RESOURCE MANAGEMENT GUIDE

State Forest: Greene-Sullivan Compartment: 6 Tract: 8
Forester: Phil Jones Date: 2/24/09
Management Cycle End Year: 2029 Management Cycle Length: 20 Years

Location

Compartment 6, Tract 8 is located in the east ½ of Section 1 – T6N – R8W of Sullivan County. It is approximately 1.5 miles north of the town of Pleasantville.

General Description

This tract is approximately 208 acres. The various land use components can be delineated as follows:

- Closed Canopy Forest – 203 ac
- Lakes/Wetland– 3 ac
- Open areas (*roads, horse trails, etc.)* – 2 ac

Over 96% of the tract has been surface mined. Spoil banks are located throughout the majority of the tract. Approximately 75% of the forest can be classified as mixed hardwood cover type. The remainder can be characterized as pockets of planted, red, Virginia, and southern yellow pine.

History

The deed history in this tract was not located. However, nearby tracts were acquired from The Central Indiana Coal Company between 1945 and 1949. No known records of the planting operation exist, but much of the current forest appears to have established around this time.

Boundary and Landscape Context

County road 600S forms the north boundary. Small crop fields border the majority of the west line except at the southern tip where it borders State Rd. 159. The south boundary is a forest road. Lower long lake forms most of the east boundary.

In general, the surrounding landscape consists of closed canopy forest interspersed with various open areas, strip mine pits, and county roads. To the west, the landscape consists of reclaimed and open pit mine ground interspersed with small crop fields and woodlots.

Topography, Geology and Hydrology

In general, only the northwest and west-central edge of the tract has not been mined. The remaining 96% of the tract has been mined. This area consists of a series long narrow, steep mounds of mine spoil (a mixture of soil, shale, sandstone, and some coal). These run east to west in the center of the tract and curve north to south in the northern portion of the tract. The south quarter of the tract is relatively flat, but there appear to be sinkholes dispersed throughout this area as a result of mining subsidence. There are a few streams that wind through the west-central portion of the tract and flow into Red Lake to the south. The result of mining below the water table down stream has caused severe head cutting and stream path alteration. These deeply incised banks are over 6 feet tall and 15 -20 feet wide in some areas. Red Lake is the only named strip pit in the tract.

Soils

Map unit: AlB2 - Ava silt loam, 2 to 6 percent slopes, eroded
Component: Ava (100%)
The Ava component makes up 100 percent of the map unit. Slopes are 2 to 6 percent. This component is on till plains. The parent material consists of loess over loamy till. Depth to a root restrictive layer, fragipan, is 20 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 2e. This soil does not meet hydric criteria.

Map unit: AlB3 - Ava silt loam, 2 to 6 percent slopes, severely eroded
Component: Ava (100%)
The Ava component makes up 100 percent of the map unit. Slopes are 2 to 6 percent. This component is on till plains. The parent material consists of loess over loamy till. Depth to a root restrictive layer, fragipan, is 15 to 40 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3e. This soil does not meet hydric criteria.

Map unit: CnD3 - Cincinnati silt loam, 12 to 18 percent slopes, severely eroded
Component: Cincinnati (100%)
The Cincinnati component makes up 100 percent of the map unit. Slopes are 12 to 18 percent. This component is on till plains. The parent material consists of loess over loamy till. Depth to a root restrictive layer, fragipan, is 22 to 36 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very low. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 21 inches during January, February, March, April, December. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Map unit: St - Strip mines
Component: Strip mines (90%)
This component is on spoil piles. Slopes are 18 to 35 percent. The parent material consists of Loamy materials overlying graded shaly regolith. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6e. This soil does not meet hydric criteria.

Access

The tract can be accessed from the west off of State Rd. 159, just north of CR 700 S. The other access point is located to the north off of CR600S (Bucktown Rd.) onto the horse trail.

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	☐	☐	☐	☒	☐	☐	☐
Pine/conifer plantations or natural stands	☐	☐	☒	☐	☐	☐	☐
Early successional forest (≤ 20 years old)	☒	☐	☐	☐	☐	☐	☐
Shrub-scrub or old field	☒	☐	☐	☐	☐	☐	☐
Grasslands/hayfield	☒	☐	☐	☐	☐	☐	☐
Cropland, pastures, feedlots	☐	☐	☒	☐	☐	☐	☐
Open water (lakes, ponds, rivers, streams, etc.)	☐	☐	☒	☐	☐	☐	☐
Riparian areas	☐	☐	☒	☐	☐	☐	☐
Developed areas	☐	☐	☒	☐	☐	☐	☐
Other: Reclaimed Mine Land	☐	☐	☐	☒	☐	☐	☐

Table 1 shows the estimated proportion of each cover/habitat type within 1 mile of tract center. The area is primarily a mix of closed canopy deciduous forest, reclaimed open pit coal mine ground, and planted pine. The reclaimed mining areas consist primarily of tall fescue, sericea lespedeza, and scattered brush. The rest of the area contains a few small crop fields, lakes, residential/developed areas, and a state and county roads. This diverse landscape has resulted in a large amount of maintained forest edge. The only cover types not represented in the habitat overview are early successional forest, grasslands and shrub-scrub/old fields. Depending upon one's interpretation, the grasslands and shrub-scrub categories could be represented within the reclaimed mine land. Pockets of early successional forest may be established throughout the tract as a result of harvest operations. Other than this, none of the proposed management activities will significantly alter the relative proportion and availability of habitat/cover types in the assessment area.

Structural Habitat Features

TABLE 2

	Target Snag Density	
Diameter (DBH) Distribution	**Goal**	**C6T8**
Including at least this many snags per acre **≥ 5"**:	4	14
Including at least this many snags per acre **≥ 9"**:	3	6
Including at least this many snags per acre **≥ 19"**:	0.5	0.2

TABLE 3

Preferred Roost Trees per Acre

Diameter (DBH) Distribution	Goal	C6T8
Total minimum roost trees per acre **≥11”**:	9	23
Including at least this many roost trees **≥ 19”**:	3	5

TABLE 4

Cavity Trees per Acre

Diameter (DBH) Distribution	Goal	C6T8
Total minimum cavity trees per acre **≥7”**:	9	18
Including at least this many roost trees **≥ 11”**:	3	12.5
Including at least this many roost trees **≥ 19”**:	1	1.5

Table 2 shows how this tract compares with the DoF guidelines for forest stand snag density. The data suggests that there are optimal snag densities for trees ≥ 5” and 9” DBH. The target density for trees ≥19” are slightly deficient. This is mostly due to the young age of the stand. The majority of the forested tract is around 50 years old. The average DBH for sawtimber size trees is only 16.5”. When applicable, some large, lower quality trees remaining after the harvest will be killed during post harvest TSI operations. As additional growing space is made available through harvest operations, the average tree growth rate and diameter will increase. This will result in a larger average DBH, thus increasing the number of trees available for larger diameter snags.

Table 3 shows how this tract compares to the Indiana Bat guidelines for preferred live roost trees. The inventory data suggests that optimal conditions exist for this habitat feature for all diameter ranges.

Table 4 shows how this tract compares to the DoF guidelines for number of cavity trees per acre. The inventory data suggests that optimal conditions exist for this habitat feature in across all diameter ranges.

There is a permanent wetland and rock outcrop located in the northwest corner of the tract. This is the result of an “end cut” from strip mining activities. This area will be excluded from harvest operations. There are numerous circular depressions at the south end of the tract. These appear to be the result of mining subsidence. These will be avoided during harvest operations.

The structural habitat features listed above will be considered during management operations. All 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 records of three bird species of concern (Henslow's Sparrow, American Bittern, Northern Harrier) to the west of forest property and one mammal (American Badger) located directly east of the tract and within the forest property.

Habitat

The Henslow's Sparrow is listed as an endangered species in Indiana. An estimated several thousand individuals breed in 19 reclaimed coal mine grasslands in southwestern Indiana. It is an obligate grassland species that historically bred in tallgrass prairie habitat. They also breed in other grasslands, including hayfields, pastures, and meadows.

The Northern harrier is listed as an endangered species in Indiana. Only one observation exists for a state forest property. The lack of observations on state forests is due to the avoidance this species has for forested areas, preferring instead marshes, meadows, grasslands, old fields, pastures, and other open areas during the breeding season.

The American Badger is listed as a species of special concern in Indiana. This species generally prefers open areas, such as grasslands, prairies, and cultivated areas and it generally avoids forests and woodlands, accounting for only one observation on a state forest property.

American bitterns most often breed in shallow wetlands dominated by tall emergent vegetation, including cattail marshes, wet meadows, bogs, shrubby marshes, and occasionally hayfields. When compared to the Least Bittern, the American Bittern uses a wider variety of wetland types, less densely vegetated sites, shallower water depths, and exclusively freshwater habitats.

Management

The biggest threat to the listed species is the loss of habitat. None of the species listed in the review are forest dwelling species. Therefore, the proposed management activities should have no impact on these species or their habitat.

Exotic/Invasive Species

Species	Immediate Management Required	Monitoring/ Re-evaluation Recommended	Mapped?
Ailanthus	☒	☒	☒
Multiflora Rose	☐	☒	☐
Japanese Honeysuckle	☐	☒	☐
Bush Honeysuckle	☐	☒	☐
Autumn Olive	☐	☒	☐

Ailanthus will be treated late this summer to early fall. At least two or more of the remaining species are prevalent on every forested tract on the property. Logistically it would be impossible to immediately treat every tract that is inventoried. Therefore, control efforts will not be made until the tract has been selected for active timber management. Treatment will primarily consist of basal bark chemical application on bush honeysuckle and autumn olive. Foliar control of multiflora rose and Japanese

honeysuckle may be made. However, control of these species will prove to be extremely costly and time consuming.

Recreation

This area is a popular location for horse riding. The horse trail winds through the entire eastern half of the tract. Red lake is the only named lake within the tract and is rarely used due to poor access. Lower long lake forms the east boundary of the tract. This lake has a boat ramp off of CR 600 S and is a popular fishing location. Other common activities include mushroom gathering, deer hunting, and turkey hunting.

Cultural

There were no cultural features found in the tract. An archeological clearance application will be submitted to the DNR Division of Historic Preservation and Archaeology prior to the implementation of activities associated with timber harvest operations.

Stand Descriptions and Silvicultural Prescriptions

Mixed Hardwood – 165 ac

Current Condition

Sweetgum, soft maple (red & silver), and cottonwood comprise 61% of the basal area (BA) in sawtimber and poletimber in the stand. The average tree diameter at breast height (DBH) for each species fall in the small to medium sawtimber size class. The remainder of the sawtimber and poletimber BA in the stand consists of American elm, black cherry, sycamore, yellow poplar, trees in the red oak group (black, shingle, red, pin), and black locust. The DBH distribution ranges from small sawtimber (black locust, black cherry, American elm) to medium sawtimber (sycamore, poplar, red oak, shingle oak, black oak) to large sawtimber (pin oak). A small component of white and Virginia pine was recorded in this stand during the inventory. This is due to various inventory plots occurring in a transition area between hardwood and pine stands.

In the sub-merchantable size class, 76% of the stems are comprised of mixed hardwoods. The dominant species are dogwood, sassafras, elm, pawpaw, and red maple. The remainder of the species in this size class consist primarily of sugar maple, shingle oak, yellow poplar and white ash.

The stand has a current stocking of 105% with a BA of 118 sq.ft/ac and 272 trees/ac. The average volume is 8,225 bd.ft./ac. The sweetgum-soft maple-cottonwood component accounts for approximately 65% of this volume.

Prescription

This stand is currently overstocked according to the stand density chart for upland hardwoods. A combination of regeneration and intermediate harvest methods is recommended for this stand. The regeneration marking should focus on implementing singletree selection to remove mature and over mature cottonwood and pin oak. Group selection openings should be carried out in areas thick with defective and poorly formed

black locust, sassafras, and silver maple. This should create large enough canopy gaps resulting in sufficient sunlight for mid canopy and understory release of mixed hardwood trees.
An intermediate harvest method is recommended for the remainder of the stand. An improvement cut should be carried out with a focus on removing inferior species, defective, or poorly formed trees competing with good growing stock. This should create adequate growing space for the remaining vigorous, dominant and co-dominant trees.

Species composition will change little as a result of the proposed harvest operation. The inventory data shows that only yellow poplar and silver maple distribution will be significantly altered. The BA of pole and sawtimber size trees may increase 4% for yellow poplar and decrease 5% for silver maple.

Overall, approximately 4,185 bd.ft./acre of sawtimber should be harvested. The remaining stocking percentage will be around 65%, with a basal area of 65 sq.ft./ac, and contain an average of 4,040 bd.ft./ac.

Pre harvest TSI operations should focus on vine removal and invasive control. Post harvest TSI may consist of crop tree release, coppicing, snag creation, cull removal, and follow up invasive control.

Pine – 38 ac

Current Condition

White pine comprises approximately 60% of the BA in sawtimber and poletimber in the stand(s). Red, loblolly, and Virginia pine account for roughly 10%, 5%, and 3%, respectively. A mixed hardwood component of black cherry, red maple, sweetgum, shingle oak, and American elm occupy the remaining BA of the stand.

White pine, shingle oak, sassafras, and sugar maple account for the majority of the stems in the sub-merchantable size class.

The stand(s) have a current stocking of 82% with a basal area of 122 sq.ft/ac and 426 trees/ac. The average volume is 7,950 bd.ft./ac. White pine accounts for approximately 65% of this volume.

Prescription

A combination of regeneration and intermediate harvest methods is recommended for this stand(s). The regeneration marking should focus on implementing group selection openings to remove pockets of decadent Virginia and red pine. An intermediate harvest with a combination of improvement cutting and free thinning is recommended for areas of white and loblolly pine. This should focus on removing suppressed trees likely to drop out from competition, as well as the removal of defective, poorly formed trees. There is a component of good growing black cherry and red maple sawtimber in this stand. Sound, good growing trees of these species should be retained over white and loblolly pine, where applicable. This combination should result in adequate growing space for the remaining desirable, dominant and co-dominant white and loblolly pine, as well as release of desirable hardwoods in the co-dominant and lower crown classes.

Species composition should change significantly in the Virginia and red pine areas as a result of the harvest. These areas should convert into early successional hardwood forest. The species composition in the white and loblolly pine area will remain relatively unchanged. However, additional growing space should significantly increase growth rate and overall tree quality should improve.

Overall, approximately 3,230 bd.ft./acre of sawtimber should be harvested. The remaining stocking percentage is difficult to estimate because of various cover types and the multiple areas and prescriptions for the stand.

Pre harvest TSI operations should focus on vine removal and invasive control. Post harvest TSI will consist of opening completion, coppicing, cull removal, crop tree release, and follow up invasive control.

Tract Summary

Overall the proposed harvesting operation could produce an estimated total of 822,120 bdft or approximately 4,000 bd.ft./ac. An estimated 125,670 bdft would come from oaks, cherry, and poplar, 221,860 bdft soft maple, 104,570 bdft pine, and 370,020 bdft from predominantly cottonwood, sweetgum, sycamore, and elm.

The proposed management activities would result in an average stocking of 67%, with a BA of 69ft², 263 trees/ac, and 4,170 bdft/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 impacts to the soil. The deeply incised streams that wind through the west-central portion of the tract and flow into Red Lake may be difficult to cross even with the use of a portable bridge. Access to the areas between and to the west of these water courses may be limited.

The tract would need to be closed to the public during harvesting operations. Therefore, horse riding and hunting activities would be adversely affected during this period. However, there are numerous locations in the surrounding property that offer the same opportunities. Wildlife habitat and biodiversity should be enhanced as a result of the proposed harvesting and TSI operations. Additional sunlight penetrating the forest floor will stimulate the development of new ground flora, consequentially increasing nesting and foraging habitat.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
TSI (Pre-Harvest)	2012 – 2013
Skid Trail / Log Yard Construction	2011 – 2013
Timber Marking	2012 - 2013
Harvest	2013 - 2015
Close Out	2014 - 2015
TSI (Post-Harvest)	2015 - 2018
Re-Inventory	2029

Attachments (on file in property office)

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

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