RESOURCE MANAGEMENT GUIDE

STATE FOREST: Harrison Crawford **COMPARTMENT**: 09 **TRACT**: 07

Date: August 5, 2009 **Forester: Wayne Werne, Christine Martin, Amanda Bradshaw**

(Inventory - June 2007)

INVENTORY SUMMARY

NUMBER OF STANDS: **2** **Est. growth: ?? bd. ft/ac/yr**
PERMANENT OPENINGS: **0.0 ac** **Est. cutting cycle: ?? yrs**
TOTAL ACREAGE: **109.1 ac** (no prev. inventory - no growth info)
AVERAGE SITE INDEX: **70-80** (for upland oaks)
AVERAGE BASAL AREA: **122 sq. ft/ac**

TRACT 907 TOTAL VOLUME (bd ft)

	CUT		LEAVE		TOTAL	
SPECIES	per acre	total	per acre	total	per acre	total
American beech	70	7,637	50	5,455	120	13,092
Bitternut hickory		-	30	3,273	30	3,273
Black oak	520	56,732	250	27,275	770	84,007
Black walnut		-	20	2,182	20	2,182
Chinkapin oak		-	60	6,546	60	6,546
Northern red oak	30	3,273	200	21,820	230	25,093
Pignut hickory	280	30,548	170	18,547	450	49,095
Post oak	60	6,546	80	8,728	140	15,274
Scarlet oak	60	6,546	20	2,182	80	8,728
Shagbark hickory		-	30	3,273	30	3,273
Sycamore		-	150	16,365	150	16,365
Sugar maple	30	3,273	30	3,273	60	6,546
White ash		-	20	2,182	20	2,182
White oak	880	96,008	2,570	280,387	3,450	376,395
Yellow-poplar	110	12,001	240	26,184	350	38,185
TTOTAL	2,040	222,564	3,920	427,672	5,960	650,236

STAND 1 – Oak hickory **ACREAGE: 82.8**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	2,500	4,580	7,080	
TOTAL VOLUME:	207,400	379,224	586,624	
BASAL AREA/ACRE:	49.7	79.2	128.9	
# TREES/ACRE:	64	442	506	

STAND 2 – Old field **ACREAGE: 26.3**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	600	1,800	2,400	
TOTAL VOLUME:	15,780	47,340	63,120	
BASAL AREA/ACRE:	31.3	67.2	98.5	
# TREES/ACRE:	69	535	604	

Note: Please reference the appendix for tables and graphs of various stand statistics

TRACT BOUNDARIES: This tract is part of an outlying block of state forest land lying north of the interstate highway. It is bordered on the west by private land (industrial park), as well as on the north by private land. The northern neighbor is currently Phil Etienne, and an attempt was made to purchase this property to get access to this block of state land. This process was held up by the commissioners of Crawford County who stand behind a nonbinding resolution passed several years ago that discourages the state from acquiring any additional land in that county. This private land is currently listed for sale.

The eastern boundary of this tract is a ridgeline that divides it from tract 906. The southern boundary is the interstate highway R.O.W. fence apparently, though older maps show a small sliver of private land between what was the state forest and what is now the interstate. It is assumed this land was bought as part of the right of way acquisition and subsequently transferred to the state forest. The tract line as it appears in the GIS layer is apparently somewhat off from the actual right of way fence for the interstate (actual line farther south).

There is an old woven wire fence on part of the western boundary with private land. There are also old fence fragments forming part of the north boundary line. Also, what is currently tract 907 was formerly part of a larger tract 905. The tract boundaries were re-delineated sometime in the 1990's.

ACCESS: Currently, access is being obtained by driving down the private road coming off of Shafer Ridge Road which goes into the Etienne property. This road is in excellent condition, but currently serves multiple parcels in that tract, because it was parcelized for sale as smaller tracts. There is apparently a road maintenance covenant in place for the future owners that requires shared maintenance costs for this road. Currently, Phil Etienne does not have a problem granting access to the state property from this property, but if this land does sell to other assorted private buyers in the future, the state will probably not be able to use that road. Currently, Phil Etienne is in the process of seeing if the current covenant can be amended to allow state access via the access road even after the land might sell. This problem was foreseen and was why the state was trying to acquire outright ownership of the Etienne property until the deal was stalled by the Crawford County officials.

This tract was also reconned/cruised in 2006 by Will Hirschfeld who noted that there was an old frontage road that extended beyond the Jasper Engines/industrial park access road to the west. This frontage road intersects the southwest corner of the tract, and could have well been established when the interstate came through and cut off certain property's former access. The legal status of this access and road is not clear, and apparently the road would require some fixing up to be used as an access road.

ACQUISITION HISTORY: The northern portions of this tract were acquired from Wilson and Alma Bye in 1954 and 1959 for an undisclosed sum of money (deeds 131.197 and 131.201). The property to the north of this that is now owned by Phil Etienne was also owned by Alma Bye up until a few years ago, so this was all part of one farm at one time. The southern portions of this tract were acquired primarily from Guy and Lula Slaughterback in 1939 (deed 131.81), but some was also part of a transfer by INDOT to DNR as they acquired I-64 right-of-way acreage, and the leftover acreage to the north of this was added onto the state forest ownership. As a side note, the Slaughterback deed calls for the grantors to reserve the right to tend and harvest the 1940 strawberry crop on that property.

TRACT DESCRIPTION: This tract was divided into two stands based on cover type and past management – oak hickory and old field. The old field also included a narrow band along the main drainage that might be more aptly described as mixed mesophytic, but this area was so narrow and blended into the actual old field sites so much, that it was included in old field stand type. Realistically, these low flat areas were undoubtedly cleared and farmed historically, with the exception of a narrow line of trees along the drainage, and have just grown back to a better stand than most of the other old field areas. The stands will be described in detail below.

Stand 1 – Oak hickory

This 83-acre stand was found on the entire west facing slope on the east side of the tract, as well as on the east facing slopes on the west side of the tract. It is the dominant stand type on this tract. There was a nice stand of white oak in the southwestern portion of the tract.

The total volume of the stand (7080 bd. ft/ac) is composed overwhelmingly of white oak (4440 bd. ft/ac), and also black oak (830 bd. ft/ac), and pignut hickory (510 bd. ft/ac). The remaining 20% of the volume consists of northern red oak, sycamore, post oak, yellow-poplar, and various other species.

Stand 2 – Old field

This 26-acre stand is found mostly along the lower slopes by the main drainage, and it also extends up the hills to the west and south. There is also a narrow band of this stand on the ridgetop along the eastern boundary of the tract, and a pocket of it farther down the slope to the south. The areas along the drainage have grown back to a more mixed mesophytic component, while the areas going up the slopes to the west have been colonized by cedar. Likely, the cedar areas suffer from old erosion and reduced site productivity.

The total volume of the stand (2400 bd. ft/ac) is composed primarily of yellow-poplar (840 bd. ft/ac), black oak (560 bd. ft/ac), and white oak (400 bd. ft/ac). The remaining 25% of the volume consists of pignut hickory, northern red oak, scarlet oak, and white ash. This old field area is coming back to an oak hickory stand type for the most part. There is also a lot of cedar growing in much of this area, but all of it was small enough not to show up on the volume tally, though it makes up a substantial part of the basal area and number of trees per acre. This stand was not cruised using the cedar scale (which gives volume to much smaller trees), like others subsequently were, and so the cedar does not appear as dominant as it truly is.

SOILS: The following soils are found on the tract in approximate order of importance.

TblG Tipsaw-Adyeville complex, 25-75% slopes Upland oak SI is 70-80, Yellow-poplar SI is 70-80, est. growth is 185-260 bd. ft/ac/yr. for both oaks and yellow-poplar.

WhfD3 Wellston silt loam, 12-18% slopes, severely eroded Upland oak SI is 70-80, Yellow-poplar SI is 90-100, est. growth is 185-260 bd. ft/ac/yr. for oaks and 335-415 bd. ft/ac/yr. for yellow-poplar.

GacAW Gatchel loam, 1-3% slopes Yellow-poplar SI is 95-105, est. growth is 375-450 bd. ft/ac/yr.

WhfD2 Wellston silt loam, 12-18% slopes, eroded Upland oak SI is 70-80, Yellow-poplar SI is 90-100, est. growth is 185-260 bd. ft/ac/yr. for oaks and 335-415 bd. ft/ac/yr. for yellow-poplar.

CqYG Corydon stony silt loam, 20-60% slopes Upland oak SI is 65-75, Yellow-poplar SI is 80-90, est. growth is 155-220 bd. ft/ac/yr. for oaks and 260-335 bd. ft/ac/yr. for yellow-poplar.

AgrC3 Apalona silt loam, 6-12% slopes, severely eroded Upland oak SI is 70-80, Yellow-poplar SI is 85-95, est. growth is 185-260 bd. ft/ac/yr. for oaks and 300-375 bd. ft/ac/yr. for yellow-poplar.

RECREATION: Due to limited access, and its location directly north of the interstate, this tract probably receives limited recreational use by the public. There are no trails or facilities here. Likely it receives some hunting use by neighbors, but the noise of the interstate nearby would also limit its utility for that as well.

WILDLIFE: This tract represents typical upland forest habitat, in addition to a small component of old field with cedar and smaller hardwoods. Consequently, it likely receives use from a typical assemblage of common game and nongame wildlife species such as white-tailed deer, wild turkey, squirrels, songbirds, snakes, box turtles, and others. Hard mast food sources are provided by the oak hickory stand, but another habitat component would come from the scattered cedar trees. These areas provide cover and bedding areas, especially during the winter months.

Snags were tallied in this inventory for potential uses by wildlife. The following tables summarize guidelines and actual data with regard to the new strategy for consideration of the Indiana bat. The categories of optimal and maintenance guideline numbers were broken down by size class subcategory, but are inclusive of size classes above that. In other words, the maintenance guideline for number of snags in the 6" class and larger was 4 per acre, but of that number 0.5 per acre should be 20"+ and 3 should be 10'-18" or

greater. This was done because larger trees are more valuable and less common, and were given the greater importance when calculating total guideline numbers.

Guidelines for preferred density of live and dead trees for use by Indiana bat:

# of live trees per acre	**Guidelines** maintenance	**Tract 907 actual present – harvest = residual**
12"-18" DBH class	**6**	**47.6 - 20.3 = 27.3**
20" DBH and greater	**3**	**8.9 - 3.3 = 5.6**
Total	**9**	**56.5 - 23.6 = 32.9**

# snags per acre	**Guidelines maintenance**	**Guidelines optimal**	**Tract 907 actual**
6" - 8" DBH class	**1**	**1**	**12.9**
10"-18" DBH class	**2.5**	**5**	**2.9**
20" DBH and greater	**0.5**	**1**	**0.5**
Total	**4**	**7**	**16.3**

These numbers show that both live tree densities as well as snag densities meet maintenance guidelines on this tract. The result for large snags is consistent with several other recently completed inventories on other tracts of the forest, where large snag densities are below one per acre, though the density here is definitely higher than on other tracts where densities seem to hover at about 0.3 per acre. The vast majority of snags are in the smaller size classes, which makes them unsuitable for most nesting or roosting purposes, but some feeding use might be gained from them.

Management activities will not intentionally remove snags, with a few exceptions of large recently dead trees or storm damage when possible, so the timber sale will not negatively impact that component significantly. Creation of more snags in this size class could be undertaken by girdling large cull trees in a post-harvest TSI operation.

Additionally, management activities involving a timber sale should not affect this habitat long-term from the perspective of any wildlife utilizing it due to the maintenance of a forested habitat on the tract. Creation of openings will create early successional forest habitat that will be beneficial to certain groups of wildlife dependent upon this habitat. Likely, early successional habitat created with such management will also benefit a wider segment of wildlife species that preferentially utilize such habitat for feeding and cover more so than later successional stage habitat.

This tract is bordered on the south by Interstate 64, which itself represents a barrier to free travel by wildlife in a north-south direction. There should be no disruption of any potential wildlife travel corridors by forest management activities. This is due to fact that this portion of the landscape is 50-75% forested, and management in this area will not

eliminate or isolate this habitat. The habitat on this tract in the context of the surrounding landscape does represent a component that would be used more preferentially by wildlife for traveling or dispersion in an east-west direction. But, again, it is not an isolated fragment of forest that would be unduly impacted with management activities.

Since this tract is part of an outlying piece of state forest acreage not connected to the main body of the forest, it is less likely that forest management activities might disrupt any forest interior species by creating edge habitat for generalist species to "invade" the area. This would possibly occur if regeneration openings were put in place that offered a habitat preferred by such generalist species which might move in and start using such habitat. In the context of the surrounding landscape, this tract represents a moderate chunk of forest in a matrix of surrounding forest and agricultural land.

WATERSHED / HYDROLOGY: The majority of the tract contains gentle to moderately steep slopes that drain into Jordan Creek which generally runs north-south through the middle of this tract. This portion of Jordan Creek is near the upstream reaches, but qualifies as an intermittent that is usually dry, and has a wide well defined channel bottom. Shortly after Jordan Creek leaves this tract, it flows under I-64 and drains into Dry Run Creek. Dry Run eventually drains into Blue River near its confluence with the Ohio River.

This area is starting to get more distant from the karst landscape with underground drainage that is more common toward the east and south. There were no caves or open sinkholes noted in this tract, but there are stories that the back reaches of Eric's River Cave (south of I-64) once had another opening near where Jasper Engines is located on the north side of the interstate, which would put it close to or in this tract. The story states that at one time, this opening allowed for a flush of leaves and other debris to be deposited throughout the cave. This opening has since reclosed.

HISTORICAL AND CULTURAL: Cultural resources may be present on the tract but their location is protected. Adverse impacts to significant cultural resources will be avoided during any management or construction projects.

RARE, THREATENED, OR ENDANGERED SPECIES: The natural heritage database check shows no recorded occurrences for any RTE species on tract 907, 906, 905, or any other nearby tracts as of 2009.

EXOTICS: At the time of the inventory, there were no notations made as to presence of exotic species. There is probably some multiflora rose in the southern portion, and possibly some other species that have come up in the old field portion. As always, ailanthus should always be monitored in case it is invading or spreading into the area. If this area is marked for a sale, an effort will be made to paint any ailanthus with a bright color for followup management.

SILVICULTURAL HISTORY AND PRESCRIPTION:

General: There were no records of previous inventories done in this tract in the files. Because of this, and since no increment cores were taken, it is not known what the overall growth rate is on this tract. The potential productivity on this tract is probably in the range of moderate based on the current cover type and soils association. The Jordan Creek bottom soils are listed as high productivity, while the old eroded hillside farm fields undoubtedly have very low productivity.

Number of trees per acre and basal area per acre figures indicate that all stands are overstocked at between 108% to 130%. Removal of trees tallied as "cut" either via a timber sale or TSI would reduce the stocking levels to about 75-85% stocking. Stocking levels would be reduced to a level considered fully stocked above the B-line.

The only record of sale activity for this tract is the northeastern portion for which the deed transfer in 1954 called for reservation of the rights to cut treetops for firewood from a recent logging operation by the previous owners. Due to the amount of volume being carried on the merchantable majority of the tract (7080 bd. ft/ac), the fact that no managed sale has taken place in the 50+ years the state has owned this tract (according to any records in the files), and the general condition of the overstory trees in the majority of the tract, the initial impression was that a light to medium level harvest could be undertaken in this tract at any time. This would produce a sale volume of about 220,000 board feet or about 2000 board feet per acre and leave about 425,000 board feet, or about 3900 board feet per acre (across the entire tract acreage).

It is recommended that Timber Stand Improvement (TSI) be undertaken in this tract after the harvest to accomplish a variety of tasks, including completion of any marked openings. TSI of pole-size trees may be required for thinning in places, and to open up the understory for potential oak regeneration to take hold or be released. Vines did not seem to be a big problem in this tract, but need to be kept at bay with TSI activities as well. Extensive understory treatment of shade tolerant species will be necessary to encourage oak regeneration where present. Ailanthus needs to be monitored and eliminated when found to be present or establishing itself.

Stand 1: Oak hickory

This 83-acre stand contains a volume of 7080 board feet per acre of which 2500 was classified as harvestable and 4580 was classified as residual. This would remove 50 square feet of basal area, which would leave the residual stand with 79 sq. ft. Stocking would drop from 130% to about 85% with the indicated management (fully stocked above the B-line).

Since there is no record of harvest in this tract since the state has owned it (50+ years), and because it currently contains a moderate volume of harvestable material and a high volume of residual growing stock, the recommendation would be to rank this stand as a

medium to high priority for conducting a harvest. Any timber sale would primarily include this entire stand as well as parts of stand 2, and possibly being combined with neighboring tract 906. The majority (72%) of the harvest volume for stand 1 (2400 bd. ft/ac) would be contained in white oak (1170 bd. ft/ac) and black oak (620 bd. ft/ac). The remainder would be contained in pignut hickory, scarlet oak, yellow-poplar, and various other species.

Most of the stand would probably be harvested under a single tree selection routine with larger regeneration openings targeting groups of low-grade trees or multiple large trees growing together. When possible, selection should also favor releasing future crop trees. The residual stand should be much heavier to white oak – the primary residual tree species, with a lesser component of other oak species, as well as mesophytic species.

Post harvest TSI should be performed to eliminate any residual cull or small pole-sized trees not cut during the harvest, as well as thin where necessary, complete any regeneration openings, and kill grapevines where present. As always, any ailanthus present should also be treated and eliminated.

Stand 2: Old field

This 26-acre stand is located primarily along the east-facing slopes and creek bottom. It contains a volume of 2400 board feet per acre of which 600 was classified as harvestable and 1800 was classified as residual. This would remove 31 square feet of basal area, which would leave the residual stand with 67 sq. ft. Stocking would drop from 108% to about 76% with the indicated management (fully stocked above the B-line).

Since this stand intermingles with the more merchantable oak hickory stand, there would likely be some trees included from here along with any timber sale taking place in stand 1. All of the harvest volume tallied in this stand (600 bd. ft/ac) was represented by pignut hickory, black oak, and yellow-poplar. Much of the composition of this area was made up of small cedars, many of which should be removed to release the oak regeneration present. Since these are relatively small areas on the hillsides and along the creek, they likely will be left alone to maintain some habitat diversity, with the exception of some hardwood trees along the edges that might be included in any hardwood sale.

TSI could be performed to eliminate any residual cull or small pole-sized trees not cut during the harvest, as well as thin where necessary, and treat the cedar and understory to eliminate shade tolerant species in favor of oaks and other more desirable species. As always, any ailanthus present should also be treated and eliminated.

PROPOSED ACTIVITIES LISTING

Summer 2007	Field inventory
Summer 2009	Write mgmt plan

Fall 2009 - 2010	Mark timber sale
Winter 2009 or Winter 2010	Sell timber sale
2010 / 2011	Post harvest TSI
2015	Recon & monitor for exotics
2020-2025	Inventory for next mgmt cycle

APPENDIX

(Various tables and graphs describing tract 907)

A SUMMARY OF VARIOUS STATISTICS FOR TRACT 907

Summary of basal area (sq ft per acre)

STAND	LEAVE	CUT	(SNAG)	TOTAL (live)
Oak hickory	79.2	49.7	??	128.9
Old field	67.2	31.3	??	98.5

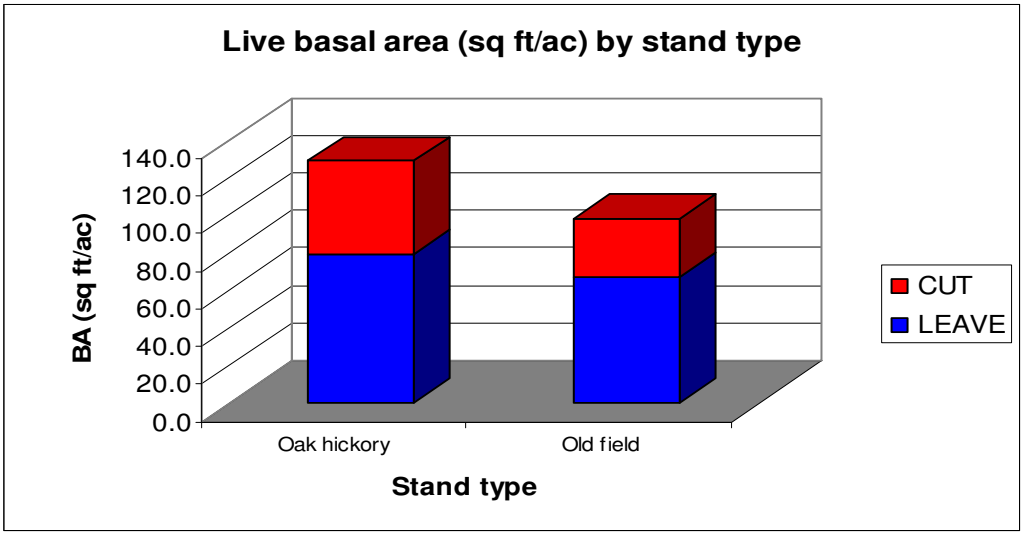
Summary of volume (bd ft per acre)

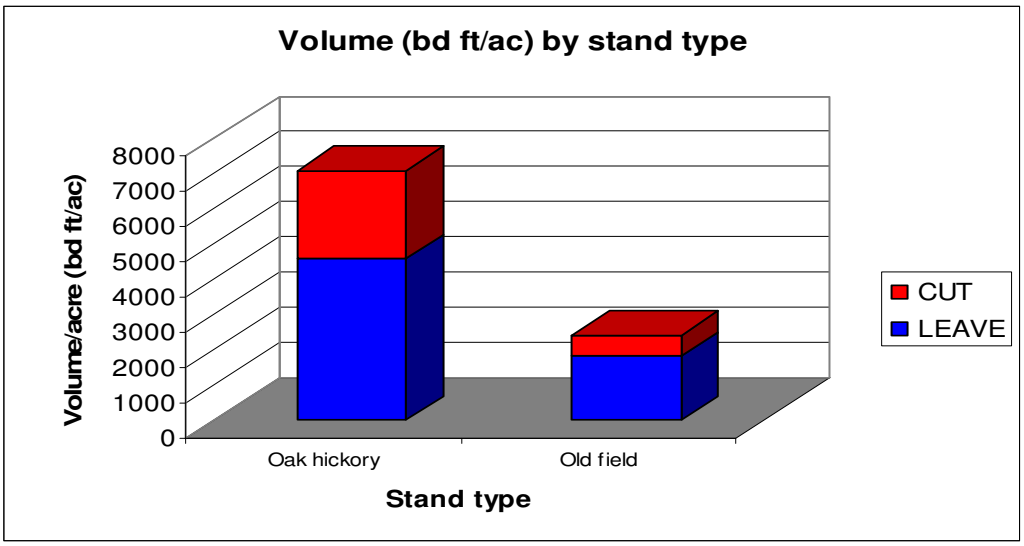
STAND	LEAVE	CUT	TOTAL (live)
Oak hickory	4580	2500	7080
Old field	1800	600	2400

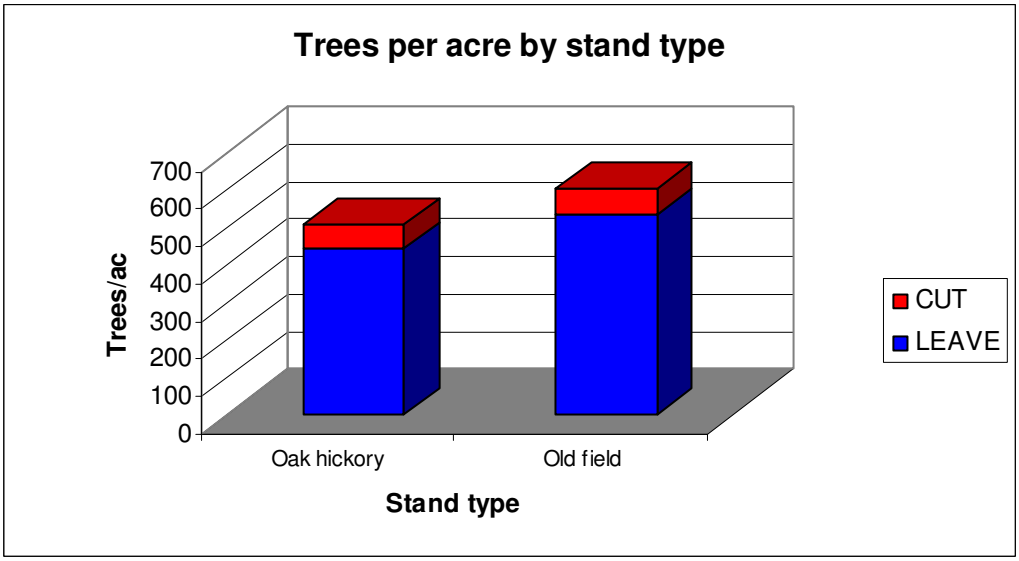
Summary of number of trees per acre

STAND	LEAVE	CUT	(SNAG)*	TOTAL (live)
Oak hickory	442	64	?	506
Old field	535	69	?	604

*snags/acre >= 9" DBH = 3.4/acre across entire tract







A SUMMARY OF VOLUME PER ACRE (bd ft/ac) BY SPECIES FOR TRACT 907

Stand 1: Oak hickory

Volume (bd ft/ac)

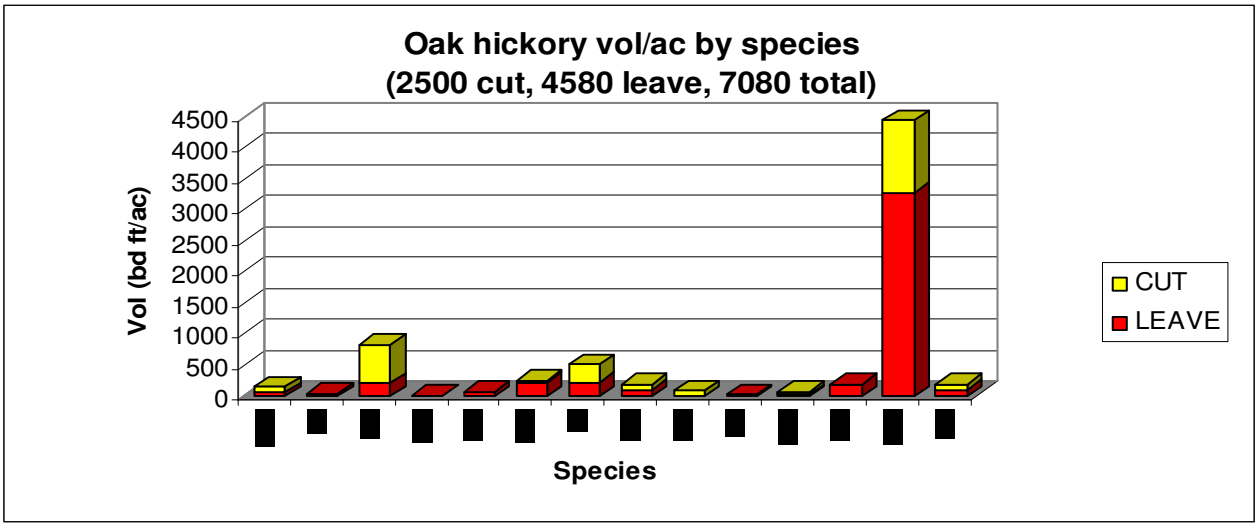
Species	CUT	LEAVE	TOTAL
AMB	90	60	150
BIH		40	40
BLO	620	210	830
BLW		20	20
ZCO		70	70
NRO	30	220	250

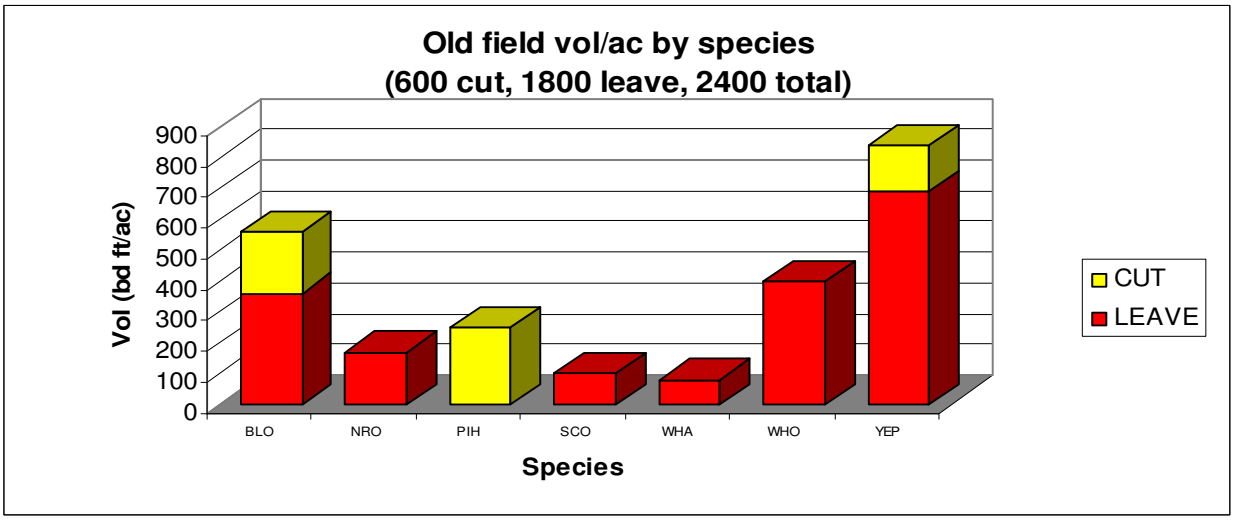
PIH	290	220	510
POO	80	110	190
SCO	90		90
SHH		30	30
SUM	40	30	70
SYC		200	200
WHO	1170	3270	4440
YEP	90	100	190
TOTAL	2500	4580	7080

Stand 2: Old field

Volume (bd ft/ac)

Species	CUT	LEAVE	TOTAL
BLO	200	360	560
NRO		170	170
PIH	250		250
SCO		100	100
WHA		80	80
WHO		400	400
YEP	150	690	840
TOTAL	600	1800	2400





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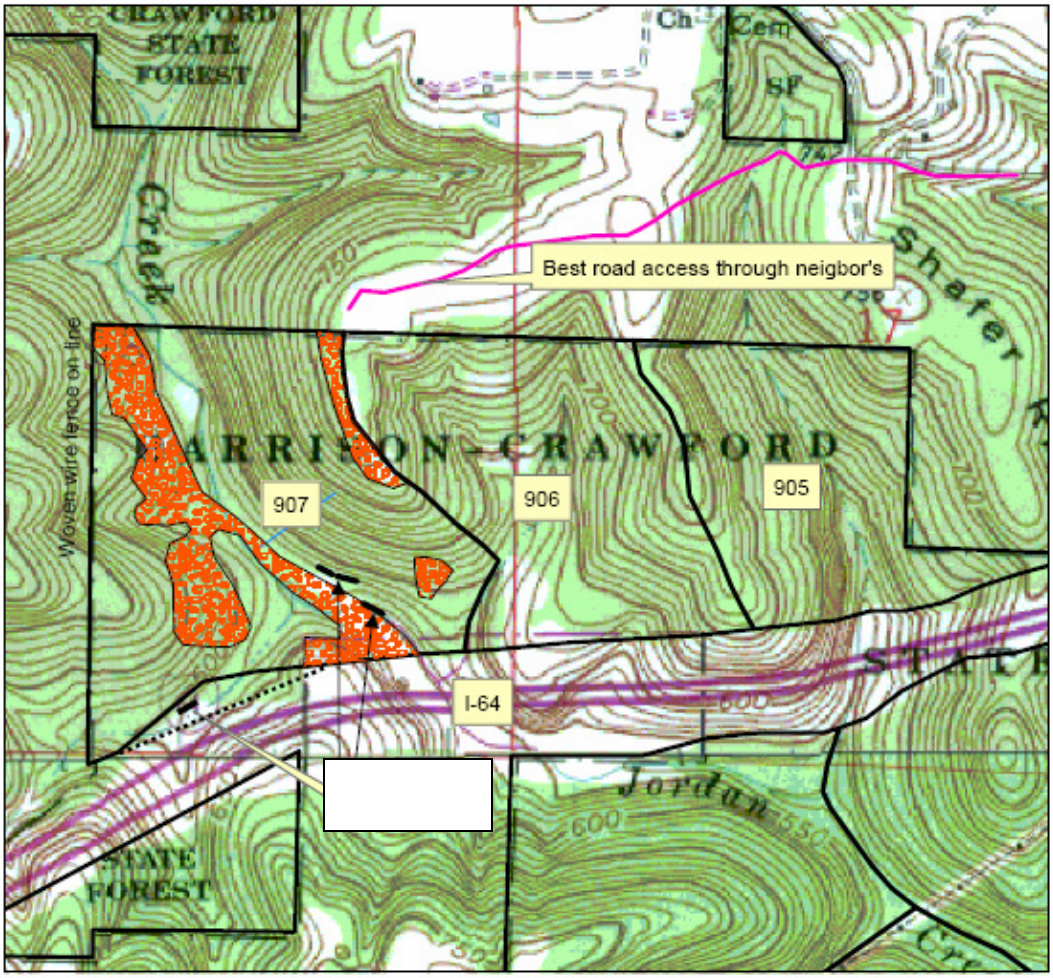
Tract 907



Legend

Tract boundaries

Oak hickory stand type - 83 acres

Old field stand type - 26 acres