Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Morgan-Monroe** Compartment: **17** Tract: **01**
Tract Acreage: **158** Commercial Forest Acreage: **158**
Forester: **Amanda Smith (for Laurie Burgess)** Date: **January 16, 2013**

Location

M1701 is located in Sections 1 and 2 of Township 9N, Range 1E of Monroe County. It is located roughly 0.3 miles south of Lake Lemon and 3.6 miles northwest of Yellowwood Lake. Public access to M1701 is only available from off of County Line Road through Y1001 of Yellowwood State Forest. Parking is available at the log yard on Y1001 on County Line Road.

General Description

M1701 consists of a total of a 158 forested acres of which 127 acres are Oak-Hickory forest and 31 acres are of Mixed Hardwood forest in Morgan-Monroe State Forest. A summary of the forest resources in M1701 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in M1701 in December 2012

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
White Oak	Sugar Maple	American Beech
Black Oak	White Oak	Sugar Maple
Yellow Poplar	American Beech	Sassafras
Northern Red Oak	Chestnut Oak	Red Maple
Scarlet Oak	Sassafras	American Elm
American Beech	Red Maple	Flowering Dogwood
American Sycamore	Pignut Hickory	Blackgum
Bitternut Hickory	Bitternut Hickory	Bluebeech
White Ash	American Elm	White Ash
Pignut Hickory	Black Cherry	Chestnut Oak
Sugar Maple	Black Oak	Ironwood
Shagbark Hickory	Shagbark Hickory	White Oak
Black Walnut		Bitternut Hickory
Chestnut Oak		Black Cherry
Basswood		Black Oak
Black Cherry		Yellow Poplar
Red Maple		*Pignut Hickory
Largetooth Aspen		*Shagbark Hickory
Hackberry		
Blackgum		
Virginia Pine		

* Species not captured in Prism Plots but present within the tract.

History

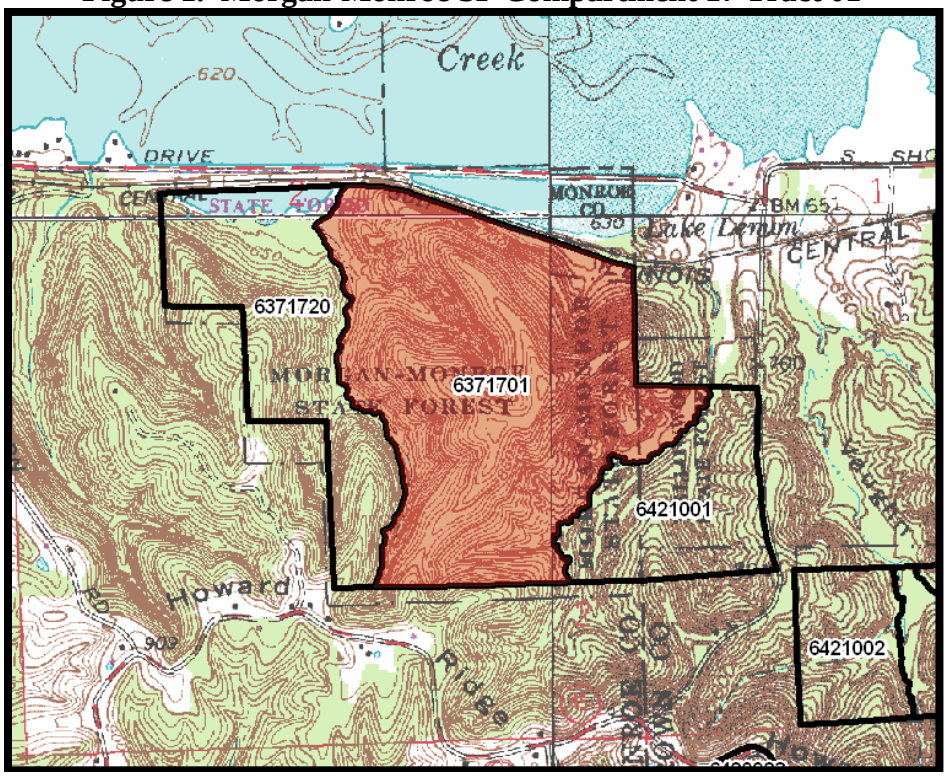
The land area that includes M1701 (see Figure 1) was deeded to the State of Indiana in 1950 by Albert and Virginia Chitwood and from the United States Forest Service in 1956 and 1967.

According to a 1939 aerial photograph, the tract area was dominantly closed-canopy forest. The very northwest edge and a small portion of the eastern edge are areas within floodplains which were cleared for agricultural use during the early 1900's. Both areas are now present in a closed canopy, Mixed Hardwoods timber type dominated by large SYC, YEP, and AMB. Prior to 2012 M1701 consisted of only 42 acres. Previous management of this tract entailed completing the boundary marking in this block of State Forest. In September of 2012 Forester Burgess submitted an access improvement roadwork project to the Division of Historic Preservation and Archaeology to improve public access as well as management access. This access project was reviewed by the DHPA and approved in October of 2012. In November of 2012, Intermittent Forester Smith combined Tracts M1701, M1721, and M1726 into a new tract M1701 of 158 acres for management. This combination of the old tracts would reduce the number of entries necessary for management of all 3 previous tracts. The first new tract resource inventory for M1701 was completed on December 13, 2012 by Intermittent Forester Amanda Smith. The results of that inventory are highlighted in the report below.

Landscape Context

The ridgetop and sideslopes of M1701 are mostly comprised of the dominant Oak-Hickory species known to occur in the Yellowwood/Morgan-Monroe State Forest ecosystem. The tract is neighbored by State Forest timberlands on the west and southeast, by Lake Lemon to the north, and by private forestland property to the south and northeast. The surrounding area is a matrix of dominantly closed-canopy forest, Lake Lemon, agriculture fields, and residential development. Lake Lemon lies just north of the tract providing habitats for migrating waterfowl as well as habitat for lowland mammals, herptiles and birds.

Figure 1. Morgan-Monroe SF Compartment 17 Tract 01



Topography, Geology and Hydrology
M1701 consists of predominantly northern, western, and southeastern facing slopes that drain into two mapped intermittent streams that lie on its east and west tract boundaries. Ephemeral drainages drain into these mapped intermittent streams that run north and south and eventually drain into Lake Lemon. In general, these upland soils were formed in residuum from sandstone, siltstone, and shale. The tract's topography ranges from 0 - 75% slopes.

Soils
Be – Beanblossom Channery Silt Loam, 1-3% slopes, occasionally flooded
This nearly level and gently sloping, deep, moderately well drained soil is on floodplains, alluvial fans, and colluvial benches. It is fairly well suited to trees. Wet periods contribute to equipment usage limitations. Rooting depth is somewhat restricted for some trees, i.e. Black Walnut, due to coarse fragments in subsoil. This soil has a site index of 95 for Yellow Poplar.

BgF – Berks-Trevlac-Wellston Complex, 20 to 70 percent slopes
These moderately steep to very steep, well drained soils are on hillsides in the uplands. They are fairly well suited to trees. Erosion hazards and equipment limitations are main management concerns due to slope. Consideration should be given during sale planning and implementation of Best Management Practices for Water Quality. This Complex has a site index of about 70 for northern Red Oak.

BkF – Berks-Weikert Complex, 25 to 75 percent slopes
This Complex consists of steep and very steep, moderately deep and shallow, well drained soils on sideslopes of the uplands. They are fairly well suited to trees. Erosion hazards, equipment limitations, and seedling mortality are concerns in management due to slope and depth to bedrock. These factors should be considered when laying out sale and implementing Best Management Practices for Water Quality. This Complex has a site index of 70 for northern Red and Black Oaks.

WmC – Wellston-Gilpin silt loams, 6 – 20 percent slopes
This soil resides on moderately sloping to moderately steep sideslopes of the uplands. Parent material is loess over loamy residuum over shale. This soil type presents a slight risk for erosion hazard and equipment limitation. These soils have a site index for northern Red Oak of 71 in the Wellston and 80 in the Gilpin.

Access
M1701 would be accessible by 2 planned skidtrails from adjacent tract Y1001 off of County Line Road. Parking is available east of M1701 at the log yard on Y1001 on County Line Road. The proposed DHPA roadwork access project was cleared for roadwork in October 2012.

Boundary
M1701 is neighbored by State Forest on the west and southeast, by Lake Lemon to the north, and by private property to the south and northeast. The western and southeastern boundaries run along the mapped intermittent streams. Railroad tracks and Lake Lemon constitute the northern boundary. The southern and northeastern boundaries run along privately owned property. The tract's private ownership boundaries have been marked and repainted by orange paint along the line for many years and are currently up to date.

Wildlife

A Natural Heritage Database Review was completed for this tract in 2012. If Rare, Threatened or Endangered (RTE) species were identified in this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

The current inventory was completed during the early winter of 2012 so summer breeding bird residents were not present. Some songbirds were heard and the following bird species were identified during the inventory:

American Crow	Pileated Woodpecker	Ring-billed Gull
Canadian Geese	Redbellied Woodpecker	Sandhill Crane
Downy Woodpecker	Redheaded Woodpecker	White-breasted Nuthatch
Hairy Woodpecker	Red-tailed Hawk	Wild Turkey

Other species or sign observed within the tract indicates use by White-tailed Deer, Grey Squirrel, Eastern Chipmunk, Raccoon, Opossum, Coyote and other small mammals. Multiple deer trails were also noted throughout the tract. M1701 has an abundant supply of food resources such as soft and hard mast. The mapped intermittent streams that run along the east and west boundaries of the tract provide a generally consistent water source for the area during nondroughty periods of the year.

The Division of Forestry has instituted special procedures for conducting forest resource inventories so that the documentation and analysis of critical live tree (legacy) and snag tree densities are examined on a tract basis in order to maintain long-term and quality forest habitats. These data are listed in Table 2 noted below. According to Table 2, all levels of snags and legacy trees met or exceeded their maintenance levels. Management practices conducted on M1701 will be conducted in a manner that will maintain long-term and quality forest habitats for Indiana Bat populations.

Table 2. Live Legacy Trees* and Snags inventoried December of 2012 on M1701

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	1,422		4,637	3,215	
20"+ DBH	474		1,619	1,145	
Snags (all species)					
5"+ DBH	632	1,106	2,421	1,789	1,315
9"+ DBH	474	948	815	341	**-133**
19"+ DBH	79	158	273	194	115

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

Communities

The ground cover of this tract consisted of mainly mesic to dry mesic species. Observed species included:

Appendaged Waterleaf	Goldenrod	Red Raspberry

Blackberry	Grapevine	Sedge spp.
Canada Violet	Grass spp.	Spicebush
Christmas Fern	Greenbrier	Spinulose Wood Fern
Clayton's Bedstraw	Jewelweed	Stinging Nettle
Cleavers	Multiflora Rose	Sweet Cicely
Dittany	Oxalis spp.	Squawroot
False Mermaid	Pawpaw	Virginia Creeper
Golden Ragwort	Poison Ivy	Wild Ginger
		Wreath Goldenrod

Squawroot (Conopholis americana) is a plant that is parasitic on the roots of oak trees.

Exotic Species

Multiflora Rose was observed during the resource inventory mainly along the northern end of the western mapped intermittent stream. Multiflora Rose has become naturalized among the Monroe County landscape, therefore, only large concentrations should be considered for treatment. However, proposed regeneration openings should also be treated where infestations are present. Moderate infestations can be controlled with foliar spraying of vegetation with a mixture of 3% Glyphosate or Triclopyr and ½% non-ionic surfactant according to label instruction. The best window for treatment occurs from July through September. Follow up treatment is often needed.

Recreation

Activities on this tract likely include hiking, bird watching, wildlife viewing, hunting, and mushrooming. Access into the tract in the past had been difficult for the general public as this tract is mostly landlocked. Improved access will become more available to the public following the planned construction of 2 skidtrails from Y1001. Parking is available east of M1701 at the log yard on Y1001 off of County Line Road.

Cultural

Cultural resources may be present on M1701 however their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

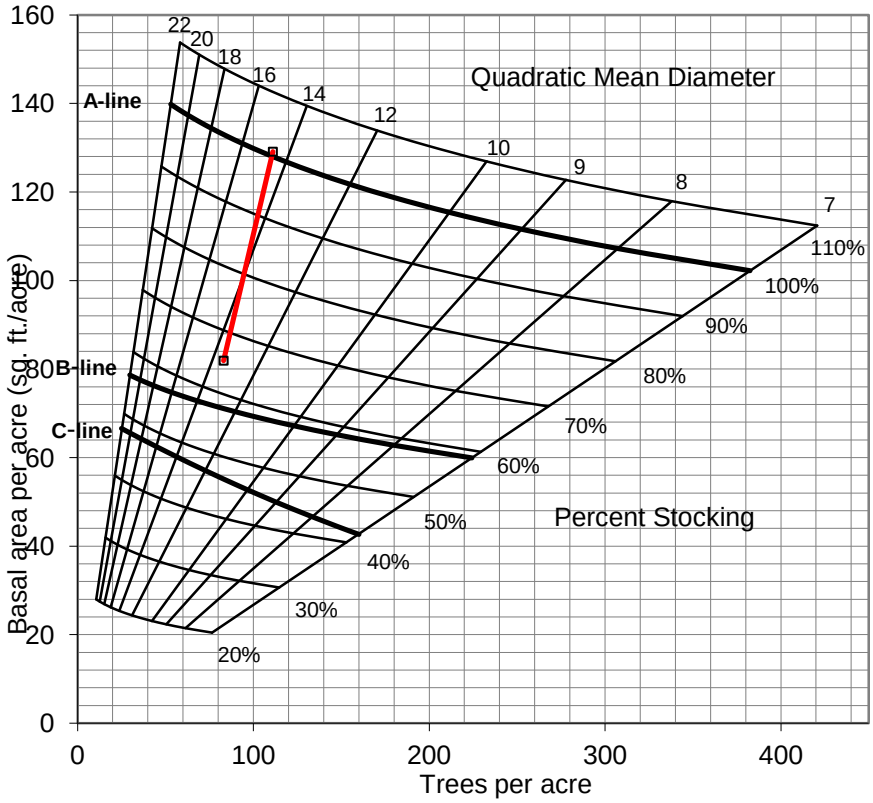
Tract Subdivision Description and Silvicultural Prescription

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. = **721 Trees/Ac.**
Overall % Stocking = **101%** (Overstocked)
BA/A = **152.3 Sq. Ft./Ac.**
Sawtimber & Quality Trees/Ac. = **52 Trees/Ac.**
Present Volume = **6,398 Bd. Ft./Ac.**
Harvest Volume = **2,503 Bd. Ft./Ac.**
Residual Volume/Ac. = **3,895 Bd. Ft./Ac.**

Table 3. Gingrich Stand and Stock Table without sub merchantable data for M1701



Summary Tract Silvicultural Prescription and Proposed Activities

The current forest resource inventory was completed on December 13, 2012 by Intermittent Forester Amanda Smith. 41 prism points were sampled over 158 acres (1 point for every 3.85 acres). A tract summary of the forest resource inventory is given above and a species breakdown of the summary is given in Table 5 below. At present M1701 is overstocked at 101% stocking and would benefit from a timber harvest. The proposed timber sale on this tract would likely yield 200 – 400 MBF. The tract's forest resource is composed of 2 different strata based on the 2 major timber types and size classes mentioned below.

Oak-Hickory Stratum

As the Oak-Hickory component of the Eastern Hardwood Ecosystem provides the most significant wildlife, timber resource, and value the retention of this stratum is important in the Property's longterm timber management program. The Oak-Hickory timber type covers roughly 75.6% of the entire tract or about 119.5 total acres. The overstory is dominated by WHO, BLO, REO, and SCO with an average basal area of 154.2 square feet per acre.

Singletree and selection cuttings are prescribed to remove lower quality stems and mature to overmature trees to release a growing stock of high quality, more vigorous stems. Likewise, careful selection by free thinning of co-dominant stems will help to improve overall croptree spacing. Lower quality trees that include low-forking, leaning, overtopped/suppressed intermediates, epicormically sprouting, and deformed trees are planned to be marked for removal in an improvement cutting. Group selections may be prescribed to regenerate timber resources in areas where there is an

abundance of advanced regeneration of Oak and Hickory seedlings or where the overstory is understocked. Group selections are important in maintaining long-term forest regeneration and sustainability goals of State Forests.

Mixed Hardwoods Stratum

The Mixed Hardwoods component of the Eastern Hardwoods Ecosystem can be very variable in their composition and thereby have more complicated prescriptions. The Mixed Hardwoods timber type in M1701 covers approximately 24.4% of this tract or about 38.5 total acres. The overstory is dominated by YEP, SYC, BLO, WHA, REO, and WHO with an average basal area of 146.4 square feet per acre.

Singletree and 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. The longterm result of these prescribed cuttings will increase timber and wildlife habitat diversity. This is often 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 and other species of significant wildlife value as the best croptrees for future conservation. Improvement cuttings in this area will also be applied to remove low-forking, leaning, overtopped/suppressed intermediates, epicormically sprouting, and deformed trees. Group selections are important in maintaining long-term forest regeneration and sustainability goals of State Forests. Planned regeneration openings generally return to Mixed Hardwoods with a strong component of YEP, however some advanced regeneration of Oaks, Hickories and Walnuts present in the understory are often able to increase their composition within this Stratum in these openings. A field review for successful regeneration is planned 3-4 years after opening TSI completion. No active management activities are planned to occur, at this time, within 50 feet of the mapped intermittent streams.

A fair amount of M1701's Yellow Poplar trees appear 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 YEP will need careful review when the tract is marked as modest mortality over the next couple of years is expected.

Sugar Maple borer damage was noted in understory SUM throughout the Mixed Hardwoods Stratum and the 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. The removal of these stems would be classified as a combination improvement and sanitation cutting.

Given the recent inventory, M1701 is suitable for a 15 year management cycle wherein growth and development of the tract's resources are evaluated by a forest inventory every 15 years. The current inventory indicates a possible harvest of between 200 – 400 MBF. A timber sale is proposed for this tract in CY2013.

Figure 2. M1701 Stratum Types Map

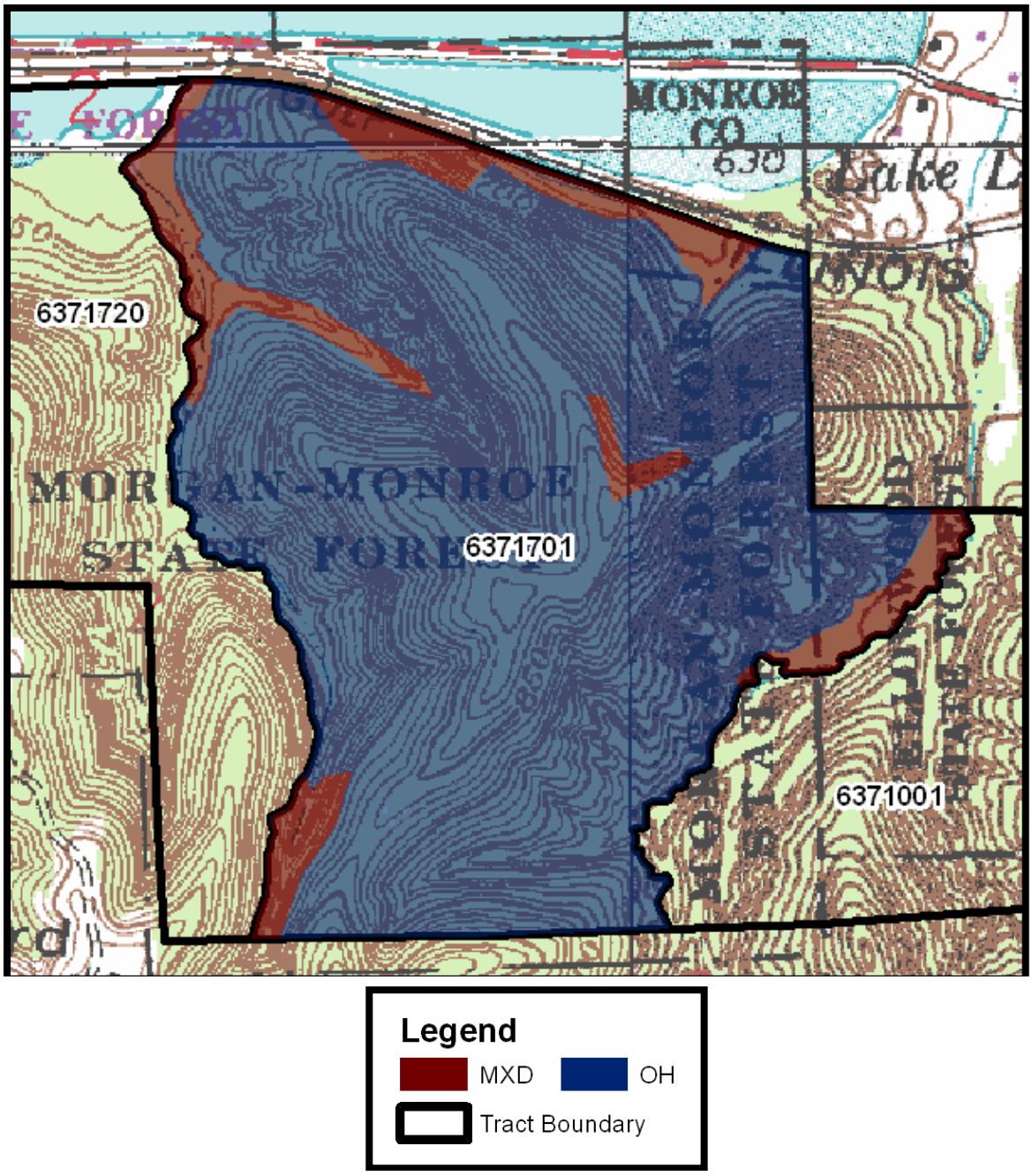


Table 5. Overview of Sawtimber Volume Estimates in M1701 in December of 2012

Species	Harvest	Leave	Total
White Oak	80,530	184,830	265,360
Black Oak	94,750	67,270	162,020
Yellow Poplar	48,030	87,980	136,010
Northern Red Oak	42,180	77,030	119,200
Scarlet Oak	36,370	25,640	62,010
American Beech	22,890	36,840	59,730
American Sycamore	15,740	30,660	46,400

Bitternut Hickory	7,740	22,970	30,710
White Ash	25,820	1,510	27,340
Pignut Hickory	3,600	19,750	23,350
Sugar Maple	8,540	13,820	22,360
Shagbark Hickory	0	12,320	12,320
Black Walnut	0	9,110	9,110
Chestnut Oak	1,520	5,960	7,480
Basswood	890	6,550	7,440
Black Cherry	5,620	0	5,620
Red Maple	1,340	3,280	4,620
Largetooth Aspen	0	4,330	4,330
Hackberry	0	2,680	2,680
Blackgum	0	1,560	1,560
Virginia Pine	0	1,340	1,340
Tract Totals (Bd. Ft.)	**395,560**	**615,430**	**1,010,990**
Per Acre Totals (Bd. Ft./Ac.)	**2,504**	**3,895**	**6,399**

Proposed Activities Listing

Proposed Management Activity	***Proposed Period***
Timber Sale roadwork project	Winter 2012-13
Timber Marking	CY2013
Timber Sale	CY2013
Postharvest Timber Stand Improvement Project	CY2014-2018
Regeneration Opening Review	CY2020
Reinventory and Management Guide	CY2027

Attachments (Included in Tract File)

- Topo Map of Tract Features
- Tract Soils Map
- Aerial Photo of Tract
- INHD Review Map
- Stocking Guide Chart
- Printed TCruise Reports

Work Cited

Federally Threatened and Endangered Species:

Service, U. S. (2012). *Threatened and endangered Species*. Retrieved January 2, 2013, from Environmental Conservation Online System: http://ecos.fws.gov/ecos/indexPublic.do

Invasive Exotic Species:

Least Wanted: Alien Plant Invaders of Natural Areas. 19 April 2012. Plant Conservation Alliance's Alien Plant Working Group. 3 October 2012 <http://www.nps.gov/plants/alien/fact.htm>

State Threatened and Endangered Species:

Resources, I. D., & Wildlife, D. o. (2012). *Nongame and Endangered Wildlife*. Retrieved January 2, 2013, from IN.gov: http://www.in.gov/dnr/fishwild/2356.htm

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