Indiana Department of Natural Resources – Division of Forestry

Draft

Resource Management Guide

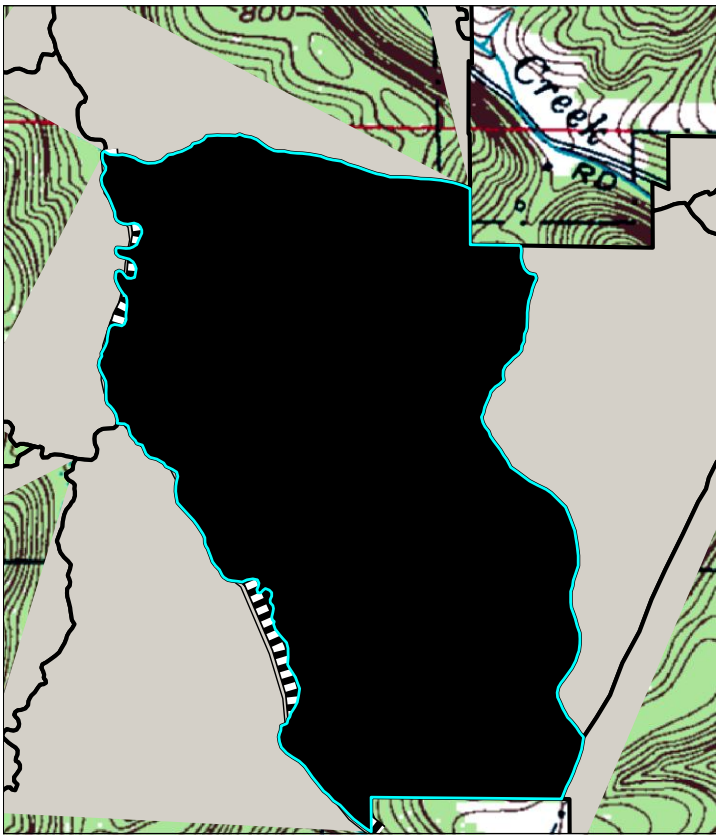
State Forest: Morgan-Monroe
Compartment 11 **Tract** 6
Tract Acreage: 178
Commercial Acreage: 176
Forester: Phil Jones
Date: April 17, 2013
Management Cycle End Year: 2027
Management Cycle Length: 15 years

Location:

Compartment 11, Tract 6 lies in all quarters of Section 11, Township-10-N, Range-1-W of Washington Township in Monroe County, Indiana. The Tract lies approximately 8 miles southwest of the city of Martinsville, Indiana.

General Description:

Figure 1. – Designation of Management Areas of M1106



M1106 is an approximately 178-acre, managed, multiple-use parcel comprising part of the 2,343 acres in Compartment 11 of Morgan-Monroe State Forest. The timber type is predominantly closed canopy Oak-Hickory, but some Mixed Hardwood areas are found throughout, particularly in upland oldfield areas. Additionally, most of the southern third of the Tract (in the south half of Section 11) was heavily harvested shortly before becoming part of Morgan-Monroe State Forest and is comprised of young Mixed Hardwoods. This Tract is mostly surrounded by State Forest on all sides however, the straight, southern edge and the "notch" in the northeast corner of the tract lies adjacent to private property. Aside from property boundaries, tract boundaries are formed by topographic features: a mapped intermittent along the west tract boundary and a series of ravines and ridge-tops along the north

and eastern tract boundaries. The Tract is easily accessible via a fire trail that extends south from Bryant Creek Road, and a very small parking area is located at the head of this trail. This Tract exhibits good opportunities for multiple use management, including timber management, wildlife management, and soil and water conservation. It is also suitable for public recreational activities such as hiking, gathering, hunting, and viewing.

For the purposes of inventory and management planning, this Tract has been subdivided into 3 Management Areas: a Northern Management Area, a Southern Management Area and a Riparian Management Area. The Northern Area comprises approximately two-thirds of the tract and has been in the State Forest system longer than the more recently acquired Southern Area. The Riparian Management Area lies along the west boundary of the N & S Area by the mapped intermittent stream which forms the Tract's west boundary. The N & S Areas are mostly distinct due to their past management history and cover type(s) and are easily distinguishable by the horizontal dashed line (just about the red "11") in Figure 1. Below are two tables (Tables 1 & 2) comprised from the 2012 Tract resource inventory data and shows the relative frequency of tree species in this Tract.

Table 1. North Area – Basic Forest Structure of M1106 in March of 2012

Overstory Layer	Understory Layer	Regeneration Layer
white oak	sugar maple	American beech
black oak	red maple	sugar maple
yellow poplar	white oak	sassafras
scarlet oak	bitternut hickory	flowering dogwood
Northern red oak	black oak	white ash
bitternut hickory	American beech	bluebeech
pignut hickory	blackgum	hickory spp.
sugar maple	sassafras	white oak
black cherry	flowering dogwood	ironwood
sassafras	red elm	black oak
shagbark hickory	pignut hickory	blackgum
American beech	white ash	Eastern redcedar
American sycamore	yellow poplar	yellow poplar
red maple	shagbark hickory	black cherry
white ash	scarlet oak	Eastern redbud
largetooth aspen	American sycamore	Elm spp.
Eastern redcedar	chinkapin oak	hackberry
mockernut hickory	Eastern redcedar	Northern red oak
black walnut		scarlet oak
green ash		

Table 2. South Area – Basic Forest Structure of M1106 in March of 2012

Overstory Layer	Understory Layer	Regeneration Layer
yellow poplar	white oak	sassafras
white oak	pignut hickory	American beech
black oak	red maple	red maple
bitternut hickory	sugar maple	sugar maple
shagbark hickory	blackgum	Eastern redcedar
Northern red oak	yellow poplar	flowering dogwood
white ash	largetooth aspen	white oak
scarlet oak	American beech	black oak
black cherry	bitternut hickory	white ash
sugar maple	white ash	hickory spp.
red maple	black oak	yellow poplar
American beech	sassafras	black cherry
blackgum	shagbark hickory	bluebeech
		Northern red oak
		persimmon

History:

Morgan-Monroe State Forest encompasses more than 24,000 acres in Morgan and Monroe counties in south central Indiana. The forest land encompasses many steep ridges and valleys, and is forested with some of the State's finest hardwoods. The original settlers of the area cleared and attempted to farm the ridges, but were frustrated by rocky soil unsuitable for agriculture. The State purchased the eroded, abandoned land to create Morgan-Monroe State Forest beginning in 1929.

M1106 spans portions of several separate land acquisitions. The western portions of the Tract were acquired during the 1940's and 1960's from Fred and Mildred Huntington, Rex M. and Ruth L. Russell, and Luther L. Cofland (administrator). The central portions of the Tract were acquired during the early 1930's from James R. Gum, Peter and Pearl Fushelberger, and Edward O. Bergan. The southernmost triangular "sliver" of the Tract was also acquired during the early 1930's, this piece from Irvin G. Stevens. The remainder of the south section was acquired in 2007 from The Nature Conservancy.

In terms of forest management, activity in the northern portion of the Tract is well documented. In 1977 the Tract boundaries were different from today. Two Tract inventories were conducted by B. Bull which included much of what is presently Tract 6. These inventories estimated 5,261 board feet (bd. ft.) per acre of total sawtimber and 2,755 bd. ft. per acre of harvest volume and 4,524 bd. ft. per acre of total sawtimber with 1,795 bd. ft. of harvest volume. The timber sale which followed in 1978 removed an average of 1,068 bd. ft. per acre.

The Tract boundaries were redrawn in 1980. Tract 6 was then established as it is presently except for the southern portion which was not acquired until nearly 30 years later. In 1990 a forest inventory was conducted by D. Breedlove that estimated 7,413 bd. ft. per acre of sawtimber with 1,883 bd. ft. designated as harvestable. A timber sale followed in 1990 that sold 199,320 bd. ft. (128 acres at the time). A considerable amount of commercial firewood totaling 140 ricks was sold in late 1990 and early 1991.

The southern portion of the Tract was privately harvested a few years prior to being acquired by Morgan-Monroe State Forest. This private harvest overall removed a significant amount of volume in this southern portion of the Tract. The current tract resource inventory was completed by Forester James Dye in March of 2012.

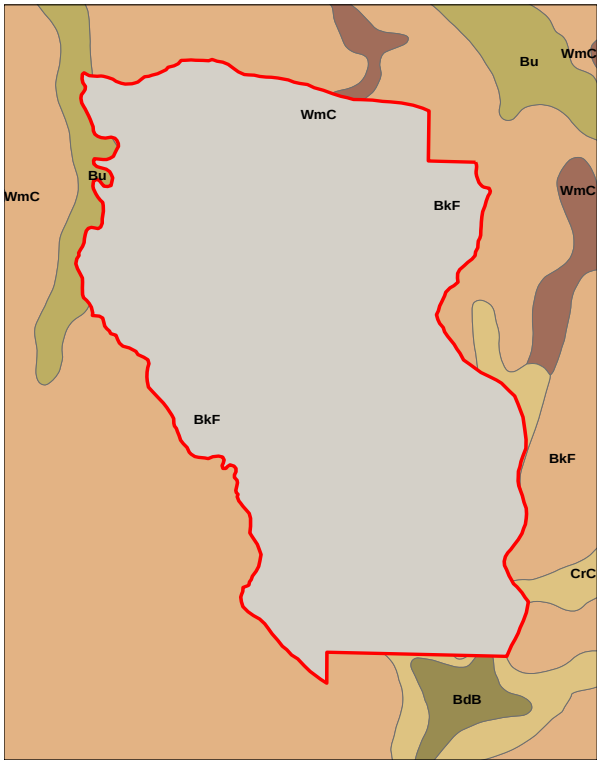
Landscape Context:

This Tract is surrounded primarily by closed canopy deciduous forest however, some pine forest occurs to the north in the west portion of the adjacent tract M1107. To the south is private property with a home and large areas of open grasslands and fields. Along the west boundary is a mapped intermittent stream and moderately steep terrain which slopes down to it. As a whole, the Tract is convex in configuration with a long narrow ridge that slopes down toward its boundaries.

Topography, Geology, and Hydrology:

The Tract's topography ranges from 0 - 75% slopes. Tract 06 has predominantly eastern and southern aspects. The Tract's soils range from 24 – 60 inches in depth to unweathered bedrock. Soils present in this Tract were formed from sandstone, siltstone, and shale parent material. One mapped intermittent creek serves as the Tract's eastern boundary. Several other unmapped ephemeral drainages also occur within the Tract. Water resources from this Tract drain into Bryant Creek which serves as a tributary for the White River.

Figure 2 – Monroe County Soil Survey Map of M1106



Soils:

The main soil types in M1106 are featured in Figure 1. The Berks-Weikert Complex (BkF) is the most dominant soil type covering approximately 146.5 of the Tract's 178 acres. It is found on hills and slopes that are steep at 25-75 percent. Next most common is the Crider Silt

Loam (CrC) which makes up about 15 acres. The Crider slopes range from 6-12 percent. The remaining soils are Wellston-Gilpin Silt Loam (WmC) and Burnside Silt Loam (Bu).

Table 3. – Basic Soil Information for M1106

BkF	**Berks-Weikert Complex**		25-75% slopes	Sandstone-bedrock-38”
	Site Index - 70	Well drained, most areas in woodland, suited to trees Severely limited to dwellings with basements due to slope & bedrock		
146.5 Acres	Erosion *Moderate*	Equipment Limitations *Severe*	Seedling Mortality *Moderate*	Windthrow Hazard *Slight*
CrC	**Crider Silt Loam**		6-12% slopes	Subsoil 58"
	Site Index - 88	Well drained, many areas in cultivated crops, well suited to trees Moderately limited to buildings due to steepness of slope		
15 Acres	Erosion *Slight*	Equipment Limitations *Slight*	Seedling Mortality *Slight*	Windthrow Hazard *Slight*
WmC	**Wellston-Gilpin Silt Loam**		6-20% slopes	Bedrock-40”
	Site Index - 71	Well drained, many areas in woodlands, well suited to trees Limited building sites, severe hazard to erosion due to silty loam soil		
13 Acres	Erosion *Slight*	Equipment Limitations *Slight*	Seedling Mortality *Slight*	Windthrow Hazard *Slight*
Bu	**Burnside Silt Loam**		Nearly level	Sandstone-bedrock-44”
	Site Index - 95	Well drained, many areas pasture or crops, soil suited to trees Limited to building sites due to flooding, absorption fields limited		
2.5 Acres	Erosion *Slight*	Equipment Limitations *Slight*	Seedling Mortality *Slight*	Windthrow Hazard *Slight*

Access:

This Tract is accessible via a fire trail that extends south/southeast from Bryant Creek Road. This fire trail is in excellent condition as it was improved for use when Tract 5 was harvested a few years ago. However, some unauthorized horse traffic has caused some excessive rutting and standing water which could become severe if not addressed. A small public parking area is located near the gate to the fire trail.

Boundary:

This Tract is mostly surrounded by adjacent State Forest land. However, a small section in the northeast corner of the Tract and the straight section of the southern boundary are next to private properties. State Forest boundaries have been recently repainted in orange and are clearly visible.

Wildlife:

Wildlife resources in this tract appear abundant. This Tract contains habitat for a variety of wildlife species. Habitat includes mostly Oak-Hickory but there are also areas of Mixed Hardwoods, large pines mixed with a few lowland hardwoods, and oldfields. The Oaks, Hickories, Walnut, and Beech provide hard mast for deer, turkey and squirrel. Snags (standing dead trees) and cavity trees provide nesting, bugging, and roosting opportunities for woodpeckers, songbirds, and small mammals. Rotten logs, crater knolls, small ponds, and the mapped intermittent stream provide habitat for herptiles and aquatic vertebrates.

Species and sign noted during the 2012 inventory include Eastern Gray Squirrel, Eastern Chipmunks, White-tailed Deer, various songbirds, and woodpeckers.

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.

Wildlife Habitat Features:

According to the data collected during the Tract's resource inventory which is represented in the following Table 4, this Tract is fairly well represented with habitat in regards to the number, size and species of dead (snag) trees suitable for consideration of the Indiana Bat (*Mytolis sodalis*) and its suggested habitat requirements.

Snags, standing dead or dying trees, may be one of the most important wildlife habitat features in Indiana's forests as they are used by a wide range of species as essential habitat features for foraging activity, nest/den sites, decomposers (e.g., fungi and invertebrates), bird perching and bat roosting. Additionally, snags are an important contributor to the future pool of downed woody material. Looking at the Tract as a whole and in terms of snags, only the largest size class meets and exceeds maintenance levels, while the two larger size classes fall just short. The somewhat reduced numbers of snags in the larger size classes is due to the health and vigor of the Tract's timber resource as well as the low abundance of any larger trees in the southern third of the Tract.

Forest wildlife species depend on live trees for shelter, escape cover, roosting and as a direct (e.g., mast, foliage) or indirect (e.g., foraging substrate) food resource. The retention of live trees with certain characteristics (legacy trees and cavity trees) is of particular concern to habitat

specialists such as cavity nesters or Species of Greatest Conservation Need like the Indiana Bat. Legacy trees of a particular species having certain characteristics suitable as live roost trees for the Indiana Bat are very well represented in all size categories. Cavity trees meet and exceed maintenance levels in all size classes.

Legacy trees, standing dead trees (snags) and cavity trees will be given consideration for retention as habitat for the Indiana Bat and other wildlife as defined by the Resource Management Strategy for the Indiana bat on State Forest Property and the Management Guidelines for Compartment-level Wildlife Habitat Features. In addition, the girdling of select cull trees could be performed through postharvest timber stand improvement (TSI) to increase snag trees, particularly in the larger size classes.

Table 4. – Wildlife Habitat Summary (Total Tract) for M1106 in March 2012

Legacy Trees*	Maintenance Level		Inventory	Available Above Maintenance	
11"+ DBH	1593		4525	2932	
20"+ DBH	531		946	415	

* Species include: AME, BIH, COT, GRA, REO, POO, REE, SHH, ZSH, SIM, SUM, WHA, and WHO

Snags (All Species)	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
5"+ DBH	708	1239	951	243	-288
9"+ DBH	531	1062	499	-32	-563
19"+ DBH	88.5	177	69	-20	-108

Cavity Trees (All Species)	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
7"+ DBH	708	1062	1267	559	205
11"+ DBH	531	708	598	67	-110
19"+ DBH	88.5	177	141	52	-36

Communities:

Currently, there is only a slight concern with exotic species within Tract 11. Several light to moderate patches of Multiflora Rose were observed. As Multiflora Rose is so widespread in Morgan-Monroe State Forest as well as the rest of the State it has become naturalized to the area.

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.

Recreation:

This tract is easily accessible via a fire trail which extends south of Bryant Creek Road and a very small parking spot is located at the head of the trail. This tract offers a few recreational opportunities such as off-trail hiking, gathering, hunting, and viewing.

There are, unfortunately, some issues with unauthorized horseback riding and ATV use. Though there is an easement for riding horses on the southernmost portion of the tract (also known as the "Leatherwood Tract"), this easement does not extend north into the remainder of this and adjacent tracts. Unauthorized traffic in these areas has damaged the primary fire trail and some of the skid trails. Carsonite posting of the tract to restrict horse use was completed in the fall of 2013.

Cultural:

Cultural resources may be present on this tract but their location is protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Tract Prescription and Silvicultural Prescription

As described earlier this Tract was divided into 3 Management Areas. Overall, the Tract's Gingrich Stand & Stocking tables for Management Areas North and South are described in Figures 3&4. The individual Management Area prescriptions are noted below.

North Area Prescription

In the north section of the Tract, White Oak is the dominant species and there is generally a strong Oak-Hickory component. Areas of Mixed Hardwoods are also present and Yellow Poplar makes up a significant portion of the Tract volume. Sawlogs are medium to large in size and often of very good or even veneer quality.

This portion of the tract also has a large component of pole-sized timber throughout. Surprisingly, White Oak is easily the most abundant species in this class. Red Maple and Sugar Maple are the next most common, while Bitternut Hickory, Black Oak, Pignut Hickory, and Blackgum follow in descending order. The large sapling understory consists mostly of American Beech, Sugar Maple, Flowering Dogwood, Sassafras, and Red Maple trees. Seedling regeneration consists mostly of American Beech, Sugar Maple, Sassafras, Flowering Dogwood, White Ash, Bluebeech and Hickory spp. however some oak regeneration is also present.
The current stocking level of 105% indicates the Tract has reached an overstocked condition. The most significant damaging agents are Grapevines and light windthrow, but these are not major concerns.

The recommendation for the north portion of the Tract is to prescribe an intermediate harvest primarily using the singletree selection method. This will result in thinning and a reduction of competition with and amongst the maturing, better quality sawtimber trees and preferred species. Mature and declining Yellow Poplar should be given particular consideration for removal and also to benefit selected future croptrees. Selected Black Oak, Scarlet Oak, and Northern Red Oak trees as well as the least vigorous White Oaks should also make up a significant portion of the harvest volume. The composition of the tract will also be improved by harvesting low quality, damaged, diseased, dying and poorly formed trees as well as harvesting less desirable species such as Red and Sugar Maple, Largetooth Aspen, American Beech, Sassafras, and American Sycamore. Any White Ash trees present should be harvested before the Emerald Ash Borer can infest the area. Group selection openings may be utilized, particularly in some upland, oldfield areas or other low quality areas in order to reestablish more productive and desirable native hardwoods.

South Area Prescription

In the south section of the Tract, Yellow Poplar is by far the dominant species, comprising about 45 percent of the area's volume. White Oak is next most common at a little less than 25 percent. Most of the area is young Mixed Hardwoods. Sawlogs are typically small and of poor to average quality. Many of the larger trees are culls.

This portion of the Tract has a large component of pole-sized timber. Largetooth Aspen and Yellow Poplar are most common however Blackgum, Pignut Hickory, White Oak, and Red Maple are also well represented. The large sapling understory consists mostly of American Beech, Sugar Maple, Flowering Dogwood, Sassafras, and Red Maple trees. Seedling regeneration consists mostly of Sassafras, American Beech, Red Maple, Sugar Maple, Eastern Redcedar, Flowering Dogwood, and White Oak.

The current stocking level of 76% indicates the tract is at about the midpoint of a fully stocked condition. Significant damaging agents are mechanical damage from the previous private harvest, traces of fire damage, and occasional grapevine infestations and windthrow.

In the South Management Area of the Tract, the recommendation is to evaluate portions of this area for an improvement, selection and/or group selection harvest to increase the area's composition of quality timber. As some of the area was heavily harvested with retention of poor quality timber some of the area could be prescribed a group selection harvest. Overall, as some of this area has already begun regenerating into a pole-sized and small sawtimber sized forest area, a combination of light harvest, regeneration and followup TSI is recommended. At present the area does offer some very good wildlife habitat.

Riparian Management Area Prescription

This Area was developed following the inventories of the 2 main Areas (North & South) and as such do not have specific volume and species data available. This area consists of land that is

defined as lying 50 feet adjacent to the banks of the mapped intermittent stream along the Tract's west boundary. This Management Area therefore includes small portions of both the North and South Management Areas. Approximately 4 acres of a generally Mixed Hardwood component of sawtimber and pole-sized timber comprise this Area. During this management cycle no harvest or TSI is planned in this Riparian Management Area.

The overall goals of these prescriptions are 1) to make an intermediate cuttings and group selections in the North Management Area of the tract which will reduce competition among the larger trees, provide resources for future croptrees through the removal of over-mature and declining trees, improve understory composition in favor of Oak regeneration, and improve overall timber species composition while providing some early successional forest wildlife habitat, and 2) to make correction actions in the South Management Area to facilitate and encourage quality stem growth, enhanced the release of advance regeneration that begun in the private harvest as well as to regenerate poorly stocked and low vigor stems which will provide additional early successional forest habitat areas for wildlife.

Post-harvest Timber Stand Improvement (TSI) should be performed to control grapevines, release preferred croptrees through the culling of low volume, poorly formed trees and less desirable species, and to encourage early successional (oak) regeneration through the creation of canopy gaps and a reduction in understory shade tolerant species (such as sugar maple and American beech).

No prescription is proposed for management of Multiflora Rose except in areas where group selection regeneration openings are planned.

Standing dead trees (snags) and cavity trees will be given consideration for retention as habitat for wildlife. Legacy trees as defined by the Resource Management Strategy for the Indiana Bat will be given consideration for retention as future habitat for the Indiana Bat. In addition, the girdling of select cull trees is recommended through postharvest TSI to address the suggested guidelines of the Strategy for the Consideration of the Indiana bat (IDNR – Division of Forestry, Resource Management Strategy for the Indiana Bat on Indiana State Forests, April 2008).

Where present and appropriately laid out, existing skid trails will be reused. Care and the application of BMP's should be taken with any new skid trails to prevent excessive erosion and damage to water quality.

Carsonite signs have been posted to restrict illegal horseback riding and will be monitored periodically to assess whether enforcement action is required.

Given the recent inventory, M1106 is suitable for a 15 year cutting cycle wherein growth and development of the Tract is reevaluated by a forest resource inventory every 15 years. An estimated harvest within this Tract could yield from 250 to 500 MBF depending on the amount

of regeneration that is planned. A combined tract timber sale is proposed for M1106 along with M1107 in late FY12-13.

Proposed Management Activities:	**Proposed Dates:**
Combined Tract Timber Sale with Tract 7	FY2012-13
Timber Harvest	CY2013-2015
Timber Stand Improvement	CY2013-16
Inventory and New Management Guide	CY2027

The following attachments are kept in the tract file:

Ecological Resource Review

Aerial photo map with noted special features

Aerial photo map with noted unique areas

Soil type tract map

Indiana Natural Heritage Database Map

TCruise reports

Table 5. North Management Area of M1106– Inventory Summary in March 2012

Total Number of Trees per Acre: 256 **Average Tree Diameter:** 9.2"

Average Site Index: 73 **Stocking Level:** 106%

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	125	Basal Area Sawtimber:	81.2
Pine Commercial Forest:	0	Basal Area Poles:	23.3
Noncommercial Forest:	0	Basal Area Culls:	3.9
Permanent Openings:	0	Sub-merchantable:	10
Other Use:	0		
Total:	125	Total Basal Area:	118.4

Table 5B. North Management Area of M1106 - Estimated Tract Volumes in March 2012

Species	Harvest (bd. Ft.)	Leave (bd. ft.)	Total Volume (bd. ft.)
white oak	41,530	297,680	339,210
black oak	36,300	103,600	139,900
yellow poplar	80,310	48,710	129,020
scarlet oak	29,520	94,750	124,270
Northern red oak	31,080	41,620	72,700
bitternut hickory	7,440	33,850	41,290
pignut hickory	8,130	32,270	40,400
sugar maple	6,650	15,430	22,080
black cherry	17,400	2,990	20,390
sassafras	10,560	7,420	17,980
shagbark hickory	0	17,000	17,000
American beech	5,170	11,770	16,940
American sycamore	10,600	3,680	14,280
red maple	8,170	2,300	10,470
white ash	8,740	0	8,740
largetooth aspen	8,570	0	8,570
Eastern redcedar	0	5,640	5,640
mockernut hickory	0	5,320	5,320
black walnut	1,320	3,460	4,780
green ash	2,550	0	2,550
Area Total	**314,040**	**727,490**	**1,041,530**
Per Acre Total	**2,512**	**5,820**	**8,332**

Table 6A. South Management Area of M1106 – Inventory Summary March 2012

Total Number of Trees per Acre: 252 **Average Tree Diameter:** 7.7"

Average Site Index: 73 **Stocking Level:** 76%

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	52	Basal Area Sawtimber:	47.9
Pine Commercial Forest:	0	Basal Area Poles:	21.6
Noncommercial Forest:	0	Basal Area Culls:	1.7
Permanent Openings:	0	Sub-merchantable:	8.8
Other Use:	0		
Total:	52	Total Basal Area:	80

Table 6B. South Management Area of M1106 - Estimated Tract Volumes in March 2012

Species	Harvest (bd. Ft.)	Leave (bd. ft.)	Total Volume (bd. ft.)
yellow poplar	15,570	75,850	91,420
white oak	0	47,860	47,860

black oak	5,080	10,030	15,110
bitternut hickory	0	14,580	14,580
shagbark hickory	0	12,340	12,340
Northern red oak	0	7,840	7,840
white ash	4,650	0	4,650
scarlet oak	0	3,680	3,680
black cherry	0	2,590	2,590
sugar maple	2,070	0	2,070
red maple	0	1,800	1,800
American beech	1,660	0	1,660
blackgum	0	1,270	1,270
Tract Total	**29,030**	**177,840**	**206,870**
Per Acre Total	**558**	**3420**	**3978**

Figure 3. – North Management Area - Gingrich Stocking Chart of Forest Inventory in M1106 in March 2012

Yellow lines indicate current values; Purple lines indicate projected values after timber harvest

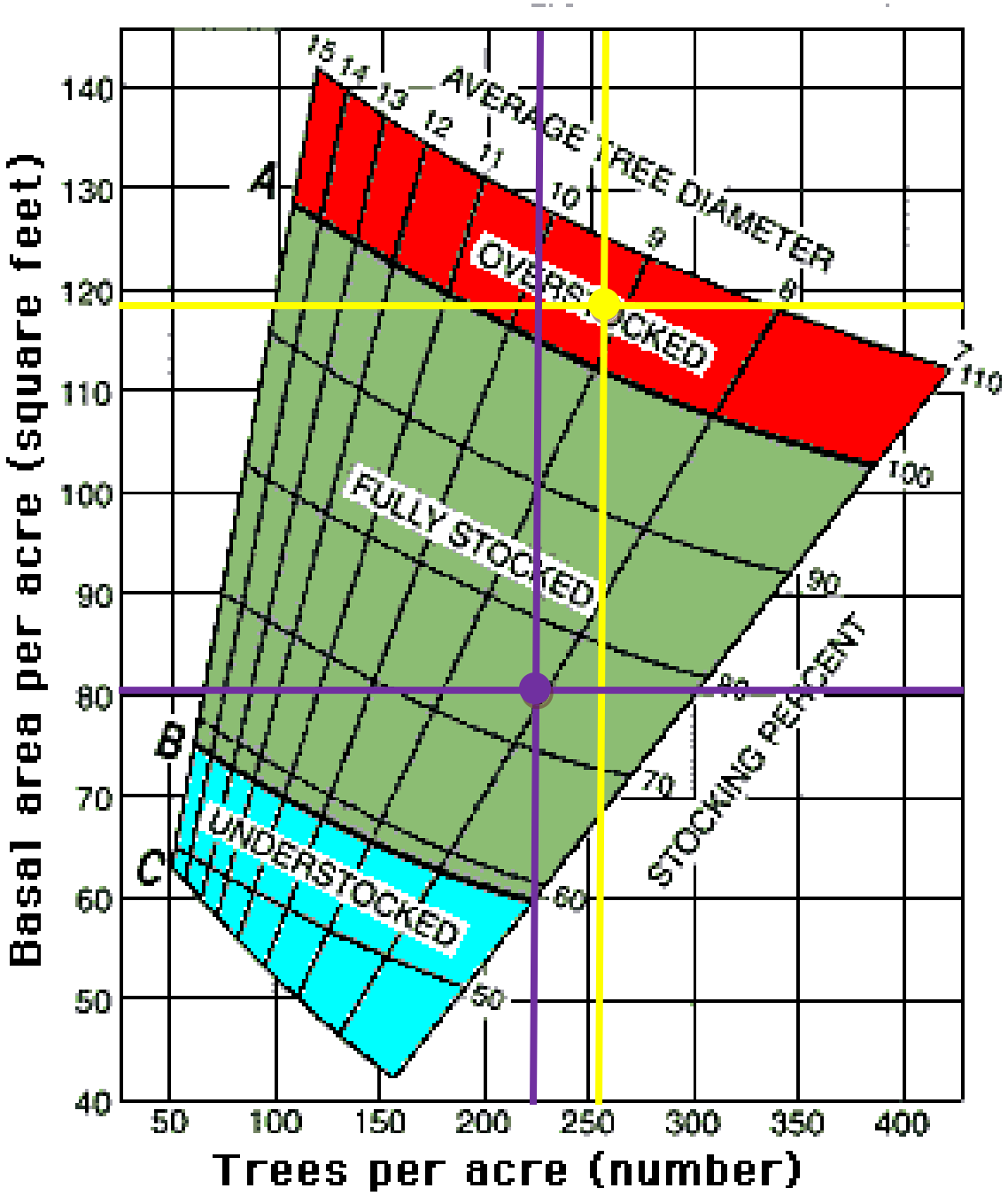
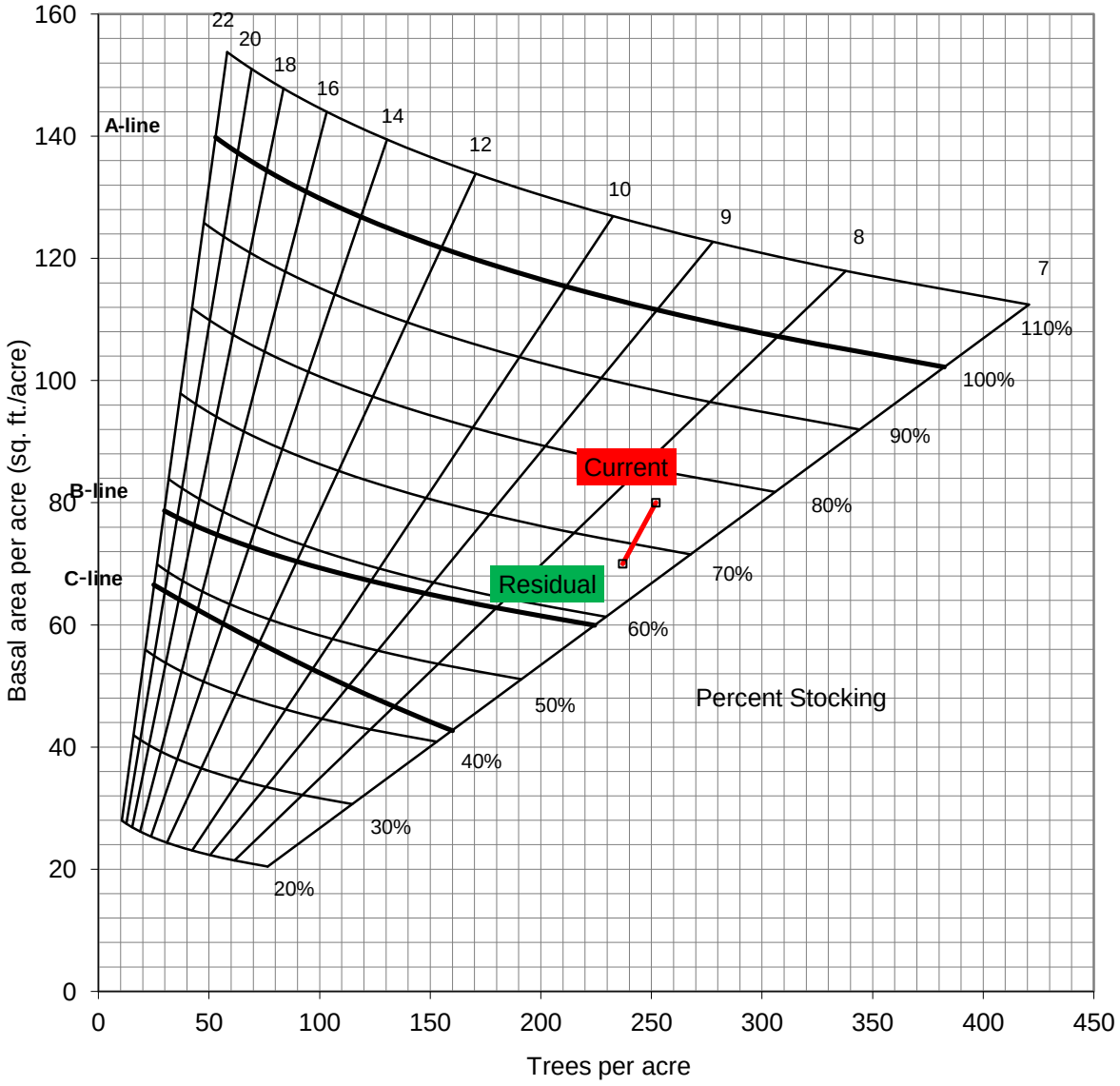


Figure 4. South Management Area - Gingrich Stocking Chart of Forest Inventory in M1106 in March 2012

Red Box indicates current values; Green Box indicates projected values after timber harvest



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You must indicate the State Forest Name, Compartment Number and Tract Number 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.

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