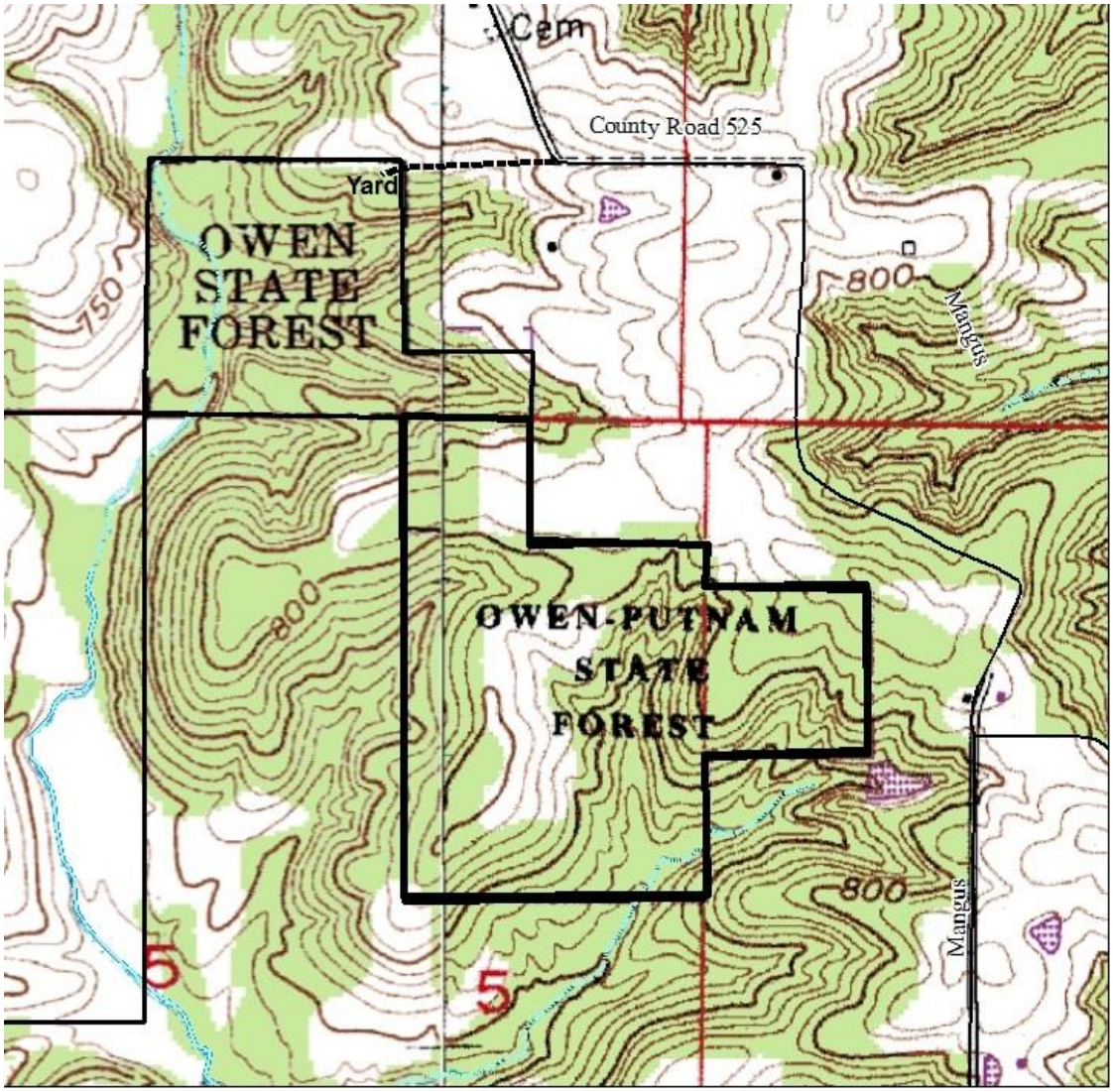
Indiana Department of Natural Resources
Division of Forestry

DRAFT RESOURCE MANAGEMENT GUIDE

State Forest: Owen-Putnam
Forester: R. Duncan
Management Cycle End Year: 2032
Compartment: 9 **Tract:** 3
Date: September 2017
Management Cycle Length: 15 Years

Location

Compartment 9, tract 3 is located along Mangus road, in section 4 and 5, township 10 N, range 4W, Morgan Township, Owen County. It is approximately 2.0 miles northwest of the forest office.



General Description

Compartment 9 tract 3 is a 74-acre, sustainably managed, multiple use parcel located within the 838 acres comprising compartment 9 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple, mixed hardwoods and pine. Red pine was planted along the ridge top to control erosion from disturbances prior to state ownership. The over-story consists of medium to large sawlog sized yellow-poplar, maple, oak, beech, hickory and ash. The quality of merchantable timber is good. However, there is some decline in the poplar due to drought and insect stress. The pole-sized under-story consists mostly of beech, maple, hickory and poplar. 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, , 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. Prior to state ownership, many of the ridge tops in the area were farmed through the 1930's. Sometime in the 1960's many of the severely eroded ridge tops were planted to pine to stabilize the soil. Compartment 9 tract 3 has been managed for many years.

- Timber inventory in 1983
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1996
- Timber harvest in 1999
- Timber stand improvement, vine control and crop tree release in 2006
- Timber inventory in 2017

Landscape Context

Compartment 9 tract 3 is located in a 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 industry, little agriculture, and some residences with small fields/pastures and small ponds located primarily along secondary 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 tops in the north, central and west areas of the tract to moderately steep slopes. Water sheds into a mapped intermittent stream flowing northeast to southwest along the southeast corner of the tract. The area is generally comprised of shallow to moderately deep, well-drained soils 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

This tract is composed of the following soils: (USDA, NRCS – Soil Survey, Owen County, IN 2005).

ZamB2- Zanesville silt loam, soft bedrock substratum, 2 to 6 percent slopes, eroded, this gently sloping, deep, moderately well drained or well-drained soil is on uplands. It is well suited to trees. This soil has a site index of 69 for white oak and 90 for yellow poplar.

ZamC2- Zanesville silt loam, soft bedrock substratum, 6 to 12 percent slopes, eroded, this moderately sloping, deep, moderately well drained or well-drained soil is on side slopes adjacent to drainage ways in the uplands. It is well suited to trees. This soil has a site index of 69 for white oak and 90 for yellow poplar.

ZamC3- Zanesville silt loam, soft bedrock substratum, 6 to 12 percent slopes, severely eroded, this moderately sloping, deep, moderately well drained or well-drained soil is on side slopes adjacent to drainage ways in the uplands. It is well suited to trees and has a site index of 69 for white oak and 90 for yellow poplar.

TtcE- Tulip-Wellston-Adyeville silt loams, 18 to 25 percent slopes, this strongly sloping to steep, deep, well drained complex is found on side slopes in the uplands. It is suited to trees. Erosion hazards, equipment limitations, windthrow hazards, and seedling mortality are management concerns that should be considered when planning sale layout and implementing Best Management Practices for Water Quality. Tulip has a site index of 80 for northern red oak and 95 for yellow poplar, Wellston has a site index of 81 for northern red oak and 90 for yellow poplar, and Adyeville has a site index of 64 for northern red oak.

TtaG- Tulip-Tipsaw complex, 25 to 60 percent slopes, this moderately and very steep, moderately deep to deep, well drained complex is found on side slopes in the uplands. It is suited to trees. Erosion hazards, equipment limitations, and seedling mortality are management concerns that should be considered when planning sale layout and implementing Best Management Practices for Water Quality. Tulip has a site index of 80 for northern red oak and 95 for yellow poplar and Tipsaw has a site index of 70 for northern red and black oak.

PrwAV- Pope fine sandy loam, 0 to 2 percent slopes, frequently flooded, very brief duration, this nearly level, deep, well-drained soil is found in the flood plains. It is well suited to trees. Equipment limitations and seedling mortality are concerns that should be considered when planning management activities. This soil has a site index of 80 for white oak and 96 for yellow poplar.

WhfD2- Wellston silt loam, 12 to 18 percent slopes, eroded, this strongly sloping, well-drained soil is on narrow ridgetops and on side slopes of the uplands. It is well suited to trees. This soil has a site index of 71 for northern red oak and 90 for yellow poplar.

PryB- Potawatomi silt loam, 1 to 3 percent slopes, this gently sloping, deep, moderately well-drained soil is found on ridgetops in the uplands. It is well suited to trees. Equipment limitations and seedling mortality are concerns that should be considered when planning management activities. This soil has a site index of 80 for white oak and 93 for yellow poplar.

Access

To access the tract from Spencer Indiana, travel west on State Road 46 approximately 4-miles to Mangus road, then travel north on Mangus road approximately 2.5-miles to the second 90 degree bend in the road with our access lane on the west side of the road. The tract is accessible to the public via the parking lot at the end of the access road. Management access as well as public recreational access to this tract is good.

Boundary

This tract is a 74-acre sustainably managed, multiple use parcel located within the 838 acres comprising compartment 9 of the Owen-Putnam State Forest. Private property borders this tract on all sides, except for a section along the north end, with the approximate boundary lines having been located and marked with orange paint and flagging. The boundary lines have been marked and documented in the past.

Wildlife

With the presence of the upland and lowland forest area, which includes oak-hickory, beech-maple, mixed hardwoods, pine, pockets of seasonal grasses and sedges, and ephemeral drainages, 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-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.

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.

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 2017) 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 ≥ 20" D.B.H. is expected to rise.

Standing dead or dying trees (snags) are somewhat well represented in this tract. Snags ≥ 5" D.B.H. and ≥ 9" D.B.H. in this tract are above the maintenance levels for both classes. However, snags in the ≥ 19" D.B.H. class are below the maintenance 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 can 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 can 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
Legacy Trees *				
11"+ DBH	666		1370	704
20"+ DBH	222		289	67
Snags (all species)				
5"+ DBH	296	518	441	145
9"+ DBH	222	444	315	93
19"+ DBH	37	74	8	-29

*** 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).

A Natural Heritage Database Review is part of the management planning process. If Rare, Threatened or Endangered communities 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 throughout the county. Control measures can be undertaken 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 parking lot and fire trail located on Mangus road. While there are no designated recreation trails on the tract it offers opportunities for public recreational activities including hunting, gathering, viewing and interpretation. Because of its parking and walkable fire trail, it is easily accessible for various 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

In 1988 a property wide inventory (TIMPIS) was conducted, including Compartment 9 tract 3. The data estimated the tract to be 86% stocked with 101 Sq. Ft. of total basal area per acre in 164 trees per acre, containing approximately 5068 Bd. Ft. of total sawtimber per acre with an estimated 1021 Bd. Ft. of harvest sawtimber per acre and a harvest proposed for 1996.

In 1998 a routine timber inventory was conducted (R. Duncan). The data estimated the tract to be 105% stocked with 128 Sq. Ft. of total basal area per acre in 173 trees per acre, containing approximately 5968 Bd. Ft. of total sawtimber per acre with an estimated 1594 Bd. Ft. of harvest sawtimber per.

In 1999 the tract was harvested (Crites Logging, Inc.) of 86,143 Bd. Ft. in 639 trees on 74 acres (1164 Bd. Ft. /acre) as part of an intermediate harvest in the form of a selective thinning and improvement cut.

In 2017 a routine inventory was conducted (R. Duncan). The data estimated the tract to be 81% stocked with 99 Sq. Ft. of total basal area per acre in 127 trees per acre and an average tree diameter of 12 inches, containing approximately 6435 Bd. Ft. of total sawtimber per acre with an estimated 1797 Bd. Ft. of harvest sawtimber per.

Timber in compartment 9 tract 3 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 red pine and Virginia 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 significant resource stress and competition is taking place and thinning is recommended. Often, there is little groundcover or desired advanced regeneration in these areas due to low light levels and browse. In the remaining less stressed and maturing areas would 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 they become populated with the insect and decline. This removal will also capture Ash seed and create conditions to recruit and encourage regeneration of the species before seed bearing trees die due to EAB.

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.

Management in the form of post harvest Timber Stand Improvement (T.S.I.) is prescribed to further 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 a diversity of forest wildlife habitat and structure.

The tract is projected to remain in the fully stocked category after the prescribed elective 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 – C9T3

Total Number Trees/Acre: 127 **Average Tree Diameter:** 12”
Average Site Index: 90-95 YEP **Stocking Level:** 81%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	68	**Basal Area Sawtimber.**	71.4
Pine Commercial Forest:	6	**Basal Area Poles:**	25.3
Noncommercial Forest:	0	**Basal Area Culls:**	2.0
Permanent Openings:	0	**Sub Merch.**	1.2
Other Use:			
Total:	74	**Total Basal Area:**	99.9

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

Species	Harvest Stock	Growing Stock	Total Volume
YEP	598	1393	1991
SUM	45	570	615
WHO	136	359	495
REO	58	540	599
WHA	523	0	523
AMB	123	395	518
BIH	31	216	247
SAS	131	240	371
VIP	0	71	71
SHH	0	118	118
REM	73	225	298
REP	39	120	159
BLC	0	138	138
PIH	10	74	84
SYC	0	72	72
BLG	0	15	15
BLO	0	29	29
ZCO	0	26	26
SWG	30	10	40
BAS	0	16	16
AME	0	10	10
Per Acre Total	1797	4637	6435
Tract Total	132,978	343,138	476,190

Proposed Management Activities

2017 ----------	Timber Inventory
2017 ----------	DHPA Archaeological Clearance Application
2017 ----------	Resource Management Guide
2018 -------	Timber Marking and Sale Layout
2018-19 ----------	Timber Sale
2018-20 -------	Timber Harvest
2019-21 -------	Post-Harvest TSI and Exotic/Invasive Control
2019-21 -------	BMP Monitoring
2032 ----------	Timber Inventory
2032 ----------	Resource Management Guide

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