Indiana Department of Natural Resources - Division of Forestry

Resource Management Guide

Harrison-Crawford State Forest **Compartment: 17 Tract: 3**
Dieter Rudolph **Date: January 29, 2010**

Acres Commercial Forest: 77
Acres Noncommercial Forest: 0
Acres Permanent Opening: 0
Acres Other: 0

Basal Area >= 14 inches DBH: 55.14 sqft/ac
Basal Area < 14 inches DBH: 55.47 sqft/ac
Basal Area Culls: 5.69 sqft/ac
Total Basal Area: 110.60 sqft/ac

Acres Total: 77

Number Trees/Acre: 265

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
Eastern Red Cedar	87.37	0	87.37
White Oak	29.37	110.3	139.67
Scarlet Oak	27.34	12.07	39.41
Black Oak	14.71	33.26	47.97
Pignut Hickory	7.52	33.56	41.08
Yellow Poplar	6.52	31.91	38.43
Sugar Maple	3.23	1.64	4.87
Post Oak	3.09	0.75	3.84
Chestnut Oak	2.27	0	2.27
Virginia Pine	2.2	1.48	3.68
Blackgum	1.88	0	1.88
Northern Red Oak	1.84	0	1.84
American Beech	1.45	0	1.45
Mockernut Hickory	0	7.67	7.67
Chinkapin Oak	0	2.02	2.02
Black Cherry	0	1.48	1.48
Black Walnut	0	0.75	0.75
Total Volume	188.79	236.89	425.68
Total Volume per Acre	2.45	3.08	5.53

Location

This 77 acre tract is located in Crawford County, Indiana. It is in section, 32 and 33 T3S R2E,

General Description

This tract is located 1.3 miles from SR 62. A firelane that comes off of SR 62 runs along the northeastern 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 northern boundary of the tract.

Within the tract were three major stands. The largest stand was the Oak Hickory stand (47 acres) which took up the eastern half and part of the southern area of the tract. This

stand was dominantly white oak with some hickories and other oak species also present. The other two stands were the Old Field stand (16 acres and the Cedar stand (14 acres). These two stands take up an area that was a field. The 1940s aerial photo shows a large portion of the area being field or young forests that had recently been field. The Old Field stand is predominately eastern red cedar, yellow poplar, and white oak with multiple other species also being present. The Cedar stand was almost completely eastern red cedar.

History

This tract of land was obtained in two separate purchases. The area in the western half of the area in section 32 was obtained in 1940 from Allen as a part of a 120 acre purchase. The eastern half of the tract in section 32 was obtained in 1940 from Cole as a part of a 40 acre purchase.

As can be seen in the 1940 aerial photo, a large portion of the western half of the stand was a field. 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 old 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

1703 is part of a contiguous body of land owned by the State of Indiana. Private property neighbors this tract to the west. The southern boundary is shared with private property on the eastern half and the Leavenworth Barrens Nature Preserve on the western half. The vegetative cover in the surrounding region (<2.5 radius) is mostly forested with a scattering of fields and dispersed individual residences. The town of Leavenworth is about 1.5 miles south of the tract. A stone quarry (Mulzer) is a little over 1.5 miles north. I-64 is a little over 2 miles to the north.

Topography, Geology, and Hydrology

The eastern portion of the tract is the top of a ridge. This slope then moves down into the flatter land that was historically a field. The northern boundary of the tract is a drainage from the top of the ridge which eventually flows into the Blue River, the major watershed for the area.

There was an open sinkhole and a cave within the tract, both marked as caves on the map. The cave marked in the southwestern corner of the tract was the sinkhole with an opening in it. This was not passable but appeared to continue underground, possibly being a part of the karst system. The other cave, which was in the eastern section of the tract, appeared to be passable. There was also running water heard issuing from this cave.

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

Corydon Stony Silt Loam (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

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

Haymond Silt Loam (HcgAH, Hm)
The Haymond series consists of very deep, well drained, soils that formed in silty alluvium. These soils are on flood plains and flood-plain steps. Slope ranges from 0 to 3 percent. Mean annual air temperature is about 55 degrees F, and mean annual precipitation is about 42 inches. The surface horizon is a brown silt loam plow layer that extends approximately 10 inches. The first subsurface horizon is a dark yellowish brown silt loam that extends to 25 inches. The second subsurface horizon is a yellowish brown silt loam that extends until 44 inches. The stratum is a massive yellowish brown fine sandy loam.

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 logging road/firelane/disabled hunters trail off of SR 62 borders the northeastern 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 while the northern boundary is a drainage. The southern and western boundaries are not defined by

geographic features and also border private property. The western boundary has the remnants of an old barbed wire fence still visible for most of the boundary. The southern boundary that is shared with the Leavenworth Barrens Nature Preserve also has the remains of a barbed wire fence; however there was no evidence of a boundary line in the southern section shared with the private property. In the 80s a timber trespass occurred in the southeastern area of the tract. This trespass was a mistake by the loggers and the timber removed was paid for by the property owner. A timber sale has occurred recently on the private property with trees being removed very close to the boundary as determined by the GPS and it is possible that a trespass could have occurred again.

Wildlife

The Natural Heritage Database Review shows no rare, threatened, or endangered species within the tract. The Leavenworth Barrens to the south of this tract is a wildlife refuge and as such has a large number of species of special concern within it.

Most of the wildlife feature goals were met for this site, the only exceptions being snags with a diameter of 19"+. The rest of the categories met the maintenance level goals at the least with the optimal levels of snags with a diameter of 5"+ and cavity trees with diameters of 11"+ and 19"+. As nearly all of the maintenance level goals are met for this tract, it shows to be a good area for wildlife. The presence of cavity trees, especially the larger ones, provides dens for many species as well as foraging opportunities.

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 high amounts of cedar help 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 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 the region of 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 19"+) and also half of the optimal levels.

Recreation

This area is mostly used by hunters due to the proximity of the firelane/disabled hunters trail. However, as this forest road only borders the tract for a short distance, it is more likely that the neighboring areas are used by hunters more often. The firelane also doubles as a horse trail but it is in close proximity to the tract, not within it.

Cultural

As the area was used as a field in the past it is possible that there are cultural sites within the tract. A couple of rock piles were observed with one of them being significantly larger than the rest within one of the Cedar stands. The rock piles were most likely cast off stones from the fields that were once in the area.

Summary Tract Silvicultural Description, Prescription, and Proposed Activities

Oak Hickory (47 acres)

The Oak Hickory stand is the largest and the oldest stand within the tract. While the other two stands were once fields, this stand was a hardwood forest, likely comprised of oaks as it is today. At the moment there are 104 sqft/ac and 5,540 bf/ac within the stand. Most of this volume and basal area is made up of white oak. The higher basal area suggests a harvest should occur which, based on the inventory, and would be roughly 1,900 bf/ac and 38 sqft/ac leaving 3,600 bf/ac and 67 sqft/ac. The low residual basal area would be the result of removing a high number of trees that were showing poor form or quality. Some common trees removed were over mature individuals, especially black oak. There were also areas of higher stocking where multiple trees were removed in order to release the residual trees which were a common trait in areas that had a large number of white oak individuals that were crowding each other. In these cases, the individuals showing the lowest future potential would be taken. Also, species common

with the Old Field stand neighboring this stand were removed in order to promote the growth associated with Oak Hickory stands.

The two stands to the north of this tract, 1702 and 1701, are like this tract in that, half of each was a field, possibly under the same ownership as this tract. These three tracts could be managed together as they are of similar stand type and age. 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. The individuals that would be removed would be individuals of lower quality so that the residual stock is higher in quality.

Old Field (16 acres)

The Old Field stand currently has a high basal area of 112 sqft/ac with a volume of 4,290 bf/ac. Of this, 1,650 bf/ac and 36 sqft/ac were deemed removable in order to reduce competition of the stand. If this amount were removed, the residual would be 2,650 bf/ac and 77 sqft/ac. Of the removable volume, roughly 1,000 bf/ac was comprised of eastern red cedar. The removal of the cedar allows for the stand to become a deciduous forest promoting the growth of the yellow poplar and white oak component of the stand.

As mentioned, by removing the cedar this stand will progress more quickly to being a hardwoods stand. To reach this goal, the stand should be harvested if a buyer for cedar can be found; if not then the stand should undergo a timber stand improvement along with the cedar stand.

Cedar (14 acres)

This stand was comprised almost completely of eastern red cedar. The stands volume was 7,950 bf/ac with 6,260 bf/ac being cedar. The total basal area of the stand was 142 sqft/ac (76 sqft/ac being cedar). The stand would benefit from having the cedar removed in order to allow the succession of the hardwoods into dominance such as black, scarlet, and white oak as well as yellow poplar, all of which were found in the stand in smaller numbers.

Like the Old Field stand, this tract should be harvested to remove the cedar element to promote hardwood growth. The removal of the cedar will basically create openings throughout the tract which benefits regeneration as well as creating a different type of habitat for the wildlife species such as fringe habitat.

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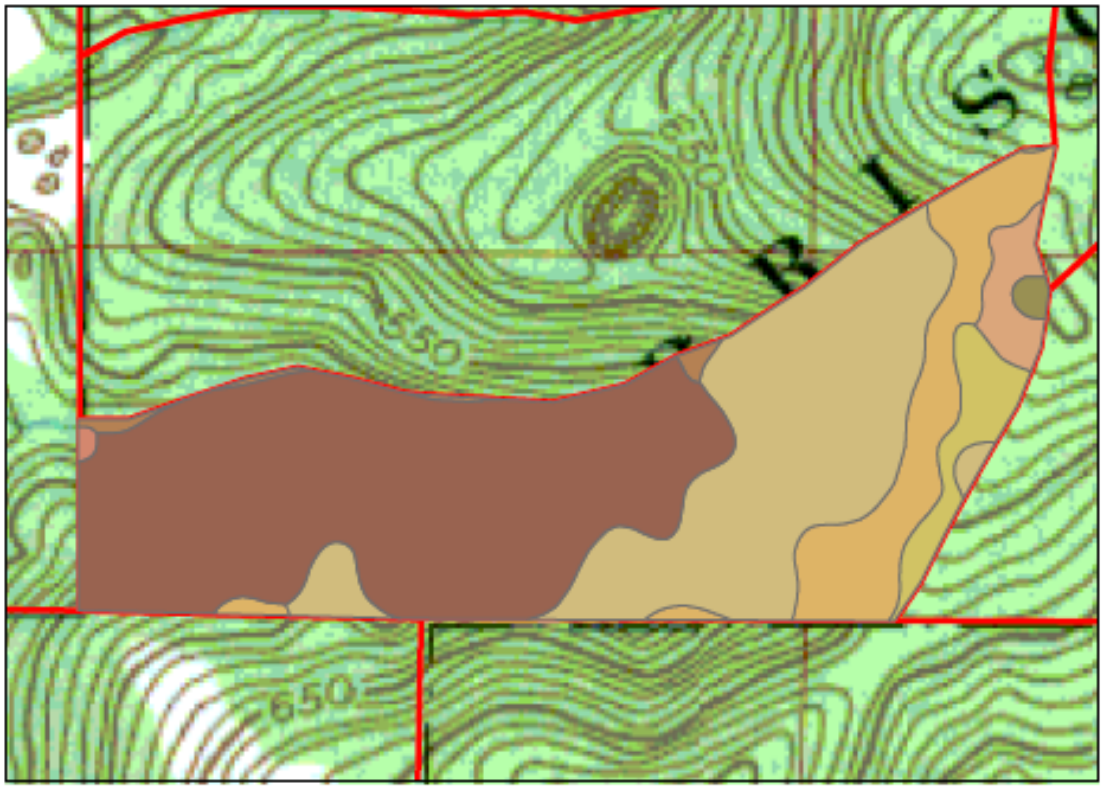
You **must** indicate the State Forest Name, Compartment Number and Tract Number in the "Subject or file reference" line to ensure that your comment receives appropriate consideration. Comments received within 30 days of posting will be considered.

Harrison Crawford State Forest
Compartment 17 Tract 3
January 29, 2010



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Miles

Legend

Soils

- AbqE2
- AgrC2
- AgrC3
- CqyG
- HafD3
- HcgAH
- WhfD2
- WhfD3

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W E
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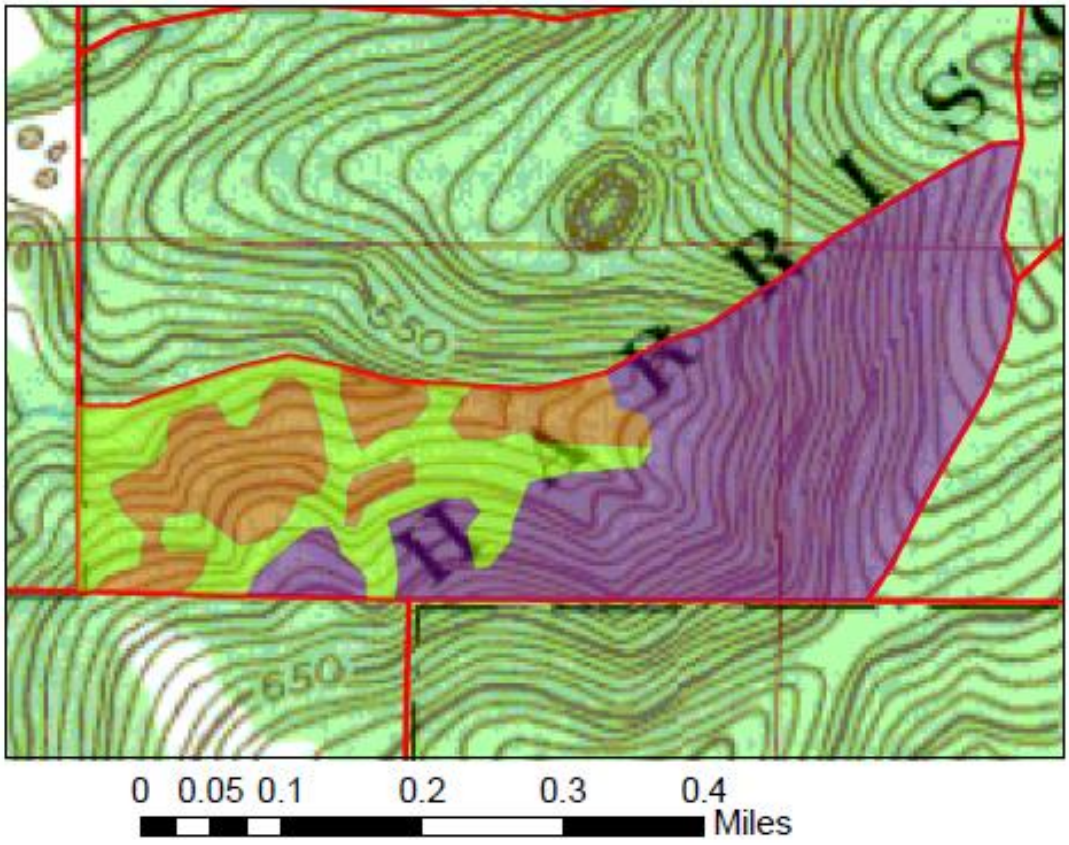
Harrison Crawford State Forest
Compartment 17 Tract 3
January 29, 2010



Legend

stands

- Cedar
- Oak-Hickory
- Old Field

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