RESOURCE MANAGEMENT GUIDE

DRAFT

State Forest: Morgan-Monroe **Compartment:** 18 **Tract:** 03
Forester: A. Zillmer **Date:** May 5, 2008
Management Cycle End Year: 2028 **Management Cycle Length:** 20 yrs

Location

Morgan-Monroe Compartment 18, Tract 3 is located in section 16 T8N, R1E of Monroe Co. It lies approximately 6 miles southeast of the city of Bloomington. This tract is accessed by Knightridge and Duke Rd off of Co. Rd. 446. This tract abuts both public and private land.

General Description

This tract is approximately 64 acres of which 57 are commercial. The dominant cover type is oak-hickory with a belt of bottomland hardwoods along the southern border. An old roadbed extends from the northwest corner of tract running along the ridge line to the southwest of tract.

History

The history on this tract is limited due to the Morgan-Monroe SF office fire. This land was purchased by the state in 1953 from Fred and Virda Ruff. The original acquisition included a total of 140 acres. In 1965, a portion of the land was converted to the U.S. federal government for the North Fork Wildlife Refuge dropping the land base to 117 acres. This particular area has gone through several tract consolidations and divisions. In 1974, Luther Tonkin II cruised 38 acres of the then Comp 26B Tract 7. The data reported that that the stand presently held 72 BA. His cruise estimated that there were 90 MBF (~2,400BF/ac) present on tract. Of this, ~1,500 BF/ac were estimated to be harvestable, leaving ~900BF/ac as growing stock. The previous management guide recommended that a harvest be performed in 1979. Silvicultural objectives aimed at reducing the stocking of American Beech (excluding good den trees) and replacing with a more suitable species for site conditions. Consideration of planting was recommended. This area was surveyed in 1977 by Robert Brummeher of the Bloomington Engineering Company. This survey clearly delineated the new boundaries of the remaining land base. Recommended harvest was not conducted. The current inventory was completed in March of 2008 by Amy Zillmer.

Landscape Context

The most dominant cover types on the landscape are closed canopy forest with small pockets of agricultural uses. Residential homes are scattered along the landscape. Due to the tract's proximity to the city of Bloomington, overall trends are moving to an increase of the urban/rural interface.

Topography, Geology and Hydrology
Tract 3 has one main ridge that runs from the northwest corner and grades down to the southeast. The northern slope of this ridge are 25% + and grade into a drainage that runs west into the neighboring Monroe Co reservoir. The southern slopes vary from 6-20% to 25% +. There are several drainages that drain south into small creek on the southern portion of the property. The underlying geology of the tract is a combination of shale and sandstone.

Soils
BkF-Berks – Weikert Complex
This is the most dominant soil found on tract. It is located along side slopes and bottoms of the tract's ridges. This soil forms from sandstone bedrock about 38" under the surface. Slopes range from 25% up to 75%. This particular tract does not approach the higher extreme. This soil has severe limitations for forest management due to slope and low strength. Roads should avoid soil when possible. It is recommended that any road construction follow contours or land shaping may be employed. This complex is well drained with a low available water capacity. Although unsuited for urban development due to slope and depth to bedrock, it is well suited for trees. This soil holds a 70 site index.

WmC- Wellston Gilpin silt loam
This soil is found mainly on ridge tops and side slopes. This soil forms from loess over loamy residuum over shale 46" under surface. Slopes generally range from 6 to 20% slopes. WmC is well drained with a moderate to low available water capacity. Severe hazards to erosion due to silty loam texture. This soil holds a 71 site index.

Sf-Steff silt loam, frequently flooded
This soil is mainly found in flood plains. It is formed from acid loamy alluvium with restrictive layer at depths of more than 80". Slopes are generally 0-2%. Steff is a moderately well drained soil with a high available water capacity. This soil has severe limitations for roads and landings due to frequency of flooding and low strength. It is moderately suited to harvest equipment

Access
This tract can be accessed from CR 446 by Knightridge and Duke Rd. Although it does not abut Duke Rd, it can be accessed by foot traffic from tract 16. Further planning will be needed to acquire suitable access across private property. An old roadbed extends across main ridge line. Rehabilitation of this previously disturbed area will provide excellent access into the tract's interior.

Boundary
The boundaries of this tract are very distinct. The northern section of the tract is bordered by state property. The boundary is clearly defined by drainage. The eastern boundary of the tract is bordered by the North Creek Wildlife Refuge. There are numerous signs along this boundary in conjunction with carsonite posts and orange paint. The southern border is also the section boundary. It has

both carsonite post and orange paint. The western boundary abuts private land. Orange paint, rebar, and carsonite posts were noted along this boundary.

Wildlife
The tract provides habitat for a variety of animals. Sightings of deer, chipmunks, woodpeckers, salamanders, and numerous songbirds were noted on the tract. These observations most likely represent a small fraction of the wildlife present due to the late winter inventory. Overall, the forest provides a steady food source in the form of mast and the neighboring reservoir provides a constant source of water. Single tree and group selection harvesting methods will increase the diversity of the area by providing canopy openings inside of the tract.

Although the Natural Heritage Database did not report any findings within tract boundaries, a few notable species were sighted in surrounding areas. These species included the river otter (*Lutra canadensis*) and bald eagle (*Haliaeetus leucocephalus*)**.**

Haliaeetus leucocephalus or the bald eagle was once a federally listed endangered species. Recently, the eagle was delisted and in currently being monitored by the U.S. Fish and Wildlife Department. Eagles are known for their secretive nature and tend to avoid or abandon areas that receive heavy or changes in human use. Surrounding tract areas provide excellent habitat for eagles to both nest and forage. Proposed management activities include leaving a buffer strip of trees along southern drainage. Further efforts to preserve mature trees along the western boundary should be considered to enhance this rich habitat.

Lutra canadensis or the river otter is a species of concern in Indiana. Although though this species was almost extirpated at the turn of the century, populations have been increasing due to management. Proposed activities will employ BMP's and will have little to no effect on this species.

<u>Indiana Bat Strategy</u>
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.

Indiana Bat Habitat Guidelines

Live Tree's-Entire Tract – Desired Species Only*

	Required	Inventory	Available for Removal
11" DBH+	576	1173	597
20" DBH+	192	300	108

Snags – Entire Tract – All Species

	Required	Inventory	Available for Removal
9" DBH+	384	199	-185
19" DBH+	64	17	-47

***Desired Species include**: AME, BIH, BLA, BLL, COT, GRA, REO, POO, SAS, SHH, ZSH, SHO, SIM, WHA, WHO*

Current tract inventory exceeds guidelines in both size categories for live trees, but is somewhat lacking in snags. Preservation of nonhazardous large diameter snags could be employed whenever possible. Post-harvest snag creation should be considered from remaining large diameter cull trees.

Communities

The ridgetop has a mixture of species including cedar, largetooth aspen, sassafras, dogwood, and other mixed hardwoods. Oak hickory is very common across northern, southern, and eastern slopes. White oak, black oak, and scarlet oak make up the majority of the southern slopes, while red oak is more frequent on northern facing slopes. Southern slopes tend to have a denser composition of greenbrier, while the northern slopes have a more mesic species like Christmas fern and spicebush. The southwestern portion of tract has a mixture of bottomland species with little ground cover. This area most likely floods during high precipitation events.

The Natural Heritage Database did not identify any rare, threatened, or endangered species within tract boundaries. It did however note trailing arbutus (*Epigaea repens*), a species of special concern to Indiana, in the surrounding area. Although rare in Indiana, this species is considered common in states to our southeast. Trailing arbutus is site specific to shaded areas with thin litter layers and relative low pH. It often colonizes dense side slopes where litter accumulation is minimal.

Recreation

There were not any indications of recreation on the tract. This area could be utilized by the surrounding area for hunting, hiking, and wildlife viewing.

Cultural

There were no cultural features noted on tract.

Tract Subdivision Description and Silvicultural Prescription

Forest Condition

Initial inventory estimated 460,470BF (7,190 BF/ac) with 124,680 BF (1,950 BF/ac) as harvest volume and 335,790 BF/ac as growing stock (5,250 BF/ac). Current estimated basal area is 102 in 151.7 trees/ac. The stand is fully stocked (93%) with an average DBH of 11". Based on cruising records from 1974, this stand has a growth rate of 147 BF/ac/yr. Overall the tract is suffering from mortality due to stocking levels. The stand could benefit from a thinning to improve quality and vigor.

Species	Harvest	Growing	Total
Black Oak	43,080	55,860	98,940
White Oak	29,690	101,800	13,1490
Northern Red Oak	11,440	35,170	46,610
Scarlet Oak	10,630	29,040	39,670
Yellow Poplar	6,780	27,410	34,190
Sugar Maple	5,260	10,780	16,040
Chestnut Oak	4,740	4,440	9,180
White Ash	4,010	3,350	7,360
Black Cherry	3,220	670	3,890
American Beech	3,110	5,700	8,810
Bitternut Hickory	2,730	0	2,730
American Sycamore	0	25,670	25,670
Basswood	0	2,330	2,330
Blackgum	0	8,330	8,330
Black Walnut	0	4,430	4,430
Pignut Hickory	0	6,260	6,260
Red Elm	0	6,830	6,830
Red Maple		3,680	3,680
Totals	**124,680**	**335,790**	**460,470**
Totals/Acre	**1,950**	**5,250**	**7,190**

*volumes are an estimate of board feet on the Doyle Scale

For the purpose of this report, this tract was broken into two subdivisions; oak-hickory and bottomland hardwoods.

Oak Hickory

Oak hickory covers approximately 57 acres of the tract and is the most dominant covertype. Initial Inventory estimated a total of 441,020 bf (7,737 bf/ac) present

on stand. 134,450 bf (2,358 bf/ac) were designated as harvest with 306,560 bf (5,379 bf/ac) left as growing stock. Currently the stand holds a basal area of 111 in 167 trees per acre. The stand is fully stocked at approximately 94% with an average DBH of 11".

Sawtimber volume is predominately white oak (32%), black oak (24%), scarlet oak (10%), yellow poplar (8%), and northern red oak (7%). To a lesser extent (<2%) American beech, bitternut hickory, black cherry, black gum, black walnut, chestnut oak, pignut hickory, red maple, sugar maple, shagbark hickory, and white ash were also noted. Many of the trees are suffering mortality due to current stocking levels. Understory wood vegetation is predominately composed of American Beech and sugar maple with a notable component of white oak and hickory.

The current stand could greatly benefit from an improvement cut. Many of the trees are suffering mortality from overcrowding. Removing deformed or poor quality trees will improve the over all stand health and vigor. Furthermore, improving spacing across the tract will benefit understory crop trees by offering some release from competing vegetation. Single tree selection by thinning from both above and below is recommended to improve overall stand quality and diversity.

Group selection methods should also be employed not only to increase horizontal heterogeneity, but to also improve overall stand health. Openings may vary between 1-5 acres in size. Post harvest TSI will be needed to ensure opening completion.

Bottomland Hardwoods

This subdivision is approximately 7 acres and consists of a belt of mixed bottomland species running east west along the creek on the southern border. Initial inventory estimated a total of 32,900 bf (4,700 bf/ac) with 410 bf (60 bf/ac) as harvest and with 32,490 bf (4,640 bf/ac) as growing stock. Present basal area is 62 in 54 trees per acre. The stand is currently under stocked (48%) with an average DBH of 14.5" Dominant species include American sycamore, sugar maple, northern red oak, white ash, black walnut, basswood, and red elm.

Due to both the low stocking on this stand and its proximity to the creek that drains directly into the Monroe Co reservoir, it is recommended that limited harvesting be done here. This area will further serve as a buffer riparian zone.

Summary Tract Silvicultural Prescription and Proposed Activities

An improvement thinning utilizing single tree and group selection should be performed across tract to improve overall stand health and improve crop tree spacing. Stand will be marked and sold in the 08/09 fiscal year. Harvest yields from tract are estimated at approximately 125,000 BF. This harvest will be

combined with tract 16 for a total of 175,000 BF. Post harvest TSI to complete any opening will be performed following harvest. It is recommended that a follow up TSI be performed eight years after harvest to release potential crop trees in openings. Tract should be up for a new management guide in 2028.

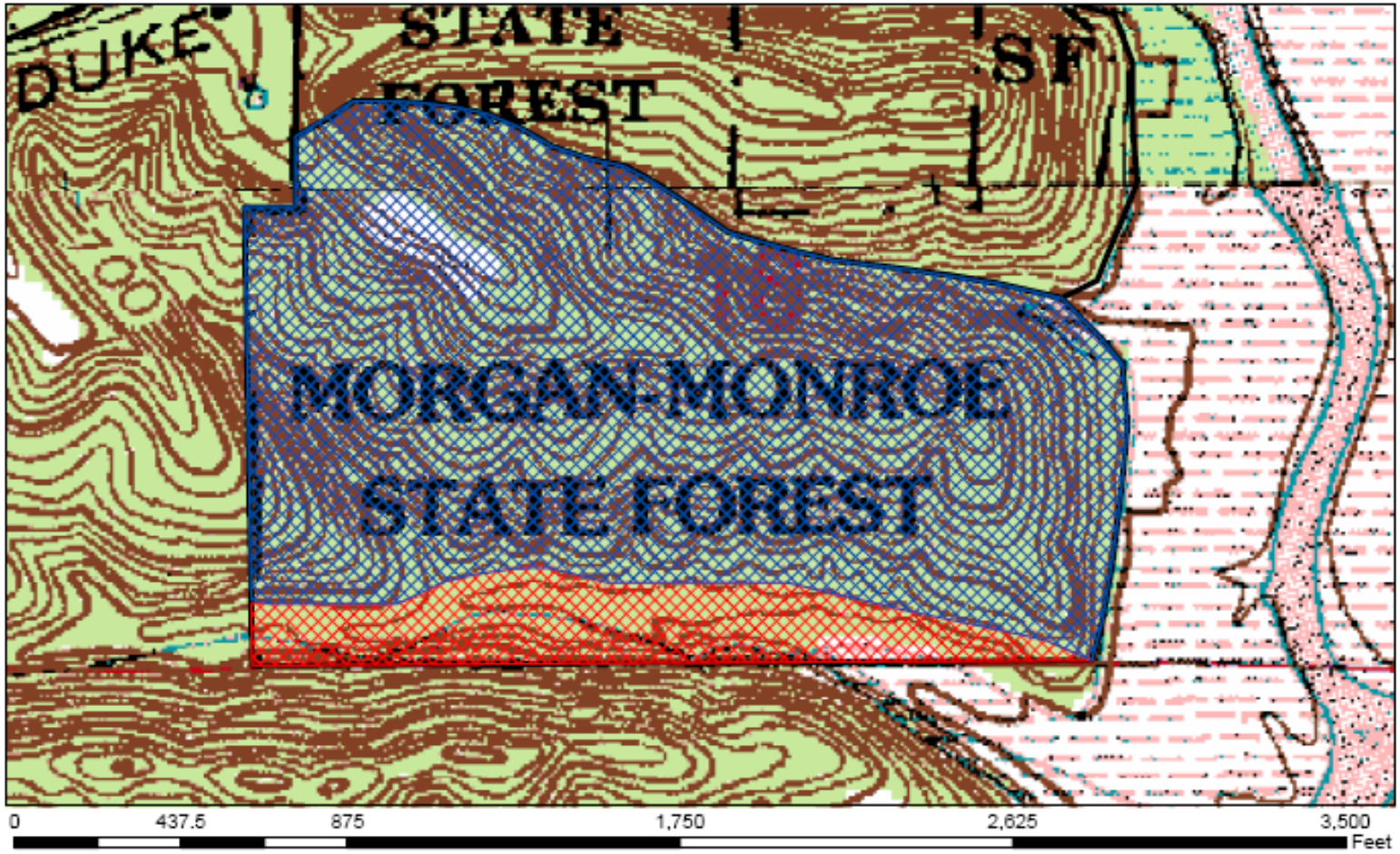
Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
DHPA Clearance for Road Rehabilitation and landings	2008
Mark Tracts 1803 &1816 (175,000 BF)	2008
Sell 175,000 BF	2008/2009
Post Harvest TSI	2011
Follow up TSI to Openings	2018
Inventory/Management guide	2028

Stand Composition Map Compartment 18 Tract 03

Unionville Quadrangle

Morgan-Monroe State Forest



Soils Map Compartment 18 Tract 03

Unionville Quadrangle

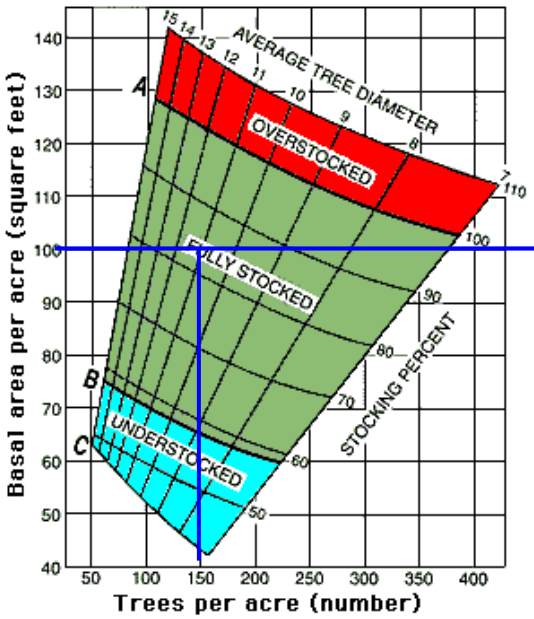
Morgan-Monroe State Forest

Proposed Management Area and Roadwork

Morgan-Moroe State Forest Compartment 18 Tract 03

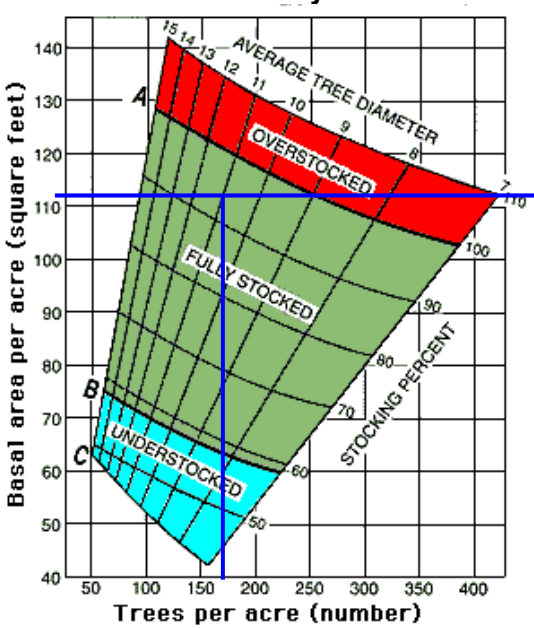
Gingrich Stock Charts
Morgan Monroe State Forest
Compartment 18 Tract 03
March 12, 2008

Tract Total



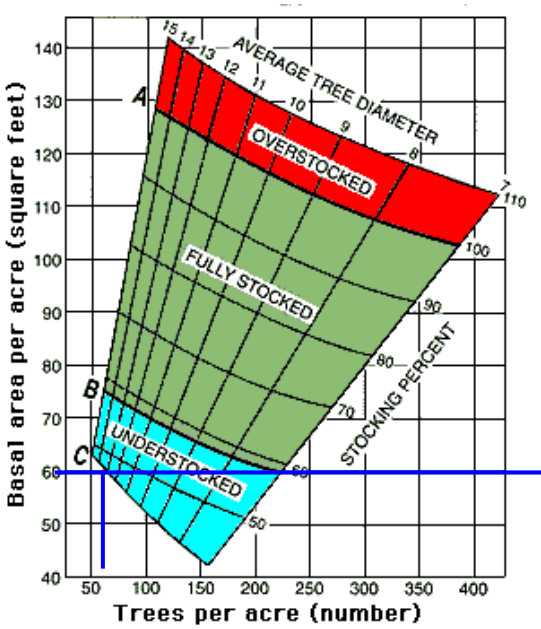
102 BA
151.7 Trees/Ac*
Fully Stocked: 93%
Avg. DBH: 11”*

Oak-Hickory Strata



111 BA
167 Trees/Ac*
Fully Stocked 94%
Average DBH: 11”*

Bottomland Hardwoods Strata



62 BA
54 Trees/Acre*
Under stocked 48%
Avg. DBH: 14.5"*

*Due to Sawtimber BA/ac being more than 50% of the total BA/ac, trees 3" or less (submerchantable) were excluded from the tree count. (Ag. Handbook #355, pgs 21-22)

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You **must** indicate "Morgan-Monroe C18 T03" 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.

Table 1. *Haul roads, log landings, and rutting hazards for forestland. Courtesy of NRCS.*

Map symbol and soil name	Limitations affecting construction of haul roads and log landings		Suitability for log landings		Soil rutting hazard	
	Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BkF—Berks-Weikert complex, 25 to 75 percent slopes						
Berks	Severe		Poorly suited		Severe	
	Slope	1.00	Slope	1.00	Low strength	1.00
	Landslides	0.50	Low strength	0.50		
			Landslides	0.50		
Weikert	Severe		Poorly suited		Severe	
	Landslides	1.00	Slope	1.00	Low strength	1.00
	Slope	1.00	Landslides	1.00		
			Low strength	0.50		
Sf—Steff silt loam, frequently flooded						
Steff	Severe		Poorly suited		Severe	
	Flooding	1.00	Flooding	1.00	Low strength	1.00
	Low strength	0.50	Low strength	0.50		

WmC—Wellston-Gilpin silt loams, 6 to 20 percent slopes						
Wellston	Moderate		Moderately suited		Severe	
	Low strength	0.50	Slope	0.50	Low strength	1.00
	Landslides	0.10	Low strength	0.50		
			Landslides	0.10		
Gilpin	Moderate		Poorly suited		Severe	
	Landslides	0.50	Slope	1.00	Low strength	1.00
	Slope	0.50	Low strength	0.50		
			Landslides	0.50		

Table 2. *Hazard of erosion and suitability of roads on forestland. Courtesy of NRCS.*

Map symbol and soil name	Pct. of map unit	Hazard of off-road or off-trail erosion		Hazard of erosion on roads and trails		Suitability for roads (natural surface)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BkF—Berks-Weikert complex, 25 to 75 percent slopes							
Berks	60	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.50
Weikert	40	Severe		Severe		Poorly suited	
		Slope/erodibility	0.75	Slope/erodibility	0.95	Slope	1.00
						Landslides	1.00
						Low strength	0.50
Sf—Steff silt loam, frequently flooded							
Steff	97	Slight		Slight		Poorly suited	
						Flooding	1.00
						Low strength	0.50
WmC—Wellston-							

Gilpin silt loams, 6 to 20 percent slopes							
Wellston	60	Slight		Severe		Moderately suited	
				Slope/erodibility	0.95	Slope	0.50
						Low strength	0.50
						Landslides	0.10
Gilpin	40	Moderate		Severe		Poorly suited	
		Slope/erodibility	0.50	Slope/erodibility	0.95	Slope	1.00
						Low strength	0.50
						Landslides	0.50