RESOURCE MANAGEMENT GUIDE

STATE FOREST: Harrison Crawford **COMPARTMENT:** 20 **TRACT:** 08

Date: October 27, 2006 - inventory **Forester: Wayne Werne**
January 3, 2008 - plan

INVENTORY SUMMARY

NUMBER OF STANDS: **6** **Est. growth: ? bd. ft/ac/yr** (no data)
PERMANENT OPENINGS: **0 ac** **Est. cutting cycle: ? yrs** (no data)
TOTAL ACREAGE: **144.3 ac**
AVERAGE SITE INDEX: **75-85** (for upland oaks)
AVERAGE BASAL AREA: **126.9 sq. ft/ac**

TRACT 2008 TOTAL VOLUME (bd. ft)

	CUT		LEAVE		TOTAL	
SPECIES	per acre	total	per acre	total	per acre	total
American beech	75	10,750	137	19,784	212	30,534
Bitternut hickory		-	22	3,175	22	3,175
Black cherry	15	2,107	8	1,169	23	3,276
Blackgum	77	11,111		-	77	11,111
Black oak	308	44,387	344	49,682	652	94,069
Black walnut	31	4,430	36	5,166	67	9,596
Chinkapin oak	68	9,812	58	8,312	126	18,124
Eastern white pine		-	71	10,173	71	10,173
Mockernut hickory	12	1,703		-	12	1,703
Northern red oak	327	47,201	426	61,400	753	108,600
Persimmon		-	17	2,395	17	2,395
Pignut hickory	138	19,870	396	57,157	534	77,027
Red maple		-	23	3,290	23	3,290
Scarlet oak	94	13,579	16	2,294	110	15,873
Shagbark hickory	122	17,648	101	14,618	224	32,265
Shortleaf pine		-	144	20,822	144	20,822
Sugar maple	102	14,690	248	35,714	349	50,404
White ash	273	39,437	120	17,273	393	56,710
White oak	308	44,387	1,379	198,975	1,687	243,362
Yellow-poplar	171	24,704	166	23,911	337	48,615
TTOTAL	2,119	305,815	3,710	535,310	5,829	841,125

STAND 1 – Oak-hickory **ACREAGE: 89.8**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	3,029	4,463	7,492	
TOTAL VOLUME:	272,004	400,777	672,782	
BASAL AREA/ACRE:	51.6	77.2	128.8	10.4
# TREES/ACRE:	54	234	288	66

STAND 2 – Mixed mesophytic **ACREAGE: 27.3**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	984	2,735	3,719	
TOTAL VOLUME:	26,863	74,666	101,529	
BASAL AREA/ACRE:	34.4	62.0	96.4	13.3
# TREES/ACRE:	44	450	494	623

STAND 3 – Planted pine **ACREAGE: 10.6**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	0	3,002	3,002	
TOTAL VOLUME:	0	31,821	31,821	
BASAL AREA/ACRE:	90.0	120.0	210.0	25.0
# TREES/ACRE:	165	157	322	36

STAND 4 – Old field - cedar **ACREAGE: 2.4**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	546	1,296	1,842	
TOTAL VOLUME:	1,310	3,110	4,421	
BASAL AREA/ACRE:	20.0	90.0	110.0	5.0
# TREES/ACRE:	126	1,032	1,158	229

STAND 5 – American beech **ACREAGE: 6.3**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	546	1,296	1,842	
TOTAL VOLUME:	3,440	8,165	11,605	
BASAL AREA/ACRE:	53.3	53.3	106.6	3.3
# TREES/ACRE:	18	132	150	1

STAND 6 – Old field **ACREAGE: 7.9**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	0	974	974	
TOTAL VOLUME:	0	7,695	7,695	
BASAL AREA/ACRE:	16.7	103.3	120.0	13.3
# TREES/ACRE:	50	997	1,047	184

TRACT BOUNDARIES: This 144-acre tract is defined by topographic and physiographic features, as well as private property lines that form its borders. The northern boundary is formed by the fire trail that comes in off of SR 462 and goes by Langdon's cave. The long western boundary is formed by a drainage that flows north toward Rock Creek. The eastern boundary is formed by a combination of SR 462 on the southern end and private property lines on the northern end. There is a 40 acre property that is subdivided that cuts into Compartment 20 Tract 08 on three sides along this eastern boundary.

ACCESS: This tract is very linearly oriented north-south along SR 462, and direct access to it is obtained off of this road. Best access is probably off of the northern fire trail that comes off of SR 462, but also from Brown's field area to the south to access the southern portion along the ridge that is located there. Access to the eastern portion across from SR 462 would have to be obtained somewhere along SR 462.

ACQUISITION HISTORY: The land that makes up this tract was acquired primarily from four different landowners about 60 - 70 years ago. These transfers include James Mackintosh in 1934 via delinquent tax sale ($0.72 per acre) – parcel # 23, Harriet Langdon in 1935 ($4.30 per acre) – parcel # 28, Samuel Breeden in 1940 – parcel # 86, and William and Elsie Smoots in 1968 ($225 per acre) – parcel # 219

TRACT DESCRIPTION: This tract was very heterogeneous and was consequently divided into six stands based on cover type and past management. Three of these stands result from different vegetative cover types on what were once agricultural fields. The stands include: oak-hickory (majority of tract), mixed mesophytic, planted pine, old field - eastern redcedar, American beech, and old field (non cedar). These stands will be described in detail below.

Stand 1 – Oak-hickory

This 90-acre stand forms the majority of the tract and is made up of a mix of oak species along with lesser amounts of more mesic site species. It represents the hillsides that were never farmed and have historically been in natural forest. The volume of this stand (7492 bd. ft/ac) is composed primarily of white oak (2646 bd. ft/ac), northern red oak (1092 bd. ft/ac), black oak (1014 bd. ft/ac), and pignut hickory (828 bd. ft/ac) with white ash, beech, shagbark hickory, yellow-poplar and other various species making up the rest. There may have been some white oak cut out of this stand for veneer in 1976, but the records in the file are very sketchy.

Stand 2 – Mixed mesophytic

This 27-acre stand is made up of more mesic site species on the north and east slopes in the northern third of the tract. This stand is a relatively young hardwood stand that has

succeeded in on former agricultural fields or pasture. The volume of this stand (3719 bd. ft/ac) is composed mostly of sugar maple (1241 bd. ft/ac), yellow-poplar (859 bd. ft/ac), and white ash (641 bd. ft/ac). Red oak, black cherry, white oak, bitternut hickory, and other species compose the rest of the volume.

Stand 3 – Planted pine

This 11-acre stand is found primarily in the northwestern corner of the tract and consists of southern pine and white pine planted in old agricultural fields. There is a small area of this stand in the south adjacent to the road as well. The volume of this stand (3002 bd. ft/ac) is made up entirely of southern yellow pine (shortleaf?) (1964 bd. ft/ac), eastern white pine (680 bd. ft/ac), and sugar maple (358 bd. ft/ac). There is a note in the file that white, loblolly, shortleaf, and Virginia pine were direct seeded on this site after disking in 1970.

Stand 4 – Old field - ERC

This 2.5-acre stand is a small area south of the pine stand that is harsher and more eroded which supports a noticeable amount of cedar in the understory, in addition to some surviving pine from the planting originally covering this area. The volume of this stand (1841 bd. ft/ac) is made up entirely of yellow-poplar (1193 bd. ft/ac) and eastern white pine (648 bd. ft/ac).

Stand 5 – American beech

This 6-acre stand is located on the lower slopes of the drainage along the western border in the middle of the tract. Without the presence of beech as the dominant species, this would have been categorized as an oak hickory or mixed stand. The volume of this stand (3689 bd. ft/ac) is made up of beech (797 bd. ft/ac), black oak (482 bd. ft/ac), pignut hickory (432 bd. ft/ac), white oak (423 bd. ft/ac), and red oak (391 bd. ft/ac), along with white ash, scarlet oak, yellow-poplar, and sugar maple.

Stand 6 – Old field

The final stand designation for this tract is represented by old field areas with more hardwood than cedar dominance. This portion of the tract encompassed about 8 acres, and is dominated with yellow-poplar in the overstory, and various species of saplings in the understory. It is located on the southern tip as well as in an area just south of the mixed mesophytic stand. The volume of this stand (924 bd. ft/ac) is composed entirely of yellow-poplar (588 bd. ft/ac), eastern white pine (178 bd. ft/ac), and red maple (159 bd. ft/ac).

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.

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 185-260 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.

HgC3 Hagerstown silty clay loam, 6-12% 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.

WeD3 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.

HaD2 Hagerstown silt loam, 12-18% slopes, 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.

ZaC2 Zanesville silt loam, 6-12% 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.

RECREATION: This tract is located near the office in the main block of forest comprising Harrison-Crawford State Forest. It abuts private property and SR 462 on about half its length, and so represents an easy access tract for various types of recreation. It contains a horse trail that runs north-south along the western side, and a fire trail that gives direct access to Langdon's cave, which is the most heavily used wild cave on the property. Likely this tract receives a very high amount of public use from horseback riding, hiking, jogging (parking area across the road), hunting, and caving.

In addition to Langdon's cave, there are a few other caves/sinkholes that are noted on this tract. Several were found and GPS'ed, but notes about one along the south boundary of the private property "inholding" from both Dan Shaver and Gretchen Herbaugh did not

lead to the discovery of whichever cave exists in that location. The one along the eastern side of this private property line is known as Ralph Jackson Trailside Cave.

WILDLIFE:
This tract provides habitat for a variety of forest-dwelling wildlife of many forms. The oak-dominated component of this tract forms a little over half of the acreage, and the mast produced by the oak and hickory here would provide nuts for wildlife known to depend on hard mast for their major food source. The diversity of forest habitat may be beneficial for some species, with the cedar and pine stands providing thermal cover for some, and the open old field portions providing more forage opportunities.

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.

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

	Number of trees per acre	
Tree type	**10 to 18 inches DBH**	**20 inch DBH and greater**
LIVE	**6 (in 12-18" class)**	**3**
SNAG	**5**	**1**

Actual numbers from tract 2008:

	Number of trees per acre (present – harvest = residual)	
Tree type	**10 to 18 inches DBH**	**20 inch DBH and greater**
LIVE	43.4 – 14.8 = **28.6 (in 12-18" class)**	12.0 – 6.1 = **5.9**
SNAG	**4.5**	**0.5**

These numbers show that all categories of tree densities meet guidelines except for snags – especially large ones. This result is consistent with several other recently completed inventories on other tracts of the forest, which seems to indicate that large snags on forested stands of this general age class equilibrate at about one quarter to one half per acre – well below the guideline of one per acre. When all snags including those less than 10 inches DBH are considered, the total number is 21.8 per acre representing 11.8 sq. feet of basal area. The vast majority of snags, therefore, are smaller than 10 inches DBH, 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, so any timber sale will not negatively impact that below target

component significantly. Creation of more snags in this size class could be undertaken by girdling large cull trees in a post-harvest TSI operation.

WATERSHED: The majority of this tract contains gentle to moderately steep slopes that drain into two intermittent streams that drain into Rock Creek to the north. There is a small wildlife pond just to the north of the fire trail beyond the northwestern corner of the tract as well. The Blue River is less than a half mile away.

There are sinkholes and some caves scattered throughout portions of this tract which indicate the karst topography that underlies it. Most of these are closed, but some promise to eventually open up when enough rainfall has drained through them.

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.

OTHER CONCERNS: The natural heritage database check revealed several hits for rare, threatened, or endangered plant or animal species located within this tract. These were all cave related species of arthropods associated with Langdon's cave location. These included cave beetles (*Pseudanophthalmus tenuis, Pseudanophthalmus eremita*), Ancestral springtail (*Sinella avita*), Golden cave harvestman (*Erebomaster flavescens*), and Blue River cave millipede (*Pseudotremia Indiana*). Any aboveground management activity will have no impact on these species due to their obligatory existence within the cave itself. There were numerous other RTE occurrences on neighboring tracts as well, but most of these were also cave related species.

There are occurrences of ailanthus in this tract. Some of the larger individuals have been treated, but there is still an abundance of small seedlings and saplings that will have to be kept under control lest they spread to other areas of the tract.

SILVICULTUAL PRESCRIPTION:

General: Number of trees per acre and basal area per acre figures indicate that all stands besides #5 (American beech) are overstocked to well overstocked. Removal of trees tallied as "cut" either via a timber sale or TSI would reduce the stocking levels in all stands to closer to the optimal stocking range (some still overstocked). There are no records of any timber sales taking place in this tract during the time of state ownership other than a small veneer sale in 1976 that may or may not have been entirely within this tract. There is a record from 1952 of selling all the cedar trees within the Langdon tract (part of 2008) as well.

Due to the amount of volume being carried on the majority of the tract (natural hardwood portion), and the length of time since the last harvest (unknown – 40+ years?), the initial impression was that a moderate level harvest could be undertaken in this tract at any time with concentration on stands 1, 2, and 5. This would produce a hardwood sale volume of about 304,000 board feet or about 2464 board feet per merchantable acre and leave about 484,000 board feet or about 3920 board feet per merchantable acre. The cedar and pine areas could be treated separately as small sales with limited acreage and volume.

TSI had been performed on parts of the northern portion of the tract (where stand 2 dominated) in about the 2001 – 2003 timeframe. This included grapevine control, some thinning, and ailanthus control (larger stems). Further ailanthus control is still needed.

It is recommended that Timber Stand Improvement (TSI) be undertaken in this tract if a harvest is undertaken to accomplish a variety of tasks. This would include completion of any marked openings, girdling of any cull trees not cut during the harvest, and additional control of any ailanthus missed in the pre-harvest TSI. TSI of pole-size trees would account for minimal to moderate amounts of basal area removal in the oak hickory and mixed mesophytic stands, while thinning of the pine stand would remove a substantial amount of basal area. Cull tree removal would account for an additional 7 to 8 square feet of basal area in the hardwood stands, but about 43 square feet per acre in the beech stand that had a fair amount of large hollow beech trees tallied as cull.

Stand 1: Oak-hickory

This stand forms the majority of the tract (90 acres) and contains 7492 board feet per acre of which 3029 was classified as harvestable and 4463 was classified as residual. This would remove 52 square feet of basal area, which would leave the residual stand with 77 sq. ft. Stocking would drop from 115% to about 72% with the indicated management.

Since this stand was last cut more than 30 years ago and currently contains a moderately high volume of harvestable material and a reasonable volume of residual growing stock, the recommendation would be to rank this stand as a medium priority for conducting a harvest. Any timber sale would include both this stand and also portions of the other merchantable hardwood stands (primarily #2 and #5). The majority of the harvest volume for stand 1 (3029 bd. ft/ac) would be contained in northern red oak (526 bd. ft/ac), white oak (494 bd. ft/ac), black oak (494 bd. ft/ac), and white ash (341 bd. ft/ac) respectively.

Most of the stand would be harvested under a single tree or group selection system favoring high quality trees of good vigor for a leave stand. Selection would also concentrate on removing low-grade trees that show major defect or indicate slow growth from suppressed growing conditions. When possible, selection should also favor releasing future crop trees. As with many other mature oak hickory stands, this stand will

continue to transition to a white oak-dominated stand as black oak is removed through silvicultural management to favor the longer lived and more vigorous white oak.

TSI should be performed to ensure eradication of ailanthus and cull trees, to complete any openings, and to complete release of future crop trees. Need for pre-harvest TSI of poles and culls is minimal.

Stand 2: Mixed mesophytic

This 27-acre STAND makes up the second largest area of the tract, and contains 3719 board feet per acre of which 984 was classified as harvestable and 2735 was classified as residual. This would remove 34 square feet of basal area, which would leave the residual stand with 62 sq. ft. Stocking would drop from 100% to about 69% with the indicated management.

This stand contains a low volume of harvestable material and a moderate volume of residual growing stock. By itself, this stand would not justify a sale because of its relative young age and low volume, but it is intermixed with stand 1 and it would make sense to do some light improvement harvesting in this stand at the same time. The recommendation would be to include this stand for a harvest taking place in the other hardwood stands. The majority of the harvest volume for stand 2 (984 bd. ft/ac) would be contained in yellow-poplar (338 bd. ft/ac), sugar maple (292 bd. ft/ac), and white ash (234 bd. ft/ac).

Most of the stand would be harvested under a single tree selection system favoring high quality trees of good vigor for a leave stand. Selection would also concentrate on removing low-grade trees that show major defect or indicate slow growth from suppressed growing conditions. When possible, selection should also favor releasing future crop trees.

There are ample numbers of ailanthus seedlings in this stand in places, and these areas need to be controlled to keep it from establishing and spreading further.

Stand 3 – Planted pine

This 11-acre stand is a planted stand on former agricultural fields made up entirely of southern pine (shortleaf?), white pine, and sugar maple. It contains a low value of 3002 board feet per acre – all of which was classified as residual volume. TSI to thin this overstocked stand, however, would remove 90 square feet of basal area, which would leave the residual stand with 120 sq. ft. Stocking would drop from a very high overstocking to about 100% with the indicated management.

The stand could be thinned for pulpwood, or TSI'ed to help the residual growth of the currently overcrowded stand. This operation would be either non-commercial or limited in its desirability for a commercial thinning. Harvest priority for this stand would be low. If there is a market for small pine, a thinning operation should be considered. Otherwise basic TSI should be undertaken to thin out this stand.

Stand 4 – Old field - ERC

This is a small 2.5-acre stand on the edge of the pine stand where yellow-poplar and white pine make up all the merchantable volume. Due to poor survivorship of the pine, eastern redcedar dominates the understory here with a pure stand in places, and intermixed with small oak in others. Probably erosion has reduced the site productivity here. The only volume present is the pine and scattered poplar. Currently, this stand contains 1841 board feet per acre of which 546 was classified as harvestable and 1296 was classified as residual. This would remove 20 square feet of basal area, which would leave the residual stand with 90 sq. ft. Stocking is considered very high, and even with the removal of the indicated basal area, the stand would still remain above 110% stocking.

This is a small stand containing generally small cedar, and so the only management prescribed would be some TSI to release the understory oak, and possibly the removal of some of the low quality overstory trees to facilitate growth of the oak present. It is possible to have an exclusive cedar sale to remove the trees present for the benefit of the oak, but the area is fairly small, and the volume would be minimal.

Stand 5 – American beech

This 6-acre stand, as described above, is located along the lower slopes of the drainage on the western border, and would have been lumped in with either the oak-hickory or mixed mesophytic stands if not for the obvious presence of large beech trees. It contains 3689 board feet per acre of which 898 was classified as harvestable and 2791 was classified as residual. This would remove 53 square feet of basal area, which would leave the residual stand with 53 sq. ft. Stocking would drop from about 90% to below 50% with the indicated management. This would leave the residual stand understocked, but this more aggressive removal would be targeted at the numerous overstory cull beech trees that were prevalent here, and which account for 43 square feet of that basal area to remove.

Obviously, if a timber sale were to be under taken in stands 1 and 2, this stand would also be included in that sale to manage the hardwood overstory as well. Most of the management, however, would probably be follow-up TSI to remove the overabundance of cull beech trees that dominate this stand.

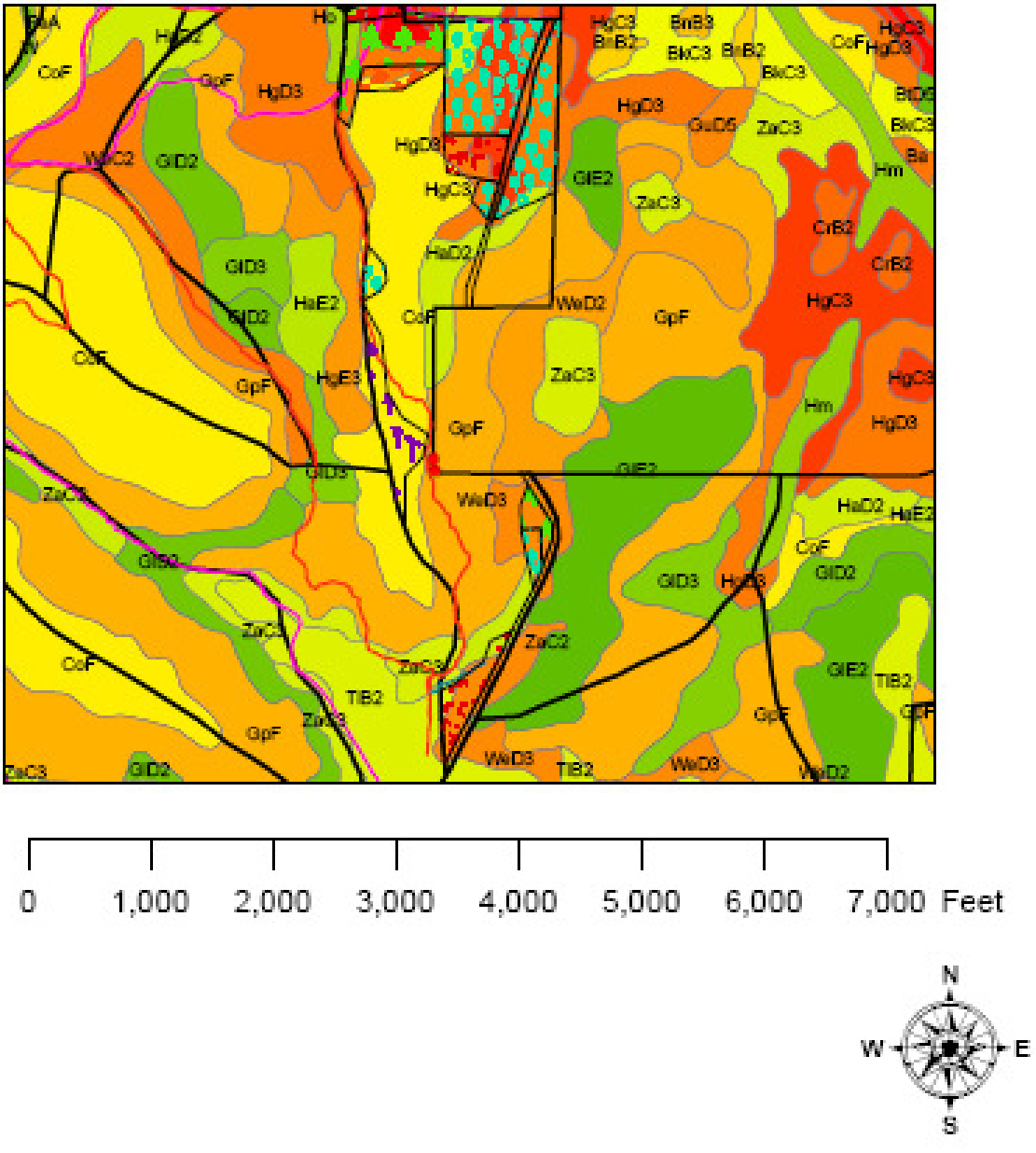
Stand 6 – Old field

This 8-acre stand is located in the southern tip of the tract, and just south of stand 2 in the more northern portion of the tract as well. It differs from stand 4 in that it is has more

hardwood dominance than cedar. It contains a low volume of 924 board feet per acre, all of which was classified as residual. TSI would remove 17 square feet of basal area, which would leave the residual stand with 103 sq. ft, still technically leaving the stand as overstocked.

Since this stand is basically a young regenerating old field, the only management prescribed would be to include this stand in any post harvest TSI in order to encourage the more valuable hardwood species by eliminating the cedar and less valuable species, as well as any vines or exotics growing here.

Tract 2008 Soils



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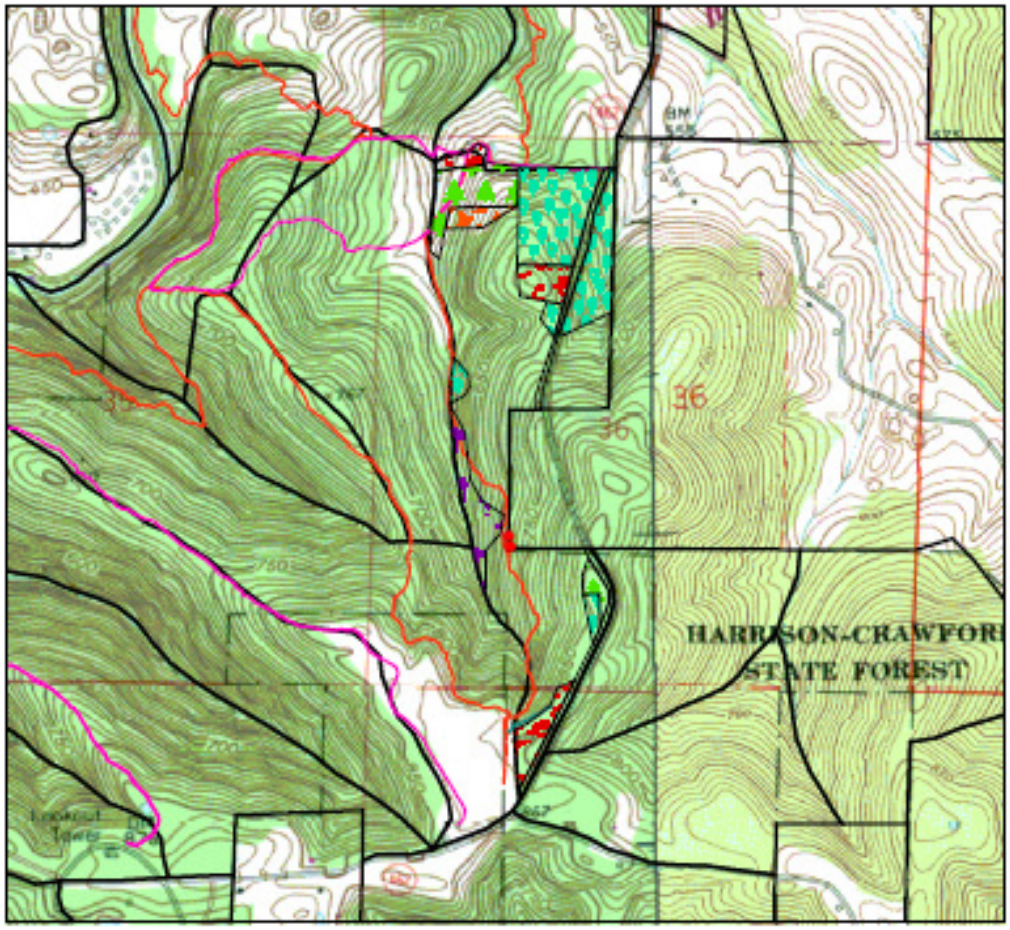
Topographic Map

Tract 2008



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Legend

- Corners
- Caves
- Old Road
- Fire Lanes
- Horse trails
- Tracts

- Stand 1: Oak-hickory
- Stand 2: Mixed mesophytic
- Stand 3: Planted pine
- Stand 4: Old field - ERC
- Stand 5: American beech
- Stand 6: Old field

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