Indiana Department of Natural Resources – Division of Forestry

DRAFT

Resource Management Guide

Harrison-Crawford State Forest **Compartment: 26 Tract: 3**
Dieter Rudolph, John Segari **Date: May 31, 2013**
Management Cycle **20 Years**

Acres Commercial Forest: 59
Acres Noncommercial Forest: 0
Acres Permanent Opening: 1
Acres Other: 0
Acres Total: 60

Basal Area >= 14 inches DBH: 59.37 sqft/ac
Basal Area < 14 inches DBH: 34.22 sqft/ac
Basal Area Culls: 6.19 sqft/ac
Total Basal Area: 93.59 sqft/ac
Number Trees/Acre: 163

	Harvest		Leave		Total	
Species	Volume, acre	Volume, Total	Volume, acre	Volume, Total	Volume, acre	Volume, Total
White Ash	790	47,420	600	36,000	1,390	83,420
Northern Red Oak	408	24,470	50	2,980	458	27,450
Sugar Maple	306	18,330	618	37,090	924	55,420
American Beech	276	16,590	26	1,550	302	18,140
Yellow Poplar	192	11,540	149	8,950	341	20,490
Basswood	98	5,900	164	9,840	262	15,740
Eastern Red Cedar	76	4,540	168	10,110	244	14,650
Chinkapin Oak	60	3,620	229	13,740	289	17,360
Scarlet Oak	30	1,830	46	2,740	76	4,570
Shagbark Hickory	0	0	248	14,860	248	14,860
White Oak	0	0	244	14,630	244	14,630
Ohio Buckeye	0	0	119	7,120	119	7,120
Black Cherry	0	0	65	3,890	65	3,890
Black Walnut	0	0	46	2,770	46	2,770
Shumard Oak	0	0	43	2,550	43	2,550
Black Locust	0	0	35	2,120	35	2,120
American Elm	0	0	16	960	16	960
Total	**2,236**	**134,240**	**2,866**	**171,900**	**5,102**	**306,140**

****Likely harvest volume of 62 MBF due to management limitations, see below.**

Location

This 60 acre tract is located in Harrison County, Indiana. It is in sections, 3 and 4 T4S R2E.

General Description

This tract is located within the main body of Harrison-Crawford State Forest near O'Bannon State Park. It is accessed by a firelane, which travels along its southern boundary and comes off Old Forest Road right before the gatehouse to the O'Bannon Class A campground. The eastern third of the tract is a series of sharp drainages leading towards a flat parcel of land

which lies between this tract and the Blue River. The central section of the tract is a thin portion of land which is mostly a steep hill leading down to the aforementioned flatland. The western third is a gradually sloping piece of land that was not historically forested and now is a young old-field stratum.

There are two strata within this tract, an Old Field stratum (14 acres) and a Mixed Hardwoods stratum (45 acres) as well as one acre of open land which is the right-of-way for the power lines. The Mixed Hardwoods stratum takes up a majority of the eastern two thirds of the tract along the steeper slopes. The Old Field stratum is in the historically non-forested site in the western section as well as along the flat lands on the north boundary.

History

The land of this tract was obtained in three separate purchases. The area in the E ½ of the E ½ of the NE ½ of section 4 as well the area in section 3 were a part of a 83 acre purchase from Engleman in 1967. The rest of the area of the tract in the NE ¼ of section 4 was a part of a 90-acre purchase from Sharp in 1967. The last portion is the small area in the NW ¼ of section 4 was part of a 70-acre purchase from Breeden in 1967.

Landscape Context

2603 is part of a contiguous body of land owned by the State of Indiana. The tract is within the main boundary of the Harrison-Crawford State Forest. All of the surrounding land is owned by the state and the land to the south of the tract is a part of O'Bannon Woods State Park.

Topography, Geology, and Hydrology

The entire tract is a north-facing slope with the southern boundary being the high point. The slope is steepest in the central section of the tract and most gradual in the western part. The eastern third of the tract is excessively steep and has multiple deep drainages. The tract to the north of 2603 is a relatively flat piece of land and sits between this tract and the Blue River, which acts as the major watershed for this tract.

One sinkhole was found within the tract at the northeast corner on a flat section of land. Other than this feature, no evidence of cave or karst features was found. Any management operations that occur in this tract should Follow Indiana's BMP's to ensure the protection of this sinkhole and any Karst features not found during the inventory.

Soils

While the topography of the tract has resulted in a variety of soil types at different slope positions, the following three account for the majority of the managed acres and should be considered when planning management activities.

CqyG- Corydon stony silt loam, 20 to 60 percent slopes
This steep to very steep, somewhat shallow, well drained soil is found on side slopes in the uplands. It is suited to trees. Equipment limitations and erosion hazards are concerns that should be considered during sale layout and implementation of Best Management Practices for Water Quality. This soil has a site index of 64 for white oak and 90 for yellow poplar.

CteC2- Crider-Vertrees silt loams, 6 to 12 karst, rolling, eroded
This moderately sloping, deep, well drained soil is on ridgetops and sideslopes on uplands and sinkholes. It is well suited to trees. Crider has a site index of 72 for white oak and 97 for yellow poplar and Vertrees has a site index of 74 for white oak.

GfcF- Gilpin-Tipsaw-Ebal complex, 18 to 35 percent slopes, stony
This moderately sloping to steep, somewhat deep, somewhat to moderately well drained complex is found on side slopes of uplands and benches. It is well suited to trees. Gilpin has a site index of 80 for northern red oak and 95 for yellow poplar, Tipsaw has a site index of 70 for black oak, and Ebal has a site index of 80 for black oak.

Access

This tract is accessed by a firelane which runs the entire southern border. The firelane comes off Old Forest Road near the gatehouse for the Class A Campground in O'Bannon Woods State Park. Internally, the many drainages limit east west access through the tract.

Boundary

A firelane/ horse trail runs along the southern boundary of the tract. The eastern boundary is marked by the largest of the drainages within the tract. The north and east boundaries are defined by the point where the slope levels off onto flat ground.

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.

In terms of wildlife habitat feature goals, no optimal levels were reached within this tract. There was also a deficit in the maintenance level for all size classes of snags. The best feature of this tract for wildlife is the large number of legacy trees of both size classes. Given time, these legacy trees will move into the snag and cavity trees. In addition, there are more than 600 cull trees accounting for almost 6 sqft/acre of BA across the tract. Many of these culls will be retained due to lack of merchantability, resulting in an increase in cavity tree density now and snag density in the end. Larger culls may be converted to snags during post harvest TSI.

The wildlife that was noted during the inventory was typical with other areas in Harrison County. Evidence of deer, turkey, squirrels, raccoons, and various birds were noted during the inventory. The difference between the Mixed Hardwoods, Old Field, and Open stratum do create a variety of habitats as well as fringe habitat for wildlife species in the area.

Wildlife Habitat Feature (Tract Wide)

Category	Maintenance level	Optimal Level	Inventory	Available Above	Available Above

				maintenance	Optimal
Legacy Trees *					
11"+	540		1795	1255	
20"+	180		353	173	
Snags (all species)					
5"+	240	420	92	-148	-328
9"+	180	360	92	-88	-298
19"+	30	60	11	-19	-49

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

Indiana Bat

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 and regeneration openings 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.

Wildlife in this tract should not be adversely affected by the management plan. No rare, threatened, or endangered species will be adversely affected during the planning period. Snags and coarse woody debris should remain at viable levels in the stratum and should continue to provide habitat for the Indiana bat. No action in this tract would result in the reduction of a hard mast source for small mammals and birds. Managing to recruit newly established or released oaks and hickories will help to ensure that this important food source is available into the near future.

Wildlife Discussion from Ecological Resource Review: 1.1 Additionally, management activities involving a timber sale should not affect this habitat long-term from the perspective of any wildlife utilizing it due to the maintenance of a forested habitat on the tract. Creation of regeneration openings will create early successional habitat that will be beneficial to certain groups of wildlife dependent upon this habitat. Likely, early successional habitat created with such management will also benefit a wider segment of wildlife species that preferentially utilize such habitat for feeding and cover more so than later successional stage habitat.

Recreation

This area is a highly used site for recreation. The Iron Bridge horse trail follows the firelane and leads to the old Iron Bridge and the Adventure Hiking Trail is in the eastern portion of this tract as well the Fire Tower mountain biking trail. There has been discussion of lower stretches of the AHT that occur in the adjacent tract 2601 being rerouted to this tract to reduce trail densities and move the trail to higher ground. The Division of Forestry is open to

these changes. Once the state park and cooperative user groups submit a proposal, it will be evaluated and decided upon by the state forester.
Due to the proximity to the road, this site is also one used frequently by hunters in deer and turkey season. There is a 300-ft buffer around the state park of no hunting.

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.

Invasive

Both garlic mustard and Ailanthus were found within this tract. The garlic mustard would form mats on the ground excluding any other regeneration for the area. The Ailanthus was mostly young individuals at this time, but should be managed before they reach the overstory. Both of these species should be removed to preserve the forest type and prevent a monoculture of exotic species. The ailanthus was treated by basal bark herbicide in the summer/fall of 2009. It should be retreated as needed prior to the next harvest.

Management Limitations

The eastern portion of the tract has several deep drainages that are not crossable by motorized equipment. Any mechanical management practices need to occur in strips going down each finger and coming out on the firelane at the top of the hill.

The thinnest portion of the tract in its center has the steepest slope with rocky outcrops making it difficult to impossible for mechanical equipment to travel up at this point.

Summary Tract Silvicultural Description, Prescription, and Proposed Activities

This tract was last inventoried in May of 1981. The following year in April this tract, as well as 2602 and the western edge of 1905, were harvested together. The harvest volumes were combined between the two tracts making it difficult to compare the last inventory to this one. The volume from the last inventory was compared with this inventory in order to get a growth trend. **As the removed volume remains among these numbers, the reality of the data should have a higher growth per season than is shown.**

The difference in volume between the last and the present inventories was minimal. An average growth per acre per year was shown to total 12 bf/ac/year. The most significant change that occurred was that this tract appears to become a mixed hardwoods covertype, which was observed during this inventory, due to the loss of volume from various oak and hickory species present in the last inventory. The harvest between the two tracts focused mainly on red oak. White oak, white ash, black oak, sugar maple, and American beech were the next highest volume by species removed from the two tracts.

<u>Mixed Hardwoods (45 acres)</u>
This stratum comprises a majority of the tract and contains the only significant timber volume of the tract. The stratum was comprised mostly of sugar maple in terms of basal area

but white ash took up roughly one third of the overall volume of the stratum. The high volume of white ash was due to larger ashes, many of which within close proximity to one of the trails. The volume per acre for the tract was 6,769 bf/ac with a basal area of 109 sqft/ac.

Based on the high basal area and the large amount of ash in the area, the stratum could benefit from a harvest. Strata with high basal area tend to create competition induced stress. This county has been flagged as one having the emerald ash borer, an insect which, as the name suggests, bores into ash trees, lays their eggs, and then leaves. The larva of this species will then eat the outer layers of wood and eventually girdle the tree. The ash borer prefers larger ash trees, which were seen in this tract, as well as stressed individuals. Native white ash has not shown resistance to this pest, so attacked trees will die. A harvest in this tract would focus on removing the larger ash trees in order to decrease the food source for this exotic insect in the hopes to keep some control on its breeding population. While a harvest occurs, the stratum would also be thinned with the focus on the residual and maintaining the aesthetics of the tract. In the process, trees of all size classes should be girdled in order to increase the snag count for the area to benefit wildlife. The eastern 19 acres should be combined with the proposed thinning in tract 2602 and 1905 to facilitate marketability. The western 26 acres is either inaccessible or better left to natural proceses.

Old Field (14 acres)

The smaller of the two, this stratum occurs in multiple locations. The total basal area for the stratum is around 70 sqft/ac, most of which is made up of pole-sized trees. The total volume was less than 2,000 bf/ac, a ¼ of which was eastern red cedar. Based on the young individuals in this stratum, it appears that the old field will eventually succeed to mixed hardwoods, as can be seen by the higher amounts of sugar maple and white ash (the main component of the Mixed Hardwoods stratum). Now, this stratum should be left to grow on its own. The low basal area suggests that competition will not be a problem for the next couple of years and the species composition shows that the stratum is naturally on the right path for the area. If the resources are present, this stratum could undergo a timber stratum improvement, which would mimic the natural progression of the stratum at a faster rate of change.

Management Summary

As mentioned elsewhere, this tract is utilized heavily by recreationists with a biking trail and the Adventure Hiking Trail going through it. The aesthetic quality of the area should be kept in mind when marking. In order to do this, the marker should try not to mark too many trees within close proximity to the trail and keep a handful of large trees (except for white ash) along the trail as many users find larger trees to be aesthetically pleasing. In addition, a buffer should be provided along the iron bridge horse trail.

The exclusion of the Old Field area from harvesting and the inaccessibility of the western half of the Mixed Hardwood portion of the tract will provide approximately 69% of the land area in undisturbed forest. That should maintain visual aesthetics for users along the recreational trails as well as provide a nearby refuge for wildlife during the harvest operation.

This tract should be marked for a single tree selection and receive approximately .5 acres of regeneration openings. Visual buffers with limited removals should be provided along the main road to the south. Despite the silviculturally appropriate 134 MBF of harvest volume shown by the inventory, buffers and light marking near trails and the exclusion of 68% of the land from harvest will likely reduce sale yields to 62 MBF. Projected harvest yield is a product of likely harvest area, 19 acres, and inventoried harvest volume per acre for the Mixed Hardwood type, 3,252 bf/ac. Actual harvest volume may be higher or lower depending upon the statistical error of the inventory.

Proposed Activities Listing:

Proposed Activity	**Proposed date:**
Post informational signs	Summer/ fall 2013
Treat ailanthus	Summer 2013
Mark Thinning	Winter 2013/2014
Sell timber	May/June 2014
Harvest	Winter 2014/2015
Post harvest tsi	2015/2016
Monitor any regeneration openings	2020
Re-inventory	2033
Write new management plan	2033

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