Indiana Department of Natural Resources - Division of Forestry

Resource Management Guide

Harrison-Crawford State Forest **Compartment: 17 Tract: 1**
Dieter Rudolph **Date: May 24, 2010**

Acres Commercial Forest: 155
Acres Noncommercial Forest: 0
Acres Permanent Opening: 0
Acres Other: 0

Acres Total: 155

Basal Area >= 14 inches DBH: 56.03 sqft/ac
Basal Area < 14 inches DBH: 49.30 sqft/ac
Basal Area Culls: 2.11 sqft/ac
Total Basal Area: 105.33 sqft/ac

Number Trees/Acre: 233

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
White Oak	84.84	259.13	343.97
Black Oak	144.89	68.69	213.58
Eastern Red Cedar	63.48	53.38	116.86
Yellow Poplar	0	45.43	45.43
Pignut Hickory	0	42	42
Scarlet Oak	11.83	11.8	23.63
Mockernut Hickory	7.37	10.23	17.6
Virginia Pine	9.02	7.84	16.86
Sugar Maple	3.72	8.38	12.1
Northern Red Oak	4.84	6.39	11.23
Shagbark Hickory	3.72	6.77	10.49
Blackgum	0	8.47	8.47
White Ash	0	8.14	8.14
American Beech	1.78	3.87	5.65
Chinkapin Oak	1.19	2.39	3.58
Ohio Buckeye	2.75	0	2.75
Black Walnut	0	0	0
Bluebeech	0	0	0
Ironwood	0	0	0
Redbud	0	0	0
Red Maple	0	0	0
Sassafras	0	0	0
Total Volume	339.43	542.91	882.34
Total MBF per Acre	2.19	3.50	5.69

Location

This 155 acre tract is located in Crawford County, Indiana. It is in section, 28 and 29 T3S R2E,

General Description

This tract is located a short distance from SR 62. A firelane that comes off of SR 62 runs along the eastern boundary of the tract. The eastern portion of the tract is on top of a

ridge which descends into lower lands that were once fields. There is a drainage that runs down from the ridge top that forms the southern boundary of the tract.

Within the tract were three major stands as well as a small area of cedar (4 acres). The largest stand was the Oak Hickory stand (101 acres) which took up the central portion and a few areas of the western section of the tract. This stand was mainly white and black oak with other various hardwood species also present in smaller amounts. The other two stands were the Old Field stand (35 acres) and the Virginia Pine stand (15 acres). These two stands as well as the cedar stand are located in the western third of the tract in an area that was a large field based on the 1940s aerial photo. The pine stand was likely planted around 50 years ago. At the moment there are large areas of blowdown throughout the stand. The Old Field stand is similar to the Oak Hickory stand based on two of its major components were white and black oak but there was also a high presence of eastern red cedar as well as a large variety of hardwood species. The trees in this stand were also consistently smaller in size than those in the Oak Hickory stand.

History

This tract of land was obtained in two separate purchases. The area in section 29 was obtained in 1939 from Stephenson as a part of an 80 acre purchase. The portion of the tract in section 28 was obtained in 1951 from Sharp as part of an 80 acre purchase.

As can be seen in the 1940 aerial photo, the western third of the tract was used as a field as well as a portion along the eastern boundary. A few areas throughout the field were severely eroded to bare mineral soil and/or rocks. A couple rock piles were found throughout this area, one of which was significantly larger than the others. There is a sudden change in the stand types from field to deciduous forest shown in the 1940s aerial photo which is likely due to the area being owned by two different families. A TSI was performed in this tract in 2000. At this time, evidence of this TSI remains in the form of standing snags with evidence of having been girdled.

Landscape Context

1701 is part of a contiguous body of land owned by the State of Indiana. Private property neighbors this tract along the western and northern boundaries with the remnants of an old barbed wire fence running the boundary as well as relatively new t-posts. Most of the neighboring private land is forested with the exception being a house near the northwest corner and a field near the northeast corner.

Topography, Geology, and Hydrology

The eastern portion of the tract is the top of a ridge with a drainage along the southern boundary and another near the northern boundary. This slope then moves down into the flatter land that was historically a field. The slopes were more severe near the drainages but gradual in the center of the tract.

There were a couple major sinkholes within the tract as well as some that had opened up though not passable at the moment. The presence of these sinkholes suggests

underground karst activity in the area. Limestone outcrops were also present within the stand which further implies underground waterways.

Soils

Adyeville Very Fine Sandy Loam (AbqE2, AciE)

The Adyeville series consists of moderately deep, somewhat excessively drained soils. Surface Horizon is 9 inches thick. The subsurface horizon then grades into 8 inches of silt loam then with the remaining 60 inches turns into a loam texture type soil. The bedrock consists of moderately cemented sandstone with some siltstone, and shale. The permeability is moderately rapid. The mean annual precipitation is about 43 inches and the mean annual temperature is about 54 degrees F.
Degree Slope: 8-60%
Woodland suitability group: 3o10
Site Index: 70
Growth Range potential: 200
Management Concerns: Runoff and erosion

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

Haggatt Silt Loam (HarE2, HarD2) Silty Clay (HafC3, HafD3)

The Haggatt series consists of deep, well-drained soils formed in clayey residuum that can be capped with up to 20 inches of loess. They are on hills and in sinkholes underlain with limestone. The Surface Horizon is a silt loam that is 5 inches thick. The first 11 inches of the subsoil is a silty clay loam. The next 28 inches of the subsoil is clay. The bedrock is fractured, indurated limestone bedrock. Mean annual precipitation is about 43 inches, and mean annual temperature is about 54 degrees F.
Degree Slope: 2-25%
Woodland suitability group: 1o1
Site Index: 68
Growth Range potential: 300
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 form 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
Management Concerns: runoff and erosion

Access

A firelane/disabled hunters trail off of SR 62 borders the eastern boundary of the tract. This firelane is in good condition but tends to get muddy and difficult to travel when wet.

Boundary

The eastern boundary of this tract is defined by the top of the ridge with the firelane on it while the southern boundary is a drainage. The northern and western boundaries are shared with private property in straight north/south and east/west lines. These two boundaries are marked by an old fence line and metal t-posts. These markings appear to be fairly accurate along the western boundary but begin to stray along the northern. There was also a section stone found on the northern boundary between sections 29 and 28. There were no specific markers found at the northwest corner. The fence lines did not meet up at the same point. There was an old rusted t-post located a couple yards off of the old fence line but this showed no signs of being an accurate boundary marker.

Wildlife

The Natural Heritage Database Review shows no rare, threatened, or endangered species within the tract. The Leavenworth Barrens Nature Preserve to the south of 1703 which is south of this tract, housed a large number of species of special concern due to it being a nature preserve. Nonetheless, no actions within this tract should affect the barrens.

Nearly all of the maintenance level wildlife goals were met for this stand. Only one goal was not met, that being cavity trees with a diameter between 7" and 11" and this deficit was by a mere three trees, a relatively minimal number. The optimal goals were met for all of the snag size classes and also by the cavity trees with a diameter of 19"+. Overall, this tract proves to be a good one for the local wildlife species.

The wildlife that was noted during the inventory was typical with other areas in Crawford County. Evidence of deer, turkey, coyotes, squirrels, raccoons, and various birds were noted during the inventory. The vast difference between the stands creates a large range of habitat for the local wildlife. The presence of cedar and pine help to create a thermal

cover for the colder months. Meanwhile, the difference between the ages of the forest in the Old Field and Oak Hickory stands creates a diverse habitat for the wildlife.

Wildlife Habitat Feature (Tract Wide)

Category	Maintenance level	Optimal Level	Inventory	Available Above maintenance	Available Above Optimal
Legacy Trees *					
11"+	693		1455	762	
20"+	231		292	61	
Snags (all species)					
5"+	308	539	1462	1118	887
9"+	231	462	140	109	-122
19"+	38.5	77	34	-4	-43
Cavity Trees (all species)					
7"+	308	462	378	70	-84
11"+	231	308	378	147	70
19"+	38.5	77	100	61	23

* species include: AME, BIH, BLL, COT, GRA, REO, POO, REE, SHH, ZSH, SIM, SUM, WHA, WHO

Indiana Bat

As management activities currently can only be performed in the winter months due to Indiana bat regulations, it is unlikely that direct harm will come to the Indiana bat as they are hibernating in nearby caves at this time. Any skid trails/haul roads created in this tract could improve the habitat for the Indiana bat by improving the canopy foraging conditions due to the reduction of understory clutter. Furthermore, the areas around likely roost trees can be opened up to benefit the bat. The edge of log yards can increase the solar exposure of roost trees which improves the microclimate and thermal conditions of the roosting areas.

Trees that are ideal for roosting bats such as large snags and large trees that have loose/exfoliating bark can be retained to provide for the Indiana bat. Furthermore, the growth of ideal tree species for the Indiana bat can be managed to promote growth to increase the recruitment of trees into the categories suitable for the Indiana bat.
At the moment this tract meets all optimal requirements for the Indiana bat. As the tract is in close proximity to Wyandotte Cave, a major hibernaculum, the tracts appeal for Indiana bat is increased. At the moment the tract meets almost all of the maintenance level goals (excepting snags with a diameter of 7"+ by a minimal amount) and also a majority of the optimal levels.

Recreation

This area is possibly used by hunters due to the proximity of the firelane/disabled hunters trail. The firelane also doubles as a horse trail but simply borders the tract, not goes through it.

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.

Summary Tract Silvicultural Description, Prescription, and Proposed Activities

This tract was last inventoried in August of 1984. The management guide from 1984 showed a total volume of 3,059 bf/ac present within this tract with white oak being the most dominant species by a large margin. The present inventoried also showed white oak as being the most dominant and had a total volume of 5,670 bf/ac. There were 25 full growing seasons between these two guides which show an increase of 104 bf/ac per growing season within this tract with most of that growth being in black oak, white oak, and red cedar.

Oak Hickory (101 acres)

The Oak Hickory stand is the largest and the oldest stand within the tract. While the other two stands were field, this stand was a hardwood forest, likely comprised of oaks as it is today. At the moment there are 113 sqft/ac and 7,320 bf/ac within the stand. Most of this volume and basal area is made up of white and black oak. The higher basal area suggests a harvest should occur which, based on the inventory, would be roughly 3,080 bf/ac and 40 sqft/ac leaving 4,240 bf/ac and 73 sqft/ac.

The two tracts to the south of this tract, 1702 and 1703, are like this tract in that, half of each was a field, possibly under the same ownership as this tract. Many of the trees within this tract were of good quality and form. The Oak Hickory stand in this tract contained on average larger trees than the other two, but the overall similarity suggests these three tracts be managed together. By removing a portion of the trees within this stand, the remaining trees would prosper from reduced competition, allowing for quicker growth and better form. Trees of lower quality or less desirable form should be removed to reduce competition. A majority of the black oaks should also be removed before they become overmature, a common occurrence with the species. Focus should also be given to the smaller sawtimber and the pole size white oaks which will move into the dominant position in the overstory after the harvest.

Old Field (35 acres)

The Old Field stand was broken up into multiple segments throughout the tract. A majority of the western third of the tract was once used as a field. Portions of this now show old field characteristics, mainly younger trees with a wide variety of tree species. A section of land along the eastern border was also in the Old Field stand but was significantly different than those in the western portion. The eastern Old Field stand had a large amount of eastern red cedar within it with few hardwoods exceeding the pole size class. The western Old Field stands were more like the Oak Hickory stand in composition with a majority of it being oak species but were on average a smaller size class. Due to the discrepancy between the two sections of the Old Field stand, the data is less accurate than desired, but the overall data shows a high amount of white oak in the western section.

The western portion of this stand should be managed along with the Oak Hickory stand in order to increase its growth rate and controlling the species present so that it will mimic the Oak Hickory stand in the future. The harvest should focus on removing the old field species such as cedar, pine, sassafras, blackgum, and yellow poplar as well as the less desirable species such as ash, beech, and maples. The goal of the harvest would be to increase the growth rates of the residual trees, increase quality growth, and quicken the rate of the stand reaching the Oak Hickory cover type.

The eastern portion is of little economical value at the moment and would not be desirable by those harvesting to remove due to the species composition and the size. For this reason a post harvest timber stand improvement should occur to remove the cedar component of the stand which will allow the stand to become dominated by hardwoods. By removing the cedar, the stand would likely be repopulated by old field species such as poplar and sassafras as well as other hardwoods from the surrounding area. At the time of the next harvest for this tract, this area would likely be managed in the same way the western portion will be this time around.

Due to the eastern Old Field stands proximity to the road, small tree size, and little economic value, this area would be ideal for the placement of the tracts main yard for the harvest.

Virginia Pine (15 acres)

This stand was of a relatively small size and almost completely pine. The pine in this stand is mostly near the cut off between pole and sawtimber sized timber. There was also a large amount of blow down within the stand. A common tendency with pine is that when blow down begins in a stand, it typically continues at a higher rate. This trend is due to the low wind resistance each individual pine tree has and the fact that the canopy gaps create an area for the wind to catch on the pine's crown and push it over. The result in continual blow down in this stand would be that the stand becomes difficult to travel in and much of the volume would be wasted. A harvest in this stand would remove the volume before it falls and begins to decay while also removing the hindrance of logs across the ground. By clearing up the ground layer of fallen logs, hardwood species have more area to grow, thus increasing the rate of change to a hardwood forest.

If a harvest cannot be performed in this stand, it will still move towards a hardwood stand, but at a slower pace. The tendency for the pines to suffer from blow down would remove the pine from the overstory and create gaps in the canopy for the hardwoods to move into. Those hardwoods already present would prosper and begin to dominate the stand as much of the pine goes to ground over the next several years.

To submit a comment on this document, click on the following link:
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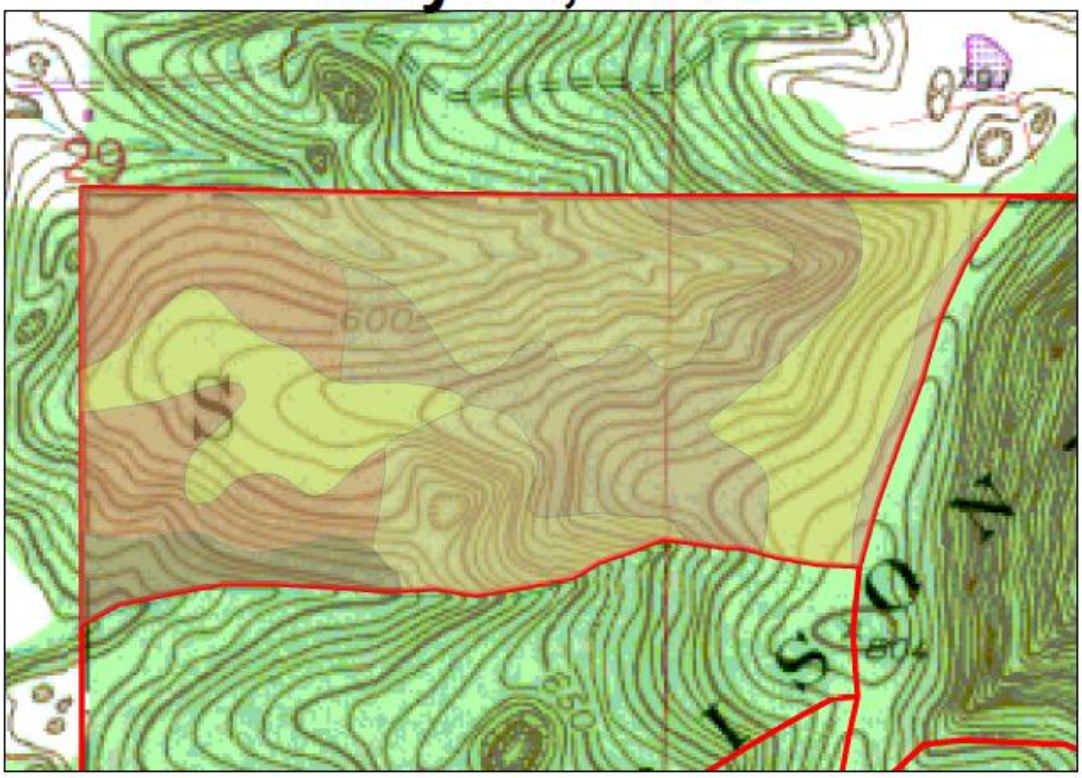
You **must** indicate the State Forest Name, Compartment Number and Tract Number in the "Subject or file reference" line to ensure that your comment receives appropriate consideration. Comments received within 30 days of posting will be considered.

Harrison Crawford State Forest
Compartment 17 Tract 1
May 24, 2010



0 0.1 0.2 0.4 0.6 0.8 Miles

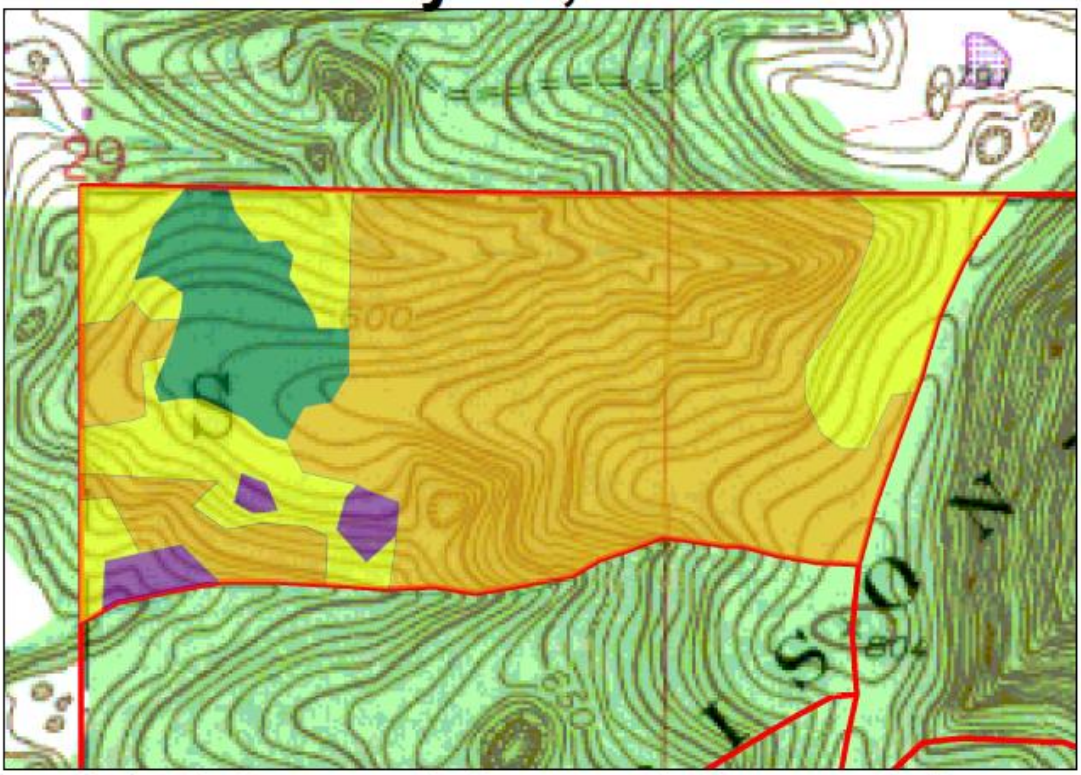
Legend

Soils

- AbqE2
- AgrC2
- HafD3
- WhfC2
- WhfD2
- WhfD3

N
W E
S

Harrison Crawford State Forest
Compartment 17 Tract 1
May 24, 2010



0 0.1 0.2 0.4 0.6 0.8 Miles

Legend

stands

- Cedar
- Oak-Hickory
- Old Field
- Virginia Pine

N
W E
S