

Indiana Department of Natural Resources - Division of Forestry

Resource Management Guide

Harrison-Crawford State Forest
Dieter Rudolph

Compartment: 18 Tract: 2
Date: December 1, 2009

Acres Commercial Forest: 108
Acres Noncommercial Forest: 0
Acres Permanent Opening: 0
Acres Other: 0

Basal Area \geq 14 inches DBH: 69.37 sqft/ac
Basal Area $<$ 14 inches DBH: 38.95 sqft/ac
Basal Area Culls: 3.24 sqft/ac
Total Basal Area: 108.31 sqft/ac

Acres Total: 108

Number Trees/Acre: 218

Species	Harvest Volume(MBF)	Leave Volume(MBF)	Total Volume(MBF)
White Oak	98	315.56	413.56
Black Oak	24.28	36.69	60.97
Pignut Hickory	11.15	48.33	59.48
Scarlet Oak	26.5	17.16	43.66
Sugar Maple	10.98	7.02	18
Post Oak	1.45	6.41	7.86
Northern Red Oak	0	6.34	6.34
Shagbark Hickory	0	6	6
White Ash	5.83	0	5.83
Chinkapin Oak	0	5.66	5.66
Sweetgum	3.79	0.93	4.72
Blackgum	2.22	0	2.22
Bitternut Hickory	0	2.08	2.08
Persimmon	0	1.96	1.96
Black Locust	1.56	0	1.56
Red Maple	0.93	0	0.93
Total	186.69	454.14	640.83
Total per acre	1.72	4.22	5.94

Location

This 108 acre tract is located in Crawford County, Indiana in section 33, T3S R2E. A firelane runs through the northern portion of the tract which comes out on SR 62.

General Description

This 108 acre tract is composed of the top of a ridge in the northern section and the finger running south of the main ridge. On both sides of this finger are drainages that eventually lead to the Blue River. The tract is almost entirely a Oak Hickory stand (101 acres) with a sliver of a Mixed Hardwoods stand (7 acres) in the southern section.

History

This land was obtained in three segments. The land south of the corner shared with private property was purchased in 1968 from Hockman as a piece of a 271 acre piece.

The area northeast of the corner was a piece of a 288.5 acre parcel and was purchased from Cole in 1969. The small piece of land to the northwest of the corner was part of a 233 acre parcel and was purchased in 1936 from Cole.

A harvest (sold in January 1989) removed 87,268 bd.ft. in 530 trees and 153 culls. 40% of the total number of trees and culls and 40% of the volume sold in that harvest was made up of white oak, illustrating the dominance of that species in this tract. At that time 3 regeneration openings were created in the tract. Of note were the 2 towards the north end of the tract. Prior to harvest, these areas were selected for 2 primary reasons. The overstory was noticeably decadent, occupied by fire damaged declining trees, mostly oaks and hickories. The second reason was that there was an above average number of advanced oak seedlings/saplings in the understory. Such an occurrence is unusual in most stands on this property.

A follow up TSI operation was performed by contractor in the following year after the harvest. In 2000, another contractor released oak crop trees in the openings discussed above .

This tract showed evidence of frequent and fairly intense past burning, as was also shown in 1807, adjacent to the east. The harvest in 1989 removed many of the fire damaged trees, but many remained.

A small area of the tract, north of the main access road, was included in a sale in March 1996. That harvest mostly involved Compartment 18, tract 7 and some of Compartment 14, tract 12.

Landscape Context

1802 is part of a continuous body of land owned by the State of Indiana and borders both state and private land. There is a corner of privately owned land sharing a border with this tract in the western section of the tract. All of the land immediately surrounding this tract is forested, mostly hardwoods with some patches of pine. The eastern boundary of the tract is defined by the drainage. A drainage also exists on the western side of the finger, but that boundary is a north/south line between state and private property.

Topography, Geology, and Hydrology

This tract is made up of a ridge top in the northern section with a finger running to the south of the main ridge. Both sides of the finger have a well established drainage which eventually leads to the Blue River, making this water body the primary watershed for the area. The largest slope area is a west facing slope, though some east and south facing slopes also occur within the tract.

There is also evidence of a high amount of karst activity in the tract and surrounding area. Multiple sinkholes were found in the southwestern section of the tract as well as a short distance into the private property. Three of these sinkholes (each just on the private side of the boundary) were lined in rock and had fissures and small holes that continued underground. Water was seen draining into each of these three holes. Water could also

be heard running in one of them, though that could have been influenced by the recent rain. Due to the presence of sinkholes and caves, protection of underground waterways remains a priority for the area.

Soils

Adyeville Very Fine Sandy Loam (AbqE2, AciE)

The Adyeville series consists of moderately deep, somewhat excessively drained soils. Surface Horizon is 9 inches thick. The subsurface horizon then grades into 8 inches of silt loam then with the remaining 60 inches turns into a loam texture type soil. The bedrock consists of moderately cemented sandstone with some siltstone, and shale. The permeability is moderately rapid. The mean annual precipitation is about 43 inches and the mean annual temperature is about 54 degrees F.

Degree Slope: 8-60%

Woodland suitability group: 3o10

Site Index: 70

Growth Range potential: 200

Management Concerns: Runoff and erosion

Apalonia Silt Loam (AgrA, AgrB, AgrC2, AgrC3)

The Apalonia series consists of very deep, moderately well drained soils forms in loess and the underlying residuum from shale with limestone and siltstone. They are moderately deep or shallow to a fragipan. The surface horizon is a silt loam 8 inches thick. The first 8 inches of the subsoil is a silty clay loam. The next 33 inches is a silt loam. The next 11 inches is clay then it turns into a clay loam for 9 inches. The last 21 inches of the subsoil is a loam. The bedrock is weakly cemented shale with moderately and strongly cemented sandstone. The mean annual precipitation is about 43 inches and the mean annual temperature is about 54 degrees F.

Degree Slope: 0-12%

Woodland suitability group: 3d9

Site Index: 60

Growth Range potential: 258

Management Concerns: runoff and erosion

Corydon Stony Silt (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

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 clay. The stratum is 9 inches of loam. The bedrock which is at 45 inches from 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

This tract is accessible through an access lane off of SR 62 which is found near the northern boundary of the tract. This main lane has areas where witnesses is an issue causing rutting. This lane is in need of reconstruction to improve drainage in places and adequate stone applied to allow all season access (disabled hunters and logging). There is a secondary lane that intersects this main trail and runs southwesterly into the northern part of 1802. This lane could be improved to allow better management access into the tract.

Boundary

The northern boundary is defined by the beginning of the slopes in the northern tract. The eastern border follows the drainage while the western boundary borders private property and does not follow any natural features. During the inventory, no corner stone or line evidence was located. If any active management occurs in the area, the land should be surveyed to find the exact property line or the suspected line should be buffered to ensure trespass does not occur.

Earlier management visits record a stone at the property corner and fencing running south of that stone to mark at least part of the western boundary of this tract.

Wildlife

The Natural Heritage Database Review show no presence of rare, threatened, or endangered species. There was an invertebrate animal, the pyramid pigtoe, in the tract to the south and the vascular plant, the deam dewberry, in the tract to the east. Neither has been observed in the past ten years.

The presence of legacy and cavity trees in the tract is above the optimal level for all size classes. The tract also meets the optimal requirement for snags for the 5''+ and 9''+ size classes and the maintenance requirements for the 19''+ size class. The presence of snags and cavity trees creates habitat for wildlife species including the Indiana bat. In terms of legacy trees, there are an adequate number of trees in the 11''+ class, but not for the 20''+ size class.

Wildlife species that were noted on this stand were those typical of the area. Evidence of deer, squirrels, chipmunks, raccoons, and turkey were seen in the area. The presence of oak and hickory species creates a source for hard mast which is beneficial to multiple wildlife species.

Wildlife Habitat Feature (Tract Wide)

Category	Maintenance level	Optimal Level	Inventory	Available Above maintenance	Available Above Optimal
Legacy Trees *					
11"+	972		6050	5078	
20"+	324		896	572	
Snags (all species)					
5"+	432	756	1282	850	526
9"+	324	648	680	356	32

19"+	54	108	105	51	-3
Cavity Trees (all species)					
7"+	432	648	1478	1046	830
11"+	324	432	1420	1096	988
19"+	54	108	445	391	337

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

Indiana Bat

As harvesting activities in 1802, currently, can only be performed in the winter months due to voluntary Indiana bat restrictions, 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 surplus of legacy trees in both diameter classes. The tract also meets the optimal requirements for all size classes for snags and cavity trees except for snags in the 19"+ size class, where the maintenance level is met.

While the optimal level for large snags was not met, it was close (short by three trees). The large surplus of legacy trees could be utilized to create more snags through girdling a few of the larger, lower quality trees. Overall, this tract creates an ideal habitat for the Indiana bat.

Recreation

This tract contained an access lane that serves as one of the 5 designated disabled hunter trails for the State Forest property. This lane also doubles as a horse trail which ran through the northern section of the tract as well as into the neighboring tracts. This horse trail showed evidence of frequent use. Popular caves in the surrounding area make this compartment one of use to the local cavers. The presence of deer and turkey along with the easy access makes this a popular area for hunting.

Cultural

No known cultural sites were found within this tract.

Management Limitations

All soil types in this tract have a management concern of runoff and erosion, especially valid due to the fact that this tract is made up of a ridgetop and its slopes. In order to limit these problems, any management activities need to be sure to leave downed dead wood and trees to hold the soil in place.

Summary Tract Silvicultural Description, Prescription, and Proposed Activities

This tract was last inventoried in 1988 and was followed by a harvest in January of 1989. The volume in the tract in 1988 was mostly white oak. The rate of growth between the harvest and the present inventory showed there to be an accumulation of 127 bf/ac/year, most of which was white oak (90 bf/ac/year). The increase in white oak shows that the harvest, whose goals were to increase white oak growth and regeneration, succeeded which suggests the tract's positive response to timber harvests.

An inventory in 3 tracts (1701, 02 and 03) north of this tract indicate that they are in need of harvest. One may consider combining this tract and 1703, immediately adjacent in a harvest to simplify administration.

Oak Hickory (101 acres)

Taking up all but 7 acres of the tract, this stand was both large and diverse. The species present were mainly oaks and hickories, but also included maple, ash, and beech to name a few. The total average basal area for the stand was 109 sqft/ac with a volume of 6,160 bf/ac. Of these measurements, the greatest portion by a significant amount was white oak.

Due to the higher basal area, this stand would benefit from a commercial thinning. This procedure would focus on improving the quality of the remaining trees with the greatest emphasis on white oak. In order to reduce competition, therefore improving quality and growth rates, the basal area should be lowered to around 70 sqft/ac. The trees that should be removed are those of less desirable species (such as red maple and sassafras) and those with poor form or growth rates. While the focus is on the remaining white oaks, a monoculture should be avoided in order to preserve the diverse habitat, food sources, and species composition. A thinning of this size would likely yield close to 2,000 bf/ac of various species.

Selections meant to reduce competition from poor quality, low vigor fire damaged trees will also be a consideration. Regeneration openings to start over areas of concentrations of damaged trees may be required to return those areas into a productive state.

Mixed Hardwoods (7 acres)

As a small stand, this portion of the tract should be grouped with the Oak Hickory stand in management practices. Like the larger stand, the Mixed Hardwoods stand was higher stocked with 103.4 sqft/ac but had a significantly lower volume of 2,370 bf/ac. The main amount of volume for this stand came from oaks (scarlet, chinkapin, and white) as well as ash. Eastern red cedar, shagbark hickory, and sugar maple were also prevalent in basal area but too small to reach merchantable volume.

A thinning following the guidelines for the Oak Hickory stand would produce a volume of less than 1,000 bf/ac but would help influence the stand to be more productive. While this area was made up mainly of south facing slopes, the stand had a large amount of

oaks. These, mainly chinkapin, oaks could be favored in the thinning to help move this stand into an Oak Hickory stand. The tree species that should be completely removed would be eastern red cedar in order to keep this as a hardwoods stand.

TRACT ACCOMPLISHMENT RECORD

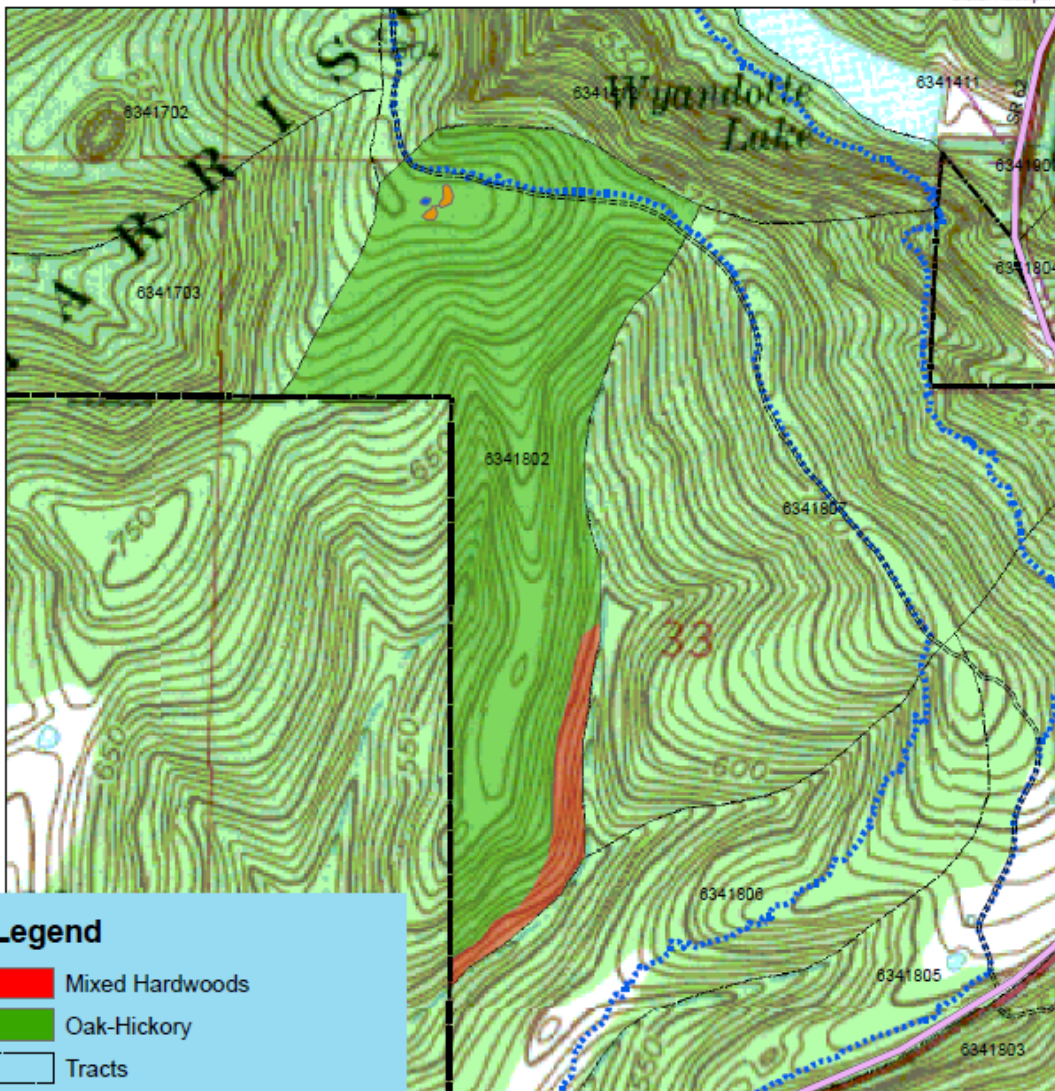
DATE PLANNED	ACTIVITY / REMARKS	DATE COMPLETED
2011	Submit DHPA clearance request for roadwork and harvest	
2011	Repair/reconstruct access road/horse trail	
2011-12	Mark timber sale (with 1703?)	
2012-13	Timber Harvest	
2013-14	TSI, including crop tree release in 1989 openings	

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 1802 Harrison-Crawford State Forest

Dieter Rudolph



Legend

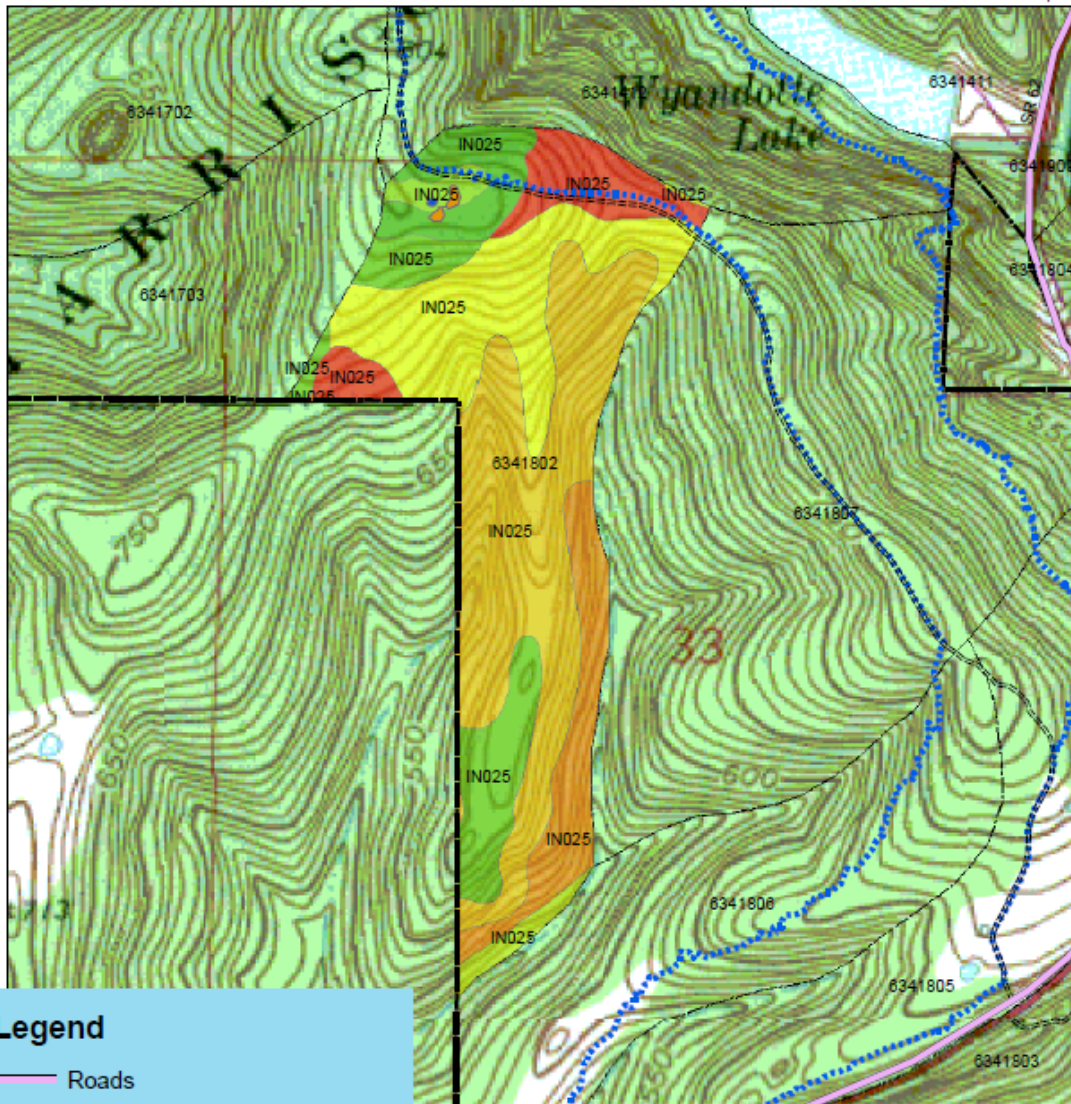
- Mixed Hardwoods
- Oak-Hickory
- Tracts
- Firelanes
- Wildlife Pond
- Wildlife Opening
- Horse Trails
- Harrison-Crawford State Forest
- Roads

0.2 0.1 0 0.2 Miles



Tract 1802 Harrison-Crawford State Forest Soils

Dieter Rudolph



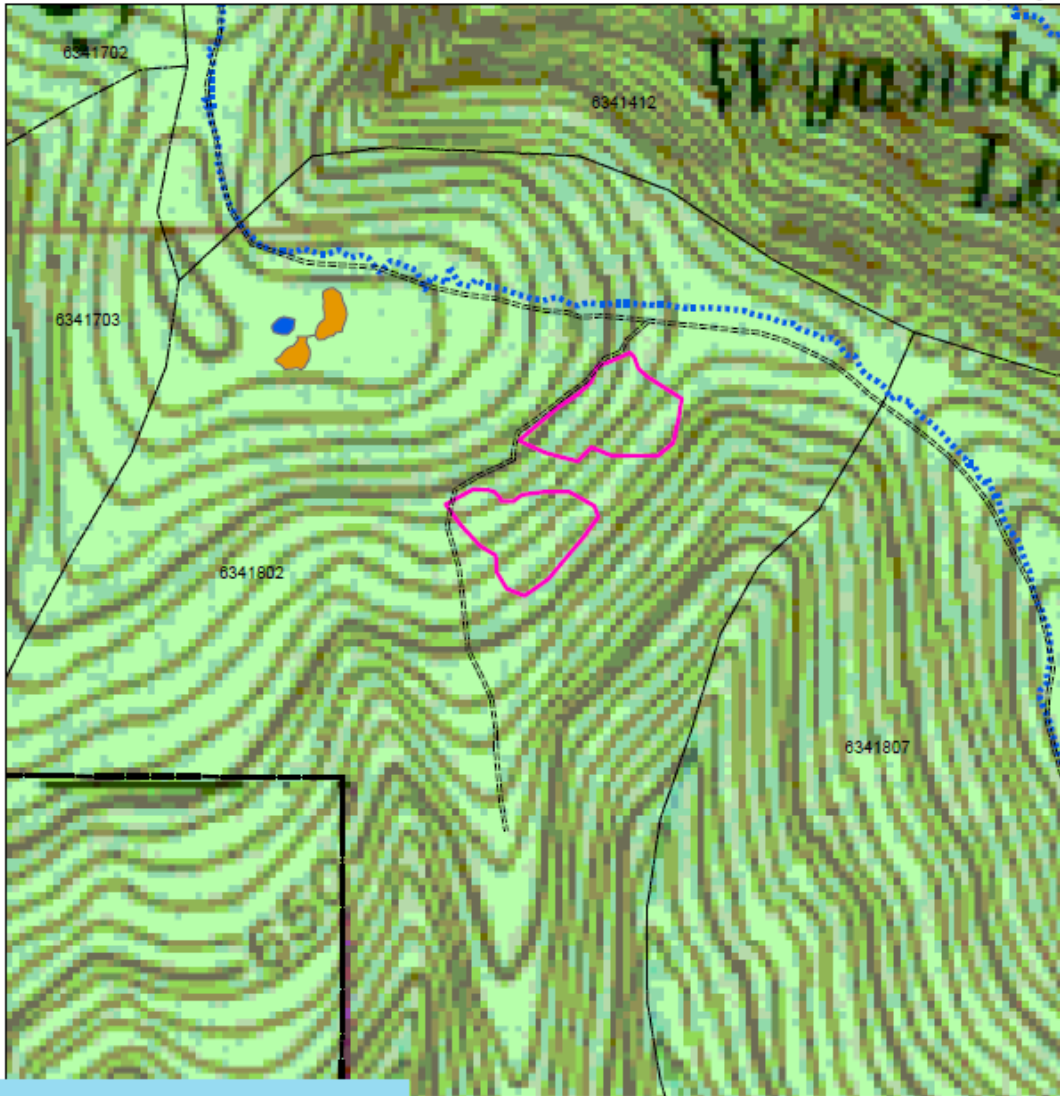
Legend

- Roads
- Firelanes
- Horse Trails
- Harrison-Crawford State Forest
- Wildlife Pond
- Wildlife Opening
- Tracts







**Tract 1802
Harrison-Crawford State Forest
Oak Regeneration Openings (1989)**

Dwayne Sleg



Legend

-  Oak Regeneration Openings (1989)
-  Tracts
-  Firelanes
-  Harrison-Crawford State Forest

0.06 0.03 0 0.06 Miles

