Indiana Department of Natural Resources – Division of Forestry
Draft
RESOURCE MANAGEMENT GUIDE

State Forest: Greene-Sullivan Compartment: 02 Tract: 03
Forester: Tom Moore / James Dye Date: 1/23/2015
Management Cycle End Year: 2035 Management Cycle Length: 20

Location

Compartment 2, Tract 3 is located primarily in the Northern ½ of Section 24 – T7N – R8W of Sullivan County. This main area consists of approximately 140 acres. It is also partially located within the southern ½ of Section 13 – T7N – R8W, also in Sullivan County, with this area consisting of about 38 acres. In addition to these main areas of the tract, there are approximately 2 acres that cross the county line and this small area is located in Section 19 – T7N – R7W of Greene County. There are approximately 180.7 total acres within this tract.

The tract is directly southeast of the Property Office. To reach it travel approximately one mile south of the Property Office on State Highway 159 and then turn east and travel a quarter mile on County Road 350 S. The tract is located north of the county road and has good access via Road 825 E and a series of campground access roads.

General Description

The tract is approximately 180.7 acres in size. The various land use components can be delineated as follows:

- Pine – 72 acres
- Mixed Hardwood – 42.7 acres
- Wetlands/Lakes – 1 acre
- Recreation – 65 acres (4 acres water, 20 acres pine, 41 acres mixed hardwood)

Approximately 73% of this tract has been surface mined. The majority of the mined area is in the northern & the western portion of the tract. The mined area is roughly 130 acres in size and has some moderately-steep to very steep stripper hills. These hills primarily run east to west. A southeastern portion of the tract has gone un-mined, and the overall un-mined areas total approximately 45 acres.

The area that has been mined is predominately growing several pine species. The un-mined area consists of mostly mixed hardwoods in flat bottomlands. The conifers are mostly made up of red pine, Virginia pine, and Eastern white pine, while the hardwood component of the tract is primarily red maple but also includes American sycamore, black cherry, ash, elm, Eastern cottonwood, tulip poplar, and occasional, various oaks. The area of this tract that was mined was planted with Eastern white pine, red pine, and probably autumn olive. All other species that occur in this portion of the tract are most likely due to natural regeneration.

There are 3 lakes that fall within the tract and one that is a boundary for the tract, they are: Butternut, Catfish, Edds, & Downing Lake.

History

The majority of this tract was deeded over by the Sentry Royalty Company on May 5th of 1964. This deed included nearly the entire tract; it comprises everything in the tract west of County Line Rd (1600W). The remainder of the tract, approximately 2 acres in size, was acquired on October 1st 1984 from the Peabody Coal Company. These 2 acres occur on the eastern side of County Line Rd (1600W). No known records exist of the planting operation, but based upon old aerial photography, planting of the western portion occurred sometime in the early 1960's. Most of the flat bottomland section of the tract regenerated naturally with red maple between 1960 & 1980. Within the flat bottomlands there is evidence of past use by private individuals, and there is some encroachment taking place. There are several piles of trash located in the bottomlands. The majority of the piles occur on the eastern side of the tract. There are also some old fence lines that

run through the property. These fence lines are very close to the surveyed boundary of this tract.

Access

The tract can be easily accessed from several different locations. The eastern boundary is largely along County Line Road (1600W). Also along the eastern boundary is an access road to a boat ramp for Downing Lake, and this lake creates the northern border, as well as some of the western border, for the tract. There is another access road to a boat ramp within this area that also provides great access. This road leads to Catfish Lake, which is in the southwestern area of the tract. Narrow Campground is near the southwestern border and is a great place to park and access the area. There is also Edds Lake Road, which runs east-west and enters the tract from the western boundary from the Narrow Lake Campground. Edds Lake Road turns into a private road and is currently the only means of road access for several private residences near Edds Lake.

Boundary and Landscape Context

Downing Lake creates the entire northern boundary of the tract and the northern ¼ of the western ½. The remainder of the western boundary is Road 825E which runs through Narrow Lake Campground. The eastern boundary primarily consists of County Line Rd (1600W) and privately owned land just east of the road. The southern boundary of the tract is bordered almost entirely by privately owned land, and the remainder of the southern boundary on the western side is bordered by County Road 350S.

Topography, Geology and Hydrology

A little more than 70% 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 almost entirely throughout the whole tract, except a south eastern portion of the area (See Maps). There are a few lakes/pits that are within the tract. In addition to the pits within the tract, there is also Downing Lake, which creates the northern boundary. The area that has gone un-mined remains a flat bottomland and will most likely remain somewhat wet throughout the spring and fall.

Soils

Forestland Productivity– Sullivan County, Indiana				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			Cu ft/ac	
Ak—Atkins silt loam				
Atkins	Pin oak	100	57	American sycamore, Baldcypress, Blackgum, Bur oak, Overcup oak, Pecan, Pin oak, Red maple, River birch, Shellbark hickory, Shumard's oak, Silver maple, Swamp white oak, Sweetgum
	Sweetgum	95	114	
AlB2—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	
Cu—Cuba silt loam				
Cuba	—	—	—	American sycamore, Baldcypress, Blackgum, Bur oak, Cherrybark oak, Eastern cottonwood, Overcup oak, Pin oak, Shingle oak, Silver maple, Swamp chestnut oak, Swamp white oak, Sweetgum
Sn—Stendal silt loam				
Stendal	Pin oak	90	72	American sycamore, Baldcypress, Blackgum, Bur oak, Overcup oak, Pecan, Pin oak, Red maple, River birch, Shellbark hickory, Shingle oak, Shumard's oak, Silver maple, Swamp chestnut oak, Swamp white oak, Sweetgum
	Sweetgum	85	86	
St—Strip mines				
Strip mines	—	—	—	Black locust, Blue spruce, Eastern white pine, Tuliptree
W—Water				
Water	—	—	—	—

Forestland Productivity– Greene County, Indiana				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			Cu ft/ac	
AvB2—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	
FcG—Fairpoint very parachannery loam, 35 to 90 percent slopes				
Fairpoint	—	—	—	—

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 the tract center. The tract is primarily a mix of closed canopy coniferous forest (51% of total acreage). There are typically mixed hardwoods interspersed with these pines. There is also an area of predominantly mixed hardwoods within this tract; it makes up about 46%. The mixed hardwoods consist mainly of red maple, but there is plenty of diversity. American sycamore, black cherry, ash, elm, Eastern cottonwood, tulip poplar, and

occasional, various oaks, and several other species are also present. There are also many areas where the pine and the hardwoods are somewhat evenly mixed. This cover type is especially present in the northwestern portions of the tract near Downing Lake. There is no cropland or grassland/hayfield habitat in this area, but at one time this cover type may have been present. Due to the low resolution of existing, historical aerial photographs, it is difficult to determine exactly what the land was used for in the past, but it seems to have been used for cropland and pasture before converting back to forestland. If a regeneration opening(s) were to be established today as a result of harvest operations (or a natural event, such as a tornado), then early successional forest habitat may subsequently be represented in the habitat overview as a result. Additionally, conversion of much of the western area of the tract for campground and recreation development is imminent and is represented in this table as "developed areas". This figure also includes campground areas already established, such as the access to Catfish Lake.

TABLE 2

Target Snag Density

Diameter (DBH) Distribution	**Goal**	**C2T3**
Including at least this many snags per acre ≥ **5"**:	4	12.88
Including at least this many snags per acre ≥ **9"**:	3	4.26
Including at least this many snags per acre ≥ **19"**:	0.5	0

Table 2 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 ≥ 5 size classes. The goal was also reached in the ≥ 9" size class. The large size class ≥ 19", is at nearly the optimum level. Most of the smaller snags consist of red pine and Eastern white pine.

TABLE 3

Cavity Trees per Acre

Diameter (DBH) Distribution	**Goal**	**C7T7**
Total minimum cavity trees per acre ≥**7"**:	4	4.20
Including at least this many roost trees ≥ **11"**:	3	0
Including at least this many roost trees ≥ **19"**:	1	0

Table 3 shows how this tract compares to DoF guidelines for the forest stand cavity tree density. The data suggests that the stand is lacking the optimal number of cavity trees for wildlife, except in the **≥7"** size class. 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. The deficiency of cavity trees may also be in part due to the considerable amount of storm damage in the tract. Some of the larger trees may have had cavities present but, due to the thickness of the canopy during the observation period, cavities in the upper regions of trees would have been difficult to notice.

TABLE 4

Preferred Legacy Trees per Acre

Diameter (DBH) Distribution	**Goal**	**C7T7**
Total minimum Legacy trees per acre **≥11"**:	9	16.33
Including at least this many Legacy trees **≥ 20"**:	3	1.73

Table 4 shows how this tract compares to the Indiana Bat guidelines for preferred legacy trees. The data shown here 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.

Deficiencies in Tables 2, 3, and 4 are primarily due to a lack of trees, including legacy trees, in the larger size classes and relative young age of the timber present. Growth rates on mine spoils can vary considerably also, and in some instances trees can thrive for a time and then slow considerably as expanding roots encounter different soil conditions. Still, in time, as the stands here continue to age, these numbers may rise.

The structural habitat features listed above will be considered during management operations. Efforts will be made to meet or exceed maintenance level guidelines for each habitat feature. The Division of Forestry has instituted procedures for conducting forest resource inventories so that the documentation and analysis of live tree and snag tree densities are examined on a compartment level basis in order to maintain long-term, quality forest habitats. Crown release performed during timber harvests will stimulate the growth of the selected crop trees and will enhance the vigor of these sawtimber trees. Timber Stand Improvement (TSI) following the harvest is planned which will increase standing snag counts. Management practices conducted in this tract will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

IDNR Natural Heritage Database (NHDB) Review

A NHDB review was conducted for this tract. There are no records showing any species of concern within this tract. If Rare, Threatened or Endangered species (RTE's) are identified for this tract, the activities prescribed will be conducted in a manner that will not threaten the viability of those species.

Exotic/Invasive Species

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

This stand is infested with Autumn Olive, and treatment is highly recommended. It is particularly thick in several pine stands, which is surprising; usually autumn olive does not persist in this type of understory. A basal or foliar spray to eradicate the autumn-olive may be the best option over this area of the tract.

A few stems of ailanthus were noticed while walking and flagging the southern boundary, but it was not a large infestation. In order to prevent further spread of ailanthus, treatment in the near term is recommended utilizing a basal bark treatment or "hack and squirt" method.

Multiflora Rose is also present throughout the tract in light to moderate concentrations, thus treatment is recommended due to the spread potential and difficulty of removal after establishment. The majority of the rose was located in the strip mined areas, but it is also occasionally present in the flat bottomlands.

Recreation

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

A campground expansion is planned in the western portion of the tract. This will include cabins and primitive campsites as well as necessary access roads, electrical lines and junction boxes, required water access points, and toilet facilities. This area has been

designated with a wide buffer to ensure both adequate space and the safety of those enjoying the recreational opportunities this tract offers.

Cultural

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

Stratum Descriptions and Silvicultural Prescriptions

Mixed Hardwood – 42.7 acres (83.7 acres total)

Current Condition

Direct observation and the 2010 forest inventory indicate this stratum is comprised of a wide variety of species. Most trees present are likely a result of natural regeneration and were not planted. Red maple comprises approximately 32% of the sawtimber volume and around 26% of the total basal area (BA) per acre. The red maple is a variety of sizes, from small stems 1-2" in diameter to greater than 30". The next species with the largest volume of sawtimber in this stratum type is Eastern cottonwood. Cottonwood comprises 15% of the total sawtimber volume and around 10% of the total BA per acre.

Red maple dominates every size class except for the sub-merchantable size class, which is dominated by river birch, American elm & dogwood species. The advanced regeneration consists largely of red maple, American elm, dogwood, and some tulip poplar.

This area consists almost entirely of flat bottomlands; this is because this part of the tract has remained un-mined. The invasives in this area of the tract were not as prevalent as in the spoil banks.

Areas along and near Edds Lake Road have significantly more tulip poplar than most other areas of the tract, and many of these poplars are not only mature or over-mature but also damaged or in decline.

This stratum is currently 100% stocked with 115.9 square feet BA, 214 trees per acre (TPA), and 4,502 board feet (bd. ft.) per acre.

Prescription

An improvement cut, utilizing single tree/group selection and regeneration cutting is highly recommended for this stratum. The timber marking and post-harvest timber

stand improvement (TSI) should focus on removing red maple and red pine, and Eastern cottonwood, as well as small American elm, boxelder, and other damaged, poorly formed, and low quality trees which are competing with future crop trees.

A well implemented thinning in this portion of the tract will help to provide great potential for future timber. The tree inventory data suggests that approximately 1,750 board feet (bd. ft.) per acre could be harvested. The harvest would result in a residual stocking of about 75%, 83.7 square feet BA, 192 TPA and 2,753 bd. ft. per acre

To remove residential traffic from the campground, an alternate road is planned for access to private property near Edds Lake Road. This alternate route would affect a very small area of the tract, which includes a portion of the mixed hardwood stratum, and some trees here may need to be removed to accommodate. Most of the impacted trees are large, declining and damaged yellow poplars, ash, or low quality black locust and associate old field species of very poor quality. During reconnaissance and in examining the timber in this area, it was determined that any additional, future marking and harvesting operations should pay special attention to this area for continued and improved forest vigor. EAB at risk ash and much of the stressed and damaged yellow poplar trees will be among the trees selected for harvest removal.

Exotic invasives such as multiflora rose, autumn olive and high bush honeysuckle should preferably be controlled during pre-harvest TSI operations. Grapevines should also be cut, leaving no more than 1-2 per acre in low quality, edge or already deformed trees. 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, and invasive monitoring and follow-up, spot treatments. There may also be some opportunity for prescribed burning to aid in reducing multiflora rose and bush honeysuckle and to help prepare the soil and forest floor for new growth. Planting or direct seeding could be considered, mainly in any large regeneration openings, and any such efforts should emphasize attempts to establish more oaks or walnut.

Pine – 72 acres (92 acres total)

Current Condition

The stand, on average, is fully to overstocked with 135.5 square feet of BA, 248 TPA, and 5,608 bd. ft. per acre. The average tree is about 8.9" DBH. Determining an exact stocking (percentage) is difficult due to the variety of species present, and the differences in assessing density of pines versus hardwoods.

Red pine comprises 43% of the BA per acre, 36.4% of the total volume in this stand and the average sawtimber red pine is 13.2" in DBH. The other dominant species in the stand is Eastern white pine with 18.6% BA per acre and 25.5% of the total sawtimber volume. The third largest component of the stand is American sycamore with 13.7% BA per acre and 17.7% of the total sawtimber volume. The majority of the Eastern white pine is sawtimber size (46.5%) with the average diameter at 16.0" DBH. There is a scattering of shortleaf pine, Eastern cottonwood, and red maple throughout the stratum.

Exotic invasive species including multiflora rose and autumn olive are present in this stratum, and grape vines are a concern due to a light to moderate density (significantly greater than 1-2 per acre). Autumn olive is the most prevalent exotic invasive species in this stand. There are heavy infestations of this shrub in many areas. These invasives and the grapevines would be best treated during pre-harvest TSI. Total eradication is unrealistic but good control is feasible.

Prescription

A free thinning and improvement cut, utilizing single/group tree selection is recommended for this stand. Timber marking should focus primarily on removing poorly formed, declining, or damaged trees, freeing up nutrients for both future crop trees such as vigorous co-dominant Eastern white pine which have not yet reached full maturity. The inventory suggests that approximately 2,700 bd. ft per acre could be harvested from this stratum. The harvest of this stand would approximately result in a residual stocking that is just above the B-line (just fully stocked), 89.1 square feet BA, 201 TPA, and 2,908 bd. ft. per acre.

Grapevines or invasives should be treated through pre-harvest TSI operations if possible, but several treatments/applications will be necessary to achieve good control. Post harvest TSI may consist of coppicing, cull removal, and further invasive control.

In this tract the autumn olive within this stand is the greatest issue in terms of exotic invasive species because of its density and suppression of tree and other native regeneration. Due to the severity of the invasives the best option for control would most likely be a combination of basal and foliar spray.

Tract Summary

The biggest concerns in this tract are restoring native vegetation through the control/removal of exotic species, and improving the forest structure for long term growth, quality, and wildlife habitat. The prescriptions in the preceding section outline

early steps in achieving these goals, but it should be understood that due to existing conditions and past disturbance, this is a long term effort that will require several management cycles.

As long as harvesting operations are not conducted during wet periods and skidding and hauling equipment remain in designated areas, there should be minimal long term impacts to the soil. Soil and water conservation measures (BMPs) will be incorporated into management activities to protect these resources.

In areas of recreation expansion, construction will need to incorporate good access road design and proper drainage and sites will need to be level with stable soil to support small cabin structures and parked vehicles. Where campsites, access roads, utilities, and other infrastructure are constructed timber will be utilized so as not to waste these wood resources. Such activity should be primarily within the area designated for recreation as shown on the map included in this plan.

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

Proposed Activity Planning

Proposed Management Activity	*Proposed Date*
Recreation Area Design & Development	2014 - 2017
Pre-harvest TSI	2019-2020
Skid Trail / Log Yard Construction	2019 - 2020
Timber Marking	2020 - 2021
Harvest	2020 – 2023
Close Out	2020 – 2023
TSI (Post-Harvest)	2023 – 2024
Re-Inventory	2035

Attachments

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

Use the link below to submit a comment on this document:

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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. Note: Some graphics may distort due to compression.