

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

RESOURCE MANAGEMENT GUIDE

State Forest: **Ferdinand**
Tract Acreage: **128.5**
Forester: **A. Smith**

Compartment: **02** Tract: **07**
Commercial Forest Acreage: **78.2**
Date: **10/6/2014**

Location

Tract 0207 is located in Dubois County, Sections 17 and 18, T3S, R3W in Jefferson Township. It is located roughly 0.1 miles west southwest of the Ferdinand State Forest office and 4.5 miles east northeast of Ferdinand. The tract is accessible off of the main forest road, by Firelane #2, and by Country Road 850 South.

General Description

Tract 0207 consists of approximately 128.5 acres with roughly 5 acres of planted eastern white pine, 56.0 acres of mixed hardwoods, 17.2 acres of oak-hickory forest, 10.4 acres of recreational land, and the 39.9 acre Ferdinand Lake. This tract is heavily used for recreation with the popular South Ridge Trail running along the southern edge of Ferdinand Lake, the beach area, three shelter houses, numerous picnic tables, a camping area, two boat ramps, and fishing in the lake. The area to the west of the lake is often marshy and has been planted in the past with bald cypress interspersed with natural wetland species. 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 0207 in relation to species dominance is noted below in Table 1.

Table 1. Overview of Forest Resources in Tract 0207 in August 2014

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Yellow Poplar	American Beech	American Beech
Eastern White Pine	Sugar Maple	Sugar Maple
White Oak	Pignut Hickory	Yellow Poplar
Bald Cypress	Eastern White Pine	Red Maple
American Beech	Blackgum	American Elm
Northern Red Oak	Black Walnut	Bluebeech
Sugar Maple	Bitternut Hickory	Eastern Redcedar
Black Oak	Red Pine	Black Walnut
Pignut Hickory	White Oak	Blackgum
Scarlet Oak	Yellow Poplar	Dogwood
Black Walnut	American Elm	Sassafras
Bitternut Hickory	Sassafras	Hackberry
Virginia Pine		Red Elm
Red Maple		Bitternut Hickory
American Sycamore		Black Oak
Pin Oak		Northern Red Oak

Blackgum White Ash Black Cherry River Birch Shagbark Hickory		Scarlet Oak White Oak White Ash
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History

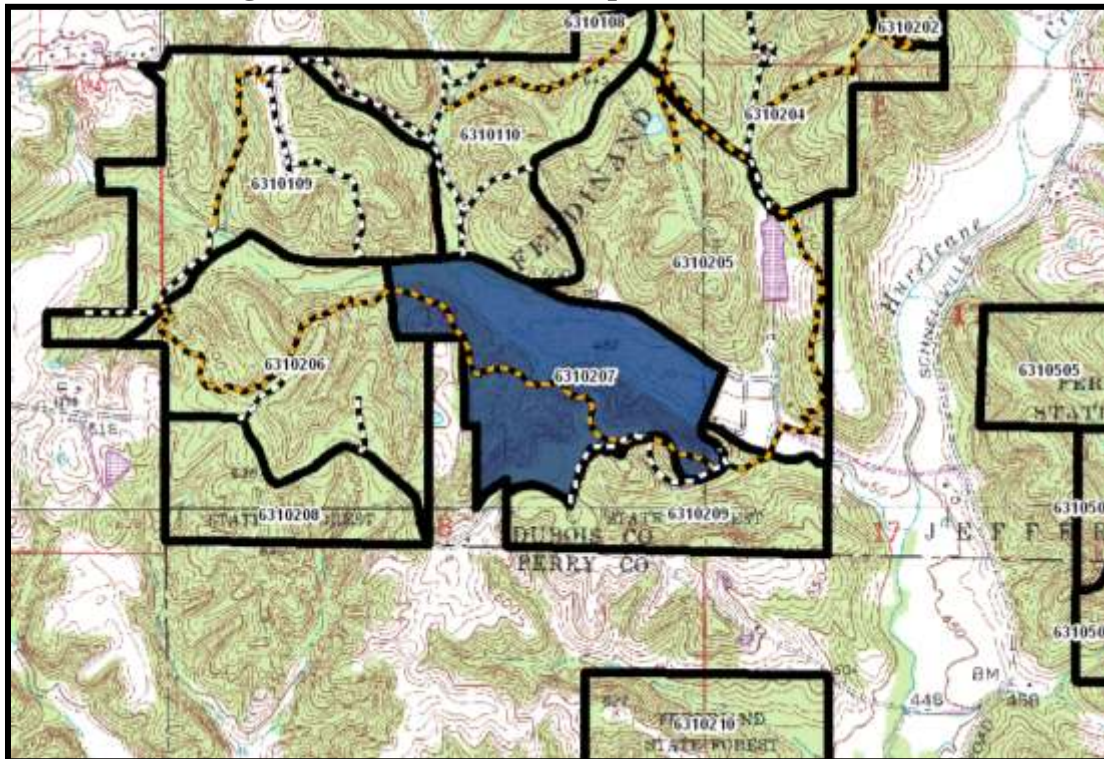
The land area that includes tract 0207 (see Figure 1) was deeded to the State of Indiana through four separate deeds in 1934. This area of Ferdinand State Forest contained the original land contributions that allowed for the creation of the forest. Eighty-four acres were deeded to the State of Indiana by Joseph and Emma Leinebach for the price of \$1.00. Herman and Marie Diek contributed 265.4 acres. Clara and George Gude contributed 10.0 acres and Henry and Agnes Tretter deeded 100 acres to the State of Indiana also for the price of \$1.00.

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 1967/68 and removed an estimated 112,520 BdFt from 58 acres. Forester Janet Eger conducted a resource inventory in 1980 and found there to be 8,347 BdFt/Acre on 30 commercial hardwood acres. 175 Bald Cypress were planted on the upper end of Ferdinand Lake in 1983. Forester Doug Brown completed a resource inventory in October, 1994 (estimated 7,549 BdFt/Acre for 38 commercial forest acres). The tract boundaries were adjusted in 1994 bring tract 7 to an estimated 135 total acres. Forester Doug Brown conducted a timber sale on August 22, 1996. DMI Furniture purchased an estimated 63,822 BdFt in 255 trees and 43 culls for \$20,222.00. Post harvest TSI was completed on January 6, 1999 by CR&R laborer Pat McDaniel. The current tract resource inventory was completed on August 7, 2014 by forester Amanda Smith.

Landscape Context

The ridgetops are mostly comprised of old field mixed hardwoods and planted pine plantations while, the sideslopes are mostly comprised of mixed hardwoods and oak-hickory. State forest surrounds all sides of the tract except for a sliver of private agriculture land that runs along the western boundary of the tract. Water sources on the tract include Ferdinand Lake, small and large ephemeral drainages, and two mapped intermittent streams.

Figure 1. Ferdinand SF Compartment 02 Tract 07



Topography, Geology and Hydrology

North, east, and west-facing slopes varying from long and gentle to abrupt and steep characterize tract 0207. Eastern white pine is the dominant species on the flatter ridgetop on the southeast boundary of the tract. Signs of past soil erosion exist under the eastern white pines.

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 (GID3) is similar to Gilpin silt loam (GID2). Gilpin silt loam (GID3) differs only in that it is severely eroded and contains less organic matter at 1-2%. Both soils have a site index of 95 for yellow poplar. Both can be subject to drought.

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 silt loam (GIE3) is a well-drained soil with a depth of more than 80 inches to the water table occurring on 18-25% side slopes in upland areas. It is severely eroded. 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.

Orthents (Omz) is the man-made dam and has a depth of more than 80 inches to the water table occurring on 0-45% slopes.

Steff silt loam (SF) is a frequently flooded soil with a depth of more than 80 inches to the water table occurring on 0-2% side slopes in upland areas. It is moderately well drained. 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 100 for sweetgum.

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.

Wellston silt loam (WeC2) is a well-drained soil with a depth of more than 40 inches to the water table occurring on 6-12% side slopes in upland areas. It is eroded and has a silt loam surface layer, contains moderately low organic matter, and has moderate permeability. Available water capacity is 7.8 inches above 60 inches. The pH ranges from 4.5 to 6.0. Bedrock begins at 40 to 72 inches. This soil has a site index of 81 for northern red 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 0207 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 0207 is bounded on the north by the paved main forest road. The east boundary is the dam and Firelane #2. The south boundary is Country Road 850 South. The west boundary runs along the private inholding and then goes due west from the NW corner of the private property. The western boundary then follows a draining north to the main forest road. The private property boundary is lined with fencing, however the fence lines are questionable and a survey should be completed or a buffer given to this area during timber management activities.

Wildlife

A Natural Heritage Database Review was completed for tract 0207 in 2014. If rare, threatened or endangered species were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species. Songbirds, ducks, geese, great blue heron, crows, chipmunks, squirrels, box turtles, toads, and a garter snake were observed in the tract during the inventory. Tract 0207 has an abundant supply of food resources such as soft and hard mast. The mapped intermittent streams and Ferdinand Lake provide a water source for wildlife.

The Division of Forestry has instituted procedures for conducting forest resource inventories so that the documentation and analysis of live tree and snag tree densities are examined on a compartment level basis in order to maintain long-term and quality forest habitats. 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 0207 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Live Legacy Trees* and Snags inventoried August, 2014 on F0207

	Maintenance Level	Optimal Level	Inventory
Legacy Trees *			
11"+ DBH	1,215		1,195
20"+ DBH	405		332
Snags (all species)			
5"+ DBH	540	945	1,287
9"+ DBH	405	810	942
19"+ DBH	67.5	135	54

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

Communities

Tract 0207 is composed of mesic to dry-mesic upland hardwoods dominated by oak-hickory, mixed hardwoods, a wet-mesic floodplain area, and pine plantings. The dominant overstory timber species include yellow poplar, eastern white pine, white oak, bald cypress, American beech, and northern red oak. The understory contains mainly American beech, sugar maple, pignut hickory, eastern white pine, blackgum, and black walnut. The ground cover of tract 0207 consists of mainly mesic to dry mesic species.

Exotic Species

Amur honeysuckle, Japanese honeysuckle, Japanese stilt grass, autumn olive, garlic mustard, and multiflora rose were observed during the inventory. Dense patches of these invasive exotic species are scattered throughout the tract, especially where deteriorating pine is giving way to hardwood species and in the presence of dead down debris. Japanese stilt grass is found along the hiking trail and firelanes as well as down in the floodplain area. Garlic mustard is also found in the floodplain area and in some of the ephemeral drainages in the spring. Control measures may be warranted for amur honeysuckle, Japanese honeysuckle, autumn olive, and multiflora rose if populations are located in future regeneration openings. The Japanese stilt grass and garlic mustard should be treated before and after timber harvest activities. There have been stilt grass and garlic mustard spot treatments using glyphosate the past two years; these treatments were located along the major drainage running north into the south side of the lake.

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. The trailhead is located along the main entrance road at a small parking area roughly 0.5 miles west of Ferdinand Lake. Several bicyclists and hikers were seen using the trail over the course of the inventory.

Cultural

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

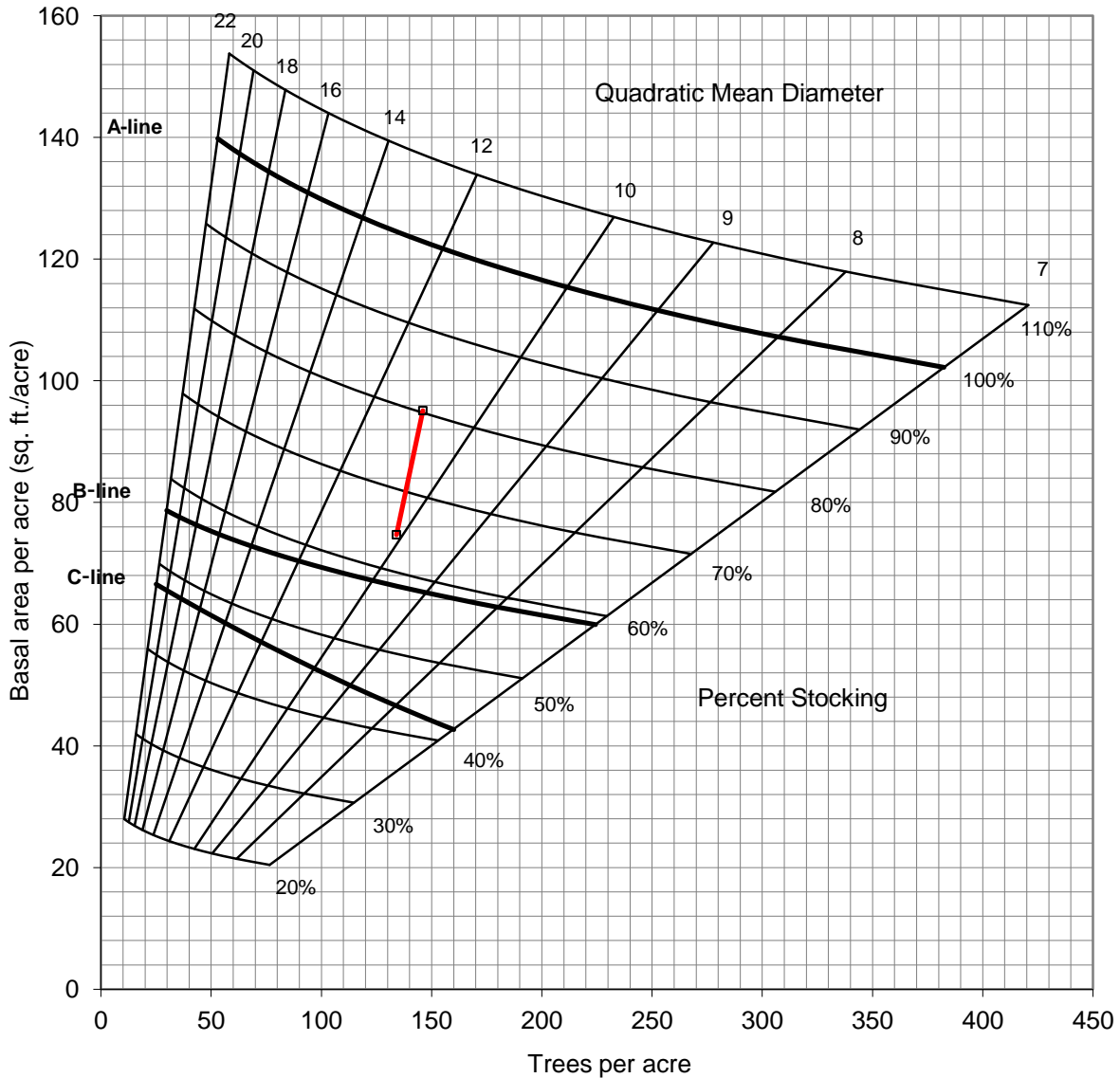
Tract Subdivision Description and Silvicultural Prescription

The overall stand structure for the 78.2 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. = **146 Trees/Ac.** Overall % Stocking Hardwoods = **81% (Fully Stocked)**
 BA/A = **95.1 Sq. Ft./Ac.** Sawtimber & Quality Trees/Ac. = **39 Trees/Ac.**
 Present Volume = **10,680 Bd. Ft./Acre**

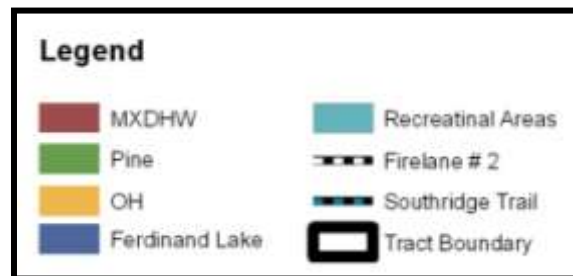
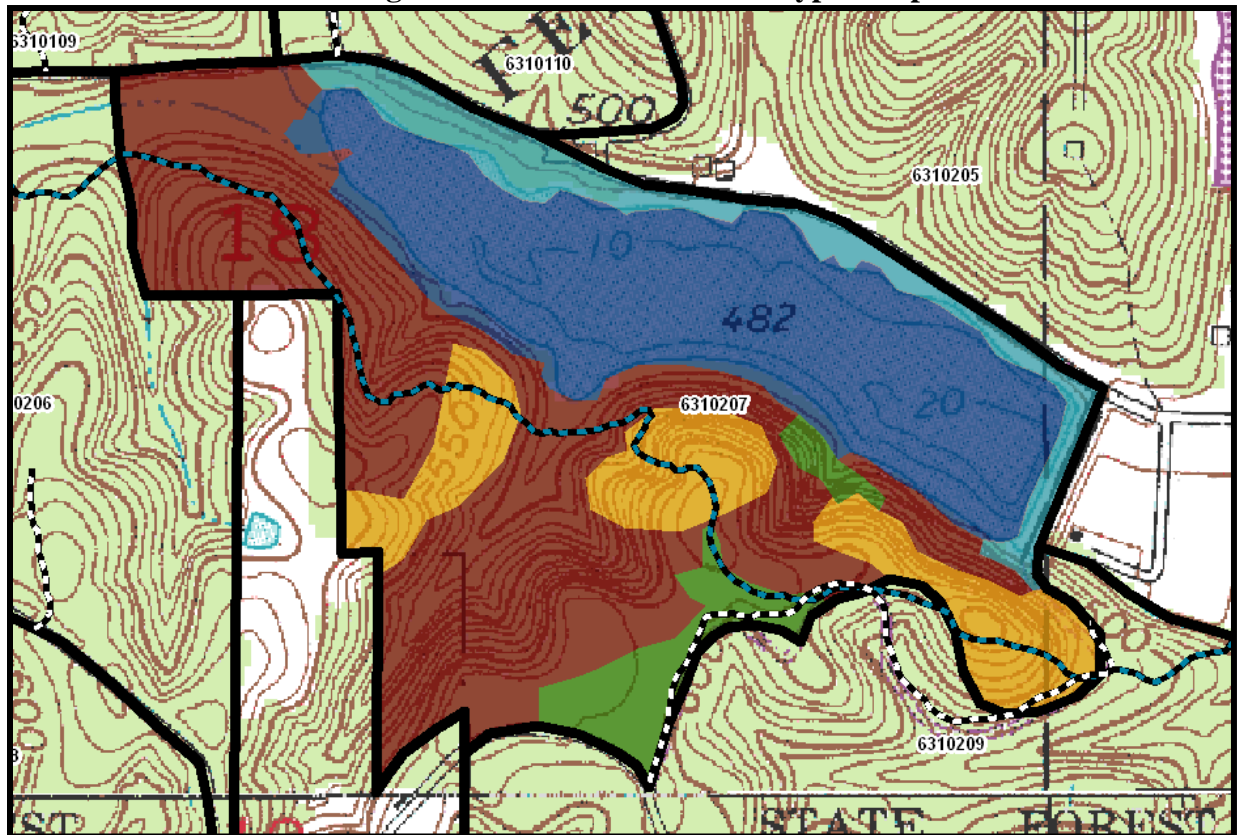
Table 2. Gingrich Stand and Stock Table for the 78.2 Commercial Forest Acres in tract 0207 in August, 2014



Summary Tract Silvicultural Prescription and Proposed Activities

The current forest resource inventory was completed on August 7, 2014 by Amanda Smith. Thirty-nine prism points were sampled over 128.5 acres (1 point for every 3.3 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 5 different stratum types based on the 3 major timber types and size classes mentioned below.

Figure 2. Tract 0207 Stratum Types Map



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 43.4% of the tract or about 56 acres with an average basal area of 87.2 square feet per acre. This stratum type is considered fully stocked at approximately 74% and 137 trees per acre. The overstory is dominated by yellow poplar, white oak, eastern white pine, American beech, northern red oak, and sugar maple. The understory layer consists of mainly sugar maple, black walnut, blackgum, pignut hickory, and yellow poplar. The regeneration layer consists of mainly sugar maple, American beech, yellow poplar, American elm, and sassafras.

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

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

A single tree selection harvest is prescribed to remove lower quality stems and mature to overmature trees which will help to improve croptree spacing. An improvement cutting is prescribed to release quality oaks, hickories and walnuts from crown competition of lesser-valued timber species. This is an important change in the Mixed Hardwood component as these timber species tend not to be heavy mast producers nor tend to provide valuable timber resources. Overall, marking objectives within this component should consider oak, hickory, walnut, and other species of significant timber and wildlife value as the preferred croptrees released. Improvement cuttings in this area will also be applied to remove low-forking, leaning, overtopped/suppressed intermediates, epicormically sprouting, and deformed trees. The long-term result of these prescribed cuttings will increase timber and wildlife habitat diversity. Group selection 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 YEP.

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 13.2% of the tract or about 17.2 acres. The overstory is dominated by white oak, northern red oak, pignut hickory, scarlet oak, American beech, and bitternut hickory with an average basal area of 110.2 square feet per acre. The understory layer consists of mainly blackgum, pignut hickory, sugar maple American beech, bitternut hickory, and white oak. The regeneration layer consists of mainly sugar maple, American beech, dogwood, blackgum, and American elm.

Single tree selection is 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 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 a group selection opening.

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 3.9% of the tract or about 5.0 acres of the tract with an average basal area of 154.6 square feet per acre. The overstory is dominated by eastern white pine with an understory layer consisting mainly of sugar maple, red maple, and eastern white pine. The regeneration layer consists of mainly sugar maple, red maple, American beech, white ash, American elm, and black cherry.

The white pine is in fair to poor condition with some of the overstory experiencing crown dieback. 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 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.

Lake and Recreational Area Stratums

The lake and recreational areas will continue to be managed to provide recreational opportunities and watershed protection. Harvest areas adjacent to the lake and recreational areas will be evaluated for BMPs and aesthetics; buffers may be implemented. Algae control has been conducted over the past several years during the recreation season. The algae growth is probably due to combination of decreasing lake depth from siltation and nutrient inputs from nearby agricultural uses. A plan to dredge the lake, possibly by 2020, will hopefully help alleviate this issue.

Summary Tract Silvicultural Prescription and Proposed Activities

Given the recent inventory and growth of tract 0207's forest resources, a managed timber harvest over the 78.2 acre commercial forest area is prescribed within the next five years and will yield an estimated 175-275MBF. 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 the 78.2 Commercial Forest Acres in 0207 in August of 2014

Species	Harvest	Leave	Total
Yellow Poplar	51,910	92,270	144,180
Eastern White Pine	48,810	85,150	133,960
White Oak	8,880	112,110	120,990
Baldcypress	0	97,630	97,630
American Beech	18,530	45,400	63,930
Northern Red Oak	17,670	40,830	58,500
Sugar Maple	14,420	22,660	37,080
Black Oak	12,160	20,740	32,900
Pignut Hickory	8,360	19,760	28,120
Scarlet Oak	0	22,340	22,340
Black Walnut	0	20,430	20,430
Bitternut Hickory	0	16,610	16,610
American Sycamore	0	12,870	12,870
Red Maple	3,430	8,040	11,470
Pin Oak	4,910	6,470	11,380
Blackgum	6,970	0	6,970
White Ash	5,360	0	5,360
Black Cherry	4,940	0	4,940
River Birch	0	3,880	3,880
Shagbark Hickory	0	1,620	1,620
Tract Totals (Bd. Ft.)	206,350	628,810	835,160
Per Acre Totals (Bd. Ft./Ac.)	2,639	8,041	10,680

Proposed Activities Listing

Proposed Management Activity

Proposed Period

Invasives Treatment	CY2015-2017
DHPA timber sale project review	CY2015-2018
Timber Marking & Invasives Evaluation	CY2015-2020
Timber Sale	CY2015-2020
Postharvest TSI & Invasives Follow-up	CY2016-2021
Regeneration Opening Review	CY2019-2024
Reinventory and Management Guide	CY2028

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Note: Some graphics may distort due to compression.