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

State Forest: Owen-Putnam **Compartment:** 5 **Tract:** 3
Forester: N. Fishburn (R. Duncan) **Date:** June 2013
Management Cycle End Year: 2033 **Management Cycle Length:** 20 Years

Location

Compartment 5, tract 3 is located in the east central area of section 15, township 11N, range 4W, Morgan Township, Owen County, Indiana. It is approximately 2 miles southwest of the town of Cataract.

General Description

This tract is a 62-acre sustainably managed, multiple use parcel located in the northern part of the 610 acres contained in compartment 5 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple, mixed hardwoods and pine. This area exhibits good opportunities for multiple use management, including timber management, wildlife management, and soil, air and water conservation. It is also a good area for public recreational activities, including hunting, hiking, gathering, viewing and interpretation. Because of its remote location it is an ideal spot for those looking for a more secluded outdoor experience.

History

Owen-Putnam State Forest was established in 1948 with most of its landholdings purchased as smaller non-contiguous tracts in the 1950's and 60's. Compartment 5 tract 3 has been managed for several years. This tract was created out of a 240 acre purchase from Marchant and Helen Gwinn in 1963.

- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1994
- Timber harvest in 1995
- Timber inventory in 2009

Landscape Context

Compartment 5 tract 3 is located in a very rural area surrounded mostly by state forest to the east and private land to the west. Predominantly the land in this area is closed canopy deciduous forests, with very few residences including some small fields/pastures and small ponds located primarily along county roads well beyond the state forest.

Topography, Geology and Hydrology

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 (Homoya et al. 1985).

The topography of this tract varies from level ground on the ridge top, located in the west central part of the tract, to moderate to steep slopes in every direction making up the remainder of the tract. On the south side of the tract, water sheds generally from north to south through ephemeral drains. On the east side of the tract, water sheds generally from west to east through ephemeral drains to the mapped intermittent stream along Surber road. On the northeast side of the tract, water sheds generally from southeast to northeast through ephemeral drains to the mapped intermittent stream. Generally the soils are composed of moderately deep to very deep, moderately drained to well drained soils on low to steep slopes underlain with sandstone, siltstone and shale. These soils occur throughout the Illinoian glaciated areas of the county. The soils are comprised of a variety of types. The dominant soils are of the Tulip, Wellston, Adyeville, Tipsaw, and Zanesville series. In the event of a harvest, the existing trail system and log yards will be utilized, eliminating the need for new trail construction and minimizing soil disturbance. Indiana Logging and Forestry Best Management Practices (B.M.P.s) will be followed to preserve soil and water quality.

Soils

The tract is composed of the following soils from most to least abundant:

- **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

- **TtaG—Tulip-Tipsaw complex**, 25 to 60 percent slopes, *Setting*: Structural benches and scarps underlain with interbedded sandstone, shale, and siltstone, *Position*: Backslopes and footslopes, *Site Index*: Upland oak 70-80

- **WhfD2—Wellston silt loam,** 12 to 18 percent slopes, eroded, *Setting*: Hills underlain with interbedded sandstone, shale, and siltstone, *Position*: Backslopes, *Site Index*: Upland oak 81

- **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

- **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

- **PryB—Potawatomi silt loam**, 1 to 3 percent slopes, *Setting*: Hills underlain with interbedded sandstone, shale, and siltstone, *Position*: Summits, *Site Index*: Upland oak 80

- **WpuAV—Wirt silt loam,** 0 to 2 percent slopes, frequently flooded, very brief duration, *Setting*: Floodplains, *Position*: Natural levees and floodplain steps, *Site Index*: Tuliptree 105

- **SneC3—Solsberry silt loam,** 6 to 12 percent slopes, severely eroded, *Setting:* Dissected till plains, *Position:* Shoulders and Backslopes, *Site Index*: Upland oak 80

- **ZamC3—Zanesville silt loam, soft bedrock substratum**, 6 to 12 percent slopes, severely eroded, *Setting*: Hills underlain with interbedded sandstone, shale, and siltstone, *Position*: Shoulders and backslopes, *Site Index*: Upland oak 69-75

- **ZamB2—Zanesville silt loam,** soft bedrock substratum, 2 to 6 percent slopes, eroded, *Setting*: Hills underlain with interbedded sandstone, shale, and siltstone, *Position*: Shoulders and summits, *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, *Position:* Backslopes, *Site Index*: Upland oak 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

Access

To access the tract from the town of Spencer, travel west on S.R. 46 approximately 3 miles to Rattlesnake road, continue north on Rattlesnake road approximately 6 miles to Surber road, continue west on Surber road about 2 miles. The tract is directly south of Surber road, which forms the northern boundary of the tract. Parking is located along both the north and south sides of Surber road. Management access as well as public recreational access to this tract is good via the county road and the state forest access trail.

Boundary

The northern and western boundary lines are adjacent to private property. The northeastern boundary line is adjacent to compartment 5 tract 2. The southeastern boundary line is adjacent to compartment 5 tract 6. The southern boundary line is adjacent to compartment 5 tract 4. The boundary lines adjacent to private property are designated between the corners O to N and N to M. Corner N is an old sign on a steel post. Line N to O has some old fence in the area. Corner O is a metal stake next to a 3 forked red maple; the forest boundary is on the maple tree. Line M to N is an old fence line. Corner M has an old sign and a survey sign on a steel post. The boundary lines were previously marked with orange paint and/or orange ribbon placed on trees approximately located. The boundary lines were repainted and reflagged in 2002. All management activities will be kept an appropriate distance, usually 50-100', from private property.

Wildlife

Wildlife resources in compartment 5 tract 3 seem abundant. Common species or sign observed include Eastern grey squirrel, Eastern fox squirrel, Eastern chipmunk, white-tailed deer, Wild Turkey, Virginia opossum, North American raccoon, Eastern box turtle, raptors, songbirds, woodpeckers, toads, frogs and various small stream aquatic life. This tract contains habitat for a variety of wildlife species.

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.

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 streams and the mapped streams provide habitat for herptiles and aquatic vertebrates.

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 (J. Bauer 2009) and represented in the following table, this tract is somewhat 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 Greatest 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 tree species having preferred characteristics for tree roosting bats. White oak and shagbark hickory are not very abundant and will be given consideration for habitat. Also, as the tract continues to mature, the number of $\geq$ 20" D.B.H. legacy trees is expected to rise.

Standing dead or dying trees (snags) are somewhat well represented in this tract. Snags in this tract are above the maintenance level in all size classes, however the snags in the $\geq$ 9" D.B.H. class and $\geq$ 19" D.B.H. class are below the optimal 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.

Cavity trees are well represented in the larger diameter classes at the maintenance and optimal levels. Cavity trees are below both maintenance and optimal levels in the small $\geq$ 7" D.B.H. class. Cavity trees are above maintenance, but below optimal levels in the medium $\geq$ 11" D.B.H class. Cavity trees are above both the maintenance and optimal levels in the $\geq$ 19" D.B.H class. Representation could be lower than actual, due to inventory being conducted during leaf on, which can impede vision. Snags and legacy trees should develop cavities in time.

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 the optimal level of large diameter snags.

Wildlife Habitat Feature Tract Summary

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	558		1351	793	
20"+ DBH	186		300	114	
Snags (all species)					
5"+ DBH	248	434	1372	1124	938
9"+ DBH	186	372	291	105	-81
19"+ DBH	31	62	32	1	-30
Cavity Trees (all species)					
7"+ DBH	248	372	240	-8	-132
11"+ DBH	186	248	240	54	-8
19"+ DBH	31	62	84	53	22

*** 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 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 etal. 2002).

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.

No exotic/invasive species were observed in this tract.

Recreation

This tract is a 62-acre sustainably managed, multiple use parcel located in the northwest corner of the 610 acres contained in compartment 5 of the Owen-Putnam State Forest. Public access to this tract is very good. This tract can be accessed from Surber road. It is a good tract for public recreational activities including hunting, hiking, gathering, viewing and interpretation. Because of the available parking and walkable fire trail, it is an ideal spot for anyone looking for an accessible yet remote outdoor experience.

Cultural
Cultural resources may be present, but their location(s) are protected. Adverse impacts to significant cultural resources 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 timber inventory (TIMPIS) was conducted, including compartment 5 tract 3 (M. Calvert). The results estimated the tract to contain 5,313 bd. ft. of total sawtimber per acre, including 2,182 bd. ft. of harvest sawtimber per acre with a total basal area (trees $\geq$ 6" d.b.h.) of 100 sq. ft. per acre and 135 trees $\geq$ 6" d.b.h. per acre.

In 1994 a routine timber inventory was conducted (J. Allen). The data estimated the tract to contain 6,956 bd. ft. of total sawtimber per acre, including 2,406 bd. ft. of harvest sawtimber per acre with 114 sq. ft. of total basal area per acre, 87 sq. ft. of total basal area per acre for trees sized 10" and larger, and a stocking level of 105%. A harvest occurred in portions of the tract in 1995.

In 2009 a routine timber inventory was conducted (J. Bauer). The data estimated the tract to contain 7,470 bd. ft. of total sawtimber per acre, including 1,640 bd. ft. of harvest sawtimber per acre with 119.6 sq. ft of total basal area per acre and a stocking level of 106 %.

Various timber types can be found on this tract. They are oak-hickory, beech-maple, mixed hardwood and pine. The over-story consists mostly of medium to large sawlog sized yellow poplar, sugar maple, oak, hickory, white ash, sassafras, and American Sycamore; with Eastern white pine and red pine comprising the pine stands. 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 sugar maple, yellow poplar, American basswood, oak, hickory, sassafras, white ash; with Eastern white pine and red pine dominating the pole sized understory in the pine stand. Oak regeneration was present in some places ranging from a few oak seedlings to populous oak seedlings.

The current stocking level of 106% indicates the tract is over stocked. Overstocking creates a crowded forest where individuals are overly competing for resources which reduces tree vigor and quality. Therefore, a timber harvest is recommended within the next two years. By the employment of good forest stewardship, timber that has a substantial commercial value may be removed in a manner that benefits the growth of saplings and other trees by thinnings, improvement cuttings, and harvest processes and at the same time provides a source of revenue to the state and counties and provides local markets with a sustainable source of building material. Overall, much of the timber is mature or reaching maturity with excessive competition for resources taking place. Some areas could benefit from the removal of less desirable species such as maple, beech and sassafras in an effort to improve the overall tract quality and species 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 done to improve the overall species composition and quality of the tract by harvesting the low quality, damaged, diseased, dying and poorly formed trees as well as harvesting less desirable species. 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 oak seedlings. Group selection openings may also be created to remove groups of undesirable species or poor quality individuals and to promote early successional tree regeneration. In combination, these silvicultural methods will reduce stand density; improve overall growing conditions and timber quality, while encouraging early successional regeneration and tree species diversity.

Management in the form of Timber Stand Improvement (T.S.I.) should be performed post-harvest to release preferred, high quality crop trees through the culling of low volume, poorly formed trees and less desirable species, and to encourage early successional regeneration and oak recruitment through the creation of canopy gaps, regeneration openings and a reduction in understory shade tolerant species (sugar maple and American beech). No invasive species were observed during inventory and should not need management control. 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 post-harvest T.S.I. to address the Management Guidelines for Compartment-Level Wildlife Habitat Features.

The overall goal of this silvicultural prescription is to improve timber quality and species composition, and create favorable growing conditions for early successional timber species, while providing forest wildlife habitat.

Inventory Summary – C5T3

Total Number Trees/Acre: 248 **Average Tree Diameter:** 9.4"
Average Site Index: 80 **Stocking Level:** 106%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	53	**Basal Area Sawtimber.**	90
Pine Commercial Forest:	9	**Basal Area Poles:**	20
Noncommercial Forest:	0	**Basal Area Culls:**	3.1
Permanent Openings:	0	**Sub Merch.**	6.5
Other Use:			
Total:	62	**Total Basal Area:**	119.6

Estimated Tract Volumes for Commercial Forest Area – Bd.Ft. Doyle Rule
***** Slight approximation due to software rounding

Species	Harvest Stock	Growing Stock	Total Volume
YEP	500	2,170	2,670
WHP	0	1,520	1,520
SUM	480	980	1,460
SYC	40	290	330
REO	0	300	300
WHA	250	0	250
AMB	120	120	240
PIH	90	100	190
BIH	0	170	170
SAS	130	0	130
BLC	0	90	90
SHH	0	80	80
BAS	20	0	20
BLW	0	10	10
***Per Acre Total**	1,640	5,840	7,470
***Tract Total**	101,380	361,990	463,370

Proposed Management Activities

2009 ---------- Timber Inventory
2013 ---------- Resource Management Guide
2013 ---------- DHPA Archaeological Clearance Application
2013/14 ---------- Timber Marking and Sale Layout
2013/14 ------- Timber Sale/Harvest
2014/15 ---------- Post-Harvest TSI and Exotic/Invasive Control
2014 ---------- BMP Monitoring
2030 ---------- Timber Inventory
2033 ---------- Resource Management Guide

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