Indiana Department of Natural Resources
Division of Forestry

Draft

Resource Management Guide

Harrison-Crawford State Forest **Compartment: 14 Tract: 9**
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Acres Commercial Forest: 160
Acres Noncommercial Forest: 0
Acres Permanent Opening: 0
Acres Other: 0

Acres Total: 160

Basal Area >= 14 inches DBH: 42.37 sqft/ac
Basal Area < 14 inches DBH: 47.90 sqft/ac
Basal Area Culls: 5.61 sqft/ac
Total Basal Area: 90.27 sqft/ac

Number Trees/Acre: 190

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
White Oak	43.08	125.36	168.44
Northern Red Oak	33.78	51.8	85.58
Yellow Poplar	27.9	78.46	106.36
Black Oak	27.87	36.81	64.68
Sugar Maple	26.32	38.32	64.64
Shumard Oak	21.25	3.38	24.63
Scarlet Oak	14.9	0	14.9
American Beech	11.93	9.79	21.72
White Ash	10.22	1.2	11.42
Pignut Hickory	7.34	21.73	29.07
Chinkapin Oak	5.76	9.03	14.79
Mockernut Hickory	5.15	1.7	6.85
Red Maple	3.38	0	3.38
Black Walnut	2.68	12.8	15.48
Basswood	2.49	0	2.49
American Elm	1.2	0	1.2
Sassafras	1.2	0	1.2
Shagbark Hickory	0	18.83	18.83
Ohio Buckeye	0	8.17	8.17
Eastern Red Cedar	0	6.46	6.46
Virginia Pine	0	3.57	3.57
Black Cherry	0	2.91	2.91
Blackgum	0	2.37	2.37
Honeylocust	0	1.2	1.2
Total	246.45	433.89	680.34
Total per acre	1.5	2.7	4.2

Location

This 160 acre tract is located in Crawford County, Indiana. It is in sections 28 and 21, T3S R2E.

General Description

This tract is located in the northern section of Harrison Crawford State Forest just south of Interstate 64. Dry Run Road is the boundary of the neighboring tract which is in close proximity to the northwestern most point of this tract. A system of horse trails run through this tract that are accessible from a firelane that goes into the tract to the southeast of 1409. This tract is comprised mostly of an east facing slope with a small portion being a north facing slope in the northern region. Sharpe Creek runs along most of the boundary of this tract, marking the northern, easterm and southeastern boundaries of the tract. For the most part the slopes are not very steep with the exception being in the major drainage in the north central portion of this tract.

This flat area of this tract was once used as a field and currently shows the characteristics of an old field stand. Within this stand are two plantations. The first is a 2 acre black walnut plantation while the other is a 4 acre provenance test for white oaks. The higher portion of the slope is made up of an oak hickory stand which totals 61 acres. The middle to lower slopes are comprised of a 66 acre mixed hardwoods stand.

There was an area in the north central portion of the tract which has undergone significant fire damage in the past. There were two levels of severity of fire damage with the a small portion being more severe than the rest. The fire damage has left a high amount of trees to be hollow in the main stem with large cavities and butt rot being present.

History

This tract was obtained in 1966 as portion of a parcel over a thousand acres for the Wyandotte Cave area. The associated Sharpe's spring is at the base of a cliff face near or on the southern tract boundary.

Landscape Context

1409 is located in eastern Crawford County. Surrounding cover is primarily hardwood forest. Blue River, a perennial stream, flows around .3 mile east of tract 9. Private property lies along the western border. About .6 mile to the west of the tract is the Mulzer crushed limestone quarry. I-64 is about 1.7 miles north. Within .3 mile is SR62. Within less than .3 mile can be found 2 private residences and the Wyandotte Caves facility is as close as .2 mile.

Topography, Geology, and Hydrology

This slope is comprised mostly of an east facing slope and a north facing slope in the northern area. The main waterway in this tract is Sharpe Creek which acts as the major boundary feature for this tract with exception of the western boundary. There is a major drainage in the north central portion of the tract which leads to Sharpe Creek. This tributary flows into the Blue River which acts as the major watershed for the area.

Topography varies greatly, from nearly flat in the eastern portion along Sharpe's Creek to extremely steep on the east facing slope at the southern part of the tract. The extremes in elevation within this tract ranges from 420 to 760 feet above sea level or a total change of 340 feet.

If karst features were identified for this area, the activities prescribed in this guide will be conducted in a manner to avoid adverse impacts.

Soils

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

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

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, Ho)

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 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

The southern portion of this tract can be accessed through a horse trail which comes out of tract 1411. A fire trail leads to this tract off of SR 62. Another starting near the beginning of Wyandotte Cave Road also will go to tract 9. The northern portion is a short distance from the county road which acts as the western boundary of tract 1403. A drainage is between these two tracts and can act as an equipment limitation. If this area is used to access this tract with machinery, the drainage needs to be evaluated to find the point with the least amount of slope leading into the drainage.

Boundary

Sharpe Creek acts as the primary boundary feature in this tract. The creek runs from the northern area of the tract, along the eastern boundary and into the southern boundary. A drainage leads to Sharpe Creek and acts as the northwestern boundary. The western boundary is shared with private property. The boundary shared with private property has fencing along it as well as some carbonate survey markers. The fence that runs along the western side of the NE ¼ of the NW ¼ of section 28 of the tract is not as accurate as the other fencing and follows the contour lines rather than the property lines. There is also a cornerstone located at one of the corners at the NE corner of the SE ¼ of the NW ¼ of section 28. The SW and NW corners of the NE ¼ of the NW ¼ of section 28 are marked by the intersections in the fence line.

Wildlife

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 tree goals for this tract were all met at the maintenance level and most of them at the optimal level. The categories that were not met at the optimal level were snags in the size class of 19"+ and cavity trees between 7" and 11".

Wildlife Habitat Feature (Tract Wide)

Category	Maintenance level	Optimal Level	Inventory	Available Above maintenance	Available Above Optimal
Legacy Trees *					
11"+	1440		3315	1875	
20"+	480		691	211	
Snags (all species)					
5"+	640	1120	1407	767	287
9"+	480	960	1136	656	176
19"+	80	160	119	39	-41
Cavity Trees (all species)					
7"+	640	960	766	126	-194
11"+	480	640	674	194	34
19"+	80	160	252	172	92

* 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 guidelines, 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 of the maintenance level goals and a majority of the optimal level goals. Meeting these goals demonstrates this tract's suitability for the Indiana Bat. The high presence of legacy trees helps ensure that this area will remain acceptable for this species in the future.

Recreation

A system of horse trails exist in this tract and act as the primary form of recreation in this tract. Hunting is a popular recreational use of tract 9, as well as caving.

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

There was a large area within this tract that had heavy fire damage making many of the trees no longer merchantable in the worst case and drastically reducing volume in the best cases. This area was found around the major drainage in the northern half of the tract and was within both the Oak Hickory stand and the Mixed Hardwoods stand.

Mixed Hardwoods (66 acres)

This stand was found along the bottom half of the slopes throughout the tract and was the largest stand in area. The most dominant tree in terms of volume was yellow poplar with over double the volume of the second largest. After yellow poplar, there was sugar maple, white oak, and northern red oak, all of which had nearly the same volume. There was also a large amount of young sugar maple, which had the highest basal area, both in the overstory, understory, and regeneration layer. The overall volume for this stand came out to be 4,600 bf/ac with 1,550 bf/ac being deemed harvestable thus leaving 3,050 bf/ac. The overall basal area was 97 sqft/ac with 35 sqft/ac being removable at this time.

This stand is reaching a basal area of 100 sqft/ac which is commonly deemed to be overstocked. In order to reduce the stocking, the stand should be thinned which will increase the growth rate and quality of the remaining trees. The area of heavy fire damage was listed as being within this stand but there was also evidence of fire damage outside of the designated area. Any individual with fire damage should be removed as it has less merchantable timber, is stressed, and has a weaker structural strength which will result in a greater chance of blow down or crown destruction. The area designated as heavy fire damage should be made into an opening(s) in order to restart the timber growth as most of the timber in that area is greatly damaged.

Oak Hickory (61 acres)

The Oak Hickory stand was located on the upper slopes of this tract and consisted mostly of white oak with over double the volume of northern red oak, the species with the second highest amount of volume. The total volume for this stand came out to be 5,625 bf/ac with a basal area of 93 sqft/ac. Of this volume, 2,325 bf/ac and 35 sqft/ac was deemed harvestable leaving 3,300 bf/ac and 56 sqft/ac. as leave stock.

This stand would benefit from a harvest in the near future. The basal area is less than the Mixed Hardwoods stand but is starting to approach an overstocked level. The harvest would remove a lot of this basal area and leave the stand relatively thin right after the harvest. This harvest is heavier than normal with the goal of removing the high amount of fire damage in the stand, including the area of fire damage designated on the map. By removing the fire damaged individuals, the area would be readied for future regeneration. The damaged trees range from being hollow in portions of the stem to being hollow throughout the entire stem. If these trees are left, they will be more susceptible to blow down and having the stem snapped. Also, by heavily thinning the stand, the area becomes more suitable for oak regeneration by allowing higher amounts of sun to reach the forest floor, thus encouraging the growth of oak which is relatively shade intolerant. The need for regeneration of the fire damaged areas creates a lower average stocking level for the whole stand.

Old Field (26 acres)

This stand is a young stand with little volume present. The trees that are within this stand are brushy, short, and dense. It is difficult to walk through this stand thanks to the dense trees as well as shrubs and vines. This area would benefit from a timber stand improvement. This practice would not create immediate revenue but would prep the stand for the future. If left alone, this stand will most likely remain the same as it is now. The high occurrence of grapevines in this stand will provide a hindrance and threat to the health, form, and longevity of the young stems.

COMPARTMENT 14 TRACT 9

PROPOSED ACTIVITIES	**DATE**
Improve access lane from Wyandotte Cave Road	2012-13
Timber harvest	2014-15
TSI (include thinning in black walnut plantation)	2015-16
Inventory	2030
Crop tree release in regeneration openings	2034
Next managed harvest	2040

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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.

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