Indiana Department of Natural Resources
Division of Forestry

DRAFT

Resource Management Guide

Harrison-Crawford State Forest **Compartment: 14 Tract: 12**
Dieter Rudolph **Date: January 20, 2010**

Acres Commercial Forest: 122
Acres Noncommercial Forest: 0
Acres Permanent Opening: 0
Acres Other: 0

Acres Total: 122

Basal Area >= 14 inches DBH: 63.54 sqft/ac
Basal Area < 14 inches DBH: 32.57 sqft/ac
Basal Area Culls: 3.91 sqft/ac
Total Basal Area: 96.12 sqft/ac

Number Trees/Acre: 188

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
Sugar Maple	34.53	27.33	61.86
Yellow Poplar	30.59	30.59	61.18
Northern Red Oak	26.31	46.1	72.41
White Ash	24.92	26.35	51.27
White Oak	23.67	96.55	120.22
Black Oak	22.94	26.49	49.43
Scarlet Oak	14.8	6.63	21.43
American Beech	11.55	5.54	17.09
Chinkapin Oak	11.16	32.15	43.31
Black Cherry	8.19	16.2	24.39
American Sycamore	6.74	7.39	14.13
Blackgum	4.15	0	4.15
Pignut Hickory	2.67	40.13	42.8
Sassafras	1.3	0	1.3
Shagbark Hickory	0	56.79	56.79
Black Walnut	0	8.93	8.93
Ohio Buckeye	0	5.48	5.48
Basswood	0	5.16	5.16
Chestnut Oak	0	4.78	4.78
Mockernut Hickory	0	4.45	4.45
Blue Ash	0	3.7	3.7
Total	223.52	450.74	674.26
Total per Acre	1.82	3.69	5.51

Location

This 122 acre tract is located in Crawford County, Indiana. It is in Section 28, T3S, R2E. The tract borders Wyandotte Lake and is near the Wyandotte Cave complex.

General Description

This tract is located a short distance from SR 62. A firelane that comes off of SR 62 runs along the western border of the tract. Wyandotte Lake can be found in the neighboring tract along the southern portion of the eastern boundary. Sharpe Creek runs along the eastern boundary as well. Sharpe Springs, the creeks source, is located in the northeastern corner of the tract. Another spring was located near the top of the hill in the central section of the tract.

There are two main stands within the tract and three minor stands. The Oak Hickory stand was the largest of the four, taking up 80 acres and a greater portion of the hillside. This stand was predominantly white oak with a large amount of black oak, red oak, and sugar maple also present. The second larger stand was the Mixed Hardwoods stand which totaled 36 acres and was found near the bottom of the hill where the slope became more gradual. This stand was mainly yellow poplar with a large amount of red oak, black cherry, and shagbark hickory also present. There are 2 regeneration openings from a 1996 harvest. The larger one is roughly 2.7 acres and near the southeastern corner of the tract, where the other is about .7 acre in size and in the central area of the tract. The main regeneration within these openings is submerchantable yellow poplar. There was also 4 acres of old field in the northeastern corner near Shape Springs which had a low basal area and was comprised mainly of yellow poplar and American sycamore.

History

This land was bought in a single purchase from the Wyandotte Cave Company. The total purchase was 1174 acres and occurred in 1966.

This tract was last inventoried in 1973 and harvested in 1996. The management guide from the last inventory did not include the volumes of the stand from that period making a comparison of volumes not possible with the amount of information present. The harvest was primarily in Compartment 18, tract 7, adjacent to the south, but included the southern upper slope of this tract. The focus of the harvest was white oak having 92,138 bf followed by black oak (47,277 bf), red oak (35,135 bf), and scarlet oak (24,853 bf). During the harvest 2 openings were made in the southern area of the tract. These openings were created by removing a decadent overstory of poor quality hardwoods such as sugar maple and American beech, trees left behind after a previous high-grade cut done prior to state ownership. These openings are currently dominated by young yellow poplar.

Landscape Context

1412 is part of a contiguous body of land owned by the State of Indiana and is almost completely surrounded by state land. The northern boundary of this tract borders a parcel of private property, while the rest of the boundaries are shared with state land. A sizeable block of private land is less than 1 mile to the west, containing single family residences and a mixture of open (mostly grassland) and forest. A commercial stone quarry is 1 mile northwest of the tract. This tract is less than ¼ mile away from the Blue River.

Topography, Geology, and Hydrology

The tract is made up of an east facing slope with the top being the western and southern boundaries of the tract. This tract contains some of the more severe slopes on the State Forest. About 1,800 feet across west to east, the elevation changes 394 feet in that distance. Geology is sandstone 'cap' under the higher elevations, covering a thick layer of limestone. There were two springs located within the tract. The first, Sharpe Spring, is a well known feature that feeds Sharpe Creek. The second is a smaller spring and is located mid-hill in the southern section of the tract and flows towards Wyandotte Lake. All water from this tract flows towards Wyandotte Lake which then flows towards the Blue River.

Soils

Adyeville Very Fine Sandy Laom (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 (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.

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 clay. The stratum is 9 inches of loam. The bedrock which is at 45 inches form the surface is 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 follows the western border of the tract. This firelane is in fair condition, but as it approaches and borders the tract, there are 2-3 locations where the road needs work to improve drainage and pass ability and to widen and straighten.

Boundary

The eastern boundary of this tract is defined by Sharpe Creek/Wyandotte Lake while the western and southern boundaries are more or less defined by the top of the hill that makes up the tract. The northern boundary is not defined by geographical feature, but is a straight east/west line shared with private property.

Wildlife

A Natural Heritage Database review was obtained for this tract. If rare, threatened or endangered species were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

The wildlife habitat suitability, focusing on legacy trees, snags, and cavity trees, shows high suitability for this area. The optimal level of trees within the stand of each size class was met for the three mentioned categories, making this site ideal for both the Indiana bat and other forest species.

Wildlife species that were noted on this stand were those typical of the area. Evidence of beaver, deer, coyote, squirrels, chipmunks, raccoons, and turkey were seen in the area as well as a wide variety of bird species. Within the Old Field stand were small trees that had been felled by beavers, though no damn was located during the inventory. The lake and creek offer a water source for these species while also creating habitat for multiple amphibious species. The presence of oak and hickory species creates a source for hard mast which is beneficial to multiple wildlife species.

Wildlife Habitat Feature (Tract Wide)

Category	Maintenance level	Optimal Level	Inventory	Available Above maintenance	Available Above Optimal
Legacy Trees *					
11"+	1098		2814	1716	
20"+	366		736	370	
Snags (all species)					
5"+	488	854	1579	1091	725
9"+	366	732	1064	698	332
19"+	61	122	132	71	10
Cavity Trees (all species)					
7"+	488	732	738	250	6
11"+	366	488	676	310	188
19"+	61	122	324	263	202

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

Indiana Bat

As management activities, currently, are only performed in the winter months due to voluntarily self-imposed Indiana bat restrictions, 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 ideal levels of legacy trees, snags, and cavity trees are beneficial to the bats which will undoubtedly be within the area prior to and following the hibernation period.

Recreation

This area is widely used by the public. The firelane doubles as a disabled hunters trail, bringing hunters into the area throughout the late fall/ early winter season. Some of the firelane also acts as a horse trail which splits off from the firelane near the northern end of the tract. There is also another horse trail running along the eastern boundary of the tract. There is a hiking loop that goes around Wyandotte Lake, along Sharpe Creek, to Sharpe Spring, and then back to the parking lot for Wyandotte Lake.

Cultural

Cultural resources may be present on this tract but their location is protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Summary Tract Silvicultural Description, Prescription, and Proposed Activities

Oak Hickory (80 acres)

This stand was the largest, taking up the slopes of this tract. The stand consisted mainly of white oak but also had a large amount of black oak, red oak and sugar maple as well as hickory and other oak species. The stand was slightly dense in terms of basal area with 102 sqft/ac and a total volume of 5,950 bf/ac. Of this, there were roughly 2,000 bf/ac and 36 sqft/ac that were harvestable at this point in time. By removing this amount the tract would retain close to 4,000 bf/ac and 65 sqft basal area/ac.

While this stand could be harvested at this time based on the volume and basal area, it could wait for a few years for a harvest to occur. By waiting, the trees will have the opportunity to increase their overall volume. Also, by waiting, the harvest will coincide with that necessary for the Mixed Hardwoods stand.

Mixed Hardwoods (36 acres)

This stand, which is roughly half the size of the Oak Hickory stand, is located near the bottom of the slopes of this tract reaching Sharpe Creek. This stand currently has 94 sqft/ac with 5,380 bf/ac in it. Of this, 1,660 bf/ac and 30 sqft/ac would be harvestable at this point in time leaving 3,720 bf/ac and 63 sqft/ac. The main species composition within this stand was yellow poplar followed by red oak, shagbark hickory, and black cherry.

While this stand could also be harvested at this point in time, it appears that the stand is both younger than the Oak Hickory stand and still growing. By waiting a few years for a harvest, the time would allow for this stand to add volume to itself and the same for the Oak Hickory stand. Since this stand is likely younger, it could likely go longer without a harvest, but by pushing the harvest back farther it risks the Oak Hickory stand becoming overmature and decadent.

Old Field (4 acres) and Regeneration Openings (3.4 acres)

The Old Field stand is too small to efficiently be managed separately from the rest of the tract. The Old Field stand is mainly American sycamore and yellow poplar. This stand should be managed at the same time as the Oak Hickory and Mixed Hardwoods stands. At the moment, the regeneration openings are comprised mostly of young yellow poplars. The regeneration openings should receive a crop tree release by the time that they are 20 years in age to encourage the more vigorous trees and while there conduct vine control work, if needed.

TRACT ACCOMPLISHMENT RECORD
Compartment 14, Tract 12

DATE PLANNED	ACTIVITY / REMARKS	DATE COMPLETED
2011	Submit archeological clearance request for needed road work	July 2011
2016	Crop tree release work on 2 regeneration openings (from 1996)	
2018-20	Timber harvest (possibly with Comp. 18, tract 7)	
2021-22	Post harvest TSI	
2030	Re-enter for next management cycle	

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