Indiana Department of Natural Resources
Division of Forestry

DRAFT

Resource Management Guide

State Forest: Owen-Putnam **Compartment:** 4 **Tract:** 2
Forester: R. Duncan **Date:** July 2011
Management Cycle End Year: 2030 **Management Cycle Length:** 20 Years

Location

The majority of compartment 4, tract 2 lies in the north-east quarter of section 17 with a small portion in the south-east quarter of section 8, township 11N, range 4W, Morgan and Jackson Townships, of Owen County, Indiana. It is approximately 3.5 miles southwest of the town of Cataract near Surber road.

General Description

This tract is a 101-acre sustainably managed, multiple use parcel located in the west half of the 1440 acres contained in compartment 4 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, mixed hardwood and pine. This area exhibits good opportunities for multiple use management, including timber management, wildlife management, and soil, air and water conservation. It is also ideal for public recreational activities, particularly hunting, but also hiking, gathering, viewing and interpretation. Because of its remote location, it is an ideal spot for anyone looking for a quieter outdoor setting.

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 4 tract 2 has been managed for several years. This tract was created out of 2 parcels that were purchased in 1950 and 1959.

- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 1992
- Timber Harvest in 1993
- Post-harvest timber stand improvement to complete a 2 acre regeneration opening in 1994
- Timber inventory in 2010

Landscape Context

Compartment 4 tract 2 is located in a very rural area. It is located in compartment 4, the largest most contiguous land holding of the Owen-Putnam State Forest. The land to the immediate west however is privately owned. Predominantly the land is this area is closed canopy deciduous forests with some scattered residences including some small fields/pastures and small ponds located primarily along county roads.

Topography, Geology and Hydrology

The topography of this tract varies from nearly level ground on the ridge tops located in the east-central area to steep, southwest facing slopes in the western portion of the tract with riparian areas located along the intermittent creek to the south. Primarily water sheds generally from the northeast to the southwest. Generally the soils are composed of shallow to deep, moderate to well drained soils on mild to steep slopes underlain with sandstone, siltstone, shale or glacial outwash. 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 Negley-Parke and Zanesville-Muskingum soil associations. These soils occupy the ridge tops and adjacent slopes. They can produce excellent timber with the other soils located in the tract often well suited to timber production. Particular care must be taken since these soils are prone to erosion. In the event of logging, the existing trail system and log yards can 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:

- NgG - Negley loam, 35-70% Slopes, Upland Oak SI 80-90
- MmG - Muskingum Stony Silt Loam, 35-70% Slopes, Upland Oak SI 80-90
- WmE - Wellston Silt Loam, 18-25% Slopes, Upland Oak SI 75-85
- ZnD3 - Zanesville Soils, 12-18% Slopes, Severely Eroded, Upland Oak SI 75-85
- ZnC3 - Zanesville Soils, 6-12% Slopes, Severely Eroded, Upland Oak SI 75-85
- PcC3 - Parke Soils, 6-12% Slopes, Severely Eroded, Upland Oak SI 87-97
- TsB - Tilsit Silt loam, 2-6% Slopes, Upland Oak SI 75-85
- OmB2 – Otwell Silt Loam, 2-6% Slopes, Moderately Eroded, Upland Oak SI 87-97
- PaB - Parke Silt Loam, 2-6% Slopes, Upland Oak SI 87-97
- Gu - Gullied Land, Residuum
- Sh - Shoals Loam

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 5 miles to Surber Road, travel west on Surber Road to Rattlesnake Campground. The tract can be accessed through the cable gate and fire trail located in Rattlesnake Campground. The tract is in close proximity to the campground and is accessible to the public on foot. Also, the tract is accessible to the public via the multi use trail which passes near this area. Management and logging access as well as public recreational access to this tract is very good.

Boundary

The western and a portion of the southeastern boundary of this tract are adjacent to private property with the northern, eastern and southern boundaries following dominant topographical features and adjacent to other tracts within the state forest. The boundary line adjacent to private property is designated as a line from corner E to corner F, to corner G, to corner H, to corner I (see attached map). Corners E, G, H and I have questionable locations and evidence, but are marked. These corners should be surveyed. In the event of a timber harvest, sale boundaries will be kept sufficient distance from questionable boundary lines.

Wildlife

Wildlife resources in compartment 4 tract 2 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.

A Natural Heritage Database review was obtained for this tract. 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 (J. Dye 2010) 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 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, with white oaks and shagbark hickories particularly abundant in this tract and having ideal characteristics necessary for tree roosting bats. Also, as the tract continues to mature, the number of 20"+ legacy trees is expected to rise.

Standing dead trees (snags) are well represented in this tract. They are above the maintenance and optimal levels in the small and medium diameter at breast height (D.B.H.) classes. However, there is some deficiency in $\geq$ 19" D.B.H. class at the optimal levels. The lack of large diameter snags at the optimal level 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, but fall short in the small diameter classes at the optimal levels. It should be noted that this data was collected during leaf on, which impedes vision and could explain or exaggerate the lack of cavity trees above the higher expectations of

the optimal levels. In addition, small diameter trees due to their young age are often less likely to have cavities.

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	Available Inventory	Available Above Maintenance	Above Optimal
Legacy Trees *					
11"+ DBH	909		2733	1824	
20"+ DBH	303		594	291	
Snags (all species)					
5"+ DBH	404	707	820	416	113
9"+ DBH	303	606	675	372	69
19"+ DBH	50.5	101	58	8	-43
Cavity Trees (all species)					
7"+ DBH	404	606	450	46	-156
11"+ DBH	303	404	450	147	46
19"+ DBH	50.5	101	157	107	56

*** 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 forest community type, with some isolated more mesic sites located along lower north slopes and floodplain occurring along the intermittent stream.

A Natural Heritage Database review was obtained for this tract. 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.

One exotic species, multi-flora rose, is present in and around this tract in moderate to heavy densities, mainly along the ridge tops where soil and vegetative disturbances have occurred prior to state ownership. Control measures should be proposed, possibly during post-harvest T.S.I., whereby mechanical methods and herbicides could be applied to treat these occurrences before their populations expand.

Recreation

This tract is a 107-acre sustainably managed, multiple use parcel located along the southwest side of the 1440 acres contained in compartment 4. It is located in the largest, with 1440 acres, most contiguous landholding of the Owen-Putnam State Forest. Public access to this tract is very good. It can be accessed through the cable gate and fire trail located in Rattlesnake Campground. The tract is in close proximity to the campground and thus is accessible to the public on foot. Also, the tract is accessible to the public via the bridal/multi use trail which

passes near this area. With the large area, extensive trail network and its close proximity to the campground, this tract and the surrounding tracts are ideal for public recreational activities, particularly hunting, but also hiking, gathering, viewing and interpretation. It is an excellent spot for persons interested in a quiet, remote outdoor experience.

Cultural

Cultural resources may be present on this tract but their location is protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Tract Description and Silvicultural Prescription

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

In 1988 a property wide timber inventory (TIMPIS) was conducted, including compartment 4 tract 2 (D. Cole and R. Winks). The results estimated the tract to contain 4,255 bd. ft. of total sawtimber per acre including 1,232 bd. ft. of harvest sawtimber per acre with a total basal area of 88.61 sq. ft. per acre and 141 trees per acre.

In 1991 a timber inventory was conducted in compartment 4 tract 2 (J. Allen). The inventory estimated the tract to contain 5,424 Bd. Ft. of total sawtimber per acre, including 1,959 bd. ft. of harvest sawtimber per acre with a total basal area of 97 sq. ft. per acre and a stocking level of 78%. As a result, a timber sale was proposed for 1993.

The tract was harvested in 1993 (Crone Lumber Co.) with 144,469 bd. ft. of sawtimber removed in 582 trees on 89 of 101 acres.

In 2010 another timber inventory was conducted (J. Dye). The data estimated the tract to contain 7,651 bd. ft. of total sawtimber per acre, including 3,248 bd. ft. of harvest sawtimber per acre with 123 sq. ft of total basal area per acre and a stocking level of 108 %.

Three timber types can be found on this tract. They are oak-hickory, mixed hardwood and pine. The over-story consists mostly of medium to large sawlog sized yellow poplar, oak, hickory, American beech and maple. The quality of merchantable timber is good with the ridge tops containing more of the mixed hardwoods and the slopes containing more of the oak-hickory. The pole-sized under-story consists mostly of sugar maple, pignut hickory, yellow poplar, sassafras, black gum and white oak with white pine located in small stands. Advanced regeneration is represented mostly by sugar maple, American beech, sassafras, dogwood, white oak, pignut hickory and black gum.

The current stocking level of 120% indicates the tract is overstocked. Therefore, a timber harvest is recommended within the next two years. Overall, the timber is reaching maturity with excessive competition for resources taking place. Some areas could benefit from the removal of 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. 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. 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 regeneration. In combination, these silvicultural methods will reduce stand density; improve overall growing conditions and timber quality, while encouraging early successional regeneration.

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 (oak) regeneration through the creation of canopy gaps and a reduction in understory shade tolerant species (sugar maple and American beech). Pre-harvest T.S.I. should be performed to control a moderate to heavy presence of grape vines. In addition, an exotic invasive species, multi-flora rose, is present and is moderately thick in some areas. It is also present in larger quantities in the nearby tracts. Both mechanical and chemical treatments could be used to treat and remove this invasive. 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 forest wildlife habitat.

Inventory Summary – C4T2

Total Number Trees/Acre: 256 **Average Tree Diameter:** 10.2”
Average Site Index: 85 **Stocking Level:** 120%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	94	**Basal Area Sawtimber.**	105.5
Pine Commercial Forest:	**7**	**Basal Area Poles:**	21.5
Noncommercial Forest:	0	**Basal Area Culls:**	3.5
Permanent Openings:	0	**Sub Merch.**	8.9
Other Use:			
Total:	101	**Total Basal Area:**	139.4

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

* Approximation due to accumulative rounding

Species	Growing Stock	Harvest Stock	*Total Volume
YEP	1811	1769	3580
BLO	1732	758	2490
REO	1604	263	1867
WHO	955	159	1114
SAS	0	668	668
WHA	0	564	564
PIH	442	88	531
SHH	321	68	389
WHP	143	211	354
SUM	329	15	344
MOH	253	68	321
BIH	146	25	171
REM	42	112	154
BAS	0	113	113
AMB	109	0	109
ZCO	39	0	39
BLW	0	34	34
LAA	0	40	40
*** Per Acre Total**	7928	4953	12881
***Tract Total**	500,270	800,710	1,300,970

Proposed Management Activities

2010 ---------- Timber Inventory
2011 ---------- Resource Management Guide
2011 ---------- DHPA Archaeological Clearance Application
2011 ---------- Timber Marking and Sale Layout
2011/12 ------- Timber Sale/Harvest
2013 ---------- Post-Harvest TSI and Exotic/Invasive Control
2013 ---------- BMP Monitoring
2030 ---------- Timber Inventory
2030 ---------- Resource Management Guide

Attachments (on file in the property office)

1. Timber Inventory Summary Reports (J. Dye, 08/24/2010)
2. Ecological Resource Review (R. Duncan, August 2011)
3. Topographic Map (R. Duncan, August 2011)
4. Soil Type Map (R. Duncan, August 2011)
5. Natural Heritage Database Review (R. Duncan, 08/23/2011)
6. Aerial Photograph (2003)
7. Upland Central Hardwoods Timber Stocking Guide (R. Duncan, August 2011)
8. Archaeological Clearance Application (R. Duncan, August 2011)
9. Archaeological Clearance Letter (A. J. Ariens)

References

1. Forest Practices Working Group. Indiana Woodland Steward Institute. 1999. Indiana logging and forestry best management practices: BMP field guide. Indiana Department of Natural Resources, Division of Forestry. Indianapolis, IN.

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3. Indiana State Forest Resource Management Procedures Manual. 2001. Indiana Department of Natural Resources, Division of Forestry. Indianapolis, IN.

4. Jacquart, E., M. A. Homoya, L. Casebeer. 2002. Natural communities of Indiana. Working draft. Indiana Department of Natural Resources, Division of Nature Preserves. Indianapolis, IN.

5. Indiana State Forests: Environmental Assessment 2008-2027. 2008. Indiana Department of Natural Resources, Division of Forestry. Indianapolis, IN.

6. Indiana Natural Heritage Database. 2010. Indiana Department of Natural Resources, Division of Nature Preserves. Indianapolis, IN

7. Management Guidelines for Compartment-Level Wildlife Habitat Features. 2008. Indiana Department of Natural Resources, Division of Forestry. Indianapolis, IN.

8. Matney, T.G. 1998. TCruise. timber cruise program version 5.20. Heuristic Solutions.

9. Resource Management Strategy for the Indiana Bat on State Forest Property. 2008. Indiana Department of Natural Resources, Division of Forestry. Indianapolis, IN.

10. Smith, D. M. 1986. The practice of silviculture. New York: John Wiley & Sons Inc.

11. United States Department of Agriculture. Natural Resource Conservation Service. Soil Survey Owen County, Indiana - Series 2005)

12. United States Department of Agriculture. Forest Service. timber stocking guide. Northeastern Area NA-MR-7.

13. United States Geological Survey. Topographical Map. 7.5 Minute Series. Cataract Quadrangle

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