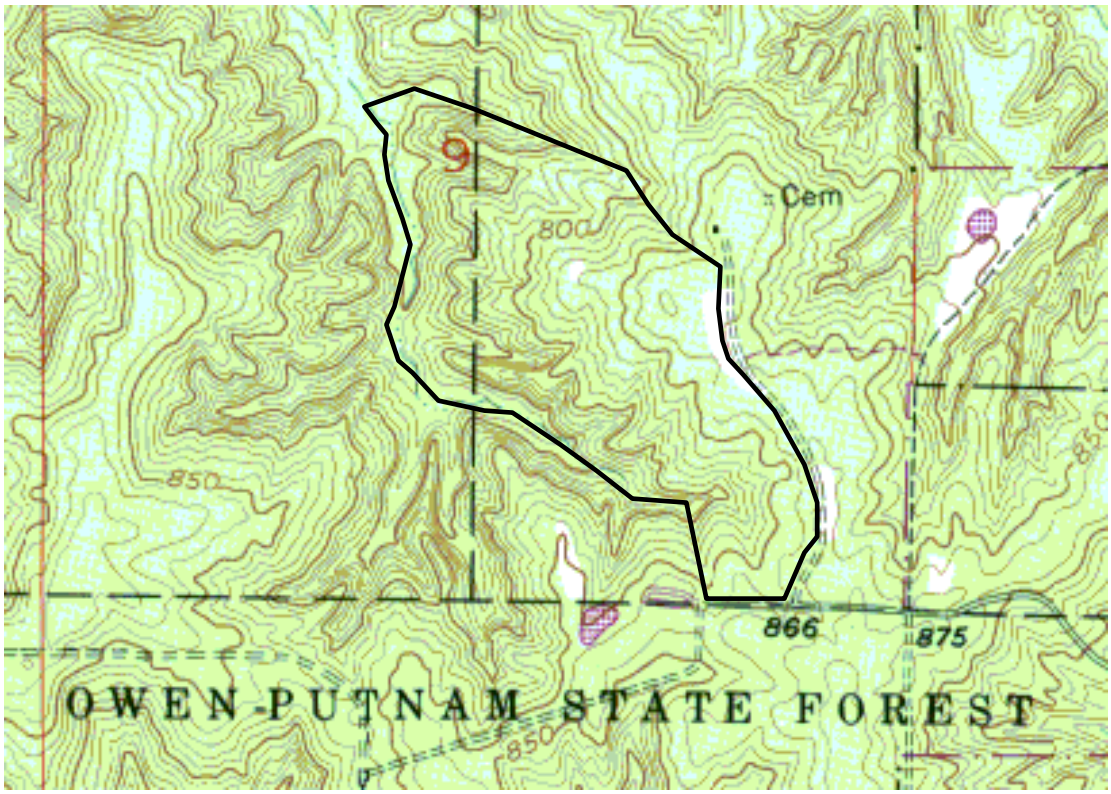
Indiana Department of Natural Resources
Division of Forestry
RESOURCE MANAGEMENT GUIDE (Draft)

State Forest: Owen-Putnam
Forester: R. Duncan
Management Cycle End Year: 2032
Compartment: 4 **Tract:** 11
Date: January 2017
Management Cycle Length: 15 Years

Location

Compartment 4, tract 11 is located primarily in the southeast quarter of section 9, township 11N, range 4W, Jennings townships, Owen county. This tract is an interior parcel of state forest. It is not adjacent to any private property. It is approximately 3 miles east of the unincorporated town of Jordan village.



General Description

This tract is a 90-acre multiple use parcel located in the central portion of the 1440 acres contained in compartment 4 of the Owen-Putnam State Forest. Timber types include primarily closed canopy mixed hardwoods with some oak-hickory, beech-maple and pine. Pine was 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, oak, hickory, maple and beech with white 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 under-story consists mostly of beech, maple, sassafras, poplar, oak and hickory, maple, sassafras, oak, hickory and beech with white pine representing some of the pole sized understory in the pine stand. 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 Pine in the 1950s when the state purchased the land. Compartment 4 tract 11 has been managed for many years.

- Timber inventory 2000
- Management guide 2000
- Timber harvest 2000
- Timber stand improvement, vine control 2010
- Timber inventory 2017

Landscape Context

Compartment 4 tract 11 is located in a very rural area. Generally the area is forested hills and ravines. This tract is an interior parcel of state forest. It is not adjacent to any private property. The private property nearby is 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. 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 south to north along the east edge of the tract to moderately steep northwest to southwest facing slopes. Water sheds into ravines that drain into an intermittent stream that flows north to Jordan Creek.

The area is generally comprised of shallow to moderately deep, medium textured, droughty, well to excessively drained soils underlain by sandstone, siltstone and shale, with outcroppings of bedrock, and 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

The soils of this tract which are located on the steeper slopes and are often shallow, stony and droughty and therefore not suited for farming and usually considered to be poorly suited for quality timber production. In general the soils are more suited for oak and hickory than poplar.

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:* Backslopes and footslopes, *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:* 69-75

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

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

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

HleAV—Holton silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration, *Setting:* Flood plains, *Position:* Flood-plain steps, *Site Index*: Upland oak 80

Access

To access the tract from Spencer Indiana, 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 central portion of the 1440 acres contained in compartment 4. It is interior tract with its boundaries entirely surrounded by state forest. Tract boundaries primarily follow natural geographical and topographical features such as major ravines, ridge tops and streams within the state forest. The tract is bounded to the north by a ravine, to the east by an access road and day-lighting area, to the south by a county road and to the west by an intermittent stream.

Wildlife

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 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 (R. Duncan 2014) 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 tree species 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, being above the maintenance levels for all 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.

Wildlife Habitat Feature Tract Summary

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance
Legacy Trees *				
11"+ DBH	810		2324	1514
20"+ DBH	270		555	285
Snags (all species)				
5"+ DBH	360	630	949	589
9"+ DBH	270	540	582	312
19"+ DBH	45	90	135	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 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 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. Control measures could be undertaken, possibly during post-harvest T.S.I., to treat problem occurrences before their populations expand. This species is well established and widespread throughout the county.

Recreation

This multiple use tract has good public access via the cable gate and fire trail for compartment 4, located in Rattlesnake campground. It is a good tract for public recreational activities including hunting, hiking, gathering, viewing and interpretation. There is a multi-use bridle trail on this tract, a walkable fire trail, and nearby parking that lend themselves to hunting and foraging access and other outdoor experiences.

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 subdivided (non-stratified).

In 1988 a property wide inventory (TIMPIS) was conducted, including Compartment 4 tract 11 (M. Calvert). The results estimated the tract to contain 4045 Bd. Ft. of total sawtimber per acre and 1380 Bd. Ft. of harvest sawtimber per acre, with a stocking level of 69% and a harvest proposed in the year 1999.

In 2000 a routine timber inventory was conducted (R. Duncan). The data estimated the tract to be 100% stocked with 128 Sq. Ft. of total basal area per acre and approximately 8499 Bd. Ft. of total sawtimber per acre and an estimated 2738 Bd. Ft. of harvest sawtimber per acre.

In 2000 the tract was harvested (Crites Logging) of 91,934 Bd. Ft. in 452 trees on 95 acres (2001 Bd. Ft. /Acre) as part of a selective thinning, improvement cut and salvage cut.

In 2009 timber stand improvement, vine control was performed (D. Reynolds) in 90 acres of compartment 4 tract 11.

In 2017 a routine inventory was conducted (R. Duncan). The data estimated the tract to be 87% (fully) stocked with 106 Sq. Ft. of total basal area per acre and approximately 7193 Bd. Ft. of total sawtimber per acre with an estimated 1828 Bd. Ft. of harvest sawtimber per acre and an average tree diameter of 14 inches.

Timber in compartment 4 tract 11 is predominantly closed canopy mixed hardwoods, with some pockets of oak-hickory, and small pine stands. The over-story consists mostly of medium to large sawlog sized poplar, oak, hickory, beech, maple and ash; with Eastern white pine, Virginia pine and some Scots pine comprising the pine stands. The quality of merchantable timber is good, except for the declining yellow poplar, 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 under-story consists mostly of beech, maple, sassafras, poplar, oak and hickory. Advanced regeneration is represented mostly by beech, maple, ash, sassafras, pawpaw, hickory, cherry, and oak.

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 will be selected for harvest to utilize their product before EAB infestation and mortality. In this manner Ash may be regenerated before the seed source is lost to EAB induced mortality.

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.

Post harvest 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 selective 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.

Inventory Summary – C4T11

Total Number Trees/Acre: 134 **Average Tree Diameter:** 14”
Average Site Index: 80 Oak **Stocking Level:** 87%

	Acres		**Sq.Ft./Acre**
Hardwood Commercial Forest:	84	**Basal Area Sawtimber.**	75.0
Pine Commercial Forest:	6	**Basal Area Poles:**	25.3
Noncommercial Forest:	0	**Basal Area Culls:**	3.1
Permanent Openings:	0	**Sub Merch.**	2.7
Other Use:			
Total:	90	**Total Basal Area:**	106.1

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

Species	Harvest Stock	Growing Stock	Total Volume
YEP	671	930	1601
WHO	111	872	983
REO	132	842	974
SUM	187	453	640
BLO	72	465	537
BIH	44	388	432
AMB	209	177	386
WHP	109	267	376
WHA	134	105	239
SAS	79	153	232
SHH	0	217	217
PIH	0	164	164
REM	39	83	123
BLG	12	87	99
BLW	0	80	80
LAA	29	14	43
BLC	0	41	41
SYC	0	26	26
Per Acre Total	1828	5364	7193
Tract Total	164,520	482,760	647,370

Proposed Management Activities

2014 ---------- DHPA Archaeological Clearance Application
2017 ---------- Timber Inventory
2017 ---------- Resource Management Guide
2017 ------- Timber Marking and Sale Layout
2017 ---------- Timber Sale
2017-18 ------- Timber Harvest
2018-19 ------- BMP Monitoring
2019-20 ------- Post-Harvest TSI and Exotic/Invasive Control
2032 ---------- Timber Inventory
2032 ---------- Resource Management Guide

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