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

State Forest: Owen-Putnam **Compartment:** 9 **Tract:** 5
Forester: N. Fishburn (R. Duncan) **Date:** July 2013
Management Cycle End Year: 2033 **Management Cycle Length:** 20 Years

Location

Compartment 9, tract 5 is located primarily in the south half of the southwest quarter of section 4, with a small portion of the tract located in the southeast quarter of the southeast quarter of section 5 township 10N, range 4W, Morgan Township, Owen County, Indiana. It is approximately 1 mile due north of the town of Vandalia.

General Description

This tract is a 101-acre sustainably managed, multiple use parcel located in the central part of the 838 acres contained in compartment 9 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 it is divided by a county road (Mangus Rd.) and has a small parking area, it is an ideal spot for anyone looking for an easily accessible 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 9 tract 5 has been managed for several years. The purchase information of this tract is unknown.

- Timber harvest in 1972
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1996
- Timber inventory in 2008

Landscape Context

Compartment 9 tract 5 is located in a somewhat less rural area surrounded mostly by private land. Predominantly the land in this area is closed canopy deciduous forests, with more frequent residences including some fields/pastures and small ponds located primarily along county roads adjacent to the state forest and S.R.46 nearby.

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 north central part of the tract to bottom land in the southwest corner of the tract, with moderate to steep slopes of western to southern to eastern aspects 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 west side of the tract, water sheds generally from east to west through ephemeral drains to the mapped perennial stream on private property to the south west. On the east side of the tract, water sheds generally from west to east into ephemeral drains that feed the mapped intermittent stream located within the east half of the tract. 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, 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

- **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

- **ZamD2—Zanesville silt loam,** soft bedrock substratum**,** 12 to 18 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

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

- **HeuE—Hickory-Wellston silt loams**, 18 to 25 percent slopes, *Setting*: Dissected till plains over interbedded sandstone, shale, and siltstone, *Position*: Backslopes and footslopes, *Site Index*: Upland oak 80

- **OfcAV—Oldenburg fine sandy loam,** sandy substratum, 0 to 2 percent slopes, frequently flooded, very brief duration, *Setting:* Flood plains, *Position:* Flood-plain steps, *Site Index*: Upland oak 85

- **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

- **SneD2—Solsberry silt loam,** 12 to 18 percent slopes, eroded, *Setting:* Dissected till plains, *Position*: Backslopes, *Site Index*: Upland oak 80

- **SneD5—Solsberry silt loam**, 12 to 18 percent slopes, gullied, *Setting*: Dissected till plains, *Position*: Backslopes, *Site Index*: Upland oak 80

- **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

- **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

- **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

- **CkkB2—Cincinnati silt loam,** 2 to 6 percent slopes, eroded, *Setting*: Dissected till plains, *Position:* Summits and shoulders, *Site Index*: 80

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

- **WpuAV—Wirt silt loam,** 0 to 2 percent slopes, frequently flooded, very brief duration, *Setting:* Flood plains, *Position:* Natural levees and floodplain steps, *Site Index*: Upland oak N/A

Access

To access the tract from Spencer, travel west on S.R. 46 approximately 5 miles to the town of Vandalia and Mangus road, continue north on Mangus road approximately 1 mile to enter this tract. The tract is on both sides of the road. Management access as well as public recreational access to this tract is good via the county road.

Boundary

The northern, western and southern boundary lines are adjacent to private property. The eastern boundary line is adjacent to compartment 9 tract 10. The boundary lines adjacent to private property are designated between the corners W to X, X to Y and Y to V. Corner W is a fence intersection with posts. Corner V is located in a small stream and has a surveyor pin and metal fence post. The remaining corners and lines have not been surveyed and are poorly if at all not witnessed. The boundary lines have been marked with orange paint and/or orange ribbon placed on trees approximately located using a compass, pacing and GPS. All management activities will be kept an appropriate distance, usually 50-100', from private property.

Wildlife

Wildlife resources in compartment 9 tract 5 seem abundant. Common species or sign observed include Eastern grey squirrel, Eastern fox squirrel, Eastern chipmunks, 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 (R. Duncan 2008) 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 relatively 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 not well represented in this tract. The snags in this tract are below the maintenance level in both the $\geq$ 9" D.B.H. class and $\geq$ 19" D.B.H. classes. 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 the lack of large diameter snags.

Wildlife Habitat Feature Tract Summary

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
Legacy Trees *					
11"+ DBH	810		1638	828	
20"+ DBH	270		309	39	
Snags (all species)					
9"+ DBH	540		226	-314	
19"+ DBH	90		0	-90	

*** 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 located 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.

A waterfall and cascade is located about a half mile to the southeast in compartment 9 tract 8. The waterfall and cascade is a nonglacial erosional feature and is also considered a visual enhancement feature of the recreational poplar top trail. This geomorphic feature is located outside the management area. Therefore management activities in this tract should not interfere with or cause harm to this feature.

An exotic/invasive species, multi-flora rose (Rosa multiflora), is present in and around this tract in patches of moderate to heavy densities. Control measures should be considered, possibly during post-harvest T.S.I., whereby mechanical methods and herbicides could be applied to treat problemoccurrences .

Recreation

This tract is a 101-acre sustainably managed, multiple use parcel located in the center of the 838 acres contained in compartment 9 of the Owen-Putnam State Forest. Public access to this tract is very good. This tract can be accessed from Mangus road that runs directly through the tract. It is a good tract for public recreational activities including hunting, hiking, gathering, viewing and interpretation. Since Mangus road runs directly through this tract, it is an ideal spot for anyone looking for an accessible 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 9 tract 5 (D. Smith & M. Calvert). The results estimated the tract to 4,156 bd. ft. of total sawtimber per acre, including 1,260 bd. ft. of harvest sawtimber per acre with a total basal area (trees $\geq$ 6" d.b.h.) of 99 sq. ft. per acre and 184 trees $\geq$ 6" d.b.h. per acre.

In 1996 a routine timber inventory was conducted (R. Duncan). The data estimated the tract to contain 3,901 bd. ft. of total sawtimber per acre, including 1,017 bd. ft. of harvest sawtimber per acre with 77 sq. ft. of total basal area per acre, 65 sq. ft. of total basal area per acre for trees sized 10" and larger, and a stocking level of 63%.

In 2008 a routine timber inventory was conducted (R. Duncan). The data estimated the tract to contain 6,250 bd. ft. of total sawtimber per acre, including 2,930 bd. ft. of harvest sawtimber per acre with 102.8 sq. ft of total basal area per acre and a stocking level of 84 %.

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, hickory, oak, sugar maple, white ash, sassafras, and black cherry; with Virginia pine dominating 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 beech, hickory, sassafras, black walnut, red maple, red elm, and ironwood; with Virginia pine dominating the pole sized understory in the pine stand. Advanced regeneration is represented mostly by American beech and sugar maple.

The tract acreage East of the County Road is more heavily stocked and contains mature timber which can support a timber harvest anytime. The current stocking level of 84% indicates the tract is fully stocked, however more growth is necessary before the overall tract becomes overstocked. When a stand reaches overstocking, it creates a crowded forest where individuals are overly competing for resources which reduces tree vigor and quality. Therefore, a timber harvest is not recommended at this time and should be reassessed in 5-10 years.

Management in the form of Timber Stand Improvement (T.S.I.) could be performed 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 (oak) regeneration through the creation of canopy gaps and a reduction in understory shade tolerant species (sugar maple and American beech). However, that need is not great. T.S.I. should be performed whereby mechanical methods and herbicides would be applied to treat the problem occurrences of multi-flora rose and grape vine before the populations expand. 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 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 – C9T5

Total Number Trees/Acre: 142 **Average Tree Diameter:** 11.7”
Average Site Index: 80 **Stocking Level:** 84%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	91	**Basal Area Sawtimber.**	66.1
Pine Commercial Forest:	10	**Basal Area Poles:**	32.8
Noncommercial Forest:	0	**Basal Area Culls:**	3.9
Permanent Openings:	0	**Sub Merch.**	0
Other Use:			
Total:	101	**Total Basal Area:**	102.8

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	1,540	1,510	3,060
REO	540	520	1,060
WHA	330	0	330
BIH	70	260	330
SUM	180	130	310
PIH	140	140	280
WHO	40	200	240
SHH	20	180	210
VIP	0	100	100
SYC	0	100	100
BLW	0	90	90
BLC	0	60	60
REE	40	0	40
SAS	0	30	30
AMB	10	0	10
HOL	0	10	10
***Per Acre Total**	2,930	3,320	6,250
***Tract Total**	263,610	299,120	562,730

Proposed Management Activities

2008 ---------- Timber Inventory
2013 ---------- Resource Management Guide
2014/15-------- Timber Stand Improvement
2028 ---------- Timber Inventory
2033 ---------- Resource Management Guide

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