Indiana Department of Natural Resources
Division of Forestry
RESOURCE MANAGEMENT GUIDE (DRAFT)

STATE FOREST: Harrison Crawford **COMPARTMENT**: 13 **TRACT**: 04

Date: October 6, 2014 **Forester: Wayne Werne**
(Inventory - July, 2014)

INVENTORY SUMMARY

NUMBER OF STANDS: **5** **Est. growth: 134-152 bd. ft/ac/yr****
PERMANENT OPENINGS: **0.5 ac** **Est. cutting cycle: 14-19 yrs**
TOTAL ACREAGE: **247 ac**
AVERAGE SITE INDEX: **70-80** (for upland oaks)
AVERAGE BASAL AREA: **100 sq. ft/ac**

The tables below approximate volume based on a series of inventory plots and measurements. **Growth** was calculated by using 2014 volume **minus cedar**, subtracting the volume from the 2000 inventory, accounting for all sale volumes, and dividing by 14 years of growth. Cedar volume was figured using a different cedar log scale (much more volume from small trees), which was not used in 2000.

TRACT 1304 TOTAL VOLUME (bd ft)

	Potential Harvest		LEAVE		TOTAL	
SPECIES	per acre	total	per acre	total	per acre	total
American beech	26	6,422		-	26	6,422
Bitternut hickory	10	2,470		-	10	2,470
Blackgum	23	5,681		-	23	5,681
Black oak	650	160,550	529	130,663	1,179	291,213
Black walnut	6	1,482	27	6,669	33	8,151
Chinkapin oak	51	12,597	88	21,736	139	34,333
*Eastern redcedar**	*251*	*61,997*		-	*251*	*61,997*
Honeylocust		-	5	1,235	5	1,235
Mockernut hickory		-	20	4,940	20	4,940
Northern red oak	66	16,302	118	29,146	184	45,448
Pignut hickory	64	15,808	178	43,966	242	59,774
Post oak	12	2,964	23	5,681	35	8,645
Red elm	5	1,235		-	5	1,235
Red maple	11	2,717	8	1,976	19	4,693
Scarlet oak	143	35,321	69	17,043	212	52,364
Shagbark hickory	46	11,362	57	14,079	103	25,441
Shortleaf pine	61	15,067	95	23,465	156	38,532
Sugar maple	46	11,362	53	13,091	99	24,453
Virginia pine	104	25,688		-	104	25,688
White ash	47	11,609		-	47	11,609
White oak	322	79,534	1,543	381,121	1,865	460,655
Yellow-poplar	425	104,975	235	58,045	660	163,020
TTOTAL	2,369	585,143	3,048	752,856	5,417	1,337,999

**Cedar volume was calculated using a special cedar scale that counts volume in trees 6" DBH and larger, which results in high volumes for stands of small trees.*

STAND 1 – Oak hickory **ACREAGE: 179.7**

	Potential Harvest	Leave	Total
VOLUME/ACRE:	2,546	3,854	6,400
TOTAL VOLUME:	457,500	692,600	1,150,100
BASAL AREA/ACRE:	45.0	58.5	103.5
# TREES/ACRE:	70	77	147

STAND 2 – Old field - hardwood **ACREAGE: 40.2**

	Potential Harvest	Leave	Total
VOLUME/ACRE:	1,232	1,156	2,388
TOTAL VOLUME:	49,500	46,500	96,000
BASAL AREA/ACRE:	40.6	37.2	77.8
# TREES/ACRE:	113	94	207

STAND 3 – Old field - VIP **ACREAGE: 9.8**

	Potential Harvest	Leave	Total
VOLUME/ACRE:	3,515	628	4,143
TOTAL VOLUME:	34,400	6,200	40,600
BASAL AREA/ACRE:	107.4	20.3	127.7
# TREES/ACRE:	153	40	193

STAND 4 – Shortleaf pine **ACREAGE: 3.0**

	Potential Harvest	Leave	Total
VOLUME/ACRE:	4,545	7,419	11,964
TOTAL VOLUME:	13,600	22,300	35,900
BASAL AREA/ACRE:	90.0	60.0	150.0
# TREES/ACRE:	116	37	153

STAND 5 – Rocky south slope **ACREAGE: 14.3**

	Potential Harvest	Leave	Total
VOLUME/ACRE:	3,285	1,226	4,511
TOTAL VOLUME:	47,000	17,500	64,500
BASAL AREA/ACRE:	75.8	34.5	110.3
# TREES/ACRE:	126	69	195

Note: Please reference the appendix for tables and graphs of various stand statistics

TRACT BOUNDARIES: This 247 acre tract is bordered on the northeast by the I-64 right-of-way, and on all other sides by other state forest tracts. A ridgeline / fire trail forms the boundary on the east with tract 1206. Drainages form the boundaries with 1207 to the southeast, 1305 to the west, and 1303 to the northwest.

ACCESS: This tract is accessed via fire trail 609 coming off of State Road 62. Fifteen years ago, this access was not very good, but road improvements have made it accessible

via semi truck currently, though some minor road improvements will be needed again. This fire trail loops around through this tract and 1305 following the ridgelines, and eventually comes out at a different location along SR 62. Two horse trails also cut across the south and north ends of this tract as well.

ACQUISITION HISTORY: The land that makes up this tract was acquired primarily from two acquisitions. The largest portion involved a transfer from a conglomeration of numerous members of the Lynch, Lentz, Landers, and Harvey families and Old Capitol Bank as guardian of two Lynch family members in 1939 for the price of $5 per acre (deed #131.52). A tax sale in 1932 accounted for the other major portion of this tract acquisition from William Brown via Harrison County for what appears to be the equivalent of about 30 cents per acre (deed #131.47). Additionally, there was a transfer from JR, Alma, and Lena Rothrock in 1950 (deed #131.153), and from Atmer and Jane Lynch in 1977 (deed #131.236). The last acquisition was for $210 per acre.

TRACT DESCRIPTION: This tract was divided into five different stand types based on cover type and past management. These stands include: mature oak hickory, old field – hardwood (advanced), old field – Virginia pine, shortleaf pine planting, and rocky south slope. These different stands gradated into each other in places where it was hard to tell which type was the more appropriate qualifier. Obviously, much of this area was previously used for farming, and has succeeded back to various forms of hardwood and cedar (as well as planted pine), which sometimes is distinctly different and sometimes blends in with the surrounding natural hardwoods. These stands will be described in detail below.

Stand 1 - Oak hickory

This 180-acre stand was the majority (73%) of the coverage of this tract, and occupied the more sloping ground across all portions of the tract that had not been cleared for farming. Mostly, this consisted of the south and west facing slopes.

The total volume of the stand (6400 bd. ft/ac) is composed primarily of white oak (2609 bd. ft/ac), black oak (1423 bd. ft/ac), yellow-poplar (877 bd. ft/ac), and pignut hickory (318 bd. ft/ac). The remaining 20% of the volume consists of scarlet oak, northern red oak, sugar maple, and various other species. It is dominated with medium to large size oak and poplar trees in the overstory and sugar maple saplings in the under and mid story. It should be noted that the volume of cedar is figured using a cedar log scale that results in a higher than Doyle volume, and includes trees down to 8" DBH as sawtimber volume. Timber removals from this stand last occurred in 2001, which gives it 13 years of growth, and previously had not been cut for probably 40 years or longer. There is some natural mortality setting in that was noticed throughout this stand.

Stand 2 - Old field – hardwood (advanced)

This 40-acre stand is found scattered around the tract in areas that were former agricultural fields that have succeeded back to a stand of mostly hardwoods with some eastern redcedar mixed in. The largest example of this stand was found in the southern portion of the tract, but also in areas near the ridgetop by the interstate. This stand did represent quite a hodgepodge, with some having a better stand of poplar, some being the result of regeneration openings put in place in 2001, while some had a distinct cedar component. Although these areas were open field or very open pasture in the middle of the 20th century, only some of the area showed signs of gully erosion, while the rest of it has come back to a good young stand of desirable trees. Most of this stand appears to have medium to high productivity in spite of past farming practices.

The total stand volume (2388 bd. ft/acre) is composed primarily of black oak (982 bd. ft/acre), yellow-poplar (312 bd. ft/acre), white oak (277 bd. ft/acre), and eastern redcedar (259 bd. ft/acre). The remaining 25% of the volume consists of pignut hickory, black walnut, and various other species. It should be noted that the volume of cedar is figured using a cedar log scale that results in a higher than Doyle volume, and includes trees down to 8" DBH as sawtimber volume.

Stand 3 – Old field – Virginia pine

This stand is located in the north end of the tract bordering some of the interstate right-of-way, and contains 9.8 acres. This area was open field before it was acquired by the state and was planted to pine soon after acquisition. There is an abundance of deep gullies in some places, which would indicate a severely degraded site with low productivity. In addition to the pine, yellow-poplar, oak, and blackgum are scattered throughout this area in the overstory with sassafras, cedar and oak present in the understory. It should be noted that the volume of cedar is figured using a cedar log scale that results in a higher than Doyle volume, and includes trees down to 8" DBH as sawtimber volume.

The volume was cruised at 4143 board feet per acre, but the basal area was 128 square feet per acre. This reinforces the impression given by walking through the stand which shows a large number of pole and small sawtimber size Virginia pine trees in an overstocked condition and minimal total volume. As with most pine stands, this one was never thinned or maintained, which has resulted in the dense stocking of small trees.

The total volume of the stand (4,143 bd. ft/ac) is composed primarily of Virginia pine (2174 bd. ft/ac), and eastern redcedar (867 bd. ft/ac), with the remaining 25% of the volume consisting of white oak, scarlet oak, and red maple.

Stand 4 – Shortleaf pine

This stand is a small 3 acre area located in conjunction to the previously described Virginia pine stand by the interstate. Although the trees in this stand were designated as shortleaf pine, they may actually be or contain another type of non-native, southern yellow pine – perhaps loblolly. It was distinct enough to segregate it out into a separate stand but had the same history of being a former agricultural field planted to pine after

state acquisition. Unlike the Virginia pine stand, these pines had much better form and size, but were also left unmanaged since planting, and so are overstocked at 150 square feet of basal area per acre. They do, however, contain a very high volume per acre. The total volume of the stand (11,964 bd. ft/ac) is composed overwhelmingly of shortleaf pine (11,580 bd. ft/ac) with a little bit of black oak (384 bd. ft/ac) mixed in.

Stand 5 – Rocky south slope

This 14-acre stand is found in several locations on south facing slopes, but mostly in the southern portion of the tract and occupies an area of shallow soils and exposed rock. It is a typical stand of this type and is dominated with small cedar, ash, and oak. Although the 1940 aerial photographs do not indicate that these areas were farmed in the past, the stand is fairly open and contains almost no trees greater than 22 inches in diameter. The short-boled nature of the overstory trees in combination with the presence of post oak and cedar would seem to indicate a naturally low productivity here, probably due to shallow soil and large amounts of limestone bedrock near the surface. This stand resembles a barrens in places.

The total stand volume (4511 bd. ft/acre) is composed primarily of eastern redcedar (2314 bd. ft/acre) and chinkapin oak (1163 bd. ft/acre). The remaining 25% of the volume consists of shagbark hickory, white oak, and sugar maple. It should be noted that the high volume of cedar is due to using a cedar log scale that results in a higher than Doyle volume, and includes trees down to 8" DBH as sawtimber volume.

SOILS: The following soils are found on the tract in approximate order of importance.

CoF Corydon stony silt loam, 20-60% slopes Upland oak SI is 65-75, Yellow-poplar SI is 80-90, est. growth is 155-220 bd. ft/ac/yr. for oaks and 260-335 bd. ft/ac/yr. for yellow-poplar.

GlE2 Gilpin silt loam, 18-25% slopes, eroded Upland oak SI is 70-80, Yellow-poplar SI is 90-100, est. growth is 185-260 bd. ft/ac/yr. for oaks and 335-415 bd. ft/ac/yr. for yellow-poplar.

HaD2 Hagerstown silt loam, 12-18% slopes, eroded Upland oak SI is 85-95, Yellow-poplar SI is 90-105, est. growth is 300-375 bd. ft/ac/yr. for oaks and 335-450 bd. ft/ac/yr. for yellow-poplar.

ZaC2 Zanesville silt loam, 6-12% slopes, eroded Upland oak SI is 70-80, Yellow-poplar SI is 85-95, est. growth is 185-260 bd. ft/ac/yr. for oaks and 300-375 bd./ ft/ac/yr. for yellow-poplar.

ZaC3 Zanesville silt loam, 6-12% slopes, severely eroded Upland oak SI is 70-80, Yellow-poplar SI is 85-95, est. growth is 185-260 bd. ft/ac/yr. for oaks and 300-375 bd./ ft/ac/yr. for yellow-poplar.

WeD2 Wellston silt loam, 12-18% slopes, eroded Upland oak SI is 70-80, Yellow-poplar SI is 90-100, est. growth is 185-260 bd. ft/ac/yr. for oaks and 335-415 bd. ft/ac/yr. for yellow-poplar.

WeC2 Wellston silt loam, 6-12% slopes, eroded Upland oak SI is 70-80, Yellow-poplar SI is 90-100, est. growth is 185-260 bd. ft/ac/yr. for oaks and 335-415 bd./ ft/ac/yr. for yellow-poplar.

GuD5 Gullied land, Virginia pine SI is 53-72, Shortleaf pine SI is 72-85, est. growth is 200-300 bd. ft/ac/yr for shortleaf pine and 100-200 bd. ft/ac/yr for Virginia pine.

CtC3 Crider soils, 6-12% slopes, severely eroded Upland oak SI is 65-75, Yellow-poplar SI is 80-90, est. growth is 155-220 bd. ft/ac/yr. for oaks and 260-335 bd. ft/ac/yr. for yellow-poplar.

RECREATION: The large size of this tract combined with the contiguous nature of state forest ownership all around make it ideal for users who prefer a remote context. This fact coupled with the access via the fire trail and two horse trails make hunting and horseback riding two high use activities. The presence of deer stands and active horse sign would bear this out. Some hiking may also be taking place in this tract. Undoubtedly, the presence of sinkholes has also led to potential exploration by cavers looking to find large new systems. Some removal of rock was noted from one of the sinkholes. All cave exploration is closed at this time due to bat conservation and WNS concerns.

WILDLIFE: This tract represents typical upland forest habitat, in addition to a component of old field successional habitat, with pine, cedar and smaller hardwoods. Consequently, it likely receives use from a typical assemblage of common game and nongame wildlife species such as white-tailed deer, wild turkey, squirrels, songbirds, snakes, box turtles, and others. Hard mast food sources are provided by the oak hickory stand, but another habitat component would come from the advanced pine and cedar areas. These areas provide denser cover for bedding areas, especially during the winter months.

Snags were tallied in this inventory for potential uses by wildlife. The following tables summarize guidelines and actual data with regard to state forest bat and wildlife conservation strategies.

Guidelines for preferred density of live and dead trees:

# of live trees per acre	Guidelines maintenance	Tract 1304 actual present – harvest = residual
12”-18” DBH class	6	35.6 – 13.7 = 21.9
20” DBH and greater	3	10.0 - 4.8 = 5.2
Total	9	45.6 - 18.5 = 27.1

# snags per acre	Guidelines maintenance	Guidelines optimal	Tract 1304 actual
6” - 8” DBH class	1	1	14.6
10”-18” DBH class	2.5	5	5.8
20” DBH and greater	0.5	1	0.5
Total	4	7	20.9

These numbers show that both live tree densities as well as snag densities meet guidelines on this tract. The result for large snags is consistent with several other recently completed inventories on other tracts of the forest, where large snag densities are below one per acre, though the density here is slightly higher than on other tracts where densities seem to hover at about 0.3 per acre. The vast majority of snags are in the smaller size classes, which makes them less suitable for most nesting or roosting purposes, but some feeding use might be gained from them.

Management activities will not intentionally remove snags, with a few exceptions of large recently dead trees or storm damage when possible, so the prescribed timber harvest will not negatively impact that below target component significantly. Creation of more snags in this size class could be undertaken by girdling large cull trees in a post-harvest TSI operation.

Since this tract represents a component of contiguous forest, management activities might disrupt forest interior species by creating temporarily edge habitat for generalist species. However, the prescribed management activities should not affect this habitat long-term from the perspective of wildlife utilizing it due to the maintenance of a forested habitat on the tract. There may be some conversion of pine and cedar to temporarily open areas that will be allowed to succeed into native hardwoods, and this would change the character of the tract over time, but will not change it into a permanently nonforested cover type. Creation of regeneration openings and/or conversion of portions of the old field area into openings will create early successional habitat that will be beneficial to certain groups of wildlife dependent upon this habitat. Likely, early successional habitat created with such management will also benefit a wider segment of wildlife species that preferentially utilize such habitat for feeding and cover more so than later successional stage habitat.

Since this tract does not border a major stream, there should be no disruption of any potential travel corridors by forest management activities. The habitat on this tract in the context of the surrounding landscape does not represent any special component that would be used more preferentially or exclusively by wildlife for traveling or dispersion, as riparian habitat might be, or as forest in a non-forested landscape might be.

WATERSHED / HYDROLOGY: The majority of the tract contains gentle to moderately steep slopes that drain into intermittent drainages that eventually drain into Blue River about ½ a mile to the south. This area is rich in karst topography as evidenced by the number of sinkholes encountered at various places throughout the tract and the presence of a few borderline caves which are indicated on the map. The use of buffers and BMPs will be employed to minimize impacts to key features and associated resources.

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

RARE, THREATENED, OR ENDANGERED SPECIES: A Natural Heritage Database Review is part of the management planning process. 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.

EXOTICS: There are numerous pockets of ailanthus scattered throughout this tract in various places where any openings have allowed it to get established. These were painted with pink when found, so pre-harvest treatment should be easier, and needs to be done to eliminate the established seed source. Surprisingly, though, ailanthus was not nearly as pervasive as it was expected to be. This could be due to past ailanthus treatment in this area and consequent reduction of the seed source.

There are also spreading areas of stilt grass within the tract along the fire trails and horse trails. The stilt grass along the trails could be sprayed easily enough, but it is hard to eliminate, and it is likely that the seed has spread naturally out into the woods in places, and this would be less feasible to control. There is a presence of Japanese honeysuckle also present in places – mostly around the homesites.

SILVICULTURAL HISTORY AND PRESCRIPTION:

General: Utilizing records of the past history of this tract, an inventory done in 2000 indicated a total standing volume of 5218 board feet per acre. In 2001, there was a timber sale that removed 364,300 board feet (1475 bf/ac) – mostly black oak, yellow-poplar, white oak, and scarlet oak. Post harvest TSI was undertaken and completed on most of this tract after the sale, but it was done with CRR labor, and was not completed on the southern third or so of the tract.

In 2005, a cedar sale was undertaken in the eroded old field site west of the southern homesite that removed 94,700 board feet of mostly eastern redcedar, but also some yellow-poplar and black oak as well. This was officially counted as 27,800 board feet due to all cedar stems below 14 inches DBH being designated as nonmerchantable, though they were bought by a cedar mill that did utilize them as merchantable. This cedar sale was incorporated into a research project to assess hardwood regeneration success after removal of the cedar overstory. The study involved two replications of five treatments: control, removal of cedar overstory, removal of cedar overstory and coppicing of oak stems, removal of cedar overstory and control of non oak competition with cut and chemical treatment, and removal of cedar overstory with control of non oak competition and oak coppicing. This sale and study were undertaken due to the fact that an abundance of oak regeneration was noted to be present in the understory of the cedar stand prior to management, and it was desired to release this oak to see how well it established on this eroded former agricultural site.

In 2007, a straight line wind event knocked down many trees in this general area, and a sale was undertaken to salvage those trees. This sale involved 355 volume trees and 61 cull trees totaling 77,700 board feet from tract 1304 - also made up primarily black oak, yellow-poplar, and scarlet oak. In 2008, Hurricane Ike generated another wind-caused salvage sale – mostly in the neighboring tract where a different sale was already underway. There were a few windthrown trees in tract 1304 that were included in that sale, and it amounted to an additional 5900 board feet removed from tract 1304.

The 2014 inventory shows between 5166 (no cedar) and 5417 board feet per acre, and this figures out to a growth rate of between 134 to 152 board feet per acre per year, after dividing the difference by 14 years of growth since the last inventory and accounting for sale removals. Cedar volume was figured using a different cedar log scale (much more volume from small trees), which was not used in 2000, and this is why cedar volume is being excluded from growth calculations, as it was given marginal volume in 2000.

The growth figures are respectable considering the areas on the tract of low productivity due to site factors or past abuse, and considering the amount of sale activity over a short period of time, and a noticeable amount of natural mortality noted in the intervening years – probably mostly due to drought. It is hoped and assumed that this growth rate can be increased into the future with the continued management and encouragement of vigorous and healthy crop trees, and long-term conversion of the pine and low grade hardwood occupying the old field areas to a better crop of hardwood trees.

Number of trees per acre and basal area per acre figures indicate that all stands are fully or overstocked at between 70% to 120%. Removal of trees tallied for potential harvest either via a timber sale or TSI would remove approximately 44% of the total tract volume, including most all the non-native Virginia Pine. Actual removals would likely be lighter than these levels. The majority stand type of mature oak hickory would be reduced to just above 40%, while the other stands would be more greatly reduced due to liquidation of pine and low grade trees in the old field areas with intention to convert to a younger forest of better hardwood diversity. Resulting stocking levels would be below

typical harvests at HCSF , but with the goal of continuing to transition this tract to a better growing state through overstory removal and understory establishment and recruitment.

Due to the amount of volume being carried on the majority of the tract (5166 bd. ft/ac – not including cedar), and the general condition of the overstory trees, a medium level improvement harvest is prescribed and could be undertaken in this tract at any time to continue the process that was started with the first managed harvest 14 years ago. This would produce a sale volume of about 350-450,000 board feet (not including pine or cedar) or about 1963 board feet per acre and leave about 735,000 board feet plus 115,000 board feet of pine and cedar, or about 2975 board feet per acre of hardwood and 465 board feet per acre of pine and cedar (according to the cedar log scale). Ideally, the shortleaf pine should be thinned, and the Virginia pine liquidated, and this might best be undertaken as a separate sale. Though, due to the relatively limited extent of these stand types, it might also be included in a more traditional hardwood sale.

The combination of the regeneration openings put into place in 2001, the natural windthrow events on at least two occasions, and the natural mortality presumed to be from drought causing death of overstory trees, has caused a number of canopy gaps to exist in this tract. In some of these opened up areas, ailanthus has gotten a foothold, and will need to be treated to prevent further establishment of a seed source.

It is recommended that Timber Stand Improvement (TSI) be undertaken in this tract after the harvest to accomplish a variety of tasks, including completion of any marked openings. TSI of pole-size trees may be required for thinning in places, and to open up the understory for potential oak regeneration to take hold or be released. Vines did not seem to be a big problem in this tract, but need to be kept at bay with TSI activities as well. Extensive understory treatment of shade tolerant species is prescribed to encourage oak regeneration where present. Most of the TSI will probably be targeted at the old field areas where the composition and stocking could be improved from what currently occupies most of this area. Ailanthus needs to be monitored and eliminated when found to be present or establishing itself. All ailanthus should be killed pre-harvest. There were several areas of ailanthus found to be establishing themselves in different places throughout the tract – usually where windthrow has opened up patches of sunlight to the ground.

Stand 1: Oak hickory

This 180-acre stand covers about 73% of the tract, and occupies the more sloping ground across all portions of the tract that had not been cleared for farming. Mostly, this consisted of the west, south, and north facing slopes. It contains a moderate volume of 6400 board feet per acre of which 2546 was classified as potentially harvestable.These figures include cedar as figured according to the cedar log scale. There is much less evidence of fire damage in this stand since the last managed sale concentrated on removing many of these trees.

Given current stand conditions and the moderate volume of both harvestable material and residual growing stock, the recommendation would be to rank this stand as a medium priority for conducting a harvest. Any timber sale would primarily include this entire stand as well as all of stand 2, with some trees from stands 3, 4, and 5. The majority of the harvest volume for stand 1 would be contained in black oak, yellow-poplar, and white oak , with scarlet oak, northern red oak, and various other species making up of the remainder of the harvest volume.

Most of the stand would be harvested under a single tree selection routine with regeneration openings targeting groups of low-grade trees or multiple large trees growing together. When possible, selection should also favor releasing future crop trees. The residual stand should be heavier to white oak, with a lesser component of other oak species.

Post harvest TSI should be performed to eliminate residual cull or small pole-sized trees not cut during the harvest, as well as thin where necessary, complete any regeneration openings, and treat the understory to eliminate shade tolerant species in favor of oaks and other more desirable species. As always, any ailanthus present should also be treated and eliminated. There are several pockets of ailanthus that should be treated pre-harvest.

Stand 2: Old field – hardwood (advanced)

This 40-acre stand covers about 15% of the tract, and contains a low volume of 2388 board feet per acre of which 1232 was classified as potentially harvestable and 1156 was classified as residual. This would remove 41 square feet of basal area, which would leave the residual stand with 37 sq. ft. The regeneration openings from the 2001 sale were included in this stand type and are mostly currently occupied by a small pole stand of poplar and other species accounting for the low basal area. These figures include cedar as figured according to the cedar log scale.

Since this stand intermingles with the more merchantable hardwood stands, this stand would be included with any timber sale taking place in stand 1. The majority of the potential harvest volume for stand 2 is contained in black oak, yellow-poplar , and eastern redcedar , with Virginia pine, white ash, white oak, and various other species making up of the remainder of the harvest volume. Much of the harvest volume tallied in this stand is represented by eastern redcedar due to use of the cedar scale. A separate cedar sale would probably have to be undertaken to achieve optimal management, as most of these cedar would be removed to encourage poplar and the oak regeneration that is usually found in the understory of such stands. Long term, this site is expected to completely convert to hardwoods due to recovery of the site from former agricultural activities and erosion.

In scattered places, there is some oak regeneration in the understory. Timber harvest and post harvest TSI should concentrate on releasing this oak regeneration – mostly with follow-up TSI. Some TSI for the neighboring tract included a small portion of this stand on the eastern edge between the wildlife opening and the fire trail, and was performed in

2014 to release the oak regeneration present in the former old field area that had had the cedar and scattered poplar overstory removed already.

The study put in place in the formerly cedar dominated area should be followed up on to record the success of the various treatments to encourage the oak regeneration and to ensure the oak regen gets recruited successfully into the next stand of trees to dominate those areas.

Stand 3: Old field – Virginia pine

This 10-acre stand contains a volume of 4143 board feet per acre of which 3515 was classified as potentially harvestable. This 85% reduction in volume and stocking over the 10 acre area is due to targeting all the Virginia pine and cedar for removal in order to convert and restore this stand to native hardwoods. Some residual oak and maple would make up what didn't get cut. These figures DO include cedar as figured according to the cedar log scale.

The original purpose of the pines was to stabilize erosion and rehabilitate the site, which has occurred successfully. The Virginia pine that is present is very dense, and the individual trees are stagnated and of very low quality. This stand is being targeted for conversion from pine and cedar into native hardwood species. This could be done by including the harvest trees with a more traditional hardwood sale involving primarily stands 1 and 2, or it could be undertaken as a separate softwood sale that would include stand 4 in a separate undertaking. The majority of the harvest volume for stand 3 would be contained in Virginia pine with the remainder being eastern redcedar and white oak.

Post harvest TSI should be performed to eliminate residual cull or small pole-sized trees not cut during the harvest, as well as complete the regeneration openings, and kill grapevines where present. As always, any ailanthus present should also be treated and eliminated.

Stand 4: Shortleaf pine

This 3-acre stand was designated as a separate stand because it was clearly dominated with what was thought to be shortleaf pine. This species might have actually been loblolly pine, but was clearly a southern yellow pine of some kind. It represented a small area of former agricultural fields that happened to have been planted with shortleaf rather than Virginia pine. It contains a very high volume of 11,964 board feet per acre of which 4545 was classified as harvestable. This would remove approximately 38% of the standing volume in a thinning operation.

This stand is overstocked and should have been thinned many years ago. It is in need of thinning or conversion, but due to the fact that shortleaf pine is a much better quality pine than Virginia pine, a thinning is prescribed and should be undertaken together with pine removal in stand 3. The entirety of the harvest volume would be made up of shortleaf

pine, and the residual stand would be primarily shortleaf pine with some black oak mixed in.

Post harvest TSI should be performed to eliminate any residual cull or small pole-sized trees not cut during the harvest, as well as thin where necessary, complete any regeneration openings, and treat the understory to eliminate shade tolerant species in favor of oaks and other more desirable species.

Stand 5: Rocky south slope

This 14-acre stand contains a volume of 4511 board feet per acre of which 3285 was classified as potentially harvestable. These figures include cedar as figured according to the cedar log scale.

Since this stand intermingles with the more merchantable hardwood stands, there would likely be some trees included from here along with any timber sale taking place in stands 1 and 2. Due to the apparent low productivity of this area and appearance of a barrens-type system, any harvesting in this area would be limited. If this stand had any harvesting done, the majority of the volume (70%) would be represented by cedar, with some chinkapin and white oak as well. Most of the harvest volume tallied in this stand is represented by eastern redcedar (2314 bd. ft/ac) due to use of the cedar scale. Most all of the cedar was tallied for removal to open this area up to more sunlight for hardwood regeneration, and a separate cedar sale would probably have to be undertaken to achieve optimal management. It is probable that little harvesting will be done in this stand which starts to approximate a barrens type ecosystem in places, as well as the fact that a low priority cedar sale would have some level of access issues for equipment.

PROPOSED ACTIVITIES LISTING

Summer 2014	Field inventory
Fall 2014	Write mgmt plan
Summer 2015 - Fall 2015	Basal bark treat ailanthus
Fall 2015 – Spring 2016	Mark timber sale
Spring 2016	Sell timber sale
2017 / 2018	Post harvest TSI
2022	Recon & monitor for exotics and regeneration
2026-2031	Inventory for next mgmt cycle

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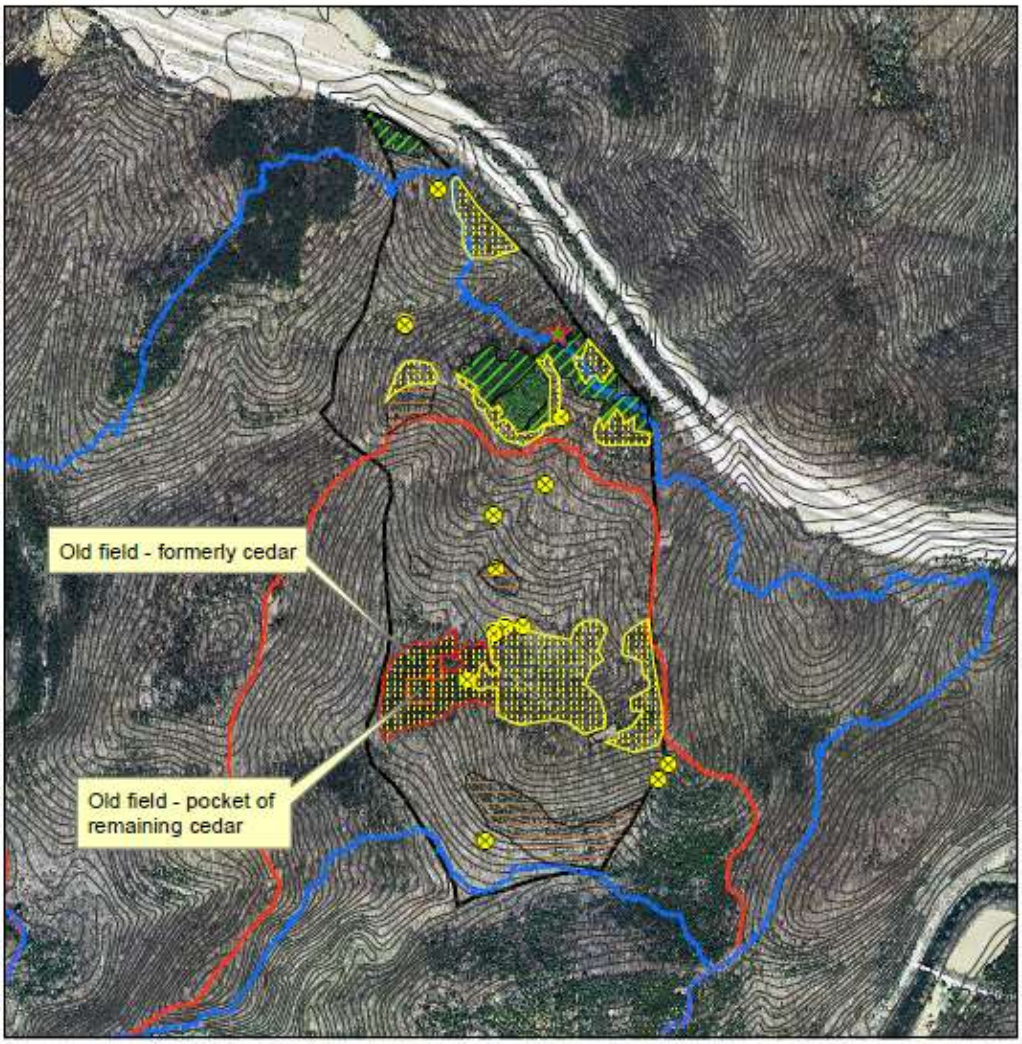
Tract 1304



0 1,500 3,000 4,500 6,000 7,500 Feet

Legend

- 1304 ailanthus
- Horse trails
- Fire trails
- tract 1304

- **Stand 1: Oak hickory (180 ac)**
- **Stand 2: Old field - hardwood (40 ac)**
- **Stand 3: Old field - V. pine (10 ac)**
- **Stand 4: Old field - Shortleaf pine (3 ac)**
- **Stand 5: Rocky south slope (14 ac)**

N W E S