Indiana Department of Natural Resources – Division of Forestry

Draft

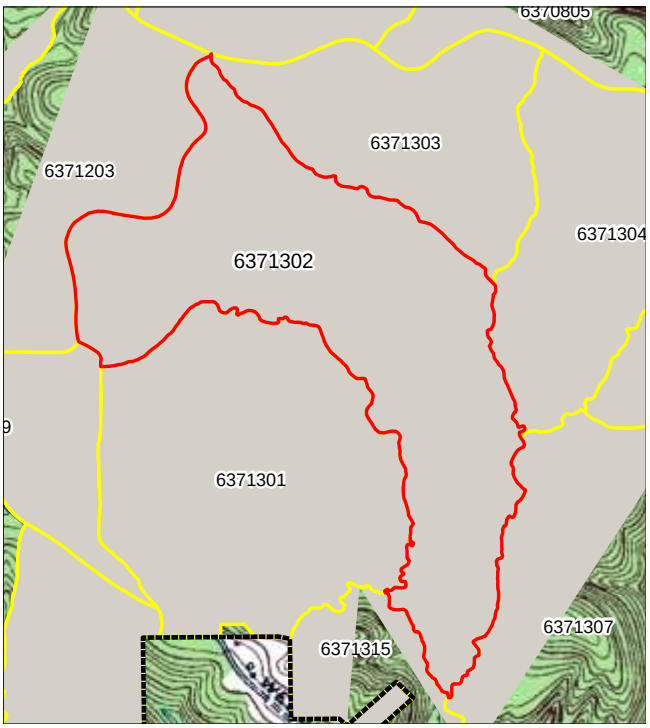
Resource Management Guide

State Forest: Morgan-Monroe
Compartment 13 **Tract** 02
Tract Acreage: 186
Commercial Acreage: 183
Foresters: D. Ramey & P. Jones
Date: July 17, 2013; Amended April 3, 2014
Management Cycle End Year: 2028
Management Cycle Length: 15 years

Location:

Morgan-Monroe Compartment 13 Tract 02 lies in the north center of Section 17 and southwest quarter of Section 8 in Township-10-N, Range-1-E in Washington Township of Monroe County, Indiana. M1302 is approximately 12 miles north northeast of the city of Bloomington, Indiana and 9 miles south of Martinsville, IN. This tract lies entirely on what is locally known as Ira Hacker Ridge.

Figure 1 – Morgan Monroe SF Compartment 13 Tract 2



General Description:

M1302 contains a total of 186 acres in mostly Oak-Hickory timber type. Mixed Hardwoods such as Yellow Poplar, Sugar Maple, White Ash, Red Maple, and American Beech are also present and are interspersed throughout the tract. 183 acres are considered commercial forest acreage as 3 acres are routinely maintained in permanent wildlife opening in a utility line R-O-W. Ira Hacker Ridge also contains a long stretch of the MMSF 3 Lakes Hiking Trail. This well known hiking trail runs the entire length of this ridge and also contains the origin for the Hardwood Ecosystem Experiment (HEE) spur trail that links the 3 Lakes Hiking Trail to the HEE's information kiosk and parking area on the Main Forest Road in M0806. M1302's timber resource ranges from small to large sawtimber in size. The overall timber quality and tree health of this tract is good. There are some old regeneration openings from harvests in 1985 and 1995 that contain mostly poletimber Mixed Hardwoods. This tract was also designated as an Evenage Management Buffer Tract for the Division of Forestry's HEE research

project that was established in 2007. The forest resources of M1302 in relation to their species dominance are noted below in Table 1.

Table 1. Overview of species composition in M1302 from April 2014 inventory

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

Bold – Species that comprise ≥ 10% of the total TPA and/or BA in each structural class
Italicized - Species that comprise ≤ 10% of the total TPA and/or BA in each structural class

History

M1302 contains some of the earliest acquisitions that formed the Morgan-Monroe State Forest. These included 4 large land acquisitions from the Farr, Stewart and Lowder families in 1929-1931. Historical aerial photography suggests that prior to government acquisition portions of the valleys and ridgetops were farmed and the sideslopes likely to have been grazed. In 1985 the north portion of the tract was harvested (old M1302 of 116 acres) and in 1995 the south portion of the tract was harvested (old M1305 of 70 acres). In April of 2014 M1305 was merged into M1302 to facilitate long term management.

- 1929-1931 - State acquisitions from Farr, Stewart & Lowder families (D.R. #153:25, 33, 55, 75).
- 4/24/31 - White Spruce Christmas Tree planting in 2 acre portion of tract completed (PR#29).
- 5/8/34 – Replanting of 30% of acreage in American Red Pine (PR#29).
- 12/1942 – 400 White Spruce harvested and sold; Revenue of $300.
- 9/24/79 – Field Design for Prescribed Burn and Oak Regeneration Study completed by Prof. Claire Merritt of Purdue University: Burn plots established on SW aspects of Old M1302; Forest Technician Bill Bull assisted in prescribed burns scheduled from 1979-1983.
- 7/79 and 2/80 – American Beech Herbicide Injection Study completed by Harvest Holt, Purdue Extension in North aspects of old M1302: Hand Axe and spray bottle application of mixed herbicides on approx 140 trees; Analysis Completed 5/28/81.
- 1984 – Forest Resource inventory cruise and Management plan prepared for old M1302 by Forester Hahn.
- 3/1984 – Timber Stand Improvement (TSI) in east drainage (Black Walnut release) completed by Forestry Staff.

- 5/29/1985 – Timber Sale of 137,480 BF over 79 Acres sold to Foley Hardwoods for $17,506.
- 1986 – 4 Acre regeneration opening TSI completed by property staff.
- 1986 – Red Oak planting in 4 acre regeneration opening completed by Hopwood Forestry Consultants.
- 4/25/88 – TSI Marked in old M1302 by Forester Hahn; to be contracted.
- 2/3/89 – TSI Completed by Contractor Hopwood Forestry Consultants.
- 1/3/90 – Forest resource inventory cruise completed in old M1305 by Forester Vadas.
- 7/19/93 – Management plan completed for old M1305 by Forester Vadas.
- 6/14/95 – Timber Sale of 141,148 BF in old M1305 sold to Kinser Timber Products for $23,158.
- 6/15/95 – Compartment Road improved into old M1305; Stone applied.
- 1996 – TSI completed in 4.5 acres of openings in old M1305.
- 2000 – South private property boundary repainted.
- 2005 – South private boundary repainted
- 2007 – Designated as Hardwood Ecosystem Experiment Evenage Buffer Tract
- 7/13/13 – 2nd Forest Resource inventory completed for old M1302 by Foresters Jones & Rubeck.
- 4/1/14 – 2nd Forest Resource inventory completed for old M1305 by Foresters Jones and Ramey.
- 4/3/14 – Tracts M1302 (116 ac) & M1305 (70 ac) combined into new tract M1302 of 186 acres.

Old M1302 - In spring of 1985 a timber sale was sold which consisted of 628 trees containing an estimated volume of 137,480 BF(Bd. ft.) of sawtimber volume. 302 cull trees were marked. About 40% of the trees harvested were Oak-Hickory, 30% Beech-Maple, and the remaining trees were predominantly White Ash, Yellow Poplar, and Basswood. The sale was closed out in fall of 1985. Postharvest TSI was completed in 1989 in 65 acres of the tract. No TSI was done in the Oak Burn Study/Regeneration areas.

Old M1305 - In summer of 1995 a timber sale was sold which consisted of 750 trees containing an estimated volume of 141,148 BF of sawtimber volume. 295 cull trees were marked. About 40% of the trees removed were Oak-Hickory, 30% Beech-Maple, and the remaining trees were predominantly White Ash, Yellow Poplar, and Basswood. The sale was closed out in fall of 1995. Postharvest TSI was completed in 1996 in 4.5 acres in the tract openings.

Landscape Context:

M1302 lies south of Main Forest Road and east of the Old Farr Road. All land surrounding this tract consists of generally closed-canopy hardwood forestland of the Morgan Monroe State Forest. Except for the northwest portion of the tract which is the old Farr Road, intermittent streams make up the majority of the tract boundaries. A maintained utility corridor of approximately 3 acres runs through the southern portion of the tract. This power line serves the I.U. Observatory in the adjacent tract but also provides early successional grassland/shrub habitat generally lacking within the landscape matrix.

Topography, Geology, and Hydrology:

M1302 consists of one long ridgetop and 2 smaller finger ridges with ridges containing mostly south, east and west aspects respectively. Slopes range from 2-6% along the ridgetops and 25-75% on the sideslopes. The two primary soils formed over limestone, which were underlain by sandstone, siltstone, or shale. Water resources from the intermittent streams and ephemeral drainages in M1302 drain into Greasy Creek, then into Bean Blossom Creek which feeds into the White River.

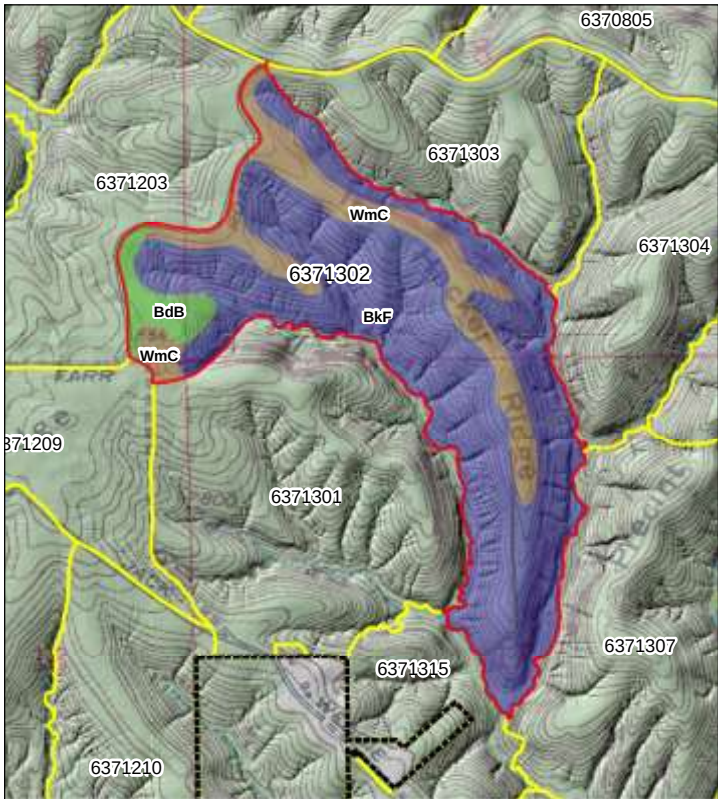
Soils:
M1302 contains 3 different soil types: BkF, WmC, and BdB (See Figure 2). These soils are listed in order of their dominance within the tract.

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 only suitable for timberland but do not typically produce high quality timber. Erosion hazards, equipment limitations, and seedling mortality are concerns in management due to soil slopes and depth to bedrock. These factors should be considered when laying out timber sales 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 Complex has a site index for northern Red Oak of 71 in the Wellston and 80 in the Gilpin.

BdB- Bedford Silt Loam, 2 to 6 percent slopes
This gently sloping, deep, moderately well drained soil is on uplands. There is a fragipan at 1.5-3.5 feet that can restrict root penetration. It is well suited to trees and has a site index of 70 for White Oak and 90 for Yellow Poplar.

Figure 2 – M1302 Soil Type Map



Access:

M1302 is accessible to the public from the Farr Road cable gate on the Main Forest Road, from the cable gate on East Farr Road or from a cable gate off Jack Weddle Road. Ira Hacker Ridge Firetrail is the main resource management access and also serves as part of the 3 Lakes Hiking Trail. Existing roadways were improved in the spring of 2014.

Boundary:

There are no private ownership boundaries. Only other Morgan Monroe State Forest tracts border this tract. The center of Section 17 and a north ½ cornerstone have been located and witnessed within the tract. The NW Section corner for Section 17 lies within the tract but its location is uncertain.

Wildlife:

Wildlife resources are abundant within M1302. 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, forested riparian areas, and scattered 20 to 30 year old regeneration openings. These openings vary 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 nearly all species and assists in controlling soil erosion.

A Natural Heritage Database Review was completed for M1302 on July 9, 2013. If Rare, Threatened or Endangered species (RTE's) were identified for M1302; the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Communities:

M1302 is comprised mostly of dry mesic upland hardwoods. The dominant overstory timber species include Pignut, Bitternut, and Shagbark Hickory as well as White, Black, Scarlet, and Chestnut Oak in the upland areas. Slopes and streamside areas were dominated by Mixed Hardwoods such as Sugar Maple, Yellow Poplar, and American Beech. The regeneration openings created in 1995 consist primarily of Maple spp., Sassafras and Yellow Poplar. The forest understory contains some Oak, but consists mainly of Hickories, Maples and Beech. Many higher quality Oak species were observed during the current forest resource inventory especially in the White Oak species groups.

Exotic and Invasive Species

Garlic Mustard *(Alliaria petiolata)* and Japanese Stiltgrass *(Microstegium vimineum)* were discovered on a north facing slope near the Three Lakes Trail at the north end of the tract. Multiflora Rose was observed in scattered, light concentrations. Initial Japanese Stiltgrass herbicide treatments are planned for July-August 2014. Garlic Mustard populations will be treated in early spring 2015. Prompt reseeding of disturbed areas after management operations are completed is also planned.

Recreation:

The 10 mile long Three Lakes Hiking Trail runs through the major ridgetop of M1302 which is locally known as Ira Hacker Ridge. This trail is planned to be rerouted during any future harvest operation. Other recreational activities that commonly occur on the tract are hunting, mushrooming, wild food gathering, and wildlife viewing.

Cultural:

All portions of M1302 were reviewed for cultural sites 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.

Stand Descriptions and Silvicultural Prescriptions:

A forest resource inventory of the old tract configuration of M1302 was completed on July 17, 2013 by Foresters Jones and Rubeck. 34 prism points were sampled over approximately 116 acres. The forest resource inventory of M1305 was completed on April 1, 2014 by Foresters Jones and Ramey. 22 prism points were sampled over approximately 70 acres. These 2 tracts and their resource inventory data were combined to form the present configuration of M1302 in the spring of 2014. A species breakdown of the combined summary is given in Table 5 below. For this management cycle there is only 1 Management Stratum that is proposed which combines the Oak-Hickory and Mixed Hardwoods timber types within the 183 acre merchantable portion of the tract. The 3 acre noncommercial area encompassed by the utility corridor will be managed by the Electric Utility Company. Overall, M1302 is currently fully stocked and a timber harvest is proposed for the commercial forested acreage.

Tract Summary Data

Total Trees/Ac. = **121 Trees/Ac.**
BA/A = **107.2 Ft²/Ac.**
Present Volume = **9,694 BF/Ac.**
Overall % Stocking = **87% Stocking**
Sawtimber & Quality Trees/Ac. = **42 Trees/Ac.**

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	183	Basal Area Sawtimber:	75
Pine Commercial Forest:	0	Basal Area Quality:	5.2
Noncommercial Forest:	3	Basal Area Poles:	22.1
Permanent Openings:	0	Basal Area Culls:	3
Other Use:	0	Sub-merchantable:	1.7
Total:	186	Total Basal Area:	107.2

Table 2. Gingrich Stand and Stock Table for M13T02 in April 2014

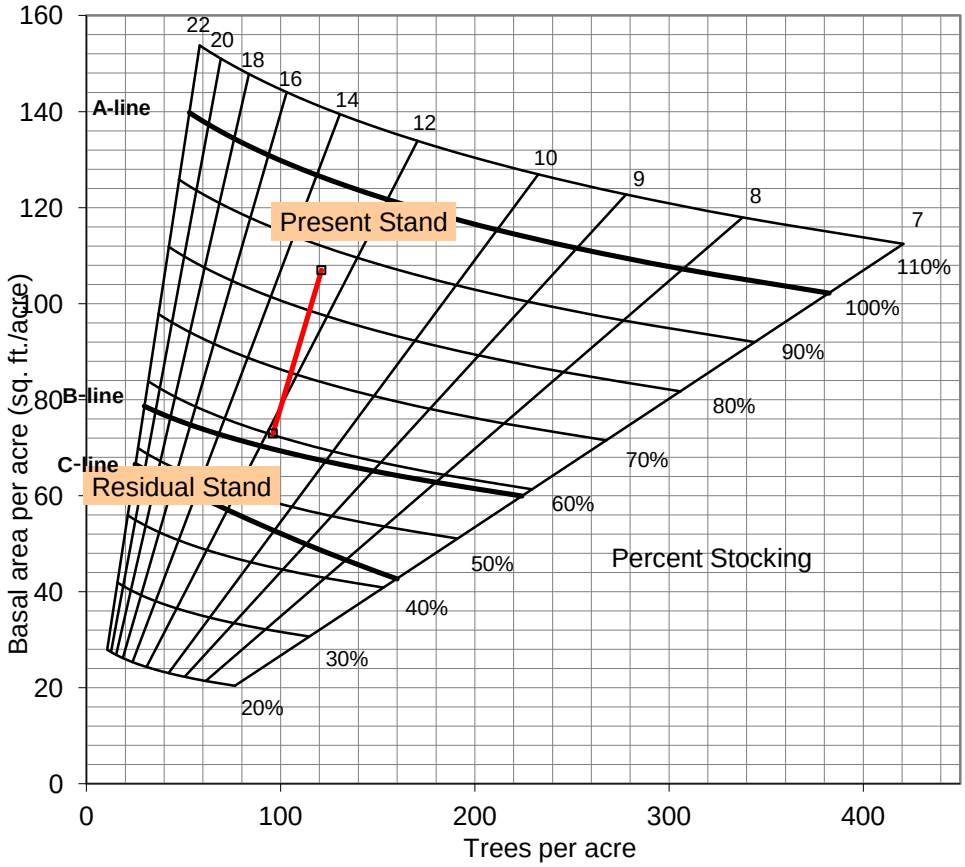


Table 3. – Estimated Present Volumes for M13T02 in April 2014

Species	Total Volume (Bd. ft.)
Black Oak	338,120
Chestnut Oak	281,630
Yellow Poplar	281,500
White Oak	218,990
Red Oak	168,640
Scarlet Oak	136,740
Sugar Maple	112,770
American Beech	70,300
Pignut Hickory	38,690
White Ash	26,290
Red Maple	19,900
Shagbark Hickory	18,440
Blackgum	17,570
Black Cherry	16,810
Black Walnut	16,130
Bitternut Hickory	15,390
Basswood	9,210
Sycamore	6,780
Sassafras	3,760
Largetooth Aspen	3,150
American Elm	2,200

Tract Total	**1,803,010**
Per Acre Total	**9,694**

Oak-Hickory/Mixed Hardwoods Stratum – 183 acres

Current Description

The timber type in this Stratum 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 60% of the total volume in the Stratum with Black, White and Chestnut Oaks being the most prevalent. The understory is dominated by Sugar Maple, Sassafras, Red Maple, American Beech and Hickory spp. There are scattered old regeneration openings from previous harvests that are dominated by Yellow Poplar, Maple spp., and Sassafras. The majority of Yellow Poplar regeneration observed in the regeneration openings is in decline due to a drought and insect infestation from CY2012.

Prescription

The management goal of this Stratum is to maintain a well stocked timber structure dominated by healthy and vigorous Oaks, Hickories, and other Mixed Hardwoods. The prescription is an improvement cutting over the majority of the area. This would be accomplished primarily through single tree selection. Trees selected for harvest would be primarily declining overstory trees, damaged or defective, poorly formed, stressed, or lower quality individual stems that are competing with croptrees. Small group selections may be implemented in areas dominated by declining Yellow Poplar or in areas of excessive mortality due to the past few years of drought.

Postharvest Timber Stand Improvement (TSI) is recommended and may include Wild Grapevine control, croptree release, large snag creation and possibly small opening completion. Preharvest Wild Grapevine control may be required in some potential group selection openings. TSI work will be most intensively prescribed in the old regeneration openings and would include Wild Grapevine control, croptree release, coppicing, and potentially invasive control. Large American Beech culls will comprise the majority of large snag creation.

Given the recent inventory and growth of M1302'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 400 to 550 MBF. A timber sale is proposed for FY2014-15.

Proposed Management Activity	***Proposed Period***
Preharvest Invasive Treatments	CY2014-2015
Timber Marking	CY2014-2015
Timber Sale	FY2014-2015
Postharvest TSI & Invasives Follow-up	Within 2 years of harvest
Regeneration Opening Review	Within 3-4 years of Postharvest TSI
Reinventory and Management Guide	CY2028

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