

Indiana Department of Natural Resources – Division of Forestry

Draft

Resource Management Guide

State Forest: Morgan-Monroe
Tract Acreage: 113
Forester(s): W. Capello/P. Jones
Management Cycle End Year: 2028

Compartment: 07 **Tract:** 01
Commercial Acreage: 110
Date: February 2/12/14
Management Cycle Length: 15 years

Location

Compartment 7 Tract 1 is located in the east ½ of Section 1, T10N, R1W of Monroe County. M0701 lies approximately 5 miles southwest of Martinsville, IN. and about 11 miles north of Bloomington, IN. The tract lies just north of the Morgan-Monroe State Forest Entrance and is adjacent to Old State Route 37.

General Description

M0701 consists of a total of 113 forested acres (Figure 1.) of which approximately 110 acres are of commercial forestland. The 3 noncommercial acres consist of the Morgan County Road and the large perennial stream known as Indian Creek. Morgan County Road bisects the tract in its northeast portion. The portion of the tract southwest of Morgan County Rd. (82 acres) is composed of mainly Oak-Hickory forest and Mixed Hardwoods such as Yellow Poplar, Sugar Maple, Beech, Sycamore, Elms and some White Pine. This area's topography is modest to steep wooded timberland with medium to large sawtimber trees. This area also contains eight regeneration openings totaling 15 acres that were created in 1987. The portion of the tract northeast of the

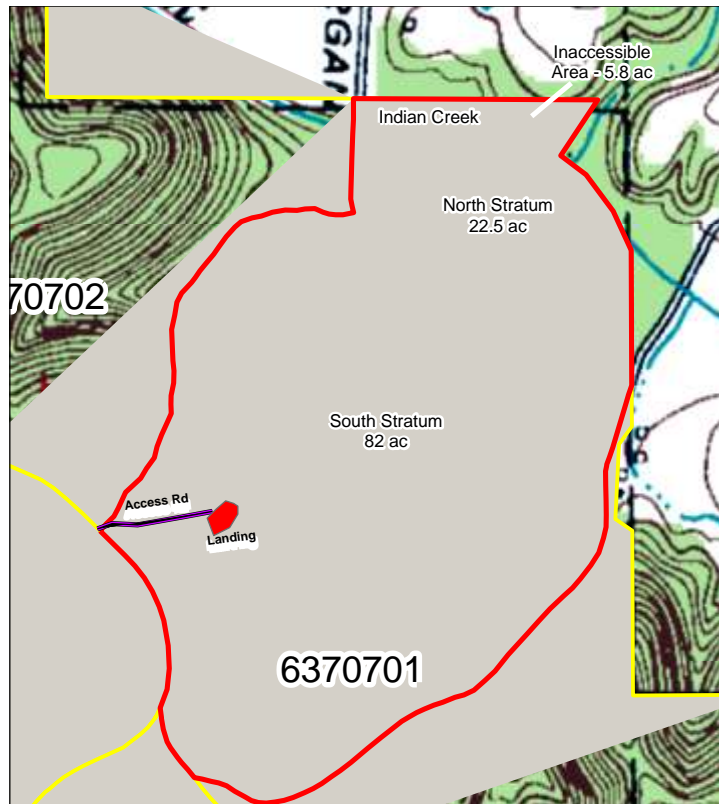


Figure 1. Morgan Monroe Compartment 7 Tract 1

Morgan County Rd. (22.5 acres) is an old bottomland field that is composed of a mixture of naturally regenerated oldfield areas as well as tree plantations. Planted species that survived include Sweetgum, Bald Cypress, Virginia Pine and Black Walnut. The Virginia Pine are decadent and in decline, the Black Walnut is of average size and quality however the Sweetgum and Bald Cypress appear to have great vigor and size. The naturally regenerated areas of this bottomland consist of primarily Yellow Poplar, Aspen, Sycamore, and Red Maple timberland. The remaining forested acreage on the north side of Indian Creek (5.8 acres) is currently inaccessible. A summary of the forest resources in M0701 in relation to species dominance is noted below in Tables 1 & 2. These descriptions include the areas south and north of Morgan County Road which have entirely different past histories and timber types.

Table 1. Species composition from the August 2010 inventory in M0701 (South 82 acres)

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Yellow Poplar Sugar Maple Red/Black Oak White Oak <i>Sycamore</i> <i>Red Pine</i> <i>Pignut Hickory</i> <i>Shagbark Hickory</i> <i>Red Elm</i> <i>Black Walnut</i> <i>Sassafras</i> <i>American Beech</i> <i>Cottonwood</i> <i>Black Cherry</i> <i>Largetooth Aspen</i>	Sugar Maple American Beech Yellow Poplar <i>Elm spp.</i> <i>Sassafras</i> <i>Red Pine</i>	American Beech Sugar Maple <i>Pignut Hickory</i> <i>Flowering Dogwood</i> <i>Red Oak</i> <i>Sassafras</i> <i>Yellow Poplar</i>

Bold – Species that comprise $\geq 10\%$ of the total TPA and/or BA in each structural class
Italicized - Species that comprise $\leq 10\%$ of the total TPA and/or BA in each structural class

Table 2. Species composition of November 2013 inventory in M0701 (North 22.5 acres)

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Yellow Poplar Sweetgum <i>Largetooth Aspen</i> <i>Black Walnut</i> <i>Bald Cypress</i> <i>Red Maple</i> <i>Sycamore</i> <i>Cottonwood</i> <i>Black Cherry</i> <i>White Ash</i> <i>American Elm</i>	Yellow Poplar Sweetgum Red Maple American Elm Black Walnut <i>Virginia Pine</i> <i>Black Cherry</i> <i>Sugar Maple</i> <i>American Beech</i> <i>Sycamore</i> <i>Bald Cypress</i>	American Elm American Beech Red Maple Yellow Poplar <i>Flowering Dogwood</i> <i>Black Cherry</i> <i>Black Walnut</i>

Bold – Species that comprise $\geq 10\%$ of the total TPA and/or BA in each structural class
Italicized - Species that comprise $\leq 10\%$ of the total TPA and/or BA in each structural class

History

M0701 was acquired in three purchases by the State in 1931, 1933 and 1948. In the period between 1933 and 1942 several plantations were established in oldfields, pastures and cropland areas. Timber inventories were first completed in this tract by Forester Bill Bull in the late 1970's and the tract at that time was comprised of Compartment 17 Tracts 1&2. These smaller units were inventoried with Quickcruises and their forested areas were identified and type mapped. The bottomland area of M0701 was not evaluated. A Compartment 17 resource management summary was completed by Forester Bull in which tracts 1 & 2 were recommended for reinventory in 15-20 years. The only recreational use of the tract at that time was hunting.

- 4-14-33 Plantation established of 250 Hemlock in 0.2 acres in NE bottomland - PR#96.
- 4-14-33 Plantation established of 275 Bald Cypress in 0.5 acres in NE bottomland - PR#94
- 4-27-33 Plantation established of 2,000 White Oak(BLW?) in 1.8 acres in NE bottomland - PR#97
- 4-28-33 Plantation established of 1,000 Sweetgum in 1.0 acres in NE bottomland - PR#95
- 4-30-34 Plantation established of 825 Jap Pine & 800 Red pine in old cornfield on ridgetop in 1.2 acres – PR#105
- 4-12-38 Plantation established of 1,100 WHP & 250 Scot Pine in weeds/grass field on ridgetop in 1.2 acres – PR#165
- Summer 1942 – 2 Plantations established of 2,400 VIP & 3600 VIP in weeds/grass fields on ridgetop in 2 & 3 acres – PR#188 & 189.
- 1978 - Old M17 T01&02 Inventories by Forester B. Bull: 85 acres: 2,881 BF present vol/A; 839 BF harvest vol/A.
- 9-22-83 TSI marking for BLW thinning by Forester M. Ratliff; thinning completed in Feb. 1984.
- 1-13-84 Diagnostic harvest recon by Forester D. Breedlove: estimated harvest of 1762 BF/A with regen potential.
- 7-25-84 Timber sale of 209,437 BF sold to Ron Speer Lumber Company for \$27,500.
- 10-1984 Timber harvesting completed and sale area closed out.
- 3-15-85 TSI marking and cost estimated completed.
- 3-3-86 TSI contracting project awarded to Akard Forestry Consultants
- 1-29-87 TSI project reviewed by forester Breedlove and work completed.
- 1992-1993 Boundary encroachment survey completed by Surveyor R. Vollmer for Riggs property.
- 1993-1994 Boundary lines posted along NE private holdings; encroachment area on west side of Hacker Creek Road planted to trees by Forester D. Vadas.
- 8-6-10 Forest resource inventory (82 acres) completed by Forester W. Capello.
- 11-2013 Forest resource inventory of 28 acres in bottomland by Forester P. Jones.

Landscape Context

The land surrounding the north and northeast portion of M0701 is privately owned and consists of a mix of closed canopy deciduous forest, agricultural land, Mixed Pine, and residential developments. There is a modest amount of acreage in pasture lands as well as grasslands in the areas north and east of the tract on private lands. A large perennial stream (Indian Creek) and riparian area runs through the northeast portion of M0701. The remaining surrounding landscape consists primarily of other State Forest tracts dominated by upland, closed canopy Central Hardwoods and Mixed Pine forest. The mixture of forestland, grasslands, pastures and riparian areas provides excellent diversity of habitats for wildlife.

Topography, Geology and Hydrology

M0701 has two main ridges. Its topography ranges from 0 - 75% slopes with elevations ranging from 850' on the western boundary along Main Forest Road down to 630' where it is mostly wetlands and floodplains on the northeast boundary of the tract. The northern ridge runs north and the southern ridge runs northeast, they both originate from the western boundary along Old SR37 and Main Forest Road. The soils are formed in residuum from sandstone, siltstone, and shale. Water resources from the two main ephemeral drainages within M0701 feed into Indian Creek which flows from east to west through the northern most portion of the tract. This perennial stream drains into the White River.

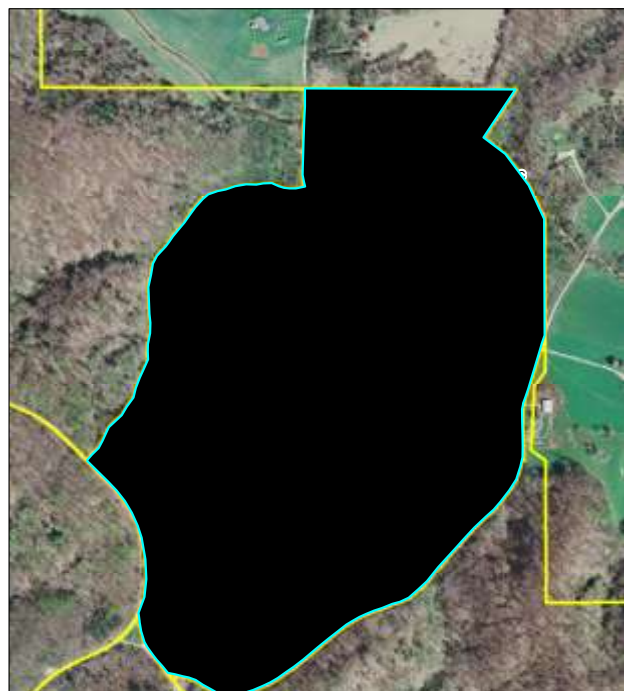
Soils

Ba Banlic Silt Loam - Lt. Green.
Nearly level. Substratum at 70" depth. Site Index of 85. Somewhat poorly drained soil. Permeability is slow. Well suited to trees.

BkF Berks-Weikert Complex – Dk. Blue.
5 – 75% slopes. Sandstone bedrock at 38" depth. Site Index of 70. Well drained. Soil suited to trees only.

Bo Bonnie Silt Loam – Red.
Level. Substratum at 60" depth. Site Index of 90. Poorly drained soil. Well suited to trees. Surface runoff slow.

CrC Crider Silt Loam – Purple.
6 – 12% slopes. Subsoil is 58" deep. Site Index of 88. Well drained soil. Soil well suited to trees.



Wa Wakeland Silt Loam - Dark Green.

Nearly level. Substratum is 60" deep. Site Index of 90. Poorly drained soil. Soil well suited to trees. Severe building limitations because of flooding.

WmC Wellston Gilpin Silt Loam - Orange.

6 – 20% slopes. Bedrock at 46" depth. Site Index is 71. Well drained soil. Well suited to trees. Moderate hazard to erosion due to silty loam soil content.

ZnC Zanesville Silt Loam – Light Green

6 – 12% slopes. Sandstone bedrock at 60" depth. Site Index is 68. Well drained soil. Soil well suited to trees.

Access

M0701 is accessible via a cable gate/ access road located along Old State Route 37 just north of the MMSF entrance at the southwestern edge of the tract. There is a small parking lot located nearby that is modestly used. The road runs approximately 500' to a landing that was evaluated and used in 2013 for the M0702 sale. The road has a good stone base and the landing could be reused for a sale in M0701. Access to the northern portion of the tract is along Morgan County Rd. A suitable location for an access and log landing has been identified and in the process of being reviewed by the Forest Archaeologist.

Boundary

Old State Route 37 forms the west boundary of M0701. Hacker Creek Road forms the southeast boundary whereas private forestland and residential private property lie along the tract's NE and north lines. These private lines are identified by orange aerosol paint and signs. The rest of the tract is surrounded by other Morgan-Monroe State Forest tracts. To settle a usage encroachment (Riggs) along the NE boundary of this tract, a property line survey by DNR surveyor R. Vollmer was initiated in 1992 and completed in 1994. A field encroachment on the west side of Hacker Creek Road was resolved and several trees were planted by Forester Vadas to recover the site. A field encroachment along the N private property line was also resolved by this survey. This lowland field was small and did not get planted but was marked at the roadside at Morgan County Road on the west end of the N line and also where the field edge met the forestland on the east end. The boundaries from this survey were posted and painted in with orange paint in 1993-1994. These boundary lines have been maintained according to our remarking cycle and were last painted in 2009. Remarking of the lines is planned for CY2014.

Wildlife

M0701 contains habitat for a variety of wildlife species. Forested habitat includes a large amount of contiguous Oak-Hickory canopy, scattered Mixed Hardwoods, riparian areas along the perennial stream and ephemeral drainages, and eight nearly 30 year old regeneration openings. The eight openings are varied in size but all have similar yet dense vegetation that favors wildlife. Sassafras, Wild Grapevines and other early successional shrubs are among those present that provide modest wildlife food resources. Other habitat structures that favor wildlife include snags (standing dead trees) and cavity trees. Snags and cavity trees provide habitat for birds, bats, and other small mammals to feed, roost, and nest. Hard mast trees such as Oaks, Hickories, and Beech provide food resources for Squirrels, Wild Turkey, and White-tailed deer. Downed woody debris provides habitat and protection for forest floor wildlife and herptile species. Overall, M0701 has an abundant supply of soft and hard mast. The mapped perennial stream that runs through the northern portion of the tract provides water sources for local wildlife year round.

A Natural Heritage Database Review was completed for M0701 in 2013. If Rare, Threatened or Endangered species (RTE's) were identified for M0701, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

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 M0701 will be conducted in a manner that will maintain the long-term and quality forest habitats for wildlife populations.

Communities

M0701 is comprised mostly of a great diversity of timber types. Dry mesic upland hardwoods such as White, Black, and Northern Red Oaks as well as Pignut and Shagbark Hickories predominate in the uplands. The lower slopes and lowland areas of M0701 are dominated by Mixed Hardwood species comprised of Sugar Maple, Yellow Poplar, and Beech. Adjacent to State Route 37 there are some oldfield plantings on the ridgetop consisting of decadent Mixed Pines however portions include Mixed Hardwoods and large Eastern White Pine. These plantings occurred over approximately 4 acres. The 1987 regeneration openings have regenerated into predominately Yellow Poplar trees. M0701's understory does contain some Oaks but consists mainly of Maples, Beech, and mixed Hickories. The portion of the tract north of Morgan County Rd (22.5 ac) is primarily mesic floodplain forest with wetter mesic floodplain forest adjacent to Indian Creek. The Sweetgum and Bald Cypress that were planted here in the 1930's have done quite well, however the Hemlock and White Oak plantings were not successful. Naturally regenerated species in this lower area include Cottonwood, Sycamore, Yellow Poplar, Red Maple, Mixed Elm, and White Ash.

Recreation

M0701 is easily accessible by recreational visitors as it lies adjacent to Old State Route 37, Hacker Creek Road, and Morgan County Road. Visitors can utilize the area for recreational opportunities such as hunting, nature study, mushroom, berry and nut gathering. A small public parking lot was created in the 1980's for recreational use adjacent to the cable access on Old SR 37.

Exotic and Invasive Species

Some light to moderate Multiflora Rose populations were observed in the flat northern portion of M0701. MF Rose has become naturalized in southern IN and some populations are being naturally controlled by the plant "virus" rose rosette disease. Control measures may be warranted if large populations are located in or surrounding planned regeneration openings. No other exotics were observed during the resource inventories. The old regeneration openings that were completed in 1987 will be further evaluated during the planned postharvest TSI project for exotic and invasive species during a planned croptree release and Wild Grapevine treatment.

Cultural Resources

A cultural resources review was completed during the forest resource inventory. Cultural resources may be present on M0701 but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

STRATUM DESCRIPTIONS AND SILVICULTURAL PRESCRIPTIONS

The current forest resource inventories in M0701 were completed on August 6, 2010 by Forester W. Capello and on November 1, 2013 by Forester P. Jones. The 2010 inventory area was the 82 acre South portion of the tract (uplands) whereas the 2013 inventory was conducted in the North lowland portion. Ten factor prism points were sampled over approximately 105 acres. For this Management Cycle the South upland area is designated the South Stratum and the North lowland area is designated as the North Stratum. Stratum summaries of the inventories are noted below along with their Gingrich Stocking Charts, current conditions and prescriptions. Overall, M0701 is presently fully stocked in both Stratum units. The inventory data for the South Stratum shows a

mid range stocking level however that is somewhat skewed in that nearly 20% of this area was regenerated during the last harvest. A harvest proposed to the B-line level over both Stratum would be beneficial to the overall forest health and stimulate residual stand growth.

1) M0701 South Stratum (82 Acres of Uplands)

Summary Data from August 2010 Inventory

Total Trees/Ac. = **256 Trees/Ac.**

Overall % Stocking = **82% Stocking**

BA/A = **87.8 Ft²/Ac.**

Sawtimber & Quality Trees/Ac. = **52 Trees/Ac.**

Present Volume = **6,345 BF/Ac.**

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	78	Basal Area Sawtimber:	73.6
Pine Commercial Forest:	4	Basal Area Quality:	0
Noncommercial Forest:	0	Basal Area Poles:	9.2
Permanent Openings:	0	Basal Area Culls:	0.4
Other Use:	0	Sub-merchantable:	4.6
Total:	82	Total Basal Area:	87.8

Table 3. Gingrich Stand and Stock Table for South Stratum in August 2010

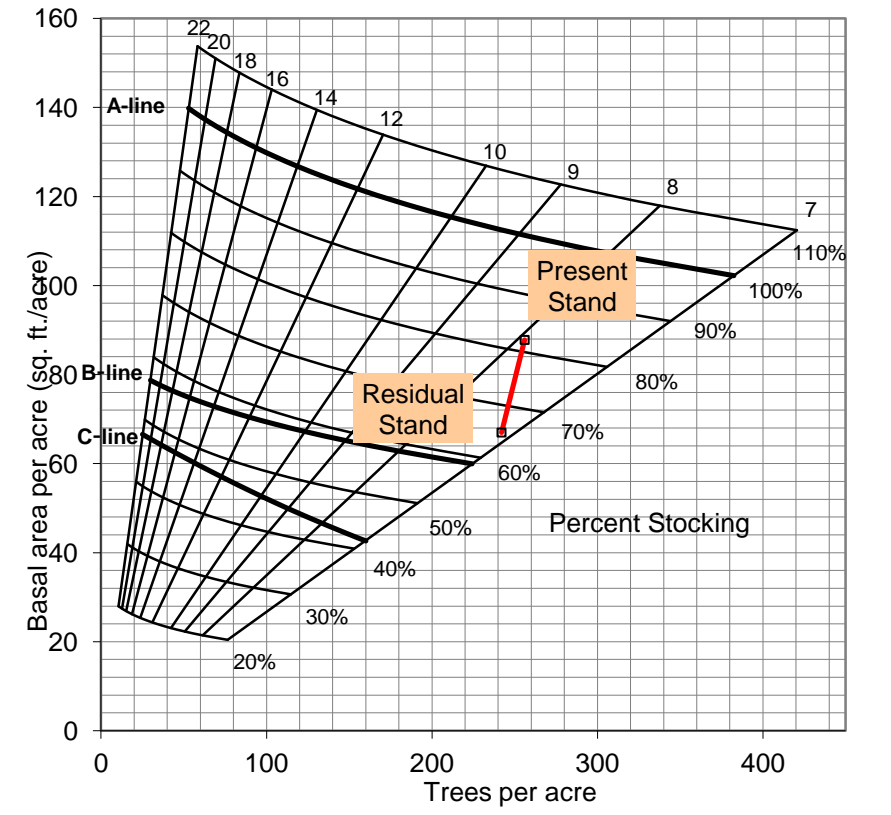


Table 4. – Estimated Present Volumes of the South Stratum in August 2010.

Species	Total Volume (bd. ft.)
Yellow Poplar	150,600
White Oak	75,200
Sugar Maple	70,360
Black Oak	59,190
Red Oak	56,930
Sycamore	28,040
Pignut Hickory	13,800
Shagbark Hickory	11,670
Red Pine	9,300
Sassafras	8,990
Cottonwood	8,130
American Beech	7,630
Red Elm	7,480
Black Walnut	5,890
Black Cherry	4,840
Red Maple	1,260
Aspen	960
Stratum Total	520,270
Per Acre Total	6,345

South Stratum – Oak-Hickory/Mixed Hardwoods

Current Condition

This mixed timber type contains mostly mature Oak-Hickory in the upland portions with Mixed Hardwoods such as Yellow Poplar, Sugar Maple, White Ash, Red Maple, and Beech on the lower slopes and drainages. Mixed Oaks and Hickories account for over 40% of the total volume and BA in the stand. Yellow Poplar and Sugar Maple account for approximately 25% and 20% of the present volumes, respectively. The understory is dominated by Sugar Maple, Sassafras, Red Maple, American Beech and Hickory spp. There are 8 regeneration openings created from the 1984 timber sale which are dominated by Yellow Poplar, Maples, and Sassafras. These openings total approximately 15 acres.

Prescription

The management prescription for this South Stratum of M0701 is to maintain a well stocked timber structure dominated by healthy and vigorous Oaks, Hickories, and other Mixed Hardwoods. The recommendation is to prescribe an improvement cutting over the majority of the area. This should be accomplished primarily through single tree selection. Trees selected for harvest would be primarily declining overstory trees, damaged or defective, poorly formed, stressed, or less desirable trees that are competing with croptrees. Opportunities to prescribe group selections will probably be lessened due to the numerous openings made during the last harvest. However, there may be a few openings prescribed in areas dominated with poor growing Yellow Poplar, declining pine areas or in areas of excessive mortality due to the past few years of drought.

2) M0701 North Stratum (22.5 Acres of Bottomlands)

Summary Data from Nov. 2013 Inventory

Total Trees/Ac. = **148 Trees/Ac.**

BA/A = **119 Ft²/Ac.**

Present Volume = **10,680 BF/Ac.**

Overall % Stocking = **98% Stocking**

Sawtimber & Quality Trees/Ac. = **53 Trees/Ac.**

	Acres		Sq. Ft. per Acre
Hardwood Commercial Forest:	22.5	Basal Area Sawtimber:	84.6
Pine Commercial Forest:	0	Basal Area Quality:	0
Noncommercial Forest:	0	Basal Area Poles:	30.0
Permanent Openings:	0	Basal Area Culls:	1.5
Other Use:	0	Sub-merchantable:	2.3
Total:	22.5	Total Basal Area:	118.5

Table 5. Gingrich Stand and Stock Table for North Stratum in November 2013

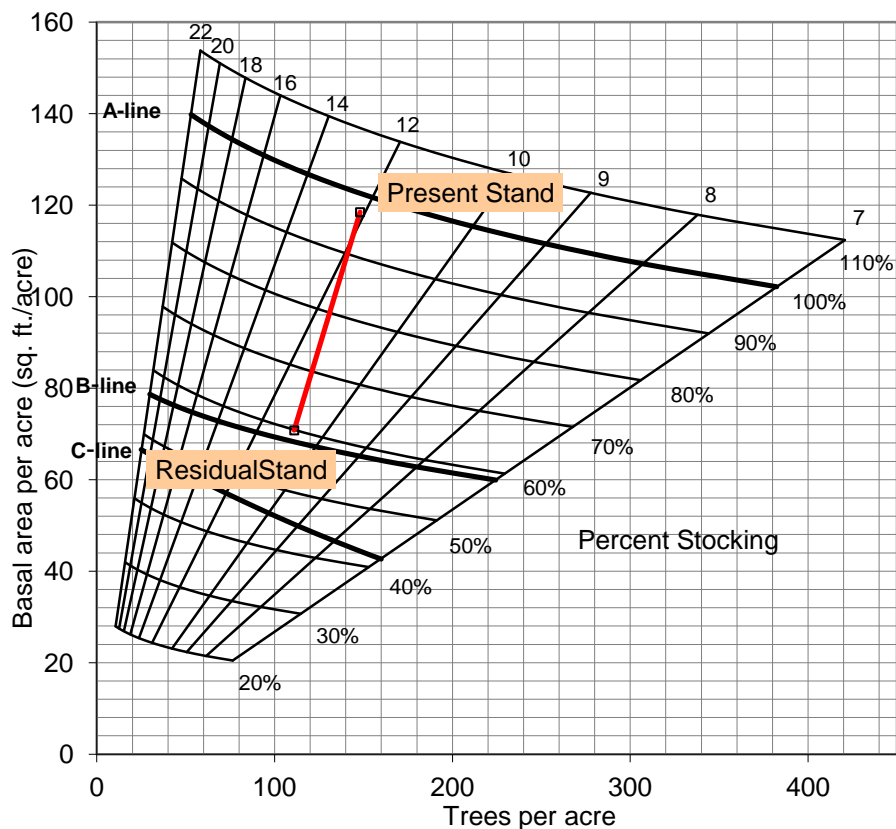


Table 6. – Estimated Present Volumes of the North Stratum in November 2013

Species	Total Volume (bd. ft.)
Yellow Poplar	111,350
Sweetgum	52,760
Aspen	22,580
Bald Cypress	12,420
Sycamore	10,550
Cottonwood	9,600
Black Walnut	7,750
Red Maple	7,300
Black Cherry	3,180
White Ash	1,600
American Elm	1,170
Stratum Total	240,260
Per Acre Total	10,678

North Stratum –Bottomland Mixed Hardwoods and Plantations

Current Condition

This mixed timber type is located on old bottomland fields and is comprised of Yellow Poplar, Sweetgum, Largetooth Aspen, Bald Cypress, Black Walnut, Red Maple, Sycamore, and Cottonwood. The Sweetgum and Bald Cypress were planted in the 1930's. The Black Walnuts were probably planted in conjunction with these plantings in the 1930's however no specific plantation information is available. It is possible that the plantation record for the White Oak planting was mislabeled and these planted trees were Black Walnut. The remaining timber species established themselves naturally in what were probably abandoned cropland or pasture fields. Yellow Poplar and Sweetgum account for 50% and 20% of the total volume and BA in the Stratum, respectively. The plantation Bald Cypress contributes nearly 5% of the present volume in this Stratum. The other listed species are more or less evenly distributed throughout the remainder of the area. The regeneration layer is mainly American Beech, Elm spp., Red Maple, and Yellow Poplar.

Prescription

The management prescription for this North Stratum of M0701 is to maintain a well stocked timber structure particularly in the Sweetgum and Cypress areas. These species are well suited to this site. They are currently overstocked and are in need of thinning before the plantations stagnate and decline. By performing a free thinning now we can release and improve the growth and vigor of the highest quality trees. The remainder of the area will receive a general improvement cutting and selection cutting to favor codominant and higher quality trees. Some small group selections may also be prescribed in areas where stocking is insufficient in numbers or quality. There are a few pockets of extremely wet areas ranging from 0.5 to 3 acres. If current harvest restriction dates remain in place these areas would likely be avoided during harvest operations and simply receive appropriate TSI work.

Overall Tract Prescription

The forest resource management goal of M0701 is to maintain a fully stocked stand composed of healthy and vigorous Oaks, Hickories and Mixed Hardwoods. The recommendation is to prescribe an improvement cutting combined with some selection cutting over the majority of the tract. This will be accomplished primarily through singletree selection. Trees selected for harvest in M0701 would primarily be damaged or defective, poorly formed, stressed, or low valued timber species that are competing with quality growing stock in the improvement cutting. Declining vigor and drought stressed overstory canopy trees would be reviewed and marked for removal in a selection cutting. Some group selections may be prescribed in areas where aggregations of low quality, understocked and/or low vigor growing stock occur.

Riparian buffer areas exist along the banks of the mapped intermittent streams and perennial streams located in the North Stratum's drainages. Unmapped intermittent streams will be reviewed by a forester during timber marking for harvest and water quality considerations. Management within all of these areas will be prescribed according to current Division of Forestry guidelines.

Postharvest Timber Stand Improvement (TSI) is also proposed and should include Wild Grapevine control, croptree release in the older group selections, large snag creation and possibly small opening completion. Preharvest Wild Grapevine control may be required in potential group selection openings. Prescribed TSI work will be the most intensive in the older regeneration openings. Areas in these openings will also be reviewed for potential invasive control treatments.

Given the recent inventory and growth of M0701's forest resources, this tract is suitable for a 15 year management cycle wherein growth and development of the tract's forest resource is evaluated by a forest inventory every 15 years. The current inventory indicates a possible harvest of between 200-300 MBF. A timber sale is proposed for FY2014-15 and may be combined with a sale in M0704.

<u>Proposed Management Activities:</u>	<u>Proposed Period</u>
DHPA Roadwork Project Review	CY2014
Timber Marking	CY2014
Timber Sale (w/M0704?)	FY2014-15
Timber Harvest	CY2014-2016
Postharvest Timber Stand Improvement Project	CY2015-2018
Regeneration Opening Review	CY2020
Inventory and New Management Guide	CY2030

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