Indiana Department of Natural Resources
Division of Forestry

DRAFT

Resource Management Guide

State Forest: Owen-Putnam **Compartment:** 7 **Tract:** 4
Forester: R. Duncan **Date:** August 2011
Management Cycle End Year: 2030 **Management Cycle Length:** 20 Years

Location

Compartment 7, tract 4 lies in the west half of section 23, township 11N, range 4W, Montgomery Township, of Owen County, Indiana. It is approximately 2 miles west of the town of Cuba and located along Hale-Hill road.

General Description

This tract is a 101-acre sustainably managed, multiple use parcel located in the east half of the 551 acres contained in compartment 7 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple and mixed hardwood. 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 7 tract 4 has been managed for several years. This tract was created out of 2 parcels that were purchased in 1950 and 1954.

- Timber harvest in 1961
- Timber inventory in 1983
- Timber harvest in 1983
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 2010

Landscape Context

Compartment 7 tract 4 is located in a rural area. A little more than half of the land adjacent to this tract is privately owned. Along the north side of this tract, running east and west, is Hale-Hill road. 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 varies from nearly level ground on the ridge top, located in the northeast corner of the tract along Hale-Hill road and the parking lot, with moderate to steep southwest facing slopes making up the majority

of the tract and riparian areas located along the intermittent and perennial creeks to the south. Primarily water sheds from north to south. Generally the soils are composed of shallow to deep, moderate to well drained soils on mild to steep slopes underlain with sandstone, siltstone and shale. 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-Adyeville complex, the Hickory-Wellston silt loams and the Tulip-Wellston-Adyeville silt loams. 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 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:

- HepG—Hickory-Adyeville complex, 35 to 60 percent slopes, Landform: 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, Landform: 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, Landform: 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, Landform: Hills underlain with interbedded sandstone, shale, and siltstone, Position: Shoulders and backslopes, Site Index: Upland oak 69-75
- SneD2—Solsberry silt loam, 12 to 18 percent slopes, eroded, Landform: Dissected till plains, Position: Backslopes, Site Index: Upland oak 80
- TtcE—Tulip-Wellston-Adyeville silt loams, 18 to 25 percent slopes, Landform: Structural benches and scarps underlain with interbedded sandstone, shale, and siltstone, Position: Backslopes and footslopes, Site Index: Upland oak 80
- PlcAV—Piankeshaw silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration, Landform: Flood plains, Position: Natural levees, flood-plain steps, and alluvial fans, Site Index: Tuliptree 95

Access

To access the tract from Spencer, travel west on S.R. 46 approximately 5 miles to Fish Creek road, continue north on Fish Creek road approximately 4 miles to Hale-Hill road, travel east on Hale-Hill road approximately 1 mile to the parking lot on the south side of the road. The tract can be accessed through the cable gate and fire trail located in the parking lot. Management and logging access as well as public recreational access to this tract is very good.

Boundary

The northwestern, the southern tip and the entire eastern boundary of this tract are adjacent to private property with the northern, half the western and the southwestern boundaries 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 Hale-Hill road to corner I, a line from corner I to corner J and a line from corner T to Hale-Hill road (see attached map). Corner I is identified with an oblong sandstone and a fence intersection. Corner J is adjacent to Bandy road with the actual corner possibly located in the road and thus not well documented. Corner T is identified with a county surveyor's stake. 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 7 tract 4 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 ($\geq$ 5") diameter at breast height (D.B.H.) class. However, there are deficiencies in the medium ($\geq$ 9") and large ($\geq$

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 poorly represented in all diameter classes at the maintenance and optimal levels, except in the large (≥ 19") D.B.H. classes at the maintenance level. 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 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		3432	2523	
20"+ DBH	303		942	639	
Snags (all species)					
5"+ DBH	404	707	655	251	-52
9"+ DBH	303	606	295	-8	-311
19"+ DBH	50.5	101	0	-51	-101
Cavity Trees (all species)					
7"+ DBH	404	606	248	-156	-358
11"+ DBH	303	404	248	-55	-156
19"+ DBH	50.5	101	59	9	-42

*** 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 and perennial 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 101-acre sustainably managed, multiple use parcel located in the east half of the 551 acres contained in compartment 7 of the Owen-Putnam State Forest. Public recreational access to this tract is very good. It can be accessed through the cable gate and fire trail located on 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 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 1961 a timber harvest was conducted in compartment 7 tract 4. However, no information is available on that harvest due to the tract records being destroyed in a fire at Morgan-Monroe State Forest in the early „80s.

In 1988 a property wide inventory (TIMPIS) was conducted, including compartment 7 tract 4 (M. Calvert and D. Smith). The results estimated the tract to contain 3,030 bd. ft. of total sawtimber per acre, including 90 bd. ft. of harvest sawtimber per acre with a total basal area (trees $\geq$ 6" d.b.h.) of 68 sq. ft. per acre and 115 trees $\geq$ 6" d.b.h. per acre.

In 1983 a timber inventory was conducted in compartment 7 tract 4 (B. Hahn). The inventory estimated the tract to contain 5,790 bd. ft. of total sawtimber per acre, including 3,667 bd. ft. of harvest sawtimber per acre. As a result, a timber sale was proposed for 1983.

The tract was harvested in 1983 (Weston Paper & Manufacturing Co.) with 183,196 bd. ft. of sawtimber removed in 629 trees on 106 acres.

In 2010 another timber inventory was conducted (J. Dye). The data estimated the tract to contain 8,963 bd. ft. of total sawtimber per acre, including 3,004 bd. ft. of harvest sawtimber per acre with 119 sq. ft of total basal area per acre and a stocking level of 106 %.

Three timber types can be found on this tract. They are oak-hickory, beech-maple and mixed hardwood. 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 and upper slopes containing more of the mixed hardwoods and the mid slopes containing more of the oak-hickory. The pole-sized under-story consists mostly of sugar maple, red maple, sassafras, northern red oak, bitternut hickory and white oak. Advanced regeneration is represented mostly by sugar maple, American beech, yellow poplar, American elm and sassafras. Oak regeneration was not represented in the advanced stages. However, many oak seedlings were observed and should be managed.

The current stocking level of 106% 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 (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 – C7T4

Total Number Trees/Acre: 260 **Average Tree Diameter:** 9.3”
Average Site Index: 85 **Stocking Level:** 106%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	101	**Basal Area Sawtimber.**	86.3
Pine Commercial Forest:	0	**Basal Area Poles:**	22.9
Noncommercial Forest:	0	**Basal Area Culls:**	1.5
Permanent Openings:	0	**Sub Merch.**	9.0
Other Use:			
Total:	101	**Total Basal Area:**	119.5

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

* Approximation due to accumulative rounding

Species	Growing Stock	Harvest Stock	*Total Volume
REO	1001	845	1846
YEP	1353	474	1827
WHO	1339	154	1494
SUM	924	350	1274
SHH	368	125	493
AMB	46	259	305
BIH	303	0	303
PIH	153	151	302
WHA	48	223	271
BLC	191	70	261
REM	114	125	239
SAS	0	230	230
MOH	118	0	118
*** Per Acre Total**	5959	3004	8964
***Tract Total**	601,900	303,410	905,320

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, 08/26/2011)
6. Aerial Photograph (2005)
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.

2. Homoya, M. A., D. B. Abrell, J. R. Aldrich, and T. W. Post. 1985. The natural regions of Indiana. Proceedings of the Indiana Academy of Science, 94:245-268

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. Spencer & Cataract Quadrangle

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.