Indiana Department of Natural Resources
Division of Forestry

DRAFT

Resource Management Guide

State Forest: Owen-Putnam
Compartment: 2 **Tract:** 1
Forester: R. Duncan
Date: September 2011
Management Cycle End Year: 2030
Management Cycle Length: 20 Years

Location

Compartment 2, tract 1 lies in the east half of section 4, township 11N, range 4W, Jennings Township, Owen County, Indiana. It is approximately 2 miles west of the town of Cataract and located along Oak road.

General Description

This tract is a 70-acre sustainably managed, multiple use parcel located in the northwest corner of the 439 acres contained in compartment 2 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple, mixed hardwoods 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 a good area for public recreational activities, including hunting, hiking, gathering, viewing and interpretation. Because of its close proximity to roads and parking 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 2 tract 1 has been managed for several years. This tract was created out of 2 parcels that were purchased in 1958 from Roy C. and Alice F. Shannon and in 1961 from William J. Davis.

- Timber inventory in 1983
- Timber harvest in 1984
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 2010

Landscape Context

Compartment 2 tract 1 is located in a rural area. Adjacent and to the south is tract 3 and to the east is tract 2. Farther to the south is compartment 4 with 1440 acres. The land to the west and north is privately owned. Adjacent and to the north of this tract is Oak road which runs in an east west direction. Along oak road are a few residences. 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 a small amount of nearly level ground on the ridge top, located in the northeast corner of the tract adjacent to the parking lot along Oak road, to moderate to steep slopes making up the remainder of the tract. Primarily water sheds from east to west. Generally the soils are composed of moderately deep to deep, moderately drained to well drained soils on moderately steep to steep slopes underlain with sandstone, siltstone and shale. In some areas the soils are underlain with till and sand. These soils occur throughout the Illinoian glaciated areas of the county. The soils are composed of a variety of types. The dominant soils are of the Hickory, Zanesville and Solsberry series. These soils occupy the slopes of which this tract is predominantly made. They can produce good timber with the other soils located in the tract often well suited to timber production. 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:

- **HesG—Hickory-Chetwynd loams**, 35 to 70 percent slopes, *Setting:* Dissected till plains, *Position:* Backslopes, *Site Index*: Upland oak 85

- **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

- **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

- **ZamC2—Zanesville silt loam,** soft bedrock substratum**,** 6 to 12 percent slopes, eroded, *Setting:* Hills underlain with interbedded sandstone, shale, and siltstone *Position:* Shoulders and Backslopes, *Site Index*: Upland oak 69-75

- **ZamD5 – Zanesville silt loam,** soft bedrock substratum**,** 12 to 18 percent slopes, gullied, S*etting*: Hills underlain with interbedded sandstone, shale, and siltstone, *Position*: Backslopes, *Other features*: Between 25 and 40 percent of this map unit is gullied. The gullied areas consist of a network of mostly U-shaped channels averaging 2 to 4 feet in depth. *Site Index*: Upland oak 69-75

- **CkkC2 – Cincinnati silt loam,** 6 to 12 percent slopes, eroded, *Setting:* Dissected till plains, *Position:* Shoulders and Backslopes, *Site Index*: Upland oak 80

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

- **SneD2—Solsberry silt loam**, 12 to 18 percent slopes, eroded, Landform: Dissected till plains, Position: Backslopes, Site Index: Upland oak 80

- **PlfB2 – Pike silt loam,** 2 to 6 percent slopes, eroded, *Setting:* Dissected outwash plains, *Position:* Shoulders and summits, *Site Index*: Upland oak 90

- **OfcAV – Oldenburg fine sandy loam,** sandy substratum, 0 to 2 percent slopes, frequently flooded, very brief duration, *Setting:* Flood plains, *Position:* Flood-plain steps, *Site Index*: Upland oak 85

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 6 miles to Old Cuba Road, continue north on Old Cuba road to Ponderosa road, continue west on Ponderosa road to Cunot-Cataract road, continue west on Cunot-Cataract road to Oak road, continue west on Oak road to the parking lot and fire trail on the south side of Oak road. Management and logging access as well as public recreational access to this tract is very good.

Boundary

The northern and western boundaries of this tract are adjacent to private property with the remainder of the tract boundary following dominant topographical features and adjacent to other tracts within the state forest. The boundary lines adjacent to private property are designated as a line from corner J to corner A and a line from corner A to corner B (see attached map). Corner J is identified with a stone, a steel post and a sign. Corner A is identified with a stone, a steel post, an iron pin with a ring on top and PK nails. Corner B is identified with a stone and a fence corner. All boundary lines adjacent to private property are well marked with orange paint and/or orange ribbon placed on trees approximately located. Any timber marking or harvest operations will be kept an appropriate distance from these boundary lines.

Wildlife

Wildlife resources in compartment 2 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.

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 represented in this tract. They are above the maintenance levels in the small (≥ 5") diameter at breast height (D.B.H.) class. However, there are deficiencies in the medium (≥ 9") and large (≥ 19") D.B.H. classes at the maintenance and optimal levels. The lack of medium and 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.

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	630		1315	685	
20"+ DBH	210		328	118	
Snags (all species)					
5"+ DBH	280	490	572	292	82
9"+ DBH	210	420	36	-174	-384
19"+ DBH	35	70	36	1	-34
Cavity Trees (all species)					
7"+ DBH	280	420	457	177	37
11"+ DBH	210	280	351	141	71
19"+ DBH	35	70	97	62	27

*** 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 70-acre sustainably managed, multiple use parcel located in the northwest corner of the 439 acres contained in compartment 2 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 on Oak 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 easily accessible 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 1983 a timber inventory was conducted in compartment 2 tract 1 (B. Hahn). However, there are no records of that inventory due to the tract file being destroyed in a fire at Morgan-Monroe State Forest in the early ‘80s.

The tract was harvested in 1984 (Illiana Hardwoods, Inc.) with 156,077 bd. ft. of sawtimber removed in 794 trees on 69 acres.

In 1988 a property wide timber inventory (TIMPIS) was conducted, including compartment 2 tract 1 (M. Calvert and D. Smith). The results estimated the tract to contain 2,564 bd. ft. of total sawtimber per acre including 140 bd. ft. of harvest sawtimber per acre with a total basal area (trees $\geq$ 6” d.b.h.) of 61 sq. ft. per acre and 115 trees $\geq$ 6” d.b.h. per acre.

In 2010 another timber inventory was conducted (J. Dye). The data estimated the tract to contain 10,315 bd. ft. of total sawtimber per acre, including 2,813 bd. ft. of harvest sawtimber per acre with 114 sq. ft of total basal area per acre and a stocking level of 99 %.

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, oak, hickory, American beech and maple with some black cherry and black walnut. The quality of merchantable timber is good with the ridge tops and upper slopes containing more of the mixed hardwoods and the slopes containing more of the oak-hickory. The pole-sized under-story consists mostly of sassafras, sugar maple, yellow poplar, red maple, black cherry and northern red oak. Advanced regeneration is represented mostly by sugar maple, sassafras, yellow poplar, basswood, American beech and white ash. Oak regeneration was not represented in the advanced stages. However, many oak seedlings were observed and should be managed.

The current stocking level of 99% indicates the tract is fully stocked and becoming over stocked. 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 (oak) 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 – C2T1

Total Number Trees/Acre: 223 **Average Tree Diameter:** 9.8”
Average Site Index: 80 **Stocking Level:** 99%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	63	**Basal Area Sawtimber.**	84.6
Pine Commercial Forest:	7	**Basal Area Poles:**	20.6
Noncommercial Forest:	0	**Basal Area Culls:**	2.0
Permanent Openings:	0	**Sub Merch.**	7.1
Other Use:			
Total:	70	**Total Basal Area:**	114.3

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

* Approximation due to accumulative rounding

Species	Harvest Stock	Growing Stock	*Total Volume
YEP	255	2615	2872
REO	650	1175	1825
BLO	590	491	1082
WHP	214	751	965
SUM	70	525	595
SCP	90	275	365
SHH	0	293	293
BIH	91	182	272
SAS	215	53	268
PIH	0	262	262
WHA	239	0	239
BLW	0	230	230
MOH	0	227	227
AMB	138	59	197
BLL	122	0	122
BAS	0	121	121
WHO	0	101	101
BLC	0	106	106
GRA	94	0	94
BLG	45	0	45
REM	0	36	36
*** Per Acre Total**	2813	7502	10,315
***Tract Total**	196,940	525,120	722,070

Proposed Management Activities

2010 ----------	Timber Inventory
2011 ----------	Resource Management Guide
2011 ----------	DHPA Archaeological Clearance Application
2012 ----------	Timber Marking and Sale Layout
2012/13 -------	Timber Sale/Harvest
2014----------	Post-Harvest TSI and Exotic/Invasive Control
2014 ----------	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, September 2011)
3. Topographical Map (R. Duncan, September 2011)
4. Soil Type Map (R. Duncan, September 2011)
5. Natural Heritage Database Review Map (R. Duncan, 09/19/2011)
6. Aerial Photograph (2005)
7. Upland Central Hardwoods Timber Stocking Guide (R. Duncan, September 2011)
8. Archaeological Clearance Application (R. Duncan, September 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

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

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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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