Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Pike** Compartment: **09** Tract: **02**
Tract Acreage: **73** Commercial Forest Acreage: **69**
Forester: **M. Vogel & A. Smith** Date: **1/4/2014**

Location

Tract 0902 is located in Pike County, Sections 1 and 35, T1S, R7W in Martin Township. It is located roughly 5 miles southeast of the town of Winslow. The tract is accessible by firelane 15 off of County Road 325. County Road 325 also makes up the southern boundary of the tract.

General Description

Tract 0902 consists of approximately 73 acres with roughly 49 acres of mixed hardwoods and oak-hickory forest, 20 acres of pine, and 4 acres of permanent opening in the Midwestern Gas pipeline right-of-way. Firelane 15 runs along the pipeline right-of-way. Bottomland hardwoods characterize the low, flat southwest corner of the tract. Heading north and upland the area transitions into old, mostly degraded mixed pine stands (interspersed with yellow-poplar, red maple, and old-field species like black cherry, sweetgum, and sassafras. An area formerly dominated by white pine on the east side of the north half has become very open, with few living trees, including the remaining white pines and large maples. Snags are abundant and the understory is thick and brushy. A small area of oak-hickory forest lies in the southeast corner. Large pole size black walnut grows near a home site located in the center of the tract. Pine mortality is consistent everywhere in the tract except the bottomland and oak-hickory areas. Japanese honeysuckle, amur honeysuckle, multiflora rose, and grape vines are found throughout the tract. Japanese honeysuckle control research plots were implemented in the tract in 1980. These plots were planted to yellow-poplar in 1982. These stands now range in size from pole to large sawtimber. The entire tract is characterized by a heavy presence of snags and dead woody debris, especially in the pine areas. The overall timber quality of this tract is poor to average and it ranges from small to large sawtimber in size. A summary of the forest resources in tract 0902 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Tract 0902 in July 2013

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Virginia Pine	Sugar Maple	American Beech
Yellow Poplar	Sweetgum	Sweetgum
American Sycamore	Red Maple	Dogwood
Red Maple	Yellow Poplar	American Elm
Sugar Maple	Sassafras	Chestnut Oak
Red Pine	Red Pine	Sugar Maple
White Ash	Virginia Pine	Black Cherry
Eastern White Pine	Black Cherry	Sassafras

Sweetgum White Oak Black Cherry Pin Oak Eastern Cottonwood Red Elm Black Oak Black Walnut Cherrybark Oak Honeylocust Shagbark Hickory Blackgum	Red Elm Shagbark Hickory Chestnut Oak Northern Red Oak American Elm Dogwood White Ash Black Oak Silver Maple Blackgum American Beech Black Walnut Chinkapin Oak Persimmon	Blackgum Black Walnut Red Elm Shagbark Hickory White Ash

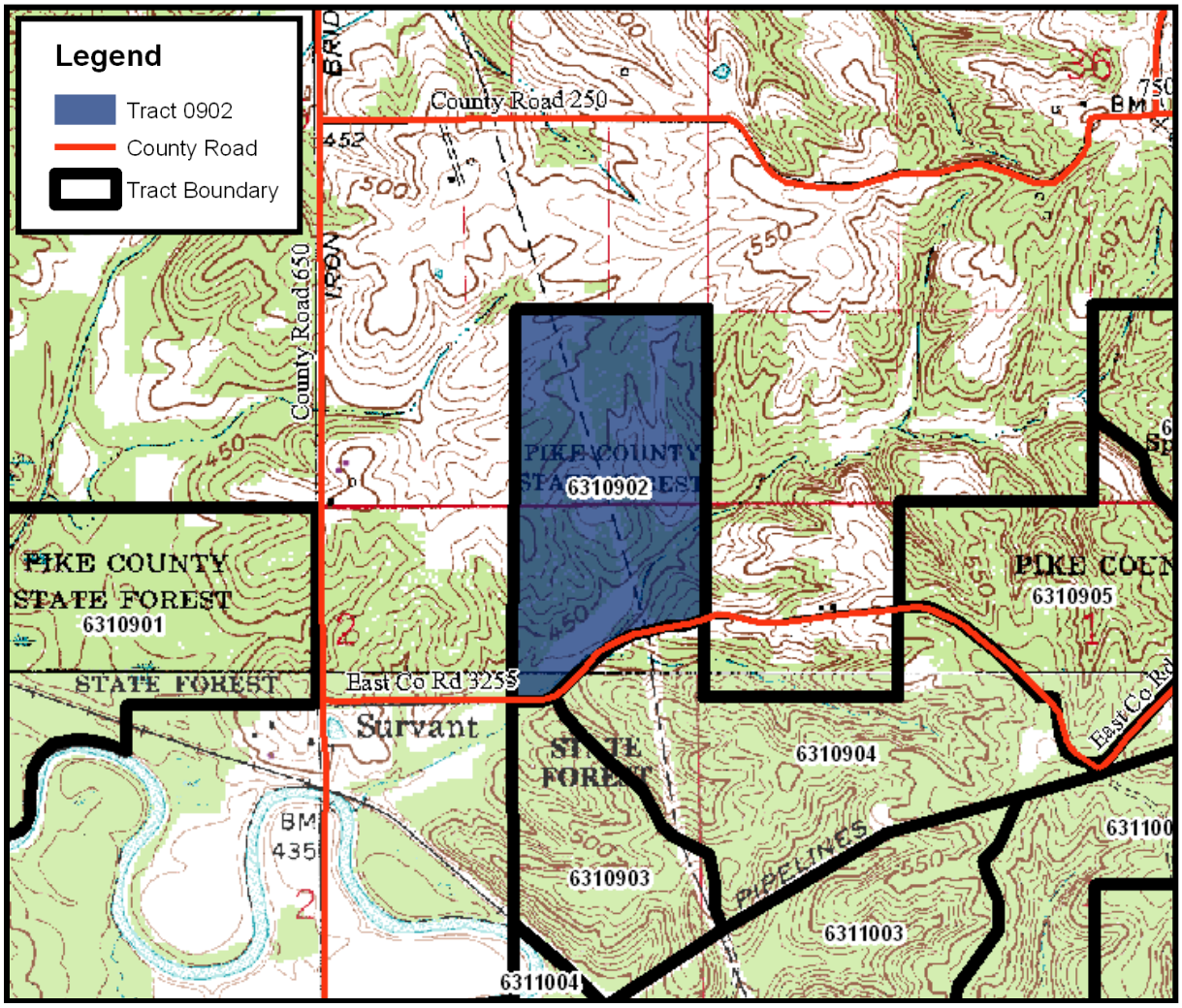
History

The land area that includes tract 0902 (see Figure 1) was deeded to the State of Indiana From Mary and John Davidson in November of 1944. The acquisition included 159.5 acres for $398.75. Records indicate that eastern white pine planted in 1954 in a three acre plot on the northern edge of the tract, just east of the pipeline right-of-way. The first resource inventory was performed by forester Rick Burgeson in 1971. The 1954 eastern white pine planting was pruned in 1980 by forester Charlie Keller. A cherrybark oak plantation was established in 1980 near County Road 325 in the southwest portion of the tract. In 1980 four honeysuckle control research plots were implemented in tract 0902. Three of the plots were located west of the pipeline right-of-way and one was located east of the right-of-way in the northern half of the tract. These plots were planted to yellow-poplar in 1982. In 1984, forester Scotty Bruer planted a 0.22 acre opening with 91 cherrybark oak seedlings. The 1984 planting had a herbicide application post planting and was inspected for survival in 1985. Forester Janet Eger inventoried tract 0902 in 1993 and estimated that there was 3,980.8 board feet of volume per acre growing on the tract. The current tract resource inventory was completed on July 26, 2013 by Miranda Vogel.

Landscape Context

The ridgetops are mostly comprised of old field mixed hardwoods and planted pine plantations while, the sideslopes are mostly comprised of mixed hardwoods. The land surrounding the tract is mostly privately owned residential property, farmland, and private woodlands, with state hardwood forest to the south. Open fields characterized by homes and agriculture lie west and north, and privately owned hardwood forest lies east.

Figure 1. Ferdinand SF Compartment 09 Tract 02



Topography, Geology and Hydrology

Tract 0902 is relatively flat, especially in the northern dry, upland portion of the tract, with a few short, mild south and east facing slopes where the area occupied by pine drops down into the low bottomland hardwoods area. A short north and west facing slope occurs as the area drops down into the drainage heading north from the oak-hickory area. An intermittent stream cuts across the southern end of the tract. Signs of decades old soil erosion exist under the pine plantations.

Soils

Gilpin silt loam (GnE) occurs on 15 to 30 per cent slopes. It is formed from a loamy residuum. Bedrock lies at a depth of 20 to 40 inches. Water movement here is moderately high. It is a well drained soil, containing about 1 percent organic matter. This soil type makes up the northern half of the oak-hickory stand in the southeast corner of the tract. The site index is 95 for yellow poplar. This soil type is moderately suited for harvesting equipment but has a limiting feature of slope and low strength.

Gilpin silt loam (GnE3) is a severely eroded soil, which occurs on 15 to 25 percent slopes. It is formed from a loamy residuum. Bedrock lies at a depth of 20 to 40 inches. Water movement here is moderately high. It is a well drained soil, containing about 1 percent organic matter. This soil type is moderately suited for harvesting equipment but has a limiting feature of slope. This soil is found mainly in a small area of the tract on the east side, which is occupied mostly by mixed pine species just north of the oak-hickory stand. The site index is 95 for yellow poplar.

Hosmer silt loam (HoB2) is an eroded soil which occurs on 2 to 6 percent slopes. It is formed from loess parent material. It is moderately well drained and contains about 2 per cent organic matter at the surface. The fragipan can be found at a depth of 20 to 36 inches. Water movement in this root restrictive layer is low. It may be saturated at a depth of 18 inches during early spring. The site index for Hosmer silt loam is 68 for white oak. It occurs throughout the tract, where mixed hardwoods and mixed pine species grow, except along the southern border. All of the soils in this tract are considered moderately suited for harvesting activity by the Natural Resources Conservation Service. This soil type is moderately suited for harvesting equipment but has low strength.

Steff silt loam (Sf) is a frequently flooded soil found on flood plains along the southern edge of the tract. It is formed from alluvial parent material, and contains about 2 percent organic matter. It is a moderately well drained soil. A root restrictive layer lies at 60 inches or more and water movement here is moderately high. It may be saturated at a depth of 18 inches in early spring. Its site index is 100 for sweetgum. This soil type is moderately suited for harvesting equipment but has low strength.

Zanesville silt loam (ZaD3) is a severely eroded soil, occurring on 12 to 18 per cent slopes, where elevation increases heading north from the flat bottomland area along the southern end of the tract. It contains about 1 percent organic matter. The fragipan lies at a depth of 12 to 24 inches. Water movement in this root restrictive layer is low. This is a moderately well drained soil that may be saturated at a depth of 18 inches in March. The site index for this soil is 60 for white oak. This soil type is moderately suited for harvesting equipment but has low strength.

Zanesville silt loam (ZaC3) is a severely eroded soil found on 6 to 12 per cent slopes. A root restrictive layer lies at a depth of 60 to 80 inches and water movement in this layer is very low. In every other respect this soil resembles ZaD3. This soil takes up a relatively small area within the tract, occurring in several small pockets in the northern half and the very southeast corner, in the oak-hickory stand. The site index is 69 for white oak. This soil type is moderately suited for harvesting equipment but has low strength.

Access

Tract 0902 is easily accessible off of County Road 325 which makes up the southern boundary of the tract. Firelane 15 through the tract from County Road 325 going in a southeast to northeast direction. An old firelane running east from the flat lowland area on the west side of the tract is hard to make out but may still provide a serviceable road if it were cleared out again.

Boundary
Most of the tract's boundaries are indicated in the field; however, the flagging will need to be updated prior to any future harvest activities. A wire fence runs most of the length of the west boundary, though fallen trees have pulled it down in places. A few brown T-posts and remnants of an old private property sign also indicate the west boundary. Fencing also runs along a short length of the north boundary from the northwest corner to just beyond the fire lane/pipeline right-of-way. What looks like an old flat road bed and appears to be mowed at this time by the neighbor to the north extends most of the length of the northern boundary. The east boundary is indicated by at least six orange T-posts and one private property sign. County Road 325 is the south boundary. A very old, illegible sign nailed to a tree marks the southwest corner. Trees at the northwest corner indicated by the tract file boundary were flagged in pink in July 2013. A State Forest Boundary sign marks the northeast corner. An orange T-post marks the southeast corner.

Wildlife
A Natural Heritage Database Review was completed for tract 0902 in 2014. If rare, threatened or endangered species were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species. Songbirds, crows, turkeys, box turtles, toads, bull frogs, snakes, squirrels, and deer have been observed in the tract. Quail were flushed from the tall grass in the open field along the northern edge of the tract and hawks were seen circling above the area. Numerous songbirds were active in the brushy old-field areas during the inventory. Since the hardwood species throughout most of the tract are red or sugar maples, tulip poplars, and gums, there are few suitable den trees or mast trees at this time. The mapped intermittent stream that cuts across the southern end of the tract and the wet forested floodplain in the southwestern portion of the tract provide an ephemeral water source for wildlife during non-droughty periods of the year.

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 and quality forest habitats. The number of Legacy Trees for Indiana Bat habitat is sufficient in large poles but beneath the maintenance level for sawtimber size trees. Harvest activities would focus on releasing legacy trees species so that they will grow in size and increase the number of legacy trees that are in the 20"+ DBH category. Management practices conducted on 0902 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Live Legacy Trees* and Snags inventoried July, 2013 on 0902

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	657		723	66	
20"+ DBH	219		107	-112	
Snags (all species)					

5"+ DBH	292	511	1,189	897	678
9"+ DBH	219	438	700	481	262
19"+ DBH	36.5	73	66	30	-7

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

Communities

Tract 0902 is composed of mesic floodplain forest and mesic to dry-mesic upland hardwoods dominated by pine plantings and mixed hardwoods. The dominant overstory timber species include Virginia pine, yellow poplar, American sycamore, red maple, sugar maple, and red pine. The understory contains mainly sugar maple, sweetgum, red maple, yellow poplar, sassafras, and red pine. The ground cover of tract 0902 consists of mainly mesic to dry mesic species.

Exotic Species

Amur honeysuckle, Japanese honeysuckle, and multiflora rose were observed during the inventory. The entire tract has a fairly heavy population of these species with more dense patches where the overstory is thin or none existent due to mortality. Control measures may be needed if populations are located in future regeneration openings. Otherwise severity and extent of infestation should be mapped for future treatment. Post harvest control measures will be conducted during the TSI operations to help reduce the invasive populations.

Recreation

Likely recreational activities on this tract include hunting, hiking, bird watching, wildlife viewing, and mushrooming. Discarded shotgun shells were noted during the inventory along the east side of the tract.

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.

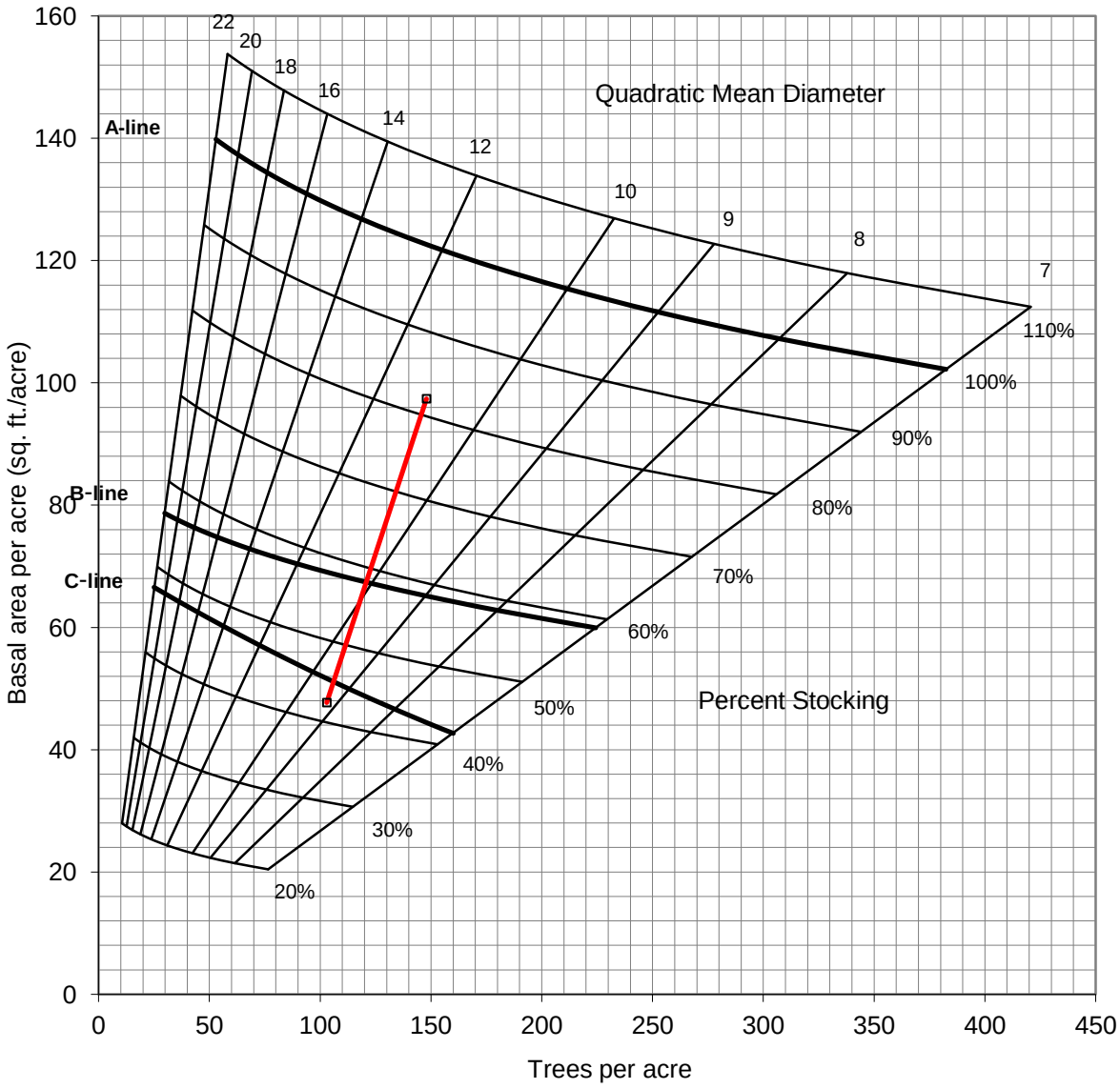
Tract Subdivision Description and Silvicultural Prescription

The overall stand structure for this tract is represented in the following Gingrich Stand and stock table that follows the individual stand summary.

Tract Summary Data

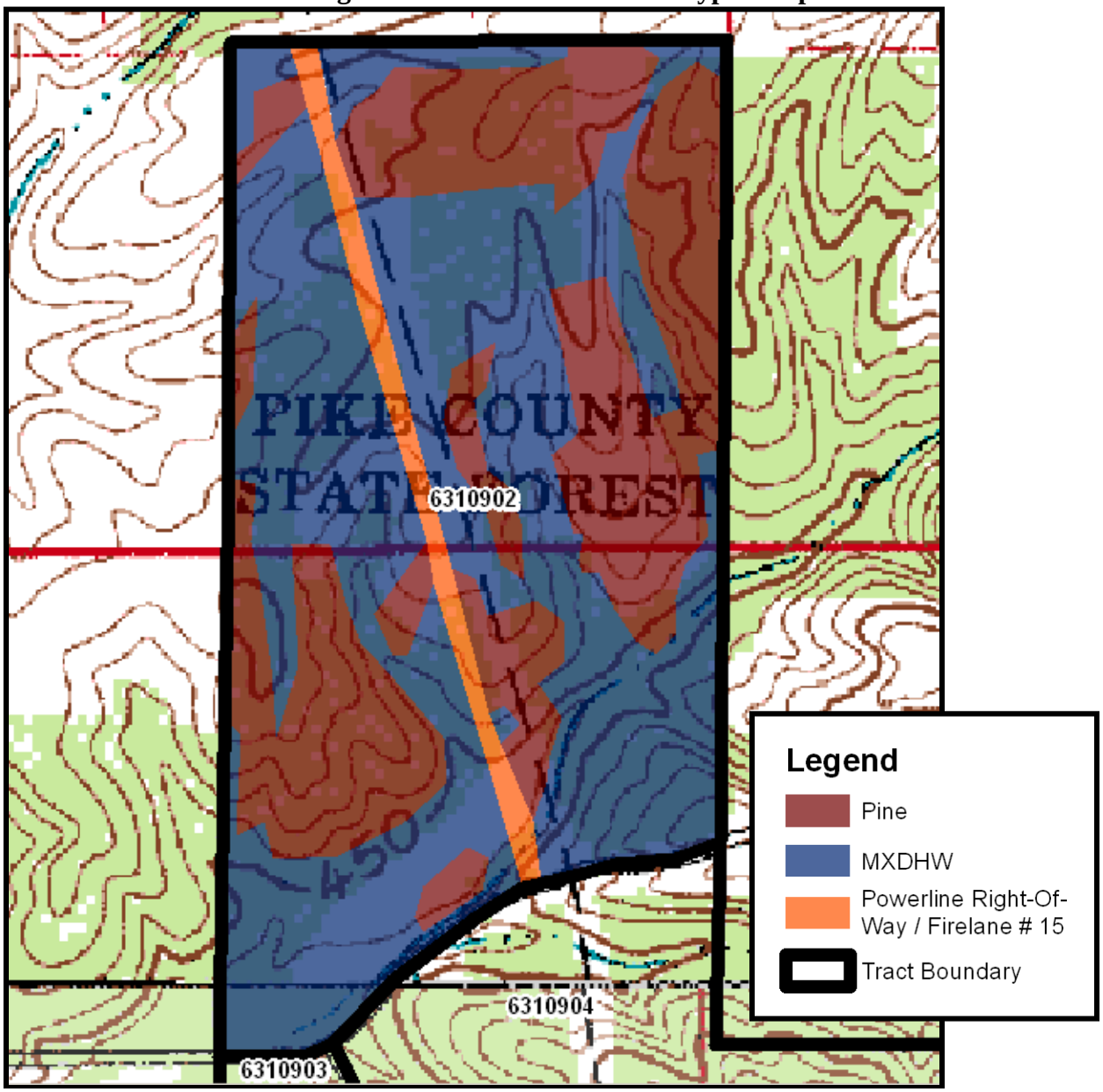
Total Trees/Ac. = **126 Trees/Ac.** Overall % Stocking Hardwoods = **82%** (Fully Stocked)
BA/A = **86.2 Sq. Ft./Ac.** Sawtimber & Quality Trees/Ac. = **31 Trees/Ac.**
Present Volume = **6,209 Bd. Ft./Ac.**

Table 2. Gingrich Stand and Stock Table for Hardwoods for 0902 in July, 2013



The current forest resource inventory was completed on July 26, 2013 by Miranda Vogel. Thirty-two prism points were sampled over 73acres (1 point for every 2.28 acres). A tract summary of the forest resource inventory is given above and a species breakdown of the summary is given in Table 3 below. The tract's forest resource is composed of 2 different stratums based on the 4 major timber types and size classes mentioned below.

Figure 2. Tract 0902 Stratum Types Map



Mixed Hardwoods Stratum

This inventory has combined the mesic flood-plain forest type, the oak-hickory forest type, and the mixed hardwoods forest type in TCruise. The mixed hardwoods stratum can be very variable in composition and thereby have more complicated prescriptions. The mixed hardwoods type covers roughly 65.8% of the tract or about 48 acres with an average basal area of 97.4 square feet per acre. This stratum type is considered fully stocked at approximately 82%. Mixed bottomland hardwoods of the mesic flood-plain forest type grow in the low, flat area that makes up the southern tip of the tract, from the west edge to the pipeline right-of-way. Large sawtimber

size sycamore and a few eastern cottonwoods prevail in the overstory, with a broad range of other mixed hardwood species including pin oak, northern red oak, shagbark hickory, yellow-poplar, black walnut, red maple, and sugar maple. White pine can be found in this area as well. Average DBH for sycamore is about 21 inches. The southeast corner of the tract is characterized by a small oak-hickory area, which contains large sawtimber size wolfy white oaks, averaging 20 inches in DBH. Data from the last inventory shows that oak-hickory composition was more extensive at that time than it is now, having been replaced by mixed hardwoods. In about the northern third of the tract on either side of the right-of-way, the mixed hardwoods areas are characterized by yellow-poplar, some large white ash, sweetgum, black cherry, occasional pin oaks, and clusters of honeylocust in the overstory. In a grassy area further south where the home site is probably located, large pole to medium sawtimber sized black walnut and mostly pole sized chestnut oak can be found growing under a mixture of large sawtimber size sycamore, black cherry, yellow-poplar, and some white ash. A few scattered cherrybark oaks were inventoried but no sign of the cherrybark oak plantation from 1980 is evident.

A fair amount the tract's yellow poplar appeared to be in modest decline as a result of the past three years of drought and the Tulip Poplar Scale insect infestation that occurred in the late spring of 2012. Affected yellow poplar will need careful review when the tract is marked as mortality is expected.

Sugar maple borer damage was noted in understory SUM throughout both the Mixed Hardwoods and Oak-Hickory stratum. In time this pest girdles the bole of the tree that results in the stem breaking apart during moderate and severe windstorms. Removal of affected trees will be classified as a combination improvement and sanitation cutting.

Single tree selection cuttings are prescribed to remove lower quality stems and mature to overmature trees which will help to improve croptree spacing. An improvement cutting is prescribed to release quality oaks, hickories and walnuts from crown competition of lesser-valued timber species. This is an important change in the Mixed Hardwood component as these timber species tend not to be heavy mast producers nor tend to provide valuable timber resources. Overall, marking objectives within this component should consider oak, hickory, walnut, and other species of significant timber and wildlife value as the preferred croptrees to release. Improvement cuttings in this area will also be applied to remove low-forking, leaning, overtopped/suppressed intermediates, epicormically sprouting, and deformed trees. The long term result of these prescribed cuttings will increase timber and wildlife habitat diversity. Group selection is a possibility in areas of low quality, disease/damaged stems, low basal area, or maturity to help maintain long-term forest regeneration and sustainability. Planned regeneration openings are expected to return to mixed hardwoods with a strong component of YEP.

Old Pine Plantation Stratum

Pines were commonly planted for erosion control purposes during the first half of the 20th century. As these pines have matured and individual trees have declined native hardwoods have become established especially in the stratum's understory and canopy gaps. This timber type covers roughly 28.8% of the tract or about 21 acres of the tract with an average basal area of 89.1 square feet per acre. Poor to fair quality red and Virginia pine are located north of the bottomland hardwoods area along the west edge and in the center of the tract. Much of the pine observed during the 1993 inventory has died. Dead down debris found throughout the northern two-thirds of the tract is from pine.

Extensive mortality is evident in the north on the west edge, where wind damage to Virginia pine was noted in 1993. Poor-quality white pine and abundant white pine snags are located north of the oak-hickory area along the east and north edges of the tract. Black cherry, sassafras, dogwood, sweetgum, red maple, and silver maple grow among the pines. 24 sawtimber sized Virginia pines are estimated per acre with an average DBH of 16 inches. Average sawtimber sized eastern white pine DBH is 20 inches. There is moderate to significant growth of hardwood species on the forest floor and in the midstory in most of the areas dominated by pine.

A dense layer of shrubs and vines including Japanese honeysuckle, poison ivy, multiflora rose, greenbrier, and Amur honeysuckle occur throughout the pine stratum wherever the overstory canopy is thin or open due to blowdown or mortality. Invasive exotics located in or near a prescribed group selection opening may need to be treated either prior to harvest and/or during the post-harvest TSI operation.

Group selections are options for management in areas of wind blowdown, low quality, disease/damaged stems, low basal area, or maturity to help maintain long-term forest regeneration and sustainability. Group selections may be appropriate to regenerate the pine into native hardwoods. Areas where poletimber hardwoods have emerged and entered the stratum canopy should be prescribed TSI for croptree release if not adequately released during the prescribed timber harvest. Overall, marking objectives within this component should consider oak and other species of significant wildlife value as the preferred croptrees for future conservation. Some quality and vigorous pine may be retained as they provide wildlife habitat diversity and cover.

Summary Tract Silvicultural Prescription and Proposed Activities

Given the recent inventory and growth of tract 0902's forest resources, a managed timber harvest over the entire tract area is prescribed within the next five years and will yield an estimated 233 MBF. TSI is recommended for large grape vines abundant throughout the tract except in the bottomland hardwoods area. Invasive exotics located in or near a prescribed group selection opening may need to be treated either prior to harvest and/or during the post-harvest TSI operation.

Table 3. Overview of Sawtimber Volume Estimates in 0902 in July of 2013

Species	Harvest	Leave	Total
Virginia Pine	56,130	28,620	84,750
Yellow Poplar	33190	44930	78120
American Sycamore	27,940	42,280	70,220
Red Maple	16,110	14,990	31,100
Sugar Maple	13,380	15,560	28,940
Red Pine	23,100	4,650	27,750
White Ash	16,570	3,830	20,400
Eastern White Pine	16,310	3,350	19,660
Sweetgum	8,930	8,860	17,790
White Oak	3790	11880	15670
Black Cherry	9,820	2,670	12,490
Pin Oak	0	9,260	9,260
Eastern Cottonwood	3,310	5,140	8,450
Red Elm	0	6,450	6,450
Black Oak	0	5,990	5,990
Black Walnut	0	5,300	5,300
Cherrybark Oak	0	4,410	4,410
Honeylocust	3,470	0	3,470
Shagbark Hickory	0	1,790	1,790
Blackgum	1,220	0	1,220
Tract Totals (Bd. Ft.)	**233,270**	**219,960**	**453,230**
Per Acre Totals (Bd. Ft./Ac.)	**3,195**	**3,013**	**6,209**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
DHPA timber sale project review	CY2014-2019
Timber Marking & Invasives Evaluation	CY2014-2019
Timber Sale	CY2014-2019
Postharvest TSI & Invasives Follow-up	CY2015-2020
Regeneration Opening Review	CY2018-2023
Reinventory and Management Guide	CY2028

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