DRAFT

RESOURCE MANAGEMENT GUIDE

Yellowwood State Forest **Compartment:** 10 **Tract:** 20
Tract acreage: 128 acres **Commercial Acres**: 92 acres **Date:** 10/20/12
Forester: L. Burgess

Location

This tract is located in Section 33, T10N, R2E of Brown County between Trevlac and Helmsburg, IN. The tract is bounded by SR45 on the north and Indian Hill Road on portions of the tract's west boundary.

General Description

Y1020 is a very diverse tract having diverse forest cover types and past management histories (see Figure 1). A railroad track runs through the north portion of the tract creating a major division whereby 42 acres of the tract lies north of the RR and 86 acres lies south. In a similar manner, the Beanblossom Creek perennial stream and floodway delineates a modest Riparian Management Areaalong its length. The 42 acre bottomland area north of the railroad track contains the majority of the Riparian Management Area of Beanblossom Creek wherein Silver Maple, Green Ash, River Birch, American Sycamore, Pin Oak, Red Maple and sumac brush species are prevalent. It also contains a modest sized and naturally regenerated abandoned old field of lowland hardwood species including Pin Oak. Other portions of this north area contain quality Black Walnut.

For the South 86 acres, Beanblossom Creek also contributes to another 8 acres of Riparian Management Area. The lowlands south of the railroad track are in a scrub mix of Sumac, European Black Alder, American Elm, Pin Oak, Black Cherry, Yellow Poplar, scattered Black Willow and invasives such as Japanese Honeysuckle, Multiflora Rose and Autumn Olive. These species naturally revegetated abandoned crop or pasture fields over the last 20 years prior to State acquisition.

Within this lowland, eleven acres were cleared by the DOF in the summer of 2011 (dozed, then slash piles burned) for the inaugural Indiana Tree Planting Project. Approximately 17,000 seedlings were planted in the May of 2012. These seedlings included BLW, WHO, REO, Cherrybark Oak, BLC, Shumard Oak, and Swamp Chestnut Oak.

Beanblossom Creek runs through the tract and separates another 8 acres from the remaining tract acreage. The steepest portion of the tract is the southern 20 acres. This acreage contains Mixed Hardwoods, Oak-Hickory and Yellow Poplar . Overall, only 92 acres of this tract are commercial forestland due to 12 acres of Riparian Management Area adjacent to Beanblossom Creek (north of the railroad), 4 acres along a modest intermittent stream at the west end of the tract (south of the railroad), 8 acres along Beanblossom Creek at the east end of the tract (south of the railroad), as well as 12 acres that include the railroad and easement itself. Currently, only 68 acres of the total commercial forestland is accessible for management, all laying south of the Railroad. However, a longterm agreement for an easement into the acreage north of the railroad track is in progress by the DOF, which will require a crossing review and permit. The 11 acres that are in the 2012 tree planting also do not contribute to harvestable acreage at this time.

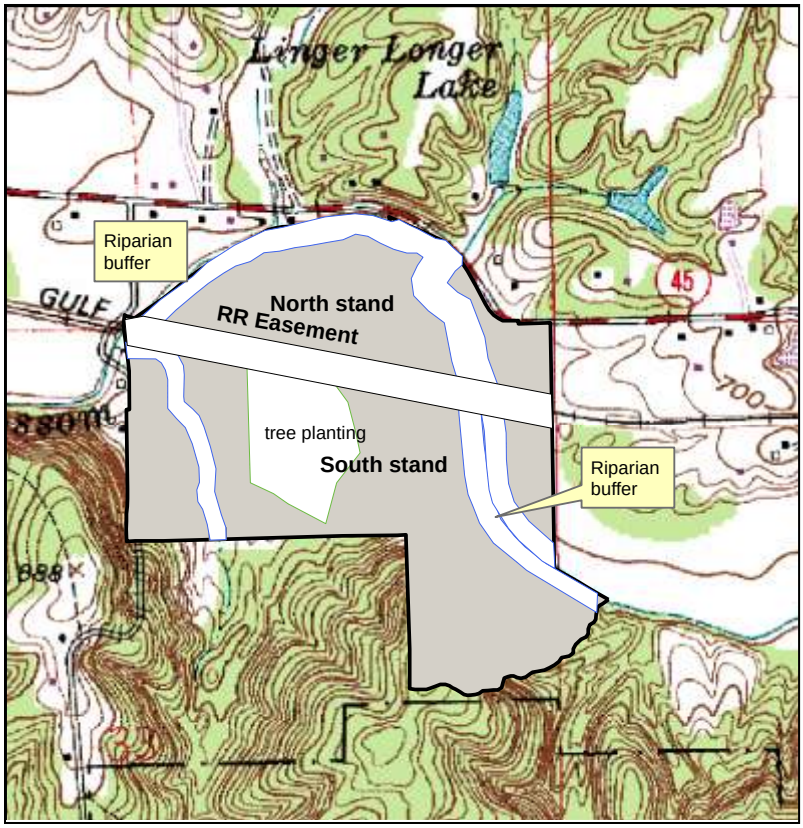


Figure 1. Y1020 Management Units and Stratum map

The 2012 inventory data in Table 1 noted 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 in Y1020 in July of 2012

Overstory Canopy Layer	Understory Poletimber Layer	Regeneration Layer
Yellow Poplar	Red Maple	Red Maple
Red & Silver Maple	Yellow Poplar	Sugar Maple
Northern Red Oak	White Ash	American Beech
American Sycamore	American Elm	American Elm
White Ash	American Sycamore	White Ash
Pin Oak	Black Walnut	Yellow Poplar
American Elm	River Birch	Bluebeech
Sugar Maple	White Oak	Black Cherry
Bitternut Hickory	Black Cherry	Flowering Dogwood
Sassafras	Sugar Maple	Ironwood
American Beech	Pin Oak	Pin Oak
Black Cherry	American Beech	American Sycamore
Scarlet Oak	Bitternut Hickory	Northern Red Oak
Pignut Hickory	Eastern White Pine	Other (E. Redcedar)
Black Walnut	Black Oak	White Oak
Black Oak	Blackgum	Sassafras
Basswood	Sassafras	Black Oak
Eastern White Pine	Northern Red Oak	Ohio Buckeye
Shagbark Hickory	Virginia Pine	Black Walnut
White Oak	*Black Willow	Bitternut Hickory
*Black Willow		Blackgum

** Noted in tract but not documented in inventory data. One black willow noted by the intermittent stream is a Property Big Tree Record.*

History

2009: Yellowwood State Forest acquired this acreage in the Goodman Tract Acquisition 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).

2009-10: Boundary Management by Forester Spalding completed: mark new lines & unmarking of old lines.

Fall 2010: Access Road improvement into old field south of Railroad track completed by FHQ Crew for Tree planting project.

CY 2010-11: Reroute of Tecumseh Hiking Trail location flagged through south portion of tract by Hoosier Hikers Council: awaiting final approval by PM Allen.

May 2012: DOF Inaugural Tree Project planting of approximately 17,000 trees over 11 acres; Forester Spalding, Jack Seifert and Y/MMSF crew.

July 2012: First Forest Resource Inventory completed by Forester Burgess.

Topography, Geology and Hydrology

The tract varies greatly in the range of slopes. Approximately 90 acres are flat to gently sloping ridgetops. The slopes within the tract are moderate with some very steep slopes in the southeast portion, some with 70% slopes. The soil types noted in next section are unglaciated soils and were formed from the bedrock material of sandstone, shale and siltstone. One mapped blueline stream (Beanblossom Creek) makes up the tract's northwestern boundary, then continues into the tract before exiting off to the east. A modest sized intermittent stream flows northward inside the tract's western boundary. The entire tract falls within the Beanblossom Creek watershed which drains into Lake Lemon.

Soils

Haymond Silt Loam (Hc): Nearly level, deep, well drained soil on floodplains. Severe limitations due to flooding. Comprises about 27% of tract acreage.

Pekin Silt Loam (PeB), 2-6 % slopes: Gently sloping, deep, moderately well drained soil. Slight harvest limitations due to fragipan restricting water movement so soil is often saturated in winter and spring. Comprises about 23% of tract acreage.

Pekin Silt Loam (PeC2), 6-12 % slopes: Moderately sloping, deep, moderately well drained. Slight harvest limitations due to slopes. Comprises about 19% of tract acreage.

Berks-Trevlac-Wellston Complex (BgF), 20-70% slopes: Moderately steep to very steep, well drained soil. Harvest limitations due to slopes. Comprises about 14% of tract acreage.

Bartle Silt Loam (Ba), 0-3 % slopes: Nearly level and gently sloping, deep, somewhat poorly drained. Slight harvest limitations due to fragipan restricting water movement so soil is often saturated in winter and spring. Approximately 6% of tract acreage.

Wellston-Gilpin Silt Loam (WeC2), 6-20% slopes: Moderately sloping to moderately steep, well drained soil. Harvest limitation due to slopes and erosion potential. Approximately 3% of tract.

Steff Silt Loam (Sf): Nearly level, deep moderately well drained soil found on floodplains. Harvest limitation due soil moisture content and potential for compaction. Approximately 3% of tract.

Chetwynd Loam (CdF), 20-50% slopes: Moderately steep to very steep, deep, well drained soil. Moderate to severe harvest limitations due to slope. Approximately 2% of tract.

Access

Recreation and resource access to tract is available from Indian Hill Road near Beanblossom Creek at the west end of the tract via a fair weather, stoned access road. A public parking

area is available to forest visitors adjacent to this gated firetrail which is the entrance to the first Indiana Tree Project.

Boundary
This tract is surrounded by private property with the exception of the southeast boundary, which borders Yellowwood State Forest. Boundary marking is up to date after marking in 2010 with the exception of Beanblossom Creek which acts as a boundary to the north.

Wildlife
Wildlife resources in this tract are abundant. Common species which are present include: Squirrels, white-tailed deer, turkey, coyotes, various small furbearing animals, and a variety of songbirds. Beaver are also active in this area with a dam recently constructed as of November 2012. American woodcock also utilize this area seasonally. They need diverse habitats to survive, including small clearings for courtship, dense shrub land or young forest thickets for diurnal foraging for earthworms, early successional forests for nesting and brood rearing, and clearings for summer roosting. Proximity to the creek and adjoining wetland acreage and forest make this very well suited to the American woodcock. This tract also has lowland acreage in the floodplain which can provide habitat for migrating ducks. An official ecological 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 following Table 2.

Table 2. Live Legacy Trees* and Snags inventoried July of 2012 on Y1020.

Legacy trees*	Maintenance level	Inventory	Available above Maintenance
11″ + DBH	1152	1190	38
20″ + DBH	384	235	-149

*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	512	896	584	72	-312
9″ + DBH	384	768	204	-180	-564
19″ + DBH	64	128	18	-46	-110

The wildlife habitat feature summary lists deficiencies in the number of snags for both "Available above Maintenance" and "Available above optimal" category. Timber harvesting could create additional snags as well during post-harvest timber stand improvement. The Spring 2012 scale outbreak on Yellow Poplar and the drought conditions affecting all species will also contribute to continued snag creation.

Communities
A Heritage Database Review was completed for this tract in 2012. 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. The majority of the tract's acreage lies just within the 5 mile buffer for a documented nesting/roosting area of an Indiana Bat.

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. No representative areas of Type 1 or Type 2 Old Growth appear to exist within Y1020. 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. No other portion of the tract appears to have natural communities that would qualify for a RSA classification based on past land use and disturbance.

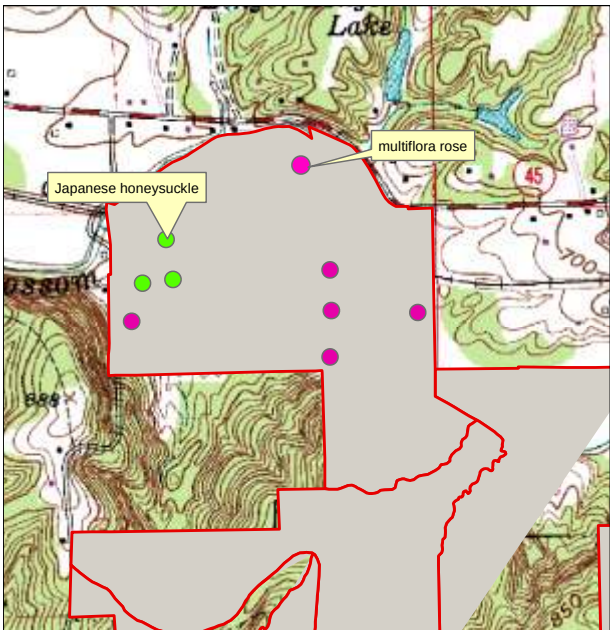


Figure 2. Exotic locations in Y1020 in July 2012

Invasives/Exotics
Multiflora Rose and Japanese Honeysuckle were observed during the July 2012 forest resource inventory (See Figure 2). Although these are not desirable species in terms of forest management, they are utilized by many songbirds that utilize scrubby habitat. Multiflora Rose has become naturalized among the Indiana landscape, therefore, only large concentrations should be considered for treatment or in areas where infestations are present in proposed regeneration openings. Japanese Honeysuckle will be treated in likewise fashion. European Black Alder is also present in the western portion of the tract. Although not native, this Alder species is beneficial to wildlife such as American woodcock as well as a proven nitrogen fixer for forest soils.

Recreation
Primary recreational use is hunting, hiking and wildlife viewing.

Cultural
Cultural 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 Inventory Summary

This tract was inventoried by 1 point per approximately 3 acres prism plots in July of 2012. Over half of this tract is currently unavailable for timber harvest due to 1) 2012 tree planting (May 2012), 2) lack of access or 3) Riparian Management buffer. The tract is divided by a railroad track, therefore creating 2 management Units classified as the Northern Management Unit (Stratums #1-3) and Southern Management Unit (Stratums #4-5). Both Management Units contain timber stratums with diverse management prescriptions.

Present volume estimates (Includes Stratums #1-5):

		Basal Area
Harvest volume	673 Bd. Ft./Acre	9.3
Leave volume	2,378 Bd. Ft./Acre	57.9
Total tract	3,051 Bd. Ft./Acre	67.2

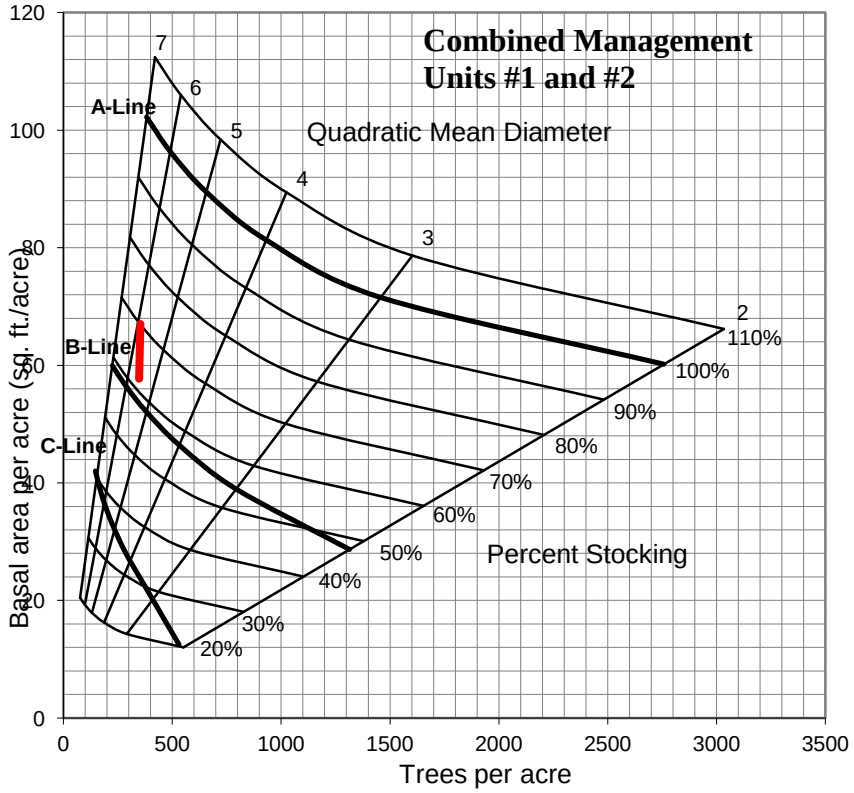
Table 3. Overview of Forest Resources of Y1020 in July 2012

Species	**Harvest Bd. Ft./Acre**	**Leave Bd. Ft./Acre**	**Total Bd. Ft./Acre**
Yellow Poplar	277	967	1,244
Northern Red Oak	139	256	395
American Sycamore	17	326	343
Red Maple	32	169	201
White Oak	18	111	129
Bitternut Hickory	0	108	108
White Ash	47	44	91
Pin Oak	0	86	86
Sugar Maple	9	53	62
Scarlet Oak	40	20	60
American Beech	41	10	51
Black Cherry	23	22	45
Black Oak	16	27	43
Pignut Hickory	14	29	43
Eastern White Pine	0	32	32
Shagbark Hickory	0	34	34
Sassafras	0	27	27
American Elm	0	31	31
Basswood	0	17	17
Black walnut	0	9	9
Totals PER ACRE (Bd. Ft.)	**673**	**2,378**	**3,051**
TRACT TOTALS	**86,144**	**305,664**	**390,480**

(Bd. Ft.)			

Total Tract Acreage	128 acres		Present Volume per Acre	3,051 Bd. Ft.
Basal Area per Acre	67 sq. ft.		Harvest Volume per Acre	673 Bd. Ft.
Number Trees per Acre	354		Residual Volume per Acre	2,378 Bd. Ft.
Stocking Percentage	71%		Average Tree Size	6 ″ dbh

Basal area per acre includes only live trees tallied as pole or sawtimber. Culls were excluded.
Number trees per acre includes only live trees



Management Unit #2 (South Stratums**) volume estimates** (57 acres that are currently in merchantable timber):

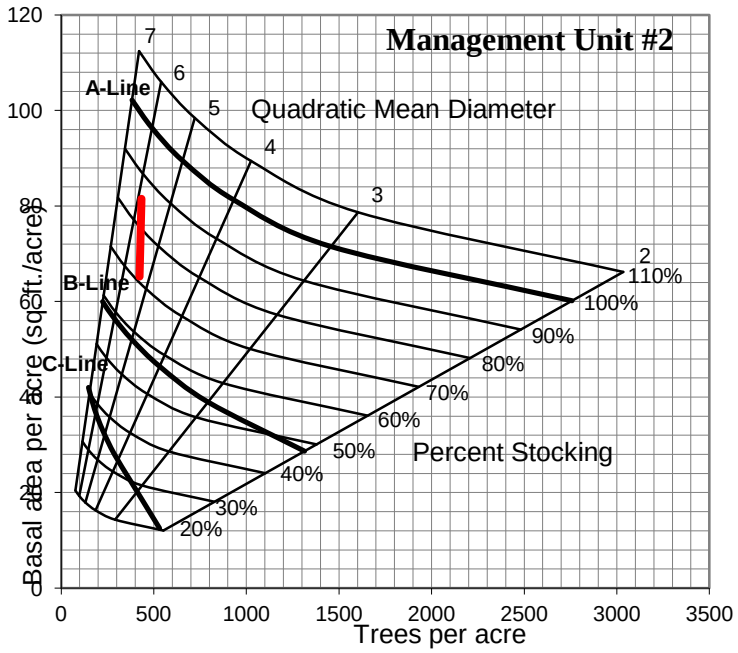
		Basal Area
Harvest volume	1,250 Bd. Ft./Acre	16.4
Leave volume	3,153 Bd. Ft./Acre.	65.2
Total Unit	4,403 Bd. Ft./Acre	81.5

Table 4. Harvest/Leave Report Summary for Management Unit #2

Species	Harvest Bd. Ft./ Acre	Leave Bd. Ft./Acre	Total Bd. Ft./Acre
Yellow Poplar	554	1884	2438
Northern Red Oak	244	432	675
White Oak	36	195	231
Bitternut Hickory	0	216	216
Sugar Maple	17	107	124
White Ash	93	0	93
Pignut Hickory	28	57	86
Scarlet Oak	79	0	79
Shagbark Hickory	0	69	69
Red Maple	45	17	62
Pin Oak	0	61	61
Sassafras	0	53	53
Black Cherry	46	0	46
American Beech	41	0	41
American Sycamore	34	0	34
Basswood	0	33	33
Black Oak	33	0	33
American Elm	0	28	28
Totals PER ACRE (Bd. Ft.)	**1,250**	**3,153**	**4,403**
Man. Unit #2 TOTALS (Bd. Ft.)	**68,610**	**160,370**	**228,980**

Hardwood stratum Acreage	54 acres		Present Volume per Acre	4,403 Bd. Ft.
Basal Area per Acre	81.5 sq. ft.		Harvest Volume per Acre	1,250 Bd. Ft.
Number Trees per Acre	433		Residual Volume per Acre	3,153 Bd. Ft.
Stocking Percentage	86%		Average Tree Size	5.8 ″ dbh

The following Chart includes Poles, Sawtimber and Sub-merchantable trees tallied:



Management Unit #1 Northern Stratums **(Inaccessible) – 42 acres**

Northern Stratum Summary

Species	**Total Bd. Ft.**
American Sycamore	1,115
Red & Silver Maples	573
Pin Oak	243
Eastern White Pine	140
Yellow Poplar	112
American Elm	77
Black Walnut	42
Total Bd. Ft. VOLUME PER ACRE	**2,302**

Additional species tallied as either sub-merchantable or poles: Black cherry, River birch and White ash.

Management Unit #1 - Northern Stratums (#1-3) Prescriptions and Proposed Activities

This northern acreage is well stocked and of an appropriate species mixture in its current state. This low lying acreage provides valuable seasonal wetlands and pools, thereby hosting ducks, herons, cranes, frogs, toads and salamanders. Many of the tree and shrub species present provide soft mass for wildlife including ash and maple. If equipment access is available in the future over the Railroad track, the creation of more vernal pools would be an excellent addition to the acreage accompanied by the management for soft mass species. Stratum**#1** would be the harvestable portion of this management unit that consists of floodplain hardwoods. Stratum**#2** would be a Riparian Management Area that would be defined as lying within 100 feet of Beanblossom Creek on either side of its banks. Currently this stratumwould not have timber harvest or timber stand improvement (TSI) prescribed. **Stratum#3** would be the naturally regenerated, abandoned old field acreage. The prescription for Stratum#3 is currently limited to TSI and control of exotic and/or invasive species.

Management Unit #2 - Southern Stratums (#4-7) Prescriptions and Proposed Activities

In Stratum**#4,** the largest abandoned old field was utilized for a forest restoration planting. 11 acres were cleared to prepare the field site for planting. 17,000 trees were planted: these included Red Oak, White oak, Cherrybark Oak, Black Walnut, Black Cherry, Swamp Chestnut Oak and Shumard Oak. The tree planting site formerly held Ash, Yellow Poplar, American Sycamore and Sumac. The tree planting was completed in May of 2012 in the central portion of the tract south of the railroad track. This planting is part of the "Indiana Tree Project" and will be officially designated as the Grunwald Planting. Funding was provided by the Hardwood Forestry Fund. An additional 7 acres located north of the railroad tracks were planned with the planting project, however access to the northern acreage was restricted due to the need to acquire a railroad crossing permit. The prescription for Stratum #4 will be to provide intermittent mowing and/or herbicidal treatments to the planting until the seedlings become established. This area may also be maintained periodically for Forest Industry tours for the Division of Forestry Indiana Tree Project.

Stratum # 5 consists of 5 acres of this unit that are inaccessible due to lying on the other side of Beanblossom Creek. The inventory noted sapling and pole sized stems of American Sycamore, White Ash as well as some Multiflora Rose in this area. One of the inventory points ended up being on the railroad tracks. The current prescription for this Stratum is TSI and control of exotic and/or invasive species.

Stratum# 6 consists of the Riparian Management Area that lies south of the railroad track. This stratum consists of approximately 3 acres on the east side of Beanblossom Creek that is 100 feet from its bank and approximately 5 acres on the west side of Beanblossom Creek. Currently this stratum would not have timber harvest or timber stand improvement (TSI) prescribed.

Stratum #7 consists of the remainder of the southern portion of Management Unit #2. The southwest portion of this Stratum contains some maturing Yellow Poplar. These Poplar contained several quality stems at the time of inventory however, as with many Yellow Poplar across this area, these trees were stricken by a heavy tuliptree scale outbreak followed by the 2012 summer drought. The steepest portion of the tract is in the most southern portion of this Stratum #7 and contains about 20 acres. This acreage consists of Mixed Hardwoods, Oak-Hickories and Yellow Poplar. Some crown thinning could be accomplished in the harvest marking to reduce basal area where needed. Marking of the Yellow Poplar may need to be more of a salvage harvest due to expected mortality in this area. Though not all Yellow Poplar will be harvested, many more will be marked for harvest than the inventory tally initially noted. While the overall average basal area was 81 sq. ft. for this stratum, the stocking is high in some places (110 at a few inventory points) and low in others (0 to 40). The stocking guide for Management Unit #2 above indicates an average removal of 16 sq. ft. of basal area. Some of the largest and better quality stems are on steep east-facing slopes in this southern 20 acres. Postharvest TSI of grapevines would be beneficial to that area.

Overall, the inventory results indicate that Management Unit #2 could sustain and benefit from a harvest in this cutting cycle. An intermediate, improvement harvest utilizing single-tree selection over most of the south acreage with the potential for regeneration openings of 1 -5 acres in size is recommended. The removal of some over-mature trees with their large crowns will release several stems of oaks and hickories.

The marking objective will be the removal of mature/over-mature stems, as well as those of low quality in an effort to improve the overall health, vigor and composition of the stratum. The reduction of stocking levels should provide space for pre-selected crop trees to move forward into the next cutting cycle. This Unit's species composition will likely become more diverse and less susceptible to insect and disease infestation which is a common problem with homogeneous stands. 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. Post harvest TSI is prescribed to reduce stocking in some areas of high basal area of pole-sized stems and release croptrees not successfully released from the harvest.

Wildlife will benefit from this harvest as well. 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. Post-harvest TSI will increase snags per acre while diversifying diameter distributions of both snags and growing stock trees.

Habitat and cover types currently present within the Unit will remain after the proposed management activities throughout the majority of the tract as the silvicultural approach is predominately singletree selection. The creation of group selection regeneration openings may convert some closed canopy areas to early successional habitat. The Mixed Hardwood

component in this Unit is primarily where group selection would occur.as they tend to have a lower Oak-Hickory composition.

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 50 - 150 MBF being possibly enlarged due to the recent drought and YEP scale infestation. As a good portion of this Management Unit #2 is not harvestable acreage this cutting cycle, the portions of this Unit that are marketable are planned to be combined with Tracts 13 and 16 of Compartment 10 to facilitate a harvest in FY2012-13.

Proposed Activities Listing	**Time Period**
DHPA roadwork Project for Y1013,16,20	October 2012
Timber marking	CY2013
Road Construction Rehab	CY2013
Timber Sale (Combined with Tracts 13 & 16)	FY2012-13
Timber Harvesting & Closeout	CY2013-16
Postharvest TSI (Combined w/Tracts 13&16)	CY2013-2016
BMP Field Review (Combined w/Tracts 13&16)	CY2013-2016
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 for an easement for the Tecumseh Hiking 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 partial of land with The Nature Conservancy leading the way. In 2008 a transfer of 190 acres from the TNC to Division of Forestry was completed. Forestry received the property east of Indian Hill Road. This area was bordered to the south by an existing part of Yellowwood State Forest. TNC subsidized a portion of the acquisition in order to allow the Division of Forestry to access discretionary funds in the Heritage Trust funds that are only available when others contribute at least 25% of the value of the match. Other agencies acquire other parts of the purchase including the Division of Nature Preserves, Sycamore Land Trust and TNC. Acres of other bottomlands, an area of hemlock, Kirtland's snake Habitat and a sandstone bluff along Beanblossom creek have also been preserved through the cooperation of all of the above noted partners in this 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.