951 or 52 – Timber harvest in NW part of old tract 26
- 10-30-56 – State acquisition from USDA
- 2-11-1981 – Forester D. Sieg performed reconnaissance of NW corner of old tract 26 and said that possible harvest was at least 10 years away
- 4-26-1990 – Forester R. Unversaw performed reconnaissance of old tract 26 and said that possible harvest was at least 10 years away
- 8-21-01 – Forest Resource inventory completed in eastern portion of tract by forester H. Kaina (old Y0226).
- 2013 – New Tract Y0225 formed from combination of old tracts 25&26.
- November 2013 – Boundary lines repainted by forester M. Spalding
- 9-24-13 - Forest Resource inventory completed by Intermittent Forester A. Smith.

Landscape Context
The ridgetops of Y0225 are mostly comprised of the Mixed Hardwoods and Oak-Hickory species known to occur in the Brown County Hills Natural Region. The sideslopes are generally comprised of Oak-Hickory species. Several oldfields within the tract are also dominated by Oak-Hickory species. Y0225 is surrounded by a dominantly closed forest canopy composed of other YSF forested tracts however some small, privately owned agriculture fields and residences are located to the southeast of the tract. The northern headwaters and intermittently flooded marshes of Monroe Reservoir lie approximately 1 mile south of Y0225 providing stable habitats for migrating waterfowl as well as habitats for lowland mammals, herptiles and birds.

Topography, Geology and Hydrology
Y0225 has predominantly southern facing slopes. The west portion of the tract drains into Lucas Hollow that contains an intermittent stream that constitutes the tract's west boundary. This stream eventually becomes a perennial stream than enters into Lake Monroe. The eastern boundary of the tract consists of a mapped intermittent that flows into Crooked Creek after leaving the tract. In general, these upland soils were formed in residuum from sandstone, siltstone, and shale. The tract's topography ranges from 0 - 70% slopes with general south, 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 present in its subsoil. This soil type 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 its 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.

TlB- Tilsit Silt Loam, 2 to 6 percent slopes
This gently sloping, deep, moderately well drained soil is on the tops of ridges in the uplands. It is well suited to trees. The rooting depth is limited by a fragipan present at a depth of 30 inches. This soil has a site index of 68 for White Oak and 90 for Yellow Poplar.

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
Y0225 is most easily accessed by the public from the firetrail at the southern tract boundary off Crooked Creek Road. There is public parking available at the head of this cable gated firetrail. Management access is best provided by the road network along the Mossop Ridge Firetrail that leads into the northern portion of the tract.

Boundary
Y0225 is surrounded on all sides by other Yellowwood State Forest (YSF) tracts except for its southeast corner where it borders private property. The northeastern boundary runs along an old road bed to the property line. The eastern boundary and part of the southern boundary are private property lines. The other part of the southern boundary is an ephemeral stream valley. The western boundary begins as an ephemeral stream valley on the north end that becomes an intermittent stream as it travels south. The tract's private ownership boundaries were recently remarked by orange paint along the line in 2013 and are scheduled for remarking in 2018. Y0225's private boundary is generally repainted every 5 years.

Wildlife
Wildlife resources are abundant within Y0225. This tract contains a diverse vegetation conducive to providing habitat for a wide variety of wildlife species. Forested habitat includes a large amount of contiguous Oak-Hickory timber species, interspersed Mixed Hardwood species, and forested riparian areas. Vegetative species include Sassafras, Flowering Dogwood, Wild Grapevine, and assorted early successional shrubs.

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. Y0225 wildlife legacy and snags tree levels are good and above the recommended maintenance levels for these habitat features. Tract 25 has an abundant supply of food resources such as soft and hard mast. Hard mast trees such as Oaks, Hickories, and American Beech provide food resources for Fox and Gray Squirrels, Wild Turkey, White-tailed Deer and Blue Jays. Downed woody debris provides habitat and cover for nearly all species and assists in controlling soil erosion. The perennial stream that determines the western boundary of the tract provides a consistent water source for wildlife during drier periods of the year. There is also a wildlife pond along the Tecumseh Trail that also provides a permanent water resource for wildlife in drought periods.

A Natural Heritage Database Review was completed for Y0225 in 2013. If Rare, Threatened or Endangered species (RTE's) were identified for Y0225; the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Communities
Y0225 is composed of the typical mesic upland hardwoods that are found within the Central Hardwood Forest. These species are generally classified as Mixed Oak and Mixed Hardwood cover types. The dominant overstory timber species include White Oak, Black Oak, Northern Red Oak, Yellow Poplar, Scarlet Oak, and Pignut Hickory. The understory poletimber consists mainly of Red Maple, Sugar Maple, Pignut Hickory, American Beech, and White Oak. The ground cover of Y0225 consists of mainly mesic to dry mesic species.

Exotic Species
Autumn Olive, Black Locust, Common Periwinkle, Japanese Honeysuckle, Japanese Stiltgrass, and Multiflora Rose were observed during the resource inventory. These populations are primarily derived from and distributed within or near the old fields present within the tract. Control measures may be warranted for MF Rose populations if they are located in planned regeneration openings. Treatment for Japanese Stiltgrass populations is most successful in mid to late summer. Eradication of Japanese Stiltgrass is unlikely; however, treatment to accessible areas prior to harvest operations is possible prior to road improvements and timber harvest to reduce viable seed in conjunction with reseeding of disturbed areas. The other exotics noted will be monitored during management activities.

Recreation
Activities within Y0225 include hiking, hunting, and mushrooming. A small public parking area is located at the head of the firetrail and cable gate on Crooked Creek Road. The Tecumseh Trail runs through the center of Y0225 along the ridgetop and roadway. A temporary reroute of this trail will be needed in the event of proposed harvest. The trail offers interpretive opportunities on resource management and such information will be placed at key locations.

Cultural
All portions of Y0225 were reviewed for cultural resources during the forest resource inventory. Cultural resources may be present within this tract but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

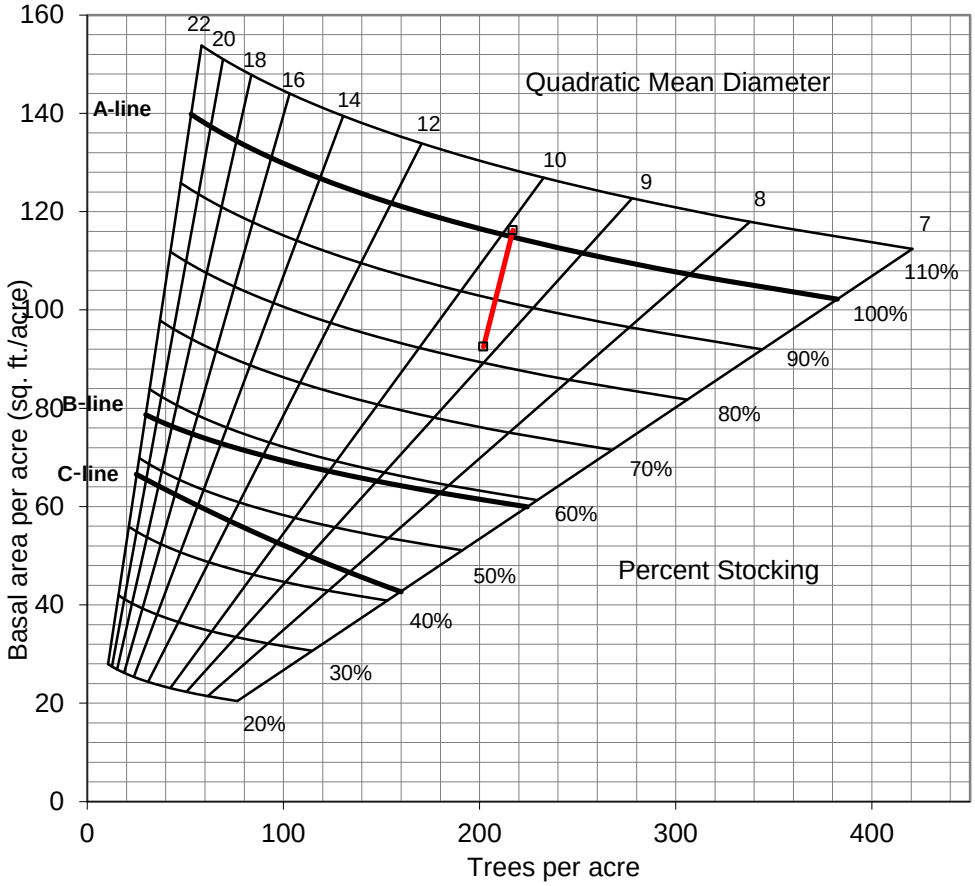
Tract Subdivision Description and Silvicultural Prescription

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

Total Trees/Ac. = **217 Trees/Ac.**
Overall % Stocking = **101%** (Over Stocked)
BA/A = **116.2 Sq. Ft./Ac.**
Sawtimber & Quality Trees/Ac. = **54 Trees/Ac.**
Present Volume = **8,300 Bd. Ft./Ac.**

Table 2. Gingrich Stand and Stock Table for Y0225 in September 2013



Summary Tract Silvicultural Prescription and Proposed Activities

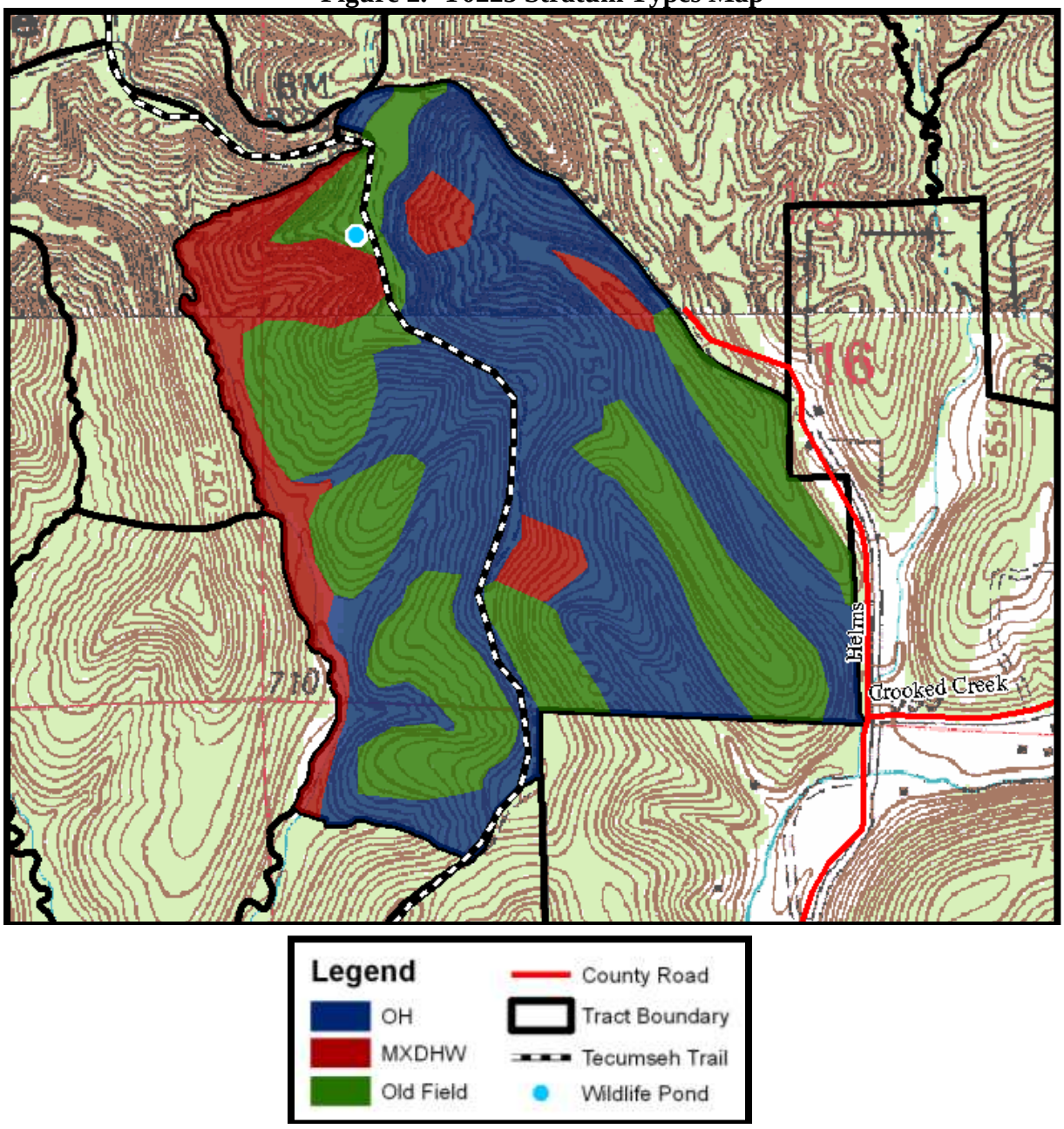
The current forest resource inventory was completed on September 24, 2013 by Intermittent Forester Amanda Smith. 41 prism points were sampled over 164 acres (1 point for every 4.0 acres). A summary of the forest resource inventory is given above and a species breakdown of the summary is given in Table 3 below. Y0225 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 major timber types and size classes as defined in Figure 2 and described below.

1) Oak-Hickory Stratum

The Oak-Hickory timber type provides significant values for both wildlife and timber products. The promotion of this Stratum is important in the Division's long term forest management objectives. The Oak-Hickory type covers approximately 56.1% of Y0225 or about 92.0 acres. The overstory is dominated by WHO, BLO, NRO, AMB, and PIH with an average basal area of 117.5 square feet per acre. The understory layer consists of mainly

poletimber SUM, WHO, BLG, PIH, SHH, and REM. The regeneration layer consists of mainly AMB, SUM, REM, IRO, DOG, WHO, and PAP. This Stratum consists of small to large sized sawtimber trees. There was a high level of mortality noted during the resource inventory especially in the SCO, BLO, and WHO.

Figure 2. Y0225 Stratum Types Map



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 portions of this Stratum that contain aggregations of low quality stems, disease/damaged stems, understocked areas or declining vigor timber.

2) Mixed Hardwoods Stratum

The Mixed Hardwoods timber type can be very variable in their composition and thereby have more complicated prescriptions. The Mixed Hardwoods timber type covers approximately 12.2% of Y0225 or about 20.0 acres. The overstory canopy is dominated by YEP, WHO, LAA, BLO, NRO, BIH, and PIH with an average basal area of 113.4 square feet per acre. The understory layer consists of mainly poletimber AMB, SAS, NRO, REM, PIH, WHA, and REE. The regeneration layer consists of mainly AMB, SUM, BLB, REM, IRO, and WHA.

A fair amount of this Stratum'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. The YEP resource will need careful examination when the tract is marked as continued mortality and decline is expected.

Sugar Maple borer damage was noted in the understory SUM in this Stratum as well as in selected areas in the Oak-Hickory Stratum. In time this borer 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 mature to overmature trees which will help to improve croptree spacing. An improvement cutting is also prescribed to release quality Oaks, Hickories and Walnuts from crown competition of non oak or hickory species. Overall, marking objectives within this Stratum should consider Oak, Hickory, Walnut, and other species of significant timber and wildlife value as the preferred croptrees for release. Improvement cuttings in this area will also be applied to remove low-forking, leaning, overtopped and suppressed intermediates, epicormically sprouting, and deformed trees. The longterm result of these prescribed cuttings will increase timber values as well as promote wildlife habitat diversity. Group selections may be prescribed in areas containing aggregations of low quality, disease/damaged stems, low basal area, or maturity. Over time these openings contribute towards long-term forest regeneration and sustainability. Planned regeneration openings are expected to return to Mixed Hardwoods with a strong component of YEP, however, a presence of Oak on the drier aspects is expected.

3) Oldfield Successional Stratum

This timber type covers roughly 31.7% or about 52.0 acres of Y0225 with an average basal area of 115.0 square feet per acre. The overstory is dominated by WHO, BLO, SCO, YEP, REM, and LAA. The understory layer consists of poletimber REM, SAS, PIH, SHH, WHA, AMB, WHO, and SUM. The regeneration layer consists of AMB, REM, IRO, SAS, and DOG.

The timber quality of this Stratum tends to be low; however, its longterm management can be very important. This Stratum is derived from natural succession processes that occur as croplands or pastured fields were abandoned. Some modest Oak regeneration is generally

present as the croplands or fields were compacted or eroded. Singletree and group selection cuttings are prescribed to remove poor form, lower quality, and declining individuals to release higher quality, more vigorous stems. Selection for high vigor and quality of stems is most important in the longterm management of this Stratum. Group selections may be prescribed in areas where aggregations of these low quality, disease/damaged stems, low stocking, or declining vigor individuals occur. As some of these poorly stocked areas may not develop into quality stands they are often selected for regeneration. These regenerated areas can provide early successional wildlife habitat and promote longterm forest regeneration and sustainability goals. Planned regeneration openings will most likely return to Mixed Hardwoods with a strong component of YEP, however Oak regeneration 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 stratum canopy should be prescribed Timber Stand Improvement (TSI) for croptree release and grapevine removal in the planned postharvest TSI project.

Summary Tract Silvicultural Prescription and Proposed Activities

Prior to State acquisition Y0225 was used for row crop agriculture and unsustainable grazing. These practices generally occurred in defined fields over about 1/3 of the current tract acreage and contained some sloping lands as well as ridgetop areas. Generally tracts acquired by Yellowwood State Forest containing crop and pasture fields were planted to Pines or hardwoods. However the fields in Y0225 were left to naturally succeed into hardwoods and this succession has progressed here since before the 1950's. As the abandoned fields represented a moderate proportion of the tract acreage, Y0225 was not reviewed by Forest staff during that period for management considerations. At present these fields have regenerated into a mixture of old field timber species of widely divergent form and quality. In addition, the natural succession of these fields over time has also provided areas for the growth and spread of invasive exotics throughout the tract. These fields will require a modest application of silvicultural treatments to bring them into more productive forest and wildlife habitats. The remainder of Y0225's forestland would also benefit from a proposed harvest comprised of mostly improvement cuttings, selection cuttings and group selections to increase their overall vigor and quality. Retention of Oak and Hickory trees will help to enhance habitats for many wildlife species including the Indiana Bat. The proposed harvest should encourage the control of wild grapevines prior to a sale. The Indiana guidelines for Best Management Practices (BMP's) will be followed during timber harvest closeout activities to maintain water quality.

Riparian areas exist along the banks of the mapped intermittent and perennial streams that comprise the eastern and western tract boundaries of Y0225. The management within these areas will be prescribed according to current Division of Forestry guidelines.

A wildlife pond and a portion of the popular Tecumseh Trail are present within Y0225. The implementation of BMP's during any management activity will lessen impacts to the pond.

In 2007 the launch of the Hardwood Ecosystem Experiment (HEE) at Yellowwood and Morgan-Monroe State Forests was initiated. The primary research goal/objective is to document ecological

impacts of different silvicultural practices that are applied over a long-term period in this portion of the Central Hardwoods Forest Region. While this tract is not part of the research study- it does serve as a buffer area and has special guidelines in terms of timber management to preserve the integrity of the adjacent Unevenaged Research Core.

A postharvest Timber Stand Improvement (TSI) project is planned following the harvest. This postharvest project will assist in the improvement and promotion of forest growth in areas where the proposed harvest was insufficient and prepare the tract's forest resources for growth and increase through the next management cycle. An evaluation of the suitability for the entire tract or portions of the tract for this project to be submitted for contracting will be made following the harvest. A field review for regeneration opening success is also planned 3-4 years after opening TSI completion.

Given the recent inventory and development of Y0225'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 300 to 400 MBF. A timber sale is proposed for FY2015-16. This sale should be combined with the sale in the adjacent Compartment 2 Tract 17.

Table 3. Overview of Sawtimber Volume Estimates in Y0225 in September of 2013

Species	Total
White Oak	451,740
Black Oak	272,850
Northern Red Oak	140,870
Yellow Poplar	98,060
Scarlet Oak	68,850
Pignut Hickory	65,510
Bitternut Hickory	48,290
American Beech	45,750
Largetooth Aspen	45,550
Sugar Maple	43,300
Red Maple	17,880
Chestnut Oak	15,100
Black Cherry	11090
Shagbark Hickory	9,900
Black Walnut	9,630
White Ash	8,950
Blackgum	4,370
Black Locust	1,900
Sassafras	1,530
Tract Totals (Bd. Ft.)	**1,361,120**
Per Acre Totals (Bd. Ft./Ac.)	**8,300**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
DHPA timber sale project review	CY2014-2015
Roadwork Rehabilitation	CY2015-2016
Timber Marking & Invasive Evaluation	CY2015-2016
Timber Sale Combined With Tract 17	FY2015-2016
Postharvest TSI & Invasives Follow-up	Within 3 years of harvest
Regeneration Opening Review	Within 3-4 years of Postharvest TSI
Reinventory and Management Guide	CY2030

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