

**Indiana Department of Natural Resources  
Division of Forestry  
DRAFT**

**RESOURCE MANAGEMENT GUIDE**

State Forest: **Ferdinand**  
Tract Acreage: **78**  
Forester: **A. Smith**

Compartment: **02** Tract: **09**  
Commercial Forest Acreage: **78**  
Date: **9/28/2015**

**Location**

Tract 0209 is located in Dubois County, Sections 17 and 18, T3S, R3W in Jefferson Township. It is located roughly 0.2 miles south of the Ferdinand State Forest office and 4.7 miles east northeast of Ferdinand, IN. The tract is accessible off of the main forest road, by Firelane #2, and by Country Road 850 South.

**General Description**

Tract 0209 consists of approximately 78 acres with roughly 14 acres of planted eastern white pine, 44 acres of mixed hardwoods, and 20 acres of oak-hickory forest. The popular South Ridge Trail runs through this tract. Also, the northeastern edge of tract 0209 is visible from the Dam Campground and the popular Sycamore Shelterhouse. 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 0209 in relation to species dominance is noted below in Table 1.

**Table 1. Overview of Forest Resources in Tract 0209**

<b>Overstory Sawtimber Layer</b>	<b>Understory Poletimber Layer</b>	<b>Regeneration Layer</b>
Eastern White Pine	Sugar Maple	American Beech
Sugar Maple	American Beech	Sugar Maple
White Oak	Bitternut Hickory	Red Elm
Yellow Poplar	Red Pine	Sassafras
American Beech	Yellow Poplar	White Ash
Northern Red Oak	Sassafras	American Elm
Pignut Hickory	Pignut Hickory	Red Maple
Black Oak	Eastern White Pine	Blackgum
American Sycamore	Black Oak	Yellow Poplar
White Ash	Red Elm	Bluebeech
Bitternut Hickory	Shagbark Hickory	Eastern White Pine
Black Walnut	Black Cherry	River Birch
Black Cherry		Bitternut Hickory
Red Pine		Black Oak
Shagbark Hickory		Ironwood
Red Elm		Pignut Hickory

## **History**

The land area that includes tract 0209 (see Figure 1) was deeded to the State of Indiana through two separate deeds in 1934. This area of Ferdinand State Forest contained the original land contributions that allowed for the creation of the forest. Seventy acres were deeded to the State of Indiana by Joseph and Emma Leinebach. Herman and Marie Diek contributed 265.4 acres to what became Ferdinand State Forest.

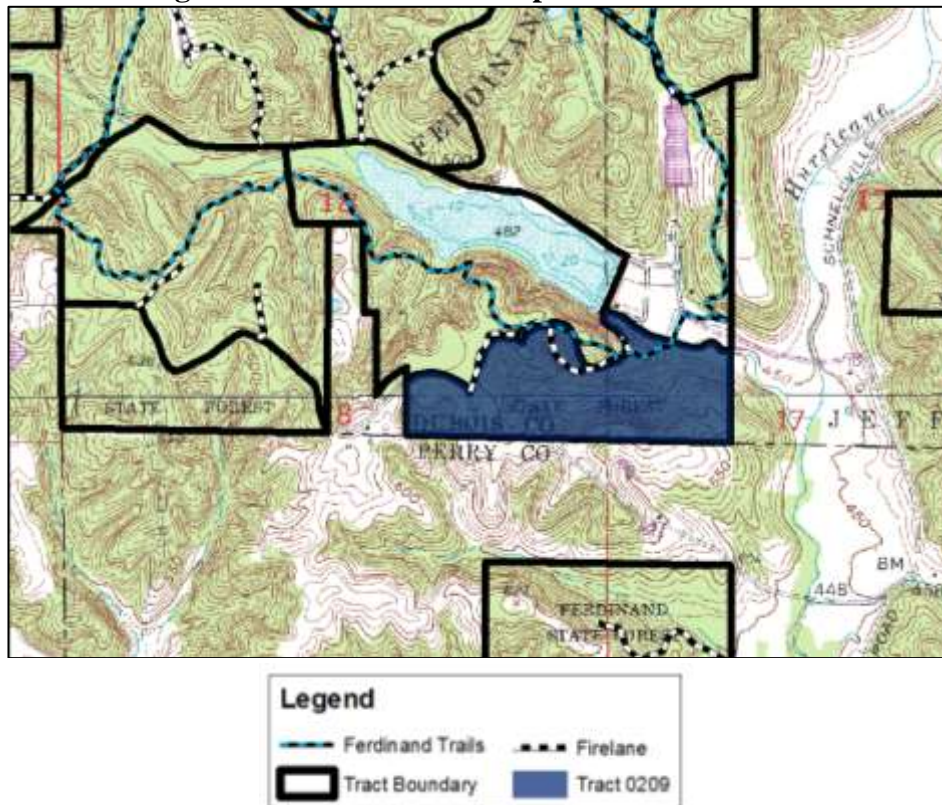
The Civilian Conservation Corps (CCC) replanted large areas across the original land contributions during the mid to late 1930's. The CCC camp also constructed Ferdinand Lake and the main forest road during this time. A timber harvest occurred in 1965 and removed an estimated 18,520 bdf in 91 sawtimber trees (some records state 85 sawtimber trees). This sale was sold to Edgar E. Hoffman & Sons for \$557.33. A second timber harvest occurred in 1967 and was sold to Dolly Madison Industries (currently DMI). This sale consisted of an estimated 103,440 bdf in 558 trees. A two acre walnut plantation was completed on 1969.

Forester Janet Eger conducted a resource inventory in 1980 and found there to be 233,974 bdf total volume for 58 acres of commercial hardwood acres. Vine TSI was completed over most of the tract in January of 1999. Forester Doug Brown completed a resource inventory in November of 1999 (estimated 7,789.4 bdf/acre total volume with 2,691.9 bdf/acre harvest volume). Forester Doug Brown conducted a timber sale on June 20, 2000. Rasche Brothers Logging purchased an estimated 85,232 bdf in 311 trees and 43 culls for \$32,852.00. Post harvest TSI was completed on 2002 by property staff and by a CR&R forester. Forester Doug Brown completed invasives TSI in 2005 and in 2006 on portions of tract 0209. The current tract resource inventory was completed in 2015 by Jacob Henry. Forester Amanda Smith completed invasives TSI for ailanthus on tract 0209 in fall 2015.

## **Landscape Context**

The ridgetops are mostly comprised of old field mixed hardwoods and planted pine plantations, while the side slopes are mostly comprised of mixed hardwoods and oak-hickory. State forest borders the tract to the north while private agriculture fields and forests border the rest of the tract. Water sources on the tract include a large ephemeral drainage that cuts across most of the tract from west to east. This ephemeral drainage flows into a perennial stream that runs along the northeast boundary of tract 0209 from Ferdinand Lake.

**Figure 1. Ferdinand SF Compartment 02 Tract 09**



### **Topography, Geology and Hydrology**

One main drainage runs from west to east-northeast through the majority of tract 0209. This creates mainly north, east, and south-facing slopes across the area. A perennial streams runs along the northeast boundary of the tract from Ferdinand Lake. Signs of past soil erosion exist under the eastern white pines- remnant scars of worn out farmlands. The Ferdinand Lake is located north of tract 0209 in tract 0207.

### **Soils**

**Cuba silt loam (Cu)** is a frequently flooded soil with a depth of more than 80 inches to the water table occurring on 0-2% slopes in flood-plain steps. It is moderately permeable at 0.6 to 2 inches per hour. Available water storage profile is high at about 10.9 inches.

**Gilpin silt loam (GID2)** is a well-drained soil with a depth of more than 40 inches to the water table occurring on 12-18% side slopes in upland areas. It is eroded and contains 1-3% organic matter. It is moderately permeable at 0.6 to 2 inches per hour above 60 inches and available water capacity is low at 3.9 inches above 60 inches. The pH ranges from 3.6 to 5.5. Bedrock begins at a depth of 20-40 inches.

**Gilpin silt loam (GIE)** is a well-drained soil with a depth of more than 40 inches to the water table occurring on 18-25% side slopes in upland areas. It contains 1-3% organic matter and is moderately permeable. Available water capacity is low, 3.7 inches in the upper 60 inches. The site index is 95 for yellow poplar.

***Gilpin-Berks complex (GoF)*** makes up the greatest area of this tract. The Gilpin-Berks complex contains Gilpin and Berks soils. They are well-drained with a depth of more than 40 inches to the water table. They occur on 20-50% side slopes in upland areas. The Gilpin surface layer is silt loam and the Berks surface layer is channery silt loam. Organic matter content is moderately low and permeability is moderate. Available water capacity is 3.7 inches above 60 inches in Gilpin soils and 2.6 inches above 60 inches in Berks soils. The pH range and depth to bedrock are the same as the previously listed Gilpin soils. The site index for Gilpin soils is 95 for yellow poplar and the site index for Berks soils is 70 for black oak.

***Tilsit silt loam (TIB)*** is a moderately well-drained soil with a depth of 18 to 30 inches to the water table occurring on 2-6% slope. Available water storage is low at 5.9 inches. The site index is 100 for yellow poplar and 60 for white oak.

***Zanesville silt loam (ZnC2)*** is a moderately well-drained soil with a depth of 2-3 feet to the water table, seasonally. It occurs on 6-12% side slopes in upland areas. Organic matter content is moderately low at 1-2% and permeability is very slow. Available water capacity is 8.2 inches above 60 inches. The pH ranges from 4.5 to 6.0. Bedrock begins at a depth of 50-90 inches. This soil has a site index of 69 for white oak and 90 for yellow poplar.

***Zanesville silt loam (ZnC3)*** is a moderately well-drained soil with a depth of 18-30 inches to the water table, seasonally. It occurs on 6-12% side slopes in upland areas. It is severely eroded. Organic matter content is moderately low at 1-2% and permeability is very slow. Available water capacity is 8.2 inches above 60 inches. The pH ranges from 4.5 to 6.0. Bedrock begins at a depth of 60-80 inches. This soil has a site index of 69 for white oak and 90 for yellow poplar.

### **Access**

Tract 0209 is easily accessible off of the main forest road, by Firelane 2, and by County Road 850 South. The South Ridge Trail cuts through the tract running along the southern side of Ferdinand Lake.

### **Boundary**

Tract 0209 is bounded on the north by in part by the perennial stream, Firelane # 2, and County Road 850 South. The east boundary is indicated by fencing along part of the line. The south boundary is indicated by fencing along part of the line. The west boundary runs along the private inholding that is bordered by a barbed wire fence.

### **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 wildlife species were observed in the tract during the inventory. (songbirds, chipmunks, squirrels, box turtles, toads, deer) Tract 0209 has an abundant supply of food resources such as soft and hard mast. The perennial stream and Ferdinand Lake provide a water source for wildlife.

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) following the harvest is planned which will increase standing snag counts. Management practices conducted on 0209 will be conducted in a manner that will maintain quality and diverse forest habitats for wildlife populations long term.

**Live Legacy Trees\* and Snags inventoried 2015 on F0209**

	<b>Maintenance Level</b>	<b>Optimal Level</b>	<b>Inventory</b>	<b>Available Above Maintenance</b>	<b>Available Above Optimal</b>
<b>Legacy Trees *</b>					
11"+ DBH	702		1,220	518	
20"+ DBH	234		236	2	
<b>Snags (all species)</b>					
5"+ DBH	312	546	820	508	274
9"+ DBH	234	468	459	225	
19"+ DBH	39	78	14		

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

**Communities**

Tract 0209 is composed of mesic to dry-mesic upland hardwoods dominated by mixed hardwoods, oak-hickory, and pine plantings. The dominant overstory timber species include eastern white pine, sugar maple, white oak, yellow pine, American beech, and northern red oak. The understory contains mainly sugar maple, American beech, bitternut hickory, red pine, and yellow poplar. The ground cover of tract 0209 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 RSAs or old growth areas appear to exist within this tract.

**Exotic Species**

Ailanthus, Japanese honeysuckle, Japanese stilt grass, autumn olive, and multiflora rose were observed during the inventory. Japanese stilt grass is found along the hiking trail and firelanes as well as down in the floodplain area. Control measures may be warranted for Japanese honeysuckle, autumn olive, and multiflora rose if populations are located in future regeneration openings. The ailanthus and Japanese stilt grass should be treated before and after timber harvest activities.

## **Recreation**

Likely recreational activities on this tract include hiking, bird watching, wildlife viewing, hunting, and mushroom hunting. The Southridge Trail runs through the tract along the southern edge of Ferdinand Lake. These are important recreation features on the property and will be given consideration during resource management planning and implementation. Trails may be temporarily closed or rerouted during active management periods.

## **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.

### **Tract Subdivision Description and Silvicultural Prescription**

The overall stand structure for the 78 commercial forest acres in this tract is represented in the following Gingrich Stand and stock table that follows the individual stand summary.

#### **Tract Summary Data**

Total Trees/Ac. = **163 Trees/Ac.**

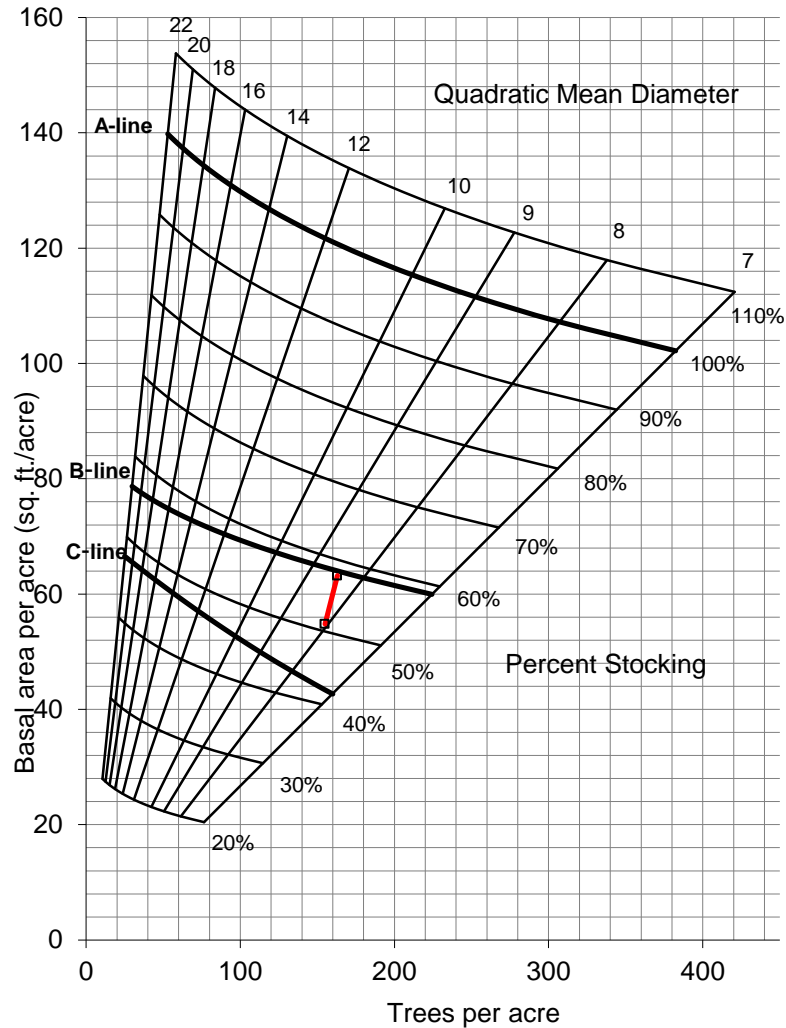
Overall % Stocking Hardwoods = **59%** (Understocked)

BA/A = **63.2 Sq. Ft./Ac.**

Sawtimber & Quality Trees/Ac. = **26 Trees/Ac.**

Present Volume = **6,524 Bd. Ft./Acre**

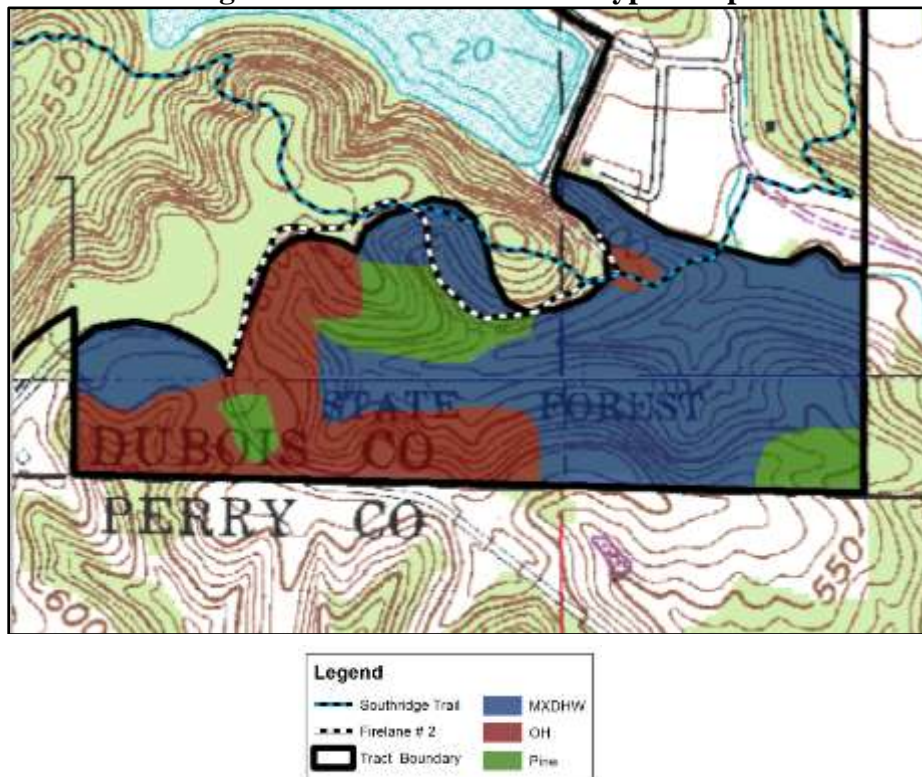
**Table 2. Gingrich Stand and Stock Table for the 78 Commercial Forest Acres in tract 0209**



**Summary Tract Silvicultural Prescription and Proposed Activities**

The current forest resource inventory was completed in 2015 by Jacob Henry. Thirty-one prism points were sampled over 78 acres (1 point for every 2.5 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 stratum based on the 3 major timber types and size classes mentioned below.

**Figure 2. Tract 0209 Stratum Types Map**



### **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 17.9% of the tract or about 14.0 acres of the tract with an average basal area of 95.2 square feet per acre. The overstory is dominated by eastern white pine, white ash, and red pine with an understory layer consisting mainly of red pine, sassafras, black oak, and sugar maple. The regeneration layer consists of mainly American beech, sugar maple, sassafras, and white ash.

The white pine is in fair to poor condition with some of the overstory experiencing crown dieback. The red pine is in poor condition. Pine openings 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 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 best croptrees for future conservation. A selection of quality and vigorous white pine may be retained as they provide some wildlife habitat diversity.



Aesthetics need to be taken into consideration when marking pine openings because of the tract's close proximity to Ferdinand Lake and the Southridge Trail.

### **Mixed Hardwoods Stratum**

The mixed hardwoods timber type can be very variable in composition and thereby have more complicated prescriptions. The mixed hardwoods type covers roughly 56.4% of the tract or about 44 acres with an average basal area of 54.2 square feet per acre. The overstory is dominated by eastern white pine, sugar maple, American beech, and yellow poplar. The understory layer consists of mainly sugar maple, American beech, and bitternut hickory. The regeneration layer consists of mainly American beech, sugar maple, red elm, American elm, and yellow poplar.

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.

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 conjunction with creation of the pine openings is recommended to salvage any over mature and declining black oaks and red oaks, dying yellow poplar, and ash within practical distance of the pine openings. The salvage harvest will help to open up the canopy somewhat to promote regenerating the oak and hickory species in the area that need more sunlight to germinate. Also, regeneration openings could be created in the west third of the tract that is dominantly American beech and sugar maple. 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 very 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 25.6% of the tract or about 20.0 acres. The overstory is dominated by white oak, northern red oak, pignut hickory, sugar maple, yellow poplar, and black oak with an average basal area of 71.6 square feet per acre. The understory layer consists of mainly American beech, pignut hickory, sugar maple, bitternut hickory, and yellow poplar. The regeneration layer consists of mainly sugar maple, American beech, white ash, sassafras, red elm, red mulberry, and American beech.

A single tree selection harvest is not prescribed over the entire oak-hickory stratum due to the low stocking numbers. However, a light salvage harvest in conjunction to the creation with the creation of pine openings is recommended to salvage any over mature and declining black oaks and red oaks, dying yellow poplar, and ash within attainable reach of the pine openings. The salvage harvest will help to open up the canopy a little in hopes of regenerating the oak and hickory species in the area that need more sunlight to germinate.

**Summary Tract Silvicultural Prescription and Proposed Activities**

Given the recent inventory and growth of tract 0209’s forest resources, a limited salvage harvest over an estimated 30 acres of the tract is prescribed. Areas of ailanthus are prescribed for treatment prior to harvest operations. Following the prescribed harvest operation, TSI is to be undertaken over the entire tract area along with assessment of invasive species for follow-up treatment.

**Table 3. Overview of Sawtimber Volume Estimates for the 78 Commercial Forest Acres in 0209**

<b>Species</b>	<b>Harvest</b>	<b>Leave</b>	<b>Total</b>
Eastern White Pine	31,770	93,480	125,250
Sugar Maple	3,890	69,750	73,640
White Oak	1,690	67,480	69,170
Yellow Poplar	7,460	45,100	52,560
American Beech	8,870	40,730	49,600
Northern Red Oak	0	36,010	36,010
Pignut Hickory	0	27,380	27,380
Black Oak	0	14,100	14,100
American Sycamore	0	10,500	10,500
White Ash	6,270	4,040	10,310
Bitternut Hickory	0	10,190	10,190
Black Walnut	0	9,640	9,640
Black Cherry	0	9,080	9,080
Red Pine	1,500	4,700	6,200
Shagbark Hickory	0	3,820	3,820
Red Elm	0	1,440	1,440
<b>Tract Totals (Bd. Ft.)</b>	<b>61,450</b>	<b>447,440</b>	<b>508,890</b>
<b>Per Acre Totals (Bd. Ft./Ac.)</b>	<b>788</b>	<b>5,736</b>	<b>6,524</b>

**Proposed Activities Listing**

<u><i>Proposed Management Activity</i></u>	<u><i>Proposed Period</i></u>
Pre-harvest Invasives Treatment	CY2016-2017
DHPA timber sale project review	CY2016-2018
Timber Marking & Invasives Evaluation	CY2016-2021
Timber Sale	CY2016-2021
Post-harvest TSI & Invasives Follow-up	CY2018-2022
Regeneration Opening Review	3 yrs post harvest
Reinventory and Management Guide	CY2030

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