RESOURCE MANAGEMENT GUIDE

STATE FOREST: Harrison Crawford **COMPARTMENT**: 30 **TRACT**: 06

Date: December 11, 2006 **Forester: Wayne Werne & Beth Winsor**

INVENTORY SUMMARY

NUMBER OF STANDS: **2** **Est. growth: 110 bd. ft/ac/yr**
PERMANENT OPENINGS: **0.0 ac** **Est. cutting cycle: 17 yrs**
TOTAL ACREAGE: **93.7 ac**
AVERAGE SITE INDEX: **75-85** (for upland oaks)
AVERAGE BASAL AREA: **123.5 sq. ft/ac**

TRACT 3006 TOTAL VOLUME (bd ft)

	CUT		LEAVE		TOTAL	
SPECIES	per acre	total	per acre	total	per acre	total
American beech	64	6,006	41	3,022	105	9,028
Bitternut hickory		-	15	1,098	15	1,098
Black cherry	38	3,542		-	38	3,542
Blackgum	93	8,723	81	5,933	174	14,656
Black oak	403	37,789	776	72,721	1,179	110,510
Eastern redcedar	168	15,760		-	168	15,760
Eastern white pine		-	48	3,538	48	3,538
Mockernut hickory	56	5,257	36	2,624	92	7,880
Northern red oak	132	12,350	27	1,997	159	14,347
Pignut hickory	358	33,563	266	19,604	624	53,168
Post oak	16	1,527		-	16	1,527
Sassafras	46	4,301		-	46	4,301
Scarlet oak	34	3,139		-	34	3,139
Shagbark hickory	76	7,093	88	6,463	163	13,557
Shumard oak	34	3,139		-	34	3,139
Sugar maple	85	7,927	26	1,909	111	9,836
Sycamore	39	3,692	24	1,754	63	5,446
Virginia pine	63	5,903	73	5,395	136	11,298
White ash	302	28,279	15	1,098	317	29,377
White oak	223	20,876	266	19,575	488	40,451
Yellow-poplar	405	37,920	358	26,362	762	64,283
Chinkapin oak		-	24	1,754	24	1,754
TTOTAL	2,634	246,787	2,162	174,847	4,796	421,634

STAND 1 – Old field – advanced **ACREAGE: 49.9**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	2,029	2,048	4,077	
TOTAL VOLUME:	101,247	102,195	203,442	
BASAL AREA/ACRE:	70.1	63.7	133.8	19.0
# TREES/ACRE:	219	263	482	92

STAND 2 – Oak hickory **ACREAGE: 43.8**

	CUT	LEAVE	TOTAL	SNAG
VOLUME/ACRE:	3,323	2,291	5,614	
TOTAL VOLUME:	145,547	100,346	245,893	
BASAL AREA/ACRE:	61.0	50.9	111.9	15.5
# TREES/ACRE:	125	218	343	92

TRACT BOUNDARIES: The entire tract is surrounded by state forest property and is bordered by Cold Friday Road to the west, Dutch Hollow Road to the northwest, and by a small drainage to the south and southwest. The northeast border follows along a central ridgetop, and then along fire trails 307 and 308 to the east and southeast.

ACCESS: There is easy access to the entire tract, due to the fact that it is right off of Cold Friday Road, Dutch Hollow Road, and fire trails 307 and 308 go through the tract and border it to the east.

ACQUISITION HISTORY: Most of the land that makes up this tract seems to have been acquired from C.D. Mauck in 1935 as part of delinquent taxes at a price of $5 per acre. The rest of the tract was acquired from a consortium of Kintners also in 1935 as an outright sale of land.

TRACT DESCRIPTION: This tract was divided into two stands based on cover type and past management. These stands include: old field - advanced and oak hickory. The old field stand was in an advanced enough stage to warrant classification as a low grade poplar-oak hardwood stand with cedar in between. These stands will be described in detail below.

Stand 1 - Old field - advanced

This 50-acre stand covered a little over half the tract, and was used for agriculture in the past and was severely eroded, containing small gullies in much of the stand. In the northwest corner, hardwoods were intermixed, and were probably remnants from woods that were grazed in the past. Stocking levels were above average, and trees were generally small and had very poor form and quality. This stand would benefit from a prescribed burn, which in turn would hopefully promote and enhance the oak regeneration present.

The total stand volume (4,077 bd. ft/acre) is composed primarily of yellow-poplar (1,362 bd. ft/acre), black oak (813 bd. ft/acre), eastern redcedar (316 bd. ft/acre), and white ash (313 bd. ft/acre), with the remaining 30% of the volume consisting of hickory, Virginia pine, sugar maple, and various other species. Eastern redcedar, sugar maple, and red elm all occurred in the understory.

Stand 2 - Oak hickory

This 44-acre stand covered a little less than half the tract, and consisted of lower quality hickory and oak trees, with several large white ash, yellow-poplar, and sycamore trees scattered thinly throughout. Stocking levels were average to high, with much of the understory consisting of sugar maple, eastern redcedar, and American beech. This stand would also be a good candidate for either a prescribed burn or for several large group selection or regeneration openings to prevent succession to more shade tolerant species.

The total volume of the stand (5,614 bd. ft/ac) is composed primarily of black oak (1,597 bd. ft/ac), pignut hickory (1,061 bd. ft/ac), and white oak (963 bd. ft/ac), with the remaining volume consisting of black gum, white ash, northern red oak, American beech, shagbark hickory and others.

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

Hagerstown Silt Loam (HaC2, HaD2, HgC3, HgD3, HgE3) (35.12 acres) Deep, moderately sloping to moderately steep, well-drained soils on uplands. Surface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil is about 46 inches thick. The depth to limestone is about 52 inches. Characteristically, this soil is eroded to severely eroded and moderate in content of organic matter and medium in natural fertility. Available water capacity is moderate or high, and permeability is moderate. Runoff is rapid to very rapid.
Degree Slope: 6-25 %
Woodland Suitability Group: 1o1 or 1r2
Site Index: 85-95 (Upland Oaks)
Growth range potential (Upland oaks): 300-375 bd.ft. /acre/year
Management Concerns: Runoff and erosion

Hagerstown Silt Loam (HaE2) (18.17 acres) Deep, moderately sloping to moderately steep, well-drained soils on uplands. Surface layer is dark yellowish brown silt loam about 2 inches thick. The subsoil is about 46 inches thick. The depth to limestone is about 52 inches. Characteristically, this soil is eroded to severely eroded and moderate in content of organic matter and medium in natural fertility. Available water capacity is moderate or high, and permeability is moderate. Runoff is rapid to very rapid.
Degree Slope: 18-25 %
Woodland Suitability Group: VIe-1 or 1r2
Site Index: 85-95 (Upland Oaks)
Growth range potential (Upland oaks): 300-375 bd.ft. /acre/year
Management Concerns: Runoff and erosion

Haymond Silt Loam (Hm) (10.43 acres) Deep, nearly level, well-drained soils on bottom lands and in basins of sinkholes in uplands. Surface layer is dark-brown about 9 inches thick. Subsoil dark yellowish-brown about 17 inches thick. Underlying material is dark yellowish-brown stratified silt loam that contains less prominent layers of loam. This soil is moderate in content of organic matter. Available water capacity is high, and permeability is moderate. Runoff is slow.
Degree Slope: 0%
Woodland Suitability Group: 1o8
Site Index: (95-105 for yellow-poplar - no rating for upland oaks)
Growth range potential (Yellow-poplar-no rating for oaks): 375-450 bd.ft./acre/year
Management Concerns: Flooding between December and June

****Crider Silt Loam (CtC3) (9.89 acres)**

Wellston Silt Loam (WeC2, WeC3, WeD2, WeD3) (9.09 acres) Moderately deep and deep, moderately sloping and strongly sloping, well drained soils on uplands. Surface layer is about 9 inches thick and yellowish-brown. The subsoil is about 31 inches thick. Depth to hard sandstone bedrock is about 40 inches. This soil is moderate in content of organic matter and low in natural fertility. Available water capacity is moderate or high, and permeability is moderate. Runoff ranges from medium to very rapid.
Degree Slope: 6-18 %
Woodland Suitability Group: 3o10
Site Index: 70-80 (Upland oaks)
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Management Concerns: Runoff and erosion

Crider Silt Loam (CrB2, CrC2, CsB3, CsC3, CtC2) (7.2 acres) Deep, gently sloping and moderately sloping well-drained soils on uplands. Surface layer is dark-brown silt loam about 8 inches thick. Subsoil is about 62 inches thick. This soil is moderate in

content of organic matter and in natural fertility. Available water capacity is high and permeability is moderate. Typically, these soils are eroded. Runoff is medium to rapid.
Degree Slope: 2-12%
Woodland Suitability Group: 1o1
Site Index: 85-95 (Upland Oaks)
Growth range potential (Upland oaks): 300-375 bd.ft./acre/year
Management Concerns: Runoff and erosion

Gilpin Silt Loam (GlD2, GlD3, GlE2, GpF) (3.6 acres) Moderately deep, strongly sloping to steep, well-drained soils. Surface layer is very dark grayish-brown silt loam about 3 inches thick. Subsurface layer is pale brown silt loam about 9 inches thick. Subsoil is about 17 inches thick. Depth to hard sandstone and shale bedrock is about 29 inches. This soil is moderate in organic matter. Available water capacity is low and permeability is moderate. Runoff is rapid to very rapid.
Degree Slope: 12-30 %
Woodland Suitability Group: 3o10 or 3r12
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Site Index: 70-80
Management Concerns: Runoff and erosion

****GpE (0.18 acres)**

** There is no information on these soils.

RECREATION: The fire trail that comes in off of Cold Friday Road and goes through the middle of this tract is one of the designated disabled hunter's trails. Therefore, this tract no doubt receives a fair amount of hunting pressure from the public. Hiking would be another form of recreation that occurs here, because of the easy access. There were three caves that were found, which are not mapped at the present, so there is potential recreation use from the caving community as well. The fire trail that forms the southeastern boundary of the tract is also a designated horse trail, so horseback riding is another form of recreation that this tract receives.

WILDLIFE: Wildlife species such as white-tailed deer, wild turkey, and squirrels as well as other non-game species can all be found on this tract. There are some hard mast food sources provided by the oak hickory stand, but another habitat component would come from the advanced old field stand. This stand provides 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.

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 or greater**
Live	**6 (in 12-18" class)**	**3**
Snag	**5**	**1**

Actual Numbers in tract 3006:

	Number of Trees Per Acre (present – harvest = residual)	
Tree Type	**10 to 18 inches DBH**	**20 inch DBH or greater**
Live	42.4 - 21.6 = **20.8 (in 12-18" class)**	9.1 - 5.6=**3.5**
Snag	**4.5**	**0.4**

These numbers show that live tree densities meet guidelines, but both large and small snags do not. 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.

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

WATERSHED: The majority of the tract contains gentle to moderately steep slopes that drain into intermittent drainages that drain into Cold Friday Hollow, which eventually drains into the Ohio River. This area appears to have a potentially extensive karst system, so much of the hydrology would consist of subsurface drainage.

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 did not show any rare, threatened, or endangered plant or animal species located within this tract. The nearest

occurrence was the striped gentian plant across Cold Friday Road in neighboring tract 2916.

A large canopy tent was found a couple hundred feet south from Dutch Hollow Road that appeared to have been left behind from the previous summer. It is rather large, and would be difficult to drag out without being disassembled first.

SILVICULTUAL PRESCRIPTION:

General: Number of trees per acre and basal area per acre figures indicate that both stands are overstocked with levels 105% to 130%. Removal of trees tallied as "cut" either via a timber sale or TSI would reduce the stocking levels to between 55% and 65% stocking. Across the whole tract, this would put the stocking right at the B-line of fully stocked to slightly understocked.

Due to the amount of volume being carried on the majority of the tract (4800 bd. ft/ac), the fact that there is no record of any timber harvest taking place back to before 1973, and the general condition of the overstory trees, the initial impression was that an improvement harvest could be undertaken in this tract at any time. This would produce a sale volume of about 247,000 board feet or about 2634 board feet per acre and leave about 175,000 board feet or about 2162 board feet per acre.

Utilizing records of the past history of this tract, an inventory done in 1973 indicated a total standing volume of 1172 board feet per acre. The 2006 inventory shows 4800 board feet per acre, and this figures out to a growth rate of 110 board feet per acre per year. This is somewhat low, but about half of this tract is quite degraded. 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 conversion of much of the low grade hardwood and cedar trees to a better crop of hardwood trees.

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 would account for about 42 square feet of basal area in stand 1 (conversion of cedar), and 16 sq. ft. in stand 2. Cull tree removal would account for an additional 5 square feet of basal area in stand 1, and 10 sq. ft. in stand 2. 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: Old field - advanced

This 50-acre stand covers about half of the tract, and contains a volume of 4077 board feet per acre of which 2029 was classified as harvestable and 2048 was classified as residual. This would remove 70 square feet of basal area, which would leave the residual

stand with 64 sq. ft. Stocking would drop from 130% to about 65% with the indicated management (fully stocked above the B-line).

Since this stand has no history of harvesting in the last 35 years, and currently contains a moderate volume of harvestable material and a moderate volume of residual growing stock, the recommendation would be to rank this tract as a medium to high priority for conducting a harvest. The preponderance of low grade trees currently present and the potential to improve the stand and establish a quality stand of oak with the regeneration present is another factor encouraging the application of a managed harvest in this stand. Any timber sale would include parts of this stand as well as all of stand 2. The majority (75%) of the harvest volume for stand 1 (2029 bd. ft/ac) would be contained in yellow-poplar (691 bd. ft/ac), eastern redcedar (316 bd. ft/ac), white ash (285 bd. ft/ac), and black oak (262 bd. ft/ac).

Much of this stand is dominated with large, open grown, low grade trees in the overstory with an abundance of sassafras, blackgum, eastern redcedar, and beech in the midstory and understory. In places, there is excellent oak regeneration in the understory ranging from seedling to sapling size. Timber harvest and post harvest TSI should concentrate on releasing this oak regeneration – mostly with larger openings.

Likely, a hardwood sale would be conducted from a separate exclusive cedar sale. The hardwood component would be marked in conjunction with stand 2 first. Subsequently, a cedar sale could be conducted to help release the oak regeneration that is present in this stand. Finally, TSI would remove any leftover competing trees and allow a new stand of oak and poplar to establish itself and grow here.

Stand 2: Oak hickory

This 44-acre stand covers the other half of the tract, and is located along the ridgetop and slopes on the east portion of the tract. It contains a higher volume of 5614 board feet per acre of which 3323 was classified as harvestable and 2291 was classified as residual. This would remove 61 square feet of basal area, which would leave the residual stand with 51 sq. ft. Stocking would drop from 105% to about 55% with the indicated management. This management reflects heavy removal of the mature overstory and the use of group selection openings and large regeneration openings. Consequently, the stocking would drop to below the B-line to a slightly understocked state.

Since this stand also has no history of harvesting in the last 35 years, and also currently contains a high volume of harvestable material and a moderate volume of residual growing stock, it should be included with stand 1 as a medium to high priority for conducting a harvest. The majority (70%) of the harvest volume for stand 2 (3323 bd. ft/ac) would be contained in pignut hickory (643 bd. ft/ac), black oak (564 bd. ft/ac), white oak (477 bd. ft/ac), white ash (322 bd. ft/ac), and red oak (282 bd. ft/ac), with various other species making up of the remainder of the harvest volume.

Most of the stand would probably be harvested under a group 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. 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.

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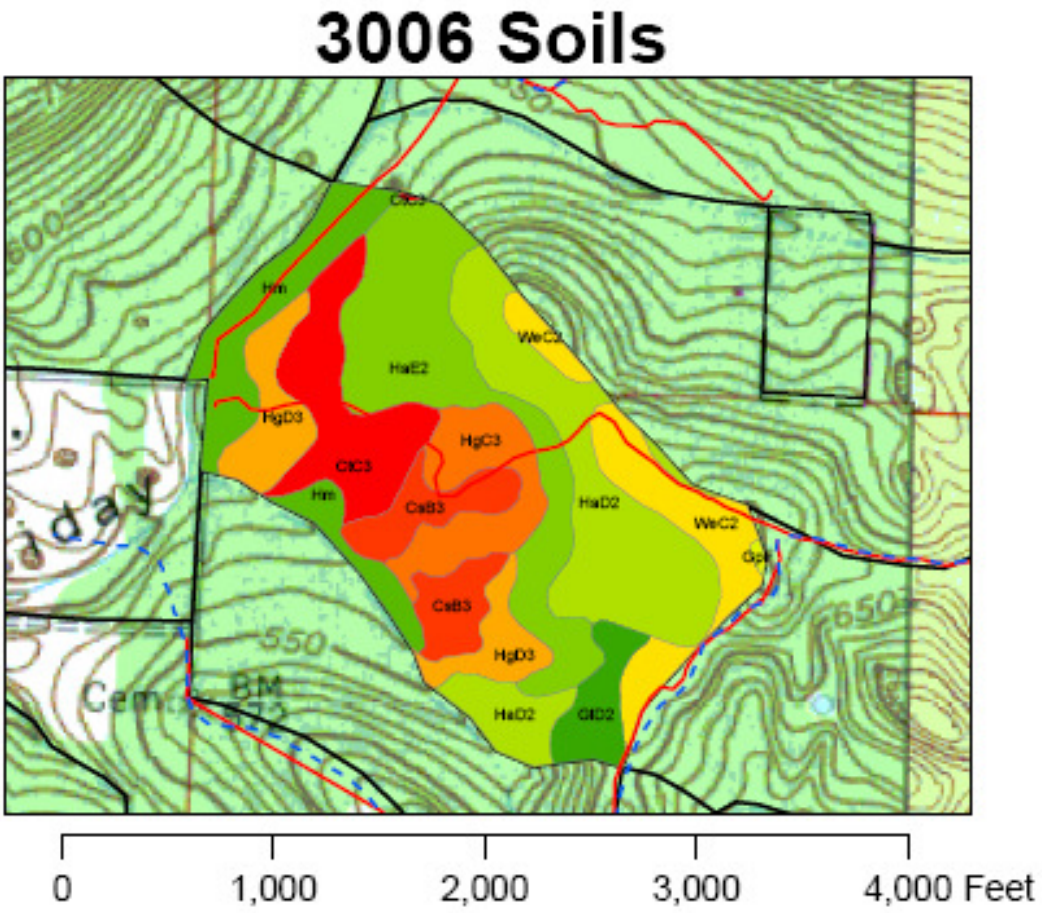

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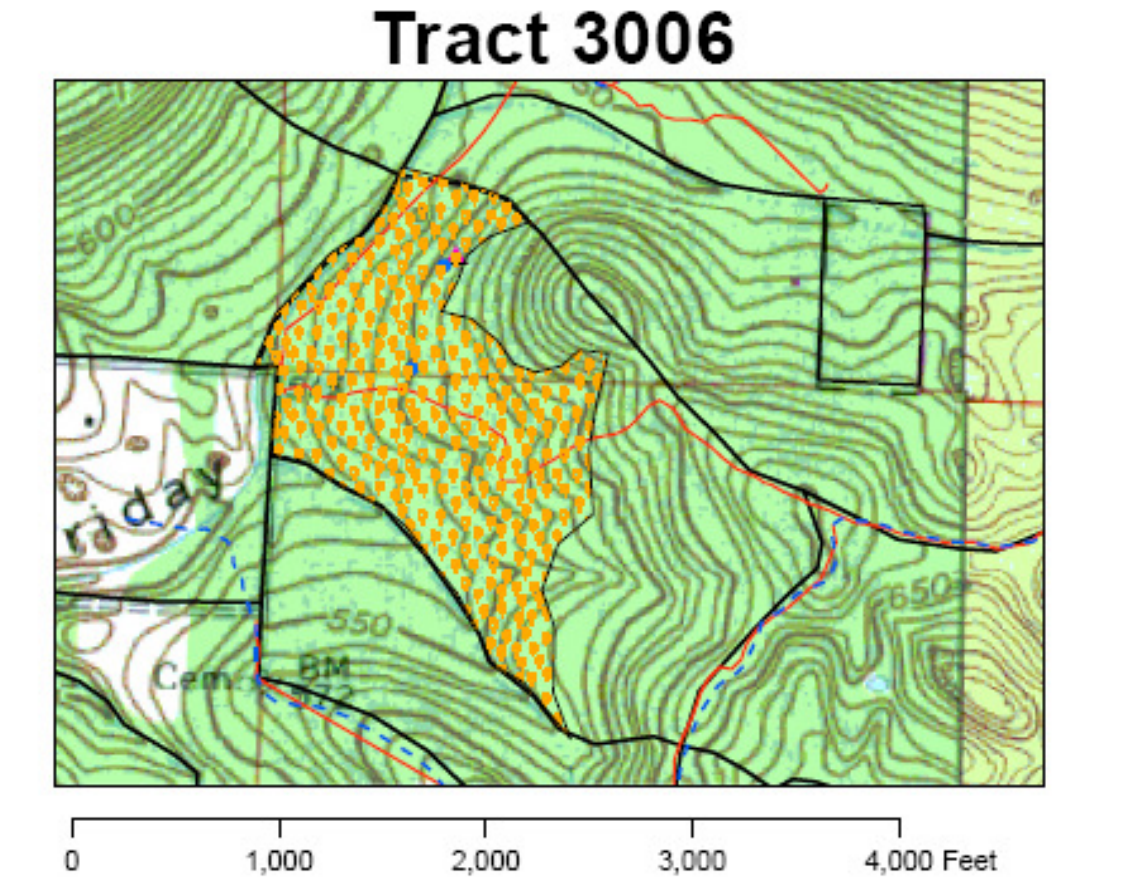
Topographic Map



Legend

- Spring
- Tent
- Cave
- Horse trails
- Fire Trails

Stand 1: Old field - successional - 50 ac

Stand 2: Oak hickory - 44 ac

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