Indiana Department of Natural Resources
Division of Forestry

DRAFT
RESOURCE MANAGEMENT GUIDE

Jackson-Washington State Forest — Compartment 2 Tract 17
Forester Michael Spalding — Date: July 23, 2009
Management Cycle End Year — Management Cycle Length: 23 years

Location
This tract is located in Section 19 T5N R5E in Brownstown Township, Jackson County. The tract borders Highway 250 at the main entrance to the office and again for a ¼-mile stretch east of Highway 39. The beginning of the tract is approximately 2 miles east of Brownstown.

General Description
This 72-acre tract changes in topography from level stream bottom ground along the perennial stream flowing out of Knob Lake to steep hills with fire-damaged and short-boled chestnut oak. Approximately the southern half of the 40-acre tract is an abandoned field that is severely eroded and was left to naturally regenerate to mixed hardwoods dominated by yellow-poplar. The balance of the acreage features excellent quality oak-hickory stands.

History
The land that contains Compartment 2 Tract 17 originated primarily from two land purchases. Less than two acres came from two other purchases. The first significant acquisition was a 201.35-acre purchase from William and Freda Jones on October 14, 1931 for $2,600.00. This purchase contributed nearly 32 acres to this tract. The second significant land acquisition was a 40-acre purchase from George Hovis on May 1, 1947 for $200.00. This 40-acre purchase is entirely contained within this tract.
The current Tract 17 is a combination of two former tracts as well as part of a third. The former Tract one consisted of the 40-acre square at the south end of the tract. The earliest management on record for this area is an inventory and management plan completed February 19, 1969. This inventory estimated a potential harvest of 15,000 bd. ft. on 30 of the 40 tract acres. The management plan recommended an improvement harvest followed by TSI to remove the larger culls and undesirables. The harvest was never conducted. Another inventory and management plan was completed in March 1979. This inventory estimated a total of 3,369 bd. ft. per acre with 1,083 bd. ft. as harvest stock and 2,286 bd. ft. as growing stock. The top three harvest species by volume were black oak, chestnut oak, and northern red oak. The forester recommended no specific practice at that time but suggested that a timber sale might be possible sometime from 1989 to 1994. The eastern boundary of Tract 9 traveled due north from the northwest corner of the 40-acre parcel until reaching the road. This tract contributed approximately 20 acres to the current Tract 17. The earliest management on record for this area is an inventory and management plan completed September 1971. At this time, only 10 of the 24 tract acres

were considered merchantable timber. On this acreage, the total estimated volume per acre was 3,506 board feet, with 2,681 bd. ft. as growing stock and 825 bd. ft. as harvest stock. The plan recommended harvesting the maple and leaving the white oak in the merchantable area, but no harvest was ever conducted. Another inventory and management plan were completed by forester John Friedrich on October 25, 1984. This inventory encompassed the entire tract acreage (estimated to be 22 acres at that time). The inventory estimated approximately 3,293 board feet per acre, with 2,756 bd. ft. as growing stock and 537 bd. ft. as harvest stock. The top three harvest species by volume were chestnut oak, black locust, and black oak. No harvest was conducted. On March 6, 1995, forester Joey Gallion cut the grape vines in black walnut trees and treated them with Tordon. The former Tract 11 contributed the remaining 13 acres and consists of the acreage east of the 20-acre piece and north of the 40-acre parcel. The earliest management on record for this tract is an inventory and management plan completed on September 20, 1971. This inventory estimated a total of 3,468 bd. ft. per acre, with 2,200 bd. ft. as growing stock and 1,268 bd. ft. as harvest stock. Another inventory and management plan were completed by forester John Friedrich on November 14, 1984. This inventory estimated a total of 4,380 board feet per acre with 3,600 bd. ft. as growing stock and 780 bd. ft. as harvest stock. No harvest was conducted in the portion located within the current Tract 17.

Landscape Context

The area of forestland in which Compartment 2 Tract 17 lies contains approximately 2,100 acres of State Forest ownership. To the southwest of this block of forest across State Road 250 is a block of approximately 2,700 acres of State Forest ownership. With the exception of the offices, property residences, and campground, these two blocks are almost entirely forested. Brownstown, approximately 2 miles northwest of Compartment 2, has not seen significant growth in land area over the last 10 years. Most of the development has been single family homes. Most of the conversion of forestland to homesites in the landscape surrounding Compartment 2 is occurring on Venus Road, approximately one mile north of this tract. Over the past 10 or so years, several acres have been lost to fragmentation due to construction of many new homes and parcelization of larger tracts of forestland. To the east and southeast of the block of forest land containing compartments one and two is land heavily dominated by agriculture and dotted with small remaining woodlots which are areas that were generally too wet to farm. The primary threat to the private forestland within the landscape of Compartment 2 will continue to be fragmentation and parcelization due to construction of single family homes.

Topography, Geology and Hydrology

The western portion of this tract is level to nearly level flat stream bottom that gives way to gentle slopes traveling east. These hills become steeper until reaching the highest point at the northeast corner of the tract. The elevation changes from approximately 610 feet at the stream to 810 feet at the highest point in the northeast corner of the tract. Most of the southern 40-acre portion of this tract consists of severely eroded gentle slopes. Aerial photos from the 1930's show this area as widely scattered trees, indicating its history of heavy grazing. The geology of this tract consists of soils underlain by siltstone and shale. A perennial stream flowing out of Knob Lake and a mapped intermittent stream converge

in this tract. BMP's must be adhered to along this perennial stream. All of the acreage in this tract is in the Pond Creek watershed, which eventually flows into the Muscatatuck River.

Soils

Beanblossom silt loam (BcrAW) (7.48 acres) can generally be found on 1 to 3 percent slopes and is located in floodplains. This well-drained soil is fairly deep with a depth to bedrock of approximately 40 to 60 inches. No site index data could be found for this soil type. Burnside silt loam, a similar soil type has a yellow-poplar site index of 95, so this soil type is potentially very productive.

Cincinnati silt loam (CcB2) (2.41 acres) 2 to 6 percent slopes, eroded, on ridge tops and side slopes, moderately well drained soil with a high seasonal water table at 2 to 3 feet. The native vegetation is hardwoods with a northern red oak site index of 80. Surface layer is silt loam with low organic matter 1 to 3 percent.

Cincinnati silt loam (CcC2) (4.92 acres) can generally be found on 6 to 12 percent slopes, eroded on side slopes and uplands. Cincinnati silt loam is a moderately well-drained soil. This is likely due to a history of grazing and/or farming prior to State of Indiana ownership. Much of this area appears to be where the current barn and youth camp are located; so much of the extent of the soil type may not receive much active forest management. The northern red oak site index for this soil type is 80.

Coolville silt loam (CoD) (12.10 acres) can generally be found on 12 to 20 percent slopes. This moderately well-drained soil has a high seasonal water table of 1 to 3 feet and a depth to bedrock of 40 to 60 inches. The northern red oak site index for this soil is 66, indicating a relatively low productivity.

Gilpin silt loam, (GnF) (0.64 acres) 25-55 percent slope, is well drained with bedrock at a depth of 20-40 inches. This soil type is commonly found on side slopes and uplands. Gilpin silt loam has a northern red oak site index of 80.

Haymond silt loam, (Hm) (8.1 acres) 0-2 percent slope, frequently flooded, with a high seasonalble watertable at 4 to 6 feet on flood plains. Permeability is moderate in the most restrictive layers above 60 inches (0.6 to 2 in/hr). Water capacity is high with 12.1 inches in the upper 60 inches. Flooding hazard is a concern for crop management and a white oak site index of 90.

Hickory loam (HrE) (0.25 acres) can generally be found on 15 to 45 percent slopes on side slopes and uplands; however, the slopes containing Hickory loam in this tract tend to be more towards the lower end of steepness. This soil is deep and well drained. Hickory loam has a white oak site index of 85, a northern red oak site index of 85, and a yellow-poplar site index of 95. These indicate a productive soil type.

Kurtz silt loam (KtF) (18.76 acres) 20 to 55 percent slopes, well-drained soil with a watertable greater than 40 inches on side slopes and a depth to bedrock of approximately 40 to 60 inches. Kurtz silt loam has a northern red oak site index of 60, indicating this soil type may have a somewhat lower productivity.

Nabb silt loam, (Naab2) (1.73 acres) 2 to 6 percent slopes, eroded. Moderately well drained soil with a seasonal watertable of 1.5 to 2 feet and is on side slopes. Permeability is slow with (<0.06 in/hr) in the most restrictive soil layers above 60 inches. Nabb silt loam has a northern red oak site index of 80 and a white oak site index of 80, indicating high productivity from this soil type.

Otwell silt loam, (OtC2) (1.78 acres) 6 to 12 percent slopes, eroded. Moderately well drained soil with a high seasonal watertable of 2 to 3 feet and is on side slopes on lacustrine terraces with a water capacity is moderate (6.9 inches in the upper 60 inches of soil). Otwell silt loam has a white oak site index of 65, which is moderately productive.

Rarden silty clay loam, (RdD3) (4.30 acres) 12 to 20 percent slopes, severely eroded. Moderately we drained soil with a high seasonal watertable at 1 to 2 feet and is on side slopes. Permeability is slow (0.06 to 0.20 in/hr) in the most restricted layers above bedrock. Water capacity is low at 4.8 inches in the upper 60 inches. Dept to bedrock is 20 to 40 inches. Rarden silty clay loam has a black oak site index of 71.

Stonehead silt loam, (SsC2) (9.88) 4 to 12 percent slopes, eroded, is a deep moderately well-drained soil type located on uplands. Bedrock below Stonehead soils ranges from 40 to 72 inches deep. Stonehead soils have a northern red oak site index of 90, indicating an very productive soil type. Although this high site index may make oak regeneration difficult due to competition from species such as yellow-poplar, successful oak regeneration on a soil such as this can lead to very high quality trees in the future.

Access

This tract may be accessed extremely well from two locations. The first is via the main forest road entrance to the road leading up to the barn. From this road, the gate at the archery range lane accesses the tract. The other access is directly off of State Road 250. Three ridges intersect the highway, and one of these could be used to construct a log yard. Work would be needed to clear the log yard and construct a very short haul road to the yard.

Access within the tract is excellent for the most part. The slopes are not as steep as in many other areas on this state forest. The largest access problems within the tract will be a result of a perennial and a mapped intermittent stream that converge within this tract. A timber bridge may be used to mitigate this problem. Another access issue will be ridges that are cut off by either private property lines or State Road 250 on the southern boundary. Well-placed and limited ephemeral stream crossings will mitigate this problem during the harvest.

Boundary

The western corner of the tract begins at the main entrance to the state forest. The tract boundary then follows a private property line marked with carsonite posts east for .3 mile. The tract boundary then turns south bordering the same landowner for ¼ mile until it intersects with Highway 250. The boundary then travels east along the highway for ¼ mile, and then travels north for ¼ mile. After traveling east for less than .1 mile, the boundary turns back west and follows an old ridge-top trail for a short distance before traveling down through an ephemeral valley to a mapped intermittent stream that forms most of the north boundary. This boundary then intersects with the access road to the property barn, which in turn travels northwest until intersecting with the main forest road. The tract boundary follows the main forest road southwest until it meets back at the beginning at the main entrance.

Wildlife

Wildlife Habitat Feature Tract Summary

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	648		1160	512	
20"+ DBH	216		235	19	
Snags (all species)					
5"+ DBH	288	504	1122	834	618
9"+ DBH	216	432	353	137	-79
19"+ DBH	36	72	32	-4	-40
Cavity Trees (all species)					
7"+ DBH	288	432	1629	1341	1197
11"+ DBH	216	288	1469	1253	1181
19"+ DBH	36	72	611	575	539

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

The only habitat feature which was estimated to be below the maintenance level in this tract is the 19" and larger size class for snags. The post-harvest TSI prescribed below in the plan will provide additional large snags by deadening large hollow cull trees. Two tracts adjacent to this one, Compartment 1 Tract 10 and Compartment 2 Tract 13, were each inventoried in the fall of 2008. Both tracts exceeded the maintenance level for snags in all size classes. Many of the legacy trees marked for harvest in the proposed timber sale will likely be sugar maple and white ash. The residual stand will retain more white oak and shagbark hickory than will be marked for the harvest.

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.

Communities
Due to the transition of topography found within this tract, it contains mesic floodplain forest in the bottom, dry-mesic upland oak-hickory, and dry upland oak-hickory. Paw paw and spicebush dominate the understory of the mesic floodplain forest, sugar maple and American beech dominate the understory of the dry-mesic upland oak-hickory, and greenbriar dominates the understory of the dry upland oak-hickory.
Exotics encountered during the inventory include the following: barberry, Japanese honeysuckle, black locust, Norway spruce, stilt grass, multiflora rose, and wintercreeper. None of these appear to be a major threat in need of control in this tract at this time. If treating other exotics in the area, it will certainly be worthwhile to treat any of these small patches. Any Norway spruce or black locusts that are timber sized should be marked during the marking of this tract.

Recreation
Due to part of this tract being within the safety zone, hunting is not a major activity in much of this tract. The primary recreational use of this area is the archery range located within the tract. Although management will not avoid this area, the archery range will need to be closed during any harvesting operations. The main forest road is frequently used by joggers and walkers, so a logger must provide a spotter to watch for traffic during any harvesting operations.

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 Subdivision Description and Silvicultural Prescription

Pine-Hardwood
This area is approximately 18 acres and contains a mixture of naturally regenerated mixed hardwoods and the remaining live white pine, shortleaf pine, and black walnut trees that were planted in the 1930's and 1940's. Some black locust and Norway spruce are still present as well. This area has an average sawtimber basal area of approximately 93 square feet per acre. Yellow-poplar is the most dominant hardwood in this area. They range from pole to large sawtimber, and some are excellent quality. Many of the small to medium sawtimber black walnut present are excellent quality as well. The planted white pine and shortleaf pine mostly range from small to large sawtimber. Many ash are present as well and do not appear to be healthy with many already dead. The understory is dominated by pawpaw and spicebush as deer do not prefer to browse on these species. A light single-tree selection harvest is recommended for this area. The focus of the harvest should be to harvest the sawtimber ash that are still alive, the mature and over-mature yellow-poplar, mature white pine, and other pine that will release the naturally-regenerated hardwoods. Due to the main forest road traveling along the western boundary of this area, considerations should be taken for the visual enhancement area.

Oak-Hickory

This cover type is found on two topographically similar areas of this tract. The slopes were generally too steep to have been cleared for farming, but are gentle enough that they contain productive soils for growing excellent quality trees. The average sawtimber basal area for these areas is 93 sq. ft. per acre; however, some areas have a much higher stocking than this. The most dominant tree species are chestnut oak, white oak, black oak, and sugar maple. Pignut hickory, northern red oak, shagbark hickory, yellow-poplar, and scarlet oak are also common overstory species found in this area. Mortality is already occurring in some areas due to overstocking. Sugar maple and American beech dominate the understory. In this area, the damaged and defective trees should be harvested to release the residual trees. In some areas the stocking will not be sufficiently reduced by simply removing the damaged and defective trees, so in these areas, harvesting should focus on removing mature, overmature, and trees with co-dominant or intermediate crown positions.

Oak-Hickory / Chestnut Oak

This area is heavily dominated by chestnut oak in the overstory. Very few white oak, pignut hickory, and scarlet oak are present as well. The average sawtimber basal area is very high for this area at 119 sq. ft. per acre. While this area contains the steepest slopes in the tract, the slopes did not appear steep enough to limit harvesting any areas. Due to the high stocking, some mortality is present throughout this area. The understory is heavily dominated by red maple, sugar maple, beech, and sassafras. Many oak seedlings are present in the regeneration layer. This area needs a thinning harvest to release the healthier residual oak and hickory trees. Because of the prevalence of chestnut oak in the overstory, any healthy white oak, scarlet oak, and pignut hickory should be favored in order to maintain species diversity in the stand.

Old Field/Yellow-Poplar

This area is typical of many naturally-regenerated old field and pasture sites. The topography is somewhat gentle and dissected by small ephemeral and intermittent streams. Due to grazing and farming prior to state ownership, the soils are extremely eroded on the slopes. The average sawtimber basal area of this area is approximately 80 square feet per acre. The perimeter of this area contains short-boled, open-grown black, white, and chestnut oaks. The most common dominant trees in this area are yellow-poplar, blackgum, sweetgum, and sassafras. Eastern redcedar, white ash, black oak, chestnut oak, white oak, scarlet oak, and pignut hickory are also fairly common. Many of the younger trees in this area are good to excellent quality, while most of the larger trees are average to very poor quality. These larger trees were the first to re-appear in this old abandoned pasture/field and therefore likely suffered both grazing and fire damage. American beech heavily dominates the understory of this area. The large poor quality and damaged trees should be harvested in order to release the healthier and higher-quality residual trees. In some places, small group selection regeneration openings may be created if all of the trees need harvested.

Summary Tract Silvicultural Prescription and Proposed Activities

The cruise completed June 22, 2009 indicated this tract contains approximately 9,211 board feet per acre with 6,965 bd. ft. as growing stock and 2,246 bd. ft. as harvest stock. The estimated total harvest volume for the tract is 161,700 bd. ft. with chestnut oak, yellow-poplar, and black oak being the top three harvest species by volume. This harvest should be marked and sold in 2012-2013. The harvest should focus on harvesting mature and overmature white pine and yellow-poplar, damaged and defective trees, ash trees, and any other trees necessary to release healthier more desirable trees for both wildlife and timber. Following the harvest, post-harvest timber stand improvement should be conducted to deaden hollow cull trees competing with healthier more vigorous residual trees, to deaden grapevines, to complete any openings, and to release any residual trees not sufficiently released by the harvest. Approximately 20 years after completion of the harvest and TSI, this tract should be inventoried again for another potential timber harvest. Because species such as white oak and shagbark hickory are often favored during marking, the sale should have an over all favorable impact on the Indiana bat habitat. Additional space in the canopy from the harvest will provide better foraging habitat for the Indiana bat.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Mark harvest	2012
Sell timber	2013
Post-harvest TSI	2013-2014
Inventory and Management Guide	2033

Sources Cited

Center for Reptile and Amphibian Conservation and Management. 2006. http://herpcenter.ipfw.edu/index.htm?http://herpcenter.ipfw.edu/outreach/MWsnakes.htm&2. Accessed: December 9, 2008.

Sullivan, Janet. 1996. Taxidea taxus. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). **Available: http://www.fs.fed.us/database/feis/ [2008, April 18].**

RESOURCE MANAGEMENT GUIDE

INVENTORY SUMMARY

			Compartment:	2
Jackson-Washington State Forest			Tract:	17
Forester:	Spalding		Date:	6/22/09
ACREAGE IN:	Commercial Forest	72		
	Power Line ROW	(2)	Total BA/Acre	134
	TOTAL AREA	72	BA Trees 6" & Up	123
			BA Trees < 6"	11

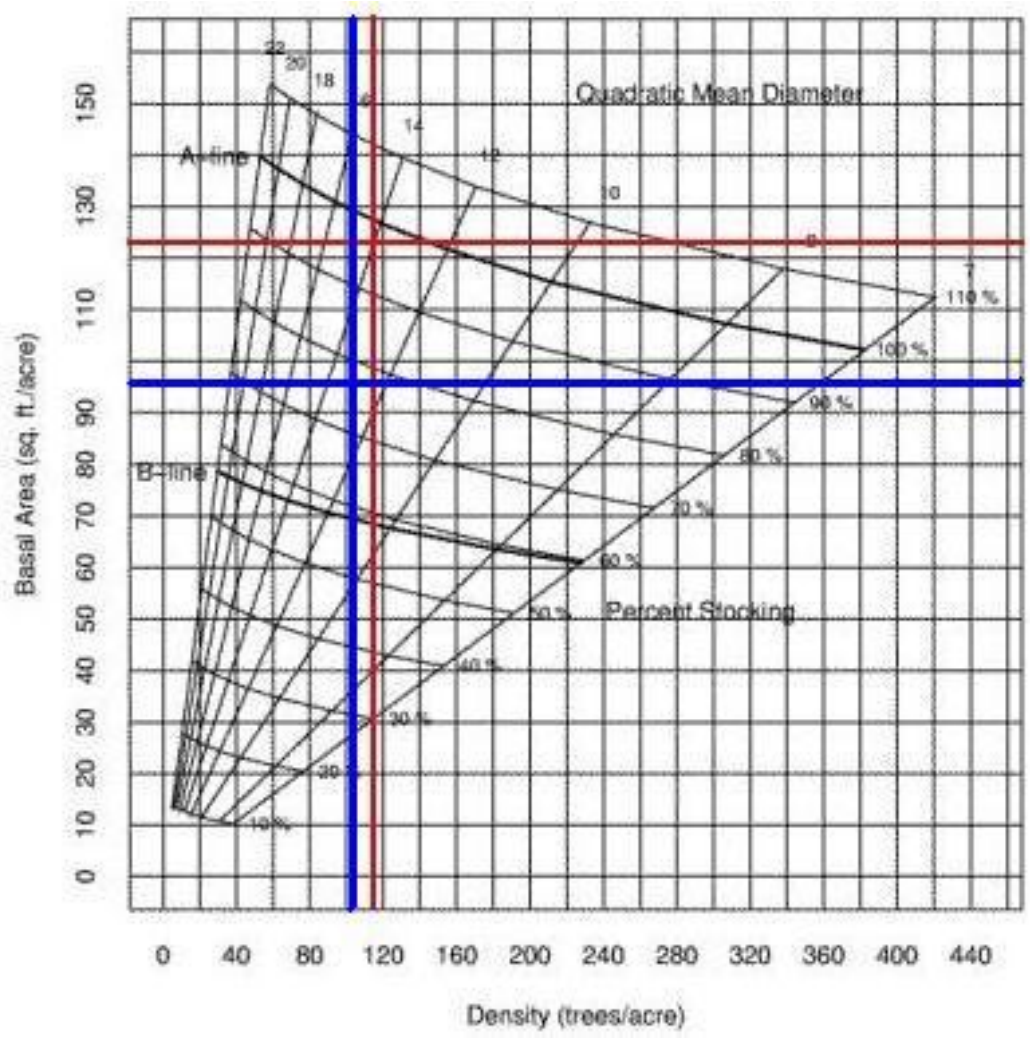
(Estimated Tract Volumes for Commercial Forest Area-Bd.Ft., Doyle Rule)

SPECIES	HARVEST STOCK	GROWING STOCK	TOTAL VOLUME
American beech	0	600	600
American sycamore	0	2,170	2,170
black cherry	1,260	10,140	11,400
blackgum	3,500	3,730	7,230
black oak	23,310	65,100	88,410
chestnut oak	35,830	98,850	134,680
eastern redcedar	1,230	1,150	2,380
eastern white pine	20,900	77,700	98,600
northern red oak	2,840	11,940	14,780
pignut hickory	2,840	20,990	23,830
red maple	1,270	600	1,870
scarlet oak	7,160	1,510	8,670
shagbark hickory	0	9,160	9,160
sugar maple	6,690	7,140	13,830
sweetgum	2,980	2,000	4,980
white ash	7,660	3,200	10,860
white oak	10,500	91,640	102,140
yellow-poplar	33,730	93,850	127,580
TRACT TOTALS	161,700	501,470	663,170
PER ACRE TOTALS	2,246	6,965	9,211

PREVIOUS CRUISE DATA

DATE:	March 1979	**GROWING STOCK**	**HARVEST STOCK**	**TOTAL VOLUME**
PER ACRE TOTALS (40 acres)		2,286	1,083	3,369
DATE:	September 1971	**GROWING STOCK**	**HARVEST STOCK**	**TOTAL VOLUME**
PER ACRE TOTALS (20 acres)		2,681	825	3,506
DATE:	October 25, 1984	**GROWING STOCK**	**HARVEST STOCK**	**TOTAL VOLUME**
PER ACRE TOTALS (20 acres)		2,756	537	3,293
DATE:	September 20, 1971	**GROWING STOCK**	**HARVEST STOCK**	**TOTAL VOLUME**
PER ACRE TOTALS (13 acres)		1,268	2,200	3,468
DATE:	November 14, 1984	**GROWING STOCK**	**HARVEST STOCK**	**TOTAL VOLUME**
PER ACRE TOTALS (13 acres)		3,600	780	4,380

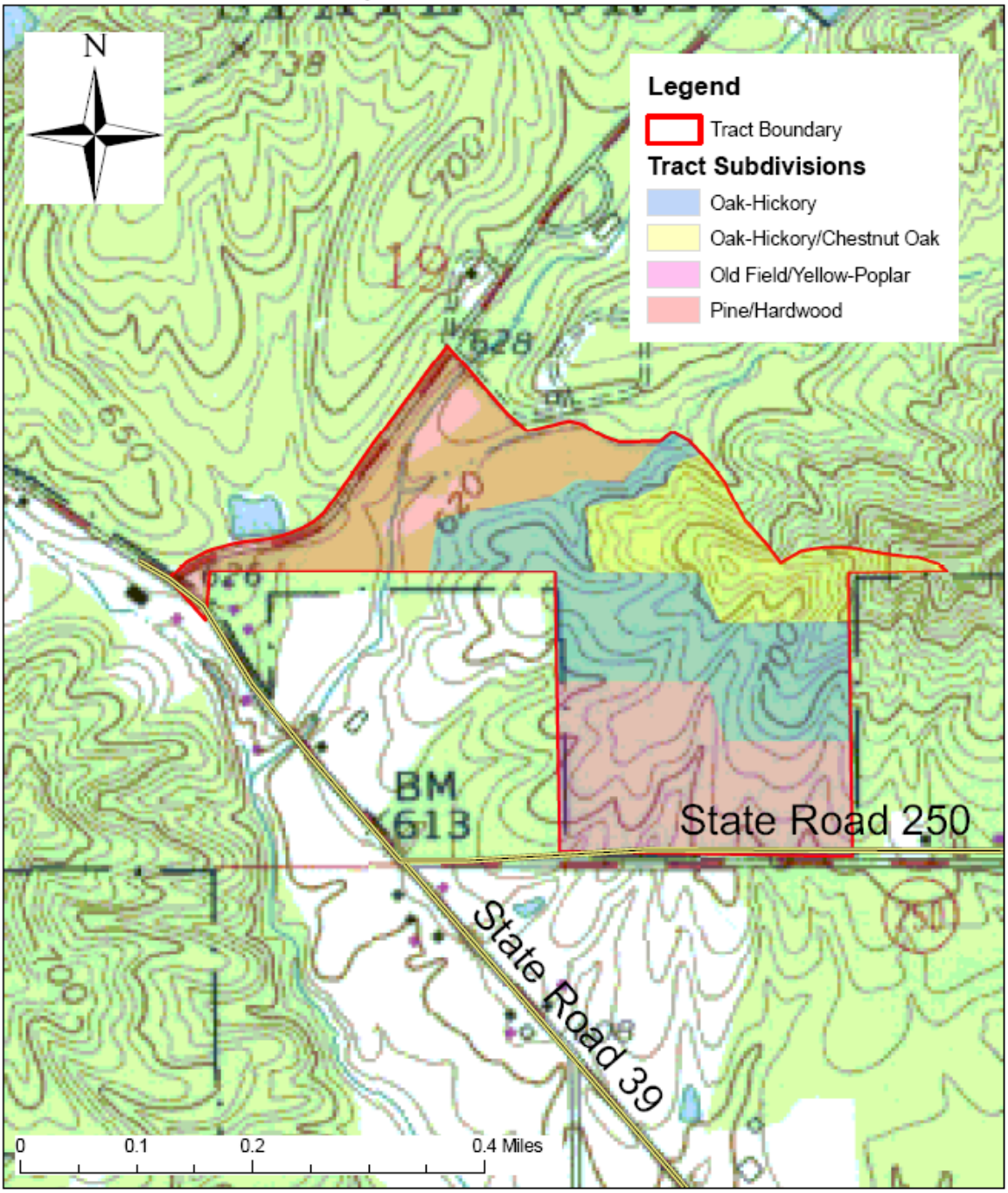
JWSF Resource Management Plan
Compartment 2 Tract 17 Stocking
July 2009 Inventory
72 acres



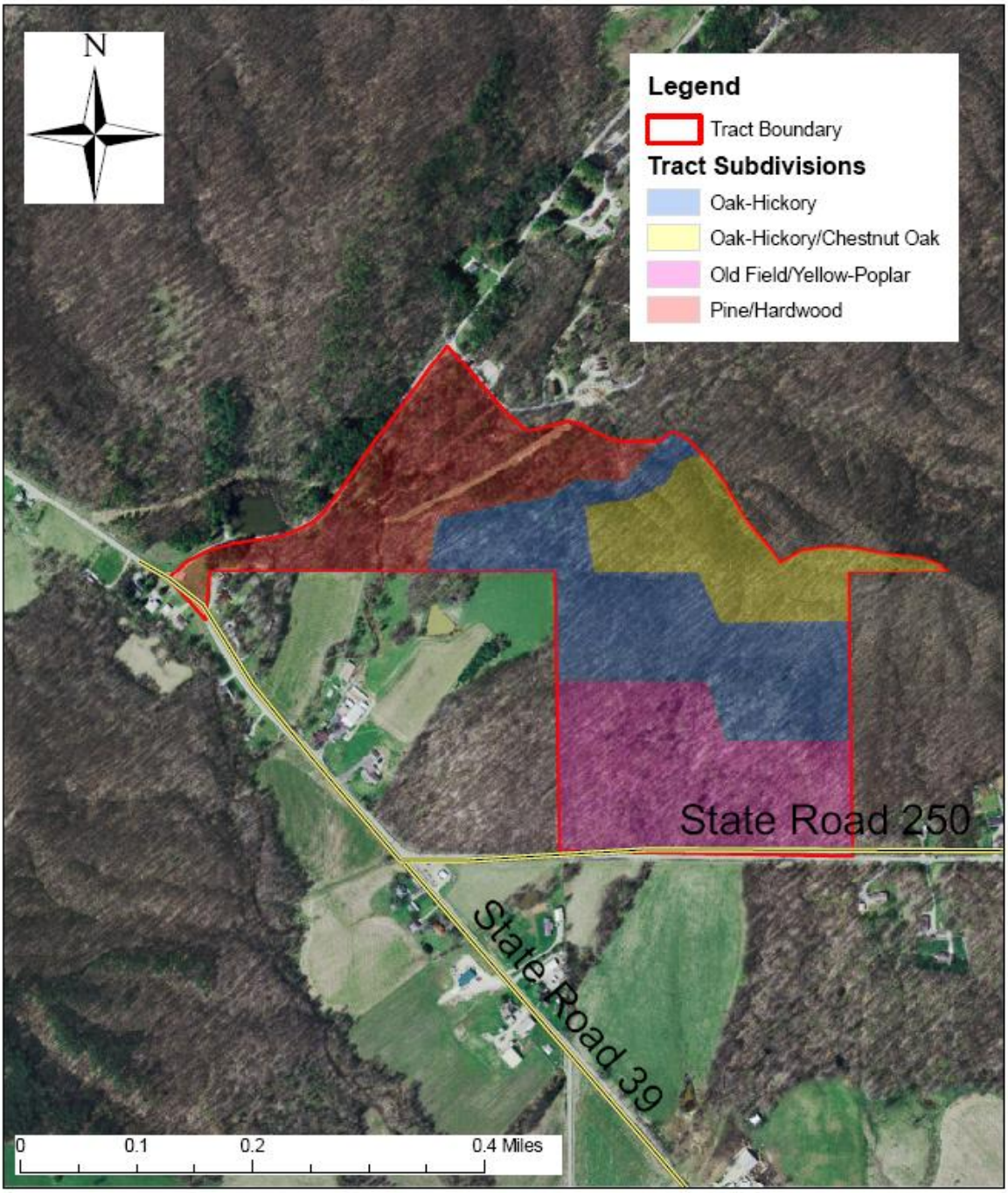
Estimated Pre-Harvest Data is in Red
Basal Area per Acre = 123 sq.ft./AC
Total #trees/acre = 118
Avg. tree diameter = 14” DBH
Percent stocking = 97%

Projected Post-Harvest Data is in Blue
Basal Area per Acre = 96 sq.ft./AC
Total #trees/acre = 103
Avg. tree diameter = 13” DBH
Percent stocking = 77%

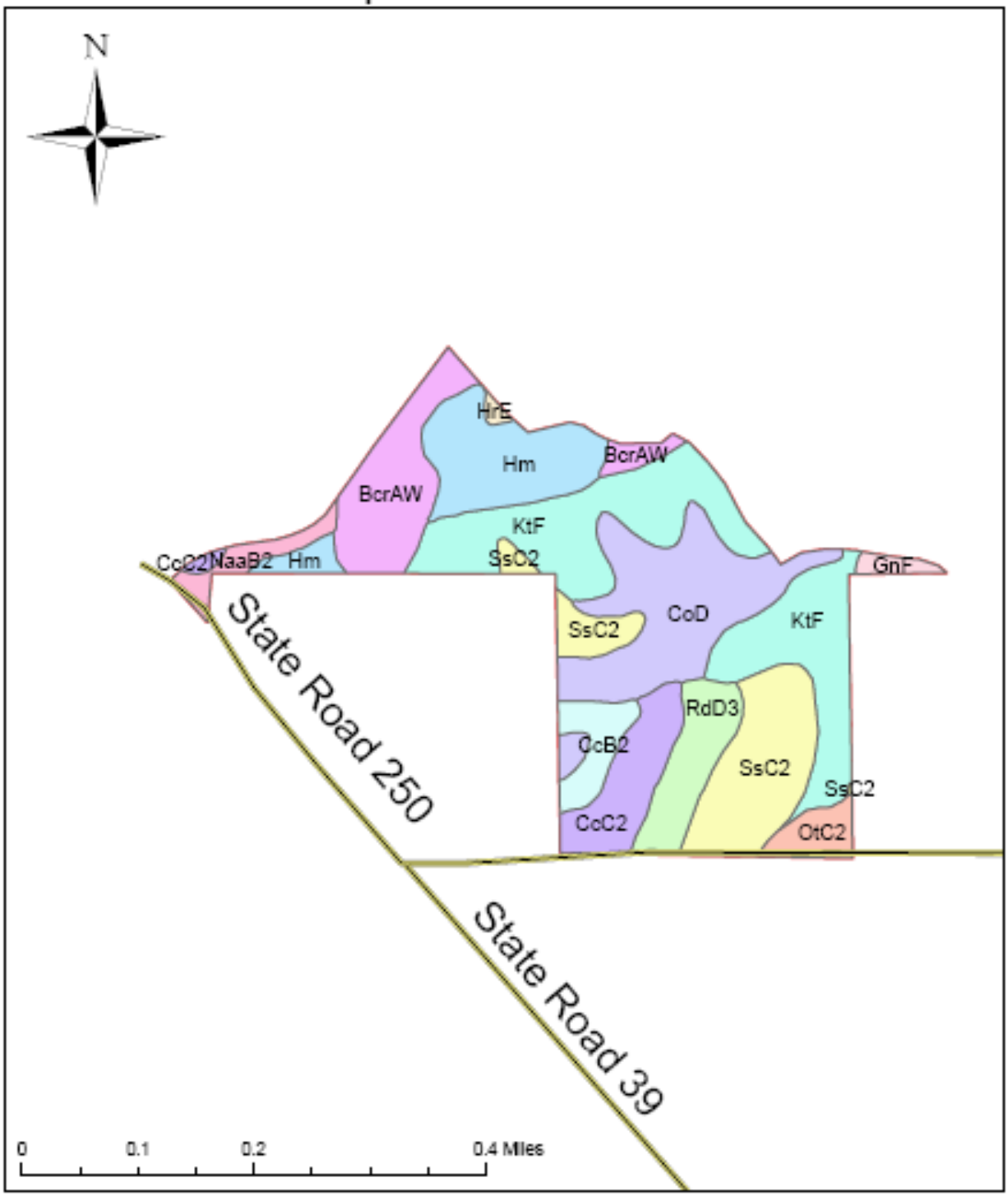
Tract Subdivisions
Jackson-Washington State Forest
Compartment 2 Tract 17



Tract Subdivisions
Jackson-Washington State Forest
Compartment 2 Tract 17



Soils Map
Jackson-Washington State Forest
Compartment 2 Tract 17



To submit a comment on this document, click on the following link:
http://www.in.gov/surveytool/public/survey.php?name=dnr_forestry

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.

Note: Some graphics may distort due to compression.