Indiana Department of Natural Resources - Division of Forestry

RESOURCE MANAGEMENT GUIDE

STATE FOREST: Harrison Crawford **COMPARTMENT**: 31 **TRACT**: 04

Date: February 28, 2011 **Forester: Wayne Werne**
(Inventory - November, 2009)

INVENTORY SUMMARY

NUMBER OF STANDS: **3** **Est. growth: 170-180 bd. ft/ac/yr****
PERMANENT OPENINGS: **0.0 ac** **Est. cutting cycle: 14-15 yrs**
TOTAL ACREAGE: **157.3 ac*** *(GIS layer shows 160.6 ac, but survey discrepancy at south gives 3.3 ac less, so modified acreage was used)*
AVERAGE SITE INDEX: **70-80** (for upland oaks)
AVERAGE BASAL AREA: **114 sq. ft/ac**

****Growth** was calculated by using 2009 volume **MINUS cedar**, subtracting an approx. volume of 700-900 bd ft/ac from the 1972 inventory and dividing by 37 years of growth. Cedar volume was figured using a different cedar log scale (much more volume from small trees), which was not used in 1972.

TRACT 3104 TOTAL VOLUME (bd ft)

	CUT		LEAVE		TOTAL	
SPECIES	per acre	total	per acre	total	per acre	total
American beech		-	10	1,573	10	1,573
Bitternut hickory		-	53	8,337	53	8,337
Blackgum		-	20	3,146	20	3,146
Black oak	295	46,404	151	23,752	446	70,156
Black walnut	15	2,360	28	4,404	43	6,764
Chinkapin oak	72	11,326	146	22,966	218	34,291
*Eastern redcedar**	*43*	*6,764*		-	*43*	*6,764*
Mockernut hickory	9	1,416		-	9	1,416
Northern red oak	176	27,685	291	45,774	467	73,459
Persimmon	23	3,618		-	23	3,618
Pignut hickory	189	29,730	334	52,538	523	82,268
Red elm		-	16	2,517	16	2,517
Sassafras	57	8,966		-	57	8,966
Shagbark hickory	24	3,775	218	34,291	242	38,067
Shortleaf pine	38	5,977	79	12,427	117	18,404
Sugar maple	152	23,910	201	31,617	353	55,527
Sycamore	41	6,449	45	7,079	86	13,528
White ash	396	62,291	205	32,247	601	94,537
White oak	402	63,235	1056	166,109	1,458	229,343
Yellow-poplar	743	116,874	1,037	163,120	1,780	279,994
TTOTAL	2,675	420,778	3,890	611,897	6,565	1,032,675

**Cedar volume was calculated using a special cedar scale that counts volume in trees 6" DBH and larger, which results in high volumes for stands of small trees.*

STAND 1 – Oak hickory **ACREAGE: 72.0**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	2,542	3,740	6,282	
TOTAL VOLUME:	183,000	269,300	452,300	
BASAL AREA/ACRE:	49.3	60.4	109.7	
# TREES/ACRE:	70	146	216	

STAND 2 – Mixed mesophytic **ACREAGE: 54.2**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	3,229	4,601	7,830	
TOTAL VOLUME:	175,000	249,400	424,400	
BASAL AREA/ACRE:	60.9	61.3	122.2	
# TREES/ACRE:	110	288	298	

STAND 3 – Old field - advanced **ACREAGE: 31.1**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	1,122	1,785	2,907	
TOTAL VOLUME:	34,900	55,500	90,400	
BASAL AREA/ACRE:	45.0	64.5	109.5	
# TREES/ACRE:	38	65	103	

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

TRACT BOUNDARIES: This tract is in the main chunk of the state forest, and is surrounded by other state forest tracts with the exception of the southern edge, which has a small portion that borders private property. The eastern boundary is formed by an intermittent drainage that divides it from tracts 3102 and 3105 to the east. There is also a fire trail / horse trail (Voyle's Pass) that parallels this drainage on the other side in those tracts. The southern boundary is formed by another intermittent drainage that divides it from tract 3107. The southwestern boundary is an indistinct line running down a ridge which divides it from tract 3108 to the west, which is also part of the Deam Bluffs Nature Preserve. The northwestern boundary is formed by the break of the hill where it flattens out to a plateau that is part of tract 3103. This line is the edge of what was formerly a flat hilltop agricultural field that is now succeeding back naturally. There is an intermittent drainage that forms the northern boundary between this tract and tract 3101. There is a little bit of private property bordering this tract on the southern tip, for which a private survey established the line, but this line is noticeably farther north than what the GIS layer shows it to be. It is not known which southern boundary line is the correct one currently.

ACCESS: Generally, this tract is accessed via fire trail 308 coming off of Cold Friday Road past Cold Friday cemetery. This trail eventually diverges into a network of trails farther back. The trail that diverges and goes past Greenbrier cemetery which eventually becomes Voyle's Pass (an old county road) continues past the cemetery and that trail intersection and provides marginal access to the northern portion of this tract. Although this trail continues on up the hill through the northern portion of 3104 into the flat portion of tract 3103, there is a spur road that has been constructed sideslope through the middle of tract 3104 before the main trail goes up the hill. This trail gives access to the majority of the tract, but is very limited for use due to numerous seeps and drainages, and no gravel present. It was used as a skid trail for the 2009 salvage sale, but it became almost impassible with a skidder due to its inherent wetness. The original trail that goes up the hill into tract 3103 eventually loops back around and goes down the hill through the western portion of this tract and connects to the other end of the sideslope trail. The portion that goes downhill also is very limited due to wetness, roughness, and steepness.

ACQUISITION HISTORY: The land that makes up this tract encompasses at least 6 separate acquisitions from different landowners. These include the following: Jerry and Beulah Binkley – 1936 (deed #131.44), William and Ruth Paris – 1938 (deed #131.53), John and Fern Deschamps – 1940 (deed #131.97), Marshall Pate – 1939 (deed #131.51), Brittie and Robert Mowrer – 1936 (deed #131.33), and James Brewster – 1934 (deed #131.37). There were only three purchase prices given for all of these, and these were all in the range of $5 per acre.

TRACT DESCRIPTION: This tract was divided into three stands based on cover type and past management. These stands include: oak hickory, mixed mesophytic, and old field – advanced. These different stands gradated into each other in places where it was hard to tell which type was the more appropriate qualifier. Obviously, some of this area was previously used for farming, and has succeeded back to various forms of hardwood and cedar, which sometimes is distinctly different and sometimes blends in with the surrounding natural hardwoods. These stands will be described in detail below.

Stand 1 - Oak hickory

This 72-acre stand was the majority of the coverage, and occupied the more sloping ground across all portions of the tract that had not been cleared for farming. Mostly, this consisted of the east and south facing slopes.

The total volume of the stand (6282 bd. ft/ac) is composed primarily of white oak (2816 bd. ft/ac), pignut hickory (938 bd. ft/ac), black oak (725 bd. ft/ac), and northern red oak (561 bd. ft/ac). The remaining 20% of the volume consists of white ash, shagbark hickory, sugar maple, and various other species. It should be noted that the volume of

cedar is figured using a cedar log scale that results in a higher than Doyle volume, and includes trees down to 6" DBH as sawtimber volume.

Stand 2 – Mixed mesophytic

This 54-acre stand also occupied the more sloping ground that had not been cleared for farming. Mostly this was the lower half of the east facing slope in the north 2/3 of the tract with a few pockets in some of the southern coves. Some of this area, however, had been cleared for farming at some point in the past and has succeeded back to a stand of yellow-poplar.

Over half the total volume of the stand (7830 bd. ft/ac) is composed of yellow-poplar (4069 bd. ft/ac). White ash (841 bd. ft/ac), sugar maple (674 bd. ft/ac), and northern red oak (398 bd. ft/ac) make up an additional 28%. The remaining 20% of the volume consists of chinkapin oak, white oak, black oak, and various other species. It should be noted that the volume of cedar is figured using a cedar log scale that results in a higher than Doyle volume, and includes trees down to 6" DBH as sawtimber volume.

Stand 3 - Old field – advanced

This 31-acre stand is found primarily on the upper slopes of the tract and along the drainage in the north, and represents former agricultural fields that have succeeded back to a stand of mostly hardwoods with some eastern redcedar and planted pine mixed in. This stand did represent quite a hodgepodge, with some being primarily a sassafras thicket, some having a better stand of poplar, some having a high number of sugar maple saplings, while some had a distinct cedar component. A 5 acre portion in the northwest corner of the tract had been planted to a southern yellow pine species at some point in the past – assumed to be shortleaf pine. It was deemed too small to further delineate out as a separate stand.

The total stand volume (2907 bd. ft/acre) is composed primarily of southern yellow pine (shortleaf?) (1059 bd. ft/acre), white ash (366 bd. ft/ac), and northern red oak (322 bd. ft/acre). The remaining 40% of the volume consists of hickory, yellow-poplar, and various other species. It should be noted that the volume of cedar is figured using a cedar log scale that results in a higher than Doyle volume, and includes trees down to 6" DBH as sawtimber volume.

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

CoF 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.

HgD3 Hagerstown silty clay loam, 12-18% slopes, severely eroded Upland oak SI is 85-95, Yellow-poplar SI is 90-105, est. growth is 300-375 bd. ft/ac/yr. for oaks and 335-450 bd./ ft/ac/yr. for yellow-poplar.

WeD2 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.

ZaC3 Zanesville 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.

ZaD2 Zanesville silt loam, 12-18 % slopes, 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.

GpF Gilpin-Berks complex, 18-30% slopes Upland oak SI is 70-80, Yellow-poplar SI is 70-80, est. growth is 185-260 bd. ft/ac/yr. for oaks and for yellow-poplar.

GlD2 Gilpin silt loam, 12-12% 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.

HaE2 Hagerstown silt loam, 18-25% slopes, eroded Upland oak SI is 85-95, Yellow-poplar SI is 95-105, est. growth is 300-375 bd. ft/ac/yr. for oaks and 375-450 bd. ft/ac/yr. for yellow-poplar.

RECREATION: This tract, in conjunction with the area surrounding it, forms the largest contiguous portion of state owned land that makes up the forest, and as such, it probably receives a high level of recreational use. The fire trails that run along the north and east boundaries of this tract are a direct access to a large part of the property from Cold Friday Road. These also serves as a horse trails. The trail that forms the western boundary of the tract is also a fire/horse trail, and would receive ample use as well. The other trails that cut through this tract also receive horse rider and hiking traffic as well.

Additionally, the adventure hiking trail skirts through the southern portion of this tract, and would consequently receive backpacking and other hiking use. It is likely that a fair

amount of hunting use is also received by this tract as well due to the large numbers of trails accessing it. And the presence of Ted's Dig – a major recreational wild cave – also ensures that this tract is used recreationally by cavers as well.

WILDLIFE: This tract represents typical upland forest habitat, in addition to a component of old field successional habitat, with cedar, planted pine, 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 advanced old field stand. This stand provides denser cover for bedding areas, especially during the winter months. The pine and cedar especially might provide cover from snow or ice, as well as roosting areas for turkeys and other birds.

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 3104 actual present – harvest = residual
12"-18" DBH class	6	40.2 – 17.2 = 23.0
20" DBH and greater	3	13.2 - 6.4 = 6.8
Total	9	53.4 - 23.6 = 29.8

# snags per acre	Guidelines maintenance	Guidelines optimal	Tract 3104 actual
6" - 8" DBH class	1	1	21.7
10"-18" DBH class	2.5	5	10.7
20" DBH and greater	0.5	1	1.1
Total	4	7	43.0

These numbers show that both live tree densities as well as snag densities meet guidelines on this tract. The result for large snags on this tract is noticeably higher than other recently completed inventories on other tracts of the forest, where large snag densities are below one per acre, and 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. There may be some conversion of cedar or the old field area to temporarily open areas that will be allowed to succeed into native hardwoods, and this would change the character of the tract over time, but will not change it into a permanently nonforested cover type. Creation of regeneration openings and/or conversion of portions of the old field area into openings will create early successional 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.

Since this tract does not border a major stream (although it is very close to the Ohio River), there should be no disruption of any potential travel corridors by forest management activities. The habitat on this tract in the context of the surrounding landscape does not represent any special component that would be used more preferentially or exclusively by wildlife for traveling or dispersion, as riparian habitat might be, or as forest in a non-forested landscape might be.

Since this tract represents a component of contiguous forest, it is possible 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 large chunk of forest in a matrix of surrounding forest land.

WATERSHED / HYDROLOGY: The majority of the tract contains gentle to moderately steep slopes that drain into intermittent drainages that eventually drain into Indian Creek about a mile to the southeast, as well as some direct drainage down the slope into the Ohio River. This area lies within a karst landscape with underground drainage, and one major cave is located here, as well as a few smaller short caves and open sinks. The upper slope portion may be high enough in elevation that a sandstone caprock layer overlies the limestone over some of the tract.

The major cave that exists here is Ted's Dig – located in the eastern portion of the tract. This is a popular cave amongst cavers, as it offers some sporting challenges including

walking, crawling, climbing, chimneying, and some pits to descend if desired. It was eventually dug open in 1981 by Ted Wilson and Tom Fritsch after initially being located in 1969 by Ted.

The entrance is a tight squeeze through the bottom of a sinkhole into the main part of the cave. There is some passage to be negotiated downward toward a stream that leads to a triple stream junction. One of the passages beyond this is the most visited and consists of several waterfalls cascading down flowstone, and eventually ends in an area named heaven for all of the formations there. Another passage at the junction leads eventually to the lake room. The other passage leads to the waterfall pit which has water cascading into it. Shortly beyond is a dry pit – both pits require ropes to access. Above the dry pit is a passage leading to what was named CHUG Hall, which has a large flowstone mass at one end. There is also 2100 feet of passage beyond the lake room named the M survey passage. Beyond this well known cave, there were several other smaller open sinks and/or "caves" this noted on the tract.

Also, there was a series of rock faces or short cliffs, some including waterfalls that were located just below the sideslope road cutting through the middle slope of this tract. One noteworthy formation is a sandstone rock standing just down from the road with an opening through it, giving the appearance of a natural bridge, or "hole in the rock." Some of these areas might have been used prehistorically for rock shelters, but they were more rock outcroppings with little shelter underneath.

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 did not show any rare, threatened, or endangered plant or animal species documented on this particular tract. However, there are observations for four rare plants very nearby in adjacent tract 3108 – which has been designated the Charles Deam Nature Preserve. These include: Allegheny stonecrop (*Sedum telephiodies*), Hairy lipfern (*Cheilanthes lanosa*), Ebony sedge (*Carex eburnean*), and Narrowleaf summer bluets (*Houstonia nigricans*). All of these would be associated with the exposed sandstone and limestone rock outcroppings and cliffs, and would not be impacted by any management on this tract.

EXOTICS: There are numerous pockets of ailanthus scattered throughout this tract in various places where any openings have allowed it to get established. These were painted with pink when found, so pre-harvest treatment should be easier, and needs to be done to eliminate the established seed source. The windstorm damage incurred by Hurricane Ike in 2008 opened up several areas that likely will be overrun by ailanthus without followup treatment.

There are also some spreading areas of stilt grass within the tract along the horse trails and fire trails. The stilt grass along the trails could be sprayed easily enough, but it is hard to eliminate, and it is likely that the seed has spread out into the woods in places, and this would be less feasible to control. There are also some areas of multiflora rose in places – especially in the old field stand – and this would be difficult to eradicate by spraying.

There were also areas of Japanese honeysuckle growing primarily in the old field areas, and near the crest of the hill, but this would also be very difficult to treat or eliminate due to its pervasiveness and scattered nature in areas hard to access due to rosebush.

SILVICULTURAL HISTORY AND PRESCRIPTION:

General: Utilizing records of the past history of this tract, an inventory done in 1972 indicated a total standing volume of somewhere between 371 to 900 board feet per acre. The records in the file from this inventory are sketchy and the tracts were defined differently back then. Consequently, it becomes hard to determine what portions of which tracts' cruise data pertain to what is now defined as tract 3104. It appears that what used to be identified as tracts 3107, 3106, and 3105 now make up the current 3104.

In 1986, there was a timber sale marked and sold that encompassed the eastern lower slope portion of this tract, as well as the northern portion of tract 3107. This removed 95,160 board feet from tract 3104 – mostly yellow-poplar, sugar maple, and black oak. It included several regeneration openings. The file indicates that TSI was prescribed and apparently performed in 1988.

The 2009 inventory shows between 6150 and 6522 (no cedar) board feet per acre – depending on the statistical totaling method used, and this figures out very roughly to a growth rate of between 170 to 180 board feet per acre per year, after dividing the difference by 37 years of growth since the last inventory. Cedar volume was figured using a different cedar log scale (much more volume from small trees), which was not used in 1972, and this is why cedar volume is being excluded from growth calculations, as it was probably given marginal volume in 1972.

The growth figures are respectable considering about one fourth of this tract is degraded and recovering old field. It is hoped and assumed that this growth rate can be increased into the future with the continued management and encouragement of vigorous and healthy crop trees, and long-term conversion of the low grade hardwood occupying the old field areas to a better crop of hardwood trees.

Number of trees per acre and basal area per acre figures indicate that all stands are close to fully stocked at between 95% to 110%. Removal of trees tallied as "cut" either via a timber sale or TSI would reduce the stocking levels to close to 60%. Stand 1 would be

considered slightly understocked at about 55%. The other two stands would be almost right on the B-line for the lower level of full stocking.

Due to the amount of volume being carried on the majority of the tract (6522 bd. ft/ac – not including cedar), the length of time since the last managed sale on only a portion of the tract (25 years back to 1986), and the general condition of the overstory trees in the older hardwood portions of the tract, the initial impression was that a medium level improvement harvest could be undertaken in this tract at any time. This would produce a sale volume of between 360,000 to 410,000 board feet (not including cedar) or about 2290 to 2600 board feet per acre and leave between 575,000 to 615,000 board feet or between 3650 to 3900 board feet per acre.

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. Most of the TSI will probably be targeted at the old field areas where the composition and stocking could be improved from what currently occupies most of this area. Ailanthus needs to be monitored and eliminated when found to be present or establishing itself. All ailanthus should be killed pre-harvest. There were several areas of ailanthus found to be establishing themselves in different places throughout the tract – usually where windthrow or old regeneration openings have opened up patches of sunlight to the ground.

Stand 1: Oak hickory

This 72-acre stand covers about half of the tract, and occupies the more sloping ground across the upper slope portions of the tract that had not been cleared for farming. Mostly, this consisted of the east and south facing slopes. It contains a volume of 6282 board feet per acre of which 2542 was classified as harvestable and 3740 was classified as residual. This would remove 49 square feet of basal area, which would leave the residual stand with 60 sq. ft. Stocking would drop from 95% to about 55% with the indicated management (slightly understocked below the B-line). These figures DO include cedar as figured according to the cedar log scale.

Since the last harvest in a portion of this stand was 25 years ago, and because it also currently contains a moderate volume of both harvestable material and 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 all of stand 2, with some trees from stand 3. The majority (83%) of the harvest volume for stand 1 (2542 bd. ft/ac) would be contained in white oak (832 bd. ft/ac), black oak (586 bd. ft/ac), white ash (395 bd. ft/ac), and pignut hickory (307 bd. ft/ac) with northern red oak and various other species making up of the remainder of the harvest volume.

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 slightly heavier to white oak, with a lesser component of other oak and hickory species, as well as a minor component of 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 treat the 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. There are several pockets of ailanthus that should be treated pre-harvest.

Stand 2: Mixed mespophytic

This 54-acre stand covers about a third of the tract, and contains a high volume of 7830 board feet per acre of which 3229 was classified as harvestable and 4601 was classified as residual. This would remove 61 square feet of basal area, which would leave the residual stand with 61 sq. ft. Stocking would drop from about 110% to about 60% with the indicated management (fully stocked on the B-line). These figures DO include cedar as figured according to the cedar log scale.

Since the last harvest in this stand was 25 years ago, and because it currently contains a high volume of both harvestable material and 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 all of stand 1 with some trees from stands 3. The majority (77%) of the harvest volume for stand 2 (3229 bd. ft/ac) would be contained in yellow-poplar (1759 bd. ft/ac) white ash (472 bd. ft/ac), and sugar maple (262 bd. ft/ac). The remainder would be contained in chinkapin oak, northern red oak, sassafras, and various other 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. There are several pockets of ailanthus that should be treated pre-harvest.

Stand 3: Old field - advanced

This 31-acre stand covers the remaining portion of the tract, and contains a volume of 2907 board feet per acre of which 1122 was classified as harvestable and 1785 was classified as residual. This would remove 45 square feet of basal area, which would

leave the residual stand with 65 sq. ft. Stocking would drop from 102% to about 60% with the indicated management (fully stocked on the B-line).

Since this stand intermingles with the more merchantable hardwood stands, there would likely be some trees included from here along with any timber sale taking place in stands 1 and 2. The majority (72%) of the harvest volume for stand 3 (1122 bd. ft/ac) would be contained in southern yellow pine (346 bd. ft/ac), northern red oak (322 bd. ft/ac), and pignut hickory (143 bd. ft/ac), with white oak, white ash, and sugar maple making up of the remainder of the harvest volume.

There was one small area of planted pine which could have been either shortleaf or loblolly pine. It is an extension of a larger planting up the hill on the neighboring tract. This area of pine is probably too small to do much management to unless combined with the other area in the next tract. Likely, this pine would be completely converted to hardwoods if it is decided to actively manage this area. Also, there were pockets of mostly eastern redcedar in portions of this stand, though the inventory did not happen to pick any larger ones up to indicate this. A separate cedar sale would probably have to be undertaken to achieve optimal management, as most of these cedar would be removed to encourage poplar and the oak regeneration that is usually found in the understory of such stands. Ultimately, these areas should be completely converted to hardwoods due to recovery of the site from former agricultural activities and erosion.

Much of this stand is dominated with sassafras, white ash, yellow-poplar, and cedar in the submerchantable to merchantable size classes. In scattered places, there is some oak regeneration in the understory. Timber harvest and post harvest TSI should concentrate on releasing this oak regeneration – mostly with follow-up TSI.

Likely, a separate hardwood sale would be conducted from an exclusive cedar sale, and there probably would not be enough concentrated cedar to justify a separate cedar sale. The hardwood component would be marked in conjunction with stands 1 and 2 first. Subsequently, a cedar sale might be conducted to help release the oak regeneration that is present in places in this stand. Finally, TSI would remove any leftover competing trees and allow a new stand of poplar and oak to establish itself and grow here.

PROPOSED ACTIVITIES LISTING

Fall 2009	Field inventory
Winter 2010 – Spring 2011	Write mgmt plan
Summer 2011 - Fall 2012	Basal bark treat ailanthus
Fall 2011 – Spring 2013	Mark timber sale
Spring 2012 - Spring 2013	Sell timber sale
2013 / 2014	Post harvest TSI
2018	Recon & monitor for exotics
2025-2030	Inventory for next mgmt cycle

APPENDIX

(Various tables and graphs describing tract 3104)

A SUMMARY OF VARIOUS STATISTICS FOR TRACT 3104

Summary of basal area (sq ft per acre)

STAND	LEAVE	CUT	(SNAG)	TOTAL (live)
Oak hickory	60.4	49.3	??	109.7
Mixed mesophytic	61.3	60.9	??	122.2
Old field - advanced	64.5	45.0	??	109.5

Summary of volume (bd ft per acre)

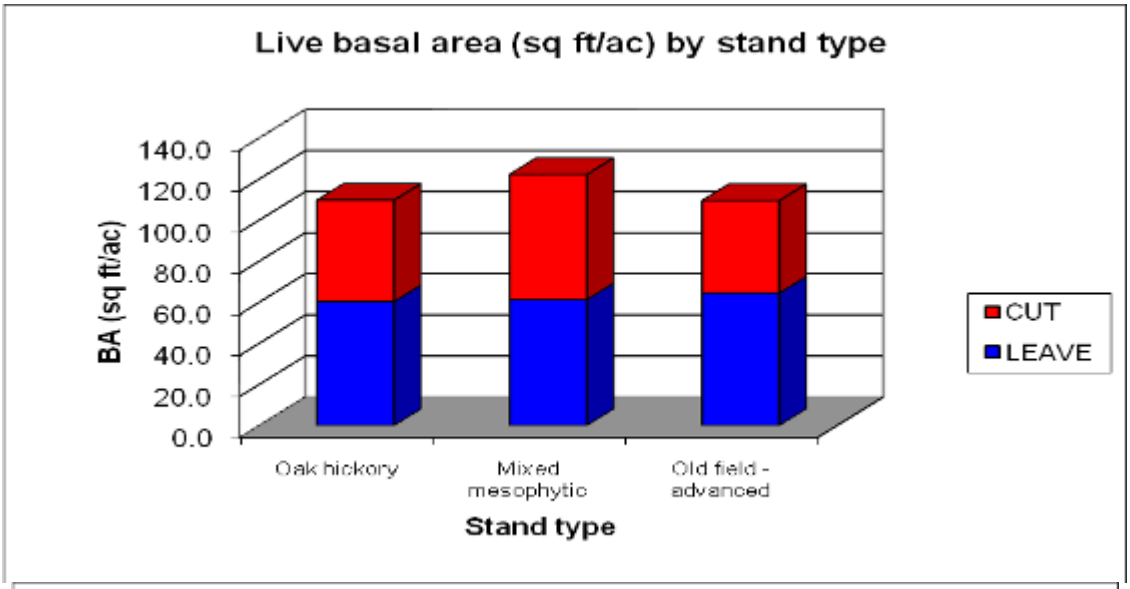
STAND	LEAVE	CUT	TOTAL (live)
Oak hickory	3740	2542	6282
Mixed mesophytic	4601	3229	7830
Old field - advanced	1785	1122	2907

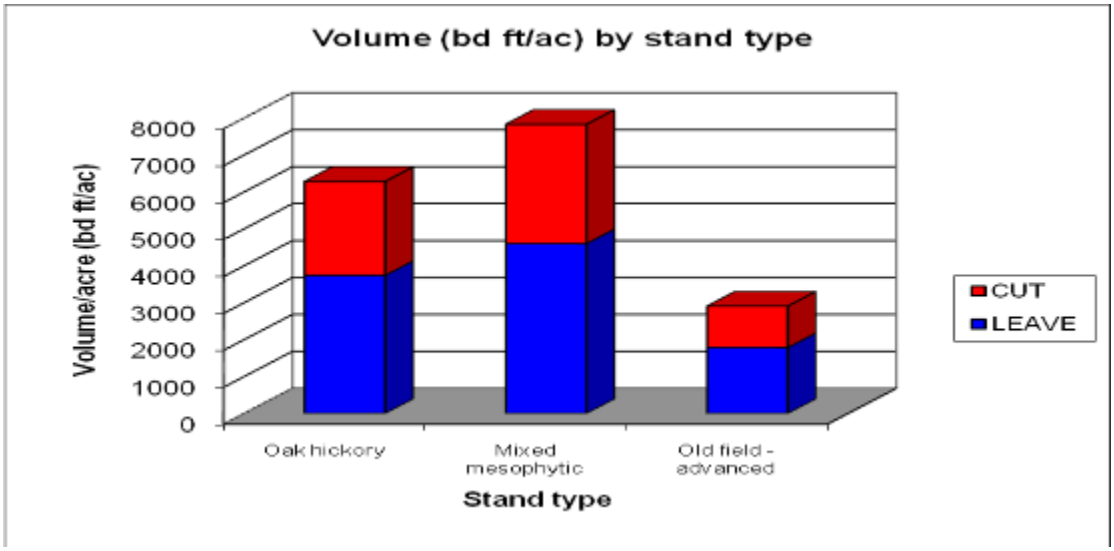
Summary of number of trees per acre

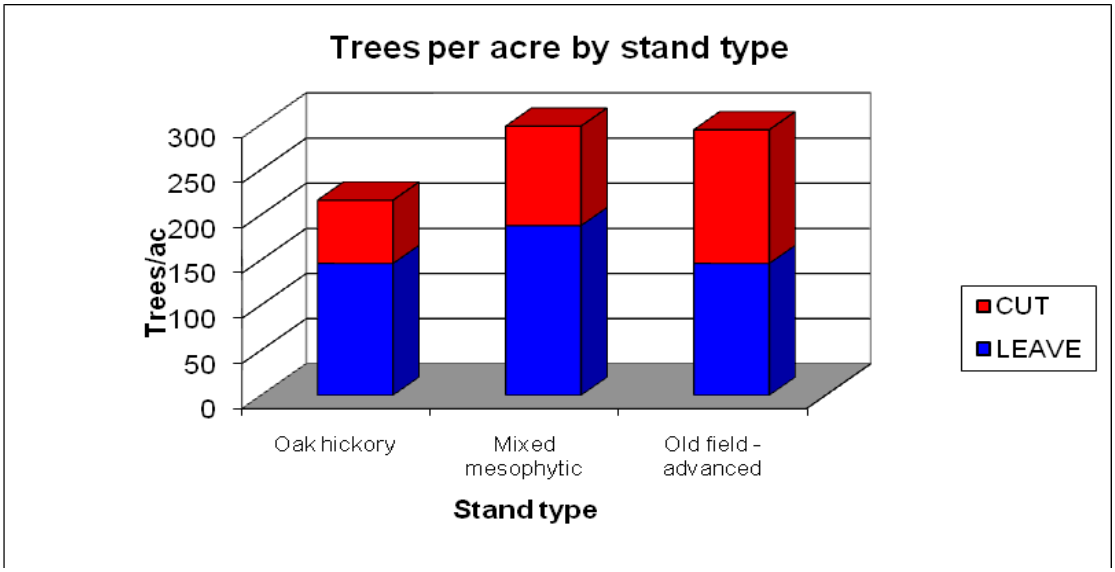
STAND	LEAVE	CUT	(SNAG)*	TOTAL (live)
Oak hickory	146	70	?	216
Mixed mesophytic	188	110	?	298

Old field - advanced	146	148	?	294

*snags/acre >= 9" DBH = 9.9/acre across entire tract







A SUMMARY OF VOLUME PER ACRE (bd ft/ac) BY SPECIES FOR TRACT 3104

Stand 1: Oak hickory

Volume (bd ft/ac)

Species	CUT	LEAVE	TOTAL
BLG		43	43
BLO	586	139	725
ZCO		126	126
ERC	40		40
MOH	18		18
NRO	169	392	561
PER	49		49
PIH	307	631	938
SAS	24		24
SHH	52	250	302
SUM	70	59	129
WHA	395	44	439
WHO	832	1984	2816
YEP		72	72
TOTAL	2542	3740	6282

Stand 2: Mixed mesophytic

Volume (bd ft/ac)

Species	CUT	LEAVE	TOTAL
AMB		23	23
BIH		93	93
BLO	51	203	254
BLW	35	45	80
ZCO	171	178	349
ERC	58		58
NRO	144	254	398
PIH	71	94	165
REE		38	38
SAS	109		109
SHH		170	170
SUM	262	412	674
SYC	97	106	203
WHA	472	369	841
WHO		306	306
YEP	1759	2310	4069
TOTAL	3229	4601	7830

Stand 3: Old field - advanced

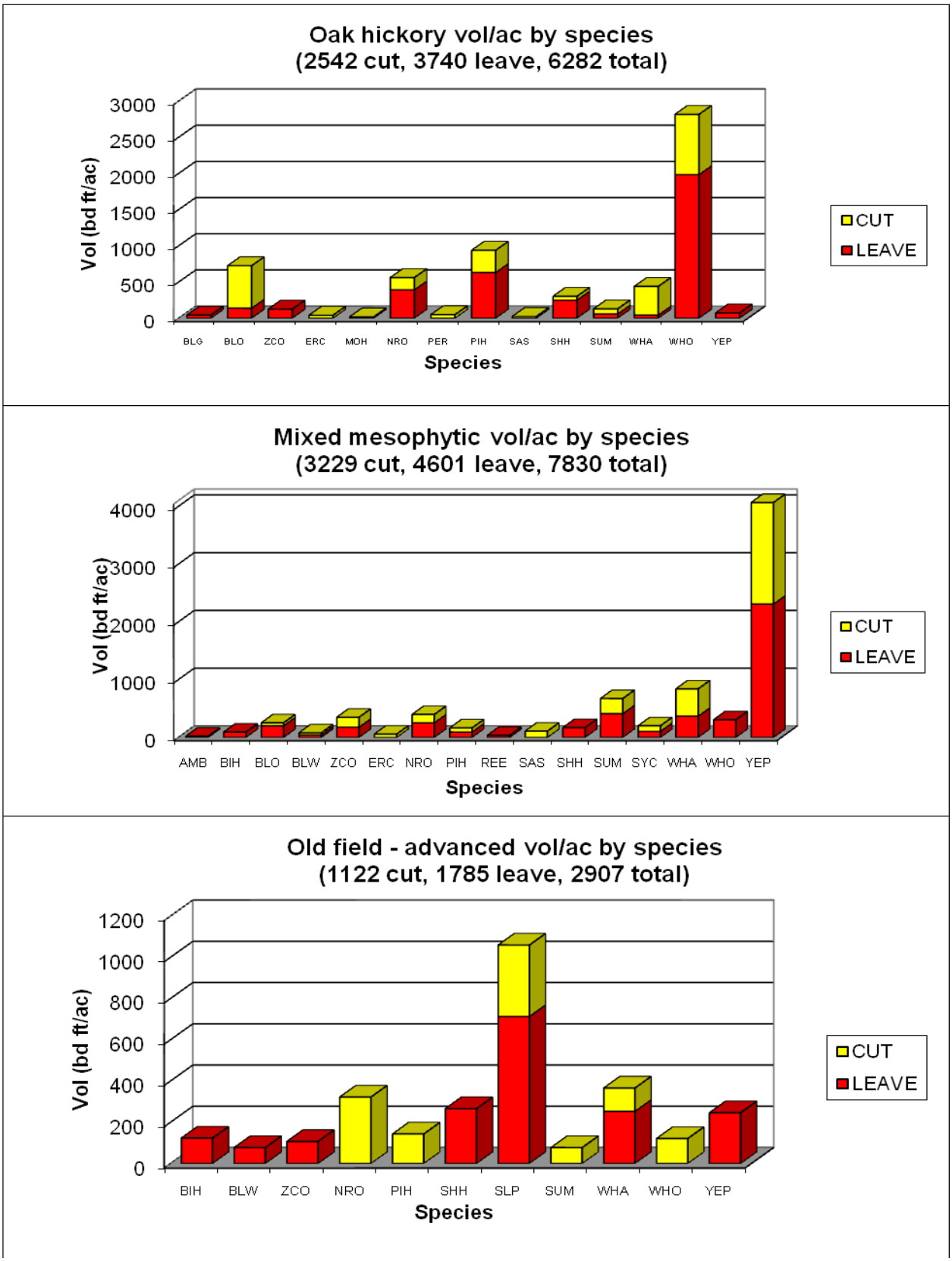
Volume (bd ft/ac)

Species	CUT	LEAVE	TOTAL

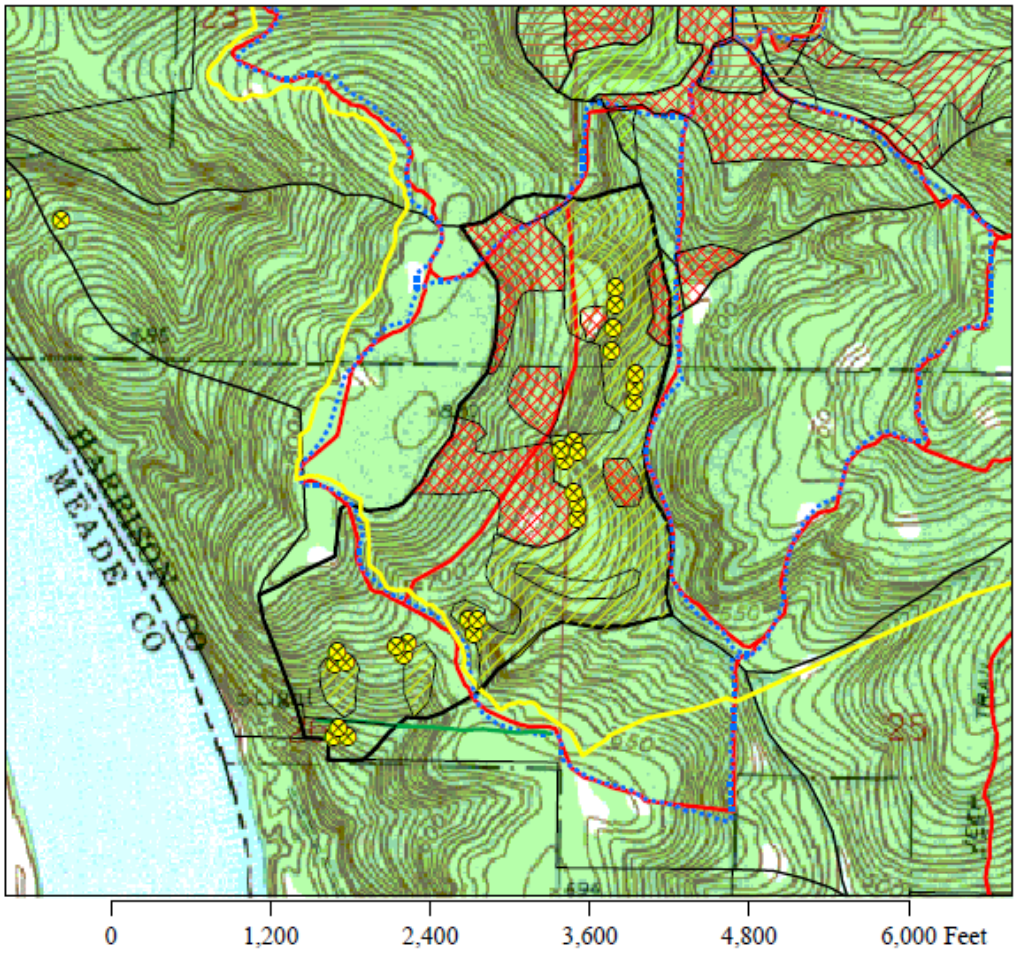
BIH		123	123
BLW		77	77
ZCO		107	107
NRO	322		322
PIH	143		143
SHH		266	266
SLP	346	713	1059
SUM	77		77
WHA	113	253	366
WHO	121		121
YEP		246	246
TOTAL	1122	1785	2907

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.


Oak hickory vol/ac by species
(2542 cut, 3740 leave, 6282 total)
Vol (bd ft/ac)
3000
2500
2000
1500
1000
500
0
BLG BLO ZCO ERC MOH NRO PER PIH SAS SHH SUM WHA WHO YEP
Species
CUT
LEAVE
Mixed mesophytic vol/ac by species
(3229 cut, 4601 leave, 7830 total)
Vol (bd ft/ac)
4000
3000
2000
1000
0
AMB BIH BLO BLW ZCO ERC NRO PIH REE SAS SHH SUM SYC WHA WHO YEP
Species
CUT
LEAVE
Old field - advanced vol/ac by species
(1122 cut, 1785 leave, 2907 total)
Vol (bd ft/ac)
1200
1000
800
600
400
200
0
BIH BLW ZCO NRO PIH SHH SLP SUM WHA WHO YEP
Species
CUT
LEAVE

Tract 3104



Legend

- Caves
- 3104 survey corner
- Historic / geologic sites
- Historic sites
- 3104 survey line
- Adventure hiking trail
- Horse trails
- Firelanes
- tract 3104
- Tracts

- Stand 1: Oak hickory - 72 ac
- Stand 2: Mixed mesophytic - 54 ac
- Stand 1: Old field - advanced - 31 ac

N
W
E
S

- Ailanthus locations - multiple stems