Indiana Department of Natural Resources – Division of Forestry

Draft

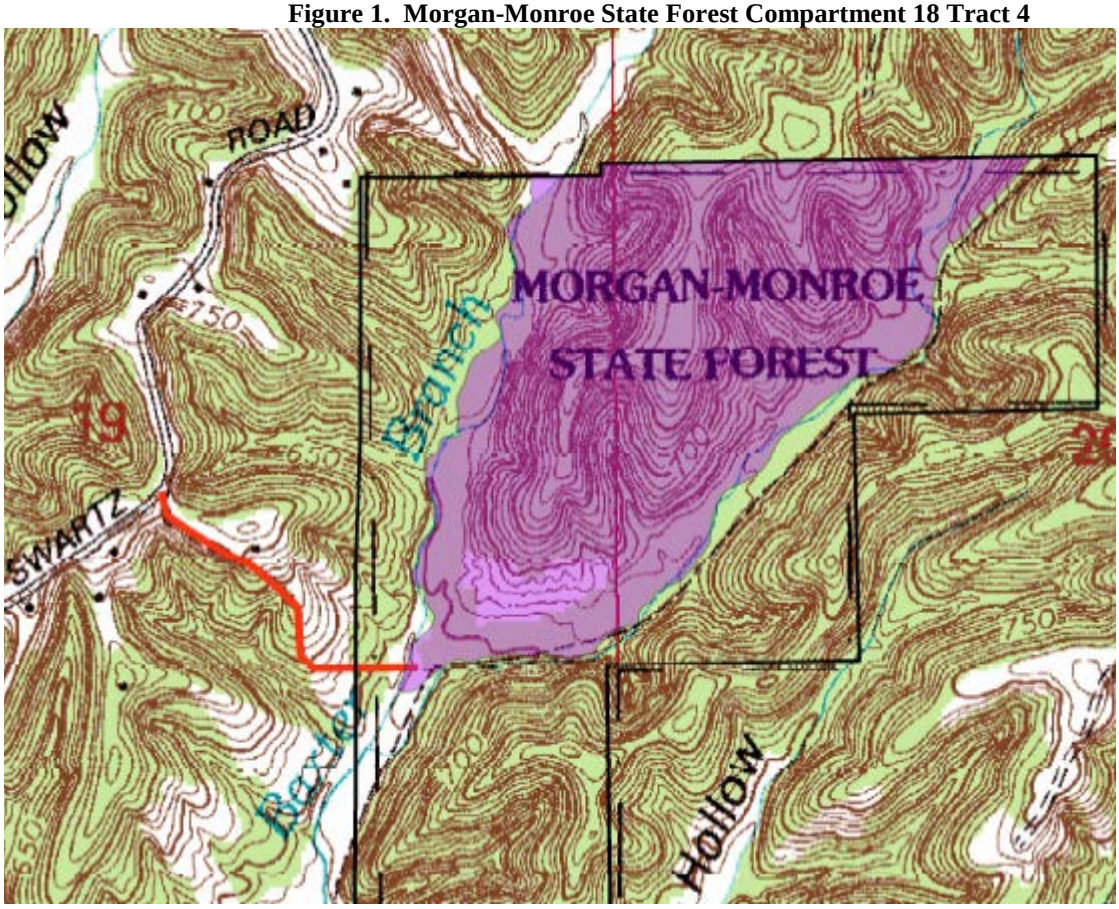
Resource Management Guide

State Forest: Morgan-Monroe
Compartment 18 **Tract** 04
Tract Acreage: 110
Commercial Acreage: 110
Forester: Amy Spalding
Date: December 30, 2011
Management Cycle End Year: 2026
Management Cycle Length: 15 years

Location

Morgan-Monroe State Forest Compartment 18 Tract 4 is located in Sections 19 & 20 of Township 8N, Range 1E of Monroe County. It is approximately 3 miles southeasterly of Bloomington and a couple of miles north of Lake Monroe situated approximately 0.3 miles west of State Road 446.

Figure 1. Morgan-Monroe State Forest Compartment 18 Tract 4



General Description

M1804 contains 110 acres of mostly closed canopy Mixed Hardwood and Coniferous Forest in Morgan-Monroe State Forest, all of which constitute commercial acres. The forest resource is predominantly medium to large sawtimber Mixed Hardwoods with mixed Eastern White/ Red/Virginia Pine stands in portions of the bottomland areas and flat ridgetops. The tract's forest inventory species composition is listed below in Table 1 according to their dominance.

Table 1. Species list by relative abundance from December 2011 inventory of M1804

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Eastern White Pine	**Red Pine**	**American Beech**
White Oak	**Sugar Maple**	**Sugar Maple**
Black Oak	*American Beech*	**Sassafras**
Red Pine	*Red Maple*	*Flowering Dogwood*
Scarlet Oak	*Eastern White Pine*	*Ironwood*
Sugar Maple	*Shagbark Hickory*	*Black Cherry*
American Beech	*Sassafras*	*Red Elm*
Red Maple	*Flowering Dogwood*	*Blackgum*
Pignut Hickory	*White Oak*	*Red Maple*
Chestnut Oak	*Pignut Hickory*	*Virginia Pine*
Shagbark Hickory	*Black Cherry*	*White Oak*
Black Cherry	*Red Elm*	*Yellow Poplar*
Blackgum	*Blackgum*	*American Beech*
Virginia Pine	*Virginia Pine*	*Sugar Maple*
Black Walnut	*Black Walnut*	*Sassafras*
Yellow Poplar		
American Elm		
American Sycamore		

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

History

Aerial photos from 1939 within M1804 indicate heavy agricultural use. The bottomlands and flat ridges were farmed. Other areas were most likely grazed (scattered barbwire fence was found across this tract during the inventory). The old farm fields were planted to a mixture of Eastern White Pine, Red Pine, and Virginia Pine sometime thereafter.

- July 20, 1954 – Land purchased from Horace N. Baxter.
- July 1973 – First forest resource inventory completed by Forester Bull.
- December 20, 1974 – 52,798 board feet of timber marked & sold on the northeast 20 acres.
- 1984 – Forester Breedlove completed 2nd forest resource inventory.
- July 5, 1984 – An encroachment and timber trespass were discovered. 179 trees were taken.
- December 11, 1986 – Private property boundaries painted and posted by Forester Breedlove.
- July 17, 1987 – Timber encroachment and timber trespass resolved.
- December 19 & 20, 1989 – Boundaries repainted.
- July 8, 1994 – Forester Vadas completed 3rd forest resource inventory.
- December 27, 2011 – Forester Amy Spalding completed current forest resource inventory.

Landscape Context

The majority of land surrounding M1804 is either privately owned or land managed by the Army Corps of Engineers (Lake Monroe) and the Hoosier National Forest. The other Morgan-Monroe State Forest tracts within this landscape context are outlying parcels similar to this one. This tract is bordered by State Forest along the east, west, and south boundaries and by a privately owned RV campground to the north. One large pond and a few field areas were also noted in the landscape

vicinity. Baxter Branch, a large mapped intermittent stream along the tract's west boundary, merges with another mapped intermittent stream along the tract's south boundary to form a perennial stream that flows south of the tract. Monroe Reservoir, its headwaters and associated riparian areas, lays southwest of the tract some ¾ mile distant. The uplands area surrounding M1804 consists primarily of 3 adjacent State Forest tracts and private forestlands dominated by closed canopy Central Hardwoods and Mixed Pine forest. The mixture of forest uplands, bottomland riparian areas and pastures provide a great diversity of habitats for wildlife.

Topography, Geology and Hydrology

M1804 is composed of several finger ridges. Its topography ranges from nearly level to 75% slopes with dominant easterly and westerly aspects. The underlying soils range from 15 - 72 inches in depth to sandstone and/or shale bedrock. Limestone outcrops were noted in some places during the resource inventory. Several ephemeral drainages occur throughout the tract. The eastern and western tract boundaries are mapped intermittent streams that converge at the southern tip of the tract. These drain into Baxter Branch which flows into Moore Creek and then into Lake Monroe.

Soils

Bu - Burnside Silt Loam

This soil type is a nearly level, deep, well drained soil on narrow flood plains with sandstone bedrock areas. It is subject to occasional flooding and so presents equipment limitations. This soil type comprises approximately 20% of M1804. This soil is well suited for the growing of Yellow Poplar, Red Oak, and Black Walnut trees. Erosion, equipment limitations, seedling mortality, and windthrow hazards are all slight for this soil type.

BkF- Berks-Weikert Complex, 25-75% slopes

This soil type has steep to very steep slopes and moderately deep and shallow well drained soils on sideslopes. M1804 is comprised of approximately 62% of this soil type. This soil type has a moderate erosion hazard, moderate to severe equipment limitations, moderate to severe seedling mortality, and slight to moderate windthrow potential. The surface runoff of this soil is rapid. Equipment use on these slopes should be constructed on contours to prevent erosion.

WmC - Wellston – Gilpin Silt Loams, 6-20% slopes

This soil type has moderately sloping to moderately steep, moderately deep and deep, well drained soils on ridgetops and sideslopes. Erosion, equipment limitation, seedling mortality, and windthrow hazards are all slight for this soil type. This soil types occupies approximately 18% of the tract.

Access

The historical access into M1804 is from an old county road that connected Swartz Road to Knight Ridge Road. This roadway emerges from behind the Pine Grove Church off of SR 446. Monroe County no longer maintains this thoroughfare as a public county road and its lack of use has resulted in significant degradation, especially at both access points into this State Forest block. For the proposed harvest, the Swartz Road access will need modest rehabilitation and BMP improvements. The remainder of the roadway eastward through State property will also receive modest rehabilitation and BMP improvements to improve road drainage and reduce longterm erosion concerns. At present public access to the tract is only available through private landholdings.

Boundary
State Forest borders this tract on all sides except along the north tract boundary. This N boundary line is currently marked in orange paint on trees as well as Carsonite posts at the corners and survey markers. The southeast and west boundaries of the tract are mapped intermittent streams. Some trash piles were noted along the intermittent stream beds. Neighbors in the area have been cooperative in attempting to resolve this issue.

Wildlife
Wildlife resources are abundant within M1804. This tract contains diverse vegetation conducive to providing habitat for a variety of wildlife species. Habitat includes habitat structures that favor wildlife including snags (standing dead trees) and cavity trees. Snags and cavity trees provide areas 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 squirrels, wild turkey, and white-tailed deer. Downed woody debris provides forest floor habitat and escape cover for many other wildlife species. The Pine plantations provide additional diversity for birds and mammalian wildlife in the form of escape and nesting cover.

A Natural Heritage Database review was completed for M1804 on December 27, 2011. If Rare, Threatened or Endangered species (RTE's) 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.

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. The application of various silvicultural prescriptions in a timber harvest will stimulate the growth of the selected croptrees, stimulate understory and forest floor plant species as well as promote early successional wildlife habitats. Timber Stand Improvement (TSI) following the harvest is planned which will increase standing snag counts. The management practices conducted on M1804 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Communities
M1804's ridgetops are comprised mostly of dry mesic Upland Hardwoods while its bottomlands are dominated by plantation Pines and Mixed Hardwoods. The dominant overstory timber species in the uplands include Black, White, Scarlet and Chestnut oaks. Slopes and streamside areas are dominated by Eastern White Pine and Mixed Hardwood species such as Sugar Maple, American Beech and Yellow Poplar. The understory contains few Oaks but generally consists of American Beech, Sugar & Red Maples, Ironwood and Elm species. Overall, M1804 has a diverse timber species mixture due in part to its varied past use history. The eastern portion of the major ridgetop was harvested in 1974 and the old bottomland fields were planted to Pine or left to natural succession.

Exotic Species
Periwinkle or *Vinca minor* was noted along the valley on the western border of tract. Due to the size and the difficult accessibility to this area, management is unlikely until after access is established. This should be considered for treatment following harvesting activities. Treatment of this species will likely entail several sustained years of treatment and follow-up. Initial treatments

could be done during the post-harvest TSI project. Other invasives may occur within the tract but were undetected due to the timing of the resource inventory. Further monitoring is recommended during marking activities.

Recreation

Public access into this tract is limited. Recreational activities could include hiking, mushrooming, wildlife viewing, and hunting.

Cultural Resources

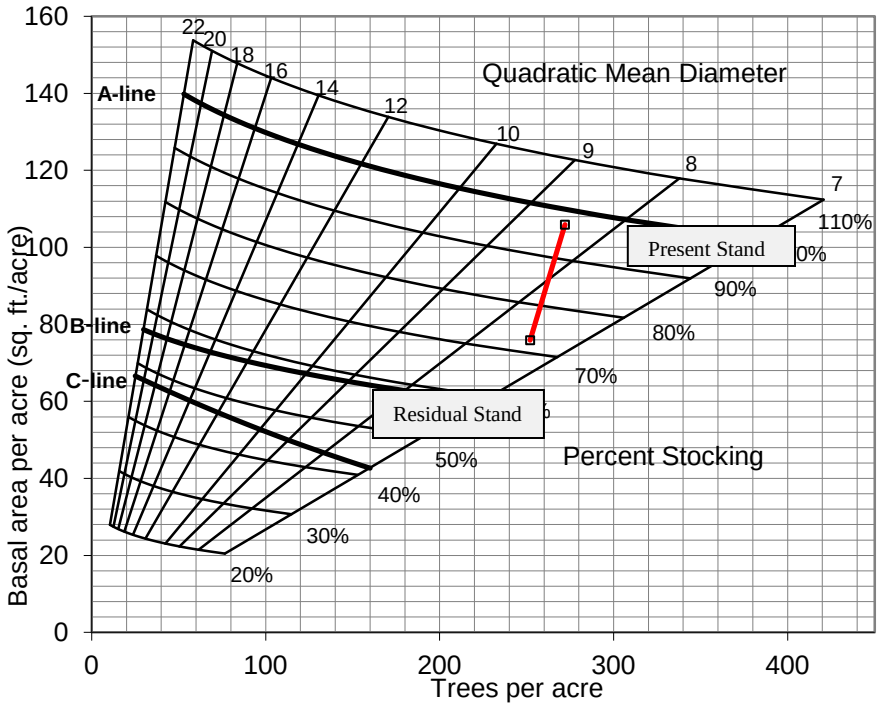
Cultural resources may be present on M1804 but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

M1804 Tract Summary Data from the December 2011 Inventory

Total Trees per Acre = **272**
Overall Percent Stocking = **97%**
Basal Area per Acre = **105.9 Square Feet**
Sawtimber & Quality Trees per Acre = **36**
Present Volume = **7,525 Board Feet per Acre**

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	91	Basal Area Sawtimber:	61.3
Pine Commercial Forest:	19	Basal Area Quality:	5.1
Noncommercial Forest:	0	Basal Area Poles:	25.9
Permanent Openings:	0	Basal Area Culls:	3.0
Other Use:	0	Sub-merchantable:	10.6
Total:	110	Total Basal Area:	105.9

Table 2. Gingrich Stand and Stock Table for M1804 in December 2011



STRATUM DESCRIPTIONS AND SILVICULTURAL PRESCRIPTIONS

This forest resource inventory was completed in December 2011 by Forester Amy Spalding. 33 prism points were evaluated over 110 acres (1 point for every 3.33 acres). The inventory data are summarized above and present volumes are detailed in Table 3 below. M1804 is fully stocked and is prescribed a timber harvest. Single tree and improvement cuttings are prescribed to thin and release desirable croptrees as well as to harvest suppressed and poorly formed trees. Group selection cuttings are prescribed to regenerate areas where there are aggregations of poor stocking, excessive stand damage, or declining canopy tree cover. For this management cycle, two Stratums are described for a proposed harvest in M1804: an Oak-Hickory Stratum and a Mixed Pine Plantation Stratum.

Table 3. Estimated Present Volumes from December 2011 inventory in M1804

Species	**Total**
Eastern White Pine	242,360
Black Oak	148,540
White Oak	123,320
Scarlet Oak	57,230
Chestnut Oak	49,750
Red Pine	40,330
Sugar Maple	34,540
Pignut Hickory	30,040
Northern Red Oak	29,360
American Beech	24,350
Yellow-Poplar	15,680
Red Maple	11,920
Virginia Pine	3,980
American Sycamore	3,520
Shagbark Hickory	3,490
White Ash	2,830
Blackgum	2,440
Black Cherry	1,460
Sassafras	1,390
Black Walnut	1,280
Totals	**827,810**
Total/Acre	**7,526**

1) Oak-Hickory Management Stratum

This is the most dominant cover type within M1804. It is predominately composed of Oak-Hickory timber types although it does include some areas with Mixed Hardwoods. This Stratum is generally dominated by Scarlet Oak, Chestnut Oak, White Oak, Northern Red Oak, Sugar Maple, and American Beech. Beech-Maples comprise the majority of the timber in the Mixed Hardwood areas. The understory is made up of shade tolerant Beech-Maple and scattered Oak. The regeneration layer is almost completely comprised of Beech-Maple species.

In general, the resource inventory noted that the Mixed Hardwood areas contained many low quality stems. This could be a result of this species mix being more susceptible to grazing damage. Some of these areas were noted to have regeneration potential. This will allow a more vigorous cohort of Mixed Hardwoods to be reestablished. Other areas would benefit from single tree selection to favor higher quality, more vigorous stems. The quality was better in the Oak-Hickory areas. This portion of the Stratum is more vigorous and favorable to respond well to an improvement cut utilizing single tree selection. An improvement cutting prescription would target the lower quality, poor formed stems to release a higher quality growing stock. Overall, some portions of this Stratum may be selected for regeneration after a more intensive review. Regeneration areas are expected to return to a mixture of shade intolerant species with Oaks being more likely to be regenerated on the drier aspects.

2) Mixed Pine Plantation Stratum

All Pines in this portion of Indiana are of plantation origin as Pines are not native to Monroe County. These Pine areas consist of parcels of Eastern White Pine, Red Pine, and Virginia Pine which were probably planted just prior to State acquisition (no plantation records were found). The White Pine plantings have been the most successful and vigorous. These areas are fully stocked with 165 square feet of basal area per acre and average about 20.6 MBF per acre. The Red and Virginia Pine plantings have not been as successful. The Virginia Pine contains little to any sawtimber sized stems after 60 years of State ownership. The Red Pine planting has had some stems grow up into the small sawtimber size class however their overall health and vigor is low. The inventory noted that in general, the Red Pine crowns were very small and thin. It is unlikely that this planting would respond to release. As adjacent tracts of private and State Forest areas within the landscape have abundant Pine plantations it is proposed that the Pine plantations within M1804 be regenerated to native hardwoods. As these areas are mostly in the bottomlands, the regeneration of these plantings would provide early successional wildlife habitat for Ruffed Grouse, American Woodcock, Whippoorwills and other early successional habitat specialists. One Pine planting along the bottom slope of the southernmost ridge on the tract was noted to have a highly bisected topography. This area was probably farmed long ago, abandoned and had modest erosion gullies which were planted to Pine. The Pine planting that is present has reduced that erosion potential and should be reevaluated during marking. The topography at this site may not be conducive for a harvest operation this management cycle. All of the Pine plantings that are proposed for regeneration should regenerate into Mixed Hardwoods.

Summary Tract Silvicultural Prescription and Proposed Activities

The prescription for M1804 is an improvement cutting type of harvest over most of the tract acreage. Harvest volumes are expected to fall between 250-400 MBF (much of that being Pine species). The harvest will comply with BMP regulations to minimize soil erosion and protect water quality. The prompt installation of water diversions in conjunction with seed and straw following harvesting will be employed to minimize any effects to neighboring water resources. The harvest will entail both single tree and group selection cuttings. Single tree selection will remove poorly formed, mature stems, and improve spacing of croptrees to increase the growth of the residual stand. Group selections will be prescribed in aggregations of timber that are inadequately stocked, contain poor quality, or stockings with declining vigor. The majority of the existing Pine plantations are also prescribed group selection cuttings to promote their regeneration into native

timberlands. The road access improvements planned into and through this tract will allow the Property to correct significant erosion concerns that exist with the abandoned county roadway as well as to provide access to treat some exotic concerns that are present in this block of State Forest.

Riparian buffer areas exist along the banks of the mapped intermittent streams that comprise the western and south drainages. Management within these areas will be prescribed according to current Division of Forestry guidelines.

Postharvest Timber Stand Improvement (TSI) is also proposed and should include Wild Grapevine control, croptree release in areas not sufficiently covered by the harvest, large snag creation and group selection opening completion. Areas within the tract will also be reviewed for potential invasive control treatments.

Given the recent inventory and growth of M1804'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 250 to 350 MBF. A timber sale is proposed for FY2014-15.

Proposed Management Activities:	**Proposed Period**
DHPA Roadwork Project Review	CY2014
Access Roadwork Improvement	CY2014
Timber Marking & Spot Treatments of Invasives/Vines	CY2014-15
Timber Sale	FY2014-15
Timber Harvest	CY2014-2016
Postharvest TSI and Invasives Treatment Project	CY2015-2018
Regeneration Opening Review	CY2020
Inventory and New Management Guide	CY2026

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