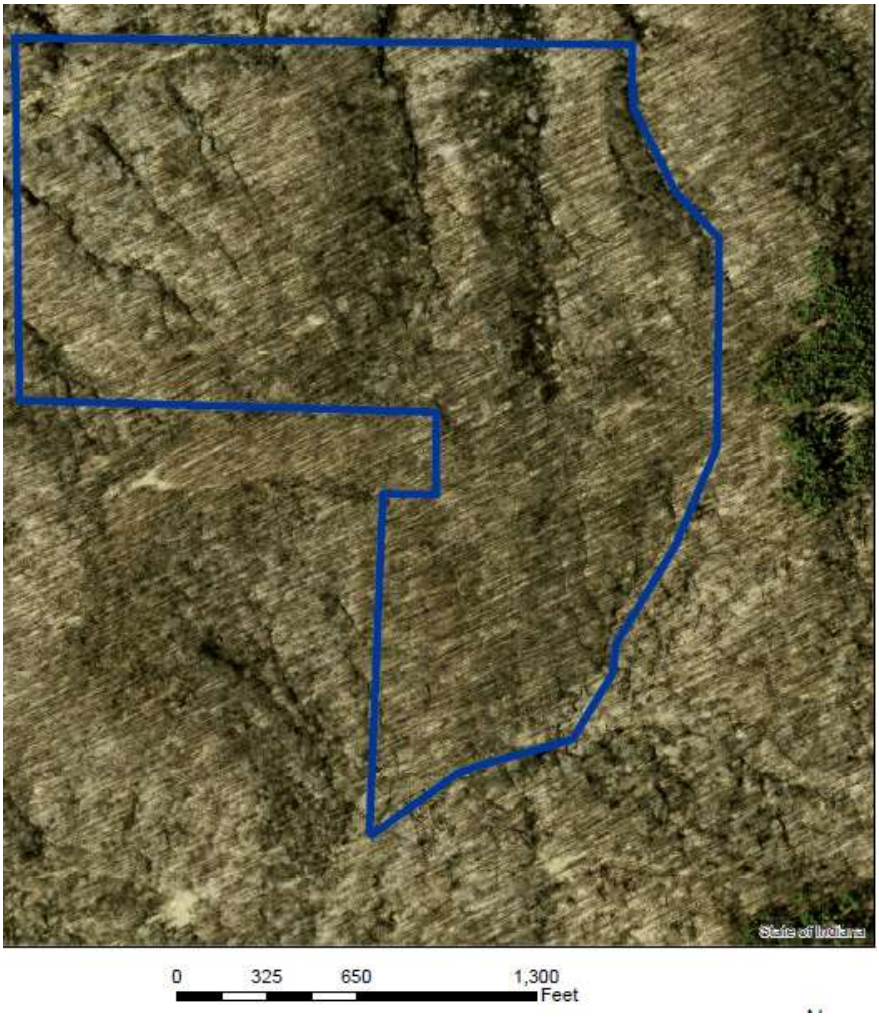
Indiana Department of Natural Resources
Division of Forestry
RESOURCE MANAGEMENT GUIDE
(DRAFT)

State Forest: Owen-Putnam
Forester: R. Duncan
Management Cycle End Year: 2030
Compartment: 4 **Tract:** 1
Date: September 2015
Management Cycle Length: 15 Years

Location

Compartment 4, tract 1 lies in the south central portion of section 8, township 11N, range 4W, Jackson Township, of Owen County, Indiana. It is approximately 2 miles northeast of the town of Jordan Village.



General Description

This tract is a 99-acre sustainably managed, multiple use parcel located in the northwest corner of the 1440 acres comprising compartment 4 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple and mixed hardwoods. The over-story consists of medium to large sawlog sized oak, maple, yellow-poplar, hickory and beech. 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 maple, sassafras, oak and hickory. Advanced regeneration is represented mostly by maple, beech, elm and hickory. 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. Compartment 4 tract 1 has been managed for several years. The vast majority of the tract was part of a June 1948 purchase with the far eastern portion being part of an acquisition that was made in October 1958.

- Timber harvest in 1968
- Timber harvest in 1975
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1993
- Timber harvest in 1994
- Timber salvage in 2005
- Timber inventory in 2009
- Timber inventory in 2013
- Timber inventory in 2014

Landscape Context

Compartment 4 tract 1 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 agriculture or industry, limited residential housing, small fields/pastures and small ponds located primarily along 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. 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 this tract varies from level ground on the ridge top, located in the center of the tract, to moderate to steep north and south facing slopes over most of the tract, with the northwest corner containing lowland area along a perennial stream (Jordan Creek). Water sheds generally to the north through ephemeral drains into Jordan creek and south into a mapped intermittent stream.

Generally the soils are composed of moderately deep to deep, well drained soils underlain with interbedded sandstone, shale, and siltstone found on side slopes in the uplands. These soils are suited to timber production. 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–Tipsaw complex 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

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

TtaG - Tulip-Tipsaw complex, 25 to 60 percent slopes, *Setting:* Structural benches and scarps underlain with interbedded sandstone, shale, and siltstone, *Position on the landform:* 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*: 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

OfaAV - Oldenburg silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration, *Setting*: Flood plains, *Position*: Flood-plain steps, *Site Index*: Upland oak 90

GabG - Gallimore-Chetwynd complex, 25 to 70 percent slopes, *Setting*: Dissected outwash plains, *Position*: Backslopes, *Site Index*: Upland oak 88-98

HesG - Hickory-Chetwynd loams, 35 to 70 percent slopes, *Setting:* Dissected till plains, *Position:* Backslopes, *Site Index*: Upland oak 85

Access

To access the tract from 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 to Rattlesnake campground and the cable gate and fire trail at the back of the campground. Management access as well as public recreational access to this tract is very good via the campground and fire trail.

Boundary

This tract is located in the northwest corner of the 1440 acres contained in compartment 4.
The north, west and southwest tract boundaries are state forest boundaries and are therefore adjacent to private land. The east boundary follows topographic features, a ravine, which it shares with compartment 4 tract 4. Private property borders have been located and marked with the boundary lines being reasonably well documented and witnessed in the past.

Wildlife

This tract contains habitat for a variety of wildlife species. Habitat includes oak-hickory, beech-maple, mixed hardwoods, pockets of seasonal grasses and sedges, and a perennial stream. The oaks, hickories and beech provide hard mast for deer, turkey and squirrel. Snags (dead trees) and cavity trees provide nesting, bugging and roosting opportunities for woodpeckers, songbirds, and small mammals. Rotten logs, crater knolls, ephemeral streams and the perennial stream provide habitat for herptiles and aquatic vertebrates.

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.

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.

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.

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 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 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 well represented in this tract. Snags are above the maintenance level in all sizes classes.

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 facilitate large diameter snags.

Wildlife Habitat Feature - Tract Summary

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance
Legacy Trees *				
11"+ DBH	891		2435	1544
20"+ DBH	297		617	320
Snags (all species)				
5"+ DBH	396	693	993	597
9"+ DBH	297	594	455	158
19"+ DBH	49.5	99	81	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 perennial stream. 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 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.

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 could be undertaken, possibly during post-harvest T.S.I., to treat problem occurrences before their populations expand.

Recreation

This multiple use tract has good public access via the cable gate and fire trail for compartment 4, located in the Rattlesnake Campground on Surber road. It is a good tract for public recreational activities including hunting, hiking, gathering, viewing and interpretation. Because of its nearby campground and walkable fire trail, 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 noted will be avoided during management or construction activities.

Tract Description and Silvicultural Prescription

This tract was not divided into subdivisions (non-stratified).

In 1968 a timber harvest was conducted (M&W Pulp Co. Nashville, IN) removing 78,700 board feet of sawtimber in 364 trees.

In 1975 a timber harvest was conducted (Crone Lumber Co. Martinsville, IN) removing 141,750 board feet of sawtimber in 601 trees.

Between 1988 and 1989 a property wide timber inventory (Timber Inventory and Management Planning Information System, TIMPIS) was conducted, including Compartment 4 tract 1. The results estimated the tract to contain 4623 bd. ft. of total sawtimber per acre with 1439 bd. ft. of harvest sawtimber per acre. A harvest was proposed for 1994.

In 1993 an inventory was conducted (D. Ramey) which estimated the tract to contain 5542 bd. ft. of total sawtimber per acre with 1604 bd. ft. of harvest sawtimber per acre and a total basal area of 78 sq. ft. per acre in trees $\geq$ 6 inches in diameter at breast height (D.B.H.), and a stocking level of 73%.

In 1994 a timber harvest was conducted (Crone Lumber Co. Martinsville, IN) removing 87,858 board feet of sawtimber in 371 trees.

In 2005 a timber salvage was conducted (R. Booe & Son Hardwoods, Inc. Brazil, IN) removing 7,500 board feet of sawtimber in 46 trees.

In 2009 an inventory was conducted (J. Bauer) which estimated the tract to contain 6670 bd. ft. of total sawtimber per acre with 1270 bd. ft. of harvest sawtimber per acre and a total basal area of 111 sq. ft. per acre.
In 2013 an inventory was conducted (N. Fishburn) which estimated the tract to contain 8223 bd. ft. of total sawtimber per acre with 2577 bd. ft. of harvest sawtimber per acre and a total basal area of 110 sq. ft. per acre, and a stocking level of 88% with an average tree diameter of 13 inches.

The Timber type is predominantly closed canopy oak-hickory and mixed hardwoods. The over-story consists mostly of medium to large sawlog sized oak, maple, yellow-poplar, hickory and beech. The quality of merchantable sawtimber is good. The pole-sized under-story consists mostly of maple, sassafras, oak and hickory. Advanced regeneration is represented mostly by maple, beech, elm and hickory. However, Northern red and white oak are often well represented in the earlier stages of regeneration throughout the tract, with red oak being especially present and more advanced along existing fire and skid trails.

The current stocking level of 88% indicates the tract is fully stocked. Some of the northern 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 removal of less desirable species such as maple, beech, sassafras, and aspen in an effort to improve the overall tract quality and composition. Thinning should be from above or below depending on specific site 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. Advanced regeneration of the more shade intolerant species such as white oak, Northern red oak and hickory were very prevalent in this tract and should be released. 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 to mid-successional, mixed hardwood tree regeneration. In combination, these silvicultural methods will reduce stand density; improve overall growing conditions and timber quality, while encouraging regeneration and tree species diversity.

Management prescription includes post harvest timber stand improvement (T.S.I.) to release preferred, high quality crop trees through the culling of low volume, poorly formed trees and less desirable species, and encourage mixed hardwood regeneration through the creation of canopy gaps and a reduction in understory shade tolerant species. T.S.I. could 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. As with all forest management activities, Best Management Practice (BMP) guidelines will be followed to protect soil and water resources.

Inventory Summary – C4T1

Total Number Trees/Acre: 124 **Average Tree Diameter:** 13”
Average Site Index: 80 **Stocking Level:** 88%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	99	**Basal Area Sawtimber.**	82.5
Pine Commercial Forest:	0	**Basal Area Poles:**	20.0
Noncommercial Forest:	0	**Basal Area Culls:**	5.0
Permanent Openings:	0	**Sub Merch.**	2.5
Other Use:			
Total:	99	**Total Basal Area:**	110.0

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

Species	Harvest Stock	Growing Stock	Total Volume
YEP	1668	592	2204
REO	140	1541	1681
SUM	57	674	731
BLO	58	648	706
WHO	21	680	702
AMB	435	246	681
PIH	48	538	586
LAA	39	32	71
WHA	55	0	55
REM	30	12	43
BAS	26	0	26
SHH	0	183	183
BIH	0	163	163
BLG	0	116	116
BLW	0	107	107
SAS	0	88	88
BLC	0	27	27
Tract Total	2577	5646	8223

Management Activities

2013 ---------- Timber Inventory
2015 ---------- DHPA Archaeological Clearance Application
2015 ---------- Resource Management Guide
2015/16 ------- Timber Marking and Sale Layout
2016 ---------- Timber Sale
2016/17 ------- Timber Harvest
2016/17 ------- BMP Monitoring
2017/18 ------- Post-Harvest TSI, Exotic/Invasive Control & Regeneration Check
2030 ---------- Timber Inventory
2030/31 ------- Resource Management Guide

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