Indiana Department of Natural Resources – Division of Forestry

DRAFT

Resource Management Guide

Harrison-Crawford State Forest **Compartment: 26 Tract: 2**
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Management Cycle **20 Years**

Acres Commercial Forest: 55
Acres Noncommercial Forest: 0
Acres Permanent Opening: 1
Acres Other: 0
Acres Total: 56

Basal Area >= 14 inches DBH: 70.88 sqft/ac
Basal Area < 14 inches DBH: 43.37 sqft/ac
Basal Area Culls: 3.07 sqft/ac
Total Basal Area: 116.25 sqft/ac
Number Trees/Acre: 209

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
Northern Red Oak	36,250	34,170	70,420
White Oak	30,610	67,960	98,570
White Ash	23,840	1,250	25,090
Sugar Maple	13,810	26,590	40,400
Black Oak	12,640	8,540	21,180
Scarlet Oak	6,470	630	7,100
Eastern Red Cedar	5,150	0	5,150
Pignut Hickory	4,010	9,540	13,550
Yellow Poplar	3,430	7,850	11,280
Chinkapin Oak	3,140	5,090	8,230
Blackgum	1,330	0	1,330
Shagbark Hickory	0	17,570	17,570
Basswood	0	8,530	8,530
Black Walnut	0	3,210	3,210
American Beech	0	2,080	2,080
Mockernut Hickory	0	1,620	1,620
Black Cherry	0	830	830
Total	**140,680**	**195,460**	**336,140**
Total per acre	**2,512**	**3,490**	**6,003**

Location

This 56 acre tract is located in Harrison County, Indiana. It is in Section 3 T4S R2E. It is on the north side of the road that divides Harrison-Crawford State Forest from O'Bannon Woods State Park, just north of the campground.

General Description

This tract is located within the main body of Harrison Crawford State Forest near O'Bannon State Park. It is accessed by Old Forest Road, which acts as the southeastern boundary, near the gatehouse to the Class A campground. The tract is primarily a ridge that runs down, in a northwest direction, to a section of flat land in the neighboring tract. The northern portion of the tract is steep slope/cliffs that lead to the Blue River. The western boundary of the tract is

a major drainage that leads to the flat land and then to the Blue River. Overall, the tract is half a west facing slope and half a north facing slope.

This tract is a combination of a mixed hardwoods and oak hickory covertype. The Oak Hickory stratum is 38 acres in total and found throughout the more gradual slopes. The main species within this stratum, in terms of volume, are white oak and red oak, both being significantly greater than any other species. In terms of basal area, the stratum was mainly the two previously mentioned oaks as well as sugar maple. The sugar maple component is comprised of a large number of smaller sugar maples, in both the understory and beginning to enter the overstory.

The mixed hardwood covertype is found in two distinct locations. The first was the Mixed Hardwoods stratum (10 acres), which was found mainly along the edges of the ridge. There is also a small regeneration opening that has come up as a mixed hardwoods covertype (mostly sugar maple and white ash). The dominant species for this were sugar maple, white ash, red oak, and white oak. Sugar maple had the largest amount of volume and basal area though both white ash and red oak were close behind it in volume. Basswood, yellow poplar, and shagbark hickory were also present in larger quantities. Overall, this stratum is a healthy mix of hardwood species.

The last stratum was the Mixed Hardwoods Steep covertype (8 acres). This stratum was in the northern portion of the tract in the steep slopes/cliffs leading to the Blue River. The slopes were terraced in parts allowing for better growth than on the areas of steep slope. This stratum was rockier with open rock faces and rock outcrops frequent. The species present in this stratum were mostly sugar maple and red oak. Due to the slopes and equipment limitations, none of these trees were merchantable.

History

The land in this tract was obtained in three segments. The area in the SE ¼ of the NW ¼ of section 3 was a part of an 80-acre purchase from Bye in 1939. The small portion of land in the NE ¼ of the SW ¼ of section 3 was a part of a 233-acre purchase from Cole in 1936. The rest of the area was a part of an 83-acre purchase from Engleman in 1967. There was a managed harvest within this tract in 1982 included some of the area of C19T5 to the east and some of C26T3 to the west. There was a combined volume of 48,322 bd.ft. removed from these tracts at that time. Sometime after that harvest, the management of Wyandotte Woods SRA constructed a small shelter house in what had been used as the log yard.

Landscape Context

Tract 2602 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 for .8 mile. Within a 5 mile radius, the majority of the land is forested, with most of the open land on private property towards the outer edges of this circle. Additionally, the town of Leavenworth, I-64, and several miles of the Blue and Ohio rivers lie within this area, as well. Lastly, the O'bannon state park is adjacent to the tract.

Topography, Geology, and Hydrology

This tract is comprised of a north facing slope and a west facing slope, both being about equal in acreage. The main feature of the tract is a ridge that starts in the southeastern section of the tract and runs down onto flat land ending in the northwestern corner. The western boundary of the tract is a major drainage with steep slopes at points. The northern boundary is the Blue River, which is the major watershed for the area. The area near the Blue River is a combination of steep slopes and cliffs with open rock faces and rocky outcrops.

No evidence of karst activity was seen within this tract although the soil type is conducive to sinkhole development. Any operations should follow Indiana's BMP's concerning appropriate buffers if sinkholes or Karst features are found.

Soils

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 Old Forest Road which is also the southeastern boundary. A horse trail runs though a portion of this tract which can also be used as an access point if needed.

Boundary

Three of the boundaries for this tract are well defined and are not easy to mistake. The northern boundary of the tract is defined by the Blue River. The western boundary is made up of a major drainage for the area. Old Forest Road acts as the southeastern boundary of the tract. The northeastern boundary is a minor drainage.

Wildlife

All of the maintenance level Wildlife goals were met. Two-thirds of the optimal goals were met with only the intermediate size class of snags being slightly deficient. The legacy trees of the desired species were found in excess, greatly surpassing the minimum requirements. Given time, these large legacy trees will move into the snag or cavity categories. Numbers below include the 12 species noted "as having relatively high value as potential Indiana bat maternity roost trees" by the USFWS. There are many other trees of various species present on the tract.

Wildlife Habitat Feature (Tract Wide)

Category	Maintenance level	Optimal Level	Inventory	Available Above maintenance	Available Above Optimal
Legacy Trees *					
11"+	504		1983	1479	
20"+	168		633	465	
Snags (all species)					
5"+	224	392	770	546	378
9"+	168	336	252	84	-84
19"+	28	56	71	43	15

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 strata do create a variety of habitats as well as fringe habitat for wildlife species in the area.

Wildlife in this tract should not be adversely affected. 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 stand 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. The main affect on habitat will be a reduction of the coniferous component of the stand. 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 Adventure Hiking Trail is in the central portion of this tract as well as a mountain biking trail. Due to the proximity to the road, this site as well as surrounding areas is also one used frequently by hunters in deer and turkey season. A shelter house and picnic area is located along the southeastern boundary of the tract in a small opening. All efforts should be made to limit visual and use impacts for these user groups. Maintaining visual buffers and limiting the sale period to a single season, will help limit impacts.

Rare Threatened and Endangered Species

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.

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

The small area of mixed hardwoods in the southeastern portion of the tract appeared to have been either a regeneration opening or an area of heavier blowdown. Since the time when either of these actions occurred, a mixed hardwoods stratum has developed. Along with these hardwoods, Ailanthus has moved into the area. As the overstory is not completely developed yet, the Ailanthus individuals could pose a problem due to their fast growth rates. This invasive species should be controlled in this area to keep it from outcompeting the regenerating hardwoods.

Management Limitations

The Mixed Hardwoods Steep stratum in the northern section of the tract is not accessible to heavy equipment due to the steep slopes and cliffs. The drainage between this tract and its western neighbor is also not crossable except near the top of the hill.

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 2603 and some of the western end 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.

Based on the data at hand, it is shown that the stratum has increased in volume at a rate of 114 bf/ac/year. The largest amount of growth came from white oak (35 bf/ac/year), northern red oak (25.5 bf/ac/year), and sugar maple (18 bf/ac/year). There was a decrease in growth

for post oak, black cherry, blackgum, pignut hickory, and American beech. These losses of volume were minimal, being at the worst the loss of 2.5 bf/ac/year (American beech).

Oak Hickory (38 acres)
This stratum was the largest of the three and was on the most accessible portion of land. The slopes within this stratum were gradual and not overly rocky. The predominate tree species in this stratum in terms of volume were white oak and red oak, with white oak being the greater. All other species were at most half of the volume of red oak. There was also a large presence of sugar maple within the stratum when looking at the basal area of the species. The high basal area of sugar maple was due to a large presence of maple in the understory level of the stratum.

The overall basal area of the stratum shows there to be 126 sqft/ac with a volume of 6,150 bf/ac. This high basal area creates competition within the stratum, which leads to tree mortality or stress within the stratum. A harvest will decrease competition to ensure healthy growth in the residual trees. There was also the presence of large white ash trees scattered throughout the stratum. These trees were in the appropriate size class to be deemed ideal for the emerald ash borer which was located in Harrison County a few years ago and is spreading. These trees should be removed in order to decrease the food source of this exotic pest. A harvest within this stratum would remove around 50 sqft of BA and 2,800 bf/ac. The residual of the stratum would be 75 sqft/ac and 3,350 bf/ac.

Mixed Hardwoods (10 acres)
This smaller stratum was located in four small areas throughout the tract. The main species within this stratum was sugar maple with the highest volume (1,800 bf/ac), white ash and red oak nearly the same volume (1,365 bf/ac and 1,300 bf/ac) and white oak (880 bf/ac). These volumes were much more similar than the oak hickory stratum, showing a higher level of diversity within the stratum, a common feature in mixed hardwoods covertypes.

Like the Oak Hickory stratum, this stratum also had a high basal area, around 120 sqft/ac with a volume of 7,300 bf/ac. Due to the high basal area, this area should also undergo a harvest in order to reduce competition induced stress and mortality. There was a large presence of larger white ash in this stratum, which should be removed for the same reasons as listed in the previous section. The two lower sections should be maintained to allow for a no harvest buffer along the Blue River.

Mixed Hardwoods Steep (8 acres)
This stratum was a poorer site due to the slope and the rockier conditions, thus resulting in the lower basal area (80 bf/ac) and volume (4,000 bf/ac). Furthermore, due to the heavier slopes and cliffs, this stratum should be left alone, both for safety reasons and heavy equipment limitations. This area also provides a valuable visual and soil disturbance buffer for the Blue River.

As mentioned elsewhere, this tract is heavily utilized 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 main road and the iron bridge trail.

The exclusion of the Mixed Hardwood Steep area from harvesting will provide approximately 15% of the land area in undisturbed riparian corridor that should maintain visual aesthetics for users along the Blue River as well as provide a nearby refuge for wildlife during the harvest operation.

Management Summary

This tract should be marked for a single tree selection and receive approximately 2 acres of regeneration openings. Visual buffers with limited removals should be provided along the main road to the south. Large trees, that are not White ash, should be left where possible for visual appeal due to the high recreation pressure the tract receives. Despite the silviculturally appropriate 140 MBF of harvest volume shown by the inventory, buffers and light marking near trail will likely reduce sale yields to 100 MBF. 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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