Indiana Department of Natural Resources
Division of Forestry

DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest Yellowwood
Forester Amy Spalding
Management Cycle End Year 2027
Compartment 02 **Tract** 10
Date May 25, 2012
Management Cycle Length 15 Years

Location

Tract 10 is located between Dewar Ridge Road and Crooked Creek Road about 6 miles SW of Nashville, IN. It is located in Section 20, Township 8 North, Range 2 East, of Brown County.

General Description

This tract contains 85 acres all of which are commercial acres of mixed hardwoods dominated by mixed oak and tulip poplar which are of medium to large sawtimber in size.

Table 1. Overview of Forest Resources from May 2012 Inventory on 6420210

Overstory	Understory	Regeneration
Yellow Poplar	Sugar Maple	Sugar Maple
Sugar Maple	Yellow Poplar	Yellow Poplar
White Oak	Red Maple	American Beech
Northern Red Oak	American Beech	Bluebeech
Red Maple	Sassafras	Sassafras
Black Oak	Shagbark Hickory	Ironwood
Pignut Hickory	White Oak	White Ash
American Beech	Basswood	
Shagbark Hickory	Black Cherry	
White Ash	Black Oak	
Bitternut Hickory	Red Elm	
Sassafras	Ironwood	
Basswood	American Sycamore	
Black Cherry	Northern Red Oak	
Blackgum		
Persimmon		

History

This tract was transferred from the Federal Government in 1956 to the State of Indiana to initiate the formation of Yellowwood State Forest. Based upon on-

ground evidence and historical aerial photos the ridgetops and bottomlands of this area were farmed and it is likely that the side slopes were used for grazing. This tract was recently reconfigured to include prior tracts 10 (northern) and 15 (southern). Due to the fact that both of those tracts had acreages under 50 acres they were combined to streamline resource management. The tracts have also had similar management histories.

Old Tract 10
In 1974 Forester Dale Williams conducted an inventory that concluded 7,563 BF/Ac were present on the tract of which 1,759 BF/ac were harvestable. Later that year Forester James Akard conducted a timber sale of 35,040 BF in 193 trees (973 BF/Ac in 5.4 Tr/Ac). A tornado came through this area on June 3, 1987 although the damage in this tract was not significant. In 1992, this area was set up for a new inventory by Forester Don Duncan. A second harvest of 80,646 BF in 256 trees (2,240 BF/Ac in 7.1 Tr/Ac) was marked and sold. TSI was performed in 1994 in which a 2.5 acre regeneration opening was completed.

Old Tract 15
In 1976 Forester James Akard marked and sold a timber sale in this tract that included 66,600 BF in 302 trees (1,665 BF/Ac in 7.5 Tr/Ac). The June 3, 1987 tornado also caused some damage in this tract however 45 trees were marked and sold. In 1994 Forester Lee Eckert completed an inventory of tract and determined that a harvest would be beneficial. It was marked and sold the following year. Approximately 55,616 BF in 167 trees and 67 culls were sold.

In 2007 the launch of the Hardwood Ecosystem Experiment at Yellowwood and Morgan-Monroe State Forests was initiated. The primary research goal/objective is to answer “What are the ecological and social impacts of long-term forest management on public and private lands in Indiana and the Central Hardwoods Region?” While these old tracts were not part of the research study- they serve as buffer areas and have special guidelines in terms of timber management to preserve the integrity of the research cores.

In May of 2012 Tract 10 was combined with Tract 15 to streamline forest management processes. This combined acreage was then inventoried by Forester Amy Spalding and Intermittent Forester Amanda Smith in May 2012. The result of this inventory is discussed further in the guide below.

Landscape Context
Closed canopy hardwood forest is the dominant land use in this area. The majority of surrounding landscape is publicly owned. Small pine plantations dot some of the ridgetops and bottomland areas. Crooked Creek Lake lies about 1 mile southeast of the tract. Other assorted agricultural uses are more common to the north along Salt and Schooner Creeks.

Topography, Geology and Hydrology
This tract consists of many north to northeast facing slopes that break off from Crooked Creek Road along Mossop Ridge and continue in a northerly direction along the main ridge that is bounded by Wolfpen Branch and Kleindorfer Hollow. The slopes within this tract contain many ephemeral drainages that move water into a mapped intermittent drainage that in turn moves water northwest into the North Fork of Salt Creek which eventually flows into Monroe Reservoir. The underlying geology of this tract is a combination of sandstone, siltstone, and limestone bedrock material.

Soils
BgF-Berks-Trevlac-Wellston Complex, 20 – 70% slopes
This Complex is found on the sideslopes and bottomlands of the tract. It is formed from a combination of siltstone interbedded with sandstone and shale. It has a very low available water capacity and is moderately rapidly permeable. This soil is well suited to woodlands, and has some limitations to harvest. Employing standard BMP regulations such as waterbars or contour shaping for haul roads mitigate these limitations. Other special logging methods such as uphill yarding with cables can be reduce erosion when using rubber tired or crawler tractors. This Complex indicates a Site Index (SI) of 70 in northern red oak, a land capability class of VIIe, and woodland ordination symbol of 4R.

WaD-Wellston – Berks – Trevlac Complex, 6 - 20 % slopes
This Complex is found along the tract's main ridge. It forms from weathered sandstone-shale-siltstone bedrock at a depth of 51" with a loess cap. The slopes range from 6 – 20%. This soil is unsuited to urban development due to slope. It is very well suited to forestry with only moderate equipment limitations due to slope and depth to bedrock on some components of the Complex. Following natural contours for road construction and land shaping can mitigate erosion hazards. This soil has a SI of 70 for northern red oak and a woodland ordination symbol of 4A.

Access
This tract has a very well established access lane that has been recently updated for the HEE Research Project. This road is in very good condition and will not likely require pre-harvest rehabilitation.

Boundary
This tract is bounded on all sides by State Forest. The south side is made up a well established firelane. The western boundary is an ephemeral drainage that drains into a mapped intermittent drain that makes up the tract's northern boundary. The eastern boundary is Crooked Creek Road.

Wildlife

A Natural Heritage Database review was obtained for this tract. 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.

Other species or sign observed during the May 2012 inventory include White-tailed Deer, Eastern Chipmunk, Raccoon, and Grey Squirrel, and numerous songbirds. Other species most likely utilizing this tract include Wild Turkey, Fox Squirrels, Opossum, Coyote and many other assorted small mammals and herptiles.

Indiana Bat Guidelines

The Indiana Division of Forestry recognizes the potential to enhance the Indiana bat habitat on its lands by implementing comprehensive management principles. These management principles include obtaining data on size, species, and numbers of snags trees. Snag trees and some specific species are an integral part of the Indiana bat policy as they are prime roosting sites for maternal colonies.

Table 2. Live Legacy Trees* inventoried May 2012 on 6420210

Size Classes	Maintenance Level	Inventory	Available For Removal
11"+ DBH	765	2060	1295
20"+ DBH	255	469	214

**** Species Include:*** *American Elm, Bitternut Hickory, Black Locust, Cottonwood,, Green Ash, Northern Red Oak, Post Oak, Red Elm, Shagbark Hickory, Shellbark Hickory, Silver Maple, Sugar Maple, White Ash, White Oak*

These species of trees, whether dead, dying, or alive have a relative high value as potential Indiana Bat roost trees and are encouraged for conservation.

Table 3. Snag Trees inventoried May 2012 on 6420210

Size Classes	Maintenance Level	Optimal Level	Inventory	Available above Maintenance	Available above Optimal
5"+ DBH	340	595	663	323	68
9"+ DBH	255	510	147	-108	-363
19"+ DBH	42.5	85	28	-14	-57

Currently this tract is meeting all guidelines for legacy and snags except for 9" & 19+" DBH snags. Snags should be retained on tract unless they present a safety hazard. Snag creation should also be incorporated into the tract's post-harvest TSI plan.

Communities

The plant community for this area is typical of much of the mesic to dry mesic upland forest communities in the Brown County Hills Region. A few exotic species such as multiflora rose and Japanese stiltgrass were noted during the inventory. Multiflora rose is relatively common among the landscape and has become naturalized. Large concentrations of MF rose should be considered for treatment. Japanese Stiltgrass is common along the main trails. With the heavy

use of this area, eradication is unlikely. However, treatment to accessible areas prior to harvest operations should be considered to reduce seed production.

Recreation
This tract does not contain any established recreational facilities. Likely uses of the tract include hunting, hiking, wildlife viewing, and mushroom hunting.

Cultural
Cultural resources may be present on the tract but their locations are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction projects as directed by the Division of Forestry's Archaeologist.

Tract Subdivision Description and Silvicultural Prescription
Forest Condition
Currently this stand has averages 9,720 BF/Ac in 40 sawtimber trees per acre. Of this volume 2,940 BF/Ac were tallied as harvestable and 6,780 BF/Ac were tallied as growing stock. This tract had an average basal area of 105 square feet per acre. As such, this stand is rated as fully stocked at 96%.

Table 4. Harvest/Leave tally by species from May 2012 inventory on 6420210

Species	Harvest	Leave	Total
Yellow Poplar	165,150	205,010	370,160
White Oak	19,980	110,650	130,630
Northern Red Oak	21,220	86,990	108,210
Black Oak	17,300	50,410	67,710
Sugar Maple	8,250	41,070	49,320
Pignut Hickory	0	33,650	33,650
Red Maple	3,580	18,730	22,310
Shagbark Hickory	0	9,770	9,770
Basswood	0	9,400	9,400
Bitternut Hickory	0	6,840	6,840
Sassafras	1,420	2,250	3,670
Blackgum	0	780	780
Persimmon	0	780	780
American Beech	2,410	0	2,410
Black Cherry	1,860	0	1,860
White Ash	8,710	0	8,710
Tract Totals	**249,880**	**576,330**	**826,210**

Mixed Hardwoods
This is the most common stratum within the tract and occupies about 57 acres. On average it has about 10,010 BF/Ac of which 3,172 BF/Ac in 13 trees of which were tallied as harvestable and 6,838 BF/Ac were left as reserve stock. This

stratum has an average of 103 square feet of basal area in 187 trees. It is fully stocked at 89%.

The overstory is dominated by Yellow Poplar and Sugar Maple. Red Maple, Black Oak, White Ash, Shagbark Hickory, Bitternut Hickory, Black Cherry, American Beech, Northern Red Oak, Persimmon, Sassafras, and White Oak were noted to a lesser extent. The majority of the understory is made up of Red Maple, Sugar Maple, and Sassafras with a notable amount of American Beech, Black Cherry, Yellow Poplar, and Shagbark Hickory. The regeneration layer is almost completely dominated by American Beech, Sugar Maple, and Red Maple.

Many of the overstory Yellow Poplars are showing strain from the ongoing drought trends occurring in our region. This strain is being magnified by an epidemic outbreak in 2012 of Tulip Poplar Scale insects. Many mature to over mature stems along with suppressed stems are displaying significant decline. Although much of this stand would benefit from regeneration, this is limited due to the silvicultural guidelines set up to protect the integrity of the HEE Research Core. Hardest hit areas should be marked accordingly. In other areas, care should be taken to remove stems with the intent of leaving a vigorous and intact canopy. White ash is also common in this area. All WHA merchantable stems should be removed in a sanitation thin to not only reduce the onset of Emerald Ash Borer, but to also reduce breeding hotspots. Areas prescribed regeneration will likely return to the current similar species mixture of mixed hardwoods being dominated by Yellow Poplar.

<u>Oak-Hickory</u>
This stratum is present over about 25 acres of the tract. This stratum averages 10,082 BF/acre in 39 sawtimber and quality trees. Of this 2,744 BF/acre were designated as harvestable and 7,338 BF/acre designated as growing stock. This stratum has an average basal area of 109.2 square feet per acre. This stand is rated as fully stocked at 100%.

The overstory is dominated by White Oak, Northern Red Oak, Sugar Maple, Pignut Hickory, and Black Oak. Yellow Poplar and American Beech were noted to a lesser extent. The majority of the understory is made up of Sugar Maple and American Beech with a notable amount of Shagbark Hickory, White Oak, and Northern Red Oak. The regeneration layer is almost completely dominated by Sugar Maple, Yellow Poplar, Sassafras, and American Beech.

In general this stand could benefit from a managed timber harvest. Although much of the White Oak portion is in good condition a general thin from below and above to remove would remove suppressed stems and improve tree spacing. Many of the Red Oak group stems such as Northern Red Oak and Black Oak are biologically mature and are succumbing to environmental stress. Thinning to remove low vigor stems to release more vigorous stems is recommended. Many of the understory Sugar Maple are displaying signs of older maple borer damage.

Suppressed stems should be removed when able to not only improve stand health but also to deter the conversion of this stand into shade tolerant Beech-Maple.

With the limitations of placement and number of size of group selection openings inside of this buffer tract, it is unlikely that portions of this stratum will receive proper regeneration treatment. The result of the proposed management should result however in a healthy, more vigorous, well spaced oak-hickory stand.

Old Harvest Regeneration Openings

Roughly two acres of this tract fall into this stratum. These are openings created from harvests in the mid 1990's. These openings have regenerated well and have an average basal area of 100 square feet in an estimated 1,163 trees. The dominant stems are Yellow Poplar with a notable amount of White Ash, Sugar Maple, and American Sycamore. The recent explosion of Tulip Poplar Scale has hit many of these young trees severely. It will remain to be seen how the Yellow Poplar regeneration will recover. It is likely that these stands will either be naturally thinned out or that the crowns will dieback and resprout, or be eventually replaced by other mixed hardwoods. Timber Stand Improvement is most likely not needed, but can be reevaluated in the future when harvest operations are completed.

Summary Tract Silvicultural Prescription and Proposed Activities

The recommendation of this guide is to conduct a managed timber harvest on this tract. Careful selection of both individual trees through singletree and group selection cutting methods should be conducted. Marking objectives should be to remove lower quality, less vigorous stems resulting in higher quality, more vigorous forest stands. As this tract contains buffer areas for one of the HEE Core units, special marking guidelines will be used to preserve the integrity of the research unit. The application of appropriate State Forest Best Management Practices (BMP's) will be applied prior to and during the harvest so that existing and newly created skid trails, access roads and yards are constructed to reduce soil erosion and reduce runoff to neighboring ephemerals and intermittent streams. Presale exotic control to accessible areas will be conducted during the summer of 2012. This tract will be marked and sold in conjunction with tract 9 for the 2012-2013 Fiscal Year. Harvest yields from tract 10 are expected to be between 200-250 MBF. Following the harvest, a post-harvest TSI plan will be prepared. As this tract is deficient in 9"+ DBH snags, snag creation will likely be a component of this plan to not only complete newly created regeneration openings but also to improve the habitat quality for Indiana Bat. Overall, the tract's cutting cycle for reinventory and a new management guide is scheduled for 15 years.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
DHPA Request	Summer 2012

Mark Timber sale	Summer 2012
Presale Exotic Treatment	Summer 2012
Timber Sale	2012-2013
Follow-up TSI plan and Exotic Control Evaluation	2013-2015
New Inventory & Management Guide	2027

Attachments (kept in Tract File)
Stand Type Map
Soil Map
DHPA Review Request
Indiana Natural Heritage Database Review Map
Ecological Resource Review
TCruise reports
Gingrich Table

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