

## Resource Management Guide

**Harrison-Crawford State Forest**  
**Christine Martin**

**Compartment: 14    Tract: 08**  
**Date: 9/12/08**

### Location

This tract of land is located within the Harrison –Crawford State Forest in Crawford County. This tract is located on three different sections; T3SR2E22, T3SR2E28, T3SR2E27.

### General Description

This stand is made up of four different stand types. There is the mixed hardwood stand which is 10 acres; the Steep Rocky stand which is 12 acres, the Oak-Hickory stand which is 77 acres and the Rocky stand type is 33 acres.

The mixed hardwoods generally follow the drainages in this tract. There is an assortment of hardwood species in this stand type. One tree that is a constant in this stand type is American beech. The steep rocky stand is located on either side of the drainage that bisects the tract in two separate sections. In this stand type the topography becomes very steep and very rocky. There are also very thin soils on this portion of the tract. Because these soils are thin the trees here are small and of poor quality. The rocky stand type is located on the lower half of the southwestern facing slope. There are some rock outcroppings here as well as in the steep rocky, but the soils are deeper so the trees here are larger and better quality. The oak-hickory section is on the northern half of the slopes on this tract. There is an assortment of oaks on this stand, depending where you are located within this stand type. On the ridge there are mainly large black oaks and white oaks. In the middle there are mainly white oaks with some large and poor formed black oaks scattered around. On the lower portion of the oak-hickory stand there are mainly white oaks, with the occasional chinkapin.

### History

This tract of land was acquired in 1966 by Wyandotte caves, which was previously owned by Rothrock.

There was a timber sale performed on this tract in 1987. This tract was combined with tracts 1406, and 1408. In total there was 165,000 board feet removed from this sale, including 62,729 board feet that were removed from tract 1408. The main species removed were black oak and pignut hickory.

In 1989 there was a TSI (timber stand improvement) contract to help improve stand vitality. All the vines were removed from the tracts, some trees were girdled to promote the healthier trees around and the regeneration openings were groomed so that the more desirable healthier trees will grow.

### Landscape Context

This tract is bordered on three sides by the Harrison-Crawford State Forest. The fourth side is bordered by O'Bannon State Park. The section of O'Bannon State Park which borders this tract is the Wyandotte Cave section. This section is forested except for the entrance to the cave and the parking area.

Wyandotte Cave road also runs to the east of this tract which breaks up the continuity of the forest. There is also a horse trail which runs to the north of the tract which adds to the segregation of continuous forest cover.

About a half mile to the north of this tract is privately owned land. This land is in agriculture. About a half mile to the southwest there are private landholdings. Most of these landholdings are forested but some are also in agriculture. To the southeast there is the same situation.

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

There are a couple different slope types on this tract due to the fact that drainage bisects the eastern portion of the tract. The drainage that cuts the tract will run into Sharpe creek. There is another drainage that makes up the boundary to the western side which also runs into Sharpe Creek.

The tract is mainly made up a south facing slope, which starts to get rockier the further down the hill you travel. There is one west slope located on the east side of the tract. This is also steep but does not get rocky as headed toward the drainage. The sides of the drainage that bisect the tract are very steep; in places they can become very rocky as well.

There are a couple caves also located on this tract. There is a cave to the west end of the tract found in the drainage. There is another cave found in the drainage that bisects the tract. This cave is found to be an active hibernacula for the Indiana bat. Because this cave is an active hibernacula, this evokes some special restrictions on timber harvesting in the area. The restriction is that there needs to be a 20 acre buffer around the cave where no harvesting will take place.

### **Soils**

#### **Apalonia Silt Loam ( AgrA, AgrB, AgrC2, AgrC3)**

The Apalonia series consists of very deep, moderately well drained soils forms in loess and the underlying residuum from shale with limestone and siltstone. They are moderately deep or shallow to a fragipan. The surface horizon is a silt loam 8 inches thick. The first 8 inches of the subsoil is a silty clay loam. The next 33 inches is a silt loam. The next 11 inches is clay then it turns into a clay loam for 9 inches. The last 21 inches of the subsoil is a loam. The bedrock is weakly cemented shale with moderately and strongly cemented sandstone. The mean annual precipitation is about 43 inches and the mean annual temperature is about 54 degrees F.

Degree Slope: 0-12%

Woodland suitability group: 3d9

Site Index: 60

Growth Range potential: 258

Management Concerns: runoff and erosion

**Corydon Stony Silt (CqyG)**

The Corydon series consists of shallow, well drained soils that formed in as much as 8 inches of loess and in the underlying limestone residuum. The Corydon soils are on hills underlain with limestone. The surface horizon is 8 inches of a silt loam. The subsoil is 9 inches of clay. The bottom of the profile is unweathered bedrock. Mean annual precipitation is about 44 inches, and mean annual air temperature is about 54 degrees F.

Degree Slope: 20-60%

Woodland suitability group: 1o8

Site Index: 64

Growth Range potential: 258

Management Concerns: runoff and erosion

**Gatchel Loam ( GacAW )**

The Gatchel series consists of very deep, somewhat excessively drained soils on flood plains. They formed in loamy alluvium containing a high percentage of rock fragments in the lower part. The surface horizon is a loam that is 4 inches thick. The first 5 inches of the subsoil is loam, the next 9 inches is a fine sandy loam. The substratum is a coarse sandy loam turning into a sandy loam. Mean annual precipitation is about 43 inches and mean annual temperature is about 54 degrees F.

Degree Slope: 0-2%

Woodland Suitability: 1o8

Site Index: 60

Growth Range potential: 155

Management Concerns: runoff and erosion

**Tipsaw Very Fine Sandy Loam ( TbIG )**

The Tipsaw series consists of moderately deep, somewhat excessively drained soils. They formed in loamy residuum from sandstone with shale and siltstone. The surface is a dark grey very fine sandy loam about 2 inches thick. The subsurface horizon is also a very fine sandy loam about 3 inches thick. The subsoil is 15 inches is a fine sand loam and the last 20 inches is a loam. The bedrock consist of a weakly cemented and moderately cemented sandstone with shale, siltstone. The mean annual precipitation is about 43 inches, and mean annual temperature is about 54 degrees F. Permeability is moderate or moderately rapid

Degree Slope: 20-70%

Woodland Suitability: 3r12

Site Index: 70

Growth Range potential: 342

Management Concerns: runoff and erosion

**Wellston Silt Loam (WhfC2, WhfD2, WhfD3 )**

The Wellston series consists of deep, or very deep, well drained soils formed in silty material from loess and from fine-grained sandstone or siltstone and with bedrock at depths of 40 to 72 inches. These soils have moderate permeability. The surface horizon is a silt loam which is 2 inches thick. The subsurface horizon is a silt loam about 8 inches thick. The first portion of the subsoil consists of 11 inches of a silt loam, the next portion consist of 4 inches of a silty clay loam. The last portion of the subsoil is one inch of a clay. The stratum is 9 inches of loam. The bedrock which is at 45 inches from the surface is an acid fine-grained sandstone. Mean annual precipitation is about 40 inches, and mean annual temperature is about 53 degrees F. Well drained. Runoff is medium to rapid.

Degree Slope: 0-50%

Woodland suitability group: 3o10

Site Index: 80

Growth Range potential: 342

### **Access**

This tract has good access. Wyandotte Cave road runs to the east of the tract.

### **Boundary**

The boundaries of this tract are made up of mainly natural boundaries. The northern boundary is made up of a ridge top, which also runs a horse trail. The west boundary is made up of a creek that turns into Sharpe Creek. Part of the southern boundary borders on the O'Bannon State Park. The Eastern boundary is made up of the Wyandotte Cave road.

### **Wildlife**

The wildlife in this tract is typical of what you would find in Crawford county Indiana. What was discovered when cruising the area is the blue-tailed skink, various song birds, deer, box turtles, and squirrels.

A natural heritage database review was preformed for this tract and there were some rare, threatened or endangered species found on this tract.

### Direct and Indirect Effects on Plants of Glades and Barrens

Nine plant species designated as state endangered, threatened, or rare occur in habitats characteristic of glades and barrens (Appendix A, Table 6). A review of reported threats to these species include, fire suppression and forest succession, land-use conversion, and competition from invasive exotic species. Areas characterized as open glades and barrens are rarely affected by forest management activities, so it is unlikely any of the proposed alternatives will adversely affect species occurring in these communities. Furthermore, a location-specific search of the Indiana Natural Heritage Database is made well in advance of each timber harvest (section 1.6.5 of this document) and forest managers avoid incompatible management activities in the presence of such species. However, as noted, many species would benefit from canopy reduction, prescribed fire, and invasive species control and may warrant management actions done outside the scope of the proposed alternatives to improve their habitat conditions.

### Direct and Indirect Effects on Plants of Forests and Open Woodlands

Twenty-five plant species designated as state endangered, threatened, or rare occur in forests or open woodlands (Appendix A, Table 6). A review of each species' habitat preferences and tolerances reveals the overwhelming majority of these species (20 of the 25) prefer open woods and/or forest edges. Threats to these species typically include, excessive shading due to canopy closure, fire suppression, and competition from invasive exotic species. Species that are threatened by shading and competition from exotics would potentially benefit from the preferred management alternative which includes 1400 acres of annual invasive species control, 2000 acres of prescribed fire, and canopy reductions due to harvesting. Five species were reviewed that reportedly preferred closed-canopy forested habitats, and threats to these species included excessive loss of tree canopy, deforestation, and competition from invasive exotic species. Since a location-specific search of the Indiana Natural Heritage Database is made well in advance of each timber harvest (section 1.6.5 of this document), forest managers would know species occur in the proposed management area that may be sensitive to harvesting and can avoid incompatible activities in the presence of such species. Species that are threatened by competition from invasive and fire intolerant species would benefit from the invasive species control and prescribed burning that is included in the preferred alternative. For these reasons it is unlikely that any of the proposed alternatives will adversely affect forest inhabiting plant species. However, as noted, many species, particularly those preferring open forests and woodlands, would benefit by canopy reduction, prescribed fire, and invasive species control.

#### Direct and Indirect Effects on Invertebrates in Subterranean Habitats

Ten invertebrate species designated as state endangered, threatened, or rare inhabit subterranean areas on DoF properties (Appendix A, Table 5). Given the subterranean nature of these species, the DoF does not anticipate the proposed activities will directly affect these species. To minimize threats to water feeding into subterranean streams, DoF applies Best Management Practices to each timber harvest. Disturbing the integrity of cave entrances and sinkholes could also affect the water and airflow entering these systems and for this reason the DoF enforces a policy of minimum disturbance around such features (DoF Procedures Manual, Section S-1 1999). Given the protective measures routinely undertaken by the DoF, no adverse affects on subterranean invertebrates are anticipated from any of the proposed alternatives.

\*\*narrations on the effects of the wildlife were sited from Draft Environmental Assessment for Indiana State Forests May 2008.

#### 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

According to the inventory of this tract there are a sufficient number of live trees per acre to support a timber harvest and still meet the requirements for the Indiana Bat Habitat Guideline. The inventory shows that there are an insufficient number of snags on this tract required for the bat. If it is decided that there should be more snag trees for the bat, a post-harvest TSI could generate the snags needed. This could be done by girdling the cull trees, especially the ones with the desirable bark characteristics.

### **Recreation**

There is a horse trail that runs the length of the northern border. This trail is used frequently. This tract also borders Wyandotte Cave. There may be heavy traffic from the public because of its location to the park.

### **Cultural**

There were no cultural sites found on this tract of land.

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

#### Oak-hickory

This stand type is 77 acres 8 of which are located in the hibernacula no harvest zone. There is 105 square feet of basal area in this stand type.

This stand is located on the ridge tops and approximately half way down the slopes. White oak and black oak are the most prevalent tree species found on this stand type. The average size for these trees is 18 inches in diameter. The further down the slope the thinner the soils become. This leads to more droughty oaks like post oak and some chinkapin oaks growing in places. The average size for these trees is 16 inches in diameter.

The regeneration on this stand type is typical of what you would find in the majority of the Harrison-Crawford, mainly sugar maple and American beech. There are a few pockets of oaks that are thriving, and these spots should be encouraged to grow in the harvest.

This area could benefit from a harvest. There are a plethora of poorly formed oaks. There are larger trees along the ridge top and most of these trees have reached maturity and are starting to decline. Removing these trees would be the best way to maintain stand vitality. There are also some poorly formed black oaks that should be taken out to let the better formed trees to grow.

If there was a harvest in this stand there would be approximately 130,000 board feet removed. There would also be 20 square feet of basal area removed bringing the stand down to a fully stocked condition of 82 square feet of basal area.

#### Mixed hardwoods

This stand type is 10 acres in size, 6 of which are inside the 20 acre no management hibernaculum zone. There are 90 square feet of basal area per acre in this stand type.

This stand is located along the drainages in the tract. There is a prevalence of yellow poplar, American beech, and eastern red cedar. The average size for the American beech is 23 inches in diameter, the average size for yellow poplar is 20 inches, and the average size for the cedar is 6 inches.

This area could support a timber harvest, but with the limitations will only contain a light harvest or no harvest at all. Because of the hibernaculum there are stricter rules about harvesting along intermittent streams. These drainages which house the intermittent streams will not be harvested, in accordance with the rules. There will be a buffer of approximately 50 feet where no harvesting will take place. Approximately half of this stand type is guarded by steep slopes so accessibility is a problem. Also the stand type has a moderate stocking level. If there would be a harvest it would be light, only to take out the poor formed and unhealthy trees. Because of the accessibility and the Indiana bat restrictions it is likely that this stand will either be lightly harvested in or not harvested in at all.

#### Rocky

This stand type is 33 acres in size. The main species in this stand type are white oak, sugar maple, and post oak. There are also a fair number of chinkapin oaks. This stand's total square feet of basal area is 103. If there were to be a harvest in this stand type on this tract there would be around 25,000 board feet removed. There would be 13 square feet of basal area per acre removed leaving the stand slightly highly stocked at 89 square feet.

This stand is located on the southern portion of the south west facing slope. The soil is thin on this stand type. Because of the thin soil the trees that are growing here are poorer quality than in the oak-hickory section. The further down slope the more this stand grades into a chinkapin post oak stand type. The soils get thinner as you travel down the slope.

This stand can support a timber harvest. The entire stand will not be harvested in because partly down the slope it becomes too rocky for the equipment to operate. The trees also become poorer quality so there is not very much merchantable timber very far down on the slope. The full 25,000 board feet will not be removed from this stand type. There might be half of that taken off with the harvest.

#### Steep rocky

In total there are 12 acres on this stand type, 6 acres of which are incorporated into the hibernaculum's 20 acre no management zone. The square feet of basal area is 102 for this

stand type. The majority of the basal area is in the young saplings which average 2-4 inches in diameter. The main tree species in this stand is sugar maple and chinkapin oak with some cedar, blackgum and red oaks.

There will be no harvesting in this area. The ground is much too steep and there are too many outcroppings. The logging equipment would not be able to work in this stand type.

### **Proposed Activities Listing**

**2011- Timber stand improvement harvest**

**2012-TSI**

**2022- re-inventory and rewrite management plan**

**To submit a comment on this document, click on the following link:**

**[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 C14 T8” 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.



Acres Commercial forest: 100  
 Acres Noncommercial Forest:32  
 Acres Permanent Openings: 0  
 Acres Other:

Basal Area  $\geq$  14 inches DBH: 66.1  
 Basal Area < 14 inches DBH: 33.4  
 Basal Area Culls: 1.9  
 Total Basal Area: 101

Acres Total: 132

Number Trees/Acre: 250

Average Site Index: 67  
 Calculated annual Growth (bd. ft.): 293

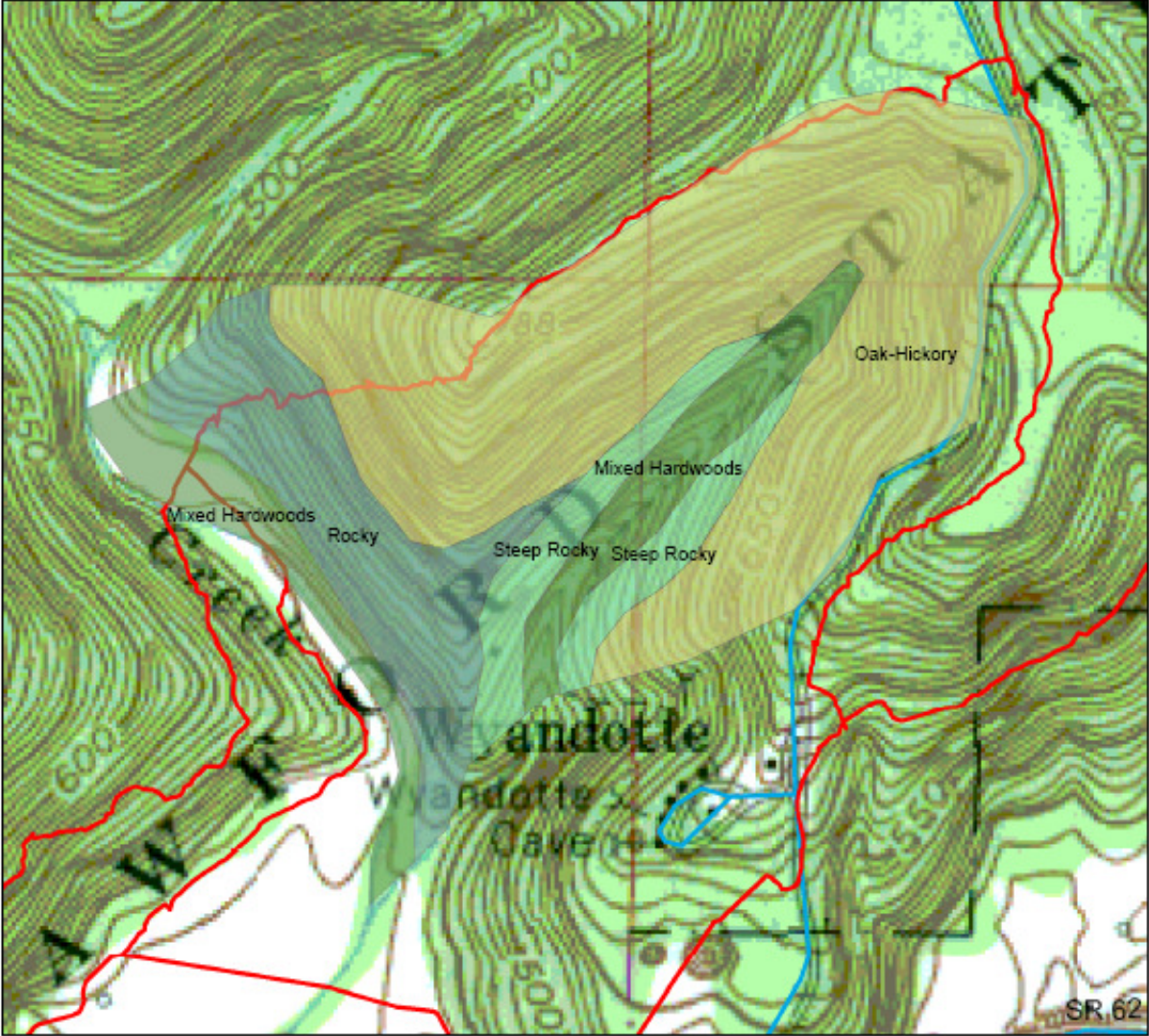
Stocking Level : fully stocked 93%

Species	Harvest	Leave	Total
Black oak	52580	79950	132530
Yellow Poplar	34020	42410	76430
White Oak	31760	232140	263900
Scarlet oak	21470	25100	46570
Post oak	16670	21840	38510
Northern Red Oak	14460	60810	75270
Pignut Hickory	12530	44920	57450
White Ash	6110	2970	9080
Bitternut Hickory	2940	0	2940
Honeylocust	2170	0	2170
Red elm	2170	0	2170
Sugar maple	1980	42710	44690
Blackgum	1720	9830	11550
Chinkapin Oak	1530	25680	27210
American beech	0	16290	16290
Black walnut	0	12400	12400
Blue Ash	0	2170	2170
Chestnut Oak	0	6050	6050
Eastern Redcedar	0	9150	9150
Sassafras	0	2540	2540
Shagbark Hickory	0	9220	9220
Shingle Oak	0	3320	3320
<b>Totals</b>	<b>202110</b>	<b>649500</b>	<b>851610</b>
<b>Totals/Acre</b>	<b>1531</b>	<b>4920</b>	<b>6452</b>

- measured in board feet from the Doyle scale

\* Exclude 30,000 board feet from the total harvestable average because of the 20 acre no harvest hibernacula zone.

# Stand Map Compartment 14 tract 8

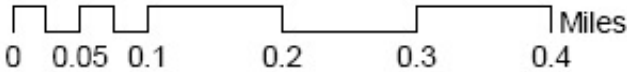


**Legend**

- County Road
- Horsetrail

**stands**

- Mixed Hardwoods
- Oak-Hickory
- Rocky
- Steep Rocky





# Air Photo Map Compartment 14 tract 8



**Legend**

- County Road
- HCSF Tracts
- horsetrails

