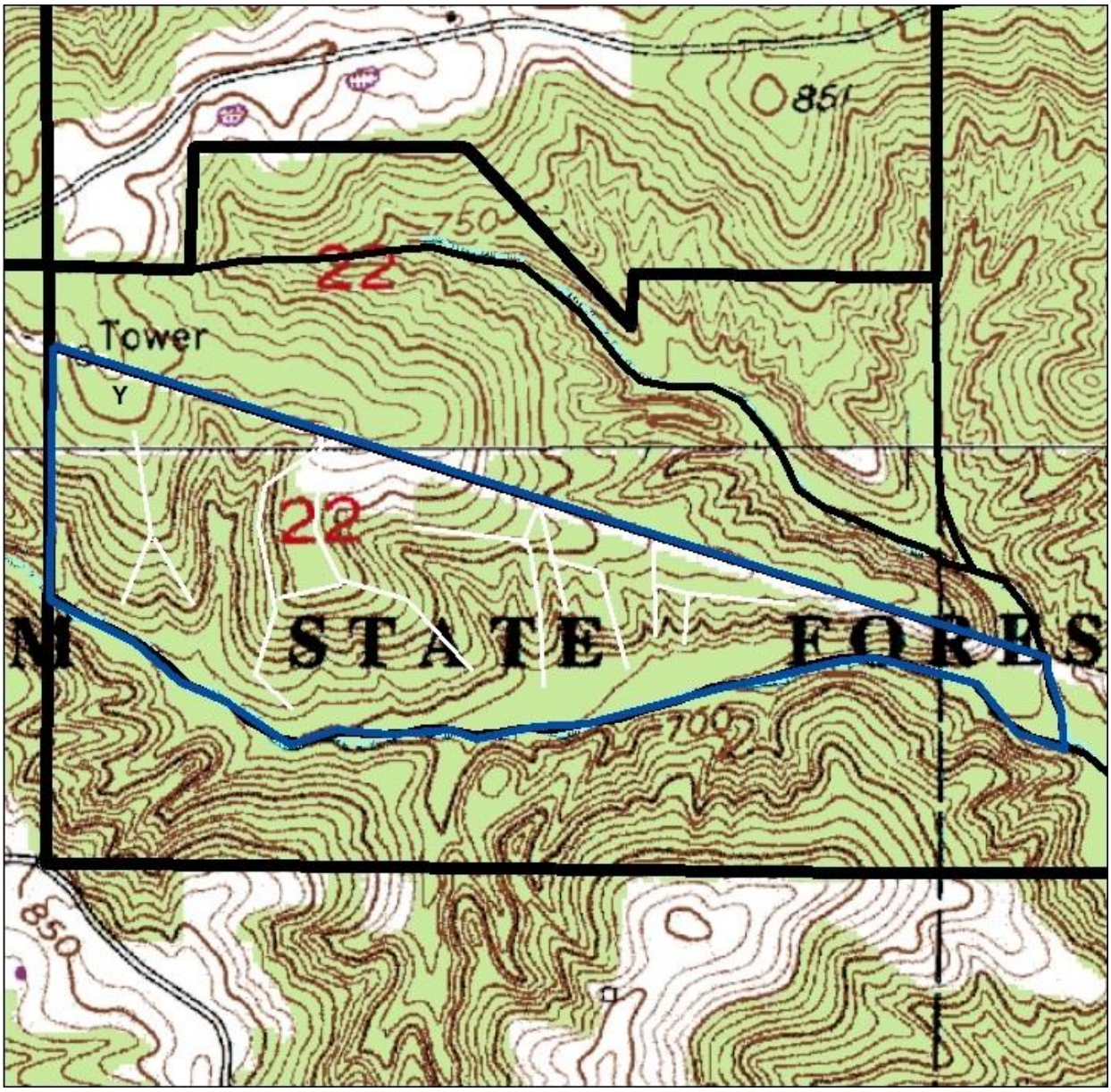
Indiana Department of Natural Resources
Division of Forestry

DRAFT RESOURCE MANAGEMENT GUIDE

State Forest: Owen-Putnam
Forester: R. Duncan
Management Cycle End Year: 2032
Compartment: 7 **Tract:** 8
Date: January 2017
Management Cycle Length: 15 Years

Location

Compartment 7, tract 8 is located along Hale Hill road, primarily in the southern half of section 22, township 11N, range 4W, Morgan Township, Owen County. It is approximately 1 mile northeast of the horse campground and approximately 4 miles northeast of the forest office.



General Description

This tract is an 81-acre, sustainably managed, multiple use parcel located within the 551 acres comprising compartment 7 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple, mixed hardwoods and pine. White pine and Virginia pine were planted along the ridge top adjacent to the power line 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, 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. 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 7 tract 8 was previously designated compartment 7 tract 3B. It continues to occupy the same area and acreage and has been managed for many years.

- Timber harvest in 1983
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1999
- Timber harvest in 1999-2000
- Timber stand improvement 2004-2005
- Timber inventory in 2016

Landscape Context

Compartment 7 tract 8 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 agriculture or industry, limited residential housing, some 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 top along the north side of the tract to moderately steep south facing slopes. Water sheds south into a mapped intermittent stream flowing northwest to southeast along the south edge of the tract, then into a perennial stream flowing northwest to southeast, then into perennial Rattlesnake creek. 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. 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).

HepG- Hickory-Adyeville complex, 35 to 60 percent slopes, this very steep, deep, well-drained soil is on dissected till plains over interbedded shale, siltstone, and sandstone. It is fairly well suited to trees. Erosion hazards and equipment limitations are main management concerns due to slopes. Consideration should be given during sale planning and implementation of Best Management Practices for Water Quality. This soil has a site index of 85 for white oak and 95 for yellow poplar.

HeuF- Hickory-Wellston silt loams, 25 to 35 percent slopes, this moderately steep to steep, deep, well-drained soil is on dissected till plains over interbedded shale, siltstone, and sandstone. It well suited to trees, Erosion hazards and equipment limitations are main management concerns due to slopes. Consideration should be given during sale planning and implementation of Best Management Practices for Water Quality. This soil has a site index of 85 for white oak and 95 for yellow poplar.

ZapD3- Zanesville, soft bedrock substratum-Tulip silt loams, 12 to 18 percent slopes, severely eroded, this strongly sloping, deep, moderately well drained soil is on narrow side slopes in the uplands. It is fairly well suited to trees. A fragipan is present that can limit rooting depth. Erosion hazards and equipment limitations are main concerns that should be considered when planning management activities. 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.

ZamD2- Zanesville silt loam, soft bedrock substratum, 12 to 18 percent slopes, eroded, this strongly sloping, deep, moderately well drained soil is on narrow side slopes in the uplands. It is fairly well suited to trees. A fragipan is present that can limit rooting depth. Erosion hazards and equipment limitations are main concerns that should be considered when planning management activities. It has a site index of 69 for white oak and 90 for yellow poplar.

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.

SneC3- Solsberry silt loam, 6 to 12 percent slopes, severely eroded, this moderately sloping, deep, moderately well drained soil is on the side slopes of the uplands. It is well suited to trees. Windthrow hazards are a concern that should be considered during management planning. This soil has a site index of 80 for northern red oak.

PlcAV- Piankeshaw silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration, this nearly level, deep, well-drained soil is on bottomland. It is flooded for very brief periods, mainly in spring and early summer. It is well suited to trees and has a site index of 95 for yellow poplar and 105 for eastern cottonwood.

Access

To access the tract from Spencer Indiana, travel west on State Road 46 approximately 5-miles to Fishcreek road, then travel north on Fishcreek road approximately 4.5-miles to Hale Hill road, then travel east on Hale Hill road approximately 1/2 mile to the forest parking lot and access road on the south side of the road. The tract is

accessible to the public via the parking lot on Hale Hill road. Management access as well as public recreational access to this tract is good.

Boundary

This tract is an 81-acre, sustainably managed, multiple use parcel located within the 551 acres comprising compartment 7 of the Owen-Putnam State Forest. Private property borders this tract along the west side with approximate boundary lines having been located and marked with orange paint and ribbon. The boundary lines have been reasonably well documented and witnessed in the past. The remainder of this tract's boundaries are internal and therefore adjacent to other state forest tracts. They primarily follow a power line ROW to the north and an intermittent stream to the south.

Wildlife

With the presence of the brushy, more open habitat of the power line ROW to the north, an intermittent stream to the south, a wildlife pond and the upland and lowland forest area, which includes oak-hickory, beech-maple, mixed hardwoods, pockets of seasonal grasses and sedges, 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.

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 2016) 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 well represented in this tract. Snags in this tract are above the maintenance levels in all size 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 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 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
Legacy Trees *				
11"+ DBH	729		1764	1035
20"+ DBH	243		366	123
Snags (all species)				
5"+ DBH	324	567	615	291
9"+ DBH	243	486	565	322
19"+ DBH	40.5	81	41	1

*** 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 slopes, and some floodplain along drainages and 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 communities.

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 could 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 Hale Hill. It is a good tract for public recreational activities including hunting, hiking, gathering, viewing and interpretation. There is no designated recreation trail in the tract. However, because of its parking and walkable fire trail, it is easily accessible for 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 1983 the tract was harvested (Kenneth Welty) of 121,482 Bd. Ft. in 929 trees as part of an intermediate harvest in the form of a selective thinning and improvement cut.

In 1988 a property wide inventory (TIMPIS) was conducted, including Compartment 7 tract 8. The data estimated the tract to contain 87 Sq. Ft. of total basal area per acre in 159 trees per acre for a stocking level of 77%, containing approximately 4014 Bd. Ft. of total sawtimber per acre with an estimated 1024 Bd. Ft. of harvest sawtimber per acre and a harvest proposed for 1997.

In 1999 a routine timber inventory was conducted (R. Duncan). The data estimated the tract to contain 93 Sq. Ft. of total basal area per acre in 91 trees per acre containing approximately 4292 Bd. Ft. of total sawtimber per acre with an estimated 1583 Bd. Ft. of harvest sawtimber per.

In 2000 the tract was harvested (Timberland Resources, Inc.) of 64,046 Bd. Ft. in 452 trees on 74 acres (865 Bd. Ft. /acre) as part of an intermediate harvest in the form of a selective thinning and improvement cut.

In 2005 a timber stand improvement (T.S.I) project was performed to release crop trees across the tract by girdling select trees and cutting grapevines.

In 2017 a routine inventory was conducted (R. Duncan). The data estimated the tract to contain 104 Sq. Ft. of total basal area per acre in 140 trees per acre for a stocking level of 86%, containing approximately 6529 Bd. Ft. of total sawtimber per acre with an estimated 2521 Bd. Ft. of harvest sawtimber per acre.

Timber in compartment 7 tract 8 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 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 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 they become populated with the insect and decline. This effort will capture Ash seed and regeneration before loss of the Ash seed source due to EAB related 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.

A thinning and improvement cut is recommended for the pine stands, which are not native or endemic to the area. The long term management direction for these areas is conversion to native hardwoods.

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 for a wide variety of forest benefits.

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 – C7T8

Total Number Trees/Acre: 140
Average Tree Diameter: 13.5”
Average Site Index: 80-85 Oak
Stocking Level: 86%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	74	**Basal Area Sawtimber.**	73.7
Pine Commercial Forest:	7	**Basal Area Poles:**	27.8
Noncommercial Forest:	0	**Basal Area Culls:**	0.6
Permanent Openings:	0	**Sub Merch.**	1.4
Other Use:			
Total:	81	**Total Basal Area:**	103.5

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

Species	Harvest Stock	Growing Stock	Total Volume
YEP	1219	759	1978
WHO	95	718	813
REO	109	646	755
AMB	275	258	533
WHA	321	40	361
WHP	101	258	358
SHH	0	288	288
SAS	29	154	182
SUM	190	155	346
BIH	0	332	332
REM	51	165	216
LAA	58	0	58
VIP	48	45	93
PIH	9	93	102
BLC	16	77	93
SYC	0	21	21
Per Acre Total	2521	4009	6529
Tract Total	204,201	324,729	528,849

Proposed Management Activities

2016 ---------- Timber Inventory
2016 ---------- DHPA Archaeological Clearance Application

2016 ---------- Resource Management Guide
2016/17 ------- Timber Marking and Sale Layout
2017 ---------- Timber Sale
2017-19 ------- Timber Harvest
2018-20 ------- Post-Harvest TSI and Exotic/Invasive Control
2018-20 ------- BMP Monitoring
2031 ---------- Timber Inventory
2031 ---------- Resource Management Guide

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