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

State Forest: Owen-Putnam **Compartment:** 9 **Tract:** 8
Forester: N. Fishburn (R. Duncan) **Date:** July 2013
Management Cycle End Year: 2033 **Management Cycle Length:** 20 Years

Location

Compartment 9, tract 8 is located in the southeast part of section 4, southwest part of section 3, northeast part of section 9, and northwest part of section 10, township 10N, range 4W, Morgan and Lafayette Townships, Owen County, Indiana. It is approximately 4 miles northwest of Spencer.

General Description

This tract is a 103-acre sustainably managed, multiple use parcel located in the southeastern 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 of its close proximity to roads and parking, it is an ideal spot for anyone looking for an easily accessible outdoor experience. The poplar top trail passes through the southeast part of this tract, with a seasonal waterfall located along the trail.

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 8 has been managed for several years. This tract was created out of land purchased from two landowners. 200 acres of land was purchased in 1950 from Orville and Thelma Haltom and 59 acres of land was purchased in 2000 from Harmon Crone.

- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1991
- Timber harvest in 1992
- Timber inventory in 2010
- Timber inventory in 2013

Landscape Context

Compartment 9 tract 8 is located in a rural area surrounded by state forest and wooded private land. Predominantly the land in this area is closed canopy deciduous forests, with 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 tops, located in the northern and southern part of this tract, to moderate to steep east and south east facing slopes making up the remainder of the tract. Water sheds generally from west to east through ephemeral drains into Fishcreek located along Fishcreek road. Generally the soils are composed of very deep, somewhat poorly drained to very 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 Zanesville, Hickory, Wellston, Tulip, and Tipsaw 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:

- **ZamD2—Zanesville silt loam, soft bedrock substratum**, 12 to 18 percent slopes, eroded, *Setting:* Hills underlain with interbedded sandstone, shale, and siltstone, *Position*: Backslopes, *Site Index*: Upland oak 69-75

- **HeuF—Hickory-Wellston silt loams,** 25 to 35 percent slopes, *Setting:* Dissected till plains over interbedded shale, siltstone, and sandstone, *Position:* Backslopes, *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

- **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

- **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

- **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

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

- **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

- **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

- **PcnA— Patricksburg silt loam, 0 to 2 percent slopes,** *Setting*: Hills underlain with interbedded sandstone, shale, and siltstone, *Position*: Nearly level summits, *Site Index*: 92

- **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

- **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

Access

To access the tract from Spencer, travel west on S.R. 46 approximately 4 miles to Fishcreek road, continue north on Fish Creek road approximately 1 mile to this tract. This tract is adjacent to Fishcreek road. Management and logging access as well as public recreational access to this tract is very good.

Boundary

The boundary of this tract was redrawn recently, due to the addition of new land purchases in this compartment. The northern and eastern boundary lines of this tract are adjacent to private property. The boundary lines adjacent to private property are designated as a line from ZN to ZM, ZM to ZL, ZL to Z and Z to ZA (see attached map). Corner ZN has no exact location, however the two connecting boundaries are visible and a large yellow-poplar near the corner has been marked. Corner ZM is a wooden fencepost. Line ZN to ZM is delineated by a chain link fence. Corner ZL is a metal stake. Line ZM to ZL follows Fishcreek road. Corner Z is a marked tree. Line ZL to Z has some partial fence. Corner ZA is a fence post. Line Z to ZA has some partial fence. The boundary lines for this tract have been re-flagged and painted in 2013. All management activities will be kept an appropriate distance from private property.

Wildlife

Wildlife resources in compartment 9 tract 8 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 intermittent stream 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 (N. Fishburn & R. Duncan 2013) 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 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 and optimal levels. White oak and shagbark hickory are two tree species having ideal characteristics necessary for tree roosting bats. White oak and Shagbark hickory are relatively abundant and will be given consideration for retention. Also, as the tract continues to mature, the number of ≥20" diameter at breast height (D.B.H.) legacy trees is expected to rise.

Standing dead or dying trees (snags) are well represented in this tract. They are above the maintenance and optimal levels in all diameter classes, except the large (≥ 19") diameter at breast height (D.B.H.) class. 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 and snags 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	927		2675	1748	
20"+ DBH	309		506	197	
Snags (all species)					
5"+ DBH	412	721	2849	2437	2128
9"+ DBH	309	618	1433	1124	815
19"+ DBH	51.5	103	21	-31	-82

*** 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 occurring 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 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 in the southern part of this tract. The waterfall and cascade is a nonglacial erosional feature and is also considered a visual enhancement feature of the recreational poplar top trail. A buffer zone will be placed around this feature during any management activities.

A second waterfall and cascade is located southeast of this tract on adjacent private property. 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.

Two exotic/invasive species, multi-flora rose (Rosa multiflora) and autumn-olive (Elaeagnus umbellata), are present in and around this tract in patches of light to heavy densities. Control measures should be considered, possibly during post-harvest T.S.I., to treat occurrences of concern.

Recreation

This tract is a 103-acre sustainably managed, multiple use parcel located in the northeast corner 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 through the cable gate and fire trail located along Fishcreek road adjacent to the office or through the cable gate and fire trail at the rear of Fishcreek Campground or through the cable gate along Fishcreek road north of the office. It is a good tract for public recreational activities including hunting, hiking, gathering, viewing and interpretation. Because of its close proximity to the office, campground and walkable fire trail, it is an ideal spot for anyone looking for an easily 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 8 (D. Smith, M. Calvert). The results estimated the tract to contain 4,708 bd. ft. of total sawtimber per acre, including 1,598 bd. ft. of harvest sawtimber per acre with a total basal area (trees $\geq$ 6" d.b.h.) of 94 sq. ft. per

acre and 156 trees $\geq$ 6" d.b.h. per acre. This tract has recently been redrawn to include new land purchases, thus the data is not entirely applicable.

In 1994 a routine timber inventory was conducted (J. Allen). The data estimated the tract to contain 5,416 bd. ft. of total sawtimber per acre, including 1,847 bd. ft. of harvest sawtimber per acre with 95 sq. ft. of total basal area per acre, 64 sq. ft. of total basal area per acre for trees sized 10" and larger, and a stocking level of 96%. This tract has recently been redrawn to include new land purchases, thus the data is not entirely applicable.

In 2010 a routine timber inventory was conducted (J. Dye). The data estimated the tract to contain 11,133 bd. ft. of total sawtimber per acre, including 2,909 bd. ft. of harvest sawtimber per acre with 130.8 sq. ft of total basal area per acre and a stocking level of 112 %. This tract has recently been redrawn to include new land purchases, thus the data is not entirely applicable.

In 2013 a routine timber inventory was conducted (N. Fishburn & R. Duncan). The data estimated the tract to contain 9,597 bd. ft. of total sawtimber per acre, including 3,687 bd. ft. of harvest sawtimber per acre with 114.6 sq. ft of total basal area per acre and a stocking level of 92 %.

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 hickory, yellow poplar, oak, sugar maple, largetooth aspen, sassafras, and American beech, with Eastern white pine and Virginia pine present in the pine stand over-story. 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, sassafras, yellow-poplar, red maple, black cherry, hickory, oak, elm, and American beech, with Virginia pine, Eastern white pine, and red pine poles present in the pine stands. Advanced regeneration is represented mostly by white ash, pawpaw, American beech, and sassafras, with some oak and hickory present. Oak regeneration was well represented in the advanced stages in some areas. Management should include the release of advance regeneration oak by providing sunlight and space.

The current stocking level of 92% indicates the tract is fully stocked-significant portions are 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 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 where applicable through the creation of canopy gaps, regeneration openeings and a reduction in understory shade tolerant species (sugar maple and American beech). Post-harvest T.S.I. should be performed whereby mechanical methods and herbicides would be applied to treat the problem occurrences of multi-flora rose and autumn-olive. 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 growth, quality and species composition, and create favorable growing conditions for early successional timber species, while providing forest wildlife habitat.

Inventory Summary – C9T8

Total Number Trees/Acre: 122 **Average Tree Diameter:** 13.1”
Average Site Index: 80 **Stocking Level:** 92%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	93	**Basal Area Sawtimber.**	88.9
Pine Commercial Forest:	10	**Basal Area Poles:**	20.0
Noncommercial Forest:	0	**Basal Area Culls:**	4.7
Permanent Openings:	0	**Sub Merch.**	1.0
Other Use:			
Total:	103	**Total Basal Area:**	114.6

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

* Approximation due to accumulative rounding

Species	Harvest Stock	Growing Stock	*Total Volume
YEP	1,750	407	2,157
SHH	0	1,499	1,499
WHP	41	1,393	1,434
BIH	66	840	906
WHO	0	228	228
LAA	545	35	580
SUM	280	54	334
REO	68	258	326
AES	129	170	298
SAS	215	73	288
WHA	177	102	279
VIP	106	64	170
PIH	166	0	166
AMB	113	0	113
BLC	0	70	70

ZHH	0	66	66
REM	32	0	32
BLW	0	30	30
BAS	0	26	26
ZCO	0	18	18
*** Per Acre Total**	3,687	5,910	9,597
***Tract Total**	379,770	608,750	988,520

Proposed Management Activities

2013 ---------- 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
2033 ---------- Timber Inventory
2034 ---------- Resource Management Guide

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.