RESOURCE MANAGEMENT GUIDE

Yellowwood State Forest — Compartment 06 Tract 05
Forester S. Sheldon — Date 3/20/2009
Revised 1/19/2010
Management Cycle End Year 2029 — Management Cycle Length 20 years

Location

C06T05 is located approximately 2 miles northeast of the Yellowwood State Forest office, off of Dubois Ridge Rd. in Sect. 21 T9N, R1E of Brown County.

General Description

C6T5 is 57 acres of closed canopy hardwood forest. Hardwood species range from small to large sawtimber size classes. The tract does a 9 acre poletimber-small sawtimber Virginia pine stand, the remnants of a larger (28 acre) Virginia pine planting that was observed in 1972. The southern ¼ of the tract is an abandoned oldfield site that has naturally succeeded into mostly upland wet site hardwoods as well as a host of exotic species. Horsetrail Y is the North Boundary of this tract and the Ten O'Clock line hiking trail runs through the southern portion of the tract.

Overstory	Understory	Regeneration
Sugar Maple	White Ash	White Ash
White Ash	Sugar Maple	Red Maple
Chestnut Oak	American Beech	Sugar Maple
White Oak	American Elm	American Beech
Black Oak	Yellow Poplar	Pawpaw
Red Oak	Pawpaw	Redbud
Chestnut Oak	Redbud	Red Oak
Black Cherry	Red Maple	Chestnut Oak
Yellow Poplar	American Sycamore	White Oak
Shagbark Hickory	Chestnut Oak	Red Oak
Pignut Hickory	White Oak	Pignut Hickory
Red Maple	Dogwood	Shagbark Hickory
American Elm	Black Cherry	Yellow Poplar
Sassafras	Sassafras	American Elm
Blackgum		Sassafras
American Beech		Black Walnut
American Sycamore		Ironwood
		Dogwood
		Blue Beech

History
Yellowwood State Forest acquired this tract of timberland in 1955 & 1956 from the US Forest Service. There is no record of any past timber management conducted on the tract except for the possible widespread planting of Virginia pine in the 1950's. In September of 1972 Forester Steve Winicker completed the first inventory of the tract covering approximately the existing 31 acres of hardwood timber. The tract's hardwood volume per acre was 1,505 BF. Approximately 28 acres of Virginia pine were ignored probably being mostly young poletimber. Winicker's inventory information was not developed into a management guide. In 1991, property lines that are also the tract's boundary lines were painted and posted and survey corners were monumented. In December 2000 Forester David C. Vadas inventoried the entire tract and determined that the tract has approximately 3,434 BF/Acre composed of mostly black, chestnut and white oaks along with some volume in tulipwood and Virginia pine. In 2002/03 TSI was done in the southern portion (old field) of the tract. Boundary lines were remarked in 2005. Forester Sean Sheldon completed the 3rd tract inventory on March 18, 2009. A preliminary prescription was completed and the original management guide was drafted in March 2009. Forester Sean Sheldon marked this tract for harvest in July, 2009.

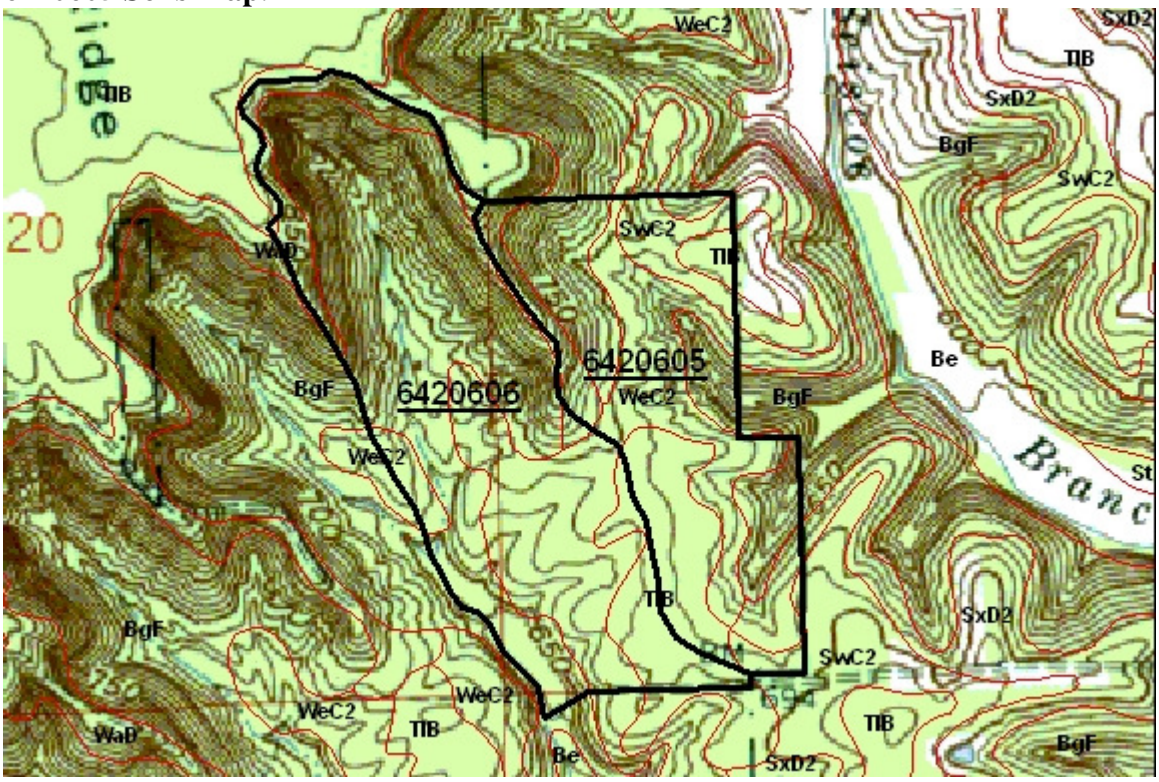
Landscape Context
Land to both the east and south of this tract is private, developed land. There is a field and pond in the property to the east of the tract. The land to the south of the tract is a home and yard. Land on all other sides is closed canopy hardwood and pine State Forest property.

Topography, Geology and Hydrology
The southern portion of the tract is primarily flat with a primary drainage that runs through the center. Slopes in the southern half of the tract range from flat to 25% grades. The northern half of the tract ranges from moderately steep to steep. The western boundary in the northern half of the tract is the top of a ridge. Slopes from this ridge are east facing steep slopes from 30-60% grades. Geology featured within the tract is derived from unglaciated sandstone/siltstone bedrock with modest depths of silt loam soils. This tract's main drainages are a watershed for a pond on the east adjacent landowner. Logging activities will need to be conducted carefully to reduce erosion hazards. Careful timber marking and road layout as well as prompt closing out of skid trails and logging roads will moderate these hazards.

Soils
The tract is fairly diverse in soil types with Wellston-Gilpin (27%), Tilsit (35%), Berks-Trevlac-Wellston Complex (22%) and Stonehead silt loams (14%) predominating. There is a small component of Wellston-Berks-Trevlac Complex and Stonehead-Trevlac.

silt loams at the northwest corner and southeast corners of the tract respectively (see Soil Type Map). Soil fertility ranges from 115-155 BF/A/Yr for the BTW soils to 185-260 BF/A/Yr for the WBT and WG soils (Oak species). Average soil site indices are 70' for oak and 80' for tulipwood. The Wellston-Gilpin, Stonehead and Stonehead-Trevlac silt loams have experienced long term erosion and the Tilsit, Stonehead and Stonehead-Trevlac soils all have seasonal wetness concerns (fragipan). Due to the shallow Berks soils, windthrow is a limiting factor for timber size on some slopes.

6420605 Soils Map:



Access

The south road entry is an abandoned old county road with poor drainage yet is an access for a significant hiking trail (Ten O'Clock Line). This access is seasonally wet and is undesirable for resource access unless significant road improvements and stoning is undertaken. The north preferred access is off of Dubois Ridge Road that coincides with the "Y" horseback riding trail. Some new roadwork to upgrade this horse trail/access route was completed in December 2009. Some additional roadwork into the tract from the North involved the creation of new yarding area and haul road access. The intent here was to reduce the amount of skidding impacts along the "Y" horse trail and increase aesthetic values along the "Y" horse trail. As a result this new construction all timber resources would be pulled uphill into this yard and hauled out by truck along the horse trail instead of skidding down the trail. Only 1 yarding area will be necessary for the harvest operation.

Boundary
Private land lays adjacent to the North, East and Southeast boundaries of this tract. Property lines are well marked with orange painting and some carsoniting has been done at the property corners (NE, E central corners and south line). Corners noted as US monuments are the Northwest, Northeast and Southeast corner of the NW1/4 of the SW1/4 of S21. The east line in the southeast portion of the tract appears to have been surveyed by Bob Vollmer in the past and there is a rebar with cap at the northeast corner of this line. This survey was apparently done due to a pond on private property that appeared to encroach the northeast property corner.

Wildlife
At present the tract is an excellent area for providing habitat and food for a great diversity of wildlife that live in mixed hardwood and oak-hickory and conifer stands. The best management of the tract would be to selectively favor the oaks and hickories that are most adapted to this tract. These species are longer lived and provide the most abundant and consistent mast. Beeches are uncommon but are increasing in the tract's understory and stand to be released in time through succession. Virginia pines planted in 1950's are now pole to small sawtimber size and cover nearly 9 acres of this tract. These pines originally covered several more acres than they do now but have succeeded to red maples and pole oaks in the southern portion of the tract. The current pine complement provides wildlife shelter and cover in inclement weather as well as provides roosting for game species like grouse and turkey. Some of these large stands have areas of windthrow and mortality creating small openings of standing dead snags as well as early successional stands of tulipwood, red maple and aspen. In other areas of the tract, tulipwood and maple are plentiful but provide little hard mast. This tract is well adapted for the squirrels, white-tailed deer, ruffed grouse and wild turkey game species as well as non-game songbirds that thrive in mixed hardwood and oak forests. Our timber management utilizes intermediate cuts and group selection along with BMP's (Best Management Practices) to provide habitat requirements for diversity of wildlife species. An appropriate number of shagbark hickories, mast producing species and den trees will be retained to provide additional habitat benefits. The south portion of the tract is still in transition from pines to upland red maple and is seasonally wet due to soil structure (fragipan). This tract could benefit from construction of a permanent wildlife opening and waterhole (several sites available on the lower flat ridgetop). The south portion of the tract has a thick understory of Japanese honeysuckle that provides shelter and escape cover for many wildlife species. Two small wild1ife waterholes were discovered during the inventory and are approximately 6' in diameter.

Legacy Trees*	**Maintenance Level**	**Inventory**	**Available Above Maintenance**
11"$^{+}$ DBH	504	729	225
20"$^{+}$ DBH	168	156	-12

* 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	224	392	537	313	145
9"+ DBH	168	336	91	-77	-245
19"+ DBH	28	56	18	-10	-38

Communities

Heritage Database has no listing of any rare or endangered plant communities in this tract. There are some records of Timber rattlesnake, bobcat, and Yellowwood tree observations in nearby tracts.

Forest Condition

The inventory shows 3,940 bd. ft. per acre Total volume. There is 2,100 bd. ft. per acre Harvest volume and 1,830 bd. ft. per acre Leave volume. The overall stocking is at 82% with an average diameter of 7.6" (see attached Inventory Summary). The southern portion of this tract is significantly less stocked and has a smaller average diameter than the northern portion of this tract. The northern portion is primarily mature to over-mature while the south portion is sparsely stocked with pole-size timber. Modest wildfire damage was noted on the upper northern slopes as well as a modest amount of windthrow due to shallow soils that occupy these sites. This tract is in need of harvest in the northern portion and in need of TSI and exotic species management in the southern portion.

Recreation

As the majority of the tract is not easily accessible to the public, the major recreational activities are horseback riding, hunting, hiking, & mushrooming. A horsetrail to the north of the tract has been constructed in the past few years and is a popular area for horseback riders. The access from off the southeastern road is poor and is perennially wet. There is an old roadbed in the south part of the tract that is presently part of the Ten O'Clock Line Hiking Trail. This trail touches just a small portion of the tract and will be avoided by any timber management.

Cultural

No cultural sites were noted during the inventory, however due to the large amount of pine planted in the tract there may be some sites that were missed due to pine density or were impacted during the planting operation. There is an old roadbed that crossed through the south-central portion of the tract that is no longer useable due to erosion and forest growth.

Tract Subdivision Description and Prescription

Volume Estimates:

Table 1: Overall Tract Stocking Chart for M0801

Species	Harvest BF	Growing Stock BF	Total BF
Bitternut Hickory	0	5,970	5,970
Black Oak	36,100	23,830	59,930
Chestnut Oak	4,500	4,230	8,730
Largetooth Aspen	2,660	0	2,660
Red Oak	10,130	1,430	11,560
Pignut Hickory	0	9,680	9,680
Red Maple	1,200	6,230	7,430
Shagbark Hickory	0	9,590	9,590
Sugar Maple	8,630	0	8,630
Virginia Pine	27,160	2,980	30,140
White Ash	0	2,630	2,630
White Oak	27,460	25,840	53,300
Yellow Poplar	0	10,240	10,240
Total	**117,840**	**102,650**	**220,490**
Totals Per Acre	**2,104**	**1,833**	**3,937**

Virginia Pine Stand 9 Ac.

There is approximately 9 acres of Virginia pine planted in this tract. As time has passed hardwood encroachment has increased and the pines have begun to die out. There remains a modest amount of healthy, well-growing pines that are vital for wildlife cover and diversity. The proposed management of this tract is to remove poorly growing pines to allow for healthy and vigorous hardwoods to occupy the canopy. Healthy pines that are of sawtimber size will remain.

Abandoned Field Stand -10Ac.

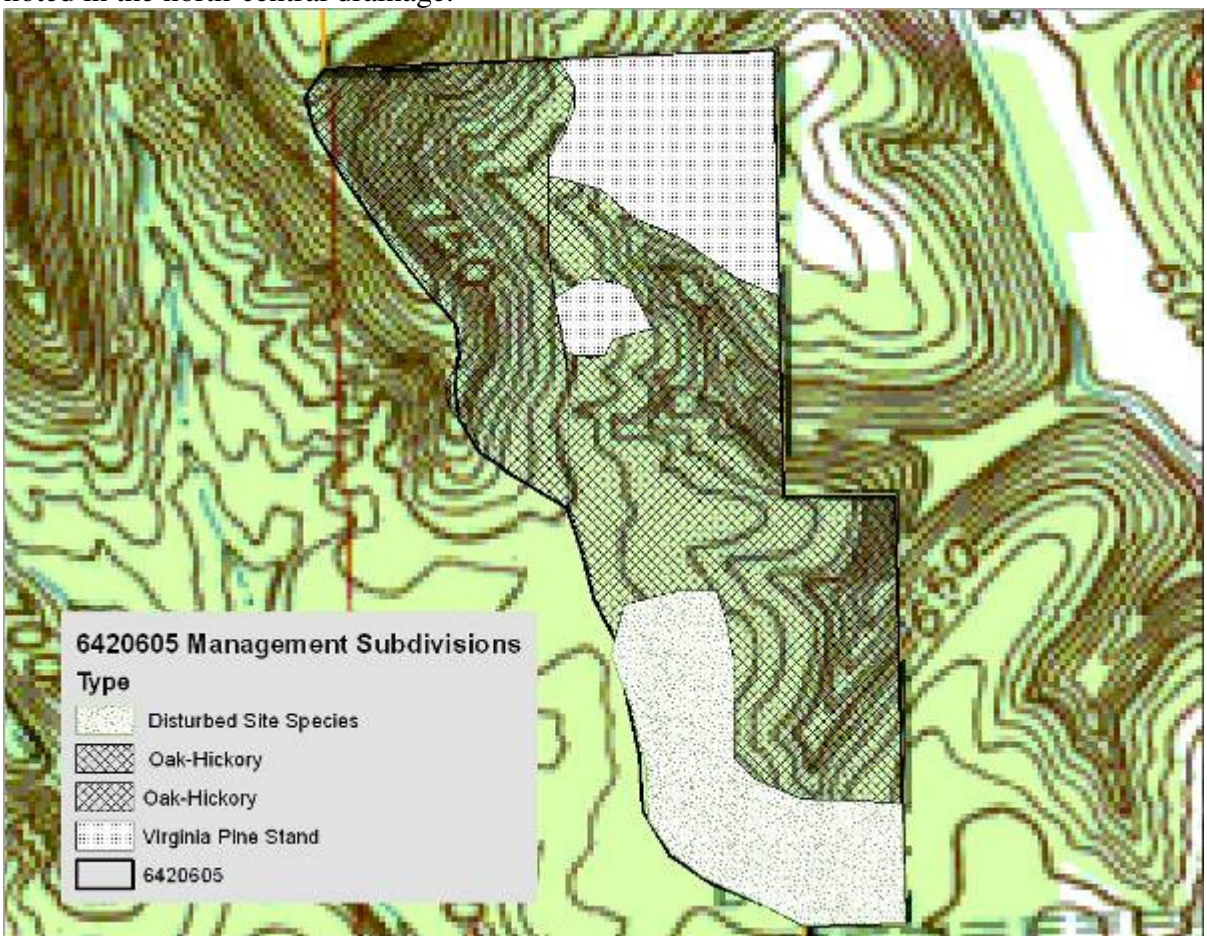
There is approximately 10 acres of “scrub” conditions in the south-central portion of this tract. This area includes SAS, REM, SUM, YEP and other disturbed site species. Grapevine and exotic species are well represented in this area. Most of the trees are of small diameter and have poor form. The proposed management of this area is TSI along with exotic species control using a selective herbicide and applied using a backpack sprayer. Some of the trees in this area will be left for wildlife habitat as they are

beginning to die out. With TSI of grapevines and understory and the removal of the competing exotic species, this area could regenerate more desirable species.

Oak-Hickory 67Ac.

The northern half of the tract is where the majority of the harvestable volume resides. This area is a nice mixed stand of Oak and Hickory with a substantial population of SUM on the northwestern portion of the tract.

Management of this area will be to selectively remove larger black, white and chestnut oaks due to maturity and/or material defect as well as to do some free thinning in the remaining oak-hickory and mixed hardwood stands. The white oak stands are of fair to good quality and approximately 15% of the tree's volume appears to be in the prime to veneer quality category. Favoring the higher quality and vigorous black, white, and chestnut oaks will be the prescription for this tract during an improvement cutting. As windthrow and moderate fire damage is present on some of the steeper slopes in the northwest portion of the tract and regeneration is likely there. Fire damage was also noted in the north-central drainage.



Tract Prescription and Proposed Activities

The planned harvest consists of 2 components: the very large sawtimber harvested in a selection cut and regeneration harvest in the northwest and north-central portion of the tract. An improvement thinning harvest is planned among the small sawtimber and medium sawtimber size classes. The very large sawtimber is mostly black, chestnut and white oaks whereas the free thinning group is mixed with mostly black oak, Virginia pine, sugar maple, aspen, sugar maple and red oaks.

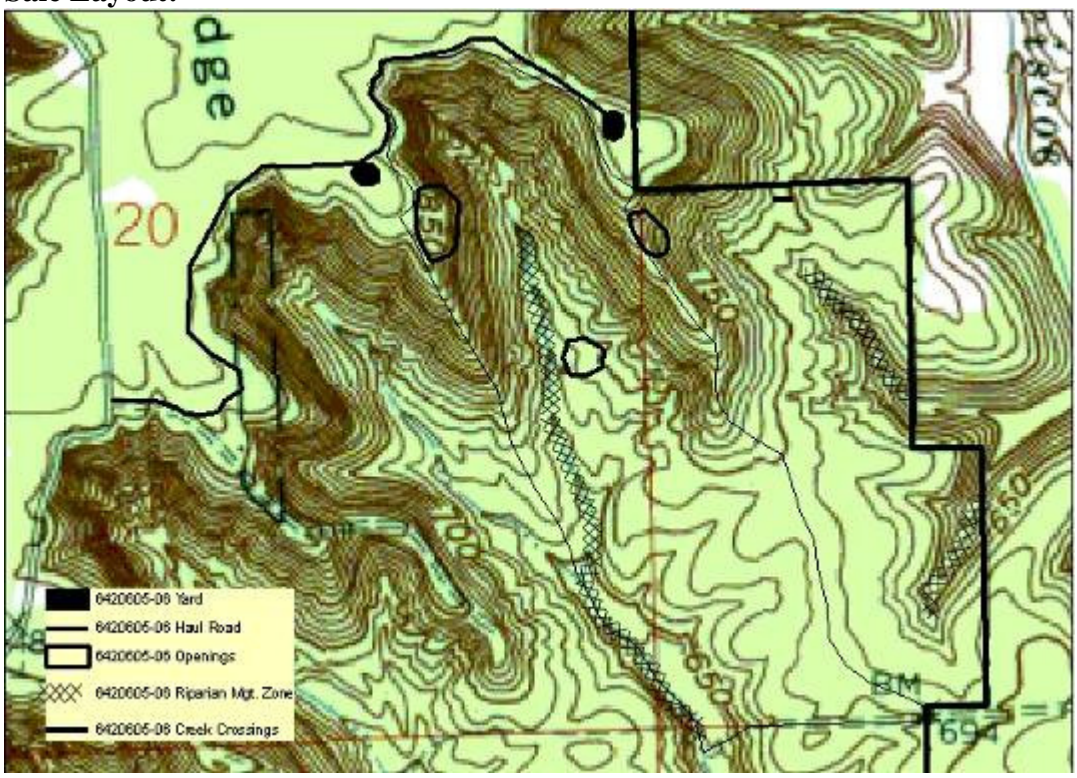
The breakdown of the harvest indicates a need to selectively remove larger black, white and chestnut oaks due to maturity and/or material defect as well as to do some free thinning in the remaining oak-hickory and mixed hardwood stands. The white oak stands are of fair to good quality and approximately 15% of the tree's volume appears to be in the prime to veneer quality category. Favoring the higher quality and vigorous black, white, and chestnut oaks will be the prescription for this tract during an improvement cutting. Regeneration openings of 1 to 5 acres are needed in the northwesterm portion of the tract where the overstory is mature to over-mature. Regeneration openings also provide necessary early successional wildlife habitat as well as promotes the regeneration of desirable hardwood species.

A planned timber harvest using predominantly improvement cutting is planned for fiscal year 2009-10. One new yard is needed at the northcentral portion of the tract: all harvested timber would be skidded uphill to this area. The access road to service this yard was improved and this yard could facilitate the harvests for adjacent tracts to the north and west. This access road will need to intersect and run along part of the Dubois ridge horsetrail for approximately ¼ mile. Access off the southeast portion of the tract was determined to be too wet, too obstructive to the hiking trail there, would require substantial road stabilization (stone) and is too far removed from the majority of the timber that would be harvested. Soil type will have some emphasis on the present and future management of this tract. The Berks soils are shallow and limit the size of timber that can grow on them. The Wellston and Gilpin soils are more modest in depth and can grow larger timber resources. Timber harvesting should be selective and skid trails should be constructed on the contour to reduce erosion hazards.

TSI needs are moderate especially in the south portion of the tract. Grapevines are modest to abundant in the southern portion of the tract and interfering with emerging poletimber mixed hardwoods and oaks. TSI is needed in some of the more recent decadent Virginia pine stands. Some large trees in openings may be deadened to compensate for low snag quantity in tract. Also, in the old fields some tulipwood and oaks could be released from competition from less desirable species such as aspen, sassafras and red maple.

Exotics are a major concern on this tract. Management for exotics should concentrate on reducing the future spread into adjacent stands of poletimber oaks by spraying using a backpack sprayer with selective herbicide.

Sale Layout:


20
650
700
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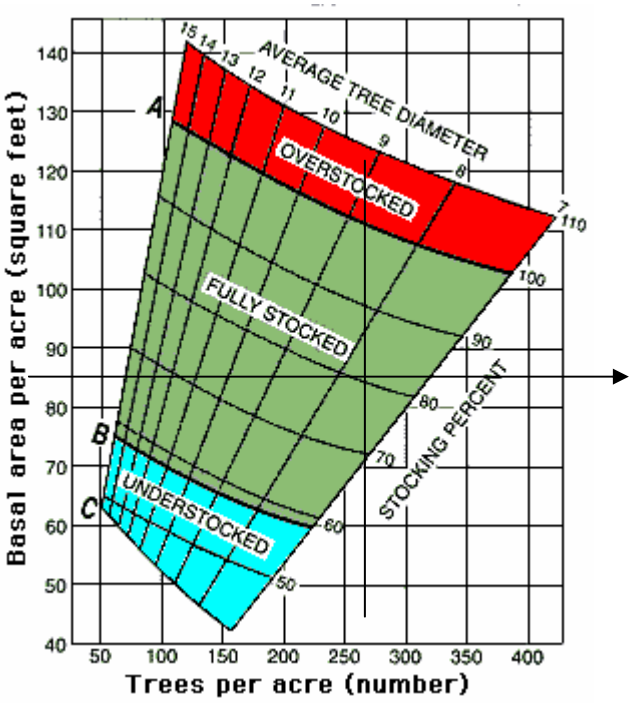
BM
6420605-06 Yard
6420605-06 Haul Road
6420605-06 Openings
6420605-06 Riparian Mgt. Zone
6420605-06 Creek Crossings



This stand is fully stocked at 267 trees per acre with an average of 84 basal area per acre.

Proposed Activities Listing
Timber Harvest planned in 2009/10 fiscal year.
TSI work during 2010/11 fiscal year.
Stand Re-inventory work 2029.

Attachments
The following attachments are kept in the tract file:
Ecological Resource Review
Aerial photo map with noted special features
Aerial photo map with noted unique areas
Soil type tract map
Indiana Natural Heritage Database Map
TCruise reports
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References Cited:
Forester David C. Vadas, 642605 Management Plan and Forester's Narrative. 1/29/2001.

Note: This draft management guide was posted on the Division of Forestry Website on June 24, 2009. This revision was completed in January, 2010.

Indiana Division of Forestry Tract-level - Ecological Resource Review

Date of Review:	3/17/2009 Revised 1/26/2010		
State Forest:	Yellowwood		
Forester:	S. Sheldon		
Compartment:	06	**Township:**	21
Tract(s):	05 56acres	**Range:**	9N
Total Acres:		**Section(s):**	1E

1. Tract-level Habitat Overview

Using readily available resources (aerial photos, area maps, GIS, personal knowledge, etc.), estimate the proportion of each cover/habitat type within **1 mile** of tract center.

Habitat/cover type	0%	0 < 1%	1-10%	11-50%	51-90%	>90%	Unknown
Closed-canopy deciduous/mixed forest	☐	☐	☐	☐	☒	☐	☐
Pine/conifer plantations or natural stands	☐	☐	☒	☐	☐	☐	☐
Early successional forest (≤ 20 years old)	☐	☒	☐	☐	☐	☐	☐
Shrub-scrub or old field	☐	☐	☒	☐	☐	☐	☐
Grasslands/hayfield	☒	☐	☐	☐	☐	☐	☐
Cropland, pastures, feedlots	☒	☐	☐	☐	☐	☐	☐
Open water (lakes, ponds, rivers, streams, etc.)	☒	☐	☐	☐	☐	☐	☐
Riparian areas	☒	☐	☐	☐	☐	☐	☐
Developed areas	☒	☐	☐	☐	☐	☐	☐
Other:	☐	☐	☐	☐	☐	☐	☐

1.1. Consider whether the proposed management activities for the tract would significantly alter the relative proportion and availability of habitat/cover types throughout the assessment area. Consider both short- and long-term changes and conditions. Discuss in the tract Resource Management Guide the possible impacts on habitat/cover types that would be completely converted or significantly reduced due to the proposed management activities. Consult with DoF Forest Wildlife Specialist, if necessary.

1.2. Consider whether the proposed management activities would significantly disrupt travel/dispersal corridors or create isolated habitat units separated from larger units of similar habitat. This is especially important when species of special conservation need have been observed in the area and could be affected by such habitat fragmentation. If applicable, address these considerations in the Resource Management Guide, including short- and long-term impacts. Consult with DoF Forest Wildlife Specialist, if necessary.

1.3. Consider whether the proposed management activity will increase the likelihood that specialist interior forest species would be affected by generalist species using forest edge habitats. Where practical, avoid situations where the perimeter of proposed regeneration (or permanent) openings would be located within 200 feet of maintained forest edges. Maintained edges include those between forest and terrestrial habitats maintained to not naturally revert into forest, such as agricultural fields, developed areas, "daylighted" permanent roads, or maintained utility right-of-way corridors. **Consult with DoF Forest Wildlife Specialist if the proposed management activity will include one or more regeneration or permanent openings totaling ≥ 5 acres within 200 feet of maintained forest edges.**

1.4. Where applicable, discuss in Resource Management Guide compliance with guidelines regarding cover types affected by proposed activities, such as the use of Best Management Practices where open water and riparian areas occur.

2. Structural Habitat Features (Snags, Cavity Trees, and Roost Trees)

	YES	NO
2.1. Were structural habitat features included in tract inventory?	☒	☐
2.2. If done, did structural habitat feature inventories meet or exceed all compartment-level guidelines?	☐	☒

2.3. Are inventory summaries for structural habitat features included in this tract's management file?..... ☒ ☐

If "no" is checked in any box above, provide an explanation in tract Resource Management Guide. If "no" is checked for **2.2**, consider if further tract-level management is necessary and address in tract Resource Management Guide.

3. Special Habitats

Are any special habitats present within or near tract? (check if 'yes')

- ☐ Permanent wetlands and pools (typically annual inundation; not including created "wildlife ponds")
- ☐ Seasonal/ephemeral wetlands and pools
- ☐ Wildlife ponds (created)
- ☐ Springs/seeps
- ☐ Sinkholes, caves, or other karst features
- ☐ Ledges, rock outcrops, cliffs, talus slopes
- ☐ Other:

For each special habitat present, refer to appropriate guidelines in DoF Procedure Manual and address management/planning considerations in the tract Resource Management Guide. If impacts are unavoidable, describe possible short- and long-term impacts and how these may be mitigated. Also, be sure to document the location of each special habitat.

4. IDNR Natural Heritage Database Review

	YES	NO
4.1. Was a Natural Heritage Database review done?	☒	☐
4.2. If a review was done, has there been recent (≤ 20 years) documented evidence of plant or animal species listed as endangered, special concern, threatened, or rare within or near this tract?	☒	☐
4.3. Are the results of the Natural Heritage Database search included in this tract's management file?	☒	☐

If "no" is checked for **4.1** or **4.3**, provide an explanation in tract Resource Management Guide. If "yes" is checked for **4.2** and species, habitats, or communities of special conservation need could be affected by management activities, address this in the Resource Management Guide in terms of possible short- and long-term impacts. Include how you will address the conservation for each of these species/habitats/communities while planning for management activities.

5. Non-native Invasive Species

In the table below, list all non-native invasive species that were observed during inventory or are known to exist within or near this tract. Consider level of management needed for each species, address management/monitoring in the tract Resource Management Guide, and map occurrences.

Species	Management Actions (check all that apply): Immediate Management Required	Monitoring/ Re-evaluation Recommended	Addressed in Management Guide?	Mapped?
Autumn olive	☒	☒	☒	☒
Multiflora rose	☐	☒	☒	☒
Japanese honeysuckle	☒	☒	☒	☒
Bush honeysuckle	☒	☒	☒	☒
	☐	☐	☐	☐
	☐	☐	☐	☐

6. Other Species Or Sign Observed During Inventory:

Comments/Notes: **Invasive species are primarily in southern tip of tract. There is an abundance in this area. The northern half of the tract has a varitey of habitats. There is a Virginia pine stand and large over-mature trees with cavities. The snag count is high especially in the pine stand.**