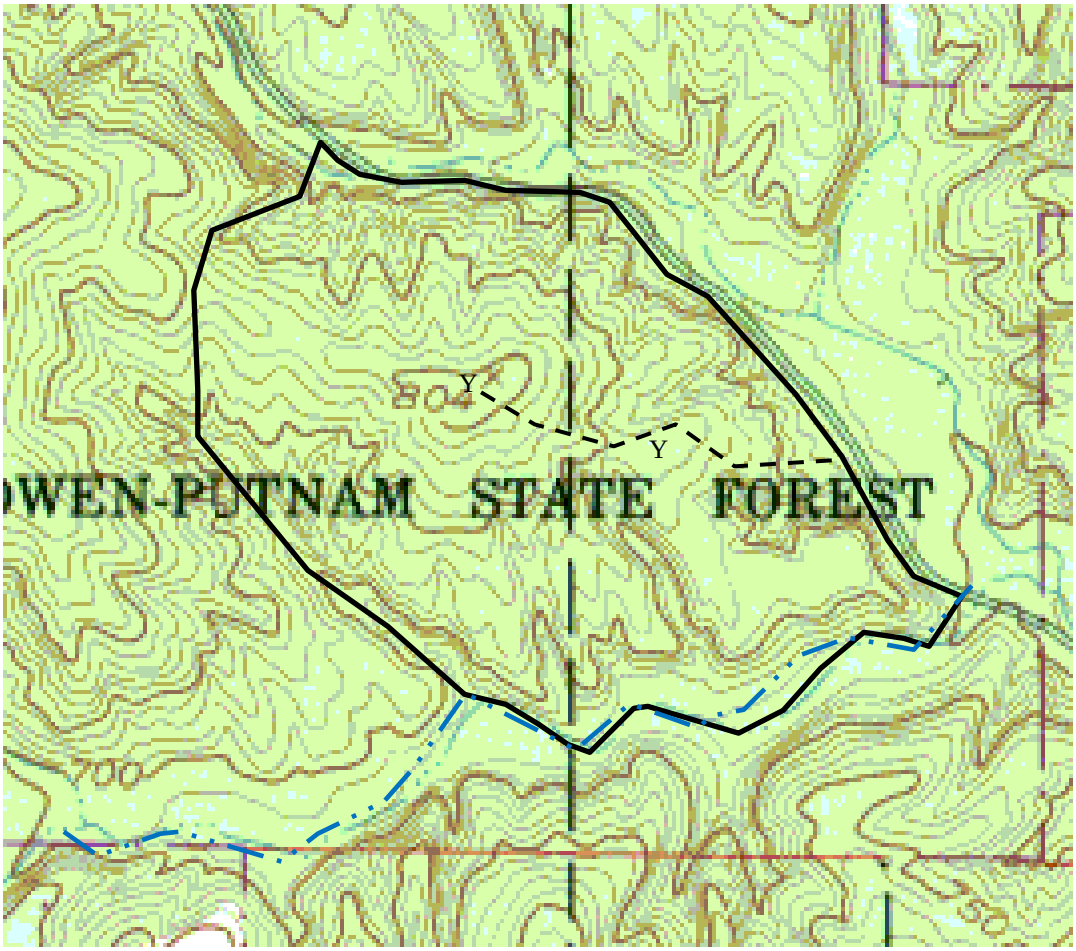
Indiana Department of Natural Resources
Division of Forestry
DRAFT RESOURCE MANAGEMENT GUIDE

State Forest: Owen-Putnam
Forester: R. Duncan
Management Cycle End Year: 2032
Compartment: 5 **Tract:** 6
Date: September 2017
Management Cycle Length: 15 Years

Location

Compartment 5, tract 6 is located along Surber road in the west half of section 15 and the east half of section 14, township 11N, range 4W, Morgan and Montgomery Township, Owen County. It is approximately 2 miles northwest of the unincorporated town of Cuba.



General Description

This tract is a 114-acre multiple use parcel located in the central portion of the 610 acres comprising compartment 5 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple, mixed hardwoods and pine. White and red pines were planted in the 1950's along the access road and ridge top to control erosion from past disturbance. The over-story consists of medium to large sawlog sized yellow-poplar, hickory, maple, oak with Eastern white pine and red pine comprising the pine stands. The quality of merchantable timber is good. However, there is some decline in the Yellow Poplar due to drought and insect stress. The pole-sized under-story consists mostly of hickory, maple, sassafras and beech with E. white pine and Red pine representing some of the pole sized understory in the pine stand. Advanced regeneration is represented mostly by American beech, maple, elm and Sassafras. This area exhibits good opportunities for multiple use management, including timber management, wildlife management, soil and water conservation and public recreational activities, such as, hunting, hiking, gathering, viewing and interpretation.

History

Owen-Putnam State Forest was established in 1948 with most of its landholdings purchased as smaller non-contiguous tracts in the 50's and 60's. The ridge tops in the area of this tract were farmed up until approximately 1930 and then planted to White and Red Pine in the 1950s when the state purchased the land. Compartment 5 tract 6 has been managed for many years.

- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 2000
- Timber harvest in 2000
- Timber stand improvement, vine control and crop tree release in 2006
- Timber inventory in 2017

Landscape Context

Compartment 5 tract 6 is located in a very rural area. Generally the area is forested hills and ravines. The private property adjacent to this compartment and tract are primarily closed canopy, deciduous, mixed hardwood forests with no industry, little agriculture, and some residences with small fields/pastures and small ponds located primarily along secondary county roads beyond the state forest.

Topography, Geology and Hydrology

This part of Owen-Putnam State Forest falls in the Shawnee Hills Natural Region, Crawford Upland Section. This section is most distinct by its rugged hills with sandstone cliffs and rockhouses. Characteristic soils are the well-drained acidic silt loams of the Wellston-Zanesville-Berks Association. The upper slopes consist of an oak-hickory assortment, with a more mesic component in the coves resembling the mixed mesophytic forest community.

The topography of the area varies from nearly level ground on the ridge top from east to west through the center of the tract to moderately steep north and south facing slopes. Water sheds into mapped intermittent streams to the north and to the south. The area is generally comprised of shallow to moderately deep, well-drained soils often containing fragipans on nearly level to steep slopes. These soils occur throughout the Illinoian glaciated

areas of the county. In the event of a harvest, the existing haul road and log yards can be utilized. However, care must be taken during the planning and execution of skid trails due to the erosive nature of some soils. Best Management Practice (BMP) guidelines will be followed to preserve soil and water quality.

Soils

Specifically, the tract is composed of the following soils:

HepG—Hickory-Adyeville complex, 35 to 60 percent slopes, *Setting*: Dissected till plains over interbedded shale, siltstone, and sandstone, *Position*: Backslopes, *Site Index*: Upland oak 85

ZamC2—Zanesville silt loam, soft bedrock substratum, 6 to 12 percent slopes, eroded, *Setting:* Hills underlain with interbedded sandstone, shale, and siltstone, *Position:* Shoulders and Backslopes, *Site Index*: Upland oak 69-75

ZapD3—Zanesville, soft bedrock substratum-Tulip silt loams, 12 to 18 percent slopes, severely eroded, *Setting*: Hills underlain with interbedded sandstone, shale, and siltstone, *Positio*n: Backslopes, *Site Index*: 69-75

SneC2—Solsberry silt loam, 6 to 12 percent slopes, eroded, S*etting:* Dissected till plains, *Position:* Shoulders and Backslopes, *Site Index*: Upland oak 80

TtcE—Tulip-Wellston-Adyeville silt loams, 18 to 25 percent slopes, *Setting*: Structural benches and scarps underlain with interbedded sandstone, shale, and siltstone, *Position*: Backslopes and footslopes, *Site Index*: Upland oak 80

AloB2—Ava silt loam, 2 to 6 percent slopes, eroded, *Setting:* Dissected till plains, *Position:* Shoulders and summits, *Site Index*: Upland oak 75-80

PbbC2—Parke silt loam, 6 to 12 percent slopes, eroded, *Setting:* Dissected outwash plains, *Position:* Shoulders and backslopes

Access

To access the tract from Spencer Indiana, travel west on State Road 46 approximately 2-miles to Rattlesnake road, then travel north on Rattlesnake road approximately 6-miles to Surber road, then travel west on Surber road approximately 2 miles. Access is the first fire trail on the left passed the second creek crossing. The tract is accessible to the public via nearby parking lots on Surber road. Management access as well as public recreational access to this tract is relatively good.

Boundary

This tract is located in the central portion of the 610 acres contained in compartment 5. Tract boundaries follow the county road to the north, a ravine to the northwest, a mapped intermittent stream to the southwest, a ravine to the south and an abandoned county road to the northeast. Private property borders this tract to the east, with approximate boundary lines having been located and marked with orange paint and flagging. The boundary lines have been marked and documented in the past.

Wildlife

With the presence of the upland and lowland forest area, which includes oak-hickory, beech-maple, mixed hardwoods, pine, pockets of seasonal grasses and sedges, ephemeral drainages, and the intermittent stream this tract contains habitat for a variety of wildlife species. Common species or sign observed include Eastern grey

squirrel, Eastern fox squirrel, Eastern chipmunks, white-footed mouse, white-tailed deer, Wild Turkey, Virginia opossum, North American raccoon, Eastern box turtle, raptors, songbirds, woodpeckers, toads, frogs and various small stream aquatic life.

Live trees in this tract provide for shelter, escape cover, roosting and as a direct (e.g. mast, foliage) or indirect (e.g. foraging substrate, bugging) food resource, with the oaks, hickories, walnuts and beech providing hard mast for deer, turkey and squirrel and the cherries providing soft mast for birds. The pine stands provide benefits such as cover, roosts and browse.

Live trees containing cavities in this tract provide nesting and denning opportunities for woodpeckers, songbirds and small mammals and potentially contribute to future snags (standing dead trees).

Snags in this tract provide essential habitat characteristics for foraging activity, nest/den sites, decomposers (e.g., fungi and invertebrates), bird perching and bat roosting, and are important contributors to the future pool of downed woody material.

Rotten logs, crater knolls, ephemeral drainages and the mapped intermittent stream provide habitat for herptiles and aquatic vertebrates.

A Natural Heritage Database Review is part of the management planning process. 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 proposed management activities for this tract should not significantly alter the relative proportion and availability of habitat/cover types or significantly disrupt travel/dispersal corridors or create isolated habitat units separated from larger units of similar habitat. Nor should the proposed management activities increase the likelihood that specialist interior forest species would be affected by generalist species using forest edge habitats. Indiana Logging and Forestry Best Management Practices (B.M.P.s) will be followed to conserve soil and water resources and related forest wildlife habitats, such as springs/seeps, ponds/wetlands and karst features.

Wildlife Habitat Features

According to the data collected during the tract inventory (R. Duncan 2017) and represented in the following table, this tract is well represented with habitat in regards to the density, size and species of live and dead trees essential for consideration of various wildlife habitat needs including habitat specialists such as cavity nesters and species of conservation need like the Indiana bat (Mytolis sodalis) and their suggested habitat requirements.

Legacy trees, as defined by the Management Guidelines for Compartment-Level Wildlife Habitat Features are well represented above the suggested maintenance levels. White oak and shagbark hickory are two species having preferred characteristics for tree roosting bats. Both are relatively abundant in this tract and will be given consideration as habitat. Also, as the tract continues to mature, the number of legacy trees $\geq$ 20" D.B.H. is expected to rise.

Standing dead or dying trees (snags) are somewhat well represented in this tract. Snags $\geq$ 5" D.B.H. and $\geq$ 9" D.B.H. in this tract are above the maintenance levels for both classes. However, snags in the $\geq$ 19" D.B.H. class are below the maintenance level. The lack of large diameter snags is often attributable to the overall good health of the forest and the short retention of large standing dead trees. Snags have short standing times and often become wind thrown.

Legacy trees, snags and cavity trees will be given consideration for retention as habitat for the Indiana bat and other wildlife as defined by the Resource Management Strategy for the Indiana Bat on State Forest Property and

the Management Guidelines for Compartment-Level Wildlife Habitat Features. In addition, the girdling of select cull trees could be performed through post harvest timber stand improvement (T.S.I.) to address large diameter snag limitations. It should be noted these are compartment level guidelines and the target snag levels may well be present on the landscape.

Wildlife Habitat Feature Tract Summary

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance
Legacy Trees *				
11"+ DBH	1026		2863	1837
20"+ DBH	342		593	251
Snags (all species)				
5"+ DBH	456	798	868	412
9"+ DBH	342	684	545	203
19"+ DBH	57	114	25	-32

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

Communities

Most of this tract is of the dry-mesic upland forest community type, with some isolated more mesic sites located along lower north slopes, and some floodplain along the streams. The dry-mesic upland forest community has moderate soil moisture with trees growing well, however the canopy is usually more open than in mesic forests. It is one of the most prevalent forest communities in Indiana. It occurs on slopes throughout the state. The dominant plants in this community are the white oak (Quercus alba), Northern red oak (Quercus rubra) and black oak (Quercus velutina). Characteristic plants in this community are the shagbark hickory (Carya ovata), mockernut hickory (Carya tomentosa), flowering dogwood (Cornus florida), hop hornbeam (Ostrya virginiana) and black haw (Viburnum prunifolium). Characteristic animals in this community are the broad-headed skink (Eumeces laticeps), white-footed mouse (Peromyscus leucopus) and Eastern chipmunk (Tamias striatus) (Jacquart et al. 2002).

A Natural Heritage Database Review is part of the management planning process. If Rare, Threatened or Endangered communities 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.

An exotic/invasive species, multi-flora rose (Rosa multiflora), is present in and around this tract in patches of light to moderate densities. It is also common through the county. Control measures can be undertaken, possibly during post-harvest T.S.I., to treat problem occurrences before their populations expand.

Recreation

While there are no developed recreation trails on this multiple use tract, it has good public access via the cable gate and fire trail located on Surber road. Hunting and gathering are the primary recreational uses of the tract.

Cultural

This tract is reviewed for cultural sites during the forest resource inventory and planning process. Cultural resources may be present but their location(s) are protected. Adverse impacts to significant cultural resources noted will be avoided during management or construction activities.

Tract Description and Silvicultural Prescription

This tract was not subdivided (non-stratified).

In 1988 a property wide inventory (TIMPIS) was conducted, including Compartment 5 tract 6 (M. Calvert 1988). The results estimated the tract to be 74% stocked with 86 Sq. Ft. of total basal area per acre in 138 trees per acre, containing 4459 Bd. Ft. of total sawtimber per acre and an estimated 1388 Bd. Ft. of harvest sawtimber per acre and a harvest proposed in 1997.

In 2000 a routine timber inventory was conducted (B. Gallogly). The data estimated the tract to contain 108 Sq. Ft. of total basal area per acre with approximately 7006 Bd. Ft. of total sawtimber per acre and an estimated 3217 Bd. Ft. of harvest sawtimber per acre.

In 2000 the tract was harvested (Joe Davison) of 152,101 Bd. Ft. in 684 trees on 110 acres (1383 Bd. Ft. /acre) as part of an intermediate harvest in the form of a selective thinning and improvement cut.

In 2017 a routine inventory was conducted (R. Duncan). The data estimated the tract to be 95% stocked with 114 Sq. Ft. of total basal area per acre in 164 trees per acre and an average tree diameter of 11.5 inches, containing approximately 7053 Bd. Ft. of total sawtimber per acre and an estimated 2117 Bd. Ft. of harvest sawtimber per acre.

Various timber types can be found on this tract. They are mixed hardwood, oak-hickory, beech-maple and pine. The over-story consists mostly of medium to large sawlog sized yellow-poplar, hickory, maple, oak with Eastern white pine and red pine comprising the approximately 6 acres of pine stands in the tract's central area. The quality of merchantable timber is good with the ridge tops and upper slopes containing more of the mixed hardwoods, and the mid to lower slopes containing more of the oak-hickory. The pole-sized under-story consists mostly of hickory, maple, Sassafras, beech with E. white pine and red pine representing some of the pole sized understory in the pine stand. Advanced regeneration is represented mostly by American beech, maple, elm and Sassafras.

The current inventory and stocking level indicates the tract is fully stocked. Some areas of the tract are sufficiently mature and crowded that resource competition is taking place and thinning may be beneficial. Often, there is little groundcover or early successional regeneration in these areas due to low light levels and browse. In the remaining areas, the tract is still maturing but could benefit from the selective removal of less desirable species and low quality individuals in an effort to improve the overall tract quality and composition.

The recommendation is to perform an intermediate cutting in the form of a thinning and improvement cut, utilizing the single tree and group selection methods within the un-even aged management system. A thinning should be done to reduce competition and mortality amongst the overcrowded timber. An improvement cut should be incorporated to improve the overall species composition and quality of the tract by select harvesting the low quality, damaged, diseased, dying and poorly formed trees as well as thinning of less desirable species, especially the declining yellow-poplar that are competing with the oak and other quality trees such as the hickory and cherry. In addition, ash trees susceptible to Emerald Ash Borer (EAB) will be selected for harvest to utilize their product before they become populated with the insect and decline. This removal will also capture Ash seed and create conditions to recruit and encourage regeneration of the species before seed bearing trees die due to EAB.

In some areas, a shelterwood-type situation may be created as trees are removed from the intermediate and understory layers while larger dominant and co-dominant trees (especially where oak is a strong component) are

left standing. This will allow more diffuse sunlight to reach the ground and improve the establishment and survival of seedlings.

Group selection openings may also be created to remove groups of undesirable species or poor quality individuals and to promote regeneration.

In combination, these silvicultural methods will reduce stand density; improve overall growing conditions and timber quality, while encouraging tree species diversity and regeneration of native mixed hardwood species.

The long term objective with the pine stands is a transitioning over the next 2 cycles away from these non-native species and towards a native hardwood mix. This would utilize a combination of group, shelterwood and single tree selection systems as described above.

Management in the form of Timber Stand Improvement (T.S.I.) is prescribed to release preferred, high quality crop trees through the culling of low volume, poorly formed trees and less desirable species, and to encourage regeneration through the creation of canopy gaps and a reduction in understory shade tolerant species. T.S.I. would also look at problem occurrences of multi-flora rose.

Standing dead trees (snags) and cavity trees will be given consideration for retention as habitat for wildlife. Legacy trees, as defined by the Resource Management Strategy for the Indiana Bat on State Forest Property, will be given consideration for retention as habitat for the Indiana Bat. In addition, the girdling of select, larger diameter cull trees could be performed through T.S.I. to address the Management Guidelines for Compartment-Level Wildlife Habitat Features.

The overall goal of this prescription is to improve timber species composition, provide resources for future crop trees through the removal of over-mature and declining trees, and provide forest wildlife habitat.

The tract is projected to remain in the fully stocked category after the prescribed elective harvest.

The existing haul road, log yard, and skid trail system will be utilized for management activities eliminating the need for any new construction. As with all forest management activities, Best Management Practice (BMP) guidelines will be followed to protect soil and water resources.

Total Number Trees/Acre: 164 **Average Tree Diameter:** 11.5”
Average Site Index: 80 Oak **Stocking Level:** 95%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	105	**Basal Area Sawtimber.**	79.2
Pine Commercial Forest:	9	**Basal Area Poles:**	30.8
Noncommercial Forest:	0	**Basal Area Culls:**	1.7
Permanent Openings:	0	**Sub Merch.**	2.4
Other Use:			
Total:	114	**Total Basal Area:**	114.1

Estimated Tract Volumes for Commercial Forest Area – Bd.Ft. Doyle Rule

Species	Harvest Stock	Growing Stock	Total Volume
YEP	902	917	1818
WHO	177	943	1119
REO	88	725	813
SUM	173	277	450
AMB	273	175	448
PIH	16	323	339
WHP	19	300	318
SHH	0	307	307
LAA	51	188	239
WHA	232	0	232
BIH	0	199	199
REM	0	180	180
SAS	72	79	151
BLG	82	0	82
ZCO	0	69	69
REP	0	64	64
BLC	0	58	58
BLO	32	12	44
SYC	0	33	33
BLW	0	21	21
SIM	0	21	21
GRA	0	16	16
BAS	0	11	11
AME	0	11	11
BLL	0	10	10
Per Acre Total	2117	4939	7053
Tract Total	241,338	563,046	804,042

Proposed Management Activities

2017 ---------- Timber Inventory
2017 ---------- DHPA Archaeological Clearance Application
2017 ---------- Resource Management Guide
2017/18 ------- Timber Marking and Sale Layout
2018 ---------- Timber Sale
2018-20 ------- Timber Harvest
2018-21 ------- Post-Harvest TSI and Exotic/Invasive Control
2018-21 ------- BMP Monitoring
2032 ---------- Timber Inventory
2032 ---------- Resource Management Guide

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