Indiana Department of Natural Resources – Division of Forestry
Draft
Resource Management Guide

Harrison-Crawford State Forest **Compartment: 20 Tract: 03**
Dieter Rudolph, Inventory Forester **August 10, 2009**
Plan Reviewed/Updated by Dwayne Sieg, Prop. Mgr. **October 1, 2014**

Acres Commercial Forest: 128
Acres Noncommercial Forest: 0
Acres Permanent Opening: 0
Acres Other: 0

Basal Area ≥ 14 inches DBH: 37.03 sqft/ac
Basal Area < 14 inches DBH: 76.34 sqft/ac
Basal Area Culls: 5.07 sqft/ac
Total Basal Area: 113.37 sqft/ac

Acres Total: 128

Number Trees/Acre: 341.51

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
Eastern Red Cedar	88.14	102.18	190.32
White Pine	88.14	81.36	169.5
Black Oak	26.58	17.19	43.77
Red Oak	9.3	23.81	33.11
Sugar Maple	8.64	19.55	28.19
Yellow Poplar	0	23.98	23.98
White Oak	0	23.69	23.69
White Ash	5.28	10.66	15.94
Chinkapin Oak	4	10.92	14.92
American Beech	7.52	4.6	12.12
Black Walnut	0	7.51	7.51
Scarlet Oak	7.28	0	7.28
Pignut Hickory	0	5.16	5.16
Shortleaf Pine	4.12	0	4.12
Sycamore	1.72	2.28	4
Black Cherry	1.16	0.99	2.15
Shagbark Hickory	0	1.47	1.47
Bitternut Hickory	0	1.27	1.27
Persimmon	0	0.99	0.99
Total	251.88	337.61	589.49
	1.89/ acre	2.66/ acre	4.55/ acre

Location

This tract is located in Harrison County Indiana, T3S R2E primarily in section 25 with small portions in sections 26 and 36. The closest road to this tract is SR 462 which runs along the eastern perimeter. Firelanes enter the tract along both the northern and southern boundaries of the tract.

General Description

This 128 acre tract contains a patchwork of multiple stands including: Mixed Hardwoods (11 acres), Old Field Cedar (38 acres), Oak Hickory (12 acres), Old Field (33 acres), Shortleaf Pine (5 acres), White Pine (27 acres), and Steep Rocky Slopes (2 acres). The Mixed Hardwoods and Oak Hickory Stands are both located in the western portion of the tract. The Steep Rocky Slopes runs along the northern edge of Rock Creek. The Pine plantations are along the south eastern boundary, in a small portion in the southwestern section, and the north central potion. The two old field stands are in the middle and a majority of the northern section of the tract.

A parking lot for the horsetrail and adventure hiking trail exists in the northeastern corner of 2003 along SR 462.

History

The land in this tract was obtained in three different segments. The portion of land in the N ½ of the SE ¼ of section 25 was a part of a 123 acre purchase from Conrad in 1974. The area in the SW ¼ of the SW ¼ was a 33 acre purchase from Bruce in 1941. The area in the SE ¼ of the SW ¼ of section 25 was a part of a 167 acre purchase from Smoots in 1968.

There have been multiple tree plantings in this tract through the years of state ownership, going back to the earliest days in the 1930s (white pine), with the most recent being a black walnut progeny test planted in 1980. White and shortleaf pines were planted in 1970. Undocumented were plantings of white and red pine and autumn olive, sometime in the 1970s. A small planting of yellow poplar and hybrid loblolly pine was installed along SR 462 in the late 1970s. It is likely that the earliest white pine planting received pruning and precommercial thinning in its younger years. A modest harvest of this early white pine was conducted in 1980. Row thinning of white pine (planted 1970) was done in 1982. The walnut progeny test was deemed a failure (for that purpose) due to inappropriate site selection (soils) and abandoned to that use. However, many trees over part of this planting have done well. These should be managed for timber production.

A small group of naturally occurring black walnut is located at the SW corner of the tract. A light thinning and vine control was done in this group in the late 1980s.

Tract 2003 shows signs of heavy farm use in the past. Very few acres escaped being cleared and tilled prior to state acquisition. The dominance of old field covertypes illustrates that much of the tract was once farmed and allowed to naturally progress to forest. The pine stands are all plantations from different time periods. Some of those that are visible from the road have signs denoting the years they were planted as well as the type of pine present.

Landscape Context

2003 is along the eastern edge of a contiguous body of land owned by the state of Indiana. It borders state land on all sides except for a small portion of the eastern border. A majority of the immediately surrounding land is forested. The small sections of state

land to the east of this tract are old plantations and are surrounded by privately owned fields. Pine plantations are present in the immediate areas surrounding the tract's northern and southern boundaries as well as the previously mentioned eastern boundary.

Topography, Geology, and Hydrology

A majority of this tract has gradual slopes. The Steep Rocky Slopes stand as well as the northeastern section is the exception to this generality, thus the reason they were not utilized as fields or pine plantations in the past. The slopes gradually decline toward Rock Creek, which acts as the major drainage for this area. The Blue River is a short distance away from this tract to the north and also acts as drainage for portions of the northern most area of the tract.

Karst features may be found scattered within this tract.

A wildlife pond is located in the southwestern corner of the tract along the firelane/horsetrail.

Soils

BkC3 - BtD5

Corydon Stony Silt Loam (CoF) Shallow, moderately steep to very steep, well-drained, stony soils on uplands. Surface layer is about 3 inches. Subsurface is about 6 inches thick. Subsoil about 9 inches thick. The depth to hard limestone bedrock is about 18 inches. High in organic matter and low in natural fertility. Runoff is rapid or very rapid. Soil type is characterized by limestone outcrops, with as much as 15% on benches which are deeper than 20 inches to bedrock.
Degree Slope: 20-60 %
Woodland Suitability Group: 3d7
Site Index: 65-75 (Upland oaks)
Growth range potential (Upland oaks): 155-220
Management concerns: Runoff and erosion

Crider Silt Loam (CrB2, CrC2, CsB3, CsC3, CtC2) Deep, gently sloping and moderately sloping well-drained soils on uplands. Surface layer is dark-brown silt loam about 8 inches thick. Subsoil is about 62 inches thick. Moderate in content of organic matter and in natural fertility. Available water capacity is high and permeability is moderate. Typically, these soils are eroded. Runoff is medium to rapid.
Degree Slope: 2-12%
Woodland Suitability Group: 1o1
Site Index: 85-95 (Upland Oaks)
Growth range potential (Upland oaks): 300-375 bd.ft./acre/year
Management Concerns: Runoff and erosion

Elkinsville Silt Loam (ElA, ElB2, ElC2, ElC3) Deep, nearly level to moderately sloping, well-drained soils on terraces. Surface layer is about 12 inches thick. Subsoil is about 50 inches thick. The underlying material is stratified layers of silt or sand and minor amounts of gravel. Moderate in content of organic matter. Available water capacity is high, and permeability is moderate. Runoff is slow to rapid.
Degree Slope: 0-12 %
Woodland Suitability: 1o1
Site Index: 85-95
Growth range potential (Upland oaks): 300-375 bd.ft./acre/year
Management Concerns: Runoff and erosion

Hagerstown Silt Loam (HaC2, HaD2, HgC3, HgD3, HgE3) Deep, moderately sloping to moderately steep, well-drained soils on uplands. Surface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil is about 46 inches thick. The depth to limestone is about 52 inches. Characteristically, this soil is eroded to severely eroded. Moderate in content of organic matter and medium in natural fertility. Available water capacity is moderate or high, and permeability is moderate. Runoff is rapid to very rapid.
Degree Slope: 6-25 %
Woodland Suitability Group: 1o1 or 1r2
Site Index: 85-95 (Upland Oaks)
Growth range potential (Upland oaks): 300-375 bd.ft. /acre/year
Management Concerns: Runoff and erosion

Haymond Silt Loam (Hm) Deep, nearly level, well-drained soils on bottom lands and in basins of sinkholes in uplands. Surface layer is dark-brown about 9 inches thick. Subsoil dark yellowish-brown about 17 inches thick. Underlying material is dark yellowish-brown stratified silt loam that contains less prominent layers of loam. Moderate in content of organic matter. Available water capacity is high, and permeability is moderate. Runoff is slow.
Degree Slope: 0%
Woodland Suitability Group: 1o8
Site Index: (95-105- no rating for upland oaks)
Growth range potential (Tulip poplar-no rating for oaks): 375-450 bd.ft./acre/year
Management Concerns: Flooding between December and June

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.

Ho

Wellston Silt Loam (WeC2, WeC3, WeD2, WeD3) Moderately deep and deep, moderately sloping and strongly sloping, well draineds soils on uplands. Surface layer is about 9 inches thick and yellowish-brown. The subsoil is about 31 inches thick. Depth to hard sandstone bedrock is about 40 inches. Moderate in content of organic matter and low in natural fertility. Available water capacity is moderate or high, and permeability is moderate. Runoff ranges from medium to very rapid.
Degree Slope: 6-18 %
Woodland Suitability Group: 3o10
Site Index: 70-80 (Upland oaks)
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Management Concerns: Runoff and erosion

Access

The firelanes along the northern and southern boundary both act as ideal access to the tract. A horsetrail also runs through the tract on the western side. SR 462 runs along the eastern edge of the tract and the two firelanes both enter the tract from SR 462.

Boundary

The northern and southern boundaries are both defined by the firelanes. The eastern boundary is SR 462 while the western boundary is an intermittent stream which combines with Rock Creek. No corner stones were found but the tract boundaries were clearly delineated by the previously mentioned features.

Wildlife

Wildlife species noted on this stand were those typical of the area. As a large portion of the area is an old field, there is a large amount of fringe habitat which is utilized by species such as deer, turkey, ruffed grouse, and many songbirds.

Indiana Bat

Implementation of forest management guidelines for Indiana Bat conservation is standard practice, including applicable seasonal restrictions. 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 potential 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 stand contains a surplus of live trees in the diameter classes between 11 and 20 inches in diameter. However there are not enough live trees greater than 20" nor are there sufficient snags in either preferred size classes throughout the tract. This latter circumstance can be attributed to the comparatively younger stands in the ex-agricultural areas. Girdling trees to create snags would not be a method to increase the amount of large snags for the bat due to the low number of 20"+ bat trees per acre making it impossible to meet bat guidelines at this time.

Indiana bat habitat guidelines (entire tract, desired species only)

Category	Required	Inventory	Available for removal
Live trees			
11"+	1152	4200	3048
20"+	384	221	-163
Snags			
9"+	768	692	-76
19"+	128	24	-104

RTE Species

A Natural Heritage Database Review is part of the management planning process. 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.

Recreation

Multiple forms of recreation occur in and around this tract. The northern firelane is used as an access to a horse trail and adventure hiking trail. This same firelane serves as one of the 5 designated disabled hunter trails. Hunters, hikers, and equestrians use the parking lot for these trails on a frequent basis. The proximity of well known caves has made the nearby area popular for caving, although at present, all caves on the State Forest are closed as a precaution against spread of a serious bat disease known as white nose syndrome (WNS). The old field characteristics present in a large portion of this tract makes it ideal for hunters to use.

Because of the high level of use along with the proximity to SR 462, aesthetics is an important consideration affecting the management options for this tract.

Cultural

Cultural resources may be present but their location(s) are protected. Adverse impacts to significant cultural resources noted will be avoided during management or construction activities.

Summary Tract Silvicultural Description, Prescription, and Proposed Activities

Mixed Hardwoods (11 acres)

This stand was broken into two sections, both located along the northwestern section of this tract. The total basal area of the Mixed Hardwoods stand was 103.8 sqft/ac, of which 20 sqft/ac was deemed harvestable while 83.8 sqft/ac was leave. The total volume for the

stand was 4,020 bf/ac, of which 1,180 bf/ac was deemed harvestable, leaving a total of 2,840 bf/ac. Of this volume, the largest portion was sugar maple, with the most harvestable board feet coming from American beech.

The eastern section of this stand type was the higher quality section. This area was comprised of scattered large sugar maple and American beech with smaller sugar maple and oak species interspersed. The second section of this stand type was smaller trees and more diverse in species composition.

This stand is prescribed a thinning via commercial harvest or TSI in order to lower the basal area and promote quality growth by lowering competition. The thinning would focus on removing lower quality trees based on an individual tree selection method. The thinning is not of immediate need, but could occur anytime.

Old Field Cedar (38 acres)

Located throughout the tract, the Old Field Cedar stand was the largest of the seven stands. It was found in two major sections and one small patch. This stand had a total of 97.6 sqft/ac with 18 sqft/ac being harvestable, leaving 79.6 sqft/ac. There was a total of 4,260 bf/ac, most of which was eastern red cedar (3,710 bf/ac). The harvestable volume for the stand total 1,550 bf/ac with a residual volume of 2,710 bf/ac.

The northern section of this stand type was partially an open grown field with short cedars growing in it. There was no true overstory in this section and had a lower basal area. The trees all had a crown ration of nearly 100% giving these trees lower potential for future harvestable timber. There are three options for this site: 1) Allow stand to grow and fill in as cedar thicket and cover type; 2) Clearcut and replant with desired hardwoods (the surrounding covertypes- old field and pine plantations- do not offer desirable tree species which would result in non-desirable species, brush, or invasive species; 3) Thin cedars to speed the progression towards hardwood forest via natural regeneration or supplemental hardwood planting. Option #3 is the prescribed option at this time.

The previously described former black walnut progeny test can be found in this northern stand next to the fire trail forming that boundary. This small planting could receive a light thinning and weeding to promote faster growth and maintain the vigor of these trees.

The other sections of this stand were more typical forested old fields.

Oak Hickory (12 acres)

This stand is located in the western section of the tract next to the Mixed Hardwoods stand. It is a dense stand with 138.6 sqft/ac of which 66.7 sqft/ac was harvestable leaving 71.9 sqft/ac. The tree species with taking up most of the basal area was sugar maple, of which almost all of it was set as harvest. The volume for the harvestable timber in this stand was 4,060 bf/ac leaving 2,800 bf/ac. The majority of the volume was from red oak and black oak.

The high harvest to leave volume was the result of the quality of the black oaks in the stand. It appeared many of the black oaks were stressed, dying, or snags. As a result, a majority of black oak should be harvested before the timber is lost (within 10 years). Much sugar maple should be removed from this stand to encourage diversity after a harvest or the loss of a majority of the black oaks.

The prescribed action at this time is a combination of single tree and group selection harvest.

Old Field (33 acres)

This stand is located throughout the tract with most of it occurring in the north. This stand is comprised mostly of small trees and brush. There is 88.6 sqft/ac, 12.9 sqft/ac being harvestable leaving 75.7 sqft/ac. The total volume for this stand is 2,550 bf/ac of which 850 bf/ac was deemed harvestable, all of which was eastern red cedar, and 75.7 bf/ac residual.

The purpose for a harvest in here would be to lower the basal area to increase the growth of the trees present. As the stand is not very dense at the moment, no action is prescribed at this time. The needs should be re-evaluated in 15 years.

Shortleaf Pine (5 acres)

The Shortleaf Pine stand was located between two White Pine stands on the eastern side and in the southwestern corner of the tract. The stand was dense with 201.4 sqft/ac. 101.4 sqft/ac should be removed leaving 100 sqft/acre with the intent to convert the stand from non-native pine to native hardwoods.

However, thinning must be done with caution, perhaps in stages to reduce windthrow tendency of this non-native pine. This caution is to protect the residual hardwood understory. The total volume for this stand was 1,220 bf/ac, all of which was shortleaf pine, most of which is prescribed for removal and should be removed.

As option, all the shortleaf pine sawtimber, submerchantable, and some of the pole sized trees could be removed in the initial thinning. By leaving most of the pole sized shortleaf pine, the stand is not drastically changed and still provides an overstory to reduce the amount of brushy vegetation and invasive species coming in while still producing a less dense stand type to promote the growth of the hardwood regeneration. Follow-up TSI in 5-10 years+- would remove the remaining pine.

White Pine (27 acres)

Located in four patches throughout the tract, this stand provided the most sawtimber. The stand is in need of a thinning as it has 151.6 sqft/ac and 7,060 bf/ac, of which 53.7 sqft/ac and 3,370 bf/ac should be removed leaving 97.8 sqft/ac and 3,690 bf/ac. The selection for trees to be thinned was based loosely on clearing out individual rows according to density and proximity of rows.

This stand is prescribed for thinning to promote the continued healthy growth of the white pine present. Many of the trees in this stand were of a larger diameter and appeared to continue to be growing. A thinning now would remove roughly half of the sawtimber as well as a large amount of pole sized logs, while increasing the growth for a future harvest.

The middle section of the White Pine stand had a large area of blowdown within it. Few trees were left standing in this area of blowdown, creating an opening that has become high in brush vegetation. No work is currently recommended in the blow down area.

The long term objective for this stand is conversion to mixed native hardwoods.

Steep Rocky Slope (2 acres)
This stand is along a portion of Rock Creek. The severity of slope makes it problematic for management. No management activity is recommended at this time.

Tract Wide Prescription

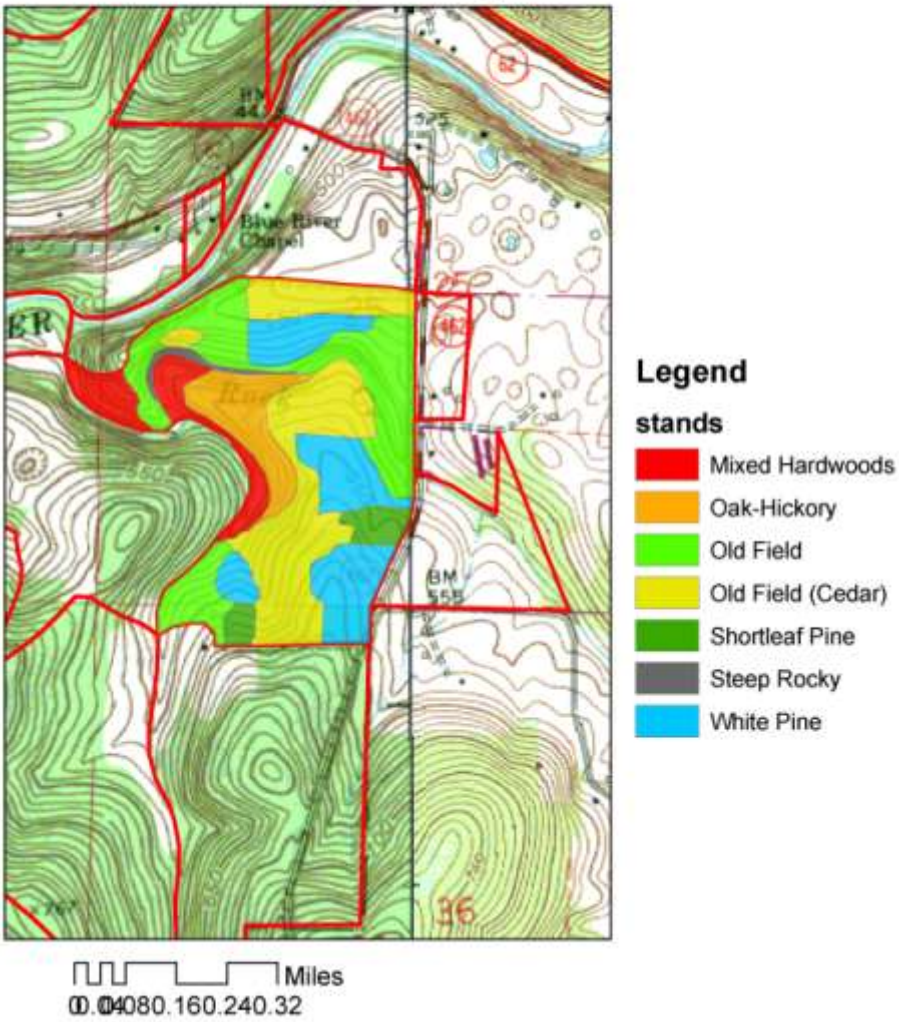
Most of the the stands could use a variety of treatments to increase their health and vigor. Most silvicultural activities would involve thinnings. The presence of recreation trails will make needed activities a challenge to protect the aesthetic values of the stands.

The pine stands can be thinned or regenerated. and should be performed in the winter when recreation use is lower. The northern White Pine stand can be accessed through the Old Field Cedar stand that consists of open grown small cedars. The described former black walnut progeny test planting would benefit from a light precommercial thinning.

COMPARTMENT 20 TRACT 3

PROPOSED ACTIVITIES	DATE
Thinning of black walnut	2015-2016
Thinning/conversion of e. red cedar	2016-2020
Commercial thinning of white pine	2017-2020
Commercial thinning/conversion of one shortleaf pine stand	2017-2025
Commercial thinning of mixed hardwoods and Oak-Hickory	2017-2025
Return to management cycle	2029

Harrison Crawford State Forest
Compartment 20 Tract 3
August 10, 2009



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