Indiana Department of Natural Resources - Division of Forestry

Resource Management Guide

Harrison-Crawford State Forest **Compartment: 19 Tract: 09**
Dieter Rudolph **Date: January 14, 2010**

Acres Commercial Forest: 174
Acres Noncommercial Forest: 0
Acres Permanent Opening: 0
Acres Other: 0

Basal Area >= 14 inches DBH: 49.90 sqft/ac
Basal Area < 14 inches DBH: 60.41 sqft/ac
Basal Area Culls: 5.86 sqft/ac
Total Basal Area: 109.54 sqft/ac

Acres Total: 103

Number Trees/Acre: 274

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
Yellow Poplar	32.66	128.13	160.79
American Sycamore	42.91	82.87	125.78
Silver Maple	18.44	63.89	82.33
White Ash	22.15	39.83	61.98
Sugar Maple	19.64	34.62	54.26
Northern Red Oak	11.68	36.93	48.61
White Oak	1.47	44.87	46.34
American Beech	34.66	10	44.66
Boxelder	17.31	22.27	39.58
Shagbark Hickory	0	25.4	25.4
Chinkapin Oak	10.55	14.83	25.38
Eastern Red Cedar	19.71	5.57	25.28
Black Cherry	12.96	7.93	20.89
Pignut Hickory	4.32	14.07	18.39
Cottonwood	8.49	7.7	16.19
Scarlet Oak	0	11.27	11.27
Chestnut Oak	6.32	1.94	8.26
Black Walnut	0	5.54	5.54
Shumard Oak	0	5.21	5.21
Hackberry	4.48	0	4.48
Blue Ash	4.32	0	4.32
Basswood	0	1.47	1.47
Total	272.07	564.34	836.41
Total per acre	1.57	3.05	4.62

Location

This 103 acre tract is located in Harrison County, Indiana. It is mainly in sections 27 and 34, but also a small portion in sections 28 and 33, T3S R2E.

General Description

This tract is located along a bend in the Blue River. The majority of the land is basically flat at the foot of Greenbrier Knob. A portion of the knob makes up the eastern section of the tract. A horse trail forms a loop within the tract and connects to a firelane in the neighboring tract.

In terms of forest, this tract had two different mixed hardwoods stands, two different old field stands, and a bottomland hardwoods stand. The first Mixed Hardwoods stand (65 acres) was found in the eastern section of the tract on the slopes on Greenbrier Knob. This stand was made up of a large variety of species but was dominated by sugar maple in terms of basal area and white ash, yellow poplar, sugar maple, and various oak species in volume. The second Mixed Hardwoods stand (42 acres) was dominated by with a large amount of beech and sugar maple in terms of basal area and yellow poplar, American sycamore, and American beech in terms of volume. This second mixed hardwoods stand was located in the western portion of the tract and around the two old field stands in the center of the tract. There was also a significantly higher amount of volume in the second mixed hardwoods stand due to the higher diameter in the trees present.

An Old Field stand (18 acres) was located in the center of the tract and had next to no harvestable volume within it. The stand was comprised of yellow poplar, white ash, eastern red cedar, black cherry, and black walnut. The only tree species that had reached sawtimber size was yellow poplar. The Old Field Bottoms stand (20 acres) was found in two sections, one near the northern edge of the tract and the other the southern edge. This stand was almost completely made up of box elder in the center while the edges were box elder with some other species, mainly American sycamore and silver maple.

The last stand was a Bottomland Hardwoods stand (29 acres) which was a narrow band found along the Blue River throughout the tract. In the southeastern corner of the tract, this stand spread away from the river slightly.

History

The land in this tract was obtained in multiple segments. A small portion of land in the NW ¼ of the NW ¼ of section 34 was a 34acre parcel purchased from Cole in 1969. Much of the rest of the land was a piece of a 151 acre parcel purchased from Eaton in 1974. Lastly, a few acres in the southern tip were part of a purchase from The Nature Conservancy in 1999. As described, the lowland area of tract 9 was largely open farm ground prior to State acquisition. The 1974 purchase showed signs of heavy high grading just prior to selling it to the State. The TNC parcel had been high graded during the 1970s by that owner (McClintock) and, again, in 1986 by that owner (Cole). Subsequent to the TNC acquisition, tract boundaries in this area of the State Forest were redrawn. That part of the tract which takes in the western end of Greenbrier Knob was previously part of Compartment 19, tract 2. No inventories had been done in either tract prior to this delineation, thus no information was lost. No scientific management of the tract had been done prior to the inventory this guide is based on (2010). There had been a very limited amount (1,551 bd.ft.) of black walnut removed in a harvest in 1971.

Landscape Context

1411 is part of a contiguous body of land owned by the State of Indiana and is almost completely surrounded by state land. The land to the north of the tract, across the Blue River, is a privately owned parcel surrounded by state land. The Blue River borders this tract on three sides while Greenbrier Knob is to the east of the tract with a part of the slope taking up 65 acres of the tract. The surrounding landscape within a mile radius is mostly forested, with 2-3 exceptions. The private land contains several acres of permanent pasture or grass, plus residences. About a mile south of the tract is O'Bannon Woods State Park, a developed recreation area. Roughly ¾ mile to the east is the Stage Stop campground, which contains a few acres of permanently open grass.

Topography, Geology, and Hydrology

The eastern portion of the tract is on the west facing slope on Greenbrier Knob. This slope differs in severity depending on location. The southern portion of the southwest facing slope is steep and rocky. Meanwhile the northwest facing slope is less steep. The least steep section of the hill is the center of the slope which decreases in height at a more gradual pace heading west from the top of the knob. Greenbrier Knob is one of the more pronounced topography features on the State Forest. From the water's edge to the top of the western end of the ridge that lies at the east end of the tract, there is a change of elevation of about 410 feet (highest point about 810 feet above sea level). The rest of the tract is relatively flat with some slope near the Blue River.

There were two caves located within the tract. One of these openings was passable and believed to be Turkey Run Cave based on the description. This cave was located on the slope of Greenbrier Knob in a rocky area near the center of the slope. The second opening was not passable but appeared to be a narrow passage into the hill. This opening was in a sinkhole right off of the horse trail on the slope of the knob.

The Blue River borders this tract on three sides and acts as the major watershed for the area.

Soils

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

Gilpin Silt Loam (GlD2, GlD3, GlE2, GpF) Moderately deep, strongly sloping to steep, well-drained soils. Surface layer is very dark grayish-brown silt loam about 3 inches thick. Subsurface layer is pale brown silt loam about 9 inches thick. Subsoil is about 17 inches thick. Depth to hard sandstone and shale bedrock is about 29 inches. Moderate in organic matter. Available water capacity is low and permeability is moderate. Runoff is rapid to very rapid.
Degree Slope: 12-30 %
Woodland Suitability Group: 3o10 or 3r12
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Site Index: 70-80
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

Markland Silt Loam (MaB2, MaD2, MaF, McD3) Deep, gently sloping to very steep, well drained and moderately well drained soils on terraces. Surface layer is dark grayish-brown silt loam about 3 inches thick. Subsurface layer is dark-brown silt loam about 4 inches thick. Subsoil is about 23 inches thick. The underlying material is yellowish-brown stratified silty clay and silty clay loam that has less prominent layers of silt loam. Moderate or low in content of organic matter and low in natural fertility. Available water capacity is high, and permeability is slow. Runoff is medium to very rapid.
Degree Slope: 2-70%
Woodland Suitability Group: 3r18
Site Index: 70-80 (Upland Oaks)
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Management Concerns: Runoff and erosion

McGary Silt Loam (Mg) Deep, nearly level, somewhat poorly drained soils on terraces. Included with it in mapping were a few small areas of gently sloping eroded soils and areas where there is a loess cap more than 14 inches thick. They formed in calcareous lacustrine material. The native vegetation was mixed hardwoods. The surface layer is grayish-brown silt loam about 8 inches thick. The subsoil is about 37 inches thick. The upper 6 inches is grayish-brown and yellowish-brown firm silty clay loam, and the next 16 inches is yellowish-brown and grayish-brown very firm silty clay. The lower 15 inches is gray very firm silty clay that has dark brown mottles. The underlying material is gray silty clay loam.
Degree Slope: 0-2%
Woodland Suitability Group: 3w5
Site Index: 70-80
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Management Concerns: Wetness

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

This tract can be accessed via a firelane that enters the woods near the fire tower. Much of the northern portion of the access lane was once a public road serving the immediate area. This lane is remote and subject to hills and seasonal obstructions such as wetness. While much of the southern portion of the lane has had improvements done to it over the past decade, the remaining length access needs substantial improvement to be used for management access and to shore up the horse use damage. This firelane has a horse trail that splits off and creates a loop within the tract.

Boundary

The Blue River creates ¾ of the boundary for the tract on the north, west, and south. The eastern boundary is the west facing slope of Greenbrier Knob. Within the tract is a section corner. Records from the 1970s describe a corner stone being placed at this corner. In recent years a survey was done of the area and the stone was not found. There are survey markers placed now marking where the corner should be but the stone was once again not located. It is possible that the original stone was removed at some point. The current survey marker was recorded via GPS as well as another that was placed while locating the section corner.

Wildlife and Plant Communities

The Natural Heritage Database Review shows the presence of multiple rare, threatened, or endangered species. The largest population of species of special concern can be found in or within close proximity to the Blue River. They include multiple invertebrate animals such as the black sandshell (1986), clubshell (1995), Ohio pigtoe (1995), little spectaclecase (1995), wavyrayed lampmussel (1995), and the kidneyshell (2004) as well as three vertebrate animals; the eastern hellbender (2005), spotted darter (2001), and the variegate darter (1983).

The presence of cavity trees meets the optimal level for all size classes. The tract also meets all of the minimal requirements for all snag size classes as well as the optimal level for 5"+ snags. Furthermore, there are an insufficient number of large legacy trees within this tract. The low number of trees is likely due to the two field stands which are mainly small diameter trees.

Even with the deficit of large legacy trees, the high amount of snags and cavity trees create a good habitat for local wildlife species. The presence of the field, forest, and the interface between the two creates habitats for multiple forest mammals as well as a wide variety of bird species. The presence of the Blue River and its riparian zone creates further habitat opportunities. Also, due to the proximity of the Wyandotte caves, a major Indiana bat hybernaculum, this bat species will likely be in the area before and after hibernation. Due to the proximity of the caves and the snags and cavity trees, this tract creates a good habitat for Indiana bat.

Wildlife Habitat Feature (Tract Wide)

Category	Maintenance level	Optimal Level	Inventory	Available Above maintenance	Available Above Optimal
Legacy Trees *					
11"+	1566		3645	2079	
20"+	522		477	-45	
Snags (all species)					
5"+	696	1218	1468	772	250
9"+	522	1044	596	74	-448
19"+	87	174	90	3	-84
Cavity Trees (all species)					

7"+	696	1044	3299	2603	2255
11"+	522	696	1565	1043	869
19"+	87	174	233	146	59

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

Indiana Bat

As management activities can only be performed in the winter months due to Indiana bat regulations, 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 stand contains a deficit in those greater than 20 inches in diameter. . The cavity trees meet the optimal requirements for all size classes. In terms of snag trees, the minimum requirements are met for all size classes and the optimal is met for the 5"+ size class.

There were also some vascular plants which created a buffer covering the entire tract. These species were the deam dewberry (1922), tall meadowrue (2001), Virginia saxifrage (1966), and the Canada lily (1980). Despite the large amount of species of special concern, only four of them have been observed within the last ten years, most of which are within the Blue River.

Recreation

The main recreational use of this tract is horse riders. The trail creates a loop within the tract and it is a popular trail by the equestrians. The area is also widely used by hunters due to the ease of access from the nearby firelane.

Cultural

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

Invasive

One area was marked for having Ailanthus within it along the slopes of Greenbrier Knob. Also, during the inventories for the two tracts to the east, a couple large pockets of Ailanthus were found. These large areas in the other tracts need to be treated to prevent their spread. While controlling these areas, this tract should also be monitored for Ailanthus and treated if more are found.

Summary Tract Silvicultural Description, Prescription, and Proposed Activities

Mixed Hardwoods (65 acres)

The larger of the two mixed hardwoods stands, this stand is located on the west facing slope of Greenbrier Knob. It currently has 4,340 bf/ac and a basal area of 110.8 sqft/ac. The amount of volume deemed harvestable was 1,560 bf/ac (27.3 sqft/ac) leaving 2,780 bf/ac (83.5 sqft/ac). In terms of volume, the dominating species were white ash, yellow poplar, white oak, and sugar maple; however sugar maple far exceeded all other species in terms of basal area.

The southern portion of this stand has some limitations, as it is the steepest and rockiest area of the stand. Due to this feature, the southern area is far more limited to the use of heavy machinery than the other portions.

Currently, the stand is dense as can be seen by the high basal area. Though, due to the low volume for the stand, a harvest at the moment may not be practical. This stand should be reevaluated when the neighboring stand, 1902, is revisited and any harvest that would occur would be combined with 1902 and 1911, both of which are primarily composed of the rest of Greenbrier Knob.

Mixed Hardwoods 2 (42 acres)

Slightly smaller than the previously described stand, this mixed hardwoods stand had a species composition favoring yellow poplar, American sycamore, American beech, and sugar maple. The trees within the stand were also larger than the other stand. There was a total estimated volume of 7,170 bf/ac with 113.9 sqft/ac. Of this volume, 2,680 bf/ac (37.6 sqft/ac) was deemed harvestable leaving 4,430 bf/ac (75.3 sqft/ac).

This stand is currently ready for a harvest. There is a large basal area which helps measure the level of competition within the stand. Also, unlike the Mixed Hardwoods stand, this stand has the volume to make a harvest feasible. The majority of the harvest would be focused on American beech and American sycamore, both of which had large individuals within the stand that have or soon will begin becoming overmature, resulting in a loss of overall volume. Other species to be targeted include the removal of eastern red cedar and boxelder in order to reduce the competition coming from non-desirable species.

Bottomland Hardwoods (29 acres)

This stand contained, as is typical of this covertype, some large silver maple, American sycamore, and eastern cottonwood. The total volume for the stand was 7,330 bf/ac and 116.2 sqft/ac. However, due to the fact that this stand was mostly a thin band running alongside the river, no harvest should be performed. By leaving this stand alone, the river health is maintained. Likewise, the majority of the species of special concern have a buffer placed around them which typically extends a short distance off of the river which, in this case, nearly covers the entire Bottomland Hardwoods stand.

Old Field (18 acres)

This stand is only a few steps away from still being a field. There are trees within it which, except for a few yellow poplar, are all submerchantable to pole sized. The area is still widely open and appears to be slow in succeeding into a closed canopy forest.

No action should be performed within this stand. At the moment, the field characteristics of this stand create habitat diversity for wildlife. Essentially, this entire stand is characteristic of fringe habitat (the area where field and forest meets) which provides foraging and shelter for many wildlife species. By leaving this stand as is, the wildlife in the area will benefit.

Old Field Bottoms (20 acres)

These two sections of this stand were once fields but, unlike the other old field stand, have become more densely forested. However, the tree that dominates this stand is boxelder which has little timber and wildlife value. There are other species within the stand such as American sycamore, yellow poplar, and white ash, but these species are mainly found around the edges of the stand. While the forest would benefit from changing the composition of the stand, it appears to be a large amount of work while the end result might not meet the goals. If the current boxelder were removed, it is likely that the species will either stump sprout or reestablish itself due to its likely dominance in the seed bank.

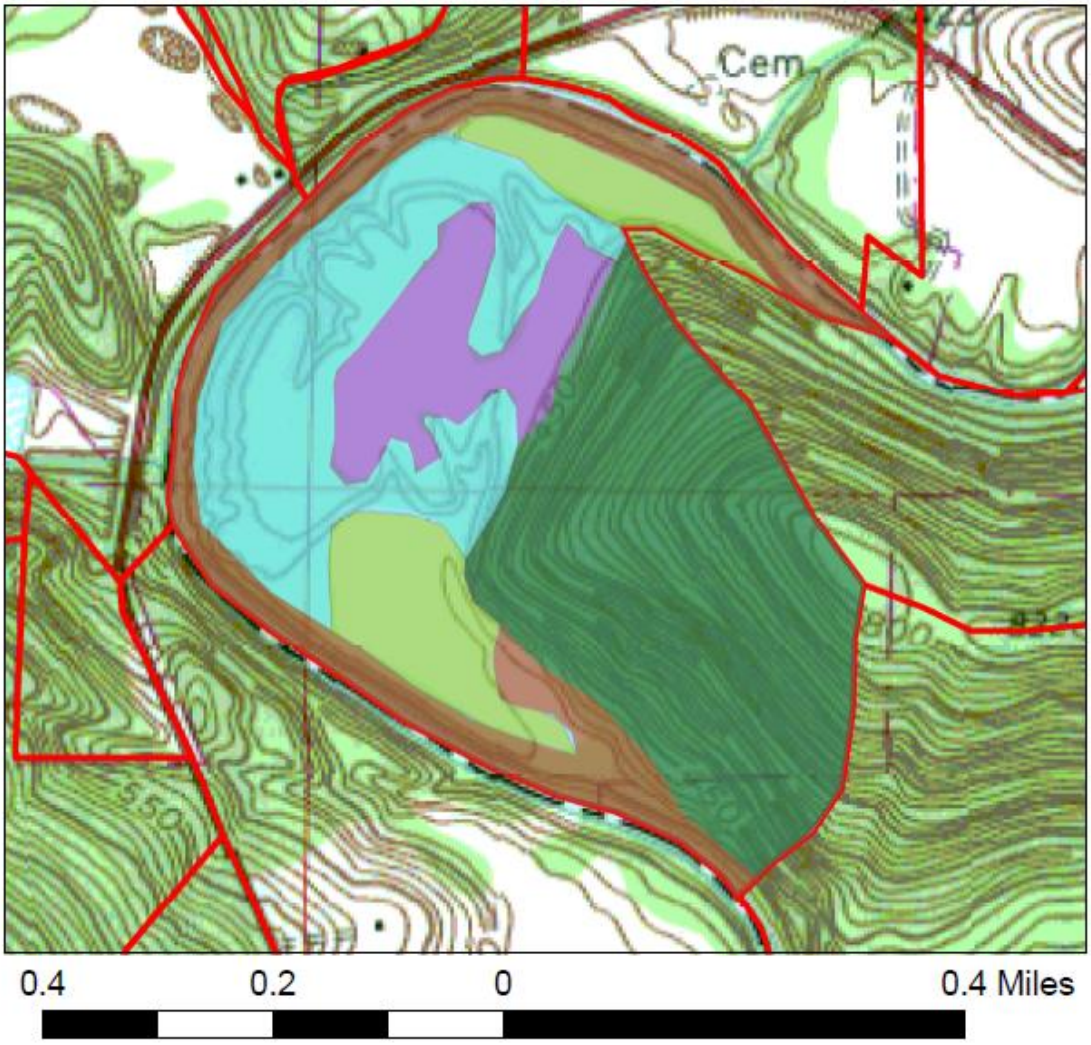
TRACT ACCOMPLISHMENT RECORD
Compartment 19, Tract 9

DATE PLANNED	ACTIVITY / REMARKS	DATE COMPLETED
2011	Locate and map unidentified homesite	
2011	Treat Ailanthus	
2011	Submit road improvement work for archeological review.	
2012	Road access improvement work	
2012	Closer evaluation of box elder stand (s) for possible conversion to other hardwoods. Conduct other TSI where needed in bottomland hardwoods	
2013-14	Mark timber harvest (possibly in conjunction with 1902 and/or 1911 and/or 1904)	
2016	Post harvest TSI	
2026	Tract Inventory	
2046	Re-enter tract for next management cycle	

To submit a comment on this document, click on the following link:
http://www.in.gov/surveytool/public/survey.php?name=dnr_forestry

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.

Tract 1909
Harrison-Crawford State Forest

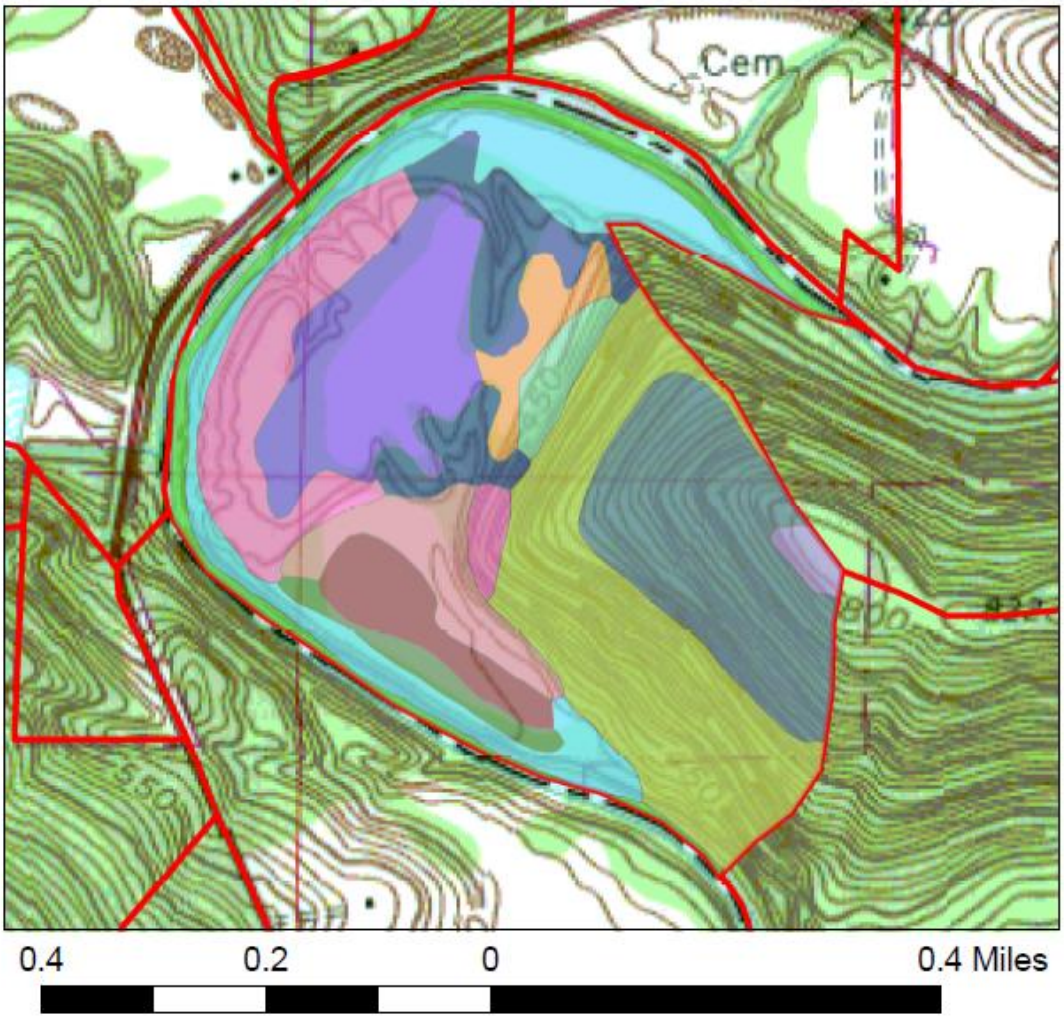


Legend

stands_1909

- Bottomland Hardwoods
- Mixed Hardwoods
- Mixed Hardwoods 2
- Old Field
- Old Field Bottoms

Tract 1909
Harrison-Crawford State Forest



Legend

Soils_1909		
Ba	ElB2	McD3
CoF	GpF	Mg
CtC2	Hm	W
ElA	MaB2	WeD2
	MaD2	