Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE

State Forest: **Ferdinand**
Tract Acreage: **98**
Forester: **A. Smith**
Compartment: **06** Tract: **10**
Commercial Forest Acreage: **98**
Date: **10/27/2015**

Location

Tract 0610 is located in Perry County, Sections 21 and 29, T3S, R3W in Clark Township. It is located roughly 5.5 miles west of Ferdinand and 6.6 miles north northwest of Bristow.

General Description

Tract 0610 consists of approximately 98 acres with roughly 17.8 acres of planted pine, 23.8 acres of mixed hardwoods, and 56.4 acres of oak-hickory forest. The overall timber quality of this tract is average and ranges from small to large sawtimber in size. A summary of the forest resources in tract 0610 in relation to species dominance is noted below in Table 1.

Table 1.Overview of Forest Resources in Tract 0610

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
White Oak	Sugar Maple	Yellow Poplar
Red Pine	Red Pine	Sugar Maple
Black Oak	White Oak	American Beech
Eastern White Pine	Northern Red Oak	Ironwood
Yellow Poplar	Blackgum	Blackgum
Bitternut Hickory	Bitternut Hickory	Eastern White Pine
Sugar Maple	Shagbark Hickory	Sassafras
Northern Red Oak	Yellow Poplar	Northern Red Oak
White Ash	American Sycamore	Pignut Hickory
American Beech	Black Cherry	White Ash
American Sycamore	Black Oak	
Largetooth Aspen	Green Ash	
Shagbark Hickory	American Elm	
Black Cherry	Sweetgum	
Pignut Hickory		
Silver Maple		
Sweetgum		
Blackgum		
Green Ash		

History

The land area that includes most of tract 0610 today (see Figure 1) was deeded to the State of Indiana in two parts in 1939. On July 6th, the State of Indiana purchased 80 acres from Perry County. On September 17th, the State of Indiana purchased 220 acres from Mary Guntel. The

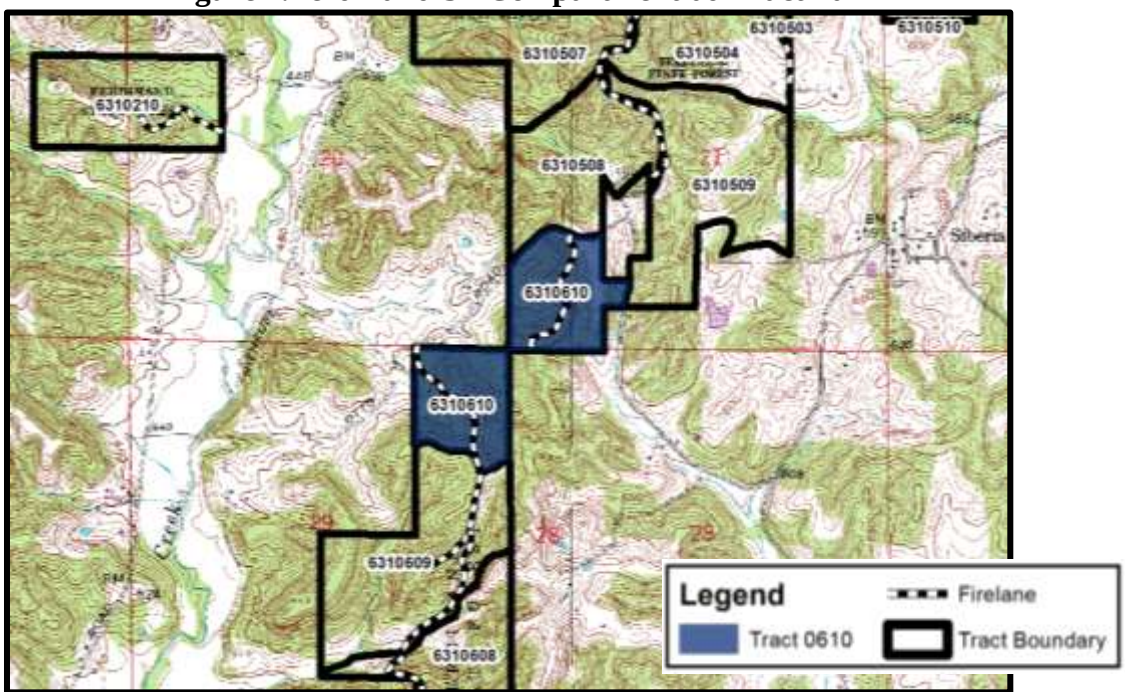
State planted eastern white pine, red pine, and Jack pine on the "Guntel Farm" in 1950. This land area was described as "open wasteland" at that time. This would have included portions of the southwest half of tract 0610. The last section of tract 0610 was purchased from Edward and Nellie Kline on April 8, 1972 when the State acquired 17 acres.

Forester Steve Brandsasse conducted the first resource inventory in April, 1973 (1,866BdFt/A total volume estimated for 44 acres of commercial hardwoods). Forester Janet Eger conducted a timber sale on July 23, 1981. Indiana Hardwoods purchased an estimated 60,455BdFt in 346 trees from 30 acres for $8,360.00. Post-harvest TSI was completed on January 29, 1982 on the 30 acre harvest area by YACC labor. Forester John Zvirblis conducted a resources inventory in December, 1997 and found there to be an estimated 6,906.5 BdFt/A total volume with 2,386.7BdFt/A harvest volume for 70 acres of commercial hardwoods. Foresters Gretchen Herbaugh and Doug Brown conducted a timber sale on April 18, 2000. Rasche Brothers Logging purchased an estimated 72,491BdFt in 328 trees and 47 culls for $32,850.00. Post-harvest TSI was completed in November, 2003 on 34 acres. Forester Doug Brown treated a small patch of ailanthus roughly 0.1 miles from the gate on firelane 20 on September 7, 2010. The current tract resource inventory was completed on July 30, 2015 by Jacob Henry.

Landscape Context

The ridgetops are mostly comprised of old field mixed hardwoods, oak-hickory, and planted pine plantations while, the sideslopes are mostly comprised of oak-hickory. State forest borders tract 0610to the south of the south half of the tract and to the north and part of the east of the north half of the tract. Private agriculture land lies to the west of the tract and private forest and agriculture fields lie to the east of the tract. Water sources on the tract include the mapped intermittent streams.

Figure 1.Ferdinand SF Compartment 06 Tract 10



Topography, Geology and Hydrology
Dominantly west, east, and south-facing slopes characterize the north half of tract 0610. While, north, east, and west-facing slopes characterize the south half of tract 0610. Slopes vary from long and gentle to abrupt and steep in tract 0610. Signs of past soil erosion exist under the pine plantations- remnant scars of worn out farmland.

Soils
Adyeville-Wellston-Deuchars silt loams (AbvD2)complex contains Adeyville, Wellston, and Deuchars soils. They occur on 8 to 20 percent slopes and are eroded. The depth to the watertable is greater than 80 inches for the Adyeville and Wellston soils but only 24 to 36 inches for the Deuchars soils. Available water capacity is low (about 4.1 inches) for Adyeville, moderate (about 8.8 inches) for Wellston, and moderate (about 9.0 inches) for the Deuchars soils. The site index for northern red oak forWellston soils is 81 and 90 for Deuchars soils.

Adyeville-Tipsaw-Ebal complex (AccG)complex contains Adeyville, Tipsaw, and Ebal soils. They occur on 20 to 50 percent slopes and are very rocky. The depth to the watertable is greater than 80 inches for the Adyeville and Tipsaw soils but only 24 to 36 inches for the Ebal soils. Available water capacity is low (about 4.1 inches) for Adyeville, low (about 3.3 inches) for Tipsaw, and moderate (about 7.2 inches) for the Ebal soils. This soil type is moderately well to somewhat excessively well drained and has a high to very high runoff class. The site index for black oak forTipsaw soils is 70 and 80 for Ebal soils.

Apalona-Zanesville silt loams (AgrB) contains Apalona and Zanesville soils. They occur on 2 to 6 percent slopes and is considered prime farmland. The depth to the watertable is 17 to 28 inches for the Apalona soils and 21 to 30 inches for the Zanesville soils. Available water capacity is low (about 4.4 inches) for the Apalona soils and moderate (about 6.3 inches) for the Zanesville soils. This soil type is moderately well drained and has a medium runoff class. The site index forApalona soils is 60 for white oak.

Apalona-Zanesville silt loams (AgrC2) contains Apalona and Zanesville soils. They occur on 6 to 12 percent slopes and are eroded. The depth to the watertable is 15 to 26 inches for the Apalona soils and 19 to 28 inches for the Zanesville soils. Available water capacity is low (about 4.0 inches) for the Apalona soils and low (about 4.9 inches) for the Zanesville soils. This soil type is moderately well drained and has a high runoff class. The site index forApalona soils is 60 for white oak.

Ebal-Deuchars-Kitterman complex (EabD2) contains Ebal, Deuchars, and Kitterman soils. They occur on 12 to 24 percent slopes and are eroded. The depth to the watertable is about 24 to 36 inches for Ebal and Deuchars soils and 12 to 24 inches for Kitterman soils. Available water capacity is moderate (about 7.5 inches) for Ebal, moderate (about 9.0 inches) for Deuchars, and low (about 4.1 inches) for the Kitterman soils. This soil type is moderately well drained and has a high to very high runoff class. The site index forEbal soils is 80 for black oak, 90 for northern red oak for Deuchars soils, and 57 for white oak for the Kitterman soils.

Gatchel loam (GacAW) is an occasionally flooded soil for a very brief duration occurring on 0 to 2% slopes. It is a somewhat excessively drained soil with a depth of more than 80 inches to the water table. Available water capacity is moderate at about 6.1 inches. The site index is not given for Gatchel loam soils but common trees to manage for are baldcypress, bitternut hickory, Blackgum, green ash, pin oak, red maple, shingle oak, and swamp white oak.

Access
Tract 0610 is easily accessible off of Calvert Road (formerly Otto Road), by Firelane 20 and Firelane 19.

Boundary
Tract 0610 is bounded halfway on the south by a shared ridge top with tract 0609 and a partial barbed wire fence. The north boundaries are indicated by Calvert Road and an old road bed. The east boundaries are indicated by barbed wire fencing, a corner stone at the section corner, and a corner stone along the most eastern boundary line. The west boundaries are indicated by partial barbed wire fencing and the tree line. The private property boundary lines need to be better identified and indicated in the field prior to any timber management activities.

Wildlife
A Natural Heritage Database review was completed for this tract. If Rare, Threatened or Endangered species (RTE's) 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. Typical common wildlife species were observed in the tract during the inventory (various songbirds, frogs, woodpeckers, eastern box turtles).
Tract 0610 has an abundant supply of food resources such as soft and hard mast. The mapped intermittent streams provide a water source for wildlife during non-droughty times of the year.

The Division of Forestry has instituted special 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. Crown release performed during timber harvests will stimulate the growth of the selected croptrees and will enhance the vigor of these sawtimber trees. Timber Stand Improvement (TSI) and crop tree release following the harvest is planned which will increase standing snag counts, which are somewhat lower than desired levels. Crop tree release work will focus on legacy tree species increasing the number of legacy trees in the larger diameter ranges over the long term management of the tract. Management practices conducted on 0610 will be conducted in a manner that will maintain diverse quality forest habitats long term for wildlife populations.

Live Legacy Trees* and Snags inventoried 2015 on F0610

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	882		1,926	1,044	
20"+ DBH	294		302	8	
Snags (all species)					
5"+ DBH	392	686	284		
9"+ DBH	294	588	199		
19"+ DBH	49	98	25		

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

Communities

Tract 0610is composed of mesic to dry-mesic upland hardwoods dominated by oak-hickory, mixed hardwoods, and pine plantings. The dominant overstory timber species include white oak, red pine, black oak, eastern white pine, yellow poplar, and bitternut hickory. The understory contains mainly sugar maple, red pine, white oak, northern red oak, blackgum, and bitternut hickory. The ground cover of tract 0609 consists of mainly mesic to dry mesic species. During the current resource inventory all portions of the tract were reviewed and evaluated for old growth potential as well as for Representative Sample Areas. No representative stratums of old growth appear to exist within this tract.

Exotic Species

Japanese stilt grass, autumn olive, and multiflora rose were observed during the inventory. The majority of the invasives were focused along the firelane. Multiflora rose and autumn olive were found scattered around the tract. Control measures may be warranted for populations are located in future regeneration openings. The Japanese stilt grass should be reviewed for treatment needs before and after timber harvest activities.

Recreation

Likely recreational activities on this tract include hunting, mushroom hunting, hiking, bird watching, and wildlife viewing.

Cultural

Cultural resources may be present but their location(s) are protected. Adverse impacts to significant cultural resources noted will be avoided during property management activities.
. A more modern trash dump was reported in the 1997 Resource Management Guide to the west side of Firelane 19 at the north end of the firelane. This area should be avoided over the course of management activities if it is still present.

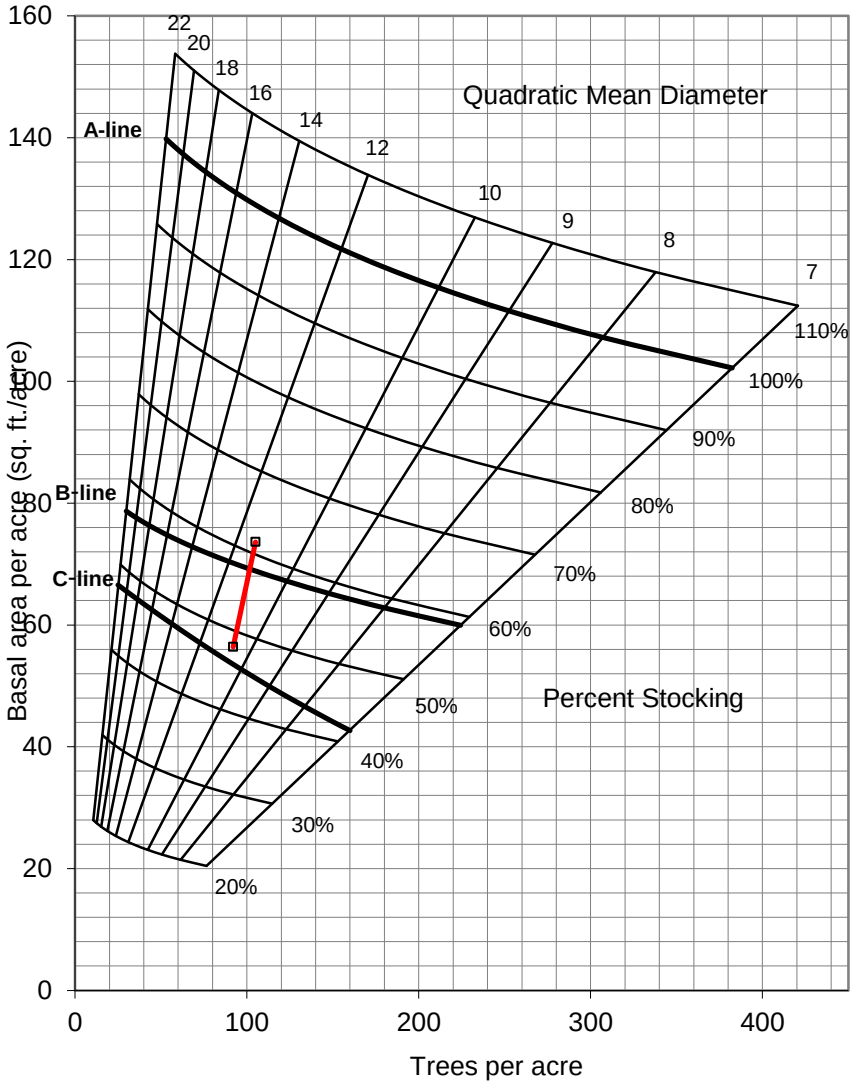
Tract Subdivision Description and Silvicultural Prescription

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.= **105Trees/Ac.** Overall % Stocking Hardwoods = **62%** (Fully Stocked)
BA/A = **73.6Sq. Ft./Ac.** Sawtimber & Quality Trees/Ac. = **28 Trees/Ac.**
Present Volume = **6,262 Bd. Ft./Acre**

Table 2.Gingrich Stand and Stock Table tract 0610

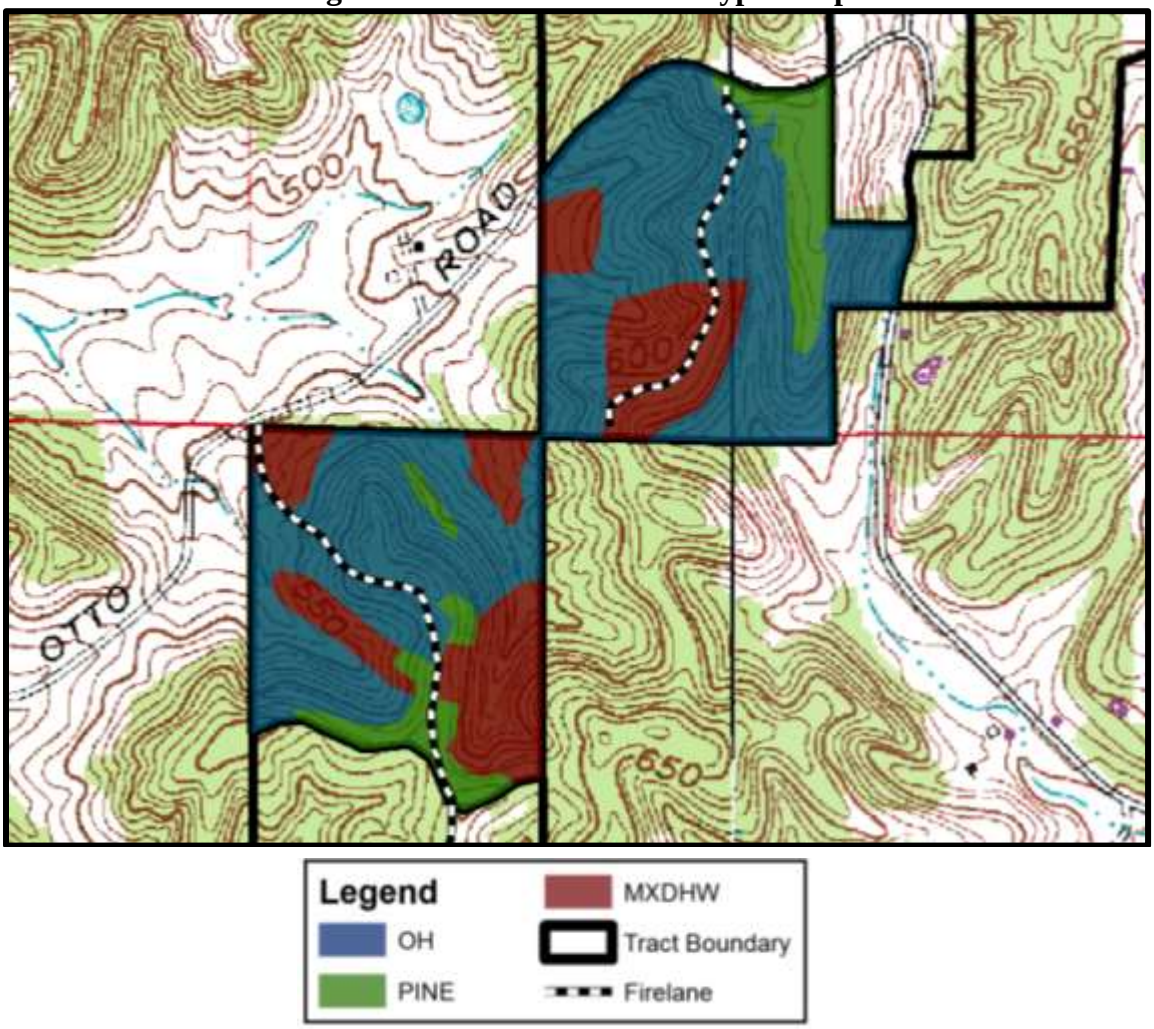


Summary Tract Silvicultural Prescription and Proposed Activities

The current forest resource inventory was completed on July 30, 2015 by Jacob Henry. Thirty-threeprism points were sampled over 128.5 acres (1 point for every 2.97 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 3 different stratums based on the 3 major timber types and size classes mentioned below.

Figure 2.Tract 0610 Stratum Types Map



Mixed HardwoodsStratum

The mixed hardwoods timber type can be very variable in composition and thereby have more complicated prescriptions. The mixed hardwoods type covers roughly 24% of the tract or about 23.8 acres with an average basal area of 51.7 square feet per acre. The overstory is dominated by yellow poplar, red pine, American beech, American sycamore, and white oak. The understory layer consists of mainly sugar maple, American elm, sweetgum, black cherry, and black oak. The regeneration layer consists of mainly yellow poplar, sugar maple, American beech, and sassafras.

A fair amount the tract's YEP appeared to be in modest decline as a result of the past drought and the Tulip Poplar Scale insect infestation that occurred in the late spring of 2012. Several areas have been hit with past wind damage.

A single tree selection harvest is not prescribed over the entire mixed hardwoods stratum due to the low stocking numbers. However, a light salvage harvest in conjuncture to the oak-hickory harvest and the creation of the pine openings is recommended to salvage any over mature black oaks, stagnant red pine, drought stressed yellow poplar, and ash within attainable reach of the other harvest areas. The salvage harvest will help to open up the canopy somewhat to encourage oak and hickory regeneration, which need more sunlight to germinate and become established. Also, group selections may be prescribed 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 yellow poplar.

Oak-Hickory Stratum

The Oak-Hickory timber type provides significant wildlife, timber resource, and value. The retention of species in this stratum is important in the Division's long-term timber management objectives. The Oak-Hickory type covers roughly 57% of the tract or about 56.4 acres. The overstory is dominated by white oak, black oak, sugar maple, bitternut hickory, and northern red oak with an average basal area of 75.0 square feet per acre. The understory layer consists of mainly sugar maple, white oak, northern red oak, shagbark hickory, Blackgum, and green ash. The regeneration layer consists of mainly blackgum, ironwood, yellow poplar, white ash, northern red oak, and pignut hickory. Several areas have been hit with past wind damage.

Single tree selection is prescribed to remove lower quality stems, declining 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. White and green ash should be marked for harvest due to the emerald ash borer moving through the area. Group selection may be implemented in areas of low quality stems, disease/damaged stems, low basal area, or maturity to help maintain long-term forest regeneration and sustainability. Regeneration will likely be mixed hardwoods with a component of yellow poplar and oak. Any areas with advanced oak regeneration present should be released with roup selection or shelterwood silviculture.

Pine 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 18% of the tract or about 17.8 acres of the tract with an average basal area of 98.6 square feet per acre. The overstory is dominated by eastern white pine, red pine, black cherry, black oak, and bitternut hickory. The understory layer consists of mainly of red pine, sugar maple, Blackgum, and yellow poplar. The regeneration layer consists of mainly sassafras, sugar maple, American beech, white oak, black oak, white ash, and blackgum.
The white pine is in fair to poor condition with some of the overstory experiencing crown dieback. The red pine is in poor condition with many experience slowed growth and dieback. There are a few areas of wind damage throughout the pine areas. Some areas of pine should be opened up to release the hardwood regeneration that has moved into the understory. Group

selection may be prescribed in areas of low quality, disease/damaged stems, low basal area, or maturity to help maintain long-term forest regeneration and sustainability. Areas where pole sized 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 best croptrees for future conservation. A selection of quality and vigorous white pine may be retained as they provide some wildlife habitat diversity.

Summary Tract Silvicultural Prescription and Proposed Activities

Given the recent inventory and growth of tract 0610's forest resources, a managed timber harvest over the 98 acre tract area is prescribed within the next five years but should consider limitations mentioned in stratum description. Harvest would yield an estimated 160-200 MBF. Tract 0610 could be harvested in conjunction with tract 0609. Problem occurrences of invasive species are prescribed for treatment prior to harvest operations. Following the prescribed harvest operation, TSI is to be undertaken along with assessment of invasive species for follow-up treatment.

Table 3. Overview of Sawtimber Volume Estimates for 0610

Species	Harvest	Leave	Total
White Oak	20,690	137,950	158,640
Red Pine	53,260	33,000	86,260
Black Oak	19,890	57,810	77,700
Eastern White Pine	9,390	61,810	71,200
Yellow Poplar	14,820	49,270	64,090
Bitternut Hickory	0	29,180	29,180
Sugar Maple	6,030	22,870	28,900
Northern Red Oak	3,770	16,430	20,200
White Ash	14,060	0	14,060
American Beech	5,510	6,100	11,610
American Sycamore	5,140	6,300	11,440
Largetooth Aspen	4,190	3,750	7,940
Shagbark Hickory	0	7,660	7,660
Black Cherry	0	7,650	7,650
Pignut Hickory	0	6,700	6,700
Silver Maple	0	4,510	4,510
Sweetgum	0	2,380	2,380
Blackgum	2,000	0	2,000
Green Ash	1,580	0	1,580
Tract Totals (Bd. Ft.)	**160,330**	**453,370**	**613,700**
Per Acre Totals (Bd. Ft./Ac.)	**1,636**	**4,626**	**6,262**

ProposedActivities Listing

Proposed Management Activity	***Proposed Period***
Pre-harvest Invasives Treatment	CY2016-2018

DHPA timber sale project review	CY2016-2019
Timber Marking &Invasives Evaluation	CY2016-2021
Timber Sale	CY2016-2021
Postharvest TSI &Invasives Follow-up	CY2017-2022
Regeneration Opening Review	3 yrs post-harvest
Reinventory and Management Guide	CY2030

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