Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Pike State Forest**
Tract Acreage: **84**
Forester: **Sabrina Schuler & Evan McDivitt**

Compartment: **09** Tract: **07**
Commercial Forest Acreage: **77**
Date: **12/31/2017**

Location

Tract 0907 is located in NE ¼ Section 1, T2S, R7W and the NW ¼ Section 6, T2S, R6W in Pike State Forest, Marion Township. The nearest town of Velpen is located approximately 2.73 miles SE of this tract. The property is approximately 84 acres total, of which 77 acres are commercial forest acreage.

General Description

Tract 0907 contains a majority of acres in mixed hardwoods, with occasional oak-hickory stands. There are white pine and Virginia pine plantings along edges of the tract near the county roads. Below is a table summarizing trees species identified during the inventory.

Figure 1. Pike SF Compartment 09, Tract 07.

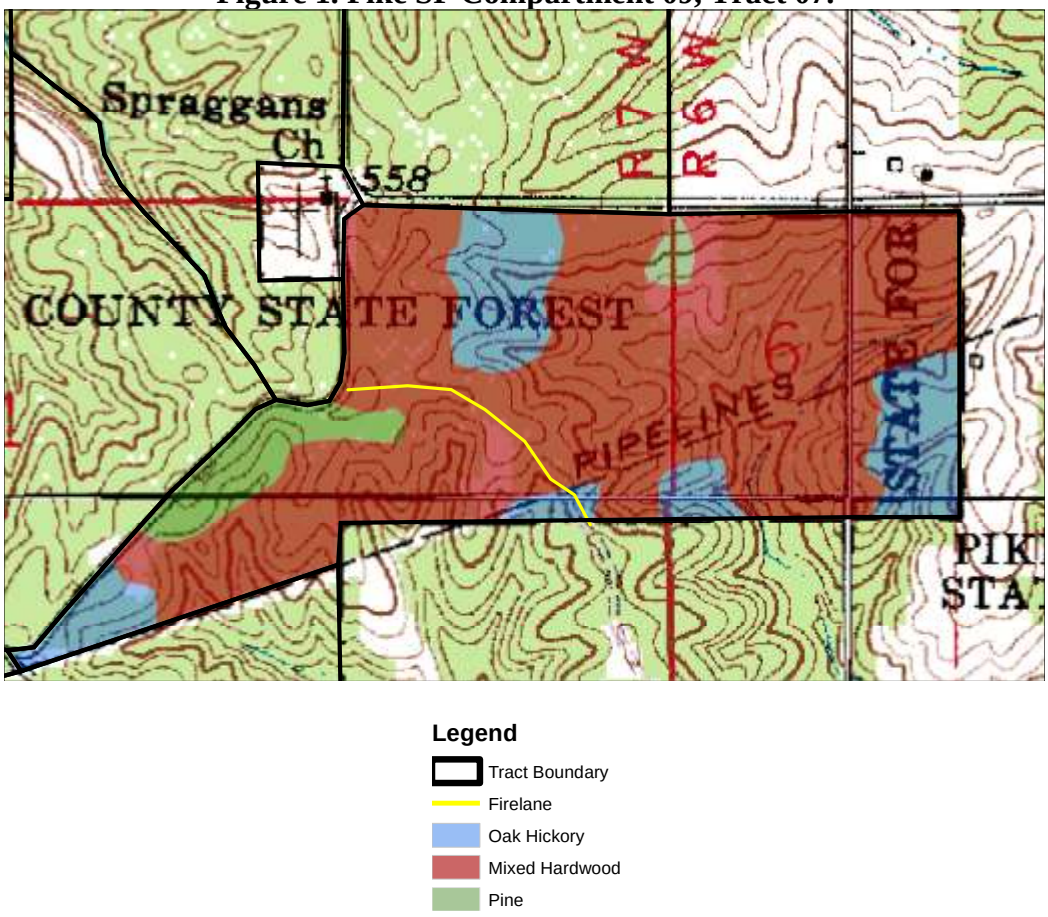


Table 1. Overview of Tree Species in Tract 0907.

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
American Beech	American Beech	American Beech
American Elm	American Elm	American Elm
American Sycamore	American Sycamore	American Sycamore
Bitternut Hickory	Bitternut Hickory	Bitternut Hickory
Black Cherry	Black Cherry	Black Cherry
Blackgum	Blackgum	Black Locust
Black Oak	Black Oak	Black Oak
Black Willow	Black Walnut	Chinkapin Oak
Chinkapin Oak	Chinkapin Oak	Dogwood
Eastern White Pine	Eastern White Pine	Eastern White Pine
Bigtooth Aspen	Hackberry	Northern Red Oak
Northern Red Oak	Ironwood	Pignut Hickory
Pignut Hickory	Northern Red Oak	Redbud
Red Maple	Ohio Buckeye	Red Maple
Shagbark Hickory	Pignut Hickory	Sassafras
Sugar Maple	Red Maple	Shagbark Hickory
Sweetgum	Sassafras	Sugar Maple
Virginia Pine	Shagbark Hickory	Sweetgum
White Ash	Sugar Maple	White Ash
White Oak	Sweetgum	White Oak
Yellow-Poplar	Virginia Pine	Yellow-Poplar
	White Ash	
	White Oak	
	Yellow-Poplar	

Mixed Hardwoods*:* This tract has about 56 acres of mixed hardwoods and consists primarily of various oaks, hickories, sugar maple, and yellow-poplar. The understory composition is dominated by beech-maple growth, but other occasional species are present including oaks, hickories, dogwood, sweetgum, yellow-poplar, American elm, sassafras, and white ash.

Oak-Hickory: This stand type was found primarily along gentler slopes and ridgetops in the north-central and southeastern parts of the tract. Oak-hickory (approximately 15 acres) has primary overstory species consisting of pignut hickory, white oak, black oak, and northern red oak, but the understory contains beech-maple and clusters of paw-paw. Regeneration varies in most areas depending on the seed bank.

Pine: Approximately 5.6 acres is in planted Virginia and Eastern white pines. The understory is composed of mixed hardwood seedlings and saplings.

Open: Approximately 7 acres of this tract is maintained as open land for a pipeline running diagonally from the northeast corner to the southwest border. No mature trees are present along

the pipeline, but regeneration of yellow-poplar, sweetgum, and black locust appear to be common.

History

Originally, this tract was divided into two separate tracts by the Texas and Eastern pipeline. This tract was purchased in a tax sale from the Pike County Commissioners in 1935. In 1999 that the tracts bordering the pipeline (previously known as Tracts 0107 to the north and Tract 0202 to the south) were combined into one to enable easier access. The 18 acres south of the pipeline (Tract 0202) was deeded to the State on June 5,1937 from Donald J. and Frances E. Strauch along with part of Tract 0107, totaling 67 acres. An oak plantation is suspected to have been planted in this area on the ridgetop, mentioned in previous management plans and is believed to have been planted in 1935.

As for Tract 0107, there were two previous owners of this tract. Robert and Hazel Heuby of Wesport, IL sold 400 acres on December 13, 1934. This land was mostly forested at the time of sale. This land is part of the 12 acres found in the southwest corner of the tract. The majority of Tracts 0107 and 0202 were pasture and severely eroded. There is one pine patch with no associated records, and now most of it is being naturally converted to hardwoods. Two small rock dams had been seen in the management plan in 1999 by Nate Orsburn, and he believed that these dams were made to slow erosion and to possibly pool water for cattle.

Resource Management History

Past management of previously mentioned Tract 0202 states that Rick Burgeson inventoried the tract in 1971, estimating approximately 1,000 bd. ft. per acre, and basal area of 63 sq. ft/acre on 18.5 acres of mostly "scrub sassafras and black locust, with larger oaks and hickories interspersed" would not require a harvest. Also noted was evidence of past site degradation from farming (eroded gullies). TSI was recommended followed by tree planting, but feasibility was questioned. No evidence of TSI was seen. Later, the tract was inventoried by Property Manager Steve Brandsasse in 1978, finding almost 4,000 bd. ft. per acre with basal area of 100 sq. ft/acre. A harvest was recommended (2,900 bd. ft. per acre) to remove mature trees (black and scarlet oak) in the 18 to 20 in. classes. In 1979, timber was sold to Petersburg Wood Products from this tract and tracts 1, 3, and 4 for widening of the pipeline. In 1982, Janet Eger inventoried the tract estimating 3,100 bd. ft. per acre with basal area of 81 sq. ft/acre. Vine control TSI was recommended followed by an improvement cut in 1992 to remove about 1,500 bd. ft. per acre in mostly black and red oak. Also suggested was combining this tract with another for the timber sale. In 1997, John Zvirblis inventoried the tract and estimated 2,600 bd. ft. per acre with a basal area of 118.4 sq. ft. A vine TSI 1-2 years in advance of a sale and a post-harvest TSI was recommended. Also mentioned combining 0107 and 0202 into what is now 0907.

Previously known Tract 0107 was inventoried in 1971 and then again in 1982, where TSI and plantings were recommended, but harvests were not in the foreseeable future.

Landscape Context

Mixed hardwoods dominate most of the ridgetops and slopes. Oak-hickory clusters occupying the tract have remained more in ridgetops and along slopes closer to bottomlands. White pine is

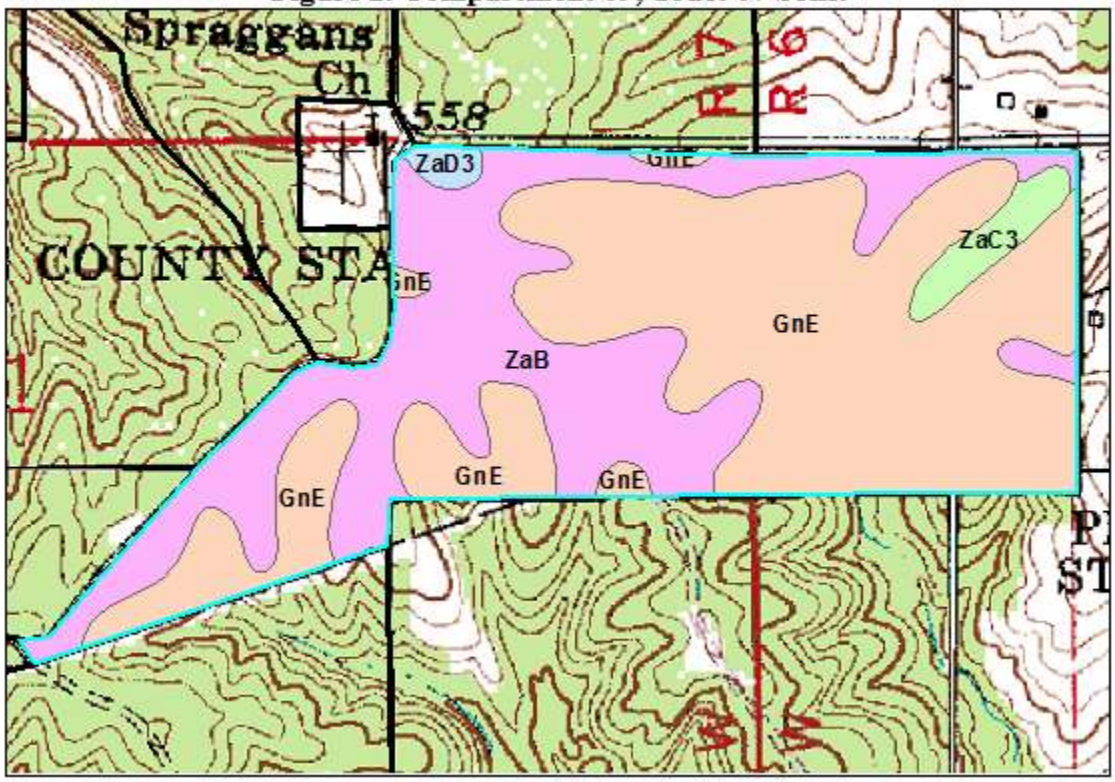
planted in the southwest region along smoother, gentle slopes near the road. To the west, the majority of the land is administered by Pike State Forest and consists of closed-canopy deciduous forest. Other prominent land uses in other directions include private land with agriculture, pasture, and residential development, as well as land administered by Pike State Forest.

Topography, Geology, and Hydrology

This tract contains a mix of shallow and steep drainages. An intermittent creek runs from southeast to the northeast corner and has steep drop-offs, being surrounded by two large hills on either side of its bank. Elevation is around 500 ft. above sea level. Most slopes face north and south, but finger ridges in the southeast corner by the stream branch out to form west- and east-facing slopes. The majority of the tract has underlying bedrock composed of nearly horizontal, interbedded gray and brown acid siltstone, shale, and sandstone. Some portions of the tract also have soils derived from loess deposits overtop siltstone, shale, and sandstone residuum.

Soils

Figure 2. Compartment 09, Tract 07 Soils.



Gilpin silt loam (GnE); *(49.2 acres)* is a moderately deep, well-drained soil type found on ridges and 15-30% side slopes. It is eroded and contains 1-3% organic matter. They are moderately permeable soils at 0.6 to 2 inches per hour above 60 inches and available water capacity is low at 3.9 inches above 60 inches, and can be subject to drought. The pH ranges from 3.6 to 5.5. Bedrock depth begins at 20 to 40 inches. Site Index is 80 for northern red oak and 95 for yellow poplar.

Zanesville silt loam (ZaB); *(31.4 acres)* is a widespread, moderately well-drained soil with a depth of 24-39 inches to the water table, seasonally. It occurs on 2-6% slopes in upland areas and is eroded, allowing a very high surface runoff rate. Organic matter content is moderately low at 1-2% and permeability is very slow. Available water capacity is around 8.2 inches above 60 inches. The pH ranges from 4.5 to 6.0. Bedrock begins at a depth of 50-90 inches. This soil can have a fragipan at 20-32 inches. Site Index is 68 for northern red oak, 70 for white oak, 77 for black oak, and 88 for yellow poplar.

Zanesville silt loam (ZaC3); *(2.3 acres)* is similar to ZnB except that it occurs on 6-12% slopes in upland areas and is severely eroded version of the soil type. Site Index is 60 for northern red oak, 70 for white oak, 77 for black oak, and 88 for yellow poplar.

Zanesville silt loam (ZaD3); *(0.8 acres)* is similar to ZnB except that it occurs on 12-18% slopes in upland areas and is severely eroded version of the soil type. Site Index is 60 for northern red oak.

Roads and Access

Access is good for this tract. Two county roads border this tract: gravel road E CR 325 S to the west that leads to the paved intersection of CR 775E and E CR 300S, which borders this tract to the north. Firelane #19 leads directly into the tract from E CR 325 S, providing excellent access from the west. There are two old roads that cross in the southwest corner and could be used as skid trails.

Boundary

Tract boundaries are: CR 325 to the west, CR 775E to the north, the pipeline in the southwest corner, and private ground on the south and east borders. Evidence of metal posts along boundaries were noted on the southern border around the intermittent stream, along with posted signs pinned up on a few trees along the south border. There was a metal gate noted in the southwest corner that belongs to private property owners to the east.

Past reconnaissance revealed barbed wire fencing along the south and east boundaries, but none was observed during the 2016 inventory.

Wildlife

A Natural Heritage Database Review was completed for tract 0907 in 2016. If rare, threatened or endangered species were identified for this area, activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

This tract appears to have stable and diverse wildlife populations, evidenced by the signs and observations noted. There is evidence of hunting by presence of a deer stand located in the southeast corner of the tract near private property. Abundant deer trails and greenbrier browse suggest deer occupy this tract heavily or move within this tract, but no deer were seen during the inventory. Tracks of raccoon, coyote, and deer, as well as many green frogs, were noted near the stream in the southeast corner of the tract by the pipeline. There are occasional areas with downed, coarse woody debris for reptiles and amphibians to inhabit. Downy Red-bellied

Woodpeckers can be heard. Other various bird species observed during the 2016 inventory include: American Kestrel, Turkey Vulture, Eastern Wood Pewee, Blue Jay, N. Parula, Blue-headed Vireo, Red-eyed Vireo, Ovenbird, Wood Thrush, Blue-winged Warbler, Northern Cardinal, and Tufted Titmouse. The pipeline opening creates a diverse patch for many species of insects and provides passageway for forest-dwelling species as well. Undergrowth plants, such as blackberry, greenbrier, spicebush, poison ivy, and various seeding grasses provide ample food resources. Food appears to be plentiful as various nuts and seeds were noted throughout the tract. Many of the small creeks were dried up at the time of inventory but the intermittent stream in the southeastern corner offers a more reliable water source for wildlife.

The Division of Forestry has instituted procedures for conducting forest resource inventories so the documentation and analysis of live tree and snag tree densities are examined on a compartment level basis in order to maintain long-term and quality forest habitats. The number of snags for all diameter classes exceeds recommended maintenance levels. Legacy trees for all size classes surpass the maintenance level and are in good condition. Management practices conducted on 0907 will promote retention of decaying trees that may be converted to snags and will maintain the long-term and quality forest habitats for wildlife populations.

Table 1. Live Legacy and Snag Trees for 0907.

	Maintenance Level	**Inventory**	**Available Above Maintenance**
Legacy Trees *			
11"+ DBH	756	2202	1446
20"+ DBH	252	361	109
Snags (all species)			
5"+ DBH	336	900	564
9"+ DBH	252	458	206
19"+ DBH	42	54	12

Communities

Tract 0907 contains dry-mesic ridges, mesic slopes, wet-mesic slopes, and wet-mesic bottomland ecosystem types. Dry-mesic ridgetops typically contain an overstory mixture of white, black, chinkapin, and northern red oaks with scattered sugar maples and white ash. Understory

associates include sugar maple, sassafras, oaks, and smaller redbuds and dogwoods. Mesic slopes typically have overstory species consisting of sugar maple, yellow-poplar, and various oaks. Their understory composition is typically beech-maple with clusters of paw-paw. Wet-mesic slopes tend to have overstory species consisting of shagbark hickory, sugar maple, northern red oak, and yellow-poplar. Commonly seen understory associates include American beech, sugar maple, and elms. Wet-mesic bottomlands are relatively flat and contain overstory species such as American sycamore, sugar maple, black maple, and ash species. Their regeneration is typically limited to wet-site species as well, the majority being composed of nettle and other understory plants. Dense thickets of spicebush, greenbrier, poison ivy, Virginia creeper, and other fruit-bearing plants are typically seen at all sites.

Exotic Species

A number of exotic species are found within this tract. The species noted are as follows: Amur honeysuckle, Japanese honeysuckle, autumn olive, multiflora rose, and Japanese stilt grass. Multiflora rose is the most prevalent, occupying almost every point in the inventory. In areas with oak-hickory overstory (southeast corner and north-central), multiflora rose and grape vines were the biggest issues, although some oak-hickory areas were free from invasives. Mixed hardwood areas contained the largest variety and abundance of invasives, including multiflora rose, Japanese honeysuckle, and scattered autumn olive and Amur honeysuckle. Japanese stilt grass was seen growing along the firelane. Concurrently with the 2016 inventory, some southwestern and western portions of the tract were treated with foliar spray (glyphosate) by an invasive species crew. The open area contains mainly Japanese honeysuckle with multiflora rose seedlings beginning to sprout. It should be noted that these species have long been prevalent in the County and eradication is not feasible, nor practical. However, problem occurrences of invasive species should be evaluated and treated as needed and practicable.

Recreation

The only recreational trail found on this tract is Fireland #19. There is evidence of illicit ATV use coming from the network of abandoned roads on private lands nearby. Recreational activities which may take place here include hiking, wildlife viewing, bird watching, hunting, and mushroom collection.

Cultural

Cultural resources may be present on this tract but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Tract Description and Silvicultural Prescription

The current forest resource inventory was completed by Sabrina Schuler. Thirty-seven prism points were sampled over 84 acres (1 point for every 2.27 acres). A tract summary is provided below. The stocking level is indicated by the chart provided in Figure 3. The tract is composed of 2 different stratums (excluding the “open” stratum, since it contains the pipeline), identified below.

Tract Summary Data

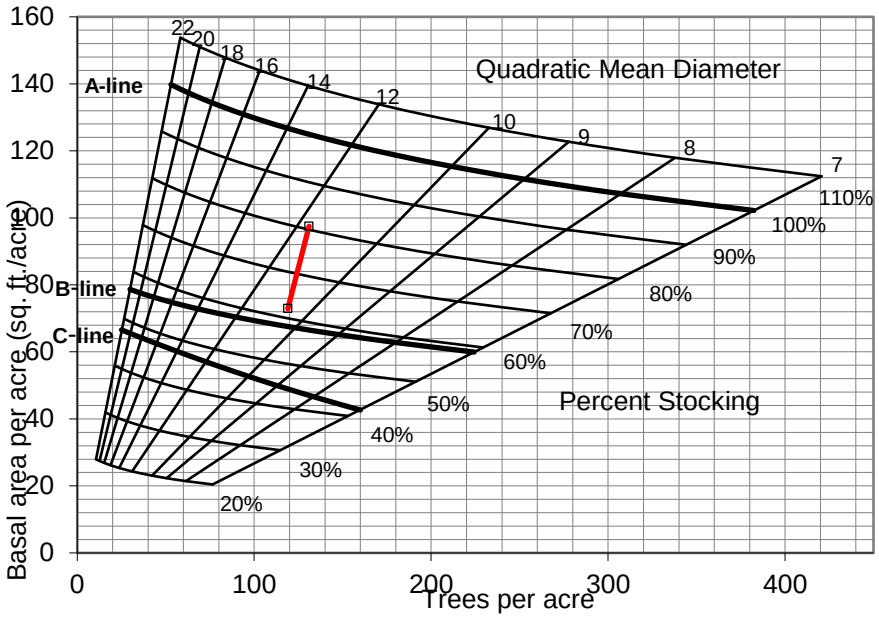
Total Trees/Ac. = **131 Trees/Ac.** Overall % Stocking Hardwoods = **81%** (Fully Stocked)
Basal Area = **97.5 Sq. Ft./Ac.** Harvestable Trees = **12 Trees/Ac.**
Present Volume = **5,699 Bd. Ft./Ac.**

Mixed Hardwoods Stratum

Mixed hardwoods tend to be variable in their compositions and thus may have more complicated prescriptions attached to them. This type of stratum occupies around 56 acres, covering roughly 67% of the acreage. Average basal area for this stratum is 102.9 square ft./acre. The overstory is dominated by yellow-poplar, sugar maple, white oak, northern red oak, and pignut hickory. The regeneration layer consists of pole-sized hickories, American beech, and sugar maple.

Single tree and group selection cuttings are prescribed to remove mature and over-mature stems in the stand to improve residual crop tree spacing. An improvement cut is prescribed to release quality oaks and hickories from crown competition of lesser-valued timber species. Overall, marking objectives within this compartment should consider oak, hickory, and other species of significant timber and wildlife value as the preferred crop trees to release. Improvement cuttings will be applied to remove low-forking, suppressed intermediates, and epicormically sprouting trees. Deformed trees that are in intermediate to advanced stages of decay and rot will be left to promote wildlife use and create a higher snag density as a result. Group selection cuts should take place where oak-hickory regeneration is abundant or in areas of over-mature crowding. Planned regeneration openings are expected to return to mixed hardwoods unless TSI measures are taken to further promote oaks and hickories. Areas with higher volume of oak-hickory regeneration will return with a heavier component of oak-hickory. Following the commercial harvest, post-harvest TSI is recommended to lower beech-maple stocking in heavy areas. A prescribed burn may be necessary as well.

Figure 3. Gingrich Stocking Level Chart for Tract 0907.



Oak-Hickory Stratum

The Oak-Hickory timber type tends to provide a very significant contribution to wildlife, timber resource, and value. The retention of species in this stratum is important to the Division's long-term timber management objectives. This stratum occupies around 15.3 acres, covering roughly 18% of the acreage. Basal area is 109.7 square ft./acre. The overstory is dominated by white oak, chinkapin oak, pignut hickory, and shagbark hickory with much of the understory being stunted. The understory is composed of smaller maples, black cherry, hickories, and white and black oaks. Regeneration in these areas is minimal, but consists of white ash, hickory, and beech-maple seedlings.

A single tree selection harvest is prescribed to remove mature and over-mature trees to release the growing stock of high quality stems and to reduce bending deformities resulting from lack of sunlight. More mature, undesirable trees will also be targeted in this category. These actions are in the hopes of creating the next cohort in the uneven-aged system and promoting oak-hickory regeneration. An improvement cut in the understory of heavy beech-maple is also recommend. Damaged trees that may offer future wildlife habitat should be left to stand, while cull trees should be removed in order to move toward a healthier forest. These cull trees will also enable more light to reach the forest understory and help promote desirable tree regeneration. Most likely, regeneration will be comprised of mixed hardwoods, mainly beech-maple unless some TSI is implemented, with a component of oak. Areas with an abundance of oak regeneration should be considered for release through a group selection cut.

Summary Tract Silvicultural Prescription and Proposed Activities

Targeted invasive species TSI is recommended prior to timber harvest operations, and a post-harvest check-up should also be conducted. Areas of beech-maple understory should be looked at for pre-harvest TSI if oak-hickory regeneration is a possibility. After timber marking and timber sale are completed, a general post-harvest TSI should be performed along with invasives TSI in large gap openings. A prescribed burn may help with setting back invasives and promoting oak regeneration. A regeneration review is recommended after installing all treatments. The tract should be re-inventoried in 15 years following management activities.

Given the recent inventory, a managed timber harvest over the majority of the tract is prescribed within the next 5 years, observing that many trees have surpassed maturity and the next generation requires release. The prescribed timber harvest is estimated at approximately 200MBF . Average harvestable basal area for the tract is 24.6 sq. ft./ac. This leaves around 72.9 sq. ft./ac. of residual basal area. Table 2 below provides numbers associated with each tree species regarding sawtimber estimates.

Table 2. Overview of Sawtimber Estimates in Tract 0907 in July 2016.

Species	Harvest	Leave	Total
American Beech	2,200	0	2,200
American Elm	1,100	0	1,100
American Sycamore	1,890	0	1,890
Bitternut Hickory	0	1,040	1,040
Black Cherry	0	2,590	2,590
Blackgum	2,050	0	2,050

Black Oak	8,840	13,550	22,390
Chinkapin Oak	2,660	4,930	7,590
Eastern White Pine	10,360	9,460	19,830
Northern Red Oak	19,260	36,400	55,660
Pignut Hickory	4,500	26,960	31,460
Red Maple	5,710	870	6,590
Shagbark Hickory	0	39,900	39,900
Sugar Maple	16,640	13,730	30,380
Sweetgum	0	2,220	2,220
Virginia Pine	0	1,350	1,350
White Ash	13,360	8,860	22,220
White Oak	10,940	37,510	48,460
Yellow Poplar	93,760	85,730	179,490
Tract Totals (bd. Ft.)	**194,310**	**284,420**	**478,730**
Per Acre Totals (bd. Ft./Ac.)	**2,310**	**3,390**	**5,700**

Proposed Activities Listing

Proposed Management Activity	***Prosposed Period***
Invasives TSI	CY 2018-2022
DHPA timber sale project review	CY 2018-2022
Timber Marking	CY 2018-2023
Timber Sale	CY 2018-2023
Postharvest TSI and Potential Prescribed Burn	CY 2020-2025
Regeneration Opening Review	3 Years Postharvest
Reinventory and Management Guide	CY 2033-2038

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