

Indiana Department of Natural Resources
Division of Forestry
RESOURCE MANAGEMENT GUIDE

Jackson-Washington State Forest

Forester: Krista Marshall

Management Cycle End Year: 2043

Compartment: 12

Date: June 13, 2023

Management Cycle Length: 20 years

Tract: 16

Acres: 52

Location

This tract, also referred to as 6351216, is located along Fire Lane 810 in the northeast quarter of Section 26 and the northwest quarter of Section 25, Township 3N, Range 4E, Washington Township, Washington County, Indiana. Salem, Indiana, is located approximately 6 miles southwest of the tract.

General Description

A single ridge splits the tract in half diagonally. This ridgetop and its upper slopes are characterized by oak-hickory forest. Along drainages and on the lower slopes, beech-maple forest is the principal cover type.

History

- 1953 (May 25) Land acquisition of 140-acre from Lief H. and Lucinda Saylor.
- 1972 Forest inventory.
- 2022-2023 Fire lane improvements.

Based on aerial photography, much of the ridgetop was historically used for farming. The land along the southern tract boundary, particularly near the southeast tip of the tract, also appears to have been farmed, grazed, or otherwise cleared. A network of roads/trails connecting the agricultural fields to one another, and the nearest county road is visible on the historical aerial photography as well. The remainder of the tract was forest covered.

This tract was formerly known as Compartment 58, Tract 4. When the tract was first cruised in 1972, the forester remarked that a majority of the stand contained young sawtimber. An improvement cut was recommended at that time. According to the property records, this area never received the recommended harvest. The majority of compartment 12 is surrounded by private property and therefore access into the compartment for management purposes has been limited, with only a few timber sales occurring in the last forty years. However, access to the compartment has increased significantly with the improvement of Fire Lane 810 in 2022 and 2023. No additional management in the tract has since been recorded.

Landscape Context

Public forestland in the Mitchell Karst Plains natural subregion surrounds most of the tract, except for a 20-acre inholding immediately adjacent to the tract's western boundary. A few watershed lakes, privately-owned forests, and agricultural fields are found in the surrounding area. Several timber harvests have occurred on the private lands within the last 15 years. Most appear to have been diameter limit high-grade harvests, while some have been harvested with

long-term management as a directive. Currently, the amount of early successional forest habitat in the compartment is relatively low. Most of the fields that were abandoned prior to state ownership have since become closed-canopy forest. Development in the area is limited to single-family residences. Some construction of homes has been seen in the area, but the distance to municipalities and poor economic conditions have kept those to a minimum.

Topography, Geology and Hydrology

The tract is divided by a single, broad east-west ridge that turns sharply to the south near the tract's center. The northeast half is characterized by north- and east-facing slopes. These drop steeply from the ridgeline. The southwest half consists of west- and southwest-facing slopes and features a much more gradual elevation change. Underlying geology is made up of mostly siltstone. The tract contains no intermittent or perennial streams, but a manmade wildlife pond is in the northern half of the tract.

The 2022 Best Management Practices (BMPs) filed guide will be followed during any management activities that may take place within the tract.

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.

Crider silt loam (CoB, CoC2, CoD2) This soil series consists of deep, well-drained, moderately permeable soils on uplands. They formed in a loess mantle and the underlying residuum from limestone. Slopes range from 0 to 30 percent. Nearly all of the soil is used for growing crops and pasture. The original vegetation was mixed hardwood forest, chiefly of oaks, maple, hickory, elm, ash, and hackberry. These soils are well-suited for trees. There are no major hazards affecting the harvest and planting of trees until you reach a slope in excess of approximately 12%. Once this percent slope is reached, special considerations need to be addressed. 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. The site indexes for hardwood species range from 90 (white oak) to 98 (tulip poplar). Preferred trees to manage for are black cherry, black oak, black walnut, bur oak, chinkapin oak, Kentucky coffeetree, red oak, pecan, shagbark hickory, sugar maple, yellow-poplar, 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.

Access

A management easement, Fire Lane 810 off North Delaney Park Road provides the only access to this tract. The fire lane has been improved from the intersection with North Delaney Park Road up to the 20-acre private inholding.

Fire Lane 810 follows along the ridge that splits the tract in half. The broadest section of this ridge, located in the center of the tract’s northern half, may serve as a log yard for all timber skidded from the tract. A second log yard may be necessary for additional timber skidded from the slopes of tract 17.

Boundary

The western tract boundary is approximately 0.2 miles and serves as the state forest boundary line along the 20-acre private inholding. Trees on the line are marked with pink flagging. The northern tract boundary begins at the inholding and follows a drainage east to its head just below a saddle. The boundary crests the saddle, continuing east along another drainage until it converges with a second drainage from the south. The eastern boundary begins at this convergence point. It then follows the drainage south to its head near the ridge top and continues up the slope to intersect Fire Lane 810. The southern tract boundary follows the fire lane northwest along the ridgetop before dropping into a drainage, where it continues until meeting the boundary line at the private inholding.

Ecological Considerations

Wildlife observed during the inventory include turkey vulture, wood frog, chipmunk, American toad, Eastern gray squirrel, raccoon, Eastern box turtle, Carolina wren, and various other songbird and woodpecker species.

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 species.

The Division of Forestry has developed compartment level guidelines for important wildlife structural habitat features such as snags. Snags are standing dead or dying trees. Snags provide value to a stand in the form of habitat features for foraging activity, den sites, decomposers, bird perching, and bat roosting. Snags eventually contribute to the future pool of downed woody material. Downed woody debris provides habitat for many species and contributes to healthy soils.

Snags	Maintenance Level	Inventory	Available Above Maintenance
5”+ DBH	208	960	752
9”+ DBH	156	267	111

19"+ DBH	26	76	50
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Current assessments indicate the abundance of these habitat features in Compartment 12, Tract 16 meet or exceed recommended maintenance levels in all diameter classes.

Invasive species noted in the tract include multiflora rose and Japanese stiltgrass. Each occurred intermittently along the fire lane that runs the length of the ridge. While neither of the invasives appear to be a problem at this time, treatment would be relatively straightforward. If not treated prior to management activities, the invasives should be monitored and treated as needed post-harvest.

Recreation

No hiking, horse, or bike trails are present in this tract. Numerous trail cameras and deer stands were located during the inventory, suggesting that the tract does receive use by hunters, accessing the area through private lands. For public safety, these activities would be altered or temporarily altered within the tract during active management.

Cultural

Cultural resources may be present, but their location(s) is protected. Adverse impacts to significant cultural resources will be avoided during any activities.

Tract Subdivision Description and Silvicultural Prescription

Dry Oak-Hickory (31.6 acres)

This subdivision/cover type is dominated by oak and hickory species. Other mixed hardwood species, primarily yellow poplar and sugar maple are present throughout this subdivision as well. Most overstory oaks and hickories exhibit good to excellent form. The ridges are comprised almost exclusively of dense sawtimber chestnut oak. These trees are of better quality than the chestnut oak found on most Jackson and Washington County ridges. However, some have developed epicormics stems/branches from stress. Where they occur in dense stands, the chestnut oak should be heavily thinned to improve growing space and increase vigor for the residual trees. There is a nice pignut hickory component in the midstory that is being outcompeted by midstory American beech, sugar maple, and red maple. It is also being overtopped by exceptionally large diameter overstory black oak that is showing signs of decline. These pignut hickory poles, along with any other suppressed midstory oak and hickory species, should be released through single tree selection or timber stand improvement (TSI). Regeneration of any species is generally limited throughout the tract. Some oak and hickory seedlings are present on the drier aspects but are never competitive with the shade tolerant regeneration they occur with. Prescribed fire is recommended throughout the tract to help promote the establishment of this oak-hickory regeneration and to encourage seed germination. To further maintain the oak-hickory forest type in this subdivision, mixed hardwoods should be selected for removal when possible, to release oak and hickory trees. Damaged, suppressed, and declining trees that are in direct competition with healthier more vigorous trees should also be removed during a harvest. One or more areas might benefit from an oak shelterwood harvest. This would encourage increased acorn production in the oaks and hickories, as well as provide saplings with the additional light needed to advance. The inventory results indicate that an estimated 118,805 to 258,951 board feet of

potential volume could be removed through a timber harvest.

Beech-Maple (20.4 acres). American beech, sugar maple, and red maple dominate this subdivision. Other species in the overstory include yellow poplar, Northern red oak, pignut hickory, black cherry, and white ash. The midstory is relatively sparse and almost always dominated by sugar maple. Interspersed among the sugar maple include some yellow poplar that could be thinned and several oak-hickory species that need release through TSI. Sawtimber American beech and red maple in the overstory typically fork low but are of average quality. Notably, most of the beech is sound without any hollowness. The overstory sugar maple is poor to decent form and quality, with a majority of trees having low forks or exhibiting sugar maple borer damage. Any trees with insect damage should be harvested to improve the overall health of the stand. Most oaks that are present in this subdivision are of decent form. However, some have sparser canopies than expected given their diameter at breast height. Northern red oaks, the most commonly occurring oak species in the subdivision, are in poor health. The red oak, in addition to the overstory yellow poplar, American beech, and red maple, generally fall into the upper size classes. Their large, spreading crowns are outcompeting adjacent trees that have better form, vigor, and quality. They are also inhibiting the recruitment of the pole-sized oaks and hickories from the midstory to the overstory. Harvesting these larger diameter trees via single tree selection, group selection, or patch-cuts would promote more vigorous growth of residual trees and increase the oak-hickory component in this subdivision. White ash trees in the overstory are still alive but showing signs of decline. Exit holes from the emerald ash borer are visible on the bark of most trees. The unhealthy white ash already impacted by the borer can either be removed during a harvest or left to become snags or contribute to the tract’s future pool of downed woody debris. Numerous areas also have a dense understory of American beech. Regeneration is generally dominated by pawpaw and white ash. There is decent oak regeneration on a few of the drier slopes that might benefit from prescribed fire for the oak to outcompete more shade tolerant seedlings. Canopy gap or patch-cut openings may be necessary to promote oak and hickory regeneration in areas with no regeneration present. The inventory results indicate that an estimated 53,132 to 105,149 board feet of potential volume should be removed through a timber harvest.

The current forest resource inventory was completed on 06/13/2023 by Krista Marshall. A summary of the estimated tract inventory results is located in the table below.

Tract Summary Data (trees >11”DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Chestnut oak	846	203,670
Black oak	228	100,530
Yellow poplar	272	81,220
American beech	129	72,090
Pignut hickory	427	62,870
White oak	157	59,840
Northern red oak	55	55,240
Sugar maple	327	49,870
Red maple	134	15,300

Shagbark hickory	73	12,370
Black cherry	41	10,710
White ash	11	6,510
Blackgum	23	4,200
Largetooth aspen	26	3,670
Basswood	34	3,100
Total:	2,783	741,190

Summary Tract Silvicultural Prescription and Proposed Activities

It is recommended this tract receive an improvement harvest within the next 5 years. This harvest could be in conjunction with the adjacent tracts or as a standalone harvest. Trees targeted for removal include mixed hardwoods that release oak and hickory trees; mature or over-mature trees that are declining in health; and any intermediate trees needed to release vigorous residual trees. Both subdivisions require single tree selection to reduce stocking, thereby improving the overall quality and vigor of the stand. Relatively heavier thinning may be necessary among the chestnut oak on the ridge and upper slopes. Several of these slopes also provide an excellent opportunity for an oak shelterwood harvest, which can have better success at regenerating oak-hickory species than single tree selection. Oak and hickory seedling establishment can also be promoted by running a low-intensity prescribed fire through the tract to reduce competition from the dense beech-maple understory. TSI of the midstory should be completed following a harvest in part to encourage the recruitment of suppressed oaks and hickories from the midstory to the overstory. Canopy gaps or patch-cuts should be implemented in areas with poorly formed or damaged trees, as well as in areas with exceptionally large-diameter trees that are in poor health. These species will likely include but are not limited to yellow poplar, red maple, and black and Northern red oak. In the beech-maple subdivision, patch-cuts or a shelterwood may be necessary to promote the regeneration of oak and hickory species. This harvest will reduce the stocking level from approximately 88% to 58%, which is just below the B-line. This dip can be attributed mostly to the heavier thinning in the chestnut oaks and the patch-cuts or shelterwoods needed in the oak-hickory or mixed hardwood subdivisions. The inventory estimated 14,254 board feet per acre, with a total potential harvest volume of 171,937 to 364,101 board feet from the entire tract. The top three harvest species by volume include chestnut oak, American beech, and yellow poplar. This harvest will result in a healthier, more vigorous stand that will be primarily dominated by the oak-hickory cover type.

Any invasive plant species present in patch-cuts, clearcuts, or shelterwoods should be treated prior to the harvest. During and after completion of the timber harvest, best management practices (BMPs) will be implemented to minimize soil erosion.

Within two years of the timber harvest, a TSI operation should follow to adequately complete any patch-cut openings or clearcuts, reduce the understory in any shelterwoods, and release residual crop trees in the remaining tract acreage. During TSI, trees will be deadened to create snags for wildlife, such as the Indiana bat.

Use of prescribed fire would occur post-harvest during the dormant season. Prescribed fire will encourage the establishment of oak and hickory species by improving conditions more suitable for seed germination and reducing understory competition.

Proposed Activities Listing

Proposed Management Activity

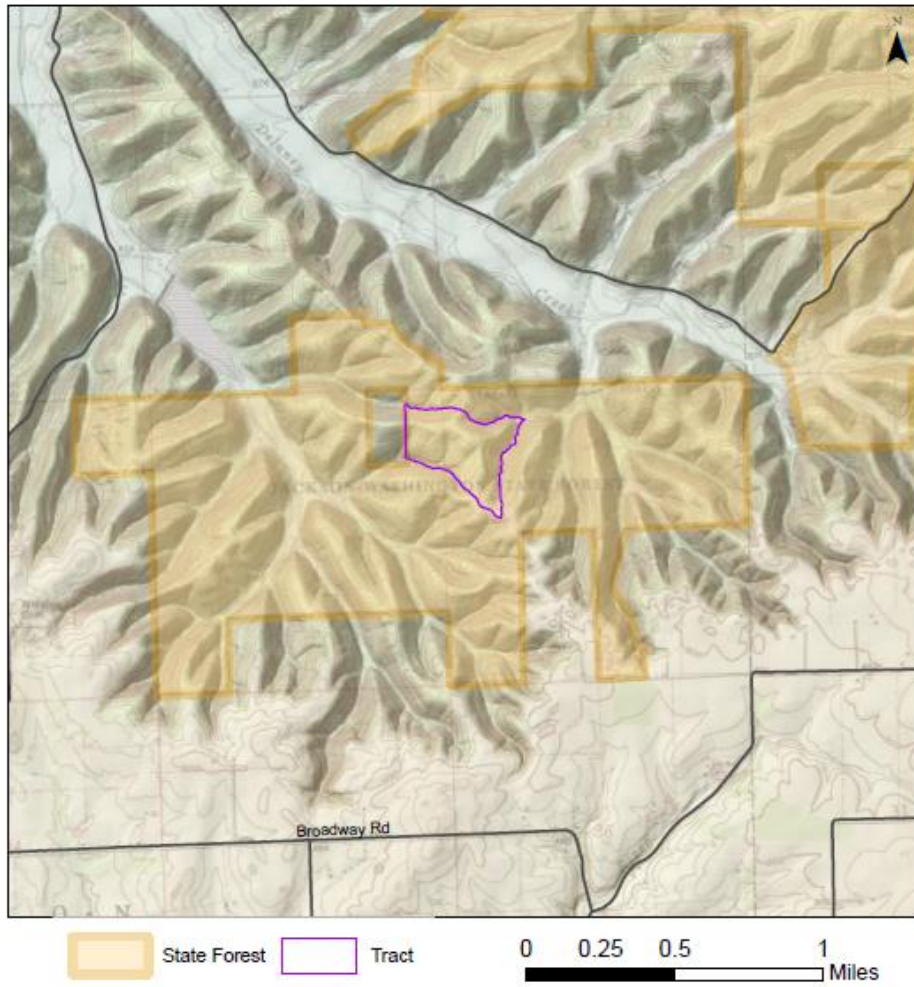
Mark timber
Pre-harvest TSI and/or invasive treatment
Timber harvest
Post-harvest TSI and/or invasive treatments
Prescribed fire regime
Regeneration monitoring
Inventory and Management Guide

Proposed Date

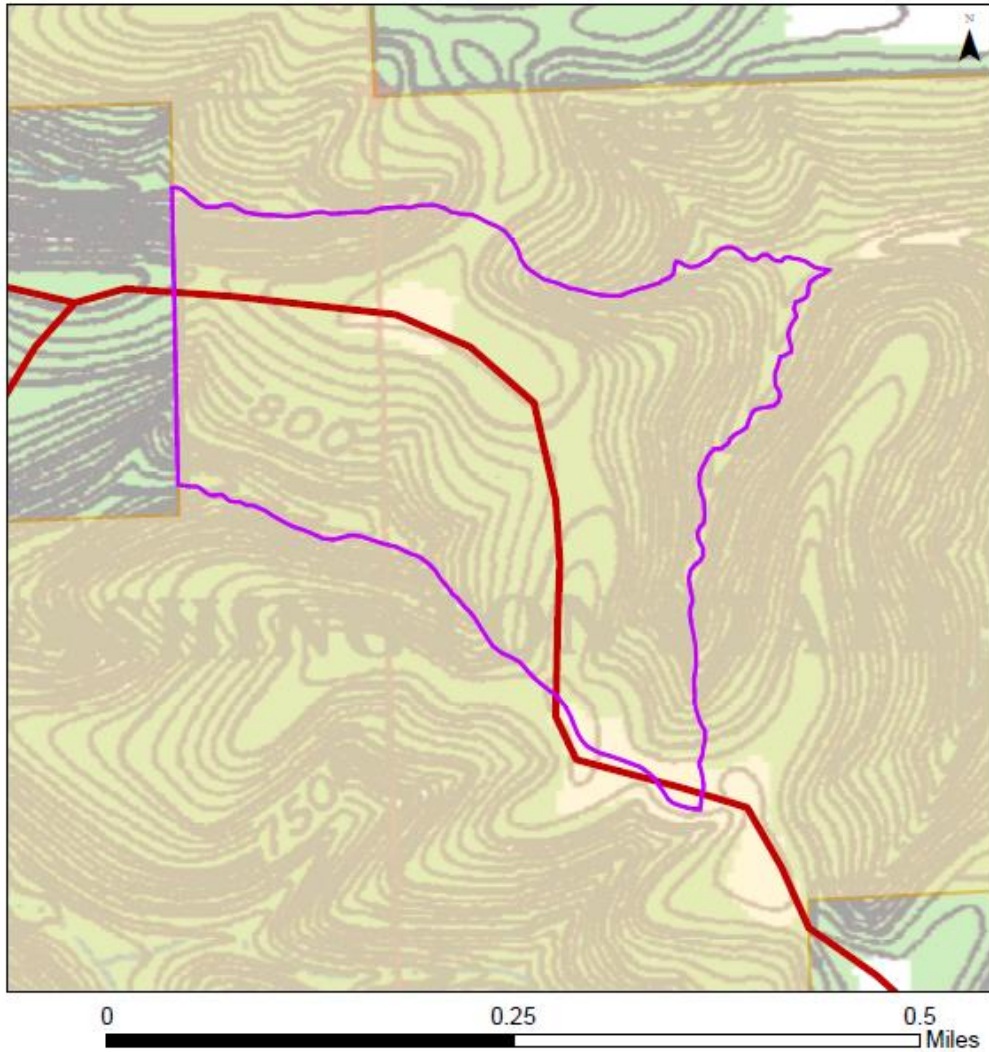
2024-2025+
2025-2026
2026-2030
1 to 2 years after harvest
1 to 2+ years after post-harvest TSI
3-5 years after the harvest
2043

Maps

Jackson-Washington State Forest Location Map Compartment 12 Tract 16

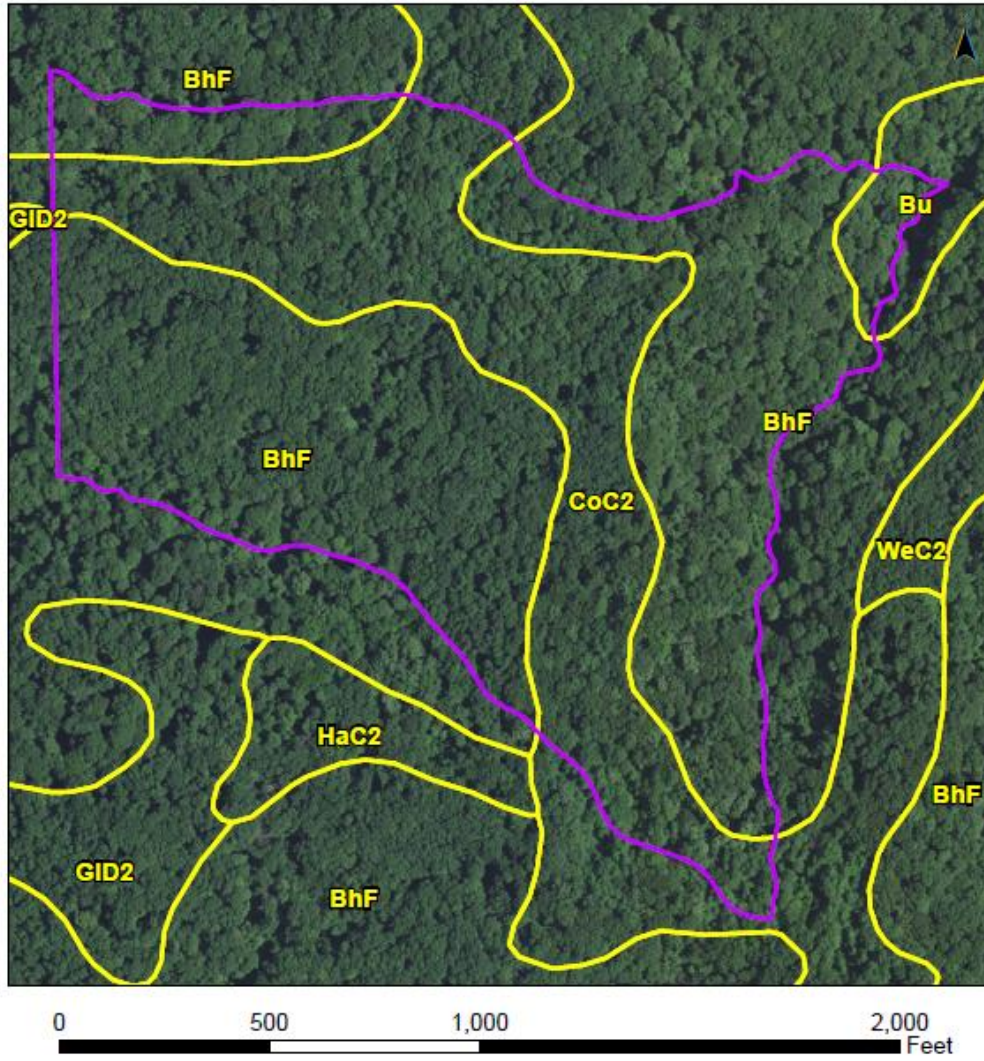


Jackson-Washington State Forest
Compartment 12 Tract 16
Tract Map

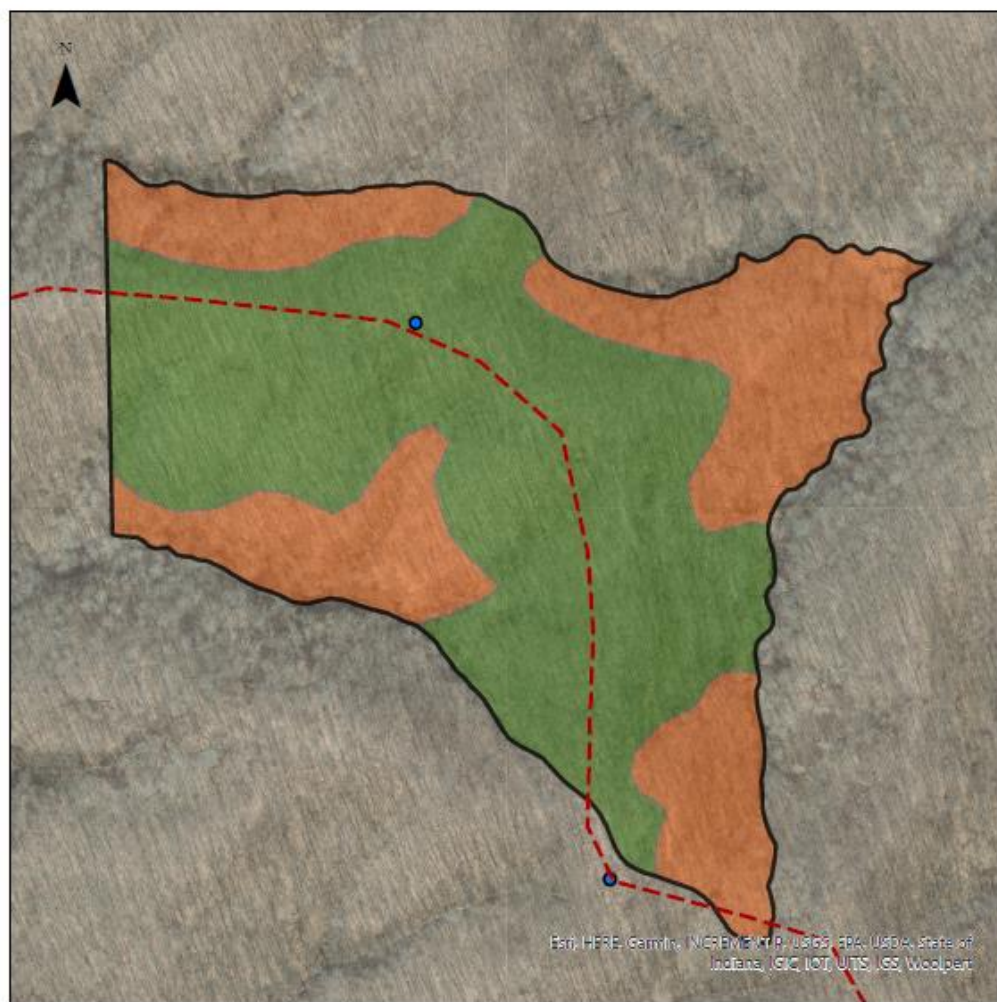


- Fire Lane
- Tract boundary
- State Forest

Jackson-Washington State Forest
Compartment 12 Tract 16
Soils Map



Jackson-Washington State Forest Compartment 12 Tract 16 Cover Types Map



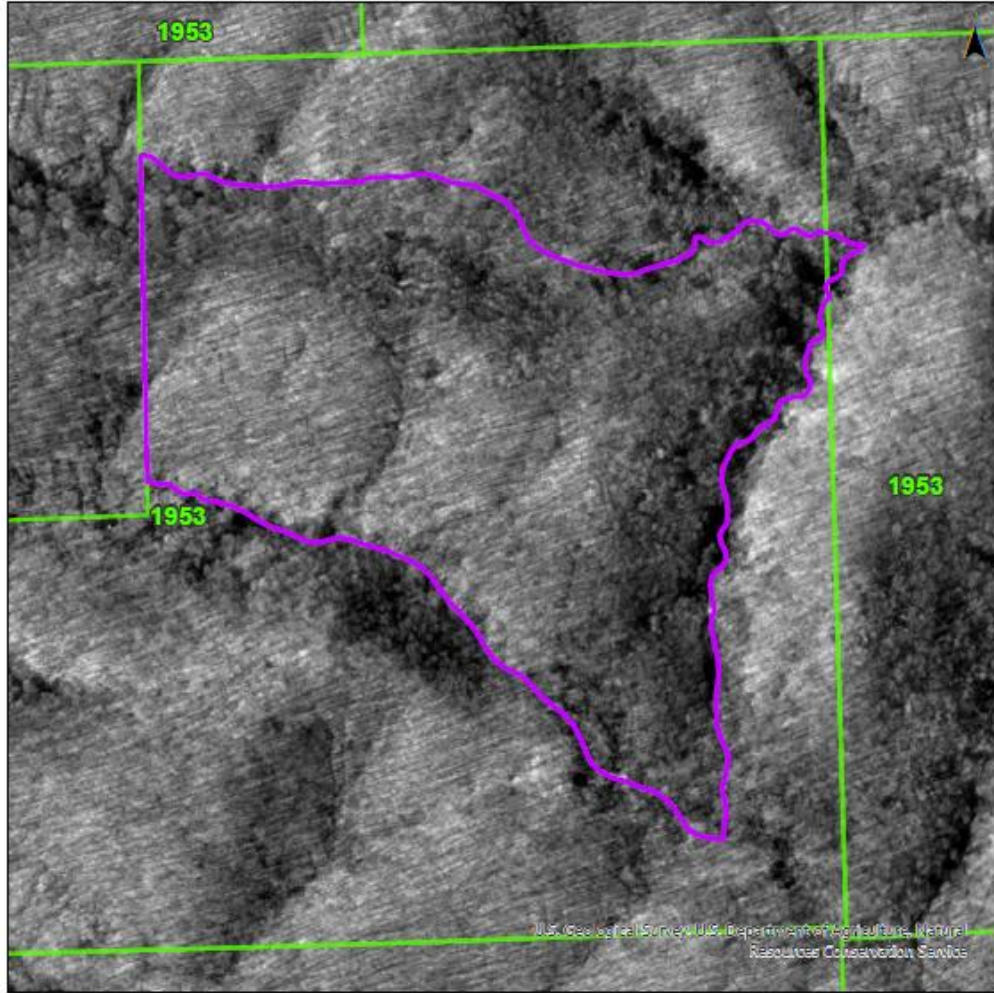
0 0.13 0.25 Miles

Legend

- Dry Oak-Hickory
- Beech-Maple
- Tract Boundary
- Wildlife Ponds
- Fire Lanes

Appendix

Jackson-Washington State Forest
Compartment 12 Tract 16
Land Acquisition Map

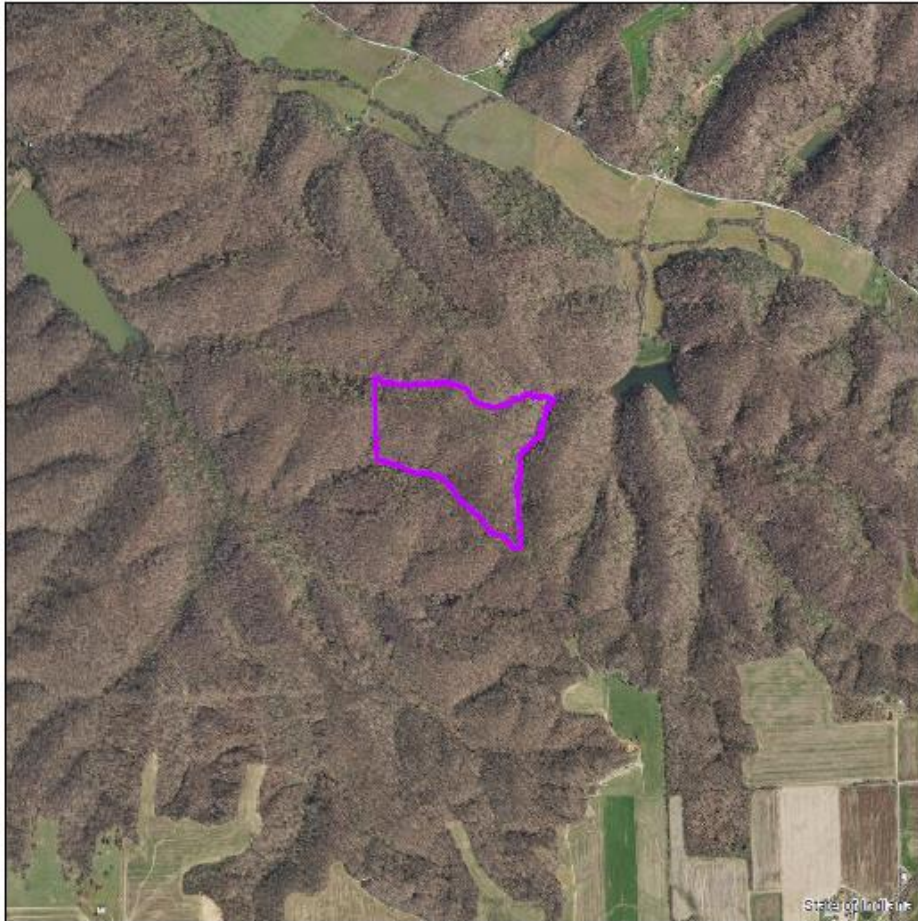


0 0.125 0.25 Miles

Tract boundary Year acquired

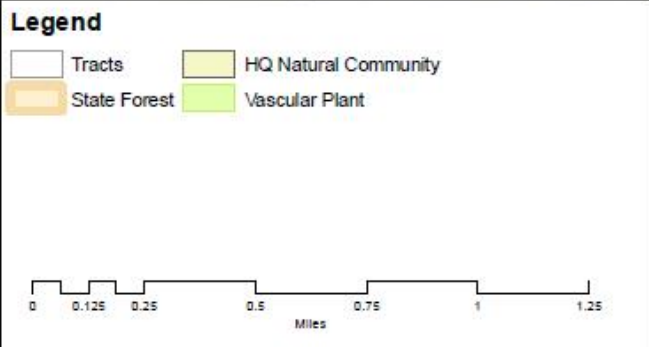
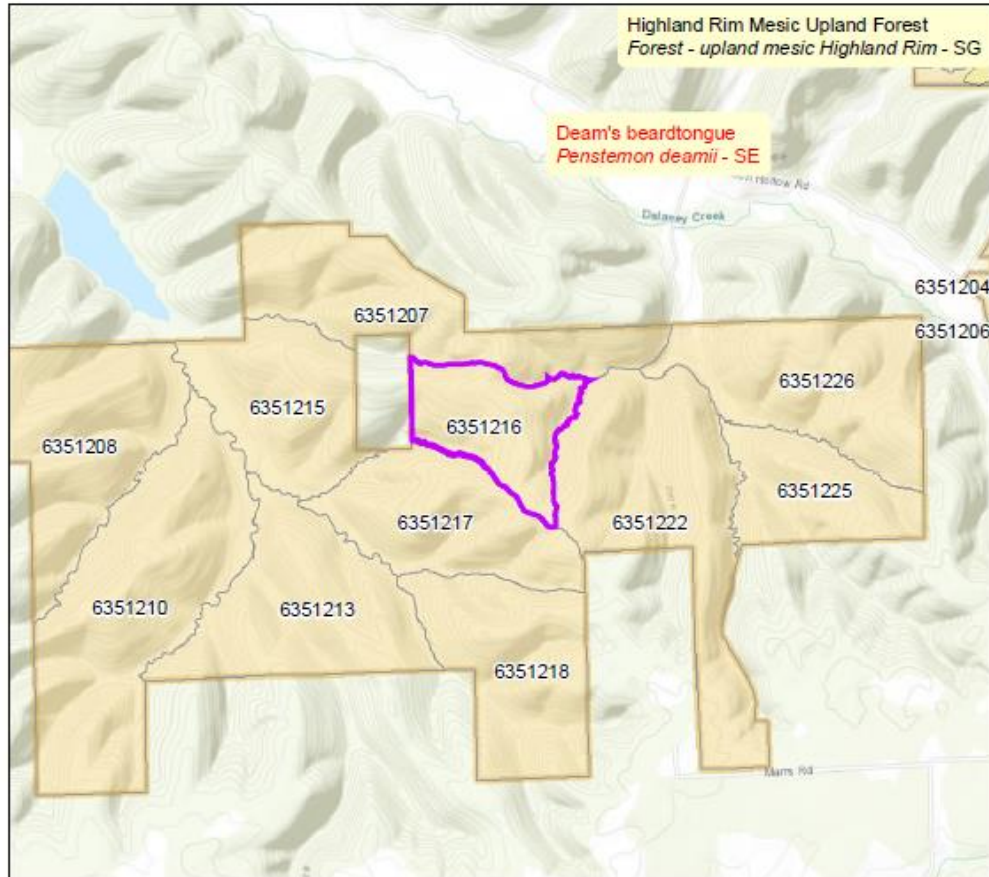
Basemap is 1998 aerial photo.

Jackson-Washington State Forest
Compartment 12 Tract 16
Ecological Review Map



0 0.5 1 2 Miles

Natural Heritage Database Review
Area - Comp - Tract = 6351216



N
Date: 10/6/2022

Labels indicate common name, scientific name and last date observed.
Red labels indicate a Global Rank of 1 or 2, and site suitability - if given - follows the date.
See State Forest EA or consult an appropriate biologist for additional information.

The Natural Heritage Database (NHDb) indicates the presence of Deam's beardtongue (*Penstemon deamii*) within a one-mile radius of the tract. This plant is listed as a rare species in Indiana. It prefers openings in forests and along roads, trails, and clearings. Deam's beardtongue benefits from periodic mowing, which reduces competition and increases light availability. It can

be affected negatively by careless use of herbicides. Given that the record is located outside of the tract, any harvest or management activities will have no direct impact. If any Deam's beardtongue is discovered during management activities, appropriate mitigation actions will be undertaken to minimize any potential negative impacts to the plant.

While the NHDb does not indicate the presence of the Eastern box turtle within the tract, one was observed during the inventory. The Eastern box turtle is a species of special concern in Indiana. It is commonly found in upland woods and forest but also inhabits bottomland forests, forest borders, and wet meadows. Box turtles nest in loose soils and rest or take cover within natural soil depressions under leaf litter, within slash and brush piles, or within briar thickets. They hibernate under logs and deep leaf litter or within soft soil. Major threats to this species include habitat loss and fragmentation. Management activities will include leaving a portion of the tract's mature canopy intact to provide suitable habitat for the Eastern box turtle. This can be achieved by excluding an area from the harvest or through intermediate cutting methods such as thinning and single tree selection. Single tree selection and patch cuts or group selection openings would help maintain Eastern box turtle cover habitat in this tract through the addition of slash piles and discarded logs and by creating small patches of early successional habitat with dense vegetation. Prescribed fire can also provide habitat conditions that benefit forest reptiles. Though box turtles are unable to avoid burn areas, it is unclear how this affects turtle mortality and their populations. Burns are often conducted in late fall, winter, or early spring prior to green-up. During much of this time, box turtles are hibernating beneath logs, within the soft soil of tree tip-up mounts, and under deep forest litter. Individuals hibernating close to the ground surface or within dry litter will be susceptible. However, those that are less exposed should not be affected by the low intensity fires characteristic of forest prescribed burns. Since fire is prescribed as a follow-up treatment in and around regeneration openings and is not typically repeated periodically over the same area, it is very likely fire will affect individuals or populations, particularly since box turtles are known to range over localized areas >20 acres throughout much of their life. For these reasons, the proposed management objectives for this tract are expected to have a minimal effect on box turtles. Any negative effects should be mitigated at least partially by the habitat benefits these management activities provide.

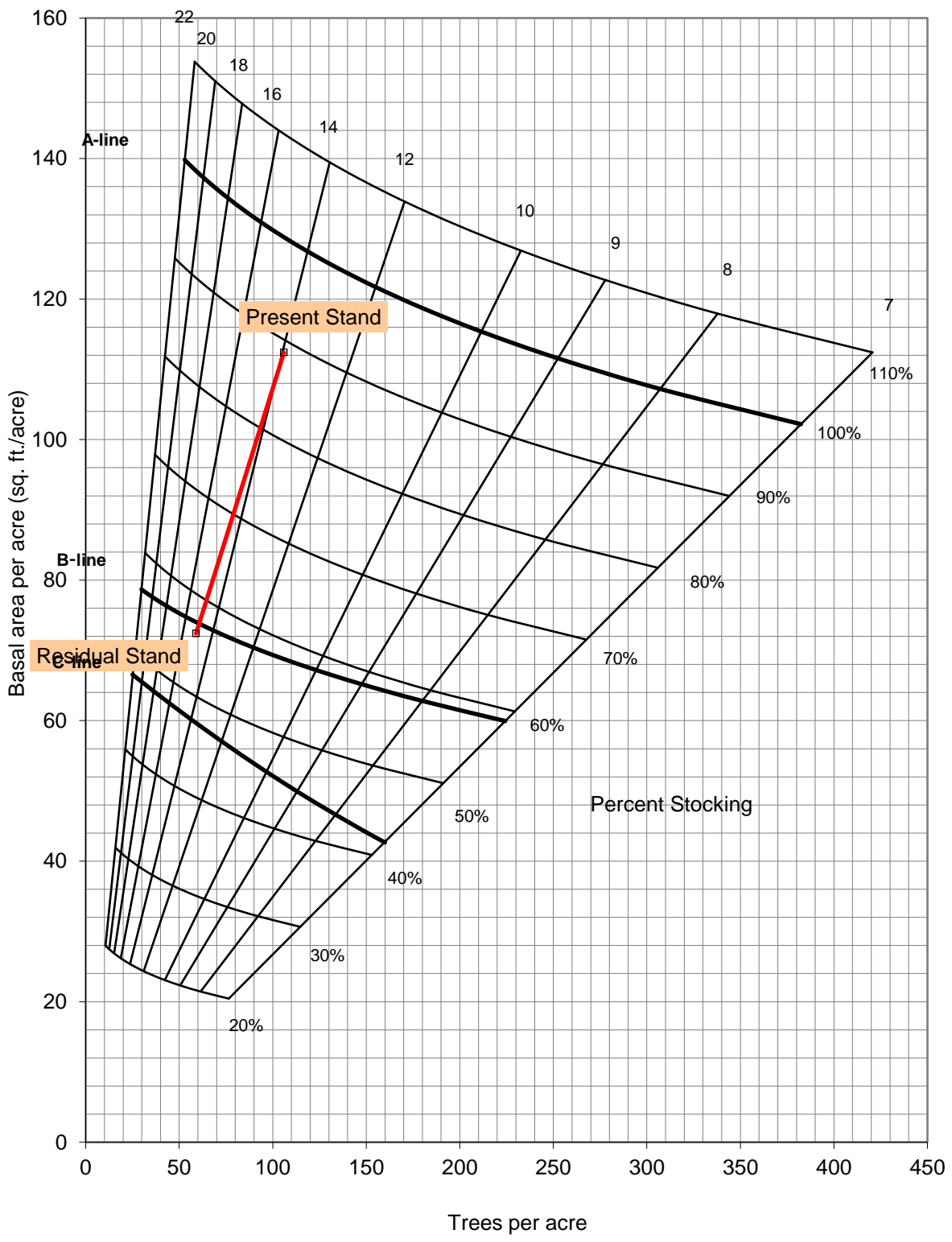
Jackson-Washington State Forest
Compartment 12 Tract 16
Sensitive Features Map



0 0.125 0.25 Miles

**This map is not
for public release.**

No cultural sites were discovered during the inventory. If any are discovered during any management activities, the archaeologist will be notified and the area avoided.



Harvest/Leave Summary Report

Tract: 63512161 Cruiser: marshall Location: Owner: IDNR	Indiana DNR, Division of Forestry 402 West Washington Street Room W296 Indianapolis, IN 46204 (317) 232-4105 Fax (317) 233-3683	Total Acres: 52 Number of Plots: 29 Cruise Method: Point BAF: 20 Cruise Date: 06/21/2023
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	Harvest			Leave				Total			
	Trees	Cords	MBF \$ Value	Trees	Cords	MBF \$ Value	# Trees	Cords	MBF \$ Value		
American Beech SM							717				
Poles	134	6	6	314	17	17	448	23	23		
Sawtimber	78	39.17	1,958	34	29.25	1,482	111	68.42	3,421		
Quality	18	3.67	294				18	3.67	294		
Basswood Sawtimber				34	3.10	217	34	3.10	217		
Black Cherry Sawtimber				41	10.71	3,320	41	10.71	3,320		
Blackgum Sawtimber	23	4.20	210				23	4.20	210		
Black Oak Sawtimber	58	29.33	4,986	170	71.20	12,104	228	100.53	17,090		
Bluebeech SM							36				
Chestnut Oak Poles				120	15	15	120	15	15		
Sawtimber	375	97.95	14,692	472	105.72	15,858	846	203.67	30,551		
Large-tooth Aspen Sawtimber				26	3.67	184	26	3.67	184		
Northern Red Oak Poles				81	6	6	81	6	6		
Sawtimber	19	16.46	3,457	37	38.78	8,143	55	55.24	11,601		
PawPaw SM							36				
Pignut Hickory Sawtimber	55	6.03	482	372	56.84	4,547	427	62.87	5,030		
Red Maple SM							108				
Poles	54	7	7	238	17	17	293	24	24		
Sawtimber	79	2.78	251	55	12.52	1,127	134	15.30	1,377		
Shagbark Hickory Poles				66	6	6	66	6	6		
Sawtimber				73	12.37	990	73	12.37	990		
Sugar Maple SM							287				
Poles	189	9	9	351	15	15	540	23	23		
Sawtimber	113	26.31	5,000	214	23.56	4,477	327	49.87	9,476		

	<i>Harvest</i>				<i>Leave</i>				<i>Total</i>			
	<i>Trees</i>	<i>Cords</i>	<i>MBF</i>	<i>\$ Value</i>	<i>Trees</i>	<i>Cords</i>	<i>MBF</i>	<i>\$ Value</i>	<i># Trees</i>	<i>Cords</i>	<i>MBF</i>	<i>\$ Value</i>
White Ash Sawtimber					11		6.51	716	11		6.51	716
White Oak Sawtimber	18		13.57	2,036	139		46.27	6,941	157		59.84	8,977
Yellow Poplar Sawtimber	76		33.22	2,325	196		48.00	3,360	272		81.22	5,685
Tract Total:		22		35,713		77		63,521		98		99,234
	1,288		272.70		3,042		468.49		5,514		741.20	
Tract Average/Ac:		0		687		1		1,222		2		1,908
	25		5.24		59		9.01		106		14.25	

6351216 RMG

Tract Total Acreage		Total (BF)	Total (BF/acre)	Total Harvest Stock (BF)	Total Harvest Stock (BF/acre)	Correction Factor		
52		746,140	14,349	272,700	5,244	99%		
	Acres	Total (BF)	Total Stocking (BF/acre)					
Beech-Maple	20	237,800	11,890					
Oak-Hickory	32	508,340	15,886					
Total		746,140						
	Acres	Harvest Stock (BF)	Harvest Stock (BF/acre)	Correcting from Tcruise	Low End Percent	High End Percent	Low End Value	High End Value
Beech-Maple	20	81,590	4,080	80,884	34%	30%	53,132	105,149
Oak-Hickory	32	193,490	6,047	191,816	38%	35%	118,805	258,951
Total		275,080		272,700			171,937	364,101

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Jackson-Washington State Forest

Forester: Krista Marshall

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Compartment 12

Date: June 12, 2023

Management Cycle Length: 20 years

Tract 17

Acres: 79

Location

This tract, also referred to as 6351217, is located along Fire Lane 810 in Sections 25 and 26, Township 3N, Range 4E, Washington Township, Washington County. Salem, Indiana, is located approximately 5.5 miles southwest of the tract.

General Description

Ridgetops and upper slopes are characterized by oak-hickory forest. Mixed hardwoods dominate the riparian areas, as well as the lower slopes.

History

- 1953 (March) Land acquisition 360 acres from Lief H. and Lucinda Saylor.
- 1953 (May) Land acquisition 140 acres from Lief H. and Lucinda Saylor.
- 1955 (September) Land acquisition 200 acres from Lief H. and Lucinda Saylor and Ita Colglazier.
- 1972 Forest inventory estimated 2,567 bddf per acre, of which 1,354 bddf per acre was considered harvestable. An improvement timber harvest was recommended for the northern half in 30 years and southern have group openings withing 10-15 years. Neither harvest occurred.
- 2013 Forest inventory estimated 11,291 bddf per acre, of which 8,392 bddf per acre was considered harvestable. Chestnut oak, white oak, and black oak were the tops species by volume. No harvest occurred.
- 2022-2023 Fire land improvements.

Based on aerial photography, the bottomland areas and much of the ridgetop were historically used for farming. A network of dirt roads is visible to the northeast, presumably connecting the agricultural fields on the ridge to those north of the tract boundary and to the nearest county road. The remainder of the tract was forested.

This tract was formerly known as Compartment 58, tract 3.

Access into the compartment for management has been significantly limited, with only a few timber sales occurring within the last fifty years.

Landscape Context

Public forestland in the Mitchell Karst Plains natural subregion surrounds most of the tract, except for a 20-acre inholding along the tract's northern boundary. The compartment within

which the tract is located is surrounded by a few watershed lakes, privately-owned forestland, and agricultural fields. Several timber harvests have occurred on the private lands within the last 15 years. Most appear to have been diameter limit high-grade harvests, while some have been harvested with long-term management as a directive. Currently, the amount of early successional forest habitat in the compartment is relatively low. Most of the fields that were abandoned prior to state ownership have since become closed-canopy forest. Development in the area is limited to single-family residences. Some construction of homes has been seen in the area, but the distance to municipalities and poor economic conditions have kept those to a minimum.

Topography, Geology and Hydrology

The tract contains one main ridge that serves as part of the northern tract boundary. Three secondary finger ridges extend west-southwest from the main ridge. Topography varies throughout the tract. However, the main ridge and its fingers are broad and flat while the side slopes are moderately steep. The tract contains a mapped intermittent stream that serves as most of the southern tract boundary. This mapped intermittent transitions into a perennial stream that drains into a private watershed lake. Overflow from the watershed lake flows into Delaney Creek, which subsequently drains into the Muscatatuck River. Additionally, two manmade wildlife ponds are located within the tract. One was constructed on the main ridge. The other is in the bottom near the intersection of two mapped intermittent streams. The tract's underlying geology consists mostly of siltstone.

The 2022 Best Management Practices (BMPs) field guide will be followed during any management activities that may take place within the tract.

Soils

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.

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.

Hagerstown silt loam (HaC2) This series consists of deep and very deep, well drained soils formed in residuum of hard gray limestone. Slope ranges from 0 to 45 percent. Permeability is

moderate. Native vegetation is mixed hardwoods. This soil is well suited to trees. The equipment limitation is moderate. During wet periods, roads tend to be slippery and ruts form easily. The roads should be built on gentle grades, and water should be removed with water bars, culverts, and drop structures. The site indexes for hardwood species range from 70 (white oak) to 90 (yellow-poplar). Preferred trees to manage for are black cherry, black oak, black walnut, chinkapin oak, chestnut oak, red oak, and white oak.

Crider silt loam (CoB, CoC2, CoD2) This soil series consists of deep, well drained, moderately permeable soils on uplands. They formed in a loess mantle and the underlying residuum from limestone. Slopes range from 0 to 30 percent. Nearly all the soil is used for growing crops and pasture. The original vegetation was mixed hardwood forest, chiefly of oaks, maple, hickory, elm, ash, and hackberry. These soils are well suited for trees. There are no major hazards affecting the harvest and planting of trees until you reach a slope in excess of approximately 12%. Once this percent slope is reached special considerations need to be addressed. 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. The site indexes for hardwood species range from 90 (white oak) to 98 (tulip poplar). Preferred trees to manage for are black cherry, black oak, black walnut, bur oak, chinkapin oak, Kentucky coffeetree, red oak, pecan, shagbark hickory, sugar maple, yellow-poplar, and 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. 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.

Access

A management easement, Fire Lane 810, off North Delaney Park Road provide the only access to this tract. The fire lane has been improved from the intersection with North Delaney Park Road up to the 20-acre private inholding.

The fire lane serves as management access into this compartment. Two areas along the main ridge may serve as log yards for timber skidded from the tract. One of these may also serve as a shared log yard for timber skidded from the southernmost slopes of tract 16.

Boundary

The tract boundary doubles as the state forest boundary line in two separate areas. The first is in the southeast corner of the tract. Here, the boundary follows a north-south property line for approximately 400 feet. Trees on the line are marked with pink flagging. The second is in the northernmost portion of the tract where the private inholding is located. Here, the boundary follows both an east-west and north-south property line for approximately 400 feet. It also

contains a concrete monument corner marker.

The northern tract boundary begins in the bottoms, following a drainage northeast up to the private inholding. It continues southeast of the inholding to the head of the drainage before cresting the ridge. Here, it follows the fire lane to the southeastern property line. This property line acts as the eastern boundary of the tract. The southern tract boundary is approximately 4,000 feet in length. It begins at the southeastern property line and heads west for 300 feet before reaching a mapped intermittent stream. It then follows this stream west until terminating at the stream's intersection with the drainage that acts part of the tract's northern boundary. Because the northern and southern boundary converge on the same point, the tract has no western boundary.

Ecological Considerations

Wildlife observed during the inventory include American crow, chipmunk, white-tailed deer, American toad, Eastern gray squirrel, opossum, raccoon, and various songbird and woodpecker species.

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 species.

The Division of Forestry has developed compartment level guidelines for important wildlife structural habitat features such as snags. Snags are standing dead or dying trees. Snags provide value to a stand in the form of habitat features for foraging activity, den sites, decomposers, bird perching, and bat roosting. Snags eventually contribute to the future pool of downed woody material. Downed woody debris provides habitat for many species and contributes to healthy soils.

Snags	Maintenance Level	Inventory	Available Above Maintenance
5"+ DBH	320	272	-48
9"+ DBH	240	231	-9
19"+ DBH	40	69	29

Inventory data for Compartment 12 Tract 17 shows that 19"+ snags exceed maintenance levels, while 5"+ and 9"+ snags are below target maintenance levels.

It is important to note that these are compartment guidelines and that even though the estimated tract data does not quite meet all target levels, it is likely that suitable levels are present for these habitat features in the surrounding landscape. The prescribed management will maintain or enhance the relative abundance of these features.

Invasive species noted in the tract include multiflora rose and Japanese stiltgrass. Multiflora rose was most prevalent in the eastern portion of the tract and along the fire lane. The stiltgrass

appeared to be restricted to the fire lane only. While neither of the invasives appear to be a problem at this time, treatment would be relatively straight forward. If not treated prior to management activities, the invasives should be monitored and treated as needed post-harvest.

Recreation

Currently, the tract does provide public access for recreation. Access through adjacent private lands occurs for hunting and fishing. For public safety, these activities would be altered or temporarily altered within the tract during active management.

Cultural

Cultural resources may be present, but their location(s) is protected. Adverse impacts to significant cultural resources will be avoided during any activities.

Tract Subdivision Description and Silvicultural Prescription

Mixed Hardwoods (31 acres)

This subdivision/cover type is primarily composed of sugar maple, yellow poplar, and American beech. Other species in the overstory include black oak, pignut hickory, black walnut, sassafras, shagbark hickory, basswood, and white oak. Overall, overstory trees tend to exhibit poor to average form. The overstory is lacking a strong oak-hickory component, and what mixed hardwood species are present typically have defect, poor vigor despite lower stocking, and poor form. In fact, several areas in this subdivision appear to have been subject to high grading prior to state ownership given the overstory is comprised of low value tree species of poor quality. Much of the black walnut has defect or is declining. Additionally, many of the sawtimber American beech fork low, have seams or burls, or are hollow throughout. A small proportion of the sugar maple trees are exhibiting sugar maple borer damage. The few oak and hickory species in the overstory are typically declining, leaning, or poorly formed as well. However, several shagbark and pignut hickories with excellent form and large crowns are present. These are beginning to show signs of stress and need to be released. The overstory yellow poplar in the more mesic soils (i.e., bottomlands) are in the larger size classes and of excellent quality. Sugar maple and American beech dominate both the mid- and understory. Little to no regeneration is present across the tract. Pawpaw, white ash, and sugar maple account for the majority of the regeneration, although some oak and hickory seedlings were observed. These were mostly pignut hickory and black, white, chestnut, and northern red oaks. Trees in the larger size classes, along with those that have defect and poor form, should be removed in one or more patch cuts to promote the establishment of healthier trees with better form. Single tree selection and timber stand improvement (TSI) should also be implemented to release the suppressed white oak, pignut hickory, and chestnut oak that is trying to recruit from the midstory into the overstory. Heavier removal of mixed hardwood species near healthy black walnut might be necessary to better meet the species' sunlight requirement. Thinning will also be needed in areas where stocking is too high, particularly among the chestnut oaks on the ridge and the smaller sawtimber yellow poplar in the bottoms. The oak-hickory component may be increased by running fire through the tract to expose bare mineral soil and reduce competition from shade tolerant species. The inventory results indicate that an estimated 54,052 to 138,129 board feet of potential volume could be removed through an improvement timber harvest.

Dry Oak-Hickory (48 acres)

This subdivision/cover type is dominated by oak and hickory species, primarily chestnut oak, white oak, and pignut hickory. The oak and hickory present in the overstory of this subdivision exhibit much better form than those in the mixed hardwoods subdivision. There is generally good spacing of overstory trees. However, a light timber harvest is recommended to maintain vigor and health. The chestnut oak on the ridges is mostly straight with clear boles. These trees are average to excellent quality. In other areas, the chestnut oak is of exceptional size with low forks, knotty boles, and cankers. Monocultures of chestnut oak with high stocking should be thinned through single tree selection. Smaller sawtimber black oak is of decent form and in good health, while black oak in the larger size classes have weak branch attachment points and are declining. Such areas may require canopy gaps or patch-cut openings to allow better quality trees to seed in and allow for more vigorous crown expansion and growth of the residual trees. The midstory is typically dominated by sugar maple, with some pignut hickory and white oak poles mixed in. There is a notable component of small sawtimber pignut hickory with excellent form in this subdivision's overstory that need released. Oak is often the primary regenerating species, followed by sassafras, red maple, pignut hickory, pawpaw, and yellow poplar. The northern red oak seedlings almost always show deer browse. There is excellent advance oak-hickory regeneration on the drier aspects. This is being hindered, however, by a dense understory of sugar maple, red maple, American beech, and greenbriar. To maintain the oak-hickory component in this subdivision, TSI and prescribed fire are recommended to reduce the maple-beech mid- and understory and promote the establishment of oak and hickory seedlings. The inventory results indicate that an estimated 103,470 to 245,633 board feet of potential volume that could be removed through a timber harvest.

The current forest resource inventory was completed on June 12, 2023, by Krista Marshall. A summary of the estimated tract inventory results is located in the table below.

Tract Summary Data (trees >11"DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Chestnut oak	1,095	275,460
White oak	393	140,150
Sugar maple	480	102,470
Yellow poplar	238	96,390
Pignut hickory	414	79,900
American beech	263	79,250
Black oak	248	75,040
Northern red oak	74	30,980
Red maple	105	18,370
Black walnut	68	17,430
Shagbark hickory	63	13,400
Bitternut hickory	25	6,010
Scarlet oak	19	5,740
Blackgum	27	4,620
American sycamore	4	4,110
White ash	5	4,030

Basswood	30	3,450
Sassafras	74	3,120
Black cherry	10	2,660
American elm	22	1,350
Total:	3,657	963,930

Summary Tract Silvicultural Prescription and Proposed Activities

This tract should receive a harvest in conjunction with the adjacent tract 16 within the next five years. Both subdivisions will require single tree selection to reduce overall stem density, release vigorous residual trees, and improve forest health. In the mixed hardwoods subdivision, overstory trees with defect and poor form, vigor, and health should be removed through patch cuts. Thinning is necessary in areas of the oak-hickory subdivision with particularly high stocking, including the ridges where chestnut oak occurs in dense monocultures. Trees in the larger size classes that are declining should be removed through group selection or patch cuts to encourage better vigor of the residual stand. Other trees targeted for removal in either subdivision include mixed hardwoods that release oak or hickory trees and mature or over-mature trees with damage or in poor health due to age, disturbance, disease, or other stressors. An oak shelterwood harvest and prescribed fire may also be options to maintain or enhance oak-hickory regeneration. The prescribed harvest will reduce the stocking level from approximately 80% to 56%, which is just below the B-line. This dip can be attributed mostly to the patch-cut openings needed in both subdivisions. The inventory estimated 12,292 board feet per acre, with a total potential harvest volume of 157,522 to 383,762 board feet from the entire tract. The top three harvest species by volume include chestnut oak, yellow poplar, and American beech. The harvest will result in a healthier, more vigorous stand of forest that will be primarily dominated by the oak-hickory cover type.

A TSI operation should occur within two years of the timber harvest. This will be done to complete any patch-cut openings; reduce the understory and competition from shade tolerant species; and release oak, hickory, and other crop trees in the remaining acreage. Some trees should be deadened to increase the number of snags that are available as wildlife habitat. This will focus on trees 5 to 18 inches in diameter at breast height (DBH) to address the tract's current deficiency in those size classes.

Use of prescribed fire would occur post-harvest during the dormant season. Prescribed fire will encourage the establishment of oak and hickory species by improving conditions more suitable for seed germination and reducing understory competition.

Any invasive plant species present in patch-cuts or shelterwoods should be treated prior to the harvest. During and after completion of the timber harvest, best management practices (BMPs) will be implemented to minimize soil erosion.

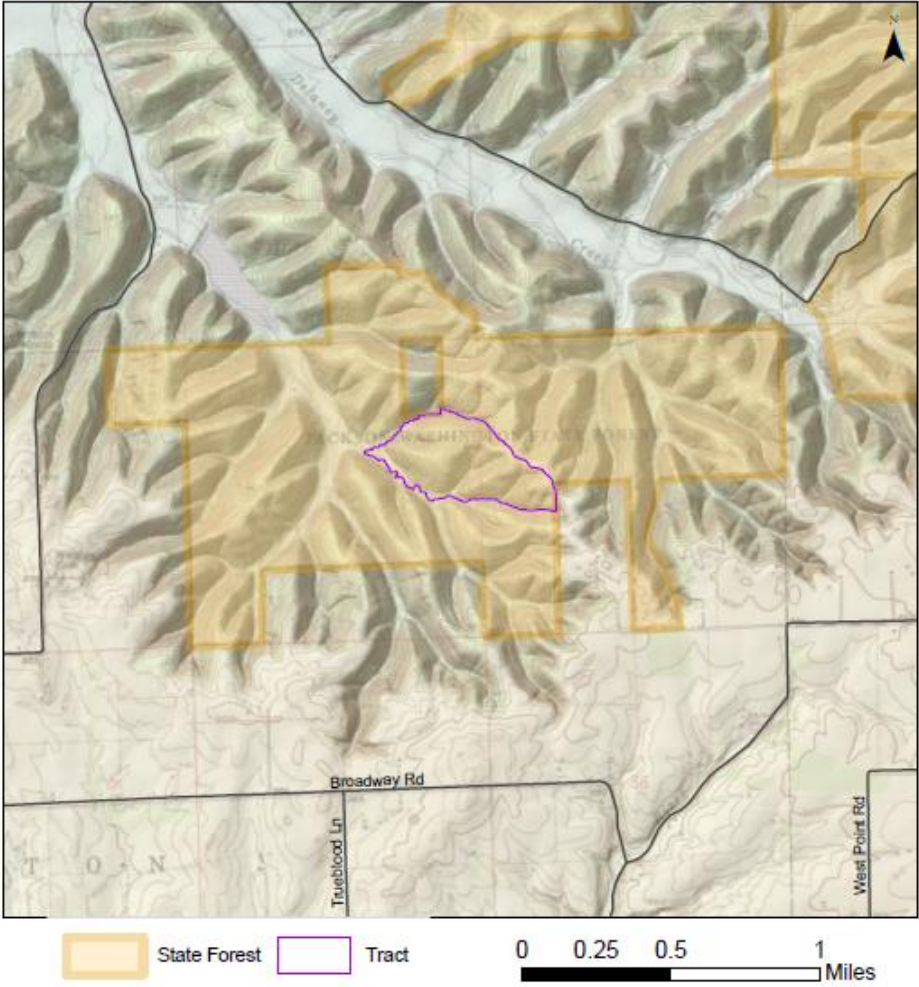
Proposed Activities Listing

<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Mark timber	2024-2025+
Pre-harvest TSI and/or invasive treatments	2025-2026
Timber harvest	2026-2030

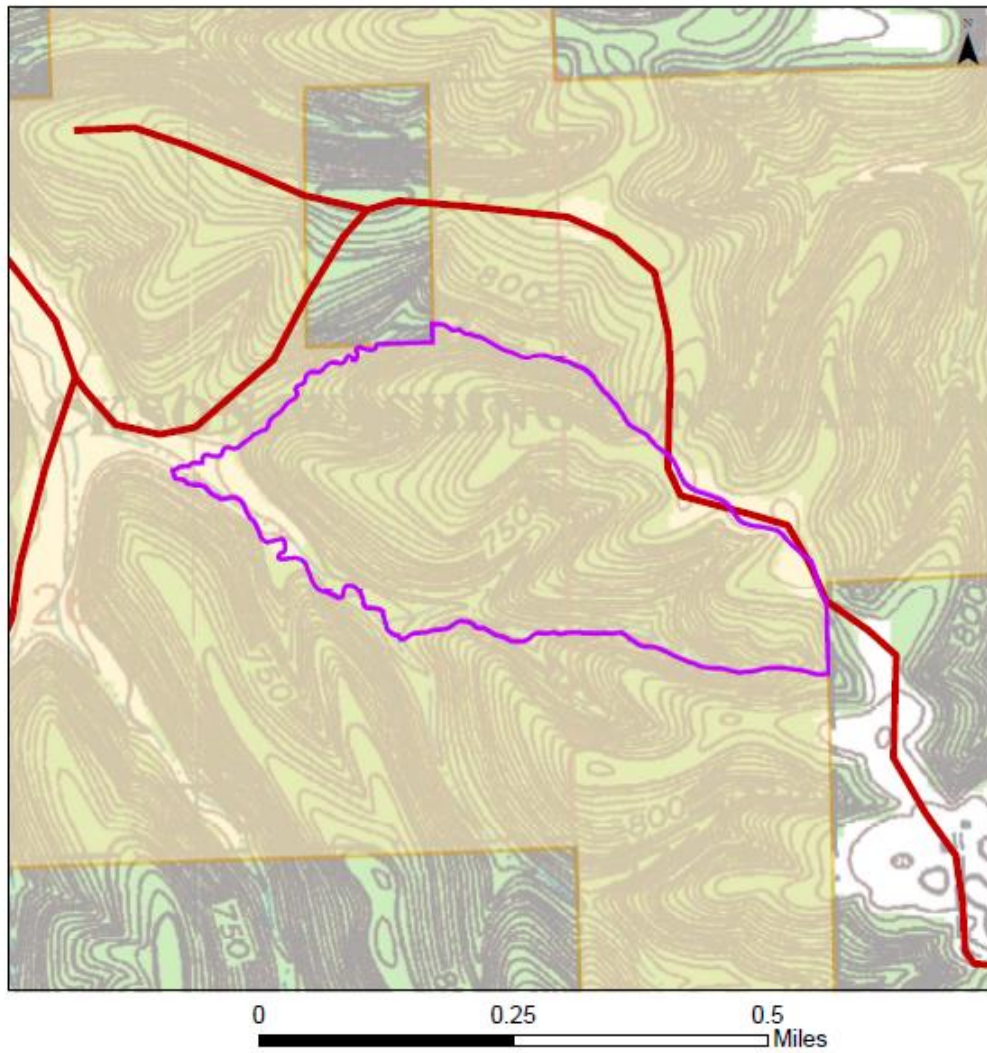
Post-harvest TSI and/or invasive treatments
Prescribed fire regime
Regeneration monitoring
Inventory and Management Guide

1 to 2 years after harvest
1 to 2+ years after post-harvest TSI
3-5 years after the harvest
2043

Jackson-Washington State Forest
Location Map
Compartment 12 Tract 17



Jackson-Washington State Forest
Compartment 12 Tract 17
Tract Map



- Fire Lane
- Tract boundary
- State Forest

Jackson-Washington State Forest
Compartment 12 Tract 17
Soils Map




Jackson-Washington State Forest Compartment 12 Tract 17 Cover Types Map



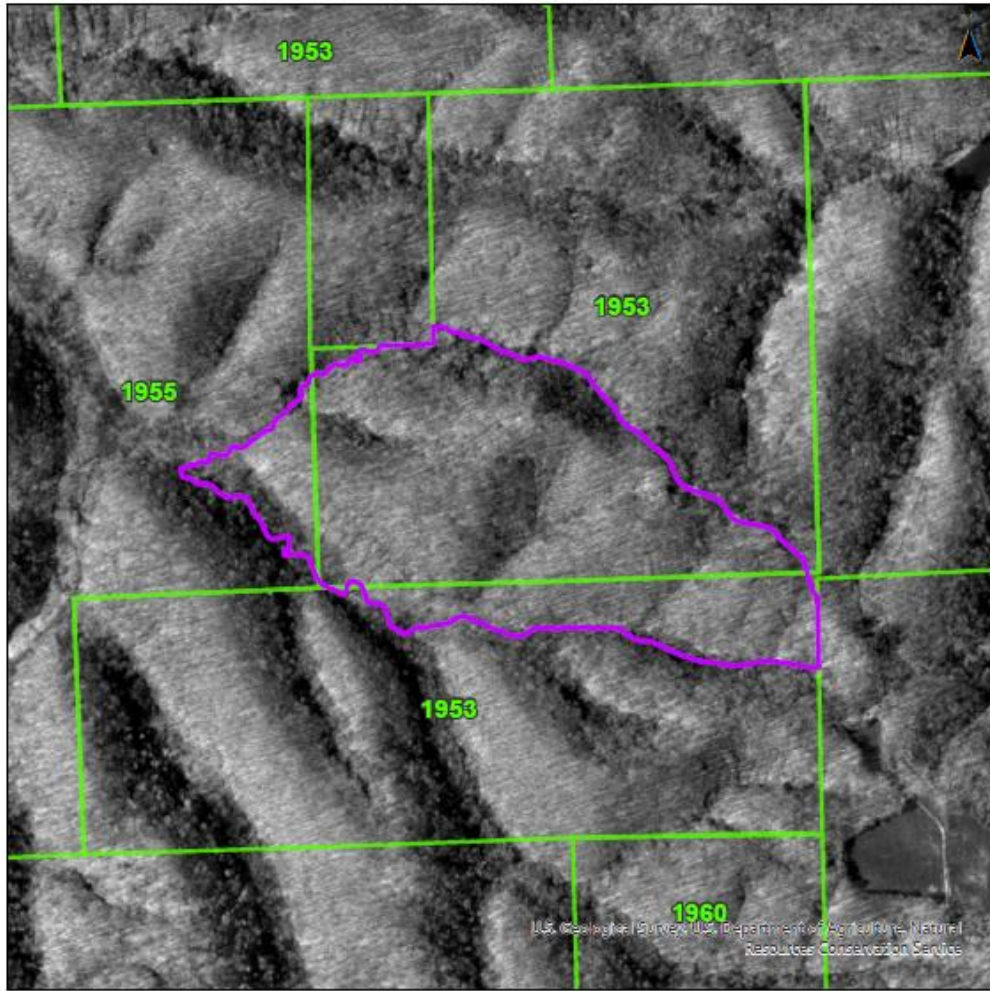
0 0.13 0.25
Miles

Legend

-  Dry Oak-Hickory
-  Mixed Hardwoods
-  Tract Boundary
-  Wildlife Ponds
-  Fire Lanes

Appendix

Jackson-Washington State Forest
Compartment 12 Tract 17
Land Acquisition Map

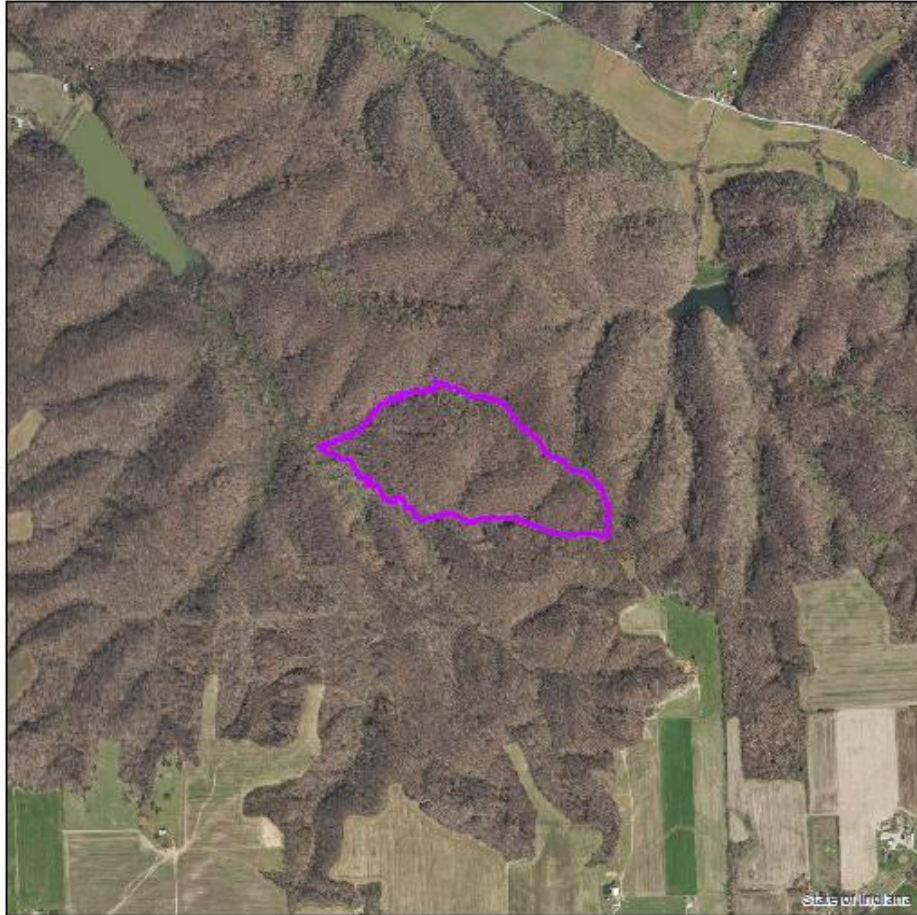


0 0.125 0.25 0.5 0.75 Miles

Tract boundary Year acquired

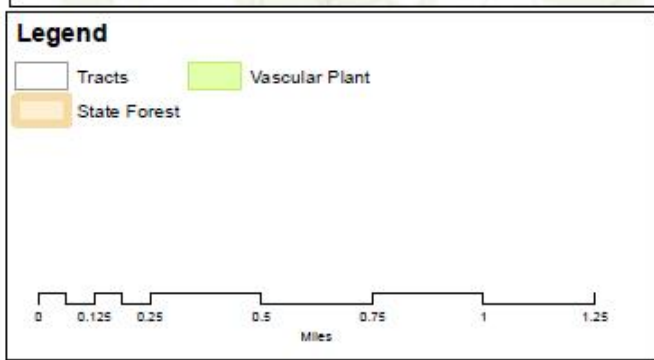
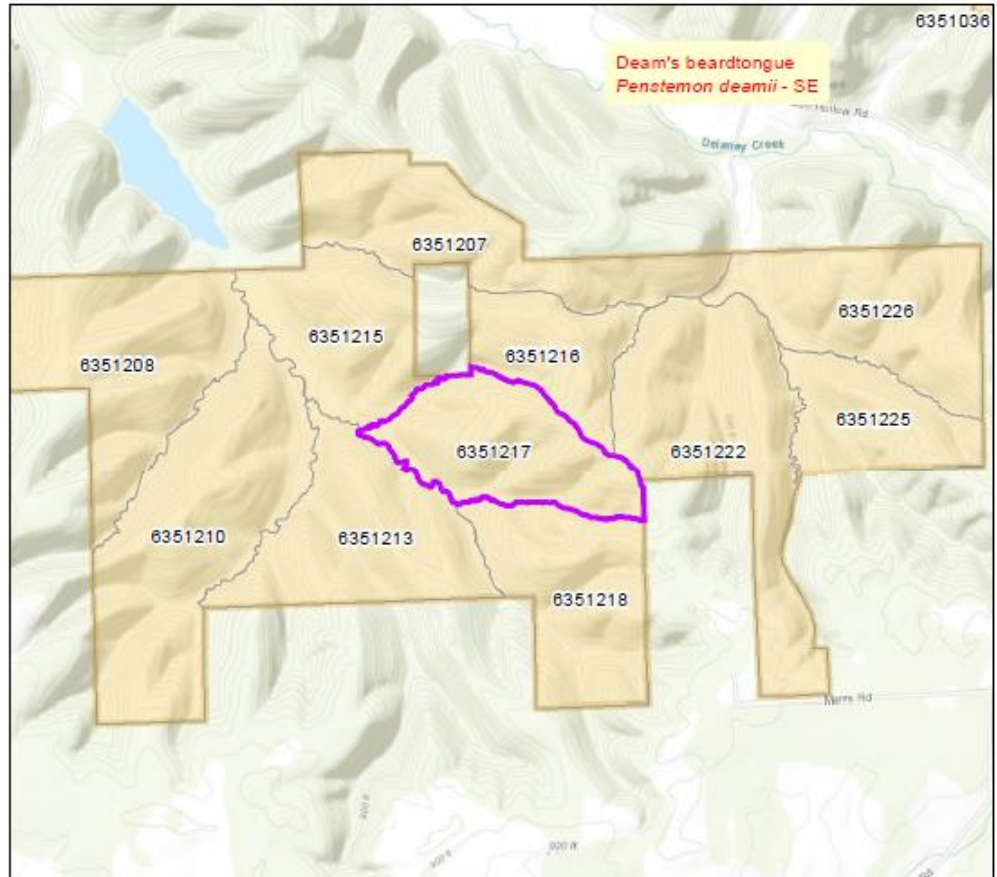
Basemap is 1998 aerial photo.

Jackson-Washington State Forest
Compartment 12 Tract 17
Ecological Review Map



0 0.5 1 2 Miles

Natural Heritage Database Review
 Area - Comp - Tract = 6351217



N


Date: 10/6/2022

Labels indicate common name, scientific name and last date observed.

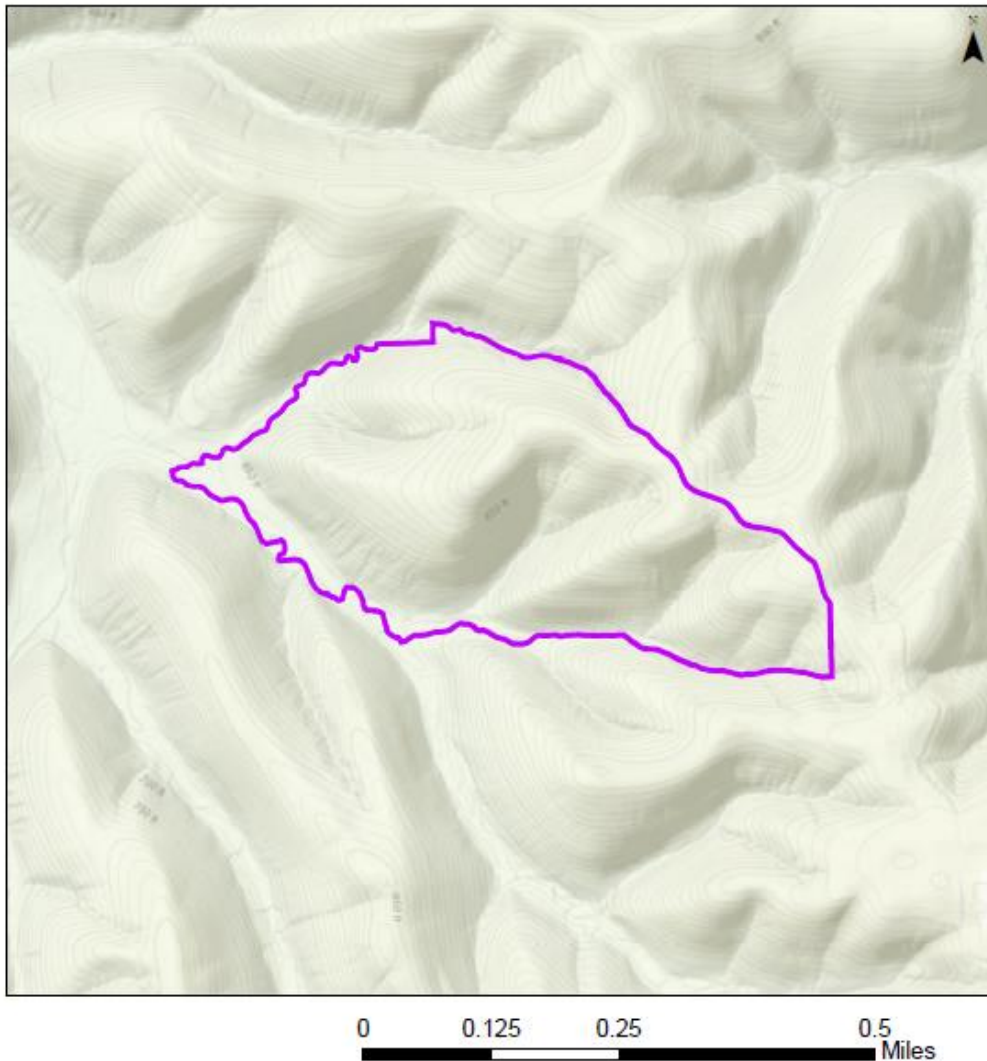
Red labels indicate a Global Rank of 1 or 2, and site suitability - if given - follows the date.

See State Forest EA or consult an appropriate biologist for additional information.

The Natural Heritage Database (NHDb) indicates the presence of Deam’s beardtongue (*Penstemon deamii*) within a one-mile radius of the tract. This plant is listed as a rare species in Indiana. It prefers openings in forests and along roads, trails, and clearings. Deam’s beardtongue benefits from periodic mowing, which reduces competition and increases light availability. It can be affected negatively by careless use of herbicides. Given that the record is located outside of

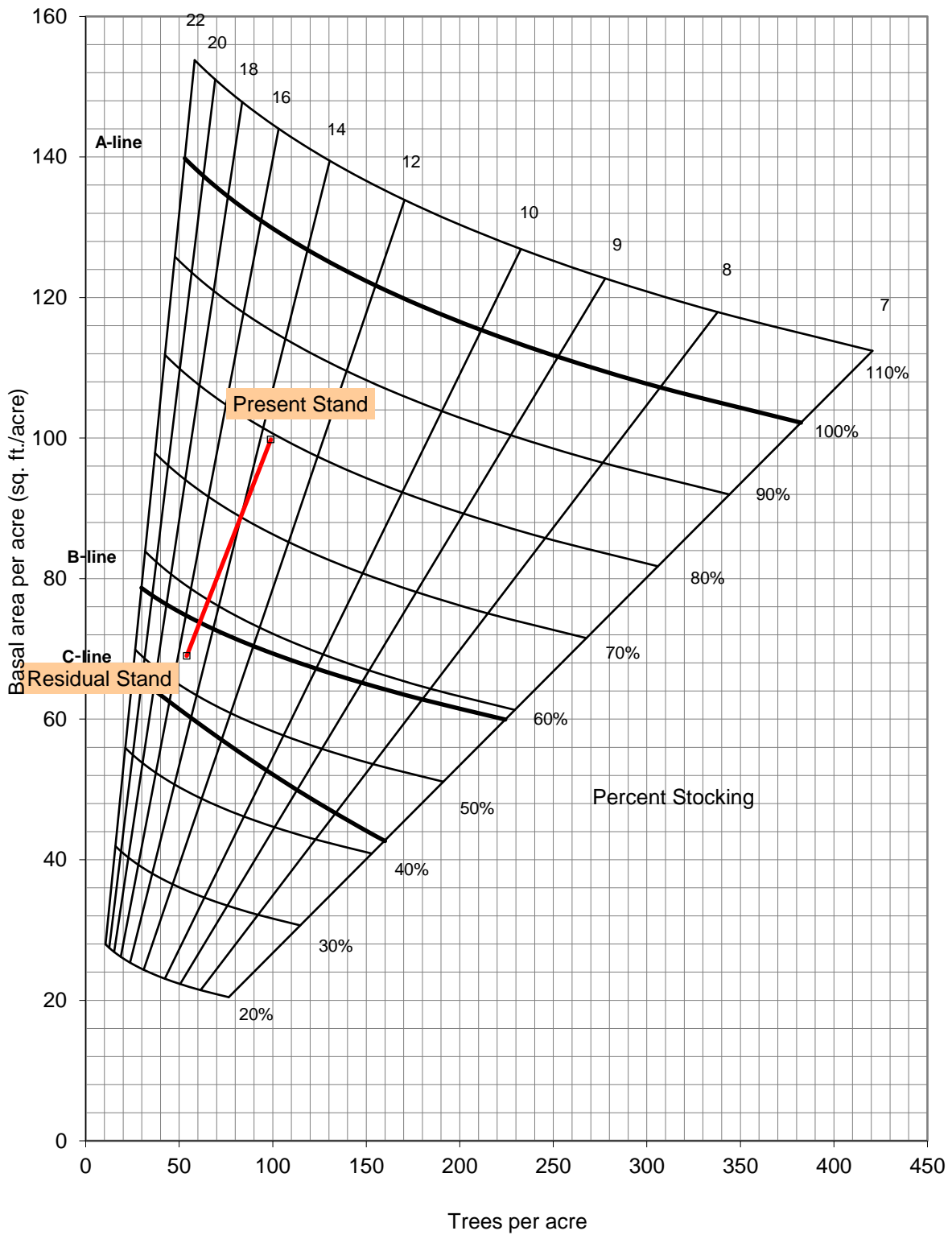
the tract, any harvest or management activities will have no direct impact. If any Deam's beardtongue is discovered during management activities, appropriate mitigation actions will be undertaken to minimize any potential negative impacts to the plant.

Jackson-Washington State Forest Compartment 12 Tract 17 Sensitive Features Map



**This map is not
for public release.**

No cultural sites were discovered during the inventory. If any are discovered during any management activities, the archaeologist will be notified and the area avoided.



Harvest/Leave Summary Report

Tract: 63512171 Cruiser: marshall Location: Owner: IDNR	Indiana DNR, Division of Forestry 402 West Washington Street Room W296 Indianapolis, IN 46204 (317) 232-4105 Fax (317) 233-3683	Total Acres: 79 Number of Plots: 39 Cruise Method: Point BAF: 10 Cruise Date: 06/19/2023
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	Harvest				Leave				Total			
	Trees	Cords	MBF	\$ Value	Trees	Cords	MBF	\$ Value	# Trees	Cords	MBF	\$ Value
American Beech SM									488			
Poles	26	4		4	92	8		8	117	12		12
Sawtimber	120		39.00	1,950	142		40.25	2,012	263		79.25	3,963
American Elm Poles	31	5		5	77	6		6	107	10		10
Sawtimber	22		1.35	94					22		1.35	94
American Sycamore Sawtimber					4		4.11	247	4		4.11	247
Basswood Sawtimber					30		3.45	242	30		3.45	242
Bitternut Hickory Sawtimber					25		6.01	481	25		6.01	481
Black Cherry Sawtimber					10		2.66	824	10		2.66	824
Blackgum Poles					58	2		2	58	2		2
Sawtimber					27		4.62	231	27		4.62	231
Black Oak Sawtimber	61		17.75	3,017	187		57.29	9,739	248		75.04	12,756
Black Walnut Sawtimber	11		3.13	970	57		14.30	4,433	68		17.43	5,403
Bluebeech SM									81			
Chestnut Oak Poles	31	4		4	142	12		12	173	15		15
Sawtimber	361		91.27	13,690	734		184.19	27,629	1,095		275.46	41,319
Ironwood SM									122			
Northern Red Oak Sawtimber	19		1.78	374	55		29.20	6,132	74		30.98	6,506
PawPaw SM									41			
Pignut Hickory Poles					83	7		7	83	7		7
Sawtimber	13		1.95	156	390		75.24	6,020	403		77.19	6,175
Quality					11		2.71	569	11		2.71	569

	Harvest				Leave				Total			
	Trees	Cords	MBF	\$ Value	Trees	Cords	MBF	\$ Value	# Trees	Cords	MBF	\$ Value
Redbud Poles					76	2		2	76	2		2
Red Elm Poles	58	2		2					58	2		2
Red Maple SM									162			
Poles	76	1		1	377	15		15	453	17		17
Sawtimber	86		12.26	1,104	19		6.11	550	105		18.37	1,654
Sassafras SM									81			
Poles					161	4		4	161	4		4
Sawtimber					74		3.12	156	74		3.12	156
Scarlet Oak Sawtimber					19		5.74	975	19		5.74	975
Shagbark Hickory Sawtimber					63		13.40	1,072	63		13.40	1,072
Sugar Maple SM									851			
Poles	476	23		23	333	16		16	809	39		39
Sawtimber	173		34.67	6,587	307		67.80	12,882	480		102.47	19,469
White Ash Poles					89	5		5	89	5		5
Sawtimber	5		4.03	443					5		4.03	443
White Oak Sawtimber	111		33.09	4,964	282		107.06	16,059	393		140.15	21,023
Yellow Poplar Poles					150	9		9	150	9		9
Sawtimber	83		54.89	3,842	155		41.50	2,905	238		96.39	6,747
Tract Total:		39		37,230		87		93,243		126		130,474
	1,762		295.17		4,229		668.76		7,815		963.92	
Tract Average/Ac:		0		471		1		1,180		2		1,652
	22		3.74		54		8.47		99		12.20	

6351216 RMG

Tract Total Acreage	Total (BF)	Total (BF/acre)	Total Harvest Stock (BF)	Total Harvest Stock (BF/acre)	Correction Factor			
79	971,080	12,292	295,170	3,736	99%			
Acres	Total (BF)	Total Stocking (BF/acre)						
Mixed Hardwoods	31	341,840	11,027					
Oak-Hickory	48	629,240	13,109					
Total	971,080							
Acres	Harvest Stock (BF)	Harvest Stock (BF/acre)	Correcting from Tcruise	Low End Percent	High End Percent	Low End Value	High End Value	
Mixed Hardwoods	20	99,720	4,986	98,664	45%	40%	54,052	138,129
Oak-Hickory	32	198,610	6,207	196,506	47%	25%	103,470	245,633
Total	298,330		295,170				157,522	383,762