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

State Forest: Owen-Putnam **Compartment:** 7 **Tract:** 1
Forester: N. Fishburn (R. Duncan) **Date:** May 2013
Management Cycle End Year: 2033 **Management Cycle Length:** 20 Years

Location

Compartment 7, tract 1 is located in the northwest corner of section 22, township 11N, range 4W, Morgan Township, Owen County, Indiana. It is approximately 3 miles southwest of the town of Cataract and located along Keene road and Hale Hill road.

General Description

This tract is a 40-acre sustainably managed, multiple use parcel located in the northwest corner of the 551 acres contained in compartment 7 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple, mixed hardwoods and some pine (1 acre). 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, it is an ideal spot for anyone looking for an easily accessible outdoor experience.

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 7 tract 1 has been managed for several years. This tract was created out of a single 40 acre parcel that was purchased in 1958 from Fay & Bessie Cullins.

- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1993
- Timber harvest in 1994
- Timber inventory in 2010

Landscape Context

Compartment 7 tract 1 is located in a "residential" rural area. The entire tract is surrounded by private land. The southeast corner of the tract is adjacent to compartment 7 tract 2. Hale Hill road runs southwest to northeast through the southeast corner of the tract. Keene road runs north to south along most of the western boundary of the tract. Predominantly the land in this area is closed canopy deciduous forests, with some residences including some small fields/pastures and small ponds located along county roads near and adjacent to 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 etal. 1985).

The topography of this tract varies from fairly level ground, located in the northwest and southeast sections of the tract, to moderate to steep slopes making up the remainder of the tract. The slopes generally run northeast and southwest with aspects facing northwest and southeast. Water sheds generally from the northwest and southeast corners of the tract to the center of the tract into a mapped intermittent stream that flows from the southwest corner of the tract to the northeast corner of the tract into a mapped intermittent stream to the northeast. Generally the soils are composed of moderately deep to very deep, moderately drained to well drained soils on moderately steep 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 Hickory, Wellston, Zanesville and Adyeville 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:

- **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

- **HeuE—Hickory-Wellston silt loams**, 18 to 25 percent slopes, *Setting*: Dissected till plains over interbedded sandstone, shale, and siltstone, *Position*: Backslopes and footslopes, *Site Index*: Upland oak 80

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

- **SneC3- Solsberry silt loam,** 6 to 12 percent slopes, severely 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

- **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

- **WpuAV—Wirt silt loam,** 0 to 2 percent slopes, frequently flooded, very brief duration, *Setting:* Flood plains, *Position:* Natural levees and floodplain steps, *Site Index*: Upland oak N/A

- **SneC2—Solsberry silt loam,** 6 to 12 percent slopes, eroded, *Setting:* Dissected till plains, *Position:* Shoulders and backslopes, *Site Index*: Upland oak 80

Access

To access the tract from Spencer, travel west on S.R. 46 approximately 3 1/2 miles to Fish Creek Road, continue north on Fish Creek Road approximately 5 miles to Hale Hill Road, travel east on Hale Hill Road approximately a 1/5 to Keene road. The tract is adjacent to the east side of Keene road. Management as well as public recreational access to this tract is very good.

Boundary

All four boundaries of this tract are adjacent to private property. The boundary lines adjacent to private property are designated as a line from corner K to corner L, from corner L to corner M, from corner M to corner N and from corner N to corner K (see attached map). According the boundary files Corner K has not been surveyed and is thought to be located near an old cable gate just south of the new cable gate. Corners L, M, and N have not been surveyed and have not been accurately located or witnessed according the boundary files. However, the boundary for this tract was flagged and painted in 1999 and 2005 using compass and pacing with remnants of old boundary markings as a guide. The boundary lines for this tract were previously marked and will be marked with orange paint and/or orange ribbon placed on trees approximately located. All management activities will be kept an appropriate distance from private property.

Wildlife

Wildlife resources in compartment 7 tract 1 seem abundant. 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, 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 (J. Dye 2010) and represented in the following table,

this tract is somewhat 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 levels. Two tree species, white oaks and shagbark hickories have ideal characteristics necessary for tree roosting bats and are particularly abundant in this tract. Also, as the tract continues to mature, the number of legacy trees ≥20" in diameter at breast height (D.B.H.) are expected to rise.

Standing dead or dying trees (snags) are somewhat well represented in this tract. They are above the maintenance and optimal levels in the small (≥ 5") diameter at breast height (D.B.H.) class. However, there is a slight deficiency in the medium (≥ 9") and large (≥ 19") diameter classes at the maintenance level with an even greater deficiency at the optimal 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, which often become wind thrown.

Cavity trees are well represented in all diameter classes at the maintenance and optimal levels, except a slight deficiency in the medium (≥ 11") diameter class at the optimal level. The low representation could possibly be due to the inventory being conducted during leaf on, which can impede vision. Snags and legacy trees should develop cavities in time.

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	Available Above Optimal
Legacy Trees *					
11"+ DBH	360		1163	803	
20"+ DBH	120		363	243	
Snags (all species)					
5"+ DBH	160	280	493	333	213
9"+ DBH	120	240	114	-6	-126
19"+ DBH	20	40	19	-1	-21
Cavity Trees (all species)					
7"+ DBH	160	240	276	116	36
11"+ DBH	120	160	144	24	-16
19"+ DBH	20	40	45	25	5

*** 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 intermittent 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 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.

Two exotic/invasive species, multi-flora rose (Rosa multiflora) and burning bush (Euonymus alatus), are present in and around this tract in patches of moderate to heavy densities. Control measures should be implemented, possibly during post-harvest T.S.I., whereby mechanical methods and herbicides could be applied to treat occurrences of concern before their populations expand.

Recreation

This tract is a 40-acre sustainably managed, multiple use parcel located in the northwest corner of the 551 acres contained in compartment 7 of the Owen-Putnam State Forest. Public access to this tract is very good. This tract can be accessed by Keene Road or Hale Hill Road. It is a good tract for public recreational activities including hunting, hiking, gathering, viewing and interpretation. Because of its close proximity to the road and parking, 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 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 7 tract 1 (M. Calvert). The results estimated the tract to contain 6,802 bd. ft. of total sawtimber per acre, including 2,382 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 114 trees $\geq$ 6" d.b.h. per acre.

In 1993 a timber inventory was conducted (D. Ramey). The data estimated the tract to contain 7,526 bd. ft. of total sawtimber per acre, including 3,674 bd. ft. of harvest sawtimber per acre with 106 sq. ft. of total basal area per acre and a stocking level of 85%. A harvest was conducted in1994.

In 2010 a timber inventory was conducted (J. Dye). The data estimated the tract to contain 12,482 bd. ft. of total sawtimber per acre, including 4,413 bd. ft. of harvest sawtimber per acre with 137.8 sq. ft of total basal area per acre and a stocking level of 120%.

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 yellow poplar, hickory, oak, sassafras, and white ash with Scots pine comprising the one acre pine stand. 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 hickory, sugar maple, sassafras, American beech, blackgum, white ash, and Yellow-poplar. Advanced regeneration is represented mostly by American beech, sugar maple, pawpaw, white ash, white oak, sassafras, and Northern red oak. Oak regeneration was well represented in the advanced stages in some areas. Management should include the release of advance regeneration by providing sunlight and space.

The current stocking level of 120% indicates the tract is over stocked. Overstocking 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 husbandry, 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 further 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 overly dominant and therefore 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. 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 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 openings and a reduction in understory shade tolerant species (sugar maple and American beech). Pre-harvest T.S.I. could be performed to control a slight presence of grape vines. Post-harvest T.S.I. should be performed whereby mechanical methods and herbicides would be applied to treat problem occurrences of multi-flora rose and burning bush before their populations expand. 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 should 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 quality and species composition, and create favorable growing conditions for early successional timber species, while providing appropriate forest wildlife habitat.

Inventory Summary – C7T1

Total Number Trees/Acre: 253 **Average Tree Diameter:** 10”
Average Site Index: 80 **Stocking Level:** 120%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	39	**Basal Area Sawtimber.**	104.5
Pine Commercial Forest:	1	**Basal Area Poles:**	20.5
Noncommercial Forest:	0	**Basal Area Culls:**	2.5
Permanent Openings:	0	**Sub Merch.**	10.3
Other Use:			
Total:	40	**Total Basal Area:**	137.8

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

* Approximation due to accumulative rounding

Species	Harvest Stock	Growing Stock	*Total Volume
YEP	1206	3324	4530
WHO	835	1914	2750
REO	521	761	1282
BIH	283	436	719
PIH	59	631	689
SAS	499	159	659
AES	441	96	536
SHH	11	455	467
WHA	389	0	389
BLG	53	116	170
AMB	75	0	75
SUM	0	66	66
BLW	0	53	53
SCP	0	39	39
REM	39	0	39
BAS	0	20	20
*** Per Acre Total**	4,411	8,070	12,483
***Tract Total**	176,520	322,780	499,290

Proposed Management Activities

2010 ---------- 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
2030 ---------- Timber Inventory
2033 ---------- 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.