Indiana Department of Natural Resources – Division of Forestry
Draft
Resource Management Guide

State Forest: Owen-Putnam **Compartment:** 3 **Tract:** 4
Forester: R. Duncan **Date:** September 2011
Management Cycle End Year: 2030 **Management Cycle Length:** 20 Years

Location

Compartment 3, tract 4 is located in the southeast corner of section 3, township 11N, range 4W, Jennings Township, Owen County, Indiana. It is approximately 1 mile southwest of the town of Cataract and located along Maze road.

General Description

This tract is a 152-acre sustainably managed, multiple use parcel located in the northwest corner of the 301 acres contained in compartment 3 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 3 tract 4 has been managed for several years. This tract was created out of a single 160 acre parcel that was purchased in 1950 from Harry J. & Effie Robbins.

- Timber harvest, 1970's, exact date unknown
- Timber inventory in 1985
- Timber harvest in 1986
- Post-harvest timber stand improvement (TSI), opening completions 1988
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 2010

Landscape Context

Compartment 3 tract 4 is located in a rural area. Along the southeast side of this tract, running east and west, is Maze road. There are a few residences along Maze road. Adjacent and to the south is tract 5. Farther to the south is compartment 4 with 1440 acres. The land to the north, east and west 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 level ground on the ridge top, located in the center of the tract, to moderate to steep slopes making up the remainder of the tract. Water sheds generally to the northeast into a mapped intermittent stream and to the southwest into ephemeral drainages that feed into Jordan creek. 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. 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 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:

- **HeuF—Hickory-Wellston silt loams,** 25 to 35 percent slopes, *Setting:* Dissected till plains over interbedded shale, siltstone, and sandstone, *Position:* Backslopes, *Site Index*: Upland oak 85

- **TtcE—Tulip-Wellston-Adyeville silt loams**, 18 to 25 percent slopes, *Setting*: Structural benches and scarps underlain with interbedded sandstone, shale, and siltstone, *Position*: Backslopes and footslopes, *Site Index*: Upland oak 80

- **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

- **ZapD3—Zanesville, soft bedrock substratum-Tulip silt loams,** 12 to 18 percent slopes, severely eroded, *Setting:* Hills underlain with interbedded sandstone, shale, and siltstone, *Position:* Backslopes, *Site Index*: Upland oak 69-75

- **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, *Setting*: Dissected till plains, *Position*: Backslopes, *Site Index*: Upland oak 80

- **SneD3—Solsberry silt loam,** 12 to 18 percent slopes, severely eroded, *Setting:* Dissected till plains, *Position:* Backslopes, *Site Index*: Upland oak 80

- **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

- **AloB2—Ava silt loam,** 2 to 6 percent slopes, eroded, *Setting:* Dissected till plains, *Position:* Shoulders and summits, *Site Index*: Upland oak 75-80

- **GmpF—Greybrook silt loam,** 25 to 35 percent slopes, *Setting:* Dissected lake plains, *Position:* Backslopes, *Site Index*: Upland oak 84-95

- **PryB—Potawatomi silt loam,** 1 to 3 percent slopes, *Setting:* Hills underlain with interbedded, sandstone, shale, and siltstone, *Position:* Summits, *Site Index*: Upland oak 80

- **HeuE—Hickory-Wellston silt loams**, 18 to 25 percent slopes, *Setting*: Dissected till plains over interbedded shale, siltstone, and sandstone, *Position*: Backslopes, *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 Maze road, continue west on Maze road to the parking lot and fire trail on the north side of Maze road. Management and logging access as well as public recreational access to this tract is very good.

Boundary

The northern, eastern, western and part of the southeastern boundary of this tract are adjacent to private property with the southwestern boundary following a large ravine and adjacent to compartment 3 tract 5. The boundary lines adjacent to private property are designated as a line from corner T to corner U, to corner V, to corner W, to corner X, to corner Y, to corner Z, to corner ZA. (see attached map). Corner T is identified with a stone, steel post and a Dorman stake. Corner U is identified with a stone, steel post, and old fence intersection. Corner V is identified with a stone, steel post and an old fence intersection. Corner W is identified as a fence intersection with the road. Corner X is presumably identified with a large witness stone, south of the roadway. Corner Y is identified with a stone and steel post. Corner Z is identified with a #4 stone, steel post and fence intersection. Corner ZA is identified with a stone, steel post and fence intersection. All the boundary lines are well marked. 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 3 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 well represented in this tract. They are above the maintenance and optimal levels in all diameter classes, except there is a slight deficiency in the large (≥ 19") diameter at breast height (D.B.H.) class 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.

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	1368		2513	1145	
20"+ DBH	456		736	280	
Snags (all species)					
5"+ DBH	608	1064	2458	1850	1394
9"+ DBH	456	912	1422	966	510
19"+ DBH	76	152	119	43	-33
Cavity Trees (all species)					

7"+ DBH	608	912	951	343	39
11"+ DBH	456	608	815	359	207
19"+ DBH	76	152	153	77	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 forest community type, with some isolated more mesic sites located along lower north slopes, and some 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 152-acre sustainably managed, multiple use parcel located in the northwest corner of the 301 acres contained in compartment 3 of the Owen-Putnam State Forest. Public access to this tract is very good. This tract can be accessed through the cable gate and fire trail located on Maze 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 1985 a timber inventory was conducted in compartment 3 tract 4 (D. Vadas). The data estimated the tract to contain 4,748 bd. ft. of total sawtimber per acre, including 1,244 bd. ft. of harvest sawtimber per acre with 121 sq. ft of total basal area per acre.

The tract was harvested in 1986 (Superior Hardwoods, Inc.) with 179,275 bd. ft. of sawtimber removed in 1,122 trees on 153 acres.

In 1988 a property wide timber inventory (TIMPIS) was conducted, including compartment 3 tract 4 (M. Calvert and D. Cole). The results estimated the tract to contain 2,794 bd. ft. of total sawtimber per acre, including 314 bd. ft. of harvest sawtimber per acre with a total basal area (trees $\geq$ 6" d.b.h.) of 54 sq. ft. per acre and 51 trees $\geq$ 6" d.b.h. per acre.

In 2010 another timber inventory was conducted (J. Dye). The data estimated the tract to contain 10,411 bd. ft. of total sawtimber per acre, including 3,402 bd. ft. of harvest sawtimber per acre with 127 sq. ft of total basal area per acre and a stocking level of 109 %.

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 walnut in the bottoms and eastern white pine and Scots pine dominating the pine stands. The quality of merchantable timber is good with the ridge tops and upper slopes containing more of the mixed hardwoods and pine, and the mid to lower slopes containing more of the oak-hickory. The pole-sized under-story consists mostly of yellow poplar, sassafras, sugar maple, red maple, Scots pine, white pine, American beech and chinkapin oak. Advanced regeneration is represented mostly by sugar maple, American beech, dogwood, sassafras and pawpaw. Oak regeneration was not represented in the advanced stages. However, many oak seedlings were observed and should be managed.

The current stocking level of 109% indicates the tract is over stocked. Therefore, a timber harvest is recommended within the next two years. 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 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 – C3T4

Total Number Trees/Acre: 238 **Average Tree Diameter:** 10”
Average Site Index: 80 **Stocking Level:** 109%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	63	**Basal Area Sawtimber.**	92.5
Pine Commercial Forest:	7	**Basal Area Poles:**	25.3
Noncommercial Forest:	0	**Basal Area Culls:**	3.5
Permanent Openings:	0	**Sub Merch.**	5.8
Other Use:			
Total:	70	**Total Basal Area:**	127.1

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

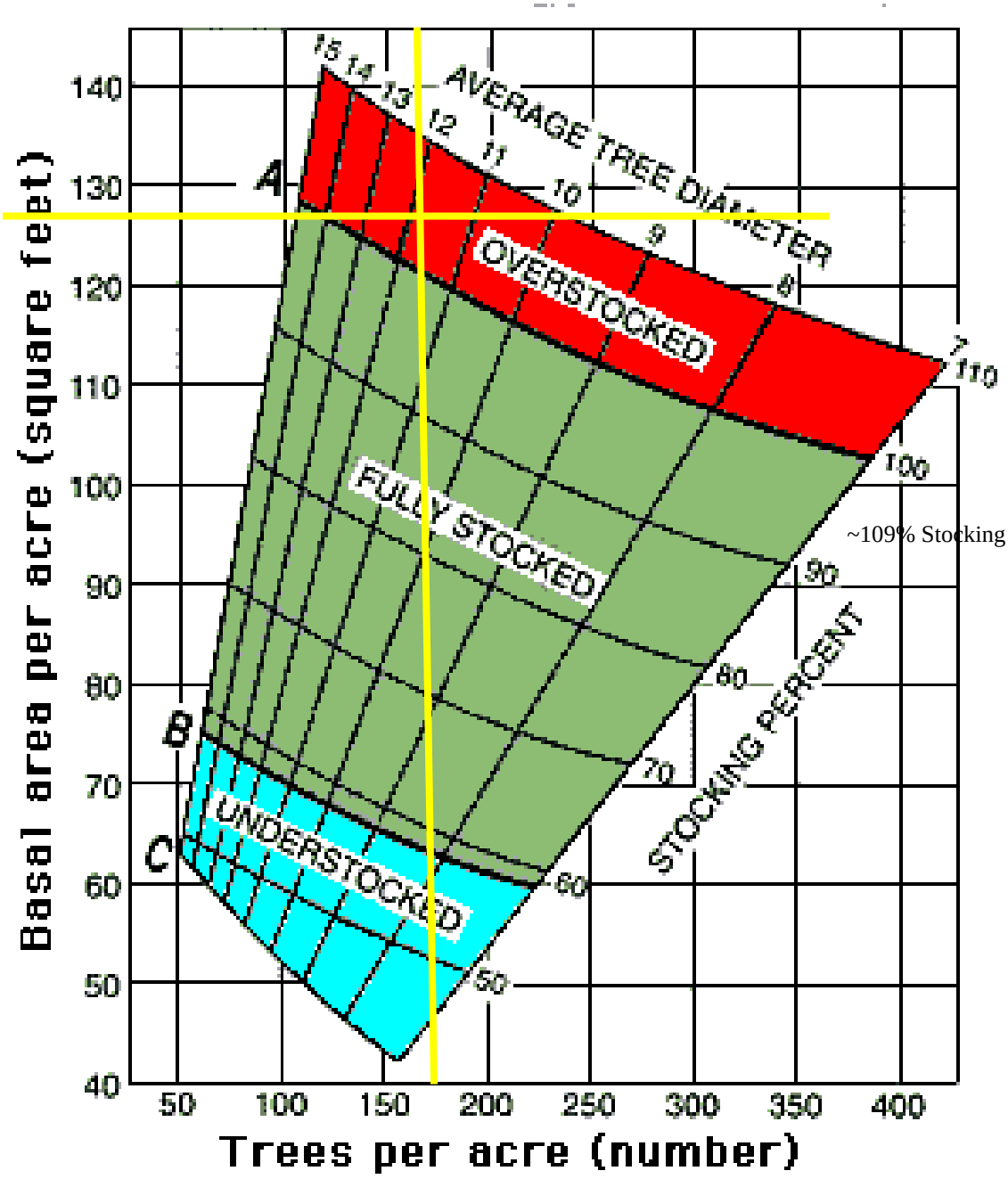
* Approximation due to accumulative rounding

Species	Harvest Stock	Growing Stock	*Total Volume
YEP	831	3010	3841
WHP	762	698	1460
WHO	251	1205	1456
BLO	287	455	742
SHH	29	411	440
REO	96	333	430
MOH	71	272	344
SAS	215	41	256
REM	181	66	247
BIH	59	142	201
PIH	81	92	173
SCP	155	44	199
LAA	132	0	132
SYC	39	85	124
WHA	100	0	100
SUM	0	57	0
BLW	49	0	49
SCO	0	46	46
AMB	45	0	45
SWG	0	36	36
ZCO	0	17	17
*** Per Acre Total**	3,402	7,009	10,411
***Tract Total**	517,110	1,065,400	1,582,510

Owen-Putnam State Forest

2010 Timber Inventory - Stocking Level
Compartment 3 Tract 4
152 - Acres

~10 Inch Average Tree Diameter



Ft. Total
Acre

~109% Stocking

238 Total Trees/Acre

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. Topographic Map (R. Duncan, September 2011)
4. Soil Type Map (R. Duncan, September 2011)
5. Natural Heritage Database Review (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

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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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