Indiana Department of Natural Resources – Division of Forestry

Draft

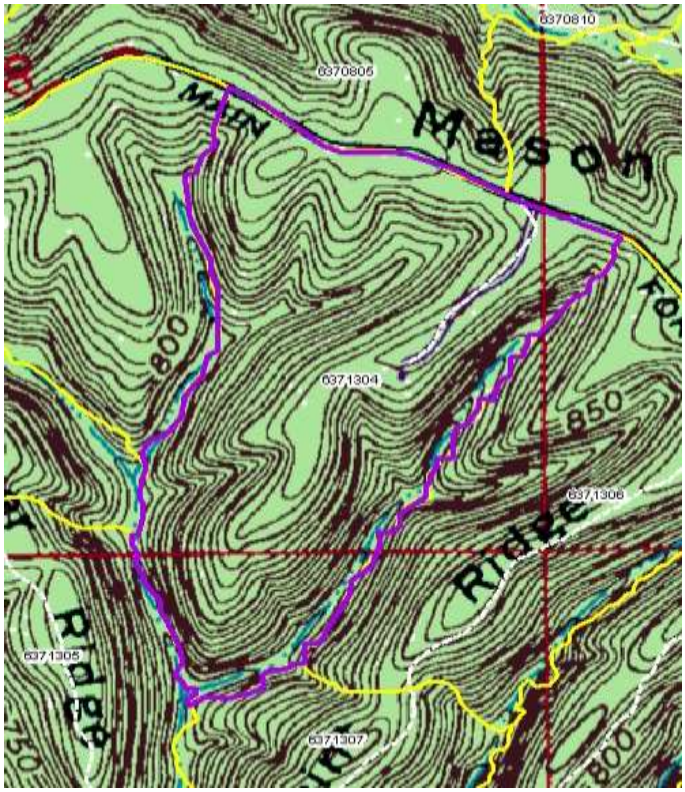
Resource Management Guide

State Forest: Morgan-Monroe
Compartment 13 **Tract** 04
Tract Acreage: 101
Commercial Acreage: 97
Foresters: Allison Rubeck for Phil Jones
Date: July 29, 2013
Management Cycle End Year: 2028
Management Cycle Length: 15 years

Location:

M1304 is located in the southeast corner of Section 8, the northeast corner of Section 17, and the southwest corner of Section 9 in Township 10N, Range 1E in Benton Township of Monroe County, Indiana. The tract lies approximately 14 miles north northeast of the city of Bloomington, Indiana and 9 miles south of Martinsville, IN being approximately 2.0 miles inside the Morgan-Monroe State Forest entrance on the south side of Main Forest Road.

Figure 1. Morgan-Monroe State Forest Compartment 13 Tract 4



General Description

M1304 consists of a total of 97 Oak-Hickory forested acres. The other 4 acres are comprised of permanent openings that include an Indiana University observatory and a utility line. Mixed Hardwoods such as Yellow Poplar, Sugar Maple, White Ash, Red Maple, American Beech and Aspen are also present and interspersed throughout the tract. Approximately 97 acres are considered commercial forest acreage. M1304's timber resource ranges from small to large sawtimber in size. The overall timber quality of this tract is fair good. Poletimber-sized, Mixed Hardwoods dominated the regeneration openings. This tract serves as a Buffer Tract for an Even-aged Management Unit of the Division of Forestry's 100 Year Hardwood Ecosystem Experiment. A summary of the forest resources in M1304 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in M1304 in July of 2013

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Chestnut Oak	**Chestnut Oak**	**Sassafras**
Black Oak	**Sassafras**	**Yellow Poplar**
Scarlet Oak	**Red Maple**	**Bitternut Hickory**
White Oak	**Sugar Maple**	*Bluebeech*
Northern Red Oak	*White Oak*	*Red Maple*
Bitternut Hickory	*American Beech*	*Sugar Maple*
Yellow Poplar	*Scarlet Oak*	*White Oak*
American Beech	*American Elm*	*American Beech*
Pignut Hickory	*Blackgum*	*Black Cherry*
Sassafras	*Northern Red Oak*	*Chestnut Oak*
Sugar Maple	*Red Elm*	*Shagbark Hickory*
Red Maple	*Yellow Poplar*	
White Ash		
Basswood		
Black Cherry		
Blackgum		
Black Walnut		
Chinkapin Oak		

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

History

- 1929 – State acquisition (DR153.33) from Lowder Family (Section 17) – *South portion (10 ac).*
- 1931 – State acquisition (DR153.75) from Stewart Family (Section 8) – *Majority of Tract.*
- 1934 – State acquisition (DR153.132) from Short Family (Section 9) – *NE Corner (4 ac).*
- 1965 – Timber Sale – *Unknown Volume (Harvested in conjunction with Observatory construction).*
- 9/28/73 – Timber Sale (51,913 BF) – *Old M1508.*
- 1991 – Commercial Firewood Management - *Storm Salvage.*
- 6/19/96 – Timber Sale (130,028 BF) *Sold to Jerry Kinser for $24,255.00.*
- 1997 – Regeneration Openings TSI Completed.
- 1997 – Other TSI Completed.
- 7-29-13 – Forest Resource Inventory completed by Intermittent A. Rubeck.

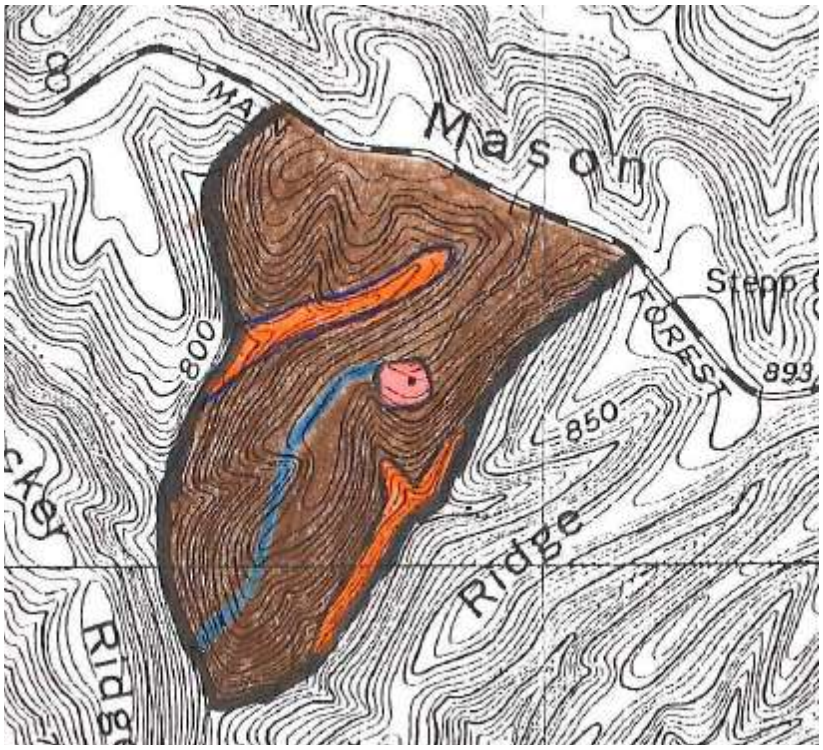
In June of 1996 a timber sale was marked and sold that included 766 trees containing an estimated volume of 130,028 Board Feet (Bd. Ft.) in sawtimber volume. 212 cull trees were also marked. About 87% of the trees removed were Oaks and the remaining trees were predominantly Yellow Poplar, American Beech, White Ash, Sugar Maple, Hickory spp., and Aspen. The sale was closed out in the fall of 1996. Postharvest TSI was completed in 1997 in the 10 openings (5.7 ac total).

Landscape Context

M1304 lies just south of Main Forest Road and has mostly southern drier aspects. Other Morgan-Monroe State Forest tracts of generally closed canopy hardwood forest completely surround the tract. Three tracts to the north across Main Forest Road form one of the Even-aged Research

Cores that is specifically managed by the HEE. Intermittent streams make up most of the east and west tract boundaries. These two streams converge together at the southern most part of this tract. A utility line runs through the center of this tract and consists of 2.4 acres of stressed hardwoods/forbs/green briar vegetation. This utility line leads to an Indiana University Observatory, which sits on a 1.5 acre open field.

Figure 2 - Landscape M1304



LEGEND

Color	Timber Type	Acreage
Brown	Oak-Hickory	83.6(85.3%)
Orange	Mixed Hardwoods	10.5(10.7%)
Blue	Permanent Opening (Utility line)	2.4(2.5%)
Pink	Indiana University Observatory	1.5 (1.5%)
	Total	98.0

Topography, Geology, and Hydrology:

M1304 consists of one long main ridge that covers the length of the tract and 2 smaller north to south nose ridges that are located in the northwest portion of the tract. Mapped intermittent streams are located along the tract's west and east boundaries. Slopes range from 2-6% on the ridgetops and 25-75% on the sideslopes. All aspects are represented within the tract. The two primary soils formed over limestone or were underlain by sandstone, siltstone, or shale. Water resources from the intermittent streams and ephemeral drainages in M1304 drain into Greasy Creek which feeds into Beanblossom Creek and from there into the White River.

Soils

This tract contains 2 different soil types: BkF and WmC. Soils listed in order of dominance and are illustrated in Figure 3 below.

BkF- Berks-Weikert Complex, 25 to 75 percent slopes

This Complex consists of steep and very steep, moderately deep and shallow, well drained soils on sideslopes of the uplands. These soils are best suited to timberland but do not typically produce high quality timber. Erosion hazards, equipment limitations, and seedling mortality are concerns in management due to slope and depth to bedrock. These factors should be considered when laying out sale and implementing Best Management Practices for Water Quality. This Complex has a site index of 70 for Northern Red and Black Oak.

WmC- Wellston-Gilpin silt loams, 6 to 20 percent slopes

These moderately sloping to moderately steep, well drained soils are on sideslopes and ridgetops in the uplands. They are well suited to trees. This soil type has a site index for Northern Red Oak of 71 in the Wellston soil and 80 in the Gilpin soil.

Figure 3 – M1304 Soil Map

Access

This tract is easily accessed as it is just south of Main Forest Road. This road is in excellent condition being paved and maintained well for forest visitors. Old haul roads located within this tract were also found to be in good condition. On Main Forest Road there is one cable gate blocked access roadway that offers resource management access as well as access by IU researchers to their Observatory. This road is in good condition and can be used during harvest. Roadways into this tract were last improved in 2013.

Boundary

There are no private ownerships adjacent to M1303. Other Morgan-Monroe State Forest tracts border all portions of this tract. The entirety of the north tract boundary is determined by Main Forest Road. Mapped intermittent streams serve as tract boundaries for the west, south and east boundaries.

Wildlife

Wildlife resources are abundant within M1304. This tract contains an adequate amount of diverse vegetation conducive to providing habitat for a variety of wildlife species. Habitats include a large amount of contiguous Oak-Hickory canopy, interspersed Mixed Hardwood species, riparian areas, and ten 15 year old regeneration openings. The ten openings are varied in size but all present similar, dense vegetation that provides wildlife habitat food and cover. Vegetative species include Sassafras, 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. 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 many wildlife species and also reduces rainfall runoff.

A Natural Heritage Database Review was completed for M1304 in 2013. If Rare, Threatened or Endangered species (RTE's) were identified for M1304; 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 procedures for conducting forest resource inventories so that the documentation and analysis of live tree and snag tree densities are examined on a compartment and tract 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 residual trees 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 M1304 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Communities

M1304 is predominantly comprised of dry mesic upland hardwoods. The dominant overstory timber species include Black, Chestnut, Scarlet and White Oak in the upland areas along with Pignut and Bitternut Hickories. Northeast slopes and streamside areas contain Oaks but are more heavily comprised of Mixed Hardwood species such as Sugar Maple, Red Maple, and American Beech. The openings created from the 1996 sale have regenerated into predominately Yellow Poplar and Maple spp. The understory in M1304 also contains some Chestnut Oaks however the poletimber species within the tract are mainly Maple spp., Yellow Poplar and Basswood. The regeneration or forest floor layer currently consists of Yellow Poplar, American Beech and Sugar Maple.

Exotic and Invasive Species

No exotic or invasives species were identified during the inventory. It is likely that light, scattered populations of Multiflora Rose and Japanese Stiltgrass exist. The populations of Multiflora Rose within the State Forest have stabilized and are being slowly contained by the Rose Rosette disease. The most appropriate time for Japanese Stiltgrass control is from midsummer to an early fall period as it is an annual plant. In the event Ailanthus and Bush Honeysuckle populations are identified in

the tract they will be treated promptly as treatments can be carried out on these species throughout the year.

Recreation

Recreation in this tract is popular due to its close proximity to Main Forest Road. There are several recreational opportunities available for the public in M1304. These would include hunting, mushrooming, wildlife viewing and off trail hiking. At present construction of a family biking trail that would link Bryant Creek Shelterhouse to the MMSF Campgrounds north of the MMSF office is under consideration. The proposed trail may run through the northern wooded portion of M1303, with initial trail work to begin in 2015. Implementation of resource management prescriptions will include recreational use considerations.

Cultural Resources

All portions of M1304 were reviewed for cultural sites during the current 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 Summary Data

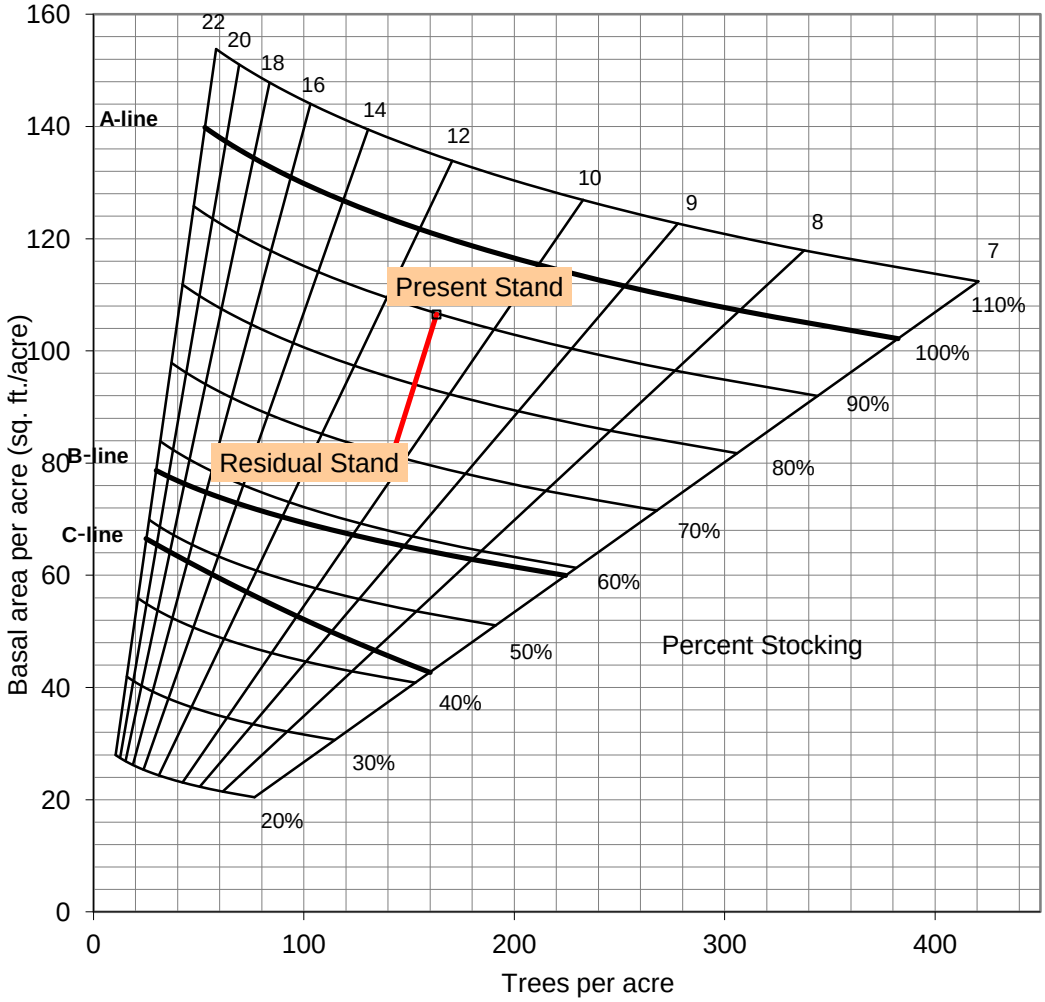
Total Trees/Ac. = **163 Trees/Ac.**
Overall % Stocking = **90% Stocking**
BA/A = **106.5 Ft²/Ac.**
Sawtimber & Quality Trees/Ac. = **41 Trees/Ac.**
Present Volume = **8,373 BF/Ac.**

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	97	Basal Area Sawtimber:	73.5
Pine Commercial Forest:	0	Basal Area Quality:	4.6
Noncommercial Forest:	0	Basal Area Poles:	22.5
Permanent Openings:	4	Basal Area Culls:	2.0
Other Use:	0	Sub-merchantable:	3.1
Total:	101	Total Basal Area:	106.5

Tract Subdivision Description and Silvicultural Prescription

M1304's current forest resource inventory was completed on July 29, 2013 by Forester Phil Jones and forest intermittent Allison Rubeck. 29 prism points were examined and sampled over 101 acres (1 point for every 3.5 acres). A summary of the inventory results are given above and a compilation of the total volume by species is presented in Table 3 below. M1304 is well stocked and a managed timber harvest is prescribed. Singletree and group selection cuttings are prescribed to thin and release desirable croptrees, remove suppressed and poorly formed trees and to regenerate areas that contain aggregations of low stocking, excessive fire or windthrow damage, or declining timber resources. For the purpose of this guide M1304 has only one designated Management Stratum based on the tract dominance of its Oak-Hickory cover type.

Table 2. Gingrich Stand and Stock Table for M13T04



Oak-Hickory/Mixed Hardwoods Stratum – 101 ac

Current Condition

The timber type is predominantly mature Oak-Hickory with some Mixed Hardwoods such as Yellow Poplar, Sugar Maple, White Ash, Red Maple, and American Beech. Oak and Hickory species account for 90% of the total volume in the tract with Black and Chestnut Oak being the most prevalent species by volume. The understory is dominated by Sugar Maple, Sassafras, Red Maple, American Beech and Hickory species. The 10 regeneration openings created from the past harvest are dominated by Yellow Poplar, Maple spp., and Sassafras. The majority of Yellow Poplar regeneration in these openings was found to have modest decline and mortality due to the Yellow Poplar scale infestation and severe droughts that have occurred in the last 5 years. The openings are now approximately 20 years old and total 5.7 acres.

Prescription

The management goal of this Stratum is to maintain a fully stocked, healthy stand dominated with vigorous Oaks and Hickories. This Stratum is prescribed an improvement and release cutting to release the highest quality and most vigorous Oak and Hickory stems. Trees targeted for removal should include the following: competing Mixed Hardwoods; suppressed trees; trees damaged by past fire or grazing; wind-damaged trees; drought-stressed trees; and any other dominant or co-

dominant trees that are overtopping or suppressing quality growing stock. An understory harvest is also planned in portions of this Stratum to reduce the density of Red Maple and American Beech so that Oak-Hickory advance regeneration is promoted and established.

Overall, the prescription is to perform a light improvement cut over the majority of the area. This should be accomplished primarily through singletree selection. However, small group selections may be implemented in areas dominated with poor growing stock. To fulfill Hardwood Ecosystem Experiment (HEE) Buffer Tract regulations, M1304 will not implement regeneration openings within 100 meters of the HEE. Research Core Area. Each opening in this Buffer Tract should not exceed 2.9 acres. Also, total acreage of regeneration openings should not exceed 5% of tract area.

Emerald Ash Borer is known to have infested a portion of MMSF approximately 3.5 miles southeast of M1304 and is expected within the tract. Ash utilization and regeneration will be incorporated into the tree selection strategies.

Summary Tract Silvicultural Prescription and Proposed Activities

The prescription for M1304 is predominantly a combination improvement cutting and singletree selection cutting over the tract acreage. Group selections may be prescribed in portions of the tract where aggregations of low stocking, low quality, ash seed sources or mature timber occur. In addition, the management that is proposed for M1304 will need to conform to the current management standards that are established for HEE Research Buffer tracts. The Indiana guidelines for Best Management Practices (BMP's) will be followed during the timber harvest and closeout activities to maintain water quality. The prompt installation of water diversions following harvesting will be employed to minimize any effects to neighboring water resources.

Riparian areas exist along portions of M1304's west, south and eastern tract boundaries which contain mapped intermittent streams. The management within these areas will be prescribed according to current Division of Forestry guidelines.

Portions of or all of M1304 will be submitted for a postharvest Timber Stand Improvement (TSI) project along with any invasive work if deemed appropriate by the administering forester. Post-harvest TSI may include Wild Grapevine control, croptree release, large snag creation and possibly small opening completion. Preharvest Wild Grapevine control may also be required in potential group selection openings. TSI work is planned to be most intensive in the older regeneration openings. A field review for regeneration opening success is planned 3-4 years after opening TSI completion.

Given the recent inventory and projected growth of M1304'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 150 to 200 MBF.

Table 3 –Volumes Estimates from July 2013 Inventory on M1304

Species	Total Volume (Bd. F.)
Chestnut Oak	241,690
Black Oak	217,500
Scarlet Oak	131,590
White oak	89,430
Northern Red Oak	48,410
Bitternut Hickory	32,830
Yellow Poplar	19,790
Sugar maple	12,860
Pignut Hickory	10,630
American Beech	9,040
White ash	6,580
Red Maple	5,020
Sassafras	4,920
Basswood	3,870
Black Cherry	3,380
Black Walnut	3,130
Chinkapin Oak	3,180
Blackgum	1,860
Tract Totals	**845,670**
Per Acre Total	**8,370**

Proposed Activities Listing

Proposed Management Activity	*Proposed Period*
Timber Marking/Invasive treatments	CY 2015-16
Timber Sale	FY2014-15 or FY2015-16
Postharvest TSI & Invasives treatment (if needed)	CY 2017-18
Regeneration Success Review	3-4 years after harvest
Reinventory and Management Guide	CY 2028

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