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

The Indiana State Forest system consists of approximately 158,000 acres of primarily forested land. These lands are managed under the principle of multiple use-multiple benefit to provide forest conservation, goods and services for current and future generations. The management is guided by scientific principles, guiding legislation and comprehensive forest certification standards which are independently audited to help insure long term forest health, resiliency and sustainability.

For management and planning purposes each State Forest is divided into a system of compartments and tracts. In general terms compartments are 500-1,000 acres in size and their subunits (tracts) are 50-200 acres in size. Resource Management Guides (RMGs) are then developed for each tract to guide their management through a 15-25 year management period. There are approximately 1,700 tracts in the State Forest system. During annual planning efforts 50-100 tracts are reviewed and RMGs developed based on current conditions, inventories and assessments.

The RMGs for Compartment 10, Tracts 8, 9, 38, 39 contained in this document are part of this year's tracts under review for Jackson Washington State Forest.

To submit a comment on this document, go to:
www.in.gov/dnr/forestry/8122.htm

You must indicate the State Forest Name, Compartment number and Tract numbers 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 review posted at http://www.in.gov/dnr/forestry/3634.htm.

Jackson-Washington State Forest Compartment: 10 Tract: 8

Forester: Quentin Beahrs Date: January 25, 2017
Management Cycle End Year: 2043 Management Cycle Length: 25

Location
The tract is located in Washington County, Indiana, more specifically Township 3 North Range 4 East, Sections 11, & 12 of Monroe Township. This area is located approximately 10 miles south of Brownstown off Delaney Park Road just north of Spurgeon Hollow Lake.

General Description
The tract is approximately 62 acres and the general cover type is mixed hardwoods; however, there are small pockets of oak-hickory mixed throughout the stand.

History
On May 22, 1954 928.5 acres of land was purchased from Elvin Nolan.

In 1971, a timber harvest was marked and sold containing an estimated volume of 97,780 bd.ft. The sale covered approximately 49 acres from parts of tract 8, 10, & 37.

In 1980, a forest inventory was conducted indicating an estimated total volume of 159,928 bd.ft.

In 2001, the property line on the south side of Delaney Park Lake was located.

Landscape Context
The majority of land surrounding the tract is Jackson-Washington State Forest. However, adjacent to the tract in the northwest corner is Delaney Park, a county owned and operated public park consisting of a lake, campground and forested land. Minor acreage of agricultural land is located to the west of the tract.

Topography, Geology and Hydrology
This tract consists of one major ridge running east and west with several small finger ridges coming off of the north facing slope. There is a mapped intermittent stream that starts in the middle of the northern tract boundary and runs west to the property line. The parent material of the tract consists of sandstone, and limestone.

Soils
Berks-Weikert complex (BhF) This soil series is steep to very steep, well drained soils are on side slopes in the upland areas. The Berks soil is moderately deep, and the Weikert soil is shallow. The two soils occur as areas so intricately mixed that mapping them separately is not practical. This soil complex is suited for trees. The erosion hazard, the equipment limitations, seedling mortality, windthrow hazard, and plant competition are concerns in managing the woods. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop

structures help to control erosion. The site indexes for hardwood species range from 50 (black oak) to 70 (white oak). Preferred trees to manage for are black oak, chestnut oak, scarlet oak, red oak, and white oak.

Burnside silt loam (Bu) This series consists of deep, well drained soils that formed in 30 to 61 centimeters (12 to 24 inches) of medium-textured alluvium and the underlying loamy-skeletal alluvium. These soils are on flood plains and alluvial fans. It is occasionally flooded for brief periods in the spring. Native vegetation is deciduous hardwoods. This soil is well suited for trees. Plant competition is moderate. Seedlings survive and grow well if competing vegetation is controlled by cutting, girdling, or spraying. The site index for hardwood species is 95 for yellow-poplar. Preferred trees to manage for are bitternut hickory, white oak, red oak, black walnut, sugar maple, and yellow-poplar.

Gilpin silt loam (GID2) This strongly sloping, moderately deep, and well-drained soil is on side slopes in the uplands. This soil is fairly well suited to trees. The erosion hazard, the equipment limitations, and plant competition are the main concerns in the management of wooded areas. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. During wet periods, roads tend to be slippery and ruts form easily. Seedlings survive and grow well if competing vegetation is controlled by cutting, girdling, or spraying. The site indexes for hardwood species range from 80 (red oak) to 95 (yellow-poplar). Preferred trees to manage for are black oak, chestnut oak, scarlet oak, red oak, and white oak.

Wellston silt loam (WeC2, WeD) This series consists of deep or very deep, well-drained soils formed in silty material from loess and from fine-grained sandstone or siltstone and with bedrock at depths of 40 to 72 inches. Wellston soils are on nearly level to steep uplands in areas of acid sandstone, siltstone, or shale bedrock; but are most common on ridgetops. Slope ranges from 0 to 50 percent but are dominantly 4 to 18 percent. Native vegetation consisted of oak, hickory, dogwood, tulip poplar, and cherry. This soil is fairly well suited to trees. The erosion hazard, the equipment limitations, and plant competition are the main concerns in the management of wooded areas. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. During wet periods, roads tend to be slippery and ruts form easily. Seedlings survive and grow well if competing vegetation is controlled. The site indexes for hardwood species is 81 (red oak) and 90 (yellow-poplar). Preferred trees to manage for are black oak, chestnut oak, persimmon, red oak, scarlet oak, shagbark hickory, sugar maple, yellow-poplar, and white oak.

Zanesville silt loam (ZaB, ZaC2) This gently sloping, deep, moderately well-drained or well-drained soil is found on ridge tops on the uplands. The soil is well suited to trees. Plant competition is moderate. Seedlings survive and grow well if competing vegetation is controlled by cutting, girdling, or spraying. The site index for this soil ranges from 70 (white oak) to 90 (yellow-poplar). Preferred trees to manage for are black oak, bur oak, chestnut oak, persimmon, scarlet oak, red oak, and white oak.

Access
Vehicle access to this tract will be from the east off Mail Route Road and fire access roads 750 and 751. This tract can also be accessed by foot using the Knobstone Trail. Starting from the Spurgeon Hollow trailhead travel southwest until you reach the first trail split. Travel northeast from the split until you reach the top of the ridge. The center of the ridge top is the tracts southern boundary.

Boundary
The tract boundaries are defined by a main ridge top to the south, drainage ravine to the north and a small section of property line in the northwest corner.

Wildlife
A diverse assortment of wildlife resources are found on this tract conducive to providing habitat for a variety of wildlife species. Habitat includes:

- Contiguous mixed hardwood canopy
- Oak-hickory pockets with varied structure
- Riparian areas

Hard mast trees such as oaks, hickories, and American beech provide food source to both game and non-game species.

Snags (standing dead or dying trees), are an important wildlife habitat features in Indiana's forests. They are used by a wide range of species as essential habitat features for foraging activity, nest/den sites, decomposers (e.g., fungi and invertebrates), bird perching and bat roosting. Additionally, snags are an important contributor to the future pool of downed woody material. Downed woody debris provides habitat and protection for many species and contributes to healthy soils.

Forest wildlife species depend on live trees for shelter, escape cover, roosting and as a direct (e.g., mast, foliage) or indirect (e.g., foraging substrate) food resource. The retention of live trees within various diameter classes is of particular concern to habitat specialists such as the Indiana bat.

The Division of Forestry has developed compartment level guidelines for two important wildlife structural habitat features. Current assessments indicate the abundance of these habitat features meet or exceed recommended base levels in all diameter classes. The prescribed management will maintain or enhance the relative abundance of these features.

A Natural Heritage Database review was completed for this tract. If Rare, Threatened or

Wildlife Habitat Feature Tract Summary					
Snags (all species)	Maintenance Level	Optimal Level	Inventory	Available Above Maintenance	Available Above Optimal
5"+ DBH	248	434	423	175	-11
9"+ DBH	186	372	342	156	-30
19"+ DBH	31	62	84	53	22

Endangered species (RTE's) were identified or encountered for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Communities

The tract is primarily a mixed hardwood forest. Grapevine, multiflora rose, and Japanese honeysuckle is prevalent throughout the tract. These species are common and prevalent throughout the county. If identified, priority control should be given to ailanthus and bush honeysuckle. These would be treated as soon as practical, with individuals and smaller areas being targeted as needed. A broader and/or situational approach should be taken with the species noted above. Control measures for these species could be warranted for larger scale road & trailside treatment projects, planned regeneration openings, pre or post-harvest TSI projects, etc.

Forest Condition

TM 901 RESOURCE MANAGEMENT GUIDE			
INVENTORY SUMMARY			
		Compartment:	10
State Forest:	Jackson-Washington	Tract:	8
Forester:	Quentin Beahrs	Inventory Date:	1/25/17

ACREAGE IN:	
Forest	62
Non-Forest	
Water	
Permanent Openings	
Other Uses	
TOTAL AREA	62

(Estimated Tract Volumes for Commercial Forest Area-Bd. Ft., Doyle Rule)

SPECIES	HARVEST STOCK	GROWING STOCK	TOTAL VOLUME
Yellow Poplar	2,820.00	124,180.00	127,010.00
Northern Red Oak	14,130.00	92,690.00	106,820.00
Chestnut Oak	19,840.00	76,060.00	95,890.00
White Ash	88,620.00	0.00	88,620.00
Sugar Maple	4,710.00	54,030.00	58,740.00
Basswood	8,430.00	21,100.00	29,540.00
Black Oak	1,990.00	25,490.00	27,470.00
American Beech	6,140.00	11,980.00	18,120.00
Blackgum	7,340.00	9,430.00	16,780.00

Pignut Hickory	0.00	12,680.00	12,680.00
Shagbark Hickory	0.00	11,210.00	11,210.00
White Oak	0.00	10,440.00	10,440.00
Bitternut Hickory	2,270.00	4,340.00	6,620.00
Red Maple	0.00	6,350.00	6,350.00
Sassafras	0.00	5,650.00	5,650.00
Black Cherry	0.00	4,350.00	4,350.00
Largetooth Aspen	0.00	3,790.00	3,790.00
Chinkapin Oak	0.00	2,870.00	2,870.00
Eastern Redcedar	0.00	2,390.00	2,390.00
Hackberry	0.00	2,110.00	2,110.00
TRACT TOTALS	156,290.00	481,140.00	637,450.00
PER ACRE TOTALS	2,520.81	7,760.32	10,281.45

The 2016 inventory estimated a total volume of 10,281.45 bd.ft. per acre. Total basal area was estimated at 109.3 sq.ft. with 124 trees per acre. These values indicate current stocking at 88%. The harvest tally proposed the removal of 2,520.81 bd.ft. per acre reducing basal area to 83.9 sq.ft. per acre and 111 trees per acre. The leave tally shows post-harvest stocking remaining in the fully stocked range, at approximately 69%, excluding culls.

Recreation

The major recreations uses on the tract are hiking and hunting. The Knobstone trail runs along the eastern half of the southern tract boundary. During any management activity, specifically a timber harvest, this portion of the trail will be considered in the harvest design and temporarily rerouted due, to safety concerns. Following the management activity the trail will be re-opened to the public.

Cultural

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 Subdivision Description and Prescription

Mixed hardwood (62 acres)

This tract is characterized as mixed hardwoods. Yellow poplar is the dominant species, with an estimated 2,048 bd. ft. of yellow poplar saw timber per acre. Northern red oak at 1,723 bd. ft. per acre and chestnut oak at 1,547 bd. ft. of saw timber per acre, are the next two most prevalent species. The bulk of the remaining tree species in this subdivision are White ash, sugar maple, basswood, and black oak. The understory is diverse, but sugar maple is the dominant understory tree, followed by white ash, and American beech. The prescribed management activity is to conduct an improvement harvest utilizing single tree selection targeting poorly formed and declining trees, which would release more resources to healthy trees with good form and vigor. The tract is limited to single tree selection due to its location within the backcountry area of Jackson-Washington State Forest. The top species for removal in the proposed harvest are white ash, chestnut oak, and Northern red oak. This proposed harvest would result in yellow poplar and Northern

red oak being the most abundant tree species in sawtimber. Following the harvest timber stand improvement (TSI) should be conducted to complete the management process. Patches of grapevine were observed throughout the mixed hardwood subdivision. Small patches of multiflora rose and Japanese honeysuckle are also present, but not as prevalent as grapevine. TSI should be completed prior to the prescribed harvest to control problem occurrences of grapevine, Japanese honeysuckle, and multiflora rose.

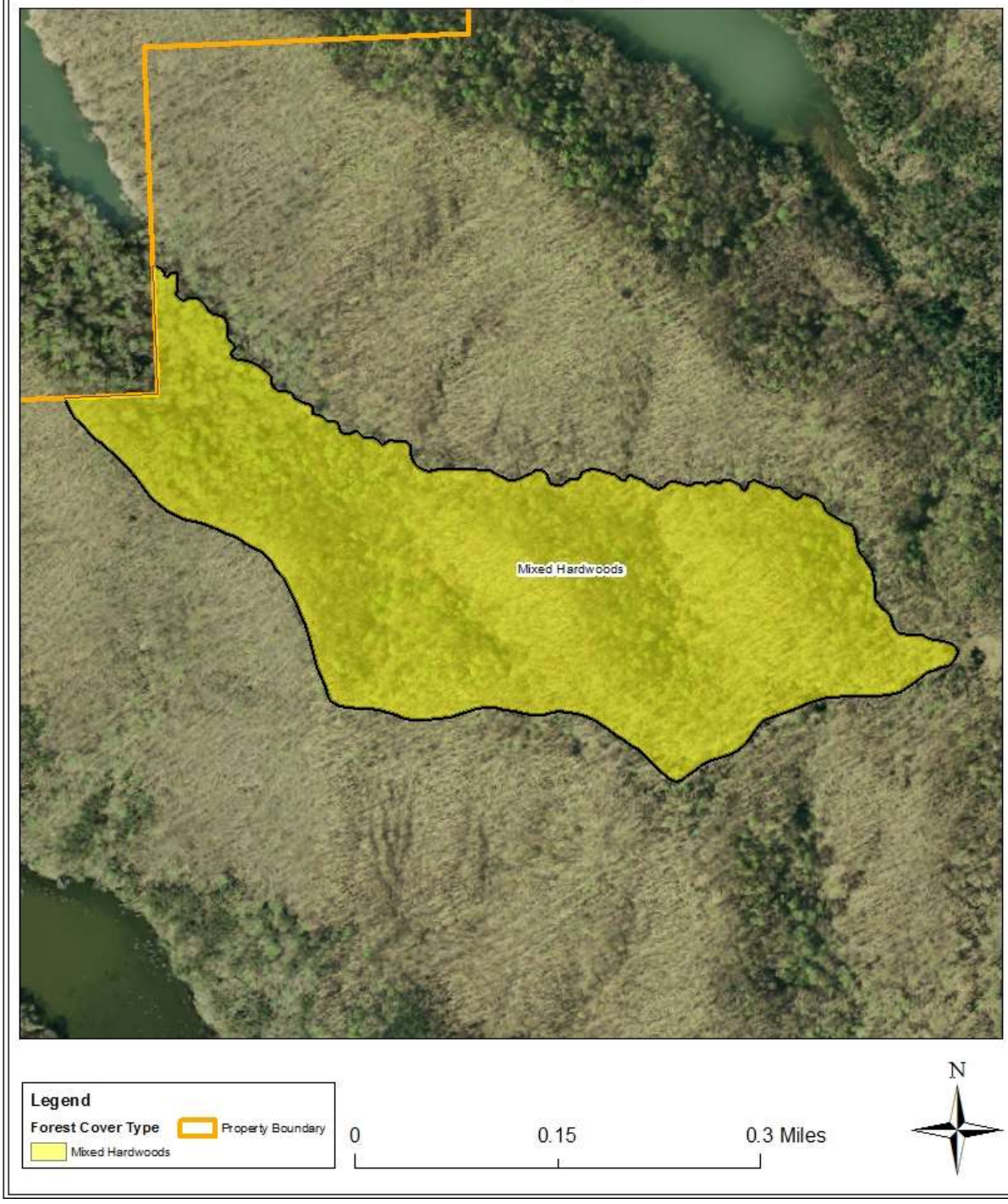
Tract Prescription and Proposed Activities

The proposed management activity is to conduct an improvement harvest to promote the overall health, resiliency and quality of the stand. This improvement harvest is recommended to occur within the next 5-10 years utilizing single tree selection. The purpose of single tree selection is to remove mixed hardwoods that release oak or hickory, drought stressed or wind damaged trees, declining ash from Emerald ash borer, mature and over-mature trees and other intermediate trees needed to release residual crop trees. Within two years of the timber harvest, a TSI operation should follow to release crop trees that were not adequately released during the harvest. Additionally, TSI should be utilized to control targeted invasive species in the stand, and deaden a small percentage of low value trees to create snags for wildlife, such as the Indiana bat. During and after completion of the proposed management activity BMP's will be implemented in order to minimize soil erosion. This tract should receive another inventory and management guide 20 years following the completion of the timber harvest. The proposed management activity should have little to no impact on wildlife communities, including the Indiana bat, within or near the tract.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Treat grapevine, Japanese honeysuckle and multiflora rose	2018-2019
Mark and Sell Timber Sale	2020-2021
Post-harvest Timber Stand Improvement	2021-2023
Trail management and maintenance	2018-2043
Forest growth and periodic monitoring	2023-2043
Inventory and revise Management Guide	2043

Jackson-Washington State Fores
Compartment 10 Tract 8
Forest Cover Type Map



Jackson-Washington State Forest Compartment: 10 Tract: 9

Forester: Ross Danson
Date: March 17, 2017
Management Cycle End Year: 2042
Management Cycle Length: 25

Location
The tract is located in Washington County, Indiana, more specifically Township 3 North Range 4 East, Sections 11, & 12 in Monroe Township. This area is located approximately 10 miles south of Brownstown off Delaney Park Road adjacent to Spurgeon Hollow Lake.

General Description
The tract is approximately 52 acres. Approximately 32 acres is considered an oak-hickory forest type and the remaining acreage an old field site composed of mixed hardwoods. The tract falls within a designated backcountry area.

History
On May 22, 1954 the state purchased 928 acres of land from Elvin Nolan and the area that makes up compartment 10 tract 09 was part of that purchase.

The tract was inventoried in March of 1971 and it was determined that a timber harvest was undue at that time.

In August of 1974 a new inventory was conducted. At that time, the tract encompassed 36 acres and the inventory estimated a total of 113,729 bd.ft. of sawtimber in the tract. The dominant species by volume was chestnut oak, at 80,517 bd.ft. of sawtimber, followed by white oak at 9,455 bd. ft. and black oak, at 7,628 bd. ft.

In 2001, the tract boundary was re-aligned and 16 acres added bring the tract to its current total acreage.

Landscape Context
The area surrounding the tract is Jackson-Washington State Forest property. The general area is heavily forested. South of the tract is Spurgeon Hollow Lake. Delaney Park, a county owned and operated park, lies north of the tract. It consists of a lake, camping and forested land. A minor amount of agricultural acreage is located to the west.

Topography, Geology and Hydrology
This tract consists of one major ridge running east and west with several small finger ridges coming off of the south facing slope. There are several ephemeral drainages on the south facing slope that feed into Surgeon Hollow Lake. No intermittent or perennial streams are found on the tract. The parent material of this tract is sandstone.

Soils

Berks-Weikert complex (BhF) This soil series is steep to very steep, well drained soils are on side slopes in the upland areas. The Berks soil is moderately deep, and the Weikert soil is shallow. The two soils occur as areas so intricately mixed that mapping them separately is not practical. This soil complex is suited for trees. The erosion hazard, the equipment limitations, seedling mortality, windthrow hazard, and plant competition are concerns in managing the woods. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. The site indexes for hardwood species range from 50 (black oak) to 70 (white oak). Preferred trees to manage for are black oak, chestnut oak, scarlet oak, red oak, and white oak.

Cuba silt loam (Cu) This series consists of very deep, well drained soils that formed in acid, silty alluvium. These soils are on flood plains, flood-plain steps and natural levees. Slope ranges from 0 to 3 percent. Native vegetation is mixed hardwood forest. This soil is well suited to trees. No major hazards or limitations affect planting or harvesting. The site indexes for hardwood species is 100 (yellow-poplar). Preferred trees to manage for are bitternut hickory, white oak, red oak, black walnut, sugar maple, and yellow-poplar.

Gilpin silt loam (GID2) This strongly sloping, moderately deep, and well-drained soil is on side slopes in the uplands. This soil is fairly well suited to trees. The erosion hazard, the equipment limitations, and plant competition are the main concerns in the management of wooded areas. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. During wet periods, roads tend to be slippery and ruts form easily. The site indexes for hardwood species range from 80 (red oak) to 95 (yellow- poplar). Preferred trees to manage for are black oak, chestnut oak, scarlet oak, red oak, and white oak.

Wellston silt loam (WeC2, WeD) This series consists of deep or very deep, well-drained soils formed in silty material from loess and from fine-grained sandstone or siltstone and with bedrock at depths of 40 to 72 inches. Wellston soils are on nearly level to steep uplands in areas of acid sandstone, siltstone, or shale bedrock; but are most common on ridgetops. Slope ranges from 0 to 50 percent but are dominantly 4 to 18 percent. Native vegetation consisted of oak, hickory, dogwood, tulip poplar, and cherry. This soil is fairly well suited to trees. The erosion hazard, the equipment limitations, and plant competition are the main concerns in the management of wooded areas. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. During wet periods, roads tend to be slippery and ruts form easily. The site indexes for hardwood species is 81 (red oak) and 90 (yellow-poplar). Preferred trees to manage for are black oak, chestnut oak, persimmon, red oak, scarlet oak, shagbark hickory, sugar maple, yellow-poplar, and white oak.

Zanesville silt loam (ZaB, ZaC2) This gently sloping, deep, moderately well-drained or well-drained soil is found on ridge tops on the uplands. The soil is well suited to trees. Plant competition is moderate. The site index for this soil ranges from 70 (white oak) to

90 (yellow-poplar). Preferred trees to manage for are black oak, bur oak, chestnut oak, persimmon, scarlet oak, red oak, and white oak.

Access
Access to this tract will be from the west using the Spurgeon Hollow Lake and Knobstone trailhead access road.

Boundary
Tract boundaries consist of a main ridge along the north, drainage ravines to the east and west and Spurgeon Hollow Lake to the south.

Wildlife
A diverse assortment of wildlife resources are found on this tract conducive to providing habitat for a variety of wildlife species. Habitat includes:

- contiguous oak-hickory canopy
- mixed hardwood stands with varied structure
- small pine pockets
- riparian areas

Hard mast trees such as oaks, hickories, and American beech provide food source to both game and non-game species.

Snags (standing dead or dying trees), are an important wildlife habitat features in Indiana's forests. They are used by a wide range of species as essential habitat features for foraging activity, nest/den sites, decomposers (e.g., fungi and invertebrates), bird perching and bat roosting. Additionally, snags are an important contributor to the future pool of downed woody material. Downed woody debris provides habitat and protection for many species and contributes to healthy soils.

Forest wildlife species depend on live trees for shelter, escape cover, roosting and as a direct (e.g., mast, foliage) or indirect (e.g., foraging substrate) food resource. The retention of live trees within various diameter classes is of particular concern to habitat specialists such as the Indiana bat.

The DoF has developed compartment level guidelines for two important wildlife structural habitat features. Current assessments indicate the abundance of these habitat features meet or exceed recommended base levels in all diameter classes. The prescribed management will maintain or enhance the relative abundance of these features.

Wildlife Habitat Feature

Snags (all species)	Maintenance Level	Inventory	Available Above Maintenance
5"+DBH	208	376	168
9"+DBH	156	305	149
19"+DBH	26	40	14

A Natural Heritage Database review was completed for this tract. If Rare, Threatened or Endangered species (RTE's) were identified or encountered for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Communities

The tract is an oak-hickory and mixed hardwood forest. Grapevine was fairly prevalent in the southern portion and northeast corner of the tract. Japanese honeysuckle and multiflora rose were also prevalent in the southern portion of the tract along the Knobstone trail. These species are common and prevalent throughout the county. If identified, priority control should be given to ailanthus and bush honeysuckle. These would be treated as soon as practical, with individuals and smaller areas being targeted as needed. A broader and/or situational approach should be taken with the species noted above. Control measures for these species could be warranted for larger scale road & trailside treatment projects, planned regeneration openings, pre or post-harvest TSI projects, etc.

Forest Condition

TM 901 RESOURCE MANAGEMENT GUIDE			
INVENTORY SUMMARY			
		Compartment:	10
State Forest:	Jackson-Washington	Tract:	09
Forester:	Ross Danson	Inventory Date:	02/03/17

ACREAGE IN:	
Forest	52
Non-Forest	
Water	
Permanent Openings	
Other Uses	
TOTAL AREA	52

(Estimated Tract Volumes for Commercial Forest Area-Bd.Ft., Doyle Rule)

SPECIES	HARVEST STOCK	GROWING STOCK	TOTAL VOLUME
Chestnut Oak	29,970	123,100	153,070
Black Oak	20,080	54,780	83,150
Yellow Poplar	7,570	70,120	77,690

White Oak	13,190	49,500	62,690
Virginia Pine	9,480	21,630	31,110
Red Maple	2,110	12,390	14,500
White Ash	9,180	1,700	10,880
Pignut Hickory	1,030	9,780	10,810
Loblolly Pine		7,350	7,350
Northern Red Oak	2,800	3,750	6,550
Sugar Maple	4,390	1,640	6,030
Shagbark Hickory		5,700	5,700
Eastern Redcedar		2,130	2,130
Black Cherry		1,870	1,870
Blackgum		1,760	1,760
Red Elm		1,410	1,410
TRACT TOTALS	99,800	368,610	476,700
PER ACRE TOTALS	1,919	7,089	9,167

The 2017 inventory estimated a total volume of 9,167 bd.ft. /acre. Total basal area was estimated at 132 sq. ft. with 201 trees/acre. These values indicate current stocking for the tract is 110%. The harvest tally proposed the removal of 1,919 bd.ft. /acre reducing basal area to 111 sq.ft. /acre and 189 trees/acre. The leave tally shows post-harvest stocking remaining in the fully stocked range, at approximately 95%, excluding culls.

Recreation

The major recreational use of this tract is hiking and hunting. The Knobstone trail runs through this tract. During the proposed management activities, specifically timber harvesting, public access into the tract will be restricted for safety concerns. Affected trail segments, if any, will be considered in the harvest design and temporarily rerouted closed due, to safety concerns. Following the management activity tract access and trail segments will be re-opened to the public.

Cultural

Cultural resources may be present but their location(s) are protected. Adverse impacts to significant cultural resources noted will be avoided during management activities.

Tract Subdivision Description and Prescription

Oak-Hickory (32 acres)

The oak-hickory subdivision makes up the largest portion of the tract. The dominant overstory species in this subdivision is chestnut oak. The inventory estimates 2,944 bd.ft. of chestnut oak sawtimber/acre. The remainder of the overstory is comprised of black oak, white oak, northern red oak, pignut hickory, and shagbark hickory. The main understory species in this subdivision are sugar maple and American beech.

The prescribed management activity is to conduct an improvement harvest that would remove poorly formed and declining trees, which would release more resources to the healthier, more vigorous trees with good form. The top species for removal in this

subdivision are chestnut oak and black oak. This harvest would still result in chestnut oak being the dominant overstory species, followed by black oak and white oak.

The improvement harvest will utilize single tree selection to release the residual stand. The harvest should be preceded by invasive species treatment along the Knobstone trail in the southern portion of the tract. Grapevine should also be treated along the Knobstone trail and in the northeast corner of the tract. Timber stand improvement (TSI) should follow the harvest to further release the residual crop trees and control problem occurrences of invasive species.

Old Field Mixed hardwood (20 acres)

A substantial portion of the tract is characterized as old field mixed hardwoods. This subdivision is located along Spurgeon Hollow Lake and in the northeast corner of the tract. The 1974 management guide indicates that the northeast corner of the tract was part of a maintained permanent opening. Since that time the opening has reverted back to tree cover and the area is now composed of mixed hardwood species. Yellow poplar is the most prevalent species in this part of the tract, followed by species such as black gum, white ash and red maple. Oaks, particularly black oak, become more common as you transition closer to the oak-hickory subdivision.

In the section of this subdivision adjacent to Spurgeon Hollow Lake, Virginia pine is the most abundant species, the inventory estimated 22 trees/acre. This section of the tract also contains a variety of hardwoods species such as yellow poplar, red maple, sugar maple, black cherry and white ash.

In the subdivision as a whole, yellow poplar is the dominant sawtimber species by volume. The inventory estimated 1,494 bd. ft. of yellow poplar sawtimber/acre. Second to yellow poplar is Virginia pine at 598 bd. ft. of sawtimber/acre. The prescribed management activity for this subdivision is to conduct an improvement harvest that would remove poorly formed and declining trees, which would release more resources to healthier, more vigorous trees with good form and vigor. The harvest will utilize single tree selection to release the residual stand. Grapevine is widespread in this subdivision, and should be treated prior to a timber harvest. Multiflora rose and Japanese honeysuckle are also fairly common in this subdivision and problem occurrences should be considered for treated prior to the harvest. TSI should follow the improvement harvest to release residual crop trees.

Tract Prescription and Proposed Activities

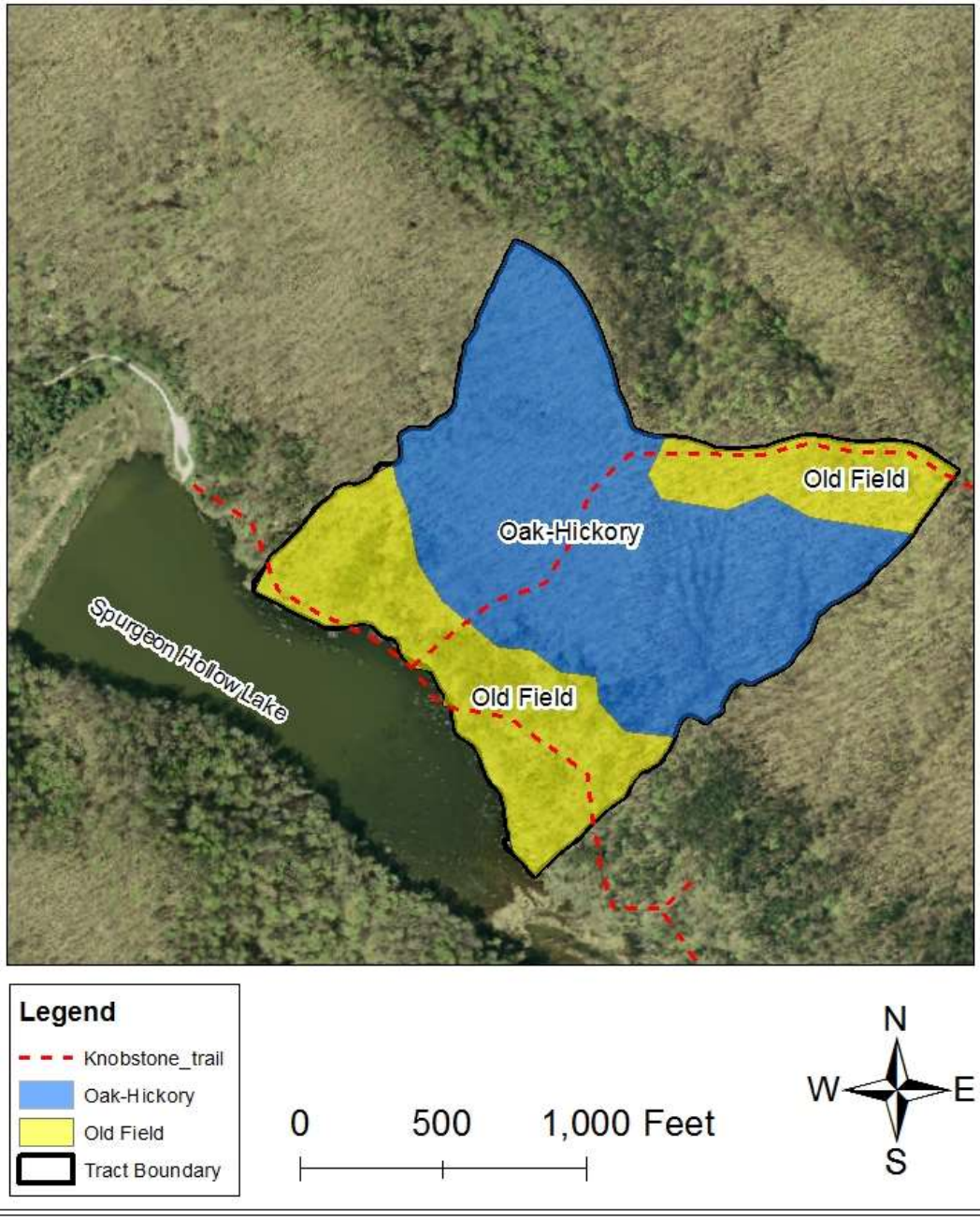
The proposed management activity is to conduct an improvement harvest utilizing the single tree selection method to improve the overall health and quality of the stand. This harvest is recommended to occur within the next 3-5 years. The tract is located within a backcountry area so group tree selection and larger regeneration openings will not be utilized. The purpose of the single tree selection is to remove drought stressed or wind damaged trees, non-native species, declining ash from Emerald ash borer, mature and over-mature trees and other intermediate trees needed to release residual crop trees. Treatment of invasive species as mentioned within each subdivision should occur one or

two years prior to the harvest. Within two years following the timber harvest, a TSI operation should be conducted to release crop trees that were not adequately released during the harvest. Additionally, TSI should be utilized to control targeted invasive species in the stand, and to deaden a small percentage of low value (cull) trees to create snags for wildlife, such as the Indiana bat. During and after completion of the proposed management activity BMP's will be implemented in order to minimize soil erosion. This tract should receive another inventory and management guide 20 years following the completion of the timber harvest. The proposed management activity should have little to no impact on wildlife communities, including the Indiana bat, within or near the tract.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Treat grapevine, multiflora rose and Japanese honeysuckle	2017-2018
Mark and Sell Timber Sale	2019-2020
Post-harvest Timber Stand Improvement	2020-2022
Trail management and maintenance	2017-2042
Forest growth and periodic monitoring	2023-2042
Inventory and revise Management Guide	2042

Jackson-Washington State Forest
Compartment 10 Tract 09
Covertype Map



Jackson-Washington State Forest Compartment: 10 Tract: 38

Forester: Quentin Beahrs Date: December 5, 2016
Management Cycle End Year: 2042 Management Cycle Length: 25

Location
The tract is located in Washington County, Indiana, more specifically Township 3 North Range 4 East, Section 14 of Monroe Township. This area is located approximately 7 miles north of Salem off Delaney Park Road.

General Description
The tract is approximately 51 acres consisting of a mixed hardwood and oak-hickory forest type. A substantial portion of the main ridge is open field.

History
On April 9, 1996 200 acres of land was purchased from Evelene Nicholson. Prior to selling the land to the State, timber was harvested from the property. This tract was inventoried prior to purchase as well. The inventory indicated a total volume of 1,618 bd.ft./acre with the top three species being sugar maple, hickory, and chestnut oak.

In 1998 the Division of Fish and Wildlife created two wildlife ponds in the open field on top of the ridge and the access road was reworked and covered in stone to improve access. In March of the same year a tree planting occurred in the northeast portion of the field.

In 2001, the tract boundaries were changed.

In 2003, the property line and corners were surveyed and marked with carsonite posts.

In 2009, approximately 8 acres along the ridgetop was planted in hardwood species. This plantation was sprayed and mowed in subsequent years and survival was good up to 2012. However, at this time native grasses and shrubs are pervasive and survival is very low. While some hardwoods seedlings have seeded in naturally, it's most likely not enough to supplement the planted seedlings and support a productive stand of hardwood trees.

In 2016, the inventory estimated a total volume of 5,354 bd.ft./acre.

Landscape Context
The area surrounding the tract to the north, and east is Jackson-Washington State Forest. Adjacent to the tract on the west, and south sides are private forestland. Within close proximity to the south, and west sides of the tract are agricultural fields. There are a few single family residences within a mile radius of the tract center.

Topography, Geology and Hydrology
This tract consists of one major ridge running east and west with several small finger ridges coming off the north and south facing slopes, and one major finger ridge extending north from the north facing slope. There is a mapped intermittent that starts in the center of the northern tract boundary and runs west to the property line. The parent material of the tract consists of sandstone, and limestone.

Soils
Berks-Weikert complex (BhF) This soil series is steep to very steep, well drained soils are on side slopes in the upland areas. The Berks soil is moderately deep, and the Weikert soil is shallow. The two soils occur as areas so intricately mixed that mapping them separately is not practical. This soil complex is suited for trees. The erosion hazard, the equipment limitations, seedling mortality, windthrow hazard, and plant competition are concerns in managing the woods. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. The site indexes for hardwood species range from 50 (black oak) to 70 (white oak). Preferred trees to manage for are black oak, chestnut oak, scarlet oak, red oak, and white oak.

Burnside silt loam (Bu) This series consists of deep, well drained soils that formed in 30 to 61 centimeters (12 to 24 inches) of medium-textured alluvium and the underlying loamy-skeletal alluvium. These soils are on flood plains and alluvial fans. It is occasionally flooded for brief periods in the spring. Native vegetation is deciduous hardwoods. This soil is well suited for trees. Plant competition is moderate. Seedlings survive and grow well if competing vegetation is controlled by cutting, girdling, or spraying. The site index for hardwood species is 95 for yellow-poplar. Preferred trees to manage for are bitternut hickory, white oak, red oak, black walnut, sugar maple, and yellow-poplar.

Wellston silt loam (WeC2, WeD) This series consists of deep or very deep, well-drained soils formed in silty material from loess and from fine-grained sandstone or siltstone and with bedrock at depths of 40 to 72 inches. Wellston soils are on nearly level to steep uplands in areas of acid sandstone, siltstone, or shale bedrock; but are most common on ridgetops. Slope ranges from 0 to 50 percent but are dominantly 4 to 18 percent. Native vegetation consisted of oak, hickory, dogwood, tulip poplar, and cherry. This soil is fairly well suited to trees. The erosion hazard, the equipment limitations, and plant competition are the main concerns in the management of wooded areas. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. During wet periods, roads tend to be slippery and ruts form easily. Seedlings survive and grow well if competing vegetation is controlled. The site indexes for hardwood species is 81 (red oak) and 90 (yellow-poplar). Preferred trees to manage for are black oak, chestnut oak, persimmon, red oak, scarlet oak, shagbark hickory, sugar maple, yellow-poplar, and white oak.

Zanesville silt loam (ZaB, ZaC2) This gently sloping, deep, moderately well-drained or well-drained soil is found on ridge tops on the uplands. The soil is well suited to trees.

Plant competition is moderate. Seedlings survive and grow well if competing vegetation is controlled by cutting, girdling, or spraying. The site index for this soil ranges from 70 (white oak) to 90 (yellow-poplar). Preferred trees to manage for are black oak, bur oak, chestnut oak, persimmon, scarlet oak, red oak, and white oak.

Access
Access to this tract will be from the east off Nicholson Hollow Road and fire access road 730. Fire access road 730 is a management easement road, not a public access road. The closest public access point to this tract would be from the Spurgeon Hollow Lake parking area. Once in the tract, an old fire trail on the top of the ridge can be used to access the entire tract.

Boundary
Tract boundaries consist of property line to the west and south, main ravine to the north and a small ridge to the east.

Wildlife
A diverse assortment of wildlife resources are found on this tract conducive to providing habitat for a variety of wildlife species. Habitat includes:

- Contiguous mixed hardwood canopy
- Oak-hickory stands with varied structure
- Open field/ young tree plantings
- Riparian areas

Hard mast trees such as oaks, hickories, and American beech provide food source to both game and non-game species. The openings (old field) are varied in size but all present similar, dense vegetation that favors wildlife preferring this habitat structure. Such vegetative species include sassafras, grapevine, and other early successional shrubs.

Snags (standing dead or dying trees), are an important wildlife habitat features in Indiana's forests. They are used by a wide range of species as essential habitat features for foraging activity, nest/den sites, decomposers (e.g., fungi and invertebrates), bird perching and bat roosting. Additionally, snags are an important contributor to the future pool of downed woody material. Downed woody debris provides habitat and protection for many species and contributes to healthy soils.

Forest wildlife species depend on live trees for shelter, escape cover, roosting and as a direct (e.g., mast, foliage) or indirect (e.g., foraging substrate) food resource. The retention of live trees within various diameter classes is of particular concern to habitat specialists such as the Indiana bat.

The Division of Forestry has developed compartment level guidelines for two important wildlife structural habitat features. Current assessments indicate the abundance of these habitat features meet or exceed recommended base levels in all diameter classes. The prescribed management will maintain or enhance the relative abundance of these features.

Snags (all species)	Maintenance Level	Inventory	Available Above Maintenance
5"+ DBH	204	361	157
9"+ DBH	153	182	29
19"+ DBH	25.5	32	7

A Natural Heritage Database review was completed for this tract. If Rare, Threatened or Endangered species (RTE's) were identified or encountered for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Communities

The tract is primarily a mixed hardwood and oak-hickory forest with an 8 acre failed tree plantation. Grapevine was fairly prevalent along the tract edges and in the central lowland valley. Japanese honeysuckle and multiflora rose were prevalent in the eastern portion of the tract. These species are common and prevalent throughout the county. If identified, priority control should be given to ailanthus and bush honeysuckle. These would be treated as soon as practical, with individuals and smaller areas being targeted as needed. A broader and/or situational approach should be taken with the species noted above. Control measures for these species could be warranted for larger scale road & trailside treatment projects, planned regeneration openings, pre or post-harvest TSI projects, etc.

Forest Condition

TM 901 RESOURCE MANAGEMENT GUIDE			
INVENTORY SUMMARY			
		Compartment:	10
State Forest:	Jackson-Washington	Tract:	38
Forester:	Quentin Beahrs	Inventory Date:	12/2/16
ACREAGE IN:			
Forest	36.7		
Non-Forest	14.3		
Water			
Permanent Openings			
Other Uses			
TOTAL AREA	51		

(Estimated Tract Volumes for Commercial Forest Area-Bd.Ft., Doyle Rule)

SPECIES	HARVEST STOCK	GROWING STOCK	TOTAL VOLUME
Sugar maple	6,480.00	67,250.00	73,730.00
Chestnut oak	8,000.00	44,800.00	52,800.00
Shagbark hickory	2,100.00	26,950.00	29,040.00
American beech	10,390.00	10,540.00	20,930.00
Yellow poplar	0.00	19,950.00	19,950.00
Pignut hickory	0.00	14,960.00	14,960.00
Black cherry	0.00	11,220.00	11,220.00
Black oak	1,270.00	9,160.00	10,430.00
White ash	6,810.00	0.00	6,810.00
White oak	0.00	6,450.00	6,450.00
Northern red oak	1,230.00	4,750.00	5,980.00
Blackgum	3,960.00	2,000.00	5,950.00
Basswood	4,640.00	0.00	4,640.00
Hackberry	0.00	4,310.00	4,310.00
Red maple	0.00	3,220.00	3,220.00
Red elm	0.00	2,670.00	2,670.00
TRACT TOTALS	44,880.00	228,230.00	273,090.00
PER ACRE TOTALS	880.00	4,475.10	5,354.71

The 2016 inventory estimated a total volume of 5,354.71 bd. ft. per acre. Total basal area was estimated at 82.2 sq. ft. with 107 trees per acre. These values indicate current stocking for the tract is 67%. The harvest tally proposed the removal of 880 bd. ft. per acre reducing basal area to 72.2 sq. ft. per acre and 102 trees per acre. The leave tally shows post-harvest stocking at approximately 60%, excluding culls.

Recreation

There are no hiking trails on or adjacent to the tract. The main recreational use of the tract is hunting. During the proposed management activities, public access into the tract

will be restricted for safety reasons. Access into the area will be permitted following the completion of activities.

Cultural
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 Subdivision Description and Prescription
Mixed hardwood (30.1 acres)
The majority of the tract is characterized as mixed hardwoods. Sugar maple is the dominant species. The inventory estimated 1,446 bd. ft. of sugar maple saw timber per acre; sugar maple is also a widespread understory tree followed by American beech in the tract. Chestnut oak at 1,035 bd. ft. per acre and Shagbark hickory at 570 bd. ft. of saw timber per acre, are the two most prevalent species outside of sugar maple. The bulk of the remaining tree species in this subdivision are American beech, Yellow poplar, Pignut hickory, Black cherry, black oak, White ash, and White oak.

The prescribed management activity is to conduct an improvement harvest that would remove poorly formed and declining trees, which would release more resources to healthy trees with good form and vigor. The top species for removal in the proposed harvest are American beech, chestnut oak, and white ash. This proposed harvest would result in sugar maple and chestnut oak being the most abundant tree species.

Additionally, the management recommendation is to use single tree selection as well as group tree selection, followed by post-harvest timber stand improvement (TSI) to facilitate oak-hickory regeneration. Patches of grapevine were observed throughout the mixed hardwood subdivision. Multiflora rose and Ailanthus is also present, but not as prevalent as grapevine. TSI should be completed prior to the prescribed harvest to control the ailanthus, and problem occurrences of grapevine and multiflora rose.

Open field (14.3 acres)
The open field subdivision was previously planted with oaks, hickories, and ash species. It appears years of reduce rain or even drought conditions have reduced the success of the original planting leaving behind scattered young saplings. TSI should be administered to reduce the grapevine present on the border of this subdivision. A supplemental planting with follow up herbicide or mowing should occur. This will improve the stocking and further release nutrients to the planted trees. Alternately, these sites can be left to evolve more slowly as early successional habitat.

Oak-hickory (6.7 acres)
This subdivision makes up the smallest portion of the tract. The average basal area for this subdivision is 72 sq. ft. per acre. The dominant species in this area is chestnut oak. The inventory estimates 1,035 bd. ft. per acre. The remainder of the overstory is comprised of white oak, Northern red oak, black oak, pignut hickory, and shagbark

hickory. The main understory species in this subdivision is white ash, sassafras, and American beech.

The prescribed management activity is to conduct an improvement harvest that would remove poorly formed and declining trees, which would release more resources to the healthy trees with good form and vigor. The top species for removal in the proposed harvest for this subdivision are chestnut oak, shagbark hickory, and black oak. This proposed harvest would result in chestnut oak, shagbark hickory, and pignut hickory as the most abundant species.

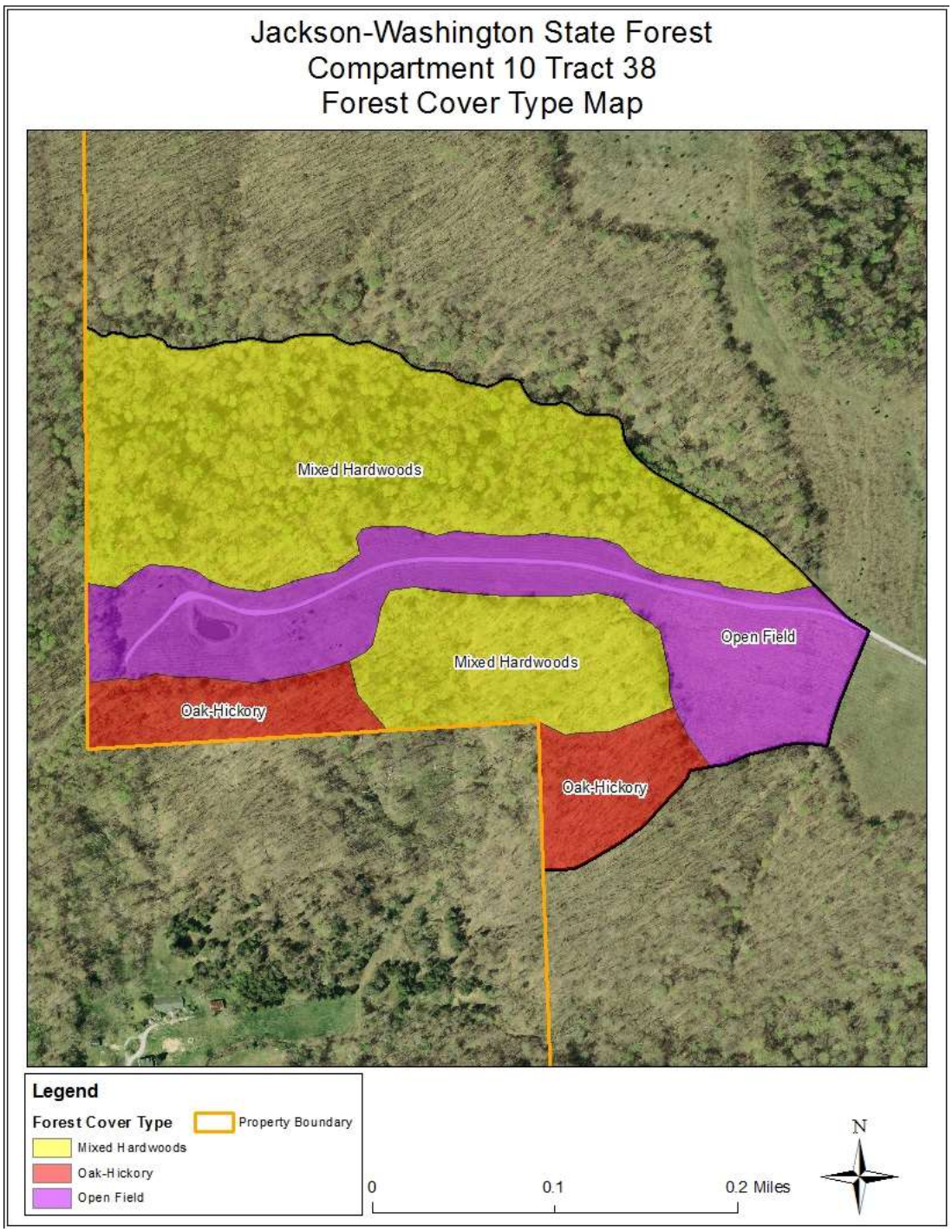
The improvement harvest should utilize single tree and group tree selection in order to release the healthiest residual stand. Some areas of this subdivision may require the use of small regeneration openings in order to facilitate oak-hickory regeneration. The improvement harvest should be preceded by pre-harvest TSI in order to control the grapevine and invasive species found throughout this subdivision. Post-harvest TSI should follow the harvest to further release the residual crop trees and complete any regeneration opening.

Tract Prescription and Proposed Activities

The proposed management activity is to conduct a thinning and improvement harvest to promote the overall health, resiliency and quality of the tract. This improvement harvest is recommended to occur within the next 3-10 years, and a combination of single tree selection and group selection methods should be utilized. The purpose of the single tree selection is to remove mixed hardwoods that release oak or hickory, drought stressed or wind damaged trees, declining ash from Emerald ash borer, mature and over-mature trees and other intermediate trees needed to release residual crop trees. Group openings will be created to facilitate the regeneration of shade intolerant species, notably oak and hickory. Within two years of the timber harvest, a TSI operation should follow to release crop trees that were not adequately released during the harvest, and to adequately complete the group openings. Additionally, TSI should be utilized to control targeted invasive species in the stand, and to deaden a small percentage of low value trees to create snags for wildlife, such as the Indiana bat. During and after completion of the proposed management activity BMP's will be implemented in order to minimize soil erosion. This tract should receive another inventory and management guide 20 years following the completion of the timber harvest. The proposed management activity should have little to no impact on wildlife communities, including the Indiana bat, within or near the tract.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*Treat
ailanthus, grapevine and multiflora rose	2017-2019
Mark and Sell Timber Sale	2019-2021
Post-harvest Timber Stand Improvement	2023-2025
3-year post-harvest regeneration opening review	2028
Forest growth and periodic monitoring	2023-2042
Inventory and Management Guide	2042


Jackson-Washington State Forest
Compartment 10 Tract 38
Forest Cover Type Map
Mixed Hardwoods
Mixed Hardwoods
Open Field
Oak-Hickory
Oak-Hickory
Legend
Forest Cover Type
Property Boundary
Mixed Hardwoods
Oak-Hickory
Open Field
0
0.1
0.2 Miles
N

Jackson-Washington State Forest Compartment: 10 Tract: 39

Forester: Ross Danson Date: January 5, 2016
Management Cycle End Year: 2042 Management Cycle Length: 25

Location
The tract is located in Washington County, Indiana, more specifically Township 3 North Range 4 East, Section 14 in Monroe Township. This area is located approximately 7 miles north of Salem off Delaney Park Road.

General Description
The tract is approximately 61 acres consisting of a mixed hardwood and Oak-Hickory forest type, with an 8 acre tree plantation.

History
The property that encompasses the tract was purchased by the Department of Natural Resources in 1996 from Evelene Nicholson. A 200 acre inventory, that encompassed the tract, was completed in 1995. The inventory estimated a total volume 1,618 bd. ft./acre. The top species by volume were sugar maple, hickory, and chestnut oak; other species included scarlet oak, white oak, red oak, black oak, black cherry, white ash, American beech, hackberry, and sycamore. The inventory narrative indicates that a timber harvest occurred sometime between 1990 and 1995, and left very little mature timber. Basal area ranged from 10-90 sq. ft./acre, but the average was 30-40 sq. ft./acre. The recommendation was to allow the tract to grow for another 20-25 years.

In 2009, approximately 8 acres along the ridgetop was planted in hardwood species. This plantation was sprayed and mowed in subsequent years and survival was good up to 2012. However, at this time native grasses and shrubs are pervasive and survival is very low. While some hardwoods seedlings have seeded in naturally, it's most likely not enough to supplement the planted seedlings and support a productive stand of hardwood trees.

Landscape Context
The tract is located approximately half a mile east of the intersection at Delaney Park and Nicholson Hollow Rd. The tract is surrounded by State Forest land to the north and east and private land to the south and west. The surrounding area is made up of mature forests, agricultural fields, single family homes, and watershed lakes/ponds.

Topography, Geology and Hydrology
The majority of the tract is encapsulated by a ridge that encircles the northern, eastern, and southern portions of the tract. The ridge descends on all sides to a lowland valley in the central portion of the tract. A prominent ephemeral drain in the eastern portion of the tract drains into an intermittent stream in the lowland valley. Numerous minor ephemerals also drain into the intermittent stream, and several small finger ridges descend off the main ridge.

Soils

Berks-Weikert complex (BhF) The site indexes for hardwood species range from 50 (black oak) to 70 (white oak). This soil series is steep to very steep, well drained soils are on side slopes in the upland areas. The Berks soil is moderately deep, and the Weikert soil is shallow. They are about 55% Berks soil and 35% Weikert soil. The two soils occur as areas so intricately mixed that mapping them separately is not practical. This soil complex is suited for trees. The erosion hazard, the equipment limitations, seedling mortality, windthrow hazard, and plant competition are concerns in managing the woods. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. Because of the windthrow hazard, harvest methods should not isolate the remaining trees or leave them widely spaced. Preferred trees to manage for are black oak, bur oak, chestnut oak, scarlet oak, red oak, and white oak.

Burnside silt loam (Bu) The site index for hardwood species is 95 for yellow-poplar. This series consists of deep, well drained soils that formed in 30 to 61 centimeters (12 to 24 inches) of medium-textured alluvium and the underlying loamy-skeletal alluvium. These soils are on flood plains and alluvial fans. It is occasionally flooded for brief periods in the spring. Most areas are used as pasture or woodland. Some areas are cleared and used as cropland. Native vegetation is deciduous hardwoods. This soil is well suited for trees. Plant competition is moderate. Preferred trees to manage for are bitternut hickory, bur oak, pin oak, red maple, shingle oak, and swamp white oak.

Gilpin silt loam (GID2) This strongly sloping, moderately deep, and well-drained soil is on side slopes in the uplands. This soil is fairly well suited to trees. The erosion hazard, the equipment limitations, and plant competition are the main concerns in the management of wooded areas. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. During wet periods, roads tend to be slippery and ruts form easily. The site indexes for hardwood species range from 80 (red oak) to 95 (yellow- poplar). Preferred trees to manage for are black oak, chestnut oak, scarlet oak, red oak, and white oak.

Wellston silt loam (WeC2, WeD) This series consists of deep or very deep, well-drained soils formed in silty material from loess and from fine-grained sandstone or siltstone and with bedrock at depths of 40 to 72 inches. Wellston soils are on nearly level to steep uplands in areas of acid sandstone, siltstone, or shale bedrock; but are most common on ridgetops. Slope ranges from 0 to 50 percent but are dominantly 4 to 18 percent. Native vegetation consisted of oak, hickory, dogwood, tulip poplar, and cherry. This soil is fairly well suited to trees. The erosion hazard, the equipment limitations, and plant competition are the main concerns in the management of wooded areas. Locating logging roads, skid trails, and landings on gentle grades and removing water with water bars, culverts, and drop structures help to control erosion. During wet periods, roads tend to be slippery and

ruts form easily. The site indexes for hardwood species is 81 (red oak) and 90 (yellow-poplar). Preferred trees to manage for are black oak, chestnut oak, persimmon, red oak, scarlet oak, shagbark hickory, sugar maple, yellow-poplar, and white oak.

Zanesville silt loam (ZaB, ZaC2) This gently sloping, deep, moderately well-drained or well-drained soil is found on ridge tops on the uplands. The soil is well suited to trees. Plant competition is moderate. The site index for this soil ranges from 70 (white oak) to 90 (yellow-poplar). Preferred trees to manage for are black oak, bur oak, chestnut oak, persimmon, scarlet oak, red oak, and white oak.

Access

Access to this tract will be from the east off Nicholson Hollow Road and fire access road 730. Fire access road 730 is a management easement road, not a public access road. The closest public access point to this tract would be from the Spurgeon Hollow Lake parking area. Once in the tract, an old fire trail on the top of the ridge can be used to access the entire tract.

Boundary

Tract boundaries consist of property line to the south-southwest, main ridge to the north, small ridge to the west and east.

Wildlife

A diverse assortment of wildlife resources are found on this tract conducive to providing habitat for a variety of wildlife species. Habitat includes:

- contiguous oak-hickory canopy
- mixed hardwood stands with varied structure
- open field/young tree plantings
- riparian areas

Hard mast trees such as oaks, hickories, and American beech provide food source to both game and non-game species. The openings (old fields) are varied in size but all present similar, dense vegetation that favors wildlife preferring this habitat structure. Such vegetative species include sassafras, grapevine, and other early successional shrubs.

Snags (standing dead or dying trees), are an important wildlife habitat features in Indiana's forests. They are used by a wide range of species as essential habitat features for foraging activity, nest/den sites, decomposers (e.g., fungi and invertebrates), bird perching and bat roosting. Additionally, snags are an important contributor to the future pool of downed woody material. Downed woody debris provides habitat and protection for many species and contributes to healthy soils.

Forest wildlife species depend on live trees for shelter, escape cover, roosting and as a direct (e.g., mast, foliage) or indirect (e.g., foraging substrate) food resource. The retention of live trees within various diameter classes is of particular concern to habitat specialists such as the Indiana bat.

The DoF has developed compartment level guidelines for two important wildlife structural habitat features. Current assessments indicate the abundance of these habitat features meet or exceed recommended base levels in all diameter classes- except the larger diameter classes which is indicative of the old field and heavy harvest history which occurred prior to State ownership. The prescribed management will maintain or enhance the relative abundance of these features.

Wildlife Habitat Feature

Snags (all species)	Maintenance Level	Inventory	Available Above Maintenance
5"+DBH	244	263	19
9"+DBH	183	159	-24
19"+DBH	31	14	-16

A Natural Heritage Database review was completed for this tract. If Rare, Threatened or Endangered species (RTE's) were identified or encountered for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

Communities

The tract is primarily a mixed hardwood and oak-hickory forest with an 8 acre failed tree plantation. Grapevine was fairly prevalent along the tract edges and in the central lowland valley. Japanese honeysuckle and multiflora rose were prevalent in the eastern portion of the tract. These species are common and prevalent throughout the county. If identified, priority control should be given to ailanthus and bush honeysuckle. These would be treated as soon as practical, with individuals and smaller areas being targeted as needed. A broader and/or situational approach should be taken with the species noted above. Control measures for these species could be warranted for larger scale road & trailside treatment projects, planned regeneration openings, pre or post-harvest TSI projects, etc.

Forest Condition

TM 901 RESOURCE MANAGEMENT GUIDE			
INVENTORY SUMMARY			
		Compartment:	10
State Forest:	Jackson-Washington	Tract:	39
Forester:	Danson & Beahrs	Inventory Date:	12/19/16

ACREAGE IN:	
Forest	53
Non-Forest	8
Water	
Permanent Openings	
Other Uses	
TOTAL AREA	61

(Estimated Tract Volumes for Commercial Forest Area-Bd.Ft., Doyle Rule)

SPECIES	HARVEST STOCK	GROWING STOCK	TOTAL VOLUME
Chestnut Oak	9,270	60,420	69,690
Sugar Maple	7,470	57,700	65,170
Yellow Poplar	6,830	45,870	52,700
American Beech	12,460	15,740	28,200
White Oak		24,370	24,370
Pignut Hickory		22,990	22,990
Northern Red Oak		19,890	19,890
Black Oak	5,060	12,580	17,630
Bitternut Hickory		16,690	16,690
Red Maple	2,990	9,890	12,890
Shagbark Hickory		7,730	7,730
Black Cherry		3,590	3,590
Red Elm		2,820	2,820
White Ash	1,150		1,150
TRACT TOTALS	45,230	300,280	345,510
PER ACRE TOTALS	741	4,923	5,664

The 2016 inventory estimated a total volume of 5,664 bdft./acre. Total basal area was estimated at 86 sq. ft. with 142 trees/acre. These values indicate current stocking for the tract is 73%. The harvest tally proposed the removal of 741 bdft./acre reducing basal area to 77 sq. ft./acre and 137 trees/acre. The leave tally shows post-harvest stocking remaining in the fully stocked range, at approximately 66%, excluding culls.

Recreation

There are no hiking trails on or adjacent to the tract. The main recreational use of the tract is hunting. During the proposed management activities public access into the tract

will be restricted for safety reasons. Access into the area will be permitted following the completion of activities.

Cultural
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 Subdivision Description and Prescription

Mixed hardwood (38 acres)
The majority of the tract falls under the mixed hardwoods subdivision. Within this subdivision, sugar maple and yellow poplar are the dominant overstory tree species. The inventory estimated 1,068 bd. ft. of sugar maple and 864 bd. ft. of yellow poplar sawtimber per acre. The most prevalent overstory species outside of sugar maple and yellow poplar is American beech, at 462 bdft./acre; this is also a prevalent understory species throughout the tract. Red maple, northern red oak, and bitternut hickory account for the bulk of the remaining sawtimber volume in this subdivision.

The prescribed management recommendation for this subdivision is to conduct an improvement harvest removing poorly formed and declining trees, which would funnel more resources to healthier trees of better form and vigor. The top species for removal in the proposed harvest are American beech and sugar maple. This proposed harvest would result in sugar maple and yellow poplar being the most abundant tree species. Additionally, the management recommendation is to create group selection openings, particularly in the central valley, to facilitate yellow poplar regeneration.

Tree Plantation (8 acres)
This subdivision was a hay field in the 1990's when the property was acquired. It was planted in hardwoods in 2009, and up to 2012 the planted seedlings appeared to be healthy and productive. Currently, native grasses and shrubs are pervasive and very few of the planted seedlings have survived. The remnants of the planting are sparsely scattered oak seedlings that extend just above the grass line. Some other hardwoods seedlings, particularly white ash, have occupied the site, but the stocking in this subdivision doesn't appear high enough to support a productive stand of hardwood trees.

The plantation was most likely the victim of the 2012 drought. The lack of adequate moisture would have made the young seedlings susceptible to factors that lead to mortality. A slightly older tree plantation in the adjacent tract, but on the same ridgetop as the failed tree plantation, is doing well. Given the success of the adjacent tree plantation, the management recommendation for this subdivision is to replant in hardwoods species. Alternately, this sites can be left to evolve more slowly as early successional habitat.

Oak-Hickory (14 acres)

The oak-hickory subdivision is located along the south facing slope in the northern section of the tract. Chestnut oak is the dominant overstory species, followed by white oak and pignut hickory. The remaining sawtimber volume is largely composed of sugar maple, and to a lesser extent, black oak. The inventory estimated 1,142 bd. ft. of chestnut oak, 399 bd.ft. of white oak and 377 bd.ft. of pignut hickory sawtimber per acre. The top species for removal within this subdivision is chestnut oak. This proposed harvest would still result in chestnut oak being the most abundant tree species. The prescribed management recommendation is to conduct an improvement harvest that would remove poorly formed and declining trees, which would funnel more resources to healthier trees of better form and vigor.

Tract Prescription and Proposed Activities

The proposed management activity is to conduct an improvement harvest to improve the overall health, resiliency and quality of the tract. This improvement harvest is recommended to occur within the next 3--10 years utilizing a combination of single tree and group selection methods. The purpose of single tree selection is to remove drought stressed or wind damaged trees, mature and over-mature trees, declining ash due to Emerald ash borer, mixed hardwoods that release quality oak and hickory, and other intermediate trees needed to release residual crop trees. Group selection openings should be created to facilitate the regeneration of yellow poplar in the lowlands, and may be necessary to facilitate the regeneration of oaks and hickories on the south facing slope.

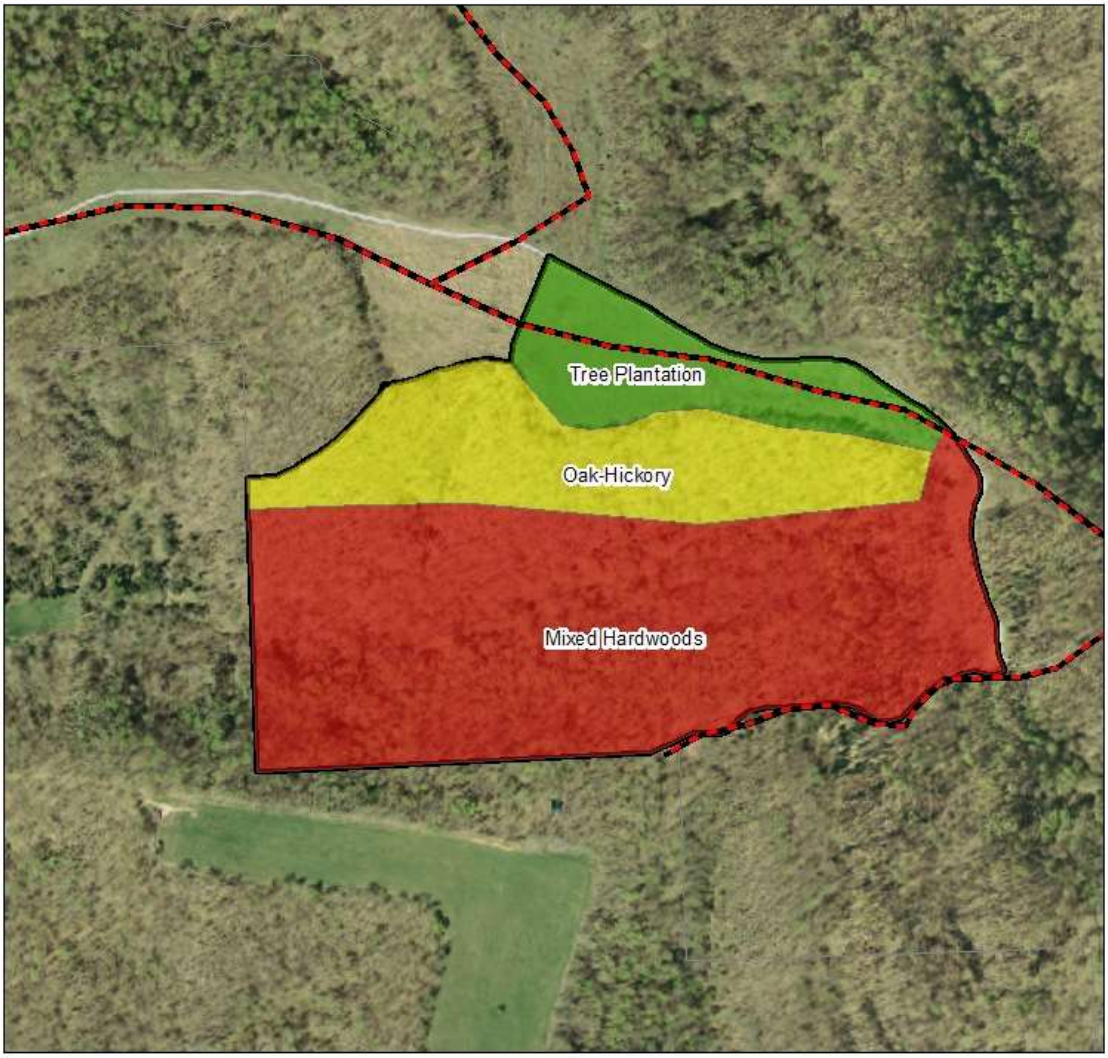
Prior to the prescribed timber harvest, problem populations of grapevine and Japanese honeysuckle should be treated. Within two years of the timber harvest, timber stand improvement (TSI) should follow to adequately complete the group openings and release residual crop trees in the remaining tract acreage. During TSI the targeted invasive species should be treated and a small percentage of low value trees deadened to create snags for wildlife, such as the Indiana bat.

During and after completion of the proposed timber harvest BMP's will be implemented in order to minimize soil erosion. This tract should receive another inventory and management guide update 20 years following the completion of the timber harvest.

Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Invasive Species Management	2017-2019
Mark and Sell Timber Sale	2019-2021
Post-harvest Timber Stand Improvement	2023-2025
3-year post-harvest regeneration opening review	2028
Forest growth and periodic monitoring	2023-2042
Inventory and Management Guide update	2042

Jackson-Washington State Forest
Compartment 10 Tract 39
Track Subdivision



Legend

- Fire Trail
- Tree Plantation
- Oak-Hickory
- Mixed Hardwoods
- Tract Boundary

0 0.125 0.25 Miles

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