

RESOURCE MANAGEMENT GUIDE

State Forest: Greene-Sullivan Compartment: 07 Tract: 07
Forester: Phil Jones Date: 7/13/10
Management Cycle End Year: 2030 Management Cycle Length: 20

Location

Compartment 7, Tract 7 is located in the SW $\frac{1}{4}$ of Section 12 – T7N – R8W of Sullivan County. There is approximately 100 acres within this tract. The tract is west of Pleasantville and about 3.5 miles south of Dugger.

General Description

The Tract is approximately 100 acres in size. The various land use components can be delineated as follows:

- Closed Canopy – 98.5 acres
- Wetlands/Lakes – 1.5 acre

Approximately 38% of this tract has been surface mined. The majority of the mined area is on the north-western portion of the tract, along the west bank of South Lake. To the north of the mined area there is a large gob pile. The eastern and southern portions of the tract have gone unmined. The unmined area accounts for about 61% of the tract.

Approximately 60 acres consists of mixed hardwoods. The primary hardwood species are white oak, black cherry, black walnut, and shingle oak. Pine occupies about 20 acres of the tract. The primary pine species present in the stand is eastern white pine; there is also a decent amount of jack pine, which is located on and around the gob pile. There is also a 20-acre section of the tract that is oak-hickory stand type. The eastern portion of the stand was planted with white oak; the exact date of planting is unknown but it is assumed to be between 1937 and 1940, estimated from old aerial photography. There was also some white oak planted on the west side of the road that runs through the tract, it is approximately 5 acres in size.

History

The majority of this tract was deeded over by the Central Indiana Coal Company on June 12th 1937. This deed included the western half of the tract, as well as a portion of the western side of the eastern half. No know records exist of the planting operation, but based upon old aerial photography, planting of the western portion occurred between 1937 and 1940. The only portion of that area that was not planted was a gob pile in the north central part of the western side. That portion was not planted until the late 1960's or early 1970's.

The eastern part of the tract was also acquired from the Central Indiana Coal Company, but not until December 30th 1941. It seems from the aerial photos that the northern half

of the eastern portion, east of CR 850, was already planted in 1937. It appears from the aerial photography that the remainder of the land was planted sometime between 1937 and 1949.

Boundary and Landscape Context

The northern half of the western side is bordered by State Highway 159 heading east into Pleasantville. The majority of the western side of the tract is bordered by South Lake. The eastern side of the tract is bordered by privately owned land, as well as the northern portion of the eastern half. The eastern most quarter of the eastern half is separated from the rest of the tract by CR 850. The land that borders the southern portion of the tract is owned by the Peabody Coal Company.

Topography, Geology and Hydrology

A little more than 1/3 of the tract has been mined and consists largely of very steep to moderately steep mounds of mine spoil (a mixture of soil, shale, sandstone, and some coal). These hills occur on the eastern side of South Lake. South Lake is the border on the west side of the tract. Generally, the hills run from east to west. The eastern portion of the tract, where the white oak was planted is mostly flat terrain. There are some low marshy areas within the stand that will stay wet late into the year.

Soils

Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber <i>Cu ft/ac</i>	
AIB2—Ava silt loam, 2 to 6 percent slopes, eroded				
Ava	Northern red oak	80	57	Baldcypress, Black oak, Blackgum, Bur oak, Chestnut oak, Common persimmon, Eastern white pine, Scarlet oak, Shingle oak, Southern red oak, Virginia pine, White oak
	Tuliptree	90	86	
	White oak	75	57	
AIB3—Ava silt loam, 2 to 6 percent slopes, severely eroded				
Ava, severely eroded	Northern red oak	80	57	Black oak, Blackgum, Bur oak, Chinkapin oak, Eastern white pine, Northern red oak, Shagbark hickory, Shingle oak, Tuliptree, White oak
	Tuliptree	90	86	
	White oak	75	57	

CnC2—Cincinnati silt loam, 6 to 12 percent slopes, eroded				
Cincinnati	Northern red oak	80	57	Baldcypress, Black oak, Blackgum, Bur oak, Chestnut oak, Common persimmon, Eastern white pine, Scarlet oak, Shingle oak, Southern red oak, Virginia pine, White oak
CnC3—Cincinnati silt loam, 6 to 12 percent slopes, severely eroded				
Cincinnati, severely eroded	Northern red oak	80	57	Baldcypress, Black oak, Blackgum, Bur oak, Chestnut oak, Common persimmon, Eastern white pine, Scarlet oak, Shingle oak, Southern red oak, Virginia pine, White oak
St—Strip mines				
Strip mines	—	—	—	Black locust, Blue spruce, Eastern white pine, Tuliptree
W—Water				

Access

The tract can be easily accessed from a boat ramp on the north-western corner of the tract. This ramp is off of State Highway 159 just after it turns east heading towards Pleasantville. The boat ramp is for access to South Lake. Another way to easily access the tract is CR 850, which runs north and south through the eastern portion of the tract.

Wildlife Habitat Features

Wildlife habitat suitable for a wide variety of native species should be optimized throughout the tract in order to promote and maintain a high level of faunal diversity.

Cover/Habitat Overview

TABLE 1

Habitat/cover type	0%	0 < 1%	1-10%	11-50%	51-90%	>90%	Unknown
Closed-canopy deciduous/mixed forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pine/conifer plantations or natural stands	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Early successional forest (≤ 20 years old)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shrub-scrub or old field	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Grasslands/hayfield	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cropland, pastures, feedlots	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Open water (lakes, ponds, rivers, streams, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Riparian areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Developed areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: Reclaimed Mine Land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 1 shows the estimated proportion of each cover/habitat type within 1 mile of the tract center. The area is primarily a mix of closed canopy deciduous forest (80%). This closed canopy forest consists of mixed hardwoods and a planted white oak stand. There is some pine throughout this tract, but it is somewhat fragmented. All together it comprises about 20 acres of the tract, which makes up about 20% of the tract. There is no cropland, early successional forest, or grassland/hayland habitat in this area. There is a fair amount of forest edge due to the interspersed forest and developed areas (i.e., roads, residences, etc.). If a regeneration opening(s) is established as a result of the harvest operations, then some early successional forest habitat may eventually be represented in the habitat overview. Other than this, none of the proposed management activities will significantly alter the relative proportion and availability of the other habitat/cover types in the assessment area.

TABLE 2

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	900		2845	1945	
20"+ DBH	300		56	-244	
Snags (all species)					
5"+ DBH	400	700	1881	1481	1181
9"+ DBH	300	600	735	435	135
19"+ DBH	50	100	42	-8	-58
Cavity Trees (all species)					
7"+ DBH	400	600	61	-339	-539
11"+ DBH	300	400	61	-239	-339
19"+ DBH	50	100	0	-50	-100

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

Table 2 shows the optimal level of trees needed for the best potential wildlife habitat. There is approximately 80 acres of closed canopy hardwood. There are also some scattered stands of pine throughout the tract, comprising about 18.5 acres. The other 1.5 acres are made up of lakes and wetlands.

This table also shows that the vast majority of the snags in this stand are 5-8" DBH and that the tract is significantly over the number of small snag trees for optimal level. But there is a lack of larger snag trees within the stand. The numbers of cavity trees are

especially deficient for all size classes. The suggested management activities should not have any drastic effects on the cover/habitat type. The legacy trees are mostly in the 11-19" range, no optimal level was given, but it seems that there is definitely room for an increase of legacy trees.

TABLE 3

Target Snag Density		
Diameter (DBH) Distribution	Goal	C7T7
<i>Including</i> at least this many snags per acre $\geq 5''$:	4	18.81
<i>Including</i> at least this many snags per acre $\geq 9''$:	3	7.35
<i>Including</i> at least this many snags per acre $\geq 19''$:	0.5	.42

Table 3 shows data that represents the number of snags in the tract compared to the guidelines set by the DoF for forest stand snag density. The data shows that the number of snag trees within the tract is considerably over the goal per acre, in the $\geq 5''$ and the $\geq 9''$ size classes. The large size class $\geq 19''$, is at nearly the optimum level. Most of the smaller snags consist of dogwood and American elm.

TABLE 4

Cavity Trees per Acre		
Diameter (DBH) Distribution	Goal	C7T7
Total minimum cavity trees per acre $\geq 7''$:	4	.61
<i>Including</i> at least this many roost trees $\geq 11''$:	3	.61
<i>Including</i> at least this many roost trees $\geq 19''$:	1	0

Table 4 shows how this tract compares to DoF guidelines for the forest stand cavity tree density. The data suggests that the stand is severely lacking the optimal number of cavity trees for wildlife. However, there are most likely more cavity trees than represented here in this table; this is due to a lack of visibility into the canopy. Some of the larger trees may have had cavities present but due to the thickness of the canopy they were difficult to notice.

TABLE 5

Preferred Legacy Trees per Acre		
Diameter (DBH) Distribution	Goal	C7T7
Total minimum Legacy trees per acre $\geq 11''$:	9	28.45
<i>Including</i> at least this many Legacy trees $\geq 20''$:	3	.56

Table 5 shows how this tract compares to the Indiana Bat guidelines for preferred legacy trees. The data shown suggests that the numbers of legacy trees within the tract at the > 11” size class are well above the goal set by the DoF. The ≥ 20 ” size class however does not reach the specified goal.

The structural habitat features listed above will be considered during management operations. Efforts will be made to meet maintenance level guidelines for each habitat feature.

IDNR Natural Heritage Database Review

A NHDB review was conducted for this tract. There are no records showing any species of concern within this tract.

Management

The biggest threat to the listed species is the loss of habitat. Since there are no species of concern, thus the proposed management activities should have no impact on any species or their habitat.

Exotic/Invasive Species

Species	Immediate Management Required	Monitoring/ Re-evaluation Recommended	Mapped?
Ailanthus	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Autumn Olive	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Multiflora Rose	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Privet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

This stand is infested with multiflora rose, immediate treatment is highly recommended. A foliar spray is almost certainly the best option, but a prescribed burn may also help but may be difficult to implement over the entire tract. Some ailanthus was noticed while performing inventory, but it was not a large amount. In order to prevent further spread of ailanthus, immediate treatment is recommended. Autumn olive was also noticed throughout the tract. There was a decent amount noticed, thus immediate treatment is recommended due to the rapid spread and difficulty of removal after establishment.

Recreation

Common activities in this tract are mushroom gathering, deer and turkey hunting.

Cultural

There were no cultural features found within this tract.

Stand Descriptions and Silvicultural Prescriptions

Mixed Hardwood – 60 ac

Current Condition

This stand is comprised of a wide variety of species. Most likely the majority of these trees were not planted, although some black locust may have been planted after mining. The majority of the trees present in this stand are a result of natural regeneration. Black cherry comprises approximately 19% of the sawtimber volume and around 19% of the total BA per acre. The majority of the black cherry in the stand is of small size. The next largest species of the sawtimber volume in the tract is black walnut. Black walnut comprises 18% of the total sawtimber volume and around 10% of the total BA per acre. Black cherry dominates every size class except for the small size class, which is dominated by American elm and white ash. The advance regeneration consists largely of American elm, white ash, dogwood, black cherry, and hickory.

A combination of disease, grapevines, and poor stocking during stand development and establishment is most likely the reason for the poor tree quality throughout the stand. The most vigorous trees in the stand consist of American elm, white ash, dogwood, and black cherry.

The stand is currently 99% stocked with 100.1 ft² of basal area (BA), 419 trees per acre (TPA), and 3,642 board feet (bd. ft.) per acre.

Prescription

An improvement cut, utilizing single tree/group selection and regeneration cutting is highly recommended for this stand. The marking should focus on removing the small American elm & dogwood, poorly formed black cherry, and the small ash. The inventory data suggests that approximately 1,494 bd. ft. could be harvested from the stand. Overall the majority of the sawtimber volume would be comprised of: black cherry (19%), black walnut (18%), and black locust (11%). The primary crop tree species would most likely be black walnut due to the poor form of the black cherry trees in this stand. The harvest would result in a residual stocking of 69%, 65.6 ft² of basal area (BA), 382 trees per acre (TPA) and 2,148 bd.ft./ac.

Invasives such as multiflora rose, grapevines, autumn olive and high bush honeysuckle should be controlled during pre-harvest TSI operations. Also, undesirable seedlings/saplings and non merchantable trees should be killed in potential regeneration openings during the pre-harvest TSI. Post harvest TSI should consist of coppicing, cull removal, prescribed burning, invasive monitoring and control, as well as planting and direct seeding trees. Planting and direct seeding would most likely consist of oak, walnut, and poplar.

Pine – 20 ac

Current Condition

The stand is currently 85% stocked with 126.2 ft² of BA, 603 TPA, and 2,331.5 bd.ft./ac. The average tree is about 4.7" DBH. Eastern white pine comprises 43% of the BA, 40.5% of the total volume in this stand and the average white pine is 15" in DBH. The other dominant species in the stand is Virginia Pine (10.5% BA and 24% volume). The remainder of the stand is comprised of black walnut (10.5% BA), shingle oak (8% of BA and 9% of volume), and red maple (8% of BA and 5% volume). The majority of the eastern white pine is pole size (67.5%) and 18% of BA is sawtimber size. There is a scattering of American elm, white ash, and pignut hickory throughout the stand. The elm and ash are small, while the hickory is small to pole size.

Invasives including multiflora rose and autumn olive are present in this stand, as well as grape vines. Multiflora rose is the most prevalent of the invasive species. The shade provided by the canopy of the pine trees helps to slow the advance of these invasive species.

Prescription

This stand is fully stocked according to the stand density chart for white pine. A free thinning and improvement cut, utilizing single/group selection is recommended for this stand. The marking should focus on releasing vigorous, co-dominant white pine. This can be accomplished by removing defective and suppressed white pine. Also, removal of undesirable, poor growing stock should be implemented as well. The inventory suggests that approximately 116,000 bd.ft could be harvested from this stand. The majority of the sawtimber volume is comprised of white pine (27%) and Virginia pine (27%). The remainder of the volume is made up of black oak, cottonwood, shingle oak and red maple, each of which comprises 9%. The harvest of this stand should result in a residual stocking of 80%, 116.2 ft² BA, 456 TPA, and 2,215.5 bd.ft./ac.

Any grapevines or invasives should be controlled through pre-harvest TSI operations. Post harvest TSI may consist of coppicing, cull removal, and invasive control.

Oak –Hickory – 20 ac

Current Condition

This stand is comprised primarily of white oak. This white oak was planted sometime between 1937 and 1940. The rest of the trees in the stand are a result of natural regeneration. White oak comprises 78.5% of the sawtimber volume and 81% of the total BA per acre. Northern red oak makes up 14.5% of the sawtimber volume and pignut hickory comprises about 7%. The average white oak sawtimber is about 13.5" DBH. For the age of the stand and the size of the white oak, it seems the growth has become somewhat stagnate. The remainder of the stand consists of small ash, elm, dogwood, and black cherry. There is also some larger size pignut hickory within this stand as well. The white oak dominates every size class except for the small size class.

A combination of grapevines, invasives, and overstocking in this stand is most likely the reason for some of the poor growth and excessive epicormic branching.

The stand is currently 110% overstocked with 112 ft² of basal area (BA), 586 trees per acre (TPA), and 3,804 board feet (bd. ft.) per acre.

Prescription

This stand is completely overstocked. Because of the high number of trees per acre, the growth of the white oak trees has stagnated. In order to help release these trees for potential growth, a crop tree release (CTR) should be performed. The marking should focus on poorly formed white oak that have no space in the canopy, as well as other trees that may be competing for resources. Also, before the crop tree release is performed, TSI should be done in order to eliminate the multiflora rose so it does not spread rapidly after more sunlight is let in to the forest floor. A foliar spray would be the best option to eradicate the multiflora rose. Autumn olive and honeysuckle should also be sprayed. For the larger honeysuckle and autumn olive, it is recommended that they be cut and a basal spray be used on the stumps. During the TSI undesirable seedlings/saplings should be killed. Post harvest TSI should consist of prescribed burning, to help with oak regeneration and invasive monitoring and control.

The inventory data suggests that approximately 5,830 bd.ft could be harvested from the stand. All of the sawtimber volume would be comprised of white oak. The harvest would result in a residual stocking of 99%, 92 ft² of basal area (BA), 546 trees per acre (TPA), and 3,512.5 bd. ft per acre.

Tract Summary

Overall the current tract has an average stocking of 103%, with a BA of 107.7 ft², 489 TPA, and 3,412 bd. ft/ac. Overall the majority of the sawtimber volume would be comprised of white oak (18%), black walnut (12%), black cherry (12%), and eastern white pine (11%).

The proposed management activities would result in an average stocking of 79%, with a BA of 81 ft², 456 TPA and 2,434 bd. ft/ac.

As long as harvesting operations are not conducted during wet periods and skidding and hauling equipment remain in designated areas, there should not be any negative long term impacts to the soil.

The tract would need to be closed to the public during harvesting operations. Wildlife habitat, timber quality and biodiversity should be enhanced as a result of the proposed harvesting and TSI operations.

Proposed Activity Planning

<i>Proposed Management Activity</i>	<i>Proposed Date</i>
Skid Trail / Log Yard Construction	2015 - 2016
Timber Marking	2016 - 2017
Harvest	2016 – 2018
Close Out	2017 – 2018
TSI (Post-Harvest)	2018 – 2020
Re-Inventory	2030

Attachments (On file in Property office)

- Maps (Tract, Inventory, Soils, Harvest)
- A stocking guide chart with the tract level stocking condition plotted and identified.
- Ecological Review
- T-Cruise Reports

To submit a comment on this document, click on the following link:

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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.