

## RESOURCE MANAGEMENT GUIDE

Harrison-Crawford State Forest                      Compartment: 29    Tract: 3  
 Forester: Dwayne Sieg                                      Date: Inventory March 2005  
 Management Cycle End Year: 2030    Management Cycle Length<sup>1</sup>: 20  
 years

Acres Commercial Forest: 74.6    Basal Area ≥ 14 Inches DBH: 61.98 ft<sup>2</sup>/ac.  
 Acres Noncommercial Forest:    Basal Area < 14 Inches DBH: 55.05 ft<sup>2</sup>  
 Acres Permanent Openings:      Basal Area Culls: 5.07 ft<sup>2</sup>  
 Acres Other:    Total Basal Area: 122.1 ft<sup>2</sup>/ac.  
 Acres Total: 74.6    Number Trees/Acre: 437

Average Site Index: 74                                      Stocking Level<sup>2</sup>: Overstocked, off scale  
 Calculated Annual Growth: 94.8 bd.ft./acre/year

SPECIES	LEAVE VOL.	HARVEST VOL.	TOTAL VOL BD.FT.
White oak	134,000	83,100	217,100
Black oak	25,900	55,000	80,900
Red oak	10,300	16,300	26,600
Sugar maple	10,000	16,300	26,300
White ash	5,200	11,100	16,300
Scarlet oak	00	12,300	12,300
Pignut hickory	3,900	8,100	12,000
Post oak	6,500	4,000	10,500
Shumard oak	2,800	2,400	5,200
Yellow poplar	00	5,200	5,200
Chinquapin oak	2,900	900	3,800
Black cherry	00	3,700	3,700
Red maple	00	3,600	3,600
Shagbark hickory	3,000	00	3,000
Persimmon	00	1,500	1,500
E. red cedar	00	700	700
Bitternut hickory	00	500	500
<b>Totals</b>	<b>204,500</b>	<b>224,700</b>	<b>429,200</b>
<b>Totals/Acre</b>	<b>2,741</b>	<b>3,012</b>	<b>5,753</b>

### Location

<sup>1</sup> Calculated Management Cycle [Min. Feasible Cut Vol.per Acre/.8 (assumed net annual growth) x Annual Growth]= years

<sup>2</sup> "Forestry Handbook" Northeastern Area, State and Private Forest Service, U.S. Department of Agriculture

Tract 3 is located in Sections 11 and 14, T4S, R2E. It is in Harrison County, Harrison TWP.

### **General Description**

The predominate cover types are oak-hickory in areas that had not been cleared for farming, mixed native hardwoods in the previously tilled or open pasture or orchard acres, and e. red cedar and dry upland hardwoods on the poorest sites. The current description of this tract might be best described as a product of its past use and abuse. Where slopes were gentle enough for farming, they have naturally reforested into native hardwoods, but with greatly varying sizes, vigor, stocking, form, soundness, and species. At the time of the inventory, the central, once farmed area, was making a shift in natural succession. Previously, sassafras, persimmon, and other primary invader species had been the most common tree species, there, but in 2005 were dying out. In this general area, scattered sawtimber of poorer form (from having once grown in the open) can be found.

### **History**

State ownership of tract 3 began in February, 1932 when the State purchased the second parcel of Harrison-Crawford from a Pfeister (131.2). This acquisition takes in most of the tract. Some of the eastern portion was also a very early purchase in 1932 from Conner/Rucker (131.4). It is believed that these parties were holders of those properties and had not actually lived or 'worked' them. There is a small part of the tract in its SW edge that was purchased from Lowe in 1934 (131.20). Lowe was most likely a resident prior to selling.

Tract 3 shows signs of a typical past of past agricultural practices, namely pasturing and maybe tillage. Extinct erosion gullies are common in the central gentle sloping areas. A local resident, whose relatives once lived on some of the property, says that there had been an orchard just north of the section line in section 11. The 1949 aerial photo shows that this area was well on its way to reforesting by that time, with crown closure over much of it. Judging from the variation in closure and crown sizes in the photograph, abandonment of farm ground must have started well before the time of that picture.

It is likely that some to a lot of the tract had indiscriminate burning during the time prior to State ownership

There is no known documentation of management of the tract prior to 1978. There were residual e. red cedar stumps noted in the 2005 inventory that appear to have been cut, possibly in the 1970s. In July, 1978, an inventory was conducted by DeMunbrun. At that time, a total volume per acre of 2,371.7 bd.ft and a basal area of 57.5 sq.ft./acre was indicated.

In 2007-08 the access road that serves tract 3 (and several others) was improved and a portion re-routed to provide better access and to discontinue use of a

segment in tract 3 that was steep, narrow, curvy and prone to damage by horse back riding as it has seepy soils.

### **Landscape Context**

Tract 3 is surrounded immediately by forested, State Forest ground. Within a short distance is the Post Oak-Cedar Nature Preserve and the O'bannon Woods State Park. The nearest private properties are over 1/2 mile away. Those properties tend to contain a mix of open grass/pasture and wooded areas with single family residences.

### **Topography, Geology and Hydrology**

The relief in tract 3 runs from about 545 feet to over 820 feet above sea level, a change of nearly 300 feet in elevation. Slopes vary from gentle to steep. Aspect ranges from southeast to westerly. Bedrock is limestone under the lower 1/3 to 1/2 of the slope, with a sandstone 'cap' above that. There are minor amounts of karst features present, with the main feature being limestone outcroppings or talus along the lower slope.

### **Soils**

The soil types on tract 3 should indicate a higher than normal productivity as types such as Hagerstown and Gilpin are well represented (57% total area). However, with the predominating southerly aspects and the degradation by farming practices, actual productivity is noticeably lower. The calculated growth of 94.8 board feet per acre per year is an indicator of this reduced capability. At the time this plan was written, the descriptions for 2 types (symbols Ho and BtD5) were not located. They occupied sites previously described as Hm-Haymond and Gu-Gullied. The descriptions for these soils are used as it is likely that the descriptions would be similar or the same. Site index was calculated using a weighted average of the indices of the soils. The low end of the range for most of the soils was used, because of the degradation of the tract during the agricultural era, both soils and resulting timber condition.

**Gilpin Silt Loam (GID2, GID3, GIE2, GpF) (25.1 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. 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

**Corydon Stony Silt Loam (CoF) (23 acres)** Shallow, moderately steep to very steep, well-drained, stony soils on uplands. Surface layer is about 3 inches. Subsurface is about 6 inches thick. Subsoil about 9 inches thick. The depth to hard limestone bedrock is about 18 inches. High in organic matter and low in natural fertility. Runoff is rapid or very rapid. Soil type is characterized by limestone outcrops, with as much as 15% on benches which are deeper than 20 inches to bedrock.

Degree Slope: 20-60 %

Woodland Suitability Group: 3d7

Site Index: **65-75** (Upland oaks)

Growth range potential (Upland oaks): **155-220**

Management concerns: Runoff and erosion

**Hagerstown Silt Loam (HaC2, HaD2, HgC3, HgD3, HgE3) (17.0 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. 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

**Wellston Silt Loam (WeC2, WeC3, WeD2, WeD3) (4.29 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. 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

**Haymond Silt Loam (Hm) (Used for Area Symbol 'Ho') (2.19 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. 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-** no rating for upland oaks)

Growth range potential (Tulip poplar-no rating for oaks): **375-450** bd.ft./acre/year  
Management Concerns: Flooding between December and June

**Gullied Land (Gu) (Used for Area Symbol BtD5) (1.86 acres)** On uplands in areas that are mostly 3-15 acres in size but in places are as large as 40 acres. Underlain at a depth of 2-6 feet by bedrock of limestone, shale, or sandstone. Bedrock is exposed in the bottoms of gullies in many places. Most of the land is barren, but in places shrubs, weeds, and wild grasses are growing.

Woodland Suitability Group: 4r3

Site Index: **72-85**

Growth range potential (Shortleaf and Virginia pine): **100-300** bd.ft./acre/year

Management Concerns: Runoff and erosion.

**Zanesville Silt Loam (ZaC2, ZaC3, ZaD2) (1.18 Acres)** Deep, moderately sloping and strongly sloping, well-drained soils on uplands. A very firm fragipan in the lower part of the subsoil. Surface layer is very dark grayish-brown silt loam about 3 inches thick. The subsurface layer is about 5 inches thick and dark yellowish-brown. Subsoil is about 42 inches thick. The depth to sandstone bedrock is about 65 inches. Moderate or low in content of organic matter and low in natural fertility. Available water capacity is high, and permeability is very slow. Runoff is medium to rapid.

Degree Slope: 6-18%

Woodland Suitability Group: 3d9

Site Index: **70-80** (Upland Oaks)

Growth range potential (Upland oaks): **185-260** bd.ft./acre/year

Management Concerns: Runoff and erosion. Fragipan limits the available water capacity.

### **Access**

Tract 3 is reached by taking Cold Friday road south to Potato Run creek, crossing the ford on the creek and entering the access road running uphill at the far side of the ford. The beginning of tract 3 is about ½ mile up this road.

### **Boundary**

Tract 3's north boundary is mostly Compartment 29, tract 1, formed by an intermittent or ephemeral stream channel. The NE boundary is another small drainage that separates the tract from Compartment 29, tract 4. It is bounded on the south by a mapped intermittent (referred to locally, as Briles Hollow) which separates it from Compartment 29, tracts 2, 8, 9, and 10.

### **Wildlife**

There should be a fair diversity of habitats found on tract 3, once again, due as a result of past agricultural practices and the natural and artificial reforestation of the various sites within the tract. Mature hardwood (oak-hickory) forest constitutes about 64% of the area. Species needing hard mast, such as squirrels, deer, turkey, and some songbirds should find a food supply in this portion. The mid succession hardwood areas offer

some soft mast, such as sassafras and persimmon. Conifers, such as e. red cedar and the small amount of mature non-native white pine offers roosting cover for some birds. At this point in time, the woodland habitat type most lacking is early succession. Regeneration opening(s) created from harvesting should provide a small amount of this succession level. There are a series of permanent wildlife openings along the main ridge, east of the tract, as well as a wildlife pond just outside the tract in 2405.

A check of the Natural Heritage Database indicated several species of plants and animals within a mile of the tract. None of these species were mapped within tract 3. However, management of the tract will take their proximities into consideration. Recommendations for their protection will be practiced, should any of those species be observed. There were a few species of subterranean invertebrates noted.

#### Indiana Bat

Timber harvest activities may have both positive and negative effects on the Indiana bat. While undetected but occupied roost trees could be cut during spring, summer or fall, the probability of disturbance or direct injury or death to bats is extremely small. Timber harvest could create conditions that are beneficial to Indiana bats. Roads and/or skid trails provide improved canopy foraging conditions by reducing clutter. Roosting habitat could also be improved by reducing clutter around roost trees. Edges of log landings and regeneration openings could provide roost trees with improved solar exposure, thus improving microclimate/thermal conditions for roosting areas. This would improve reproductive success and fitness, contributing to local population stability or increase. In cases of maternity trees this could provide conditions that increase growth and activity rates of young bats, leading to reduced time for parental care.

Suitable roost trees such as large diameter snags or live trees with loose or exfoliating bark will be retained in sufficient numbers to provide continuing roosting habitat for the Indiana bat.

A major hibernacula, Jug Hole Cave, is just over a mile from tract 3. A single male Indiana bat was tracked to an overnight roost tree in Compartment 29, tract 1 during a survey done in 2004. See Appendix for additional information about the Indiana bat's habitat needs and management around it.

#### Hooded Warbler

This warbler was noted (1988) within a mile of the tract. This species is included in this narrative as it is mobile.

The hooded warbler is a forest-gap species that nests within a dense shrub layer in mature deciduous forests (Crawford et al. 1981, Robbins et al. 1989, Moorman et al. 2002). Preferred nesting sites often are associated with regenerating forest gaps (Gartshore 1988, J. Castrale, IDNR, pers. comm. 2008). This species is associated with large forested tracts, so extensive deforestation, clearing, and fragmentation on breeding and wintering grounds are thought to be threats (NatureServe Explorer 2008). The hooded warbler frequently is parasitized by the brown-headed cowbird (NatureServe Explorer 2008, J. Castrale, IDNR, pers. comm. 2008).

The management implications are that temporary regeneration openings would provide the natural regeneration needed for preferred nesting sites.

### Special Habitats

In the 'Ecological Resource Review' document developed for this tract, it asks for explanations for such habitats found in or near this tract. First listed were seasonal ephemerals or pools. Included as such when consideration was given were the occasional pools in the mapped intermittent streams Potato Run and Briles Hollow that are just outside or along the edge of the tract. These habitats were not noted within the tract. Management activities in tract 3 should not affect these features. There is a wildlife pond in Compartment 24, tract 5, just outside of this tract. There could be a potential impact on this pond by a planned log yard. Keep debris and runoff out of the pond during logging activities. While none were noted, it is likely that there is/are sinkholes within the tract. Follow the DoF Procedures manual to avoid allowing runoff and debris into the feature. There are amounts of outcroppings and talus in areas of the tract. Disturbance should be minimal with occasional skid trails crossing through them during a harvest.

### **Communities**

Plant communities found in tract 3 should be fairly consistent with those found in the nearby region. Again, oak-hickory forest is the prevailing cover type, with species such as white, scarlet, and black oaks, pignut and shagbark hickories commonly found making up the overstory. Since there has been several decades, now, of fire prevention and absence of browsing livestock, the lower and mid canopies are being occupied primarily by shade tolerants such as sugar maple and American beech. There are small areas of limestone outcroppings and surface rock that are inhabited by forest glade communities. Eastern red cedar and post oak are the main overstory species in these areas. Where open farm ground once occurred, natural hardwood species are going through a succession process with the earliest invaders such as sassafras and

persimmon fading out of the stand and being replaced by species such as red and sugar maple and white ash. Some of the harsher sites that had been farmed are more commonly inhabited by e. red cedar, hickories, to name a few. Again, the NHDB noted several plant species of concern within a mile of the tract, but none within. Many, if not most of the plants noted are protected within the boundaries of the Post Oak-Cedar Nature Preserve to the north. The presence of Japanese stilt grass has been observed along the forest roads/horse trails in the area. This species should be monitored and treated if opportunity/resources are available.

### **Recreation**

The primary recreational use of tract 3 is most likely horse back riding, as the 'Cypress Pond' and 'Blackie's Hollow' trails go along either the south border or on the access road described earlier. Hunters also use this tract in the pursuit of game.

### **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.

### **Tract Subdivision Description and Silvicultural Prescription**

Subdivision of this tract should logically follow the past practices influences already described in earlier sections of this plan. The accompanying layout, showing the 1949 aerial photo provides the basic subdivisions. The following describes the silvicultural needs of each area.

-Areas open or semi open or mostly forested in 1949 (around 20.9 acres). These were the farmed areas previously described. They are completely reforested with crown closure, but are generally small trees. There are some scattered 'wolf' trees, trees that had grown much of their lives without competition from other trees. The stocking and quality varies considerably, although very little was observed to contain high quality growing stock. Release better second story trees from less desirable wolf trees. Thin where needed.

-Semi Open Glade-Like Areas (around 3.2 acres). These sites contained above normal surface limestone and occasional outcroppings of bedrock. Productivity is lower in these thin soils. Form is poorer and height is less, here. Improvement cutting might be practical in the transition zones around the edges of these locations.

-Fully Forested Prior to 1949 (around 50.5 acres). This portion of the tract was shown to have full canopy closure in 1949. It is apparent that most of the type was under forest cover during the agricultural use era of the

tract. It is probable that small amounts of this area had been once farmed, but abandoned long enough ago that it had reforested by 1949. There is some variation within the area that would be considered as sub stands. Changes in aspect would be the primary cause for the variation, although factors as woodland pasturing, fire, or past cutting would play a roll in these changes. Cover type is oak-hickory with white oak easily predominating. Black and scarlet oaks are common, but are generally overmature and exhibiting the locally common trait of fading out of the stand. Remove mature and overmature stems to capture merchantable value before it is lost to mortality. Remove white ash where possible to prevent loss to eventual mortality from emerald ash borer infestation. This area is overstocked and thinning will be necessary in various locations to improve or maintain vigor. Improvement selections will remove defective trees from the stand. There may be reason to create one or more regeneration openings of 1 to 5 acres. Utilize interim guidelines concerning the endangered Indiana bat when making selections.

### **Summary Tract Silvicultural Prescription and Proposed Activities**

Tract 3 is in need of an improvement harvest, with some thinning of the stands to bring stocking down to a more optimum level. Removal of defective and mature trees is also warranted. Include tracts 2901 and 2904 as part of harvest. Post harvest TSI will be useful on some sites, releasing crop trees to optimize growth rates. Vines were not noted to be excessive and invasive exotic trees (*Ailanthus*) were not observed during inventory so control on these species is unlikely to be needed.

### **Proposed Activities Listing**

- 2009-10 Mark harvest. Include with merchantable areas of tracts 2901, 2904. Identify any areas of oak regeneration and perform understory TSI in any of those locations.
- 2010. Sell harvest. There is need for harvests in adjacent tracts 1 (to the NW) and 4 (to the east) that are limited in area. Include these tracts with a harvest in tract 3.
- 2012. Limited post harvest TSI. Complete any regeneration openings created during harvest.
- 2025. Tract inventory
- 2025-30. Crop tree release on any regeneration openings created during last harvest.
- 2030-35. Prepare harvest.

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[http://www.in.gov/surveytool/public/survey.php?name=dnr\\_forestry](http://www.in.gov/surveytool/public/survey.php?name=dnr_forestry)

You **must** indicate “Harrison-Crawford C29 T3” 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.

APPENDIX

HARRISON-CRAWFORD STATE FOREST  
RESOURCE MANAGEMENT GUIDE  
ADDENDUM

**COMPARTMENT 29, TRACT 3**

Dwayne Sieg, Property Manager

**METHODS** Sampling was done using a variable radius random plot system, using a 10.0 factor prism. There were 35 (1 for every 2.1 acres) plots measured. Software was 2Dog.

**SNAG GUIDELINES** Minimum 5 snags per acre  $\geq$  9 inches DBH. Minimum 1 snag tree per acre  $\geq$  19 inches DBH

**RESULTS**

**SNAG COUNT**

SPECIES	$\geq$ 9" DBH	$\geq$ 19" DBH	TOTALS
American elm	.2		0.2
Black oak	1.1	.2	1.3
E. red cedar	.5		0.5
Post oak	.2		0.2
Sassafras	.9		0.9
Sugar maple	.6		0.6
White oak	.6		0.6
Red oak	.9		0.9
Scarlet oak	.2	.1	0.3
<b>TOTALS</b>	5.2	0.1	5.5

**LIVE TREE GUIDELINES**

**Guideline standards: Minimum 3 live trees per acre  $\geq$  20" DBH;  
Minimum 6 live trees per acre  $\geq$  11" DBH, these trees preferably of bark  
characteristics determined to be desirable for the Indiana bat**

	Live Trees $\geq$ 11"DBH	Live Trees $\geq$ 11"DBH Harvest	Live Trees $\geq$ 20"DBH	Live Trees $\geq$ 20"DBH Harvest
	33.6	19.1	11.1	6.7
<b>Residual Trees</b>		<b>28</b>		<b>4.4</b>

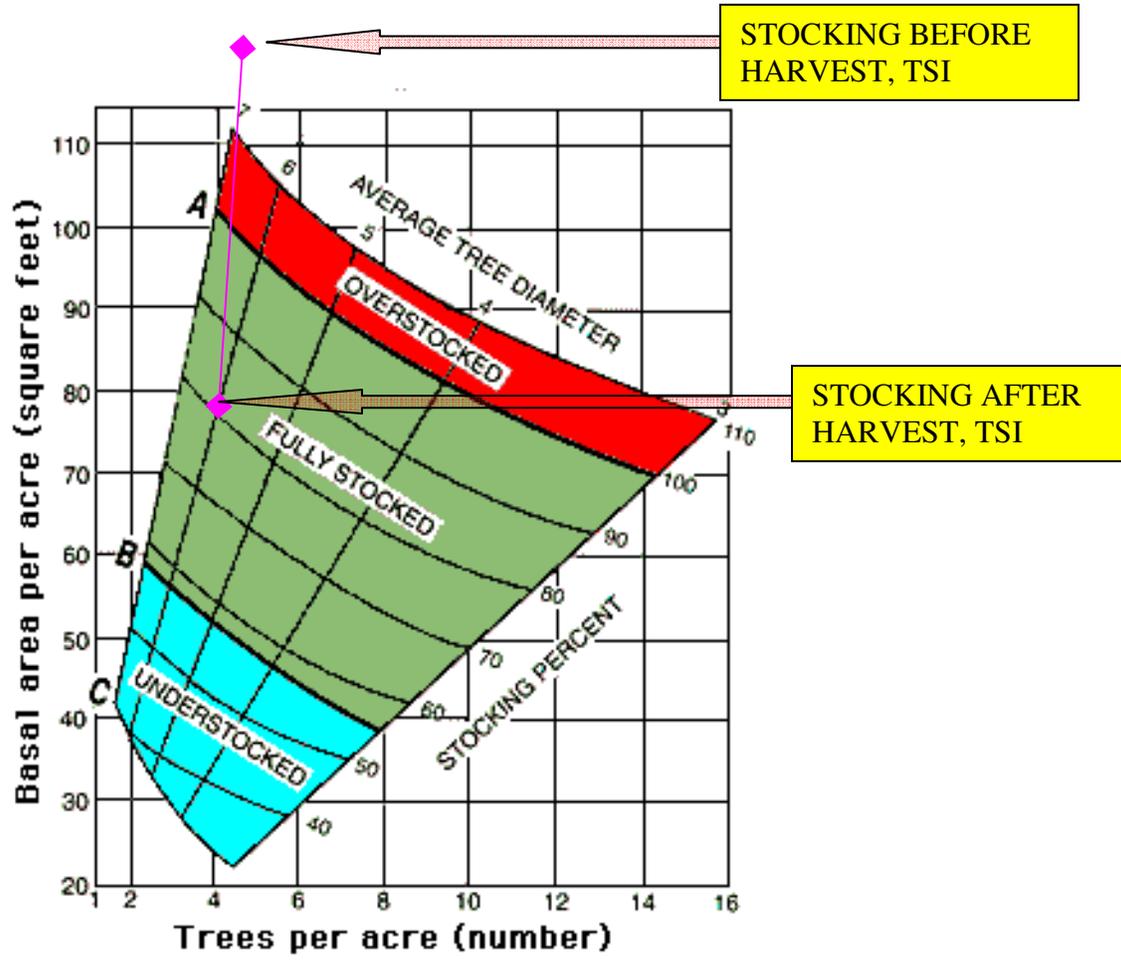
**HARVEST IMPACTS**

The trees designated as 'harvest' include poles and sawtimber needing removed by timber stand improvement (TSI). The residual live trees under 20" DBH (28) should easily fulfill the minimum number recommended (3) per acre. The inventory indicates that the residual number of trees 20" DBH or larger will exceed the recommended minimum by 1.4 trees per acre. The interim guidelines for the Indiana bat calls for leaving the 3

largest trees per acre from a list of 14 species when harvesting. White oak is on that list and is the predominate species on the tract. This species now, and to the distant future will supply ample numbers of trees with desirable bark characteristics. However, efforts during the harvest and subsequent should take advantage of any possible circumstances to grow these trees to larger size, faster (thin and release) and to encourage regeneration of these oaks, should there be areas of advanced regeneration (understory release and subsequent removal of overstory at the appropriate time). Inventory indicated a shortfall (of the guidelines) of snags in the  $\geq 20$ " DBH category. Numbers of snags could be artificially created by girdling up to 75 trees in that size range, should it be necessary, although if that many cull trees of that size range cannot be found, it would call for killing otherwise sound or nearly sound trees (not preferred).

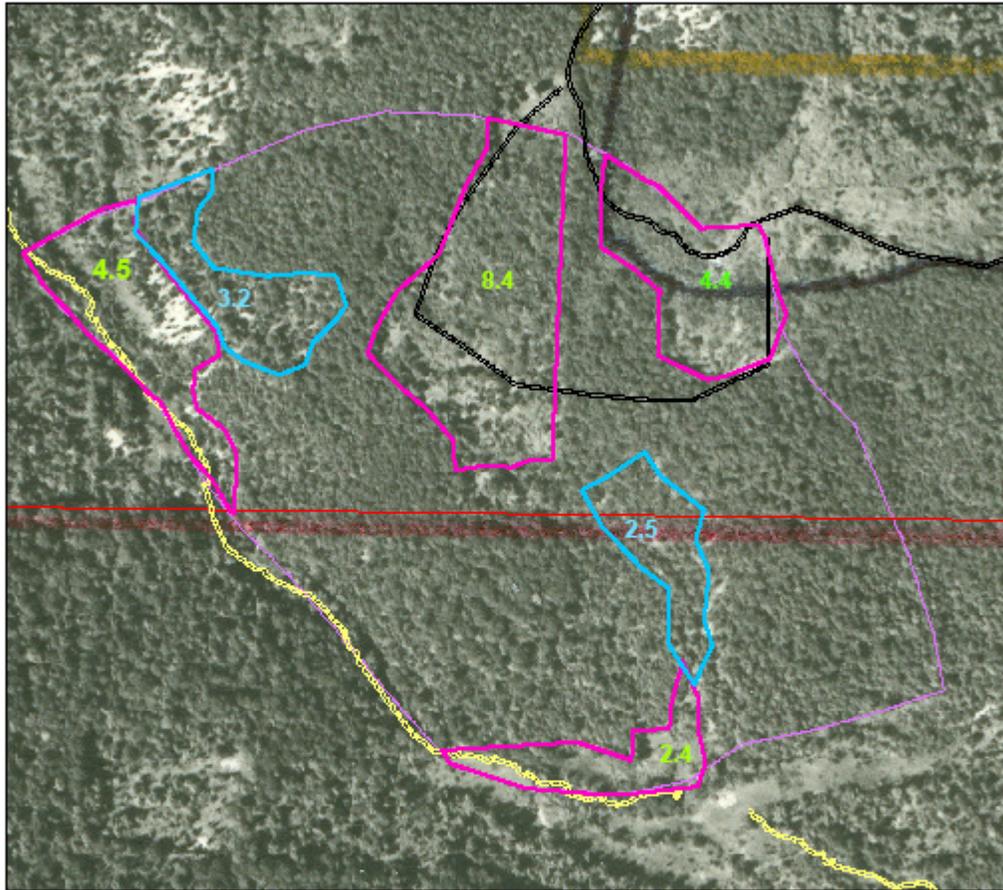
Note: Information for cavity trees had not been required at the time of this inventory (2005).

GINGRICH STOCKING TABLE  
UPLAND CENTRAL HARDWOODS



Harrison-Crawford State Forest  
1949 Aerial Photo/Cover Typing  
Compartment 29, Tract 3  
July 2009

Dwayne Sieg



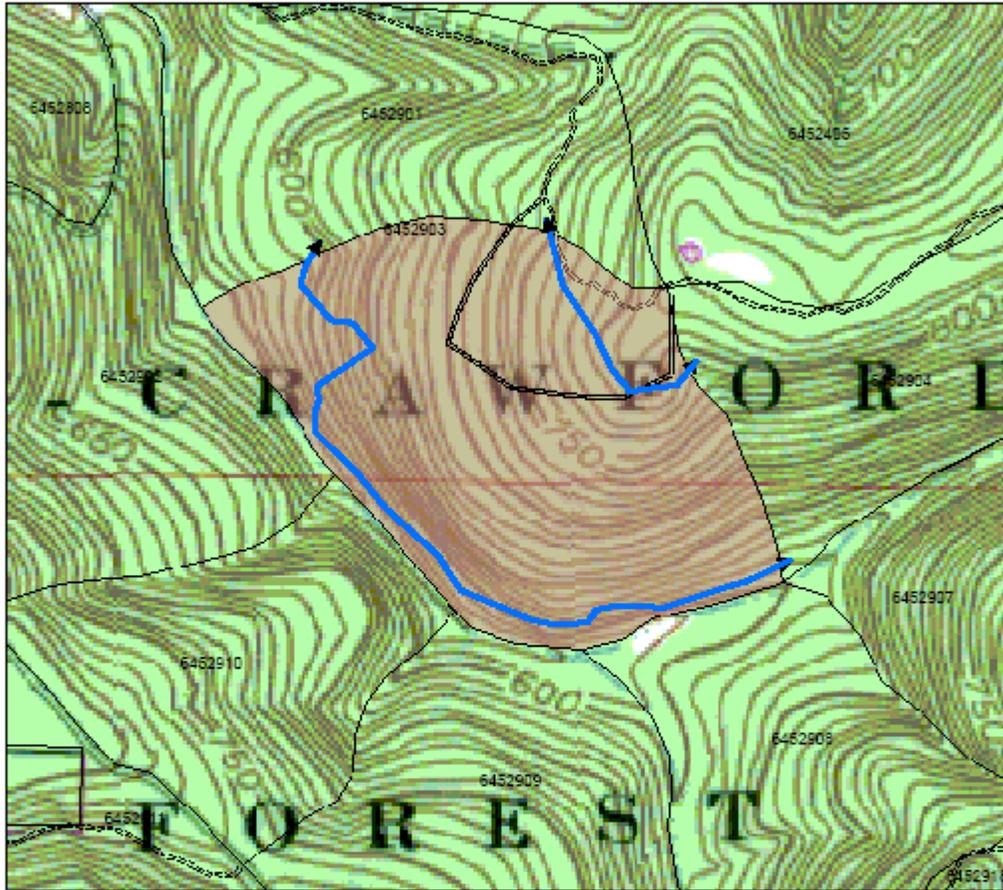
490 245 0 490 Feet

-  Open or Semi Open Ground (19.7 acres total)
-  Semi Open Glade Like Areas (5.7 acres total)
-  Tract Boundary
-  Old Cold Friday Road
-  Historic Site
-  Stone Pile



Harrison-Crawford State Forest  
PLANNED HARVEST AREA  
Compartment 29, Tract 3  
July 2009

Dwayne Sieg



775 387.5 0 775 Feet



←→ Area Within Tract Planned for Harvest



Harrison-Crawford State Forest  
 STAND TYPE MAP  
 Compartment 29, Tract 3  
 July 2009

Dwayne Sieg

