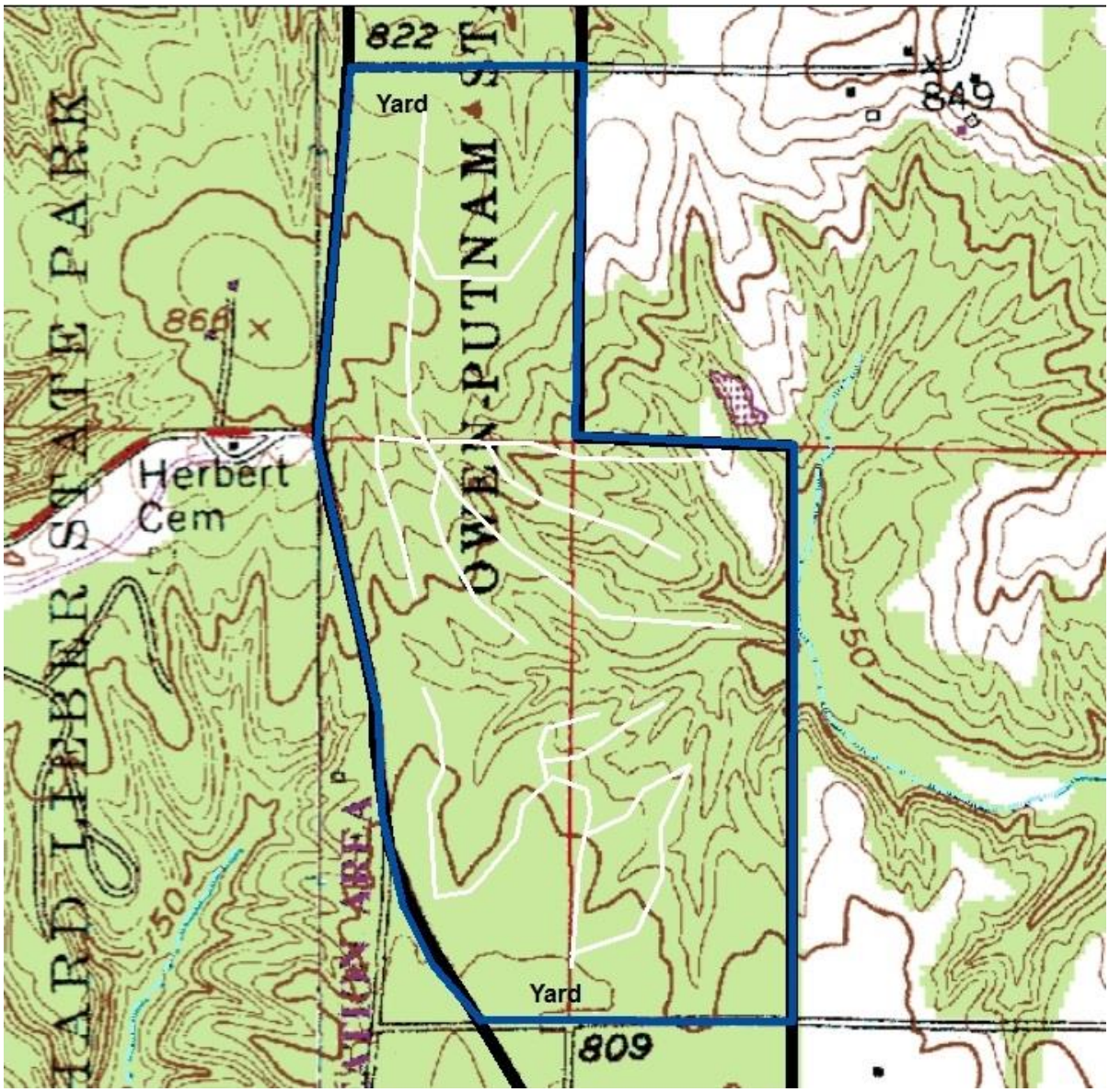
Indiana Department of Natural Resources
Division of Forestry
DRAFT RESOURCE MANAGEMENT GUIDE

State Forest: Owen-Putnam **Compartment:** 1 **Tract:** 2
Forester: R. Duncan **Date:** September 2017
Management Cycle End Year: 2032 **Management Cycle Length:** 15 Years

Location

Compartment 1, tract 2 is located primarily in the east central portion of sections 8,16 and 17, township 12N, range 4W, Cloverdale Township, Putnam County. The tract is near the small town of Cunot and the Lieber State Recreation Area and Cagles Mill Lake. The tract is separated from Lieber SRA by State Rd. 243 to the west, with private property to the east and state forest property to the north and south.



General Description

This tract is a 167-acre, sustainably managed, multiple use parcel located within the 560 acres comprising compartment 1 of the Owen-Putnam State Forest. Timber types include closed canopy oak-hickory, beech-maple, mixed hardwoods and pine. This tract was once part of a farm with nearly level terrain in the west end and gentle slopes moving east, southeast. The western section was planted to Red and White Pine 40 to 50 years ago to control erosion most likely from farming practices before state ownership, with scattered sections of Black Locust, Pine and Yellow Popular. The Black Locust and pine areas have been hit hard by strong winds, which created several acres of windthrow and habitat for wildlife. Two large blocks of Red and White Pine remain intact along the western edge of the tract. The over-story consists of medium to large sawlog sized yellow-poplar, maple, oak, hickory and ash. The quality of merchantable timber is good. However, there is some decline in the poplar due to drought and insect stress. The pole-sized under-story consists mostly of beech, maple, hickory and poplar. This area exhibits good opportunities for multiple use management, including timber management, wildlife management, soil and water conservation and public recreational activities, such as, hunting, hiking, gathering, viewing and interpretation.

History

Owen-Putnam State Forest was established in 1948 with most of its landholdings purchased as smaller non-contiguous tracts in the 50's and 60's. Prior to state ownership, many of the ridge tops in the area were farmed through the 1930's. Sometime in the 1960's many of the severely eroded ridge tops were planted to pine to stabilize the soil. Compartment 1 tract 2 has been managed for many years.

- Timber inventory in 1976
- Timber stand improvement in 1987
- Property wide timber inventory (TIMPIS) in 1988
- Timber inventory in 2001
- Timber harvest in 2003
- Timber stand improvement, crop tree release and vine control in 2005
- Timber inventory in 2017

Landscape Context

Compartment 1 tract 2 is located in a rural area. Generally the area is forested hills and ravines. The private property adjacent to this compartment and tract are primarily closed canopy, deciduous, mixed hardwood forests with no industry, some agriculture, some scattered rural and more concentrated residential housing, small fields/pastures and small ponds located primarily along county roads beyond the state forest.

Topography, Geology and Hydrology

This part of Owen-Putnam State Forest falls in the Shawnee Hills Natural Region, Escarpment Section. This section includes the rugged hills situated along the eastern border of the region. It is a blend of the Crawford Upland Section and the Mitchel Karst Plain Section of the Highland Rim. Sandstone and sandstone derived soils (Wellston-Zanesville) cap most of the hills, and the lower elevations present limestone and limestone-derived soils. The upper slopes consist of an oak-hickory assortment, with a more mesic component in the coves resembling the mixed mesophytic forest community.

The topography of the area varies from nearly level ground on the ridge top along the west side of the tract to moderately steep east facing slopes. Water sheds into a mapped intermittent stream flowing northwest to southeast near the east edge of the tract. The main soils of this tract belong to the Iva, Ava and Cincinnati series and are generally silty soils on glacial outwash. These soils are generally deep-well-drained medium textured with

moderate permeability. These soils occur throughout the Illinoian glaciated areas of the county. In the event of a harvest, the existing haul road and log yards can be utilized. Care must be taken during the planning and execution of skid trails due to the erosive nature of some soils. Best Management Practice (BMP) guidelines will be followed to preserve soil and water quality.

Soils

The tract is composed primarily of the Iva silt loam, Ava silt loam and the Cincinnati silt loam. The Iva series consists of deep, somewhat poorly drained, slowly permeable soils on loess covered uplands. The Ava series consists of deep, moderately well drained soils on loess-covered uplands. These soils have a fragipan that is very slowly permeable. They formed in loess, glacial drift, and residuum of limestone and sandstone bedrock. The Cincinnati series consists of deep, well drained soils on loess-covered uplands. These soils have a fragipan. Permeability is moderate above the fragipan and moderately slow or slow in and below the fragipan. These soils formed in loess, glacial drift, and residuum of limestone and sandstone.

Specifically, the tract is composed of the following soils:

IvA- Iva silt loam, 0 to 2 percent slopes, this nearly level and gently sloping, deep, somewhat poorly drained soil is on broad, convex ridgetops of the loess covered uplands. It is well suited to trees. Water tolerant species are favored in timber stands. This soil has a site index of 75 for white oak and 85 for yellow poplar.

AvB- Ava silt loam, 1 to 6 percent slopes, this gently sloping, deep, moderately well drained is on knolls and narrow ridgetops and on side slopes along drainage ways in the uplands. It is well suited to trees. This soil has a site index of 75 for white oak and 90 for yellow poplar.

CnD2- Cincinnati silt loam, 12 to 18 percent slopes, eroded, this strongly sloping, deep, well-drained soil is on the sides of draws in the uplands and on breaks between the uplands and bottom land. It is well suited to trees. This soil has a site index of 80 for northern red oak.

CnC2- Cincinnati silt loam, 6 to 12 percent slopes, eroded, this moderately sloping, deep, well-drained soil is on ridgetops and side slopes in the uplands. It is fairly well suited to trees. This soil has a site index of 80 for northern red oak.

HoG- Hickory loam, 25 to 70 percent slopes, this steep to very steep, deep, moderately well drained and well-drained soil on side slopes in the uplands. It is well suited to trees. This soil has a site index of 85 for white oak and 95 for yellow poplar.

Sh- Shoals silt loam, occasionally flooded; this is a nearly level, deep, somewhat poorly drained soil on bottom lands. It is well suited to trees. Wet times of year should be considered when planning management activities. This soil has a site index of 90 for pin oak and yellow poplar.

AwC2- Ava silt loam, 6 to 12 percent slopes, eroded, this moderately sloping, deep, moderately well drained is on knolls and narrow ridgetops and on side slopes along drainage ways in the uplands. It is well suited to trees and has a site index of 75 for white oak and 90 for yellow poplar.

Access

To access the tract from Spencer Indiana, travel north on U.S. 231 to S.R. 42, travel west on S.R. 42 to S.R. 243, travel north on S.R. 243 to Co. Rd. 1250S, travel Co. Rd. 1250S east to the parking lot on the north side of the road, or continue traveling north on S.R. 243 to Co. Rd. 1175S, travel Co. Rd. 1175S east to the parking lot on the south side of the road. The tract is accessible to the public via the parking lots on Co Rd. 1175S on the north

end of the tract and Co. Rd. 1250S on the south end of the tract. Management access as well as public recreational access to this tract is good.

Boundary

This tract is a 167-acre, sustainably managed, multiple use parcel located within the 560 acres contained in compartment 1 of the Owen-Putnam State Forest. Private property borders this tract along the east side with approximate boundary lines having been located and marked with orange paint and ribbon. The boundary lines have been marked and documented in the past with a clearly identified old fence along the east side. The remainder of the tract boundaries border state forest and Lieber SRA.

Wildlife

With the presence of the upland and lowland forest area, which includes oak-hickory, beech-maple, mixed hardwoods, pine, pockets of seasonal grasses and sedges and ephemeral drainages, this tract contains habitat for a variety of wildlife species. 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, woodpeckers, toads, frogs and various small stream aquatic life.

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. The pine stands provide benefits such as cover, roosts and browse.

Live trees containing cavities provide nesting and denning opportunities for woodpeckers, songbirds and small mammals and potentially contribute to future snags (standing dead trees).

Snags 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 and ephemeral drainages provide habitat for herptiles and aquatic vertebrates.

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.

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 (R. Duncan 2017) 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 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. White oak and shagbark hickory are two species having preferred characteristics for tree roosting bats. Both are relatively abundant in this tract and will be given consideration as habitat. Also, as the tract continues to mature, the number of legacy trees $\geq$ 20" D.B.H. is expected to rise.

Standing dead or dying trees (snags) are well represented in this tract. Snags $\geq$ 5" D.B.H. and $\geq$ 9" D.B.H. in this tract are above the maintenance levels for both classes. However, the snags in the $\geq$ 19" D.B.H. class are below the maintenance 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. Snags can have short standing times and often become wind thrown.

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 can be performed through post harvest timber stand improvement (T.S.I.) to address large diameter snag limitations. It should be noted these are compartment level guidelines and the target snag levels may well be present on the landscape.

Wildlife Habitat Feature Tract Summary

	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance
Legacy Trees *				
11"+ DBH	1503		3029	1526
20"+ DBH	501		627	126
Snags (all species)				
5"+ DBH	668	1169	1079	411
9"+ DBH	501	1002	930	429
19"+ DBH	83.5	167	37	-47

*** 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 slopes, and some floodplain along drainages. 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).

A Natural Heritage Database Review is part of the management planning process. If Rare, Threatened or Endangered communities 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 communities.

An exotic/invasive species, multi-flora rose (Rosa multiflora), is present in and around this tract in patches of light to moderate densities. It is also common throughout the county. Control measures can be undertaken during post-harvest T.S.I., to treat problem occurrences before their populations expand.

Recreation

While there are no recreation trails on this multiple use tract, it has good public access via the parking lots and fire trails located on Co. Rd. 1175S on the north end of the tract and Co. Rd. 1250S on the south end of the tract. Management access to this tract is also good. Hunting and gathering are the primary recreational uses of the tract.

Cultural

This tract is reviewed for cultural sites during the forest resource inventory and planning process. Cultural resources may be present but their location(s) are protected. Adverse impacts to significant cultural resources noted will be avoided during management or construction activities.

Tract Description and Silvicultural Prescription

In 1976 a routine timber inventory was conducted (Julie Akard). The data estimated the tract to contain 81 Sq. Ft. of total basal area per acre with 75,920 Bd. Ft. of total growing stock, 30,860 Bd. Ft. of total harvest stock and 106,780 Bd. Ft. of total sawtimber.

In 1987 a yellow poplar timber stand improvement (T.S.I) project was performed across 6 acres in compartment 1 tract 2. The project deadened 220 Sq. Ft. of basal area in 483 trees.

In 1988 a property wide inventory (TIMPIS) was conducted, including Compartment 1 tract 2. The data estimated the tract to be 71% stocked with 81 Sq. Ft. of total basal area per acre in 158 trees per acre, containing approximately 2771 Bd. Ft. of total sawtimber per acre with an estimated 754 Bd. Ft. of harvest sawtimber per acre and a harvest proposed in 1998.

In 2001 a routine timber inventory was conducted. The data estimated the tract to contain 116 Sq. Ft. of total basal area per acre and approximately 6107 Bd. Ft. of total sawtimber per acre with an estimated 2131 Bd. Ft. of harvest sawtimber per acre.

In 2003 the tract was harvested (R. Booe & Son Hardwoods, Inc.) of 187,300 Bd. Ft. in 775 trees on 130 acres (1440 Bd. Ft. /acre) as part of an intermediate harvest in the form of a selective thinning and improvement cut.

In 2005 a timber stand improvement (T.S.I) project was performed to release crop trees across the tract by girdling select trees and cutting grapevines.

In 2017 a routine inventory was conducted (R. Duncan). The data estimated the tract to be 92% stocked with 112 Sq. Ft. of total basal area per acre in 159 trees per acre and an average tree diameter of 11 inches, containing approximately 6943 Bd. Ft. of total sawtimber per acre and an estimated 1859 Bd. Ft. of harvest sawtimber per acre.

Timber in compartment 1 tract 2 is predominantly closed canopy mixed hardwoods, with some pockets of oak-hickory, and small pine stands. The over-story consists mostly of medium to large sawlog sized poplar, oak, hickory, beech, maple and ash; with Eastern white pine, Red Pine, Virginia pine and jack pine comprising approximately 15 acres of pine stands in the tract's Northwest and Southwest corners . 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 beech,

maple, sassafras and poplar; with E. white pine and jack pine representing some of the pole sized understory in the pine stand. Advanced regeneration is represented mostly by beech, maple, sassafras and poplar.

The current inventory and stocking level indicates the tract is fully stocked. Some areas of the tract are sufficiently mature and crowded that resource competition is taking place and thinning may be beneficial. Often, there is little groundcover or early successional regeneration in these areas due to low light levels and browse. In the remaining areas, the tract is still maturing but could benefit from the selective removal of less desirable species and low quality individuals in an effort to improve the overall tract quality and 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 incorporated to improve the overall species composition and quality of the tract by select harvesting the low quality, damaged, diseased, dying and poorly formed trees as well as thinning of less desirable species, especially the declining yellow-poplar that are competing with the oak and other quality trees such as the hickory and cherry. In addition, ash trees susceptible to Emerald Ash Borer (EAB) will be selected for harvest to utilize their product before they become populated with the insect and decline. This removal will also capture Ash seed and create conditions to recruit and encourage regeneration of the species before seed bearing trees die due to EAB.

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 seedlings.

Group selection openings may also be created to remove groups of undesirable species or poor quality individuals and to promote regeneration.

In combination, these silvicultural methods will reduce stand density; improve overall growing conditions and timber quality, while encouraging tree species diversity and regeneration of native mixed hardwood species.

The long term objective with the pine stands is a transitioning over the next 2 cycles away from these non-native species and towards a native hardwood mix. This would utilize a combination of group and single tree selection systems as described above.

Management in the form of Timber Stand Improvement (T.S.I.) is prescribed to release preferred, high quality crop trees through the culling of low volume, poorly formed trees and less desirable species, and to encourage regeneration through the creation of canopy gaps and a reduction in understory shade tolerant species. T.S.I. would also look at problem occurrences of multi-flora rose.

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 could be performed through T.S.I. to address the Management Guidelines for Compartment-Level Wildlife Habitat Features.

The overall goal of this prescription is to improve timber species composition, provide resources for future crop trees through the removal of over-mature and declining trees, and provide forest wildlife habitat.

The tract is projected to remain in the fully stocked category after the prescribed elective harvest.

The existing haul road, log yard, and skid trail system will be utilized for management activities eliminating the need for any new construction. As with all forest management activities, Best Management Practice (BMP) guidelines will be followed to protect soil and water resources.

Inventory Summary – C1T2

Total Number Trees/Acre: 159
Average Tree Diameter: 11”
Average Site Index: 80-90
Stocking Level: 92%

	Acres		Sq.Ft./Acre
Hardwood Commercial Forest:	136	**Basal Area Sawtimber.**	78.9
Pine Commercial Forest:	31	**Basal Area Poles:**	29.8
Noncommercial Forest:	0	**Basal Area Culls:**	1.4
Permanent Openings:	0	**Sub Merch.**	2.5
Other Use:			
Total:	167	**Total Basal Area:**	112.6

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

Species	Harvest Stock	Growing Stock	Total Volume
YEP	511	1529	2042
WHO	114	711	825
REO	209	512	721
AMB	131	288	418
SUM	197	201	398
WHP	118	196	314
REM	102	175	277
BIH	96	189	284
PIH	37	233	270
SHH	0	257	257
SAS	80	169	249
WHA	148	43	190
LAA	23	149	172
VIP	25	70	95
BLC	0	74	74
ZCO	28	40	68
BAS	20	33	53
BLO	13	38	51
REE	0	51	51
BLW	0	37	37
JAP	0	34	34
REP	0	27	27
BLL	0	20	20
AME	0	9	9
SYC	7	0	7
Per Acre Total	1859	5085	6943
Tract Total	310,453	849,195	1,159,481

Proposed Management Activities

2017 ----------	Timber Inventory
2017 ----------	DHPA Archaeological Clearance Application
2017 ----------	Resource Management Guide
2017/18 -------	Timber Marking and Sale Layout
2018 ----------	Timber Sale
2018-20 -------	Timber Harvest
2019-21 -------	Post-Harvest TSI and Exotic/Invasive Control
2019-21 -------	BMP Monitoring
2032 ----------	Timber Inventory
2032 ----------	Resource Management Guide

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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 and posted at http://www.in.gov/dnr/forestry/3634.htm Note: Some graphics may distort due to compression.