DRAFT

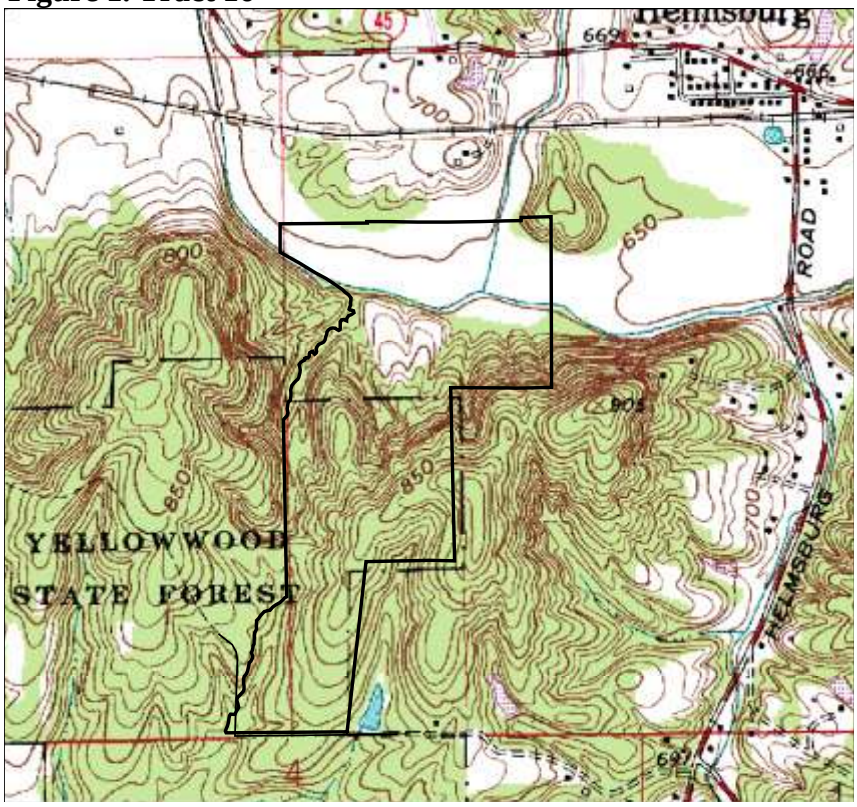
RESOURCE MANAGEMENT GUIDE

Yellowwood State Forest | Compartment **10** | Tract **16**
Total Tract acreage: **120 acres** | Commercial Acres: **90** | Date: **11/27/12**
Forester: **L. Burgess**

Location

This tract is located in Section 34, T10N, R2E of Brown County. It is located approximately ½ mile southwest of Helmsburg, Indiana. The tract is accessible by a firetrail from its southeast corner using Dollsberry Lane.

Figure 1. Tract 16



General Description

Y1016 contains 120 acres, 90 acres of which are commercial. The noncommercial 30 acres include 25 acres north of Beanblossom Creek and also east of Lick Creek that are currently inaccessible as well as 5 acres along the south bank of Beanblossom Creek that are classified as a Riparian Management Area. The cover types within this tract contain mostly Oak-Hickory with some Mixed Hardwood stratums. The south portion of the 25 inaccessible acres also includes another 7 acres in the Riparian Management Area along the north bank of Beanblossom Creek and the east & west banks of Lick Creek. The 2012 inventory data noted in Table 1 lists the frequency of tree species within each category of the tract's forest canopy (listed in descending order of occurrence).

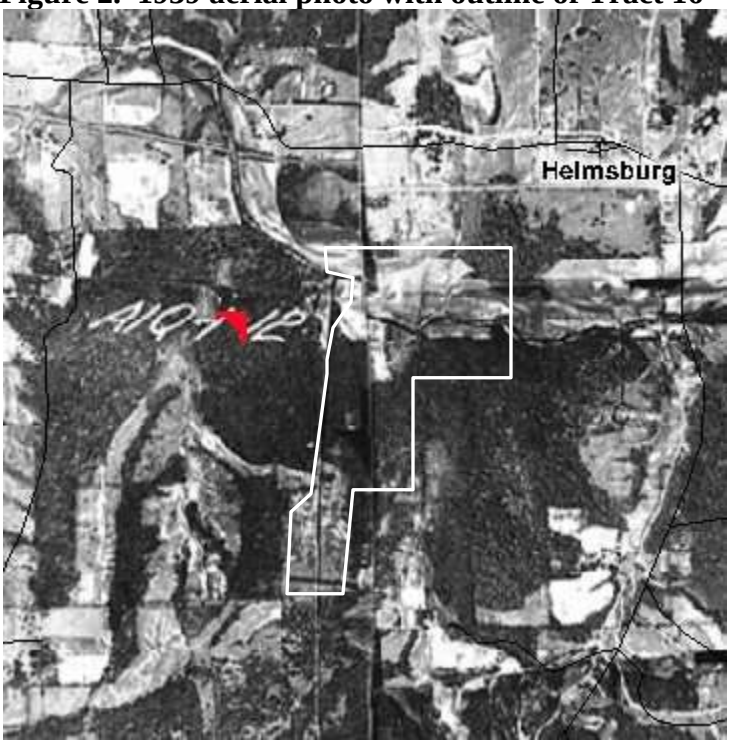
Table 1. Overview of Forest Resources of Y1016 in August 2012

Overstory Sawtimber Layer	Understory Poletimber Layer	Regeneration Layer
Yellow Poplar	Sugar Maple	American Beech
White Oak	Yellow Poplar	Sugar Maple
Black Oak	White Oak	Red Maple
Northern Red Oak	Green Ash	Blackgum
Sugar Maple	Black Cherry	Bluebeech
Pignut Hickory	Red Maple	American Elm
Green Ash	Black Oak	Boxelder
Scarlet Oak	American Elm	Green Ash
American Beech	Pignut Hickory	Ohio Buckeye
Black Cherry	White Ash	Black Cherry
Blackgum	Northern Red Oak	Yellow Poplar
Bitternut Hickory	American Beech	Blackgum
American Beech	Black Walnut	Black Oak
American Sycamore	Bitternut Hickory	Flowering Dogwood
Black Walnut	Black Locust	White Oak
	Basswood	Scarlet Oak
		Pignut Hickory
		Sassafras

Tract History

The State acquired the southern portion of this acreage from the federal government in December 1956. The northern acreage (The Goodman Tract Acquisition*) was acquired in 2009 from a purchase with The Nature Conservancy in their efforts to expand the wooded land base within the Brown County Hills Project Area (*See additional information on acquisition at end of guide). The current tract configuration was changed in 2009 from 61 acres to include the northern acquisition to total the current tract acreage of 120 acres (see Figure 2).

Figure 2. 1939 aerial photo with outline of Tract 16



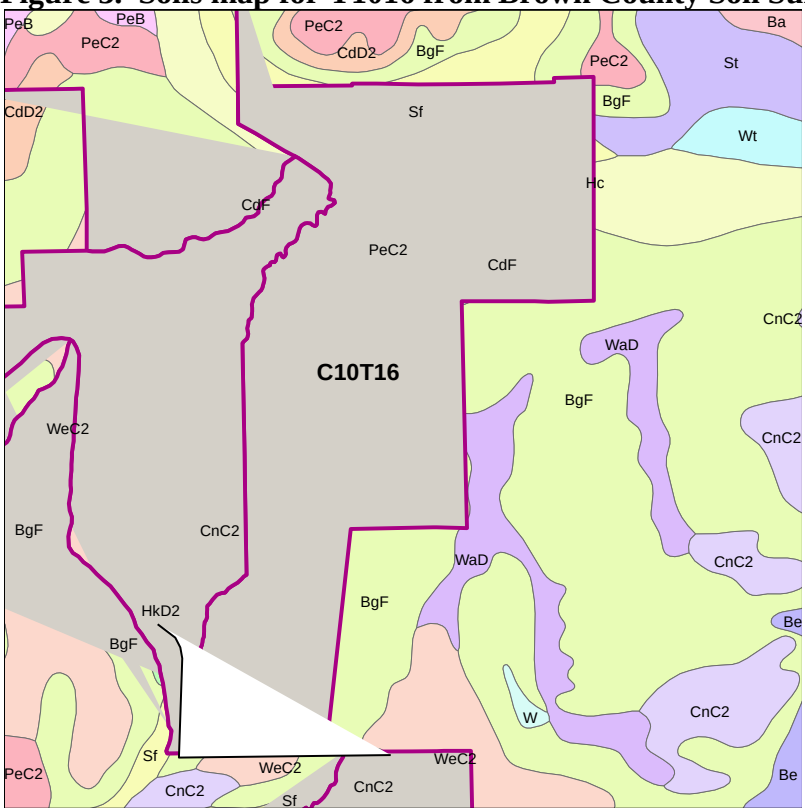
Resource management history:

1/76	Forester Williams. Inventory: Tallied harvest 156,116 BF., leave 198,088 BF.
4/14/82	Forester Duncan. Marked merchantable trees along property line in water line R-O-W (20 ft. permanent easement).
11/1/85	Forester Eckart. Installed culvert below private lake dam and improved access road.
12/23/85	Forester Eckart. Began harvest marking within tract.
1/6&7/86	Forester Eckart. YSF Crew cut locust posts along tract's ridgetop.
1/8/86	Forester Eckart. Put 15 ton riprap around culvert on new road to stabilize fill dirt.
1/15/86	Forester Eckart. Timber marking completed.
1/27/86	Forester Eckart and crew. Vine control in areas of merchantable timber.
3/19/86	Forester Eckart. Timber sale in conjunction with Tract 17. Total of 155,459 BF sold to Foley Hardwoods for $19,122.00
4/16/86	Forester Eckart. Three tri-axles of #2 stone were spread on the haul road leading to the tract in front of Fran Snider's home.
5/12/86	Forester Eckart. Dalton Morgan logging crew moved onto tract. Dalton built new haul road down main ridge instead of using waterline ROW due to excessive wetness.
6/20/86	Forester Eckart. Drained large mudhole on top of large culvert and smoothed ruts in main haul road using FHQ JD 450.
6/27/86	Forester Eckart. Dalton Morgan logging crew finished harvesting.
7/9/86	Forester Eckart. Constructed a wooden gate on Yellowwood Trail leading west from Dollsberry Lane to discourage ORV traffic.
7/31/86	Forester Eckart. David Axsom (commercial firewood cutter) cutting tops.
8/13/86	Forester Eckart. Noted considerable mortality of BLO in all diameter classes. Could be result of droughty spring and late frost.
10/28/86	Forester Eckart. Began marking postharvest TSI.
10/29/86	Forester Eckart. Commercial firewood cutting complete.
11/13/86	Forester Eckart. TSI marking complete.
4/15/87	Forester Eckart. Planted 75 Autumn Olive in the 2 log yards for wildlife enhancement.
3/16/89	Forester Eckart. Seeded a portion of recent log road to prevent erosion.
9/5/89	Forester Eckart. Postharvest recon.
4/92	Permanent easement for Brown County Water Utility. Located along tract's eastern boundary and to the south (map from deed in tract file).
2/2009	State acquisition of Goodman Tract: 62 acres were added to Tract 16.
2010-11	Routine boundary line remarking completed.
8/20/12	Forester Burgess completed first new tract resource inventory.

Topography, Geology and Hydrology

This tract contains some of the steeper slopes of Yellowwood State Forest with some slopes of 70% or more. The topographic map for this area is somewhat deceiving in regards to the number of finger ridges that are set above these steeper slopes as only a small portion of the southern third of the tract's total acreage is flat to gently sloping ridgetops. The northernmost 25 acres are bottomland. The soil types (see Figure 3) noted in the next section are unglaciated soils and were formed from the bedrock material of sandstone, shale and siltstone. Two mapped perennial (blueline) streams run along the northern boundary (Beanblossom and Lick Creeks). The entire tract falls within the Beanblossom watershed which drains into Lake Lemon.

Figure 3. Soils map for Y1016 from Brown County Soil Survey



Soils

Berks-Trevlac-Wellston Complex (BgF): 20-70% slopes. Approximately 60% of tract. Moderately steep to very steep, well drained soils. Harvest limitations due to slope.

Wellston-Gilpin Silt Loam (WeC2): 6-20% slopes. Approximately 5% of tract. Moderately sloping to moderately steep, well drained soils. Harvest limitations due to slope and erosion potential.

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Steff Silt Loam (Sf). Approximately 10% of tract. Nearly level, deep, moderately well drained soil found on floodplains. Harvest limitations due to soil moisture content and potential for compaction.

Wellston-Berks-Trevlac Complex (WaD): 6-20 % slopes. Approximately 5% of tract. Moderately sloping to moderately steep on sideslopes and narrow ridgetops. Slight harvest limitation due to slope.

Pekin Silt Loam (PeC2): 6-12 % slopes. Approximately 5% of tract. Moderately sloping, deep, moderately well drained soil. Slight harvest limitation due to slope.

Chetwynd Loam (CdF): 20-50 % slopes. Less than 5% of tract. Moderately steep to very steep, deep, well drained soil. Moderate to severe harvest limitations due to slope.

Haymond Silt Loam (Hc). Approximately 10% of tract. Nearly level, deep, well drained soil in floodplains. Severe limitation due to flooding.

Cincinnati Silt Loam (CnC2): 6-12% slopes. Less than 5% of tract. Moderately sloping, deep, well drained soil. Slight harvest operation limitations.

Access

Recreational and resource management access to tract is available from Dollsberry Lane.

Division of Historical Preservation and Archaeology roadwork project submitted to the DOF

Archaeologist on 9-17-12 for rehab of Dollsberry Lane and other roadwork in Y1013&20. Archaeologic clearance for improvements received 10-19-12. Road construction rehab is planned to be completed in February 2013.

Boundary

This tract is surrounded by State Forest acreage on the west and very southern portions. Private land boundaries exist along the eastern and northern portions of the tract. Boundary marking and review is up to date after remarking was completed in 2010/2011.

Wildlife

Wildlife resources in this tract are abundant. Common species which are present include: Squirrels, White-tailed Deer, Turkey, various small furbearing animals, and a variety of songbirds. Beaver are also present; a recently constructed dam was found in Beanblossom Creek. An official ecological and wildlife review was completed on the tract. This review focuses on wildlife habitat, looking at what is present in the tract and what can be created through management activities. The resource inventory for this tract also included recording structural habitat features at each data point; these records include snag (dead, standing tree) tree counts. The results of these collected data for snag counts are included in the Table 2.

Table 2. Wildlife Habitat Features Summary of Y1016 in August 2011

Legacy trees*	Maintenance level	Inventory	Available above Maintenance
11″ + DBH	1080	1961	881
20″ + DBH	360	486	126

*Species include American elm, Bitternut hickory, Cottonwood, Green ash, Red oak, Post oak, Red elm, Shagbark hickory, Shellbark hickory, Silver maple, Sugar maple, White ash and White oak

Snags (all species)	Maintenance level	Optimal level	Inventory	Available above Maintenance	Available above Optimal
5″ + DBH	480	840	161	-319	-679
9″ + DBH	360	720	161	-199	-559
19″ + DBH	60	120	54	-6	-66

The wildlife habitat feature summary lists deficiencies in the number of snags for both "Available above Maintenance" and "Available above optimal" category. The proposed timber harvest could create additional snags as well as completion of a planned post-harvest Timber Stand Improvement (TSI) project.

Communities

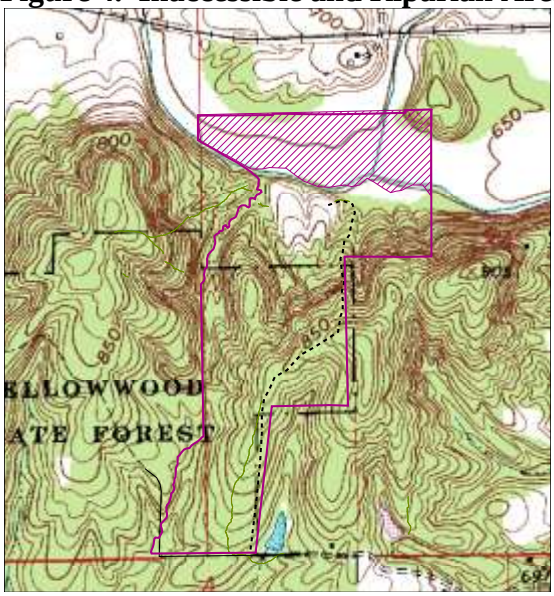
A Heritage Database Review was completed for this tract. If rare threatened or endangered species were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Dry-mesic Upland Forest and Dry Upland Forest were noted within the tract. An area of approximately two acres of Virginia Pine with some scattered Eastern Redcedar is located in the northcentral portion of the tract just south of Beanblossom Creek**.** These areas provide valuable canopy cover and wintering habitat for songbirds and mammals.

Bottomlands (see Figure 4) adjacent to the Pine acreages also contain valuable and locally rare wildlife habitats such as vernal pools and forested wetlands. These low lying habitats provide

seasonal pools which host ducks, herons, cranes, frogs, toads and salamanders. The majority of the tract's acreage lies just within the 5 mile buffer for the nesting/roosting area of the IN Bat.

Figure 4. Inaccessible and Riparian Area of Y1016



Tract boundary 25 acres inaccessible

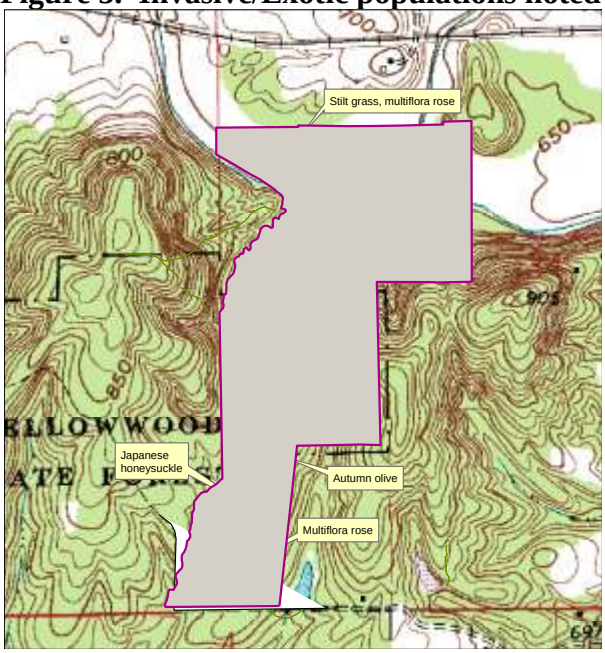
Old Growth and Representative Sample Area (RSA) Assessments

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. A Representative Sample Area (RSA) is an ecologically viable representative example of a natural community that is designated to establish and/or maintain an ecological reference condition, to create or maintain an under-represented ecological condition, or to serve as a refugia for species, communities, and community types. No representative areas of Type 1 or Type 2 Old Growth nor RSA's appear to exist within Y1016. An area should be considered for Type 1 Old Growth classification if it contains 3 or more acres of forest land that appear to have never been harvested or disturbed by man. An area should be considered for Type 2 Old Growth classification if it contains 20 or more acres that have not been logged in the last 80 years and shows developing old growth characteristics.

Invasives/Exotics

Multiflora Rose, Autumn Olive, Japanese Stiltgrass and Japanese Honeysuckle were noted within the tract (See Figure 5). Japanese Stiltgrass and Multiflora Rose have become naturalized in our forest. Prompt seeding of exposed areas following harvest is planned to reduce Stiltgrass populations. Only larger clumps of Multiflora Rose within planned regeneration openings will be treated to reduce competition with forest seedlings. Autumn olive and Japanese honeysuckle infestations are generally treated prior to harvest. A preharvest exotic treatment plan will be prepared for these last 2 species.

Figure 5. Invasive/Exotic populations noted in Y1016 in August 2012



Recreation

The primary recreational users of this tract are hunters and hikers. At the time of this report the Tecumseh Trail is undergoing a permanent reroute which may direct the trail into Tract 16. The trail will be temporarily re-routed during the harvest operations.

CulturalCultural resources may be present on this tract, if present their location is protected. Adverse impacts to significant cultural resources noted will be avoided during any management or construction activities.

2012 Resource Inventory Summary

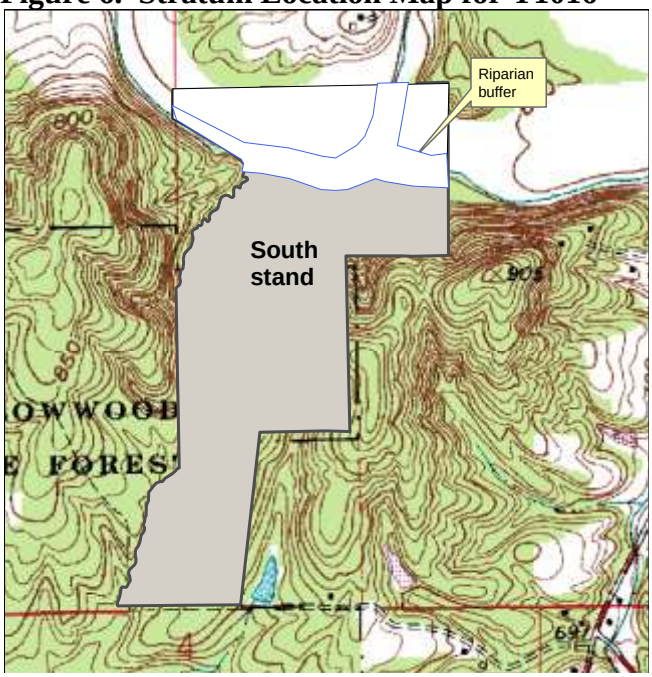
2012 Forest Resource Summary

Present tract volume estimates (120 acres):

Harvest volume	2,137 Bd. Ft./Acre
Leave volume	2,824 Bd. Ft./Acre
Total tract	4,961 Bd. Ft./Acre

This tract was divided into 2 management stratum based accessibility (See Figure 6). The Northern Stratum is predominately floodplain forest and lies north of the main perennial stream known as Beanblossom Creek and along portions of Lick Creek. The Southern Stratum lies south of Beanblossom Creek and contains the majority of the merchantable timber resource on its upland area.

Figure 6. Stratum Location Map for Y1016



Stratum #1 Northern Stratum (Inaccessible Bottomland) – 25 acres

Northern Stratum Summary

Present volume estimates: Basal Area

Total tract 1,470 Bd. Ft./Acre 51

Table 3. Present Volume per Acre Report Summary for Stratum #1 in Y1016

Species	**Total Bd. Ft.**
Northern red oak	326
Green ash	252
Black walnut	222
Black oak	171
White oak	155
Black cherry	103
Eastern cottonwood	81
Yellow poplar	64
Shumard oak	53
American sycamore	43
BF VOLUME PER ACRE	1,470
TOTAL BF VOLUME	36,750

Other species tallied: American Elm, Black Locust (culls only), Boxelder, Ohio Buckeye, Sugar Maple and White Ash. River Birch was also noted.

Stratum#2 Southern Stratum (Accessible) – 95 Acres

Southern Stratum**Summary**

Present volume estimates: Basal Area

Harvest volume 2,699 Bd. Ft./Acre 24

Leave volume 3,180 Bd. Ft./Acre. 70

Total tract 5,879 Bd. Ft./Acre 94

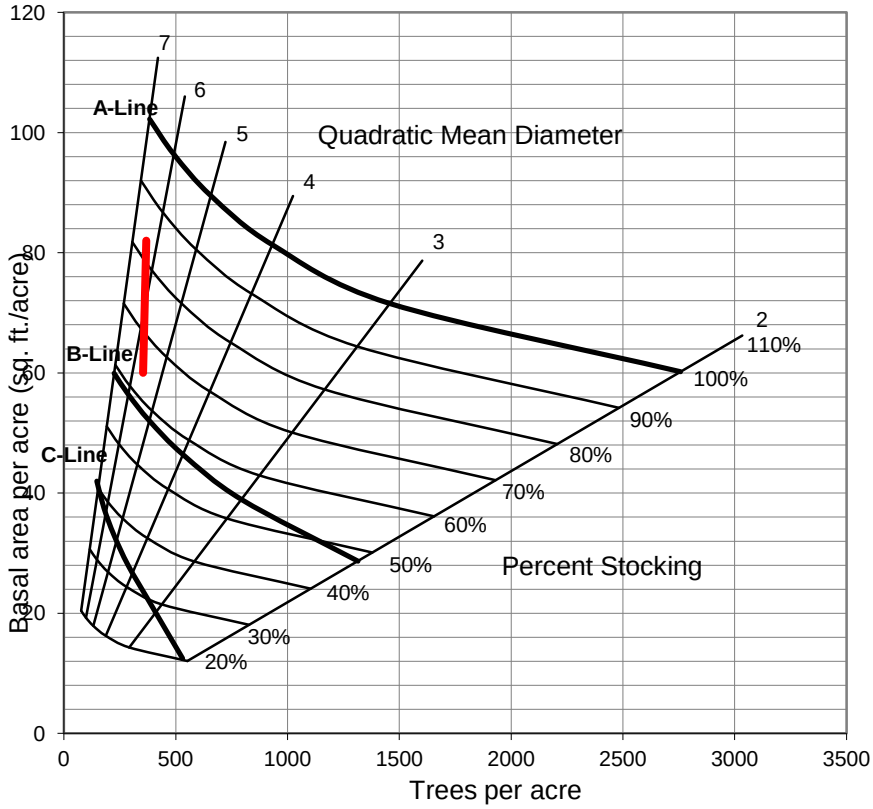
Table 4. Harvest/Leave Volume per Acre Report Summary for Stratum#2 in Y1016

Species	Harvest Bd. Ft.	Leave Bd. Ft.	Total Bd. Ft.
White oak	263	1,004	1,267
Yellow poplar	990	147	1,137
Northern red oak	329	608	937
Black oak	481	451	932
Bitternut hickory	64	273	337
Largetooth aspen	188	56	244
Pignut hickory	53	143	196
Sugar maple	95	94	189
Scarlet oak	58	125	183
Red maple	60	59	119
Chestnut oak	0	107	107
American beech	72	33	105
American sycamore	0	64	64
Black cherry	24	16	40
Black locust	22	0	22
BF VOLUME PER ACRE	**2,699**	**3,180**	**5,879**
TOTAL BF VOLUME	**256,405**	**302,100**	**558,505**

Hardwood stratum Acreage	**95 acres**	**Present Volume per Acre**	**5,879 BF/A**
Basal Area per Acre	**87 sq. ft.**	**Harvest Volume per Acre**	**2,699 BF/A ft.**
Number Trees per Acre	**371**	**Residual Volume per Acre**	**3,180 BF/A**
Stocking Percentage	**85%**	**Average Tree Size**	**6.3″ dbh**

Basal area per acre includes only live trees tallied as pole or sawtimber. Submerchantable and culls were excluded. Number of trees per acre includes only live trees.

The following Gingrich Chart for **Stratum**#2 (Southern **Stratum**) includes all tallied trees: Poles, Sawtimber, Sub-merchantable and culls.



Tract Prescription and Proposed Activities

The tract was inventoried by 1 point per 3.6 acres prism plots in August of 2012. The tract's timber resource is comprised primarily of Mixed Hardwoods with areas of Oak-Hickory and oldfield areas of Yellow Poplar, Red Maple, Sugar Maple, Black Locust and pole-sized Sassafras. The management areas for Y1016 have been divided into 2 Stratums due to accessibility (See Figure 6). Overall, the inventory results indicate that portions of Y1016 could sustain and benefit from a harvest this cutting cycle.

Prescription for Stratum #1- North Stratum (Inaccessible & Riparian Management Area):

The majority of this stratum is young Bottomland Hardwoods with mixed poletimber and small sawtimber size classes. Approximately 8 acres of Stratum #1 are in old field regeneration which developed from natural succession as it recovered from past land uses of farming or grazing. The aerial photo from 1939 (on page 2 of this guide) indicates the lack of forest cover of the area. There is a good variety of both soft and hard mast for wildlife as well as good cover for small mammals among the tall, thick grasses and sedges near the creeks. A portion of this stratum (Riparian Management Area) lies within 100 feet of the blueline streams of Beanblossom Creek and Lick Creek. During this cutting cycle no harvest or TSI is planned in the Riparian Management Area. A small area of mature timber exists in the 7 eastern acres yet is even further inaccessible due to Lick Creek. Some postharvest TSI in portions of Stratum #1 is planned following the sale and harvest of the Southern Stratum (#2) in areas that are not located within the Riparian Management Area.

Prescription for Stratum #2 (South Stratum):

This stratum consists of 95 acres, 5 of which are in a Riparian Management Area along Beanblossom Creek. The volume estimates were run on the total 95 acres; adjustments will be made in the field to

not include marking within the Riparian Management portion. The management recommendation is for an intermediate, improvement harvest utilizing singletree selection over most of the remaining acreage and group selection regeneration openings prescribed mostly in the oldfield portions. The openings will primarily be created due to the removal of the lower vigor Yellow Poplar. A visual recon of the area after the inventory was completed indicates high declines or mortality of Yellow Poplar due to the scale outbreak in spring/summer 2012 as well as from the drought conditions that followed throughout the summer. The dominant harvest species by volume would be Yellow Poplar and Black Oak. The main species to be retained in the overstory would be White Oak, Northern Red Oak and Black Oak. Stocking is adequate throughout most of the hardwood stratums however some portions have low stocking and would receive a lighter harvest marking. The current inventory noted several overmature Black Oak (many with dieback evident in the crowns) as well as mature Yellow Poplar that would be marked for removal in a selection cutting. The removal of such trees with their large crowns will release several more vigorous stems in the understory.

The marking objective will be the removal of mature/over-mature stems as well as those of lower quality in an effort to improve the overall health, vigor and composition of the area. The reduction of stocking levels should provide space for pre-selected croptrees to move forward into the next cutting cycle. The Gingrich Chart created from the 2011 inventory data (based on 95 acres) gives a general guideline of removing 22 sq. ft. of basal area for best site utilization. Species composition will likely become more diverse and less susceptible to insect and disease infestation which is a common problem with homogeneous stratums; part of this effort is expected to include harvesting of ash trees due to nearby Emerald ash borer infestations. These management techniques will improve the overall health, vigor and quality of the residual stand while utilizing stems that would drop out due to natural mortality, overstocking or maturity. TSI is planned in a post harvest project to reduce stocking in some areas of high basal area with pole-sized stems and release croptrees not successfully released from the harvest.

Wildlife will benefit from this harvest as well. Tops and other harvest debris provide beneficial cover for many bird and small mammal species. Additional sunlight penetrating the forest floor will simulate the development of new ground flora, subsequently increasing nesting and foraging habitat. This is essential for game and non-game species as well as continued forest development. Postharvest TSI will increase the density of snags per acre while diversifying diameter distributions of both snags and growing stock trees.

Habitat and cover types currently present within the tract will generally remain the same after the proposed management activities throughout the majority of the tract as the silvicultural approach is predominately singletree selection. The management prescription provides for group selection regeneration openings which will convert some areas of currently closed canopy or impaired forest canopy areas to early successional forested habitats. The Mixed Hardwood stratums are most often where regeneration strategies are applied as they tend to have lower Oak-Hickory elements.

Given the recent inventory, this tract is suitable for a 15 year cutting cycle wherein growth and development of the tract is reevaluated by a forest inventory every 15 years. The current inventory indicates a possible harvest of between 175- 250 MBF. A combined tract timber sale is proposed for this tract along with Tracts 13 & 20 in FY12-13.

Proposed Activities Listing	**Time Period**
Timber Marking	CY2012-2013
Road Construction Rehab	CY2013
Timber Sale (Combined with Tracts 13 & 20)	CY2013
Postharvest TSI (Combined w/Tracts 13 & 20)	CY2013-2015
BMP Field Review (Combined w/Tracts 13&20)	CY2013-2015
Tract Reinventory & New Management Guide	CY2027

***Goodman Tract Acquisition Information** (continued from front page).

The first contact with the landowner was in 1999 to allow easement for the Tecumseh Trail. The property was being held by an LLC out of Cincinnati, Ohio. Mr. Goodman was the owner and he had future plans to develop the area. It was hoped the railroad would allow us to use their bridge abutment to install a bridge at this location to cross Beanblossom Creek. This started a discussion about the purchase of almost 338 acres in this area.

In 2005 several agencies started working together to acquire this parcel of land with The Nature Conservancy leading the way. In 2008, a transfer of 190 acres from the TNC to the Division of Forestry was made. YSF received the portion of the property east of Indian Hill Road. This area was bordered to the south by an existing part of Yellowwood State Forest which helped consolidate the State Forest and reduce boundary lines. TNC partnered in the acquisition to allow Forestry to access discretionary funds in the Indiana Heritage Trust funds that are only available when others contribute at least 25% of the value of the match. Other agencies acquired other parts of the Goodman Acquisition including the Division of Nature Preserves, Sycamore Land Trust and TNC. Acres of bottomland, a hemlock population, Kirtland's snake Habitat and a sandstone bluff along Beanblossom creek have been preserved through this Goodman Acquisition.

To submit a comment on this document, click on the following link:
http://www.in.gov/surveytool/public/survey.php?name=dnr_forestry

You must indicate the State Forest Name, Compartment Number and Tract Number in the "Subject or file reference" line to ensure that your comment receives appropriate consideration. Comments received within 30 days of posting will be considered.

Note: Some graphics may distort due to compression.