

**Resource Management Guides
Martin State Forest
30-day Public Comment Period**

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 300-1,000 acres in size and their subunits (tracts) are 10 - 300 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 1,600 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 listed below and contained in this document are part of the properties annually scheduled forest inventories under review for Martin State Forest.

Compartment 3 Tract 2
Compartment 5 Tract 5
Compartment 6 Tract 4

To submit a comment on this document, go to:

<https://www.in.gov/dnr/forestry/state-forest-management/public-comment/submit/>

You must indicate the State Forest Name, Compartment number and Tract number in the "subject or file reference" line to ensure that your comment receives appropriate consideration. Comments received within 30 days of posting will be considered and review posted at:

<https://www.in.gov/dnr/forestry/state-forest-management/public-comment/>

Note: Some graphics may distort due to compression.

Martin State Forest
Forester: Bailey McIntire & Alex Gust
Management Cycle End Year: 2042

Compartment: 3 Tract: 2
Date: 7-1-2021 105 Acres
Management Cycle Length: 20 years

Location

Tract 2, also known as 6360302 is located south side of Williams Road in Martin County T4N R3W section 25. The eastern boundary of the tract is the Martin-Lawrence County line. The nearest town (Shoals) is approximately 6 miles southwest.

General Description

Most of the area is well established forest, but one area in the north central portion is young black oak/tulip poplar/red pine. The south area in the bottom along the creek is old farm field forested in a mix of planted white pine and natural tulip poplar.

History

- December 15, 1966 – Deeded to State of Indiana from the U.S.D.A. Forest Service. Prior to the purchase of these parcels by the Forest Service in 1940/1941, this area was in three separate private ownerships. The western half of the tract was owned by George and Cora Mefford, who sold it on November 1, 1940 (Deed Record Book 81, page 298). The next (to the east) quarter of the tract was owned by James R. Marshall and his wife. They sold their property to the Forest Service on August 19, 1940 (Deed Record Book 81, page 210). The easternmost quarter of the tract was owned by William and Katie Gerkin before being sold to the Forest Service on March 3, 1941 (Deed Record Book 81, page 425).
- 1971-1973 (circa) – Inventory noted in file but not clearly dated. Notes indicate 60 of 120 acres contained merchantable size trees. Volume estimated at 1,824 bdf/acre for total of 109,440 bdf. Majority of the volume was in the primary drainages. The inventory noted a three-acre opening planted to red pine in the early 1970's. Most of the pine had declined.
- 1974 – A “Site Preparation-Tree Planting” form dated 1974 indicated that 1,500 European Black Alder seedlings were planted on this tract, “Just south of White River on Williams Rd.” These seedlings may have been planted along with the pine. Two other areas of the tract were also planted. One area in the far southwest corner of the tract, near the stream, was planted to pine - probably in the early 70's, but no planting record could be found.
- The tract was harvested in 1974 where 349 trees containing an estimated 65,630 board feet was sold for \$7,900.60
- March 1981 – White pine black locust was planted in an old log yard in an area adjacent to Williams Road in the northeast portion of the tract.
- July 1997 – A portion of this tract (north slope of the northeast corner) was dedicated as part of the Henshaw Bend Nature Preserve.
- In 2000 an inventory was conducted by Jim Lauck which reported an estimated volume of 759,800 board feet, 7,168 board feet/acre. Top three species by volume were black oak, white oak, and yellow poplar.

- In 2003 a harvest was conducted which contained 541 trees containing an estimated 119,600 board feet which was sold. For \$41,861.20
- In 2004 Post-harvest TSI was conducted.
- In 2012 an inventory was conducted by Abe Bear which notes an estimated 910,896 board feet, 8,133 board feet/acre. Top three species by volume were yellow poplar, black oak, and white oak.
- Pine stands thinned using TSI August 2012 by property staff.
- In 2022, tract boundaries were modified relocating 7 acres in the northeast corner of tract 6360302 to 6360301. These 7 acres were part of the Henshaw Bend Nature Preserve and moving them to 6360301 placed all the nature preserve in 6360301. This update changed acres for both 6360302 and 6360301 to 105 and 79 acres, respectively.

The history of land use on the tract appears obvious. The flat bottomland area along the southern boundary was open in the 1930's. Since then, it has regenerated to native hardwoods and planted pine. The steeper slopes were likely grazed by livestock. The small flat in the north central portion of the tract shows sign of severe erosion. This area was likely farmed. Trees are growing here, but they are small becoming well established.

Landscape Context

All the land surrounding this tract is forested. The areas south and north are owned by Martin State Forest. The tract to the north is the dedicated Henshaw Bend Nature Preserve. The area to the south is managed by Martin State Forest. Land to the east is owned by the U.S. Forest Service and receives no active management. Beyond public land ownership is private property. Much of the private property nearby had been harvested within a year prior to the 2012 inventory on this tract.

Topography, Geology and Hydrology

The bulk of the tract lies on a generally south facing slope. The grade is moderate in most areas, with some steeper pitches being found in the side drainages. A few areas have rocky sandstone outcrops. Water drains to the south from most of the tract, eventually to the East Fork of the White River.

Soils

Three major soil types dominate the tract. Wellston is found across most of the tract on the moderate slopes, Zanesville is found on the flat ridge tops and gentle upper slopes, and Burnside is present in the bottomland. The only issues may be the fragipan associated with the Zanesville soil and the occasional very brief flooding in the Burnside.

WpfG – Wellston Tipsaw Adveville complex, 18 to 70 percent slopes

This severe sloping, moderately deep, moderate to excessively drained soils is on side slopes.

AgRB - Apalona-Zanesville silt loams, 2 to 6 percent slopes

This is a gradual sloping, moderately drained soil found on uplands and upper side slopes. The fragipan can limit rooting depth. This soil has a site index of 70 for white oak and 88 for yellow poplar.

Bu-Burnside silt loam, occasionally flooded, 0 to 2 percent

This is a deep, well drained, and moderately well drained soils on flood plains. These soils are moderately permeable.

Access

Access to the tract is excellent due to the county road along much of the north boundary, one interior fire lane (3B) in the western portion, another fire lane (3A) along the western portion of the north line, and an interior skid trail which is being maintained for access into the central portion of the tract. An old roadbed enters the tract from Williams Road at the saddle in the ridgeline near the eastern line. This road is visible up the ridge line to the eastern property line. Three log yards and two parking units are maintained in this tract. From west to east one log yard is located at the entrance to fire lane 3A, a parking unit is located at the entrance to fire lane 3B, a log yard is located on Williams Road in the center of the tract, a third log yard is located on Williams Road in the eastern portion of the tract, and a second parking unit is located on Williams Road at the saddle on the ridgeline.

Boundary

Clockwise from the Northeast corner: A steel post marks the east line near the road. This is Martin-Lawrence County line. The line runs south over the ridgeline down to the stream channel. One more steel post was located on the ridge top. No more evidence was found until a T post marking the line was discovered across the creek. This post seems to be about 20 yards west of the line ran from the county road. (The line was shot with a hand compass and vegetation was very dense.) The boundary follows the drainage west just past fire lane 3B to meet private property. This line is poorly defined. The line turns north and runs to the ridge top. No evidence was found along this line. At the ridge top, the line turns back west. No evidence is present along the line until the west line is reached. Here there is a survey marker set by the Division of Forestry. The line turns north and crosses fire lane 3A. At a point just north of the fire lane, the line turns east. This line has been surveyed and is marked with orange carsonite posts. Although the line does not exactly follow the fire lane, the lane is generally used as the property line for management. The remainder of the boundary follows Williams Road back to the east and the point of beginning. Portions of the private property line were painted orange during the previous inventory in 2012 and repainted by Josh Kush in 2016.

Ecological Considerations

Wildlife use this tract heavily and many species were observed during the inventory. Those observed were White-tailed deer, fox and red squirrels, chipmunks, various songbird species, red-tailed hawks, turkey vultures, box turtles, and rabbits. There are numerous mast-producing trees on the tract, especially hard mast. Several den trees or potential den trees were seen during the inventory.

The Indiana DNR Division of Forestry has developed compartment level guidelines for snag tree retention, an important wildlife feature. Snags are standing dead or dying trees. Snags provide value in a forest in the form of habitat features for foraging activity, den sites, decomposers, bird perching, bat roosts, squirrel caches, and stores a wide variety of invertebrates. As time passes, these snags fall contributing to the nutrient cycling as downed woody debris (DWD). DWD decomposes providing nutrients for remaining and new vegetative growth as well contributing to the complexity of the forest floor.

Snags	Maintenance Level	Inventory	Above Maintenance level
5"+ DBH	448	750	302
9"+ DBH	336	565	229
19"+DBH	56	83	27

A snag inventory was conducted along with the timber inventory and showed to be above maintenance level for snags in all DBH categories. The prescribed management will maintain or enhance the relative abundance of these features.

The tract is entirely forested. The dominate cover type is oak-hickory which covers about 90 acres and is found primarily on the slopes and ridgetops. Mixed hardwoods cover type is present on about 15 acres and is found in the lower portions by ephemeral drainages and the intermittent stream.

The mesic oak-hickory community overstory is mostly black oak with representation from white and red oak and some hickories (e.g., shagbark, pignut, bitternut). Mid-story in this community is composed of white oak and pignut hickory with maple and beech also having a presence. Regeneration openings created in the 2003 harvest are dominated by yellow poplar with some oak saplings and briers beneath them. Throughout the tract there are some oak saplings but mostly dominated by maple (red and sugar), American beech, and some white ash. The non-woody community of the stand is a mixture of species commonly associated with this forest type which includes but not limited to, green brier, and viburnum.

For the mixed hardwood community, the overstory is mostly yellow poplar with sugar and red maple, American beech, and some oak (white, black, red), and pignut hickory. In the midstory it is mostly red and sugar maple, American beech, with a few pignut hickory and white oaks. For the understory it is almost exclusively sugar maple and American beech with some red maple, and white ash. The non-woody community of the stand is a mixture of species commonly associated with this forest type which includes but not limited to, spicebush, viburnum, and various species of grasses.

Multi-flora rose is scattered throughout the tract with greater concentrations being found around the log yards and in the bottomland.

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.

Recreation

The most common form of recreation on this tract is hunting and many old tree stands were seen at time of inventory. There are no dedicated recreation trails in this tract.

Cultural

This tract was reviewed for cultural sites during the forest resource inventory. Cultural resources may be present on this tract, but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Tract Subdivision Description and Silvicultural Prescription

A current forest resource inventory was completed on 07/01/2021 by Seasonal Resource Manager Bailey McIntire. A summary of the estimate tract inventory results is in the tables below.

This tract can be split into two different cover types with most of the tract being classified as mesic oak-hickory and some areas being classified as mixed hardwoods.

Mesic Oak-Hickory-90 acres

Tract Summary Data (Trees > 11" DBH)

Species	# Sawtimber Trees	Estimated Total Bd. Ft.
Black Oak	721	279,310
White Oak	449	212,540
Northern Red Oak	258	122,380
Yellow Poplar	178	72,640
Pignut Hickory	151	38,020
Shagbark Hickory	150	29,630
Sugar Maple	139	26,420
American Beech	98	22,970
Bitternut Hickory	18	11,860
Chinkapin Oak	39	11,480
Eastern White Pine	28	10,620
Red Maple	48	5,800
Eastern Redcedar	27	3,560
Total	2,304	847,230

Inventory analysis for this cover type shows an estimated total volume of 847,230 Board Feet (BF) with 1,374-2,374BF per acre of potential volume to be removed through a timber harvest. For the midstory it is predominantly white oak and hickory (pignut and shagbark) with a few black and red oak throughout. Some sugar and red maple are present in the midstory as well. The understory is dominated by red and sugar maple and American beech. There are some oak and hickory saplings present but far fewer and more scattered. With the canopy now closed in this tract the midstory oak and hickory is starting to decline as the overstory crowns have expanded to fill in canopy gaps. This portion of the tract could use an improvement harvest to release midstory oak and hickory and to capture mortality in the larger black oaks which show signs of decline. The harvest would primarily focus on poor quality, damaged, low vigor, poor health trees. Prior to or shortly after the harvest this area could use a prescribed fire with a goal of exposing bare mineral soil and reducing the amount of maple and beech saplings over the entire area but focusing in areas that are identified to have potential for oak and hickory regeneration to occur. This would help to promote the establishment of less shade tolerant species such as oak and hickory to ensure they remain a strong component of the composition of species long term.

Mixed Hardwood-15 acres

Tract Summary Data (Trees > 11" DBH)

<u>Species</u>	<u># Sawtimber Trees</u>	<u>Estimated Total Bd. Ft.</u>
Yellow Poplar	113	55,070
Sugar Maple	231	33,590
Red Maple	99	20,910
American Sycamore	67	14,050
Black Oak	18	11,430
Pignut Hickory	21	7,650
Northern Red Oak	20	7,040
White Oak	7	5,700
Black Walnut	38	5,560
Sassafras	6	2,530
Basswood	9	1,740
Total	629	165,270

Inventory analysis of this stand shows an estimated total volume of 165,270 BF with 2,445-3,445 BF per acre of its potential volume to be removed through a timber harvest. The midstory is predominantly yellow poplar, red and sugar maple, and American beech. In the understory it is almost exclusively red and sugar maple and American beech with some white ash present. Most of this cover type is in the bottomland area near the ephemeral stream and transitioned to yellow poplar with some areas containing good quality black walnut that could use release. The maple and beech present are of low quality and vigor and should be thinned. Some of the mixed hardwood areas are near old regeneration openings that could be extended while the timber stand improvement (TSI) is performed in the old openings. The goal in these openings would be to promote some species that are less shade tolerant to establish within the openings. These openings would be extended when the improvement harvest is conducted in the oak-hickory cover type within the same tract. With these openings, some of the denser areas will also be marked for an improvement harvest focusing on poor quality, damaged, low vigor, and poor health trees to sustain and improve the health of the tract while reducing competition for available nutrients and sunlight.

The whole tract would benefit from some post-harvest TSI which would focus on releasing desirable trees from competition and complete openings that were created during the harvest. The TSI would focus on removing poor form/vigor stems thus releasing some of the better quality and healthier saplings in the midstory and understory.

Summary Tract Silvicultural Prescription and Proposed Activities

Both cover types will be managed under the same general prescription. An improvement harvest is recommended utilizing single tree selection, regeneration opening, group selection, or shelterwood cuts to promote less shade tolerant species in those areas removing an estimated 169,880-289,880 BF. Prior to the harvest TSI is recommended to reduce vines present in previous openings. Within two years after the harvest, TSI is recommended to complete any

openings created and to reduce the understory in any shelterwoods to increase light penetration to the ground layer. Starting within two years after post-harvest TSI a prescribed fire regime should be started on suitable areas of the tract. This will reduce the understory competition and expose bare mineral soil to promote species which require more light and bare mineral soil for seed germination. 3-5 years after the harvest a walkthrough of the areas that were established for regeneration openings or shelterwoods for any additional TSI needs and address invasive species accordingly. The evaluation should be done every 5-10 years after the initial evaluation. Additionally, every year the fire lane should be maintained by brush hogging as staffing permits to maintain accessibility. In 2041 this tract will need to be inventoried and a new resource management guide drafted.

Soils/Hydrology: Management activities conducted on this tract will abide by State established BMP's to minimize the impacts of the management on soils and hydrology.

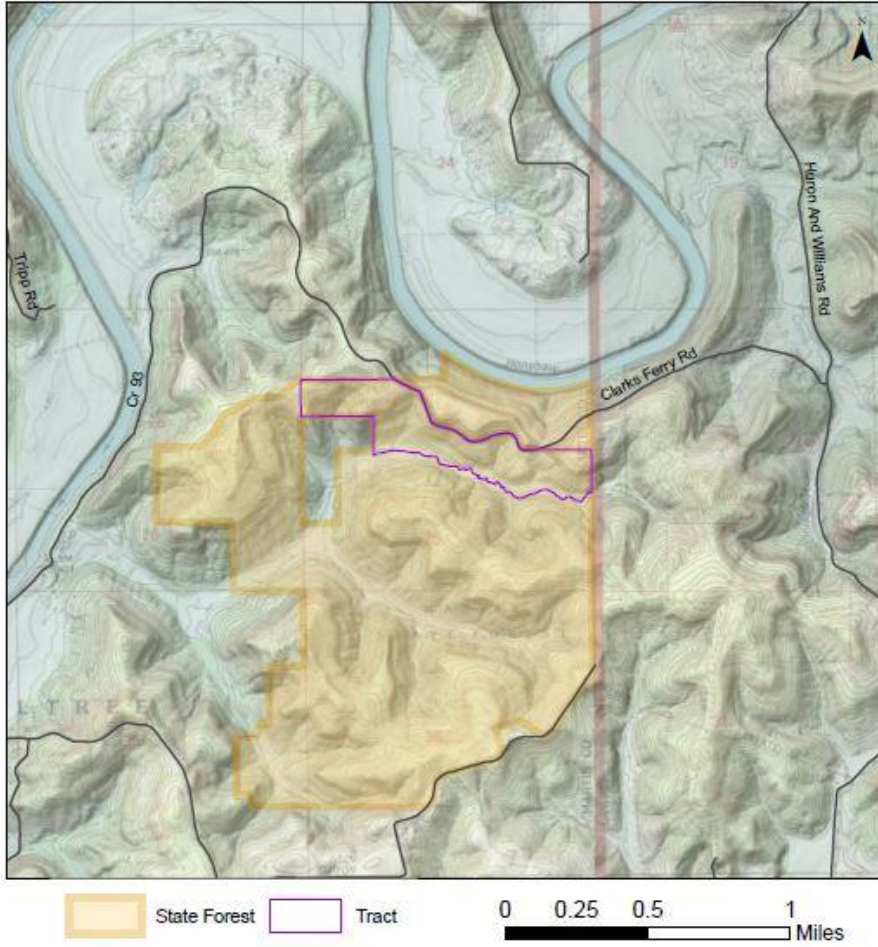
Wildlife: Activities prescribed for this tract will maintain habitat for wildlife and even enhance habitat for some species that require a range of forested habitat for example closed canopy and early successional through management. Also, for bats the number of snags will increase with the TSI and prescribed fire within the tract.

Recreation: Recreation within the tract will be temporally suspended during periods of active management for public safety. The prescribed management is likely to enhance hunting recreation by sustaining long term forest health, increasing hard and soft mast, and diversifying forest structure.

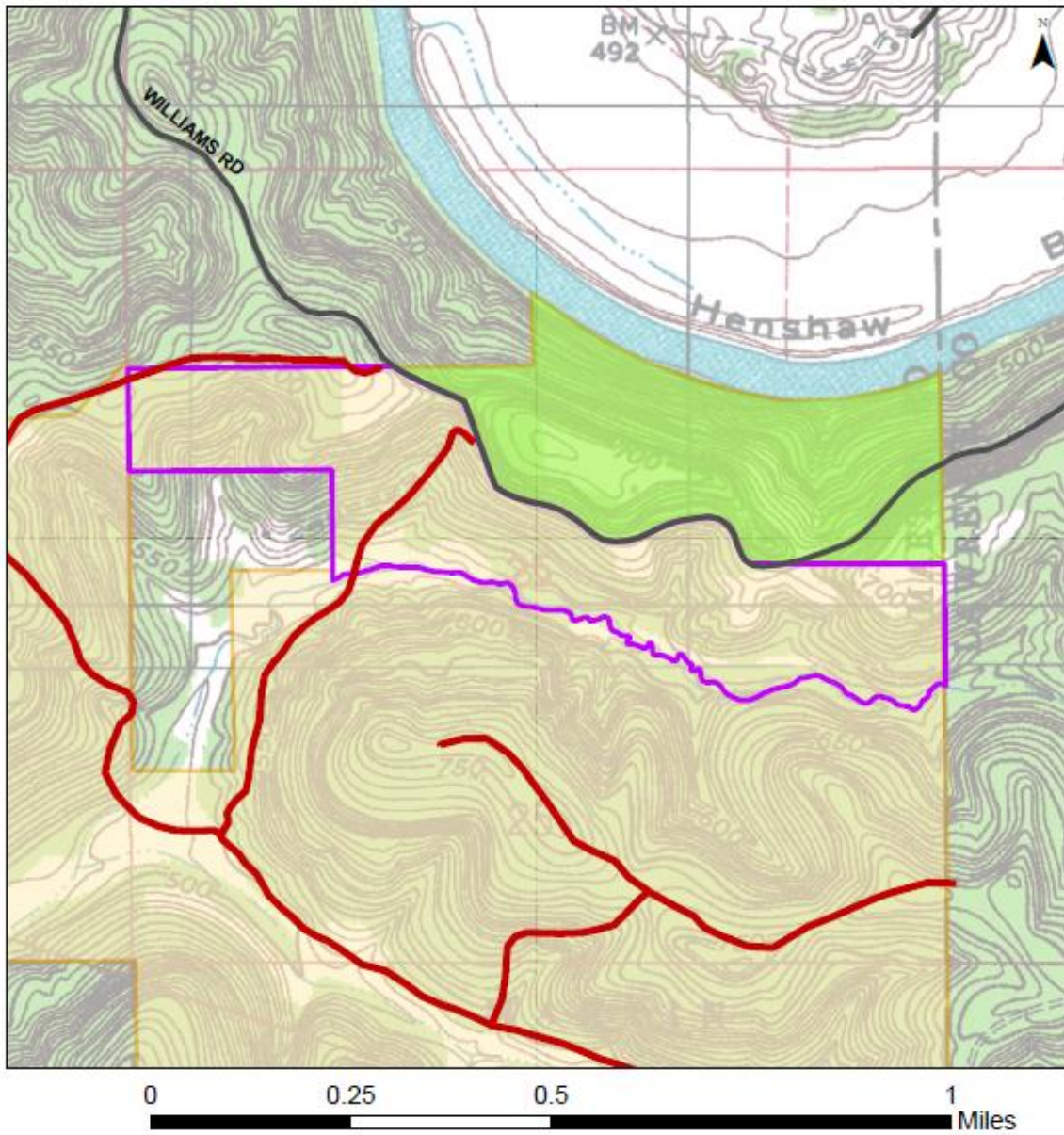
Proposed Activities Listing

<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Pre- Harvest TSI/invasives	Fall 2022- Spring 2023
Timber Harvest	2023-2026
Post-Harvest TSI Including Invasives	1-2 Years after Harvest
Prescribed Fire Regime	>1Year after TSI
Monitor regeneration opening	3 years post-harvest-2041
Inventory and resource management guide	2040-2042

Location Map Compartment 3 Tract 2

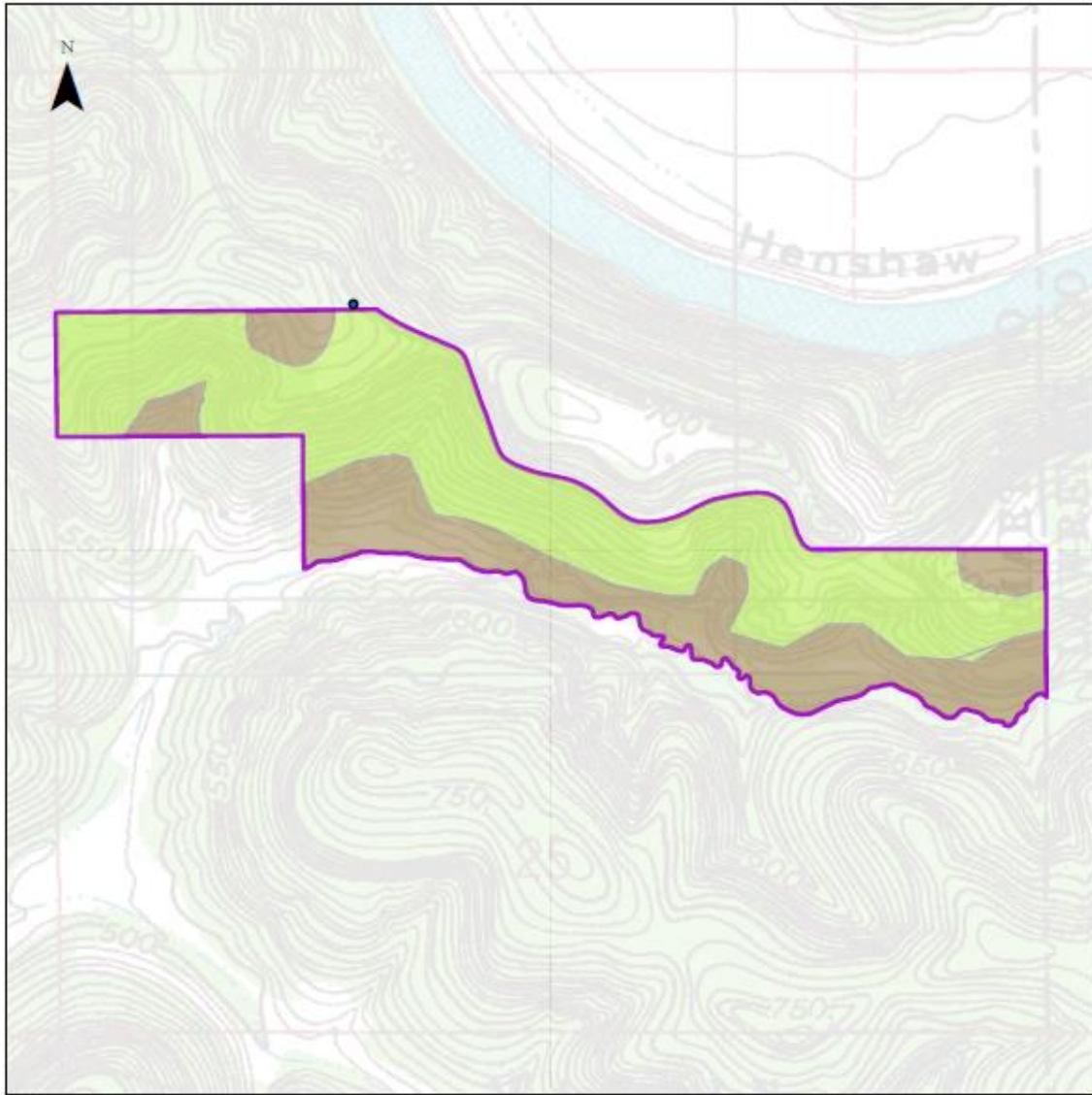






Martin State Forest Compartment 3 Tract 2 Tract Map



- Fire Lane
- Nature Preserve
- Tract boundary
- State Forest

Martin State Forest Compartment 3 Tract 2 Cover Types Map



-  Tract Boundary
 -  Wildlife Ponds
- CoverType
-  Mesic Oak-Hickory
 -  Mixed Hardwoods

0 0.13 0.25
Miles

Martin State Forest
Forester: Alex Gust
Management Cycle End Year 2042

Compartment 05 Tract 05
Date 6/1/2022 Acres 120
Management Cycle Length 20 Years

Location

Compartment 5 Tract 5, also known as 6360505, is in Martin County, T3N R3W, in sections 11&14. This tract is approximately 5 miles northeast of Shoals, Indiana.

General Description

This tract consists of mostly oak-hickory cover type which covers approximately 92 acres with the remainder in mixed hardwoods cover type. The oak-hickory on the western aspect slopes has good quality oak and hickory present with some areas exhibiting fire damage at the base of the trees. For the eastern aspect of the oak-hickory cover type most of the timber appeared to be of excellent quality. There are two old regeneration openings present which have regenerated mainly to tulip poplar with some black cherry and oak around the edges.

History

- November 1968 – This tract was obtained through a land exchange with the U.S.D.A. Forest Service.
- December 1973 – The tract was inventoried by Bill Hahn which indicated there was an estimated 449,758 board feet (BF) doyle, 3,747 BF/acre.
- December 1976 – Sold an estimated 98,502 BF in 362 trees and another 8,144 BF in 20 ‘prime’ white oak trees. This harvest was completed in 1978 and was confined to the east, northeast side of the ridge.
- Spring 1979 – The three log yards were planted to yellow poplar. The center yard had a 10-15’ wide strip down the center planted to sorghum/sunflower for wildlife. In 1981, this yard had an area along the north edge cleared, disced, and planted with a wildlife mixture. The third (southernmost) yard also had an area along its south edge planted for wildlife at this time.
- 1999 – an inventory by Jim Lauck was conducted and reported 1,053,930 board feet doyle, 8,782 BF/acre. Top three species by volume were black oak, white oak, and red oak.
- 2000 – Sold an estimated 240,648 BF in 1,124 trees for \$84,226.90. Two openings totaling 2.5 acres were created during the 2001 harvest. Top three species by volume were black oak, white oak, and red oak.
- 2003 – Post-harvest timber stand improvement (TSI) was completed.
- 2012 – Inventory completed by forester Abe Bear was conducted and reported 846,960 BF doyle, 7,058 BF/acre. Top three species by volume were white oak, black oak, and northern red oak. In the guide it stated the tract should be harvested around 2015-2020 focusing on the western side of the tract. This harvest was not conducted for unknown reasons.

Landscape Context

Most of the surrounding landscape is well established forestland with some areas being agricultural mostly for cattle but a few for row crop production. Only a few residential areas are within the landscape. I do not expect many changes occurring in this landscape within the next

twenty years.

Topography, Geology and Hydrology

The entire tract drains into Beaver Creek, mostly through two intermittent streams that form the north and west tract boundaries, and very minorly (~2 acres) through an intermittent stream ¼ mile north of the tract.

Soils

Most of this tract is in the Wellston-Tipsaw-Adyeville complex, 18 to 70 percent slopes. This severe sloping, moderately deep, moderate to excessively drained soils is on side slopes.

The next most prevalent soil is Wellston silt loam, 6-12 percent slopes, this moderately sloping, well drained soils is on narrow ridgetops and on side slopes of the uplands. Well suited for trees. The soil has a site index of 81 for red oak and 90 for yellow poplar

The third soil type is Wellston silt loam, 12-18 percent slopes, this steeply sloping, moderately well drained soils on structural scarps, ridges, and hill slopes. The soil has a site index of 81 for red oak and 90 for yellow poplar.

Access

Fire lane 19 traverses this tract along the prominent ridge that runs from northwest to southeast and then south. The fire lane enters the tract at the tract's northernmost point, close to the northeast corner of a privately owned tract of land. The fire lane parallels the north boundary of this private parcel, beginning at Williams Road, and then turns southeast upon entering tract 5 and follows the ridge until it meets U.S. 50. It is a well-maintained road. A low area approximately ¼ mile west of the private property corner, and steep slopes from U.S. 50 to the top of the ridge restrict road use at times. There is an old roadbed that begins at U.S. 50 at the major drainage at the northeast corner of the tract. This roadbed runs parallel to the highway, 100-200 feet from the highway, for approximately ¼ mile before turning back to meet with the highway again. This roadbed has been abandoned for many years and may have been a section of the old U.S. 50 highway. In the early 1990s, fire lane 19 was improved along its entire length to allow better access for resource management, fire suppression and timber harvesting.

Boundary

The north boundary follows a major drainage southeast from the northeast corner of private property to U.S. 50. The east and south boundaries follow U.S. 50 to its intersection with the north boundary of private property. From this point the property line follows this boundary west to its intersection with the major north-running drainage, and then follows this drainage north to the south boundary of private property. The private property boundary makes up the west tract boundary. The common boundary with private property in the southern end of the tract is not obvious and flagging only provides an estimate of the line location. A tree with fencing running both directions marks the southeast property corner, and the line between the two corners has occasional old fence wire showing along with numerous private property signs

Ecological Considerations

Wildlife use this tract heavily and many species were observed during the inventory. Those

observed were eastern wild turkey, white-tailed deer, squirrels, chipmunks, various songbirds, hawks, turkey vultures, and rabbits. There are numerous mast-producing trees within the tract, especially hard mast. Several den trees or potential den trees were observed during the inventory. This tract has a good mix of tree species providing a wide range of benefits such as foraging, protection in the form of thick areas in the old regeneration openings, and water in the intermittent streams and the wildlife pond within the tract.

The Indiana DNR Division of Forestry has developed compartment level guidelines for snag tree retention, an important wildlife feature. Snags are standing dead or dying trees. Snags provide value in a forest in the form of habitat features for foraging activity, den sites, decomposers, bird perching, bat roosts, squirrel caches, and stores a wide variety of invertebrates. As time passes, these snags fall contributing to the nutrient cycling as downed woody debris (DWD). DWD decomposes providing nutrients for remaining and new vegetative growth as well contributing to the complexity of the forest floor.

Snags	Maintenance Level	Inventory	Above Maintenance Level
5"+DBH	480	713	233
9"+DBH	360	258	-102
19"+DBH	60	115	55

Snag inventory data indicates both the 5" and 19+" DBH size class exceed maintenance level targets. While the 9" DBH size class is below the maintenance level target, it should be noted that these are compartment level targets. While a particular size class may be low in one tract it may exceed in another.

This tract is over half mesic oak-hickory community with the remaining acres being mixed hardwood areas in lower portions of the tract by ephemeral drainages and a portion on the ridgetop where past land use was likely farming.

The mesic oak-hickory community overstory is mostly white oak with a good representation of species from the red oak group (e.g., red, black, and scarlet) and hickory (e.g., shagbark and pignut.) The midstory is a good mix of white oak and pignut hickory with some black oak and shagbark hickory. Regenerating openings created in the 2001 harvest are dominated by yellow poplar with some black cherry, white oak, and black and red oak. Poplar is overtopping the oak. The regeneration openings do have an abundance of vines and should be controlled. Greenbrier is present in the openings as well. Throughout the tract there are some oak saplings but mostly it is dominated by maple (e.g., red and sugar), American beech, and white ash. The non-woody community of the tract is a mixture of species commonly associated with this forest type which includes but not limited to, green brier, viburnum, and blackberry.

The mixed hardwood community overstory is mostly yellow poplar with American beech, maple (e.g., sugar and red), American sycamore and some oak (e.g., white, black, red) and pignut hickory mixed in. The midstory is mostly maple, American beech, and blackgum with a few pignut hickory and chinkapin oak. The understory is almost exclusively sugar maple and American beech with some red maple, white ash, and blackgum. The non-woody community of

the stand is a mixture of species commonly associated with this forest type which includes but not limited to, spicebush, viburnum, and various species of grasses. There is some multiflora rose within this tract which will need to be treated to minimize spread and reduce abundance.

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.

Recreation

Recreation within this tract is primarily hunting, gathering, and hiking. A small section of hiking trail is in the very southern portion of the tract. In the late 1980s, a spur trail (approximately 300 feet long) was built to connect fire lane 19 to fire lane 6. This trail was then continued another 300 feet west from fire lane 6 to the “Cookshack Trail”. A parking area located at the south end of fire lane 19 provides recreational access to the tract and the spur trail to Cookshack Trail.

Cultural

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

Tract Subdivision Description and Silvicultural Prescription

This tract has two distinct cover types which are oak-hickory and mixed hardwoods. Most of the area is represented by oak-hickory.

Mesic Oak-Hickory – 92 Acres

This cover type has some quality timber present. Most of the highest quality is in the east portion of the tract where there is a greater presence of northern red oak. White oak is still a good portion of the overstory. On the west side there is more evidence of past fire with some trees having visible fire scars. The west side has mostly white oak with black and scarlet oak being the next prominent species. Midstory throughout this cover type has a good oak/hickory component with some maple/beech coming into this stratum as well. Overall, the canopies have closed since the last harvest. Also, many black oaks are showing signs of decline and some of them have significant dieback in the crown. There is blowdown present on the west slope which trees are still in good shape to be salvaged and there are many dead/dying scarlet oaks that can be salvaged as well. Taking all of this into consideration the tract could benefit from a harvest utilizing single tree and group selection or patch cuttings with the objective of maintaining the overall health and quality of the stand while releasing future trees in the midstory. During this harvest, the trees targeted for removal should be poor quality/vigor, damaged, and poor/declining health. There is a good amount of oak saplings present, especially on the western side where mortality of scarlet/black oak was observed. There are a few patches of multiflora rose in this stand that should be controlled to minimize spread.

Mixed Hardwood – 28 Acres

This cover type is mostly lower quality timber with most of the better quality being yellow poplar that is larger and showing signs of decline. The next most prominent species is red maple located on the ridgetop. In the lower areas by the intermittent streams there is a good mixture of sugar maple, American sycamore, American beech, and some black walnut. This cover type has

good stocking but could benefit from an improvement harvest to remove some of the over mature and declining yellow poplar while improving the overall health, vigor, and quality of the stand. During the next harvest, the trees targeted for removal should be poor quality/vigor, damaged, and poor/declining health trees. There are vines present in the old regeneration opening that must be controlled prior to this harvest. This will minimize negative impacts to growth and survival of the young trees advancing in the openings. Also, there is a good number of oak/hickory seedlings present around the edges of the openings that need to be released from other competing trees to promote the oak/hickories in the opening.

The current forest resource inventory was completed on 6/1/2022 by Forester Alex Gust. A summary of the estimated tract inventory results are located in the table below.

Tract Summary Data (trees >11”DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
White Oak	1,147	335,140
Black Oak	731	230,960
Northern Red Oak	409	169,140
Yellow Poplar	483	164,150
Scarlet Oak	373	114,740
Pignut Hickory	276	39,530
Sugar Maple	254	33,580
American Sycamore	63	27,330
Black Cherry	83	20,870
Bitternut Hickory	118	15,210
Red Maple	91	13,010
Blackgum	65	6,060
American Beech	71	4,500
Chinkapin Oak	63	3,300
Shagbark Hickory	16	3,130
Largetooth Aspen	20	2,990
Black Walnut	13	2,860
Honeylocust	27	1,920
Total:	9,165	1,188,420

Summary Tract Silvicultural Prescription and Proposed Activities

Both cover types would benefit from an improvement harvest with some areas using group or patch-cut openings or an oak shelterwood to promote less shade tolerant species especially on the south and west slopes. The estimated removal is 237,684 - 415,947 BF. Prior to a harvest, some timber stand improvement (TSI) should be completed to address vines in the mixed hardwood cover type and openings established during the previous harvest. Within two years following the harvest, TSI should be conducted to complete openings and reduce the understory in any oak shelterwood areas to increase light penetration to the ground layer. Starting within two years

following post-harvest TSI a prescribed fire regime should be established to reduce shade tolerant species in the understory and improve oak seed germination to promote species which require light and contact with bare mineral soil for seed germination. Between 3-5 years following the harvest a walkthrough of the tract should occur to review openings and shelterwoods for established regeneration and invasive species. Between 8-12 years following the post-harvest TSI openings should be monitored for additional TSI needs. Annually, the fire lane should be maintained for continued accessibility. In 2042 this tract should be inventoried, and a new management guide developed.

Soils/Hydrology: Management activities conducted on this tract will abide by Division of Forestry Best Management Practices (BMPS) standards to minimize the impacts of the management on soils and hydrology.

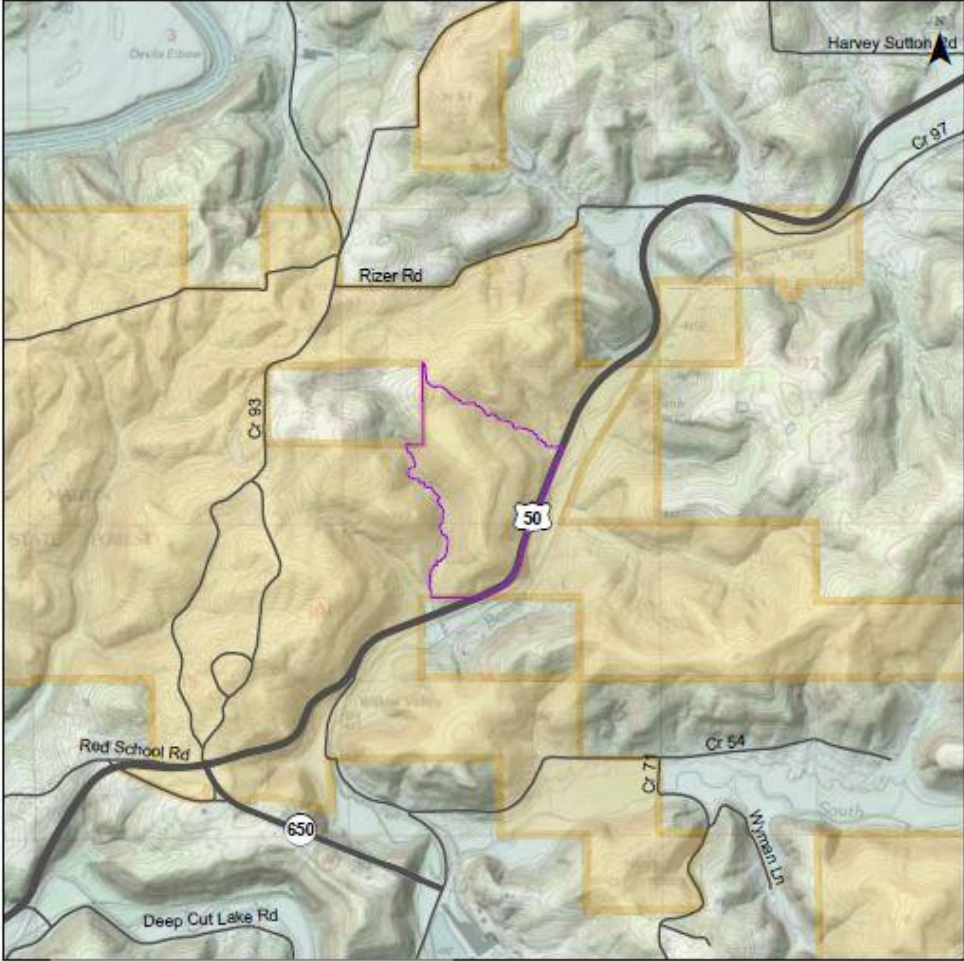
Wildlife: Activities prescribed for this tract will maintain habitat for wildlife and even enhance habitat for some species that require a range of forested habitat for example closed canopy and early successional through management. Also, for bats the number of snags will likely increase through TSI and prescribed fire.

Recreation: Access within the tract will be temporally suspended during active forest management for public safety. Overall, with the proposed management for this tract will enhance hunting opportunities due to improving crown spacing which will increase hard mast production. Early successional habitat created will provide suitable foraging, refuge, and nesting habitat for a broad range of game and non-game wildlife.

Proposed Activities Listing

<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Pre- Harvest TSI	Fall 2022
Timber Harvest	2023-2024
Post-Harvest TSI Including Invasives	1-2 Years after Harvest
Prescribed Fire Regime	At least 1 Year after TSI
Regeneration opening monitoring	3 years post-harvest-2041
Inventory and new guide	2041-2043

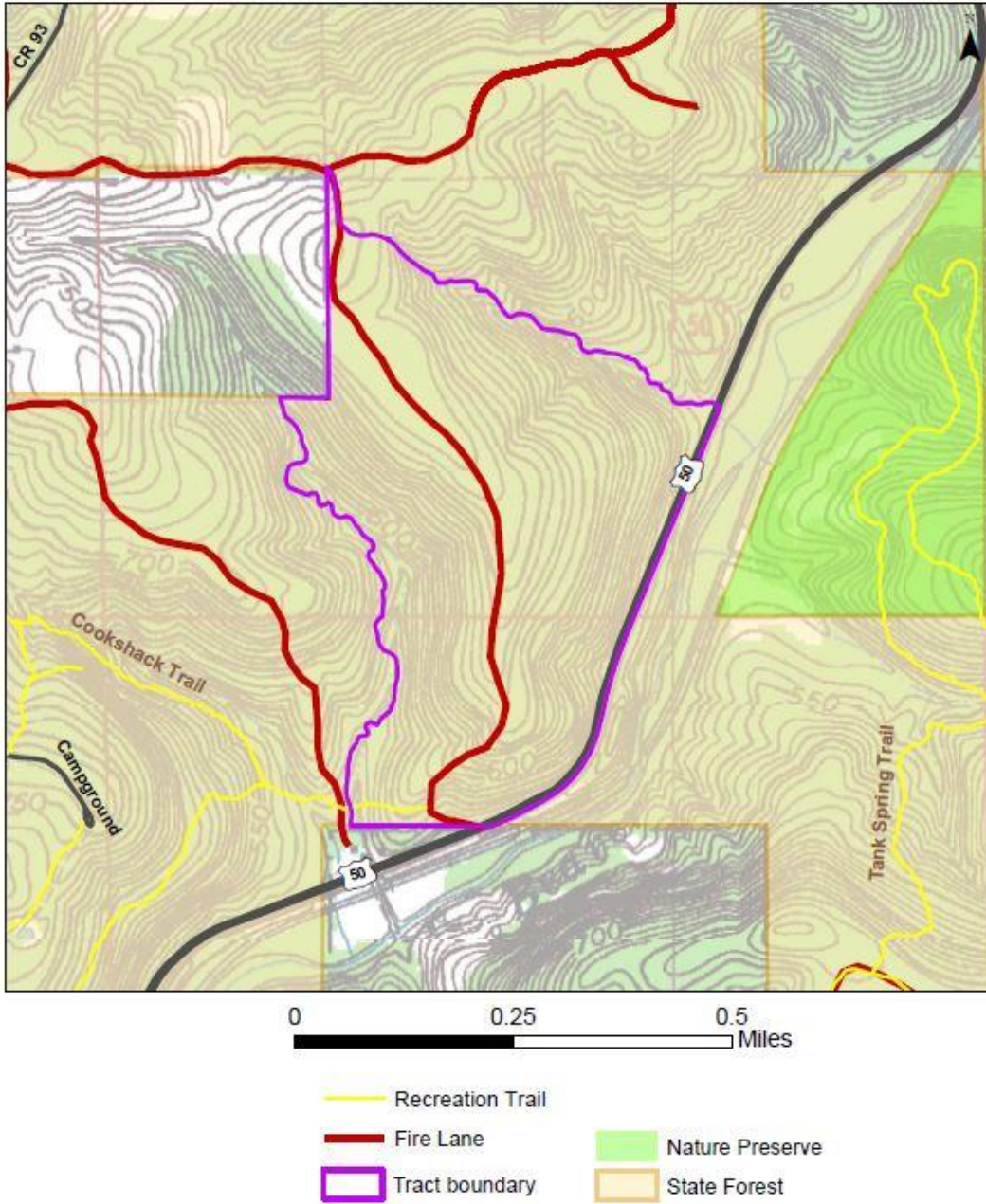
Location Map
Compartment 5 Tract 5



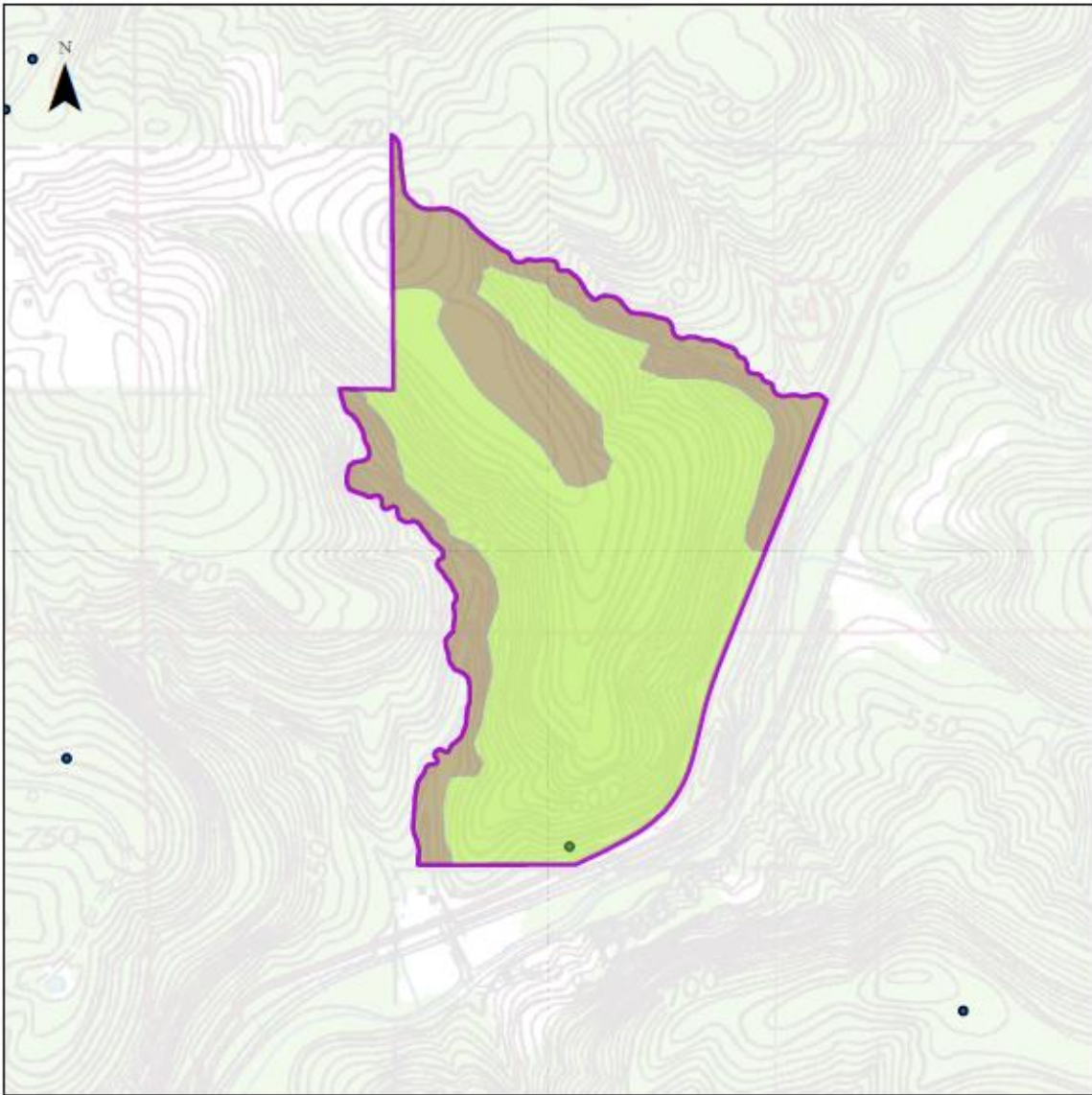
State Forest Tract

0 0.25 0.5 1 Miles

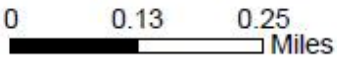
Martin State Forest Compartment 5 Tract 5 Tract Map



Martin State Forest Compartment 5 Tract 5 Cover Types Map



- Tract Boundary
 - Wildlife Ponds
- CoverType
- Mesic Oak-Hickory
 - Mixed Hardwoods



Martin State Forest
Alex Gust/Bailey Mcintire
Management Cycle End Year 2041

Compartment 6
Date: 6/30/2021
Management Cycle Length 20 Years

Tract 4
109 Acres

Location

Tract 4, also known as 6360604, is located about 4 miles northeast of Shoals Indiana on the southeast side of US 50 and CSX Railroad line in Martin County, T 3N, R 3W, Sections 13 & 14. Tank Spring Nature Preserve (Comp 6 Tract 3) borders the tract to the north.

General Description

The tract is mostly a northern aspect dominated slope. The far southern edge of the tract falls on the south facing slope south of fire lane 6A. The timber is mostly mesic oak hickory but there are some mixed hardwoods. Most areas of oak-hickory, except for the south slope, are mesic. Also, along the western section of the tract is the CSR railroad tracks, which makes up approximately 12 acres of the tract.

History

- 1942 – This property was originally acquired by the USDA in 1942. The NW ¼, NE ¼ and 10 acres off the W side of the NE ¼, NE1/4, Section 14 were acquired in a “taking” action. The SE ¼, NE ¼, Section 14, and the W ½, NW ¼, Section 13 were purchased at a tax sale.
- This area was transferred to state of Indiana in a 1966 land exchange with the forest service.
- Short section of fire lane was constructed in 1994 connecting this tract to Tract 7 to the southwest when an easement was purchased allowing access.
- In 1997 the tract area was simplified where the tract was reduced from 127 acres to what it is now. The acres it was reduced by were added to Tract three to the north.
- In 1999 an inventory was conducted by Jim Lauck which reported an estimated volume of 822,921 board feet, 8,229 board feet/acre. Top three species by volume were black oak, Yellow Poplar, and white oak,
- The tract was harvested in 2000 where 873 trees containing an estimated 189,429 board feet was sold for \$67,642.00. Top three species by volume were black oak, white oak, and yellow poplar.
- In 2002 post-harvest TSI was completed by property staff.
- In 2012 an inventory was conducted by Abe Bear which reported an estimated volume of 799,170 board feet, 7,332 board feet/acre. Top three species by volume were northern red oak, white oak, and yellow poplar.

Landscape Context

The primary land use in the area is timber production. This tract is part of a larger block of Martin State Forest. The tract to the north is the Tank Spring Nature Preserve and is primarily used for recreation. A large block of land to the north and east is owned by one individual. It is primarily used for timber production and open grassland. The only developed land in the area is the US Gypsum plant to the south and scattered residential homes. No changes in landscape are expected to occur in the surrounding area.

Topography, Geology and Hydrology

The topography is very workable in this tract. Much of the tract has a northern dominated aspect. Slopes are mild and there are no rock rims to restrict access. At least one flowing spring was found on the western side of the tract

Soils

AcIf – Adyeville-Tipsaw-Wellston complex, 18 to 50 percent slopes

This steep slopped soil type is somewhat moderately deep well drained to excessively drained found on hillsides.

WhfC2 - Wellston silt loam, 6 to 12 percent slopes

This moderately sloping, well drained soils is on narrow ridgetops and on side slopes of the uplands.

AgrB - Apalona-Zanesville silt loams, 2 to 6 percent slopes

This is a gradual sloping, moderately drained soil found on uplands and upper side slopes. The fragipan can limit rooting depth.

WhfD2 - Wellston silt loam, 12 to 18 percent slopes

This steeply sloping, moderately well drained soils on structural scarps, ridges, and hill slopes.

WprAH—Wirt loam, 0 to 2 percent slopes frequently flooded, brief duration.

This is a near level, deep, well-drained soil type experiences occasional flooding during parts of the year.

Access

The primary access for this tract is fire lane 6A from Tank Spring Road. The fire lane has steep descent from the county road but manageable for equipment.

Boundary

Beginning at the southeast tract corner, the boundary heads north up the hill and crosses the fire lane just west of the small wildlife pond in tract 5. The boundary follows the drainage northwest until reaching the section line dividing tracts 4 and 3. The boundary turns west along this line and meets HWY 50. HWY 50 forms the western boundary until reaching the west portion of the south property line. Here the tract boundary turns east and follows the property line to a corner stone marking the northeast corner of private property. There are bits of wire and stone fence along this line. At the corner stone, the line turns south for ¼ mile to another corner stone located just on the east side of fire lane 6A. Here, the line turns east for ½ mile to the point of beginning. The final ½ mile length is also private property line. There are bits of wire fencing and a ¼ stone along this line. All private property lines were painted orange in the summer of 2020.

Ecological Considerations

Wildlife use this tract heavily and many species were observed during the inventory. Those observed were eastern wild turkey, white-tailed deer, red and fox squirrels, chipmunks, various songbirds, hawks, turkey vultures, and a few rabbits. There are numerous mast-producing trees

on the tract, especially hard mast. Several den trees or potential den trees were seen during the inventory.

The Indiana DNR Division of Forestry has developed compartment level guidelines for snag tree retention, an important wildlife feature. Snags are standing dead or dying trees. Snags provide value in a forest in the form of habitat features for foraging activity, den sites, decomposers, bird perching, bat roosts, squirrel caches, and stores a wide variety of invertebrates. As time passes, these snags fall contributing to the nutrient cycling as downed woody debris (DWD). DWD decomposes providing nutrients for remaining and new vegetative growth as well contributing to the complexity of the forest floor.

Snags	Maintenance Level	Inventory	Above Maintenance level
5"+ DBH	436	768	332
9"+ DBH	327	657	330
19"+DBH	54.5	159	105

A snag inventory was conducted along with the timber inventory, and it showed to be above maintenance level for snags in all size classes. The prescribed management will maintain or enhance the relative abundance of these features.

This tract is over half oak-hickory community with the remaining acres being mixed hardwood in the northern aspect slopes and lower portions of the tract by ephemeral drainages. There is also some open area where the CSR railroad tracks run along the west side of the tract.

The oak-hickory community overstory is mostly black oak with a good representation of white oak and of other species from the red oak group (red and scarlet) and some hickory (shagbark and pignut.) Midstory in this community has a good mixture of white oak and pignut hickory with some black oak and shagbark hickory present as well. Regeneration openings created during the 2000 harvest are dominated by yellow poplar with some black cherry and white ash present but being overtopped by the poplar. Greenbrier was observed. Throughout the tract there are some oak saplings, but it is mostly dominated by maple (red and sugar), American beech, and white ash. The non-woody community of the stand is a mixture of species commonly associated with this forest type which includes but not limited to, green brier, viburnum, and blackberry.

The mixed hardwood community overstory is mostly yellow poplar with American beech, maple (sugar and red), and some oak (white, black, red) and pignut hickory mixed in. In the midstory it is mostly red and sugar maple, American beech, and blackgum with a few pignut hickory and white oak. For the understory it is almost exclusively sugar maple and American beech with some red maple, white ash, and blackgum. The non-woody community of the stand is a mixture of species commonly associated with this forest type which includes but not limited to, spicebush, viburnum, and various species of grasses. There were some multiflora rose observed.

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.

Recreation

The Tank Spring hiking trail runs through the eastern portion of the tract which is moderately well traveled. Other recreation use on this tract is hunting and there were a couple old stands found during the inventory.

Cultural

This tract was reviewed for cultural sites during the forest resource inventory. Cultural resources may be present on this tract, but their location(s) are protected. Adverse impacts to significant cultural resources will be avoided during any management or construction activities.

Tract Subdivision Description and Silvicultural Prescription

Forest Condition

A current forest resource inventory was completed on 06/30/2021 by Seasonal Resource Manager Bailey Mcintire. A summary of the estimate tract inventory results is in the tables below.

Oak-Hickory- 62 acres

Stand Summary Data (Trees > 14" DBH)

Species	# Sawtimber Trees	Estimated Total Bd. Ft.
Black Oak	423	179,180
Northern Red Oak	334	168,580
White Oak	198	97,580
Yellow Poplar	91	59,470
Bitternut Hickory	186	49,640
Sugar Maple	162	32,080
American Beech	33	13,120
Shagbark Hickory	44	9,580
Pignut Hickory	25	6,860
Chinkapin Oak	15	6,610
Sassafras	10	4,500
Black Cherry	6	3,880
Black Walnut	7	3,110
Total	1,534	634,190

Inventory analysis for this cover type shows an estimated total volume of 634,190 board feet (BF) with 102,672 - 139,872 BF available for removal during a timber harvest. For the midstory it is predominantly white oak and hickory (pignut and shagbark) with a few black and red oak throughout. Some sugar and red maple are present in the midstory as well. In the understory it is dominated by sugar maple and American beech with some red maple. There is some oak and hickory saplings present but few and scattered. With the canopy now closed throughout most of the tract the midstory oak and hickory is starting to slowly decline. This portion of the tract would benefit from an improvement harvest to release midstory oak and hickory and to capture mortality in the larger black oaks which show decline. Some areas could benefit from a shelterwood cut or regeneration opening to reduce mid shade tolerant species and improve sunlight advancing the oak and hickory mid and understory. The harvest would focus on removing poor quality, damaged, low vigor, poor health, and salvage blowdown. Prior to or

shortly after the harvest this area would benefit from a prescribed fire with the goal of exposing bare mineral soil and reducing the amount of maple and beech saplings focusing in areas that are identified to have potential for oak and hickory regeneration or where already present. This would help to promote the establishment of less shade tolerant species such as oak, hickory, and black cherry to ensure they remain a strong component within this cover type.

Mixed Hardwood- 35 acres

Stand Summary Data (Trees > 14" DBH)

Species	# Sawtimber Trees	Total Bd. Ft.
Yellow Poplar	245	107,140
American Sycamore	66	55,420
Black Oak	58	44,360
Northern Red Oak	122	38,920
Sugar Maple	37	14,140
Sassafras	55	12,270
Bitternut Hickory	29	9,050
Shagbark Hickory	26	8,760
Pignut Hickory	58	6,530
American Beech	24	4,870
Black Walnut	15	3,820
Boxelder	70	2,550
Total	805	307,830

Inventory analysis of this cover type shows an estimated total volume of 307,830 BF with 35,910 - 53,410 BF available for removal through a timber harvest. The midstory is predominantly yellow poplar, red and sugar maple, American beech and blackgum. The understory is almost exclusively red and sugar maple and American beech with some white ash. Most of this cover type has low to moderate quality maple and beech and would benefit from a harvest removing some of the poorest quality to release better, more vigorous trees. Areas with low basal area (BA) and poor-quality trees would be ideal locations for regeneration openings. The goal of the openings would be to promote species diversity, vigor, and quality. Other areas will be marked for improvement focusing on the removal of poor quality, damaged, low vigor, and poor health trees to sustain and improve the health of the stand long term while releasing the better-quality trees.

The entire tract would benefit from some post-harvest TSI which would focus on releasing trees from competition and complete openings that were put in during the harvest. Further, TSI would focus on removing poor form/vigor stems thus releasing the better quality and healthier saplings in the midstory and understory.

Summary Tract Silvicultural Prescription and Proposed Activities

Both cover types would benefit from an improvement harvest utilizing single tree and patch cuts or group selection openings. Oak shelterwood could be used to promote less shade tolerant species in some locations. The harvest would remove an estimated 138,582 - 193,282 BF. Prior to harvest, timber stand improvement (TSI) is recommended to reduce vines in the mixed

hardwood stand and thin old openings established during the previous harvest. Within two years after the harvest, TSI is recommended to complete any openings established and reduce the understory in any shelterwoods established. Following post-harvest TSI a prescribed fire regime should be started to reduce shade tolerant species in the understory and expose bare mineral soil to promote species which requires more light and bare mineral soil for seed germination. 3-5 years after the harvest a walkthrough should be conducted to evaluate regeneration within any shelterwood or openings for additional TSI needs. The evaluation should be done every 5-10 years after the initial to closely monitor the regeneration and any invasive species that may become established. Also, every year the fire lane should be maintained by brush hogging as labor staff permit to maintain accessibility. In 2042 this tract will need to be inventoried and a new management guide will need to be written for future management.

Soils/Hydrology: Management activities conducted on this tract will abide by State established BMP's to minimize the impacts of the management on soils and hydrology.

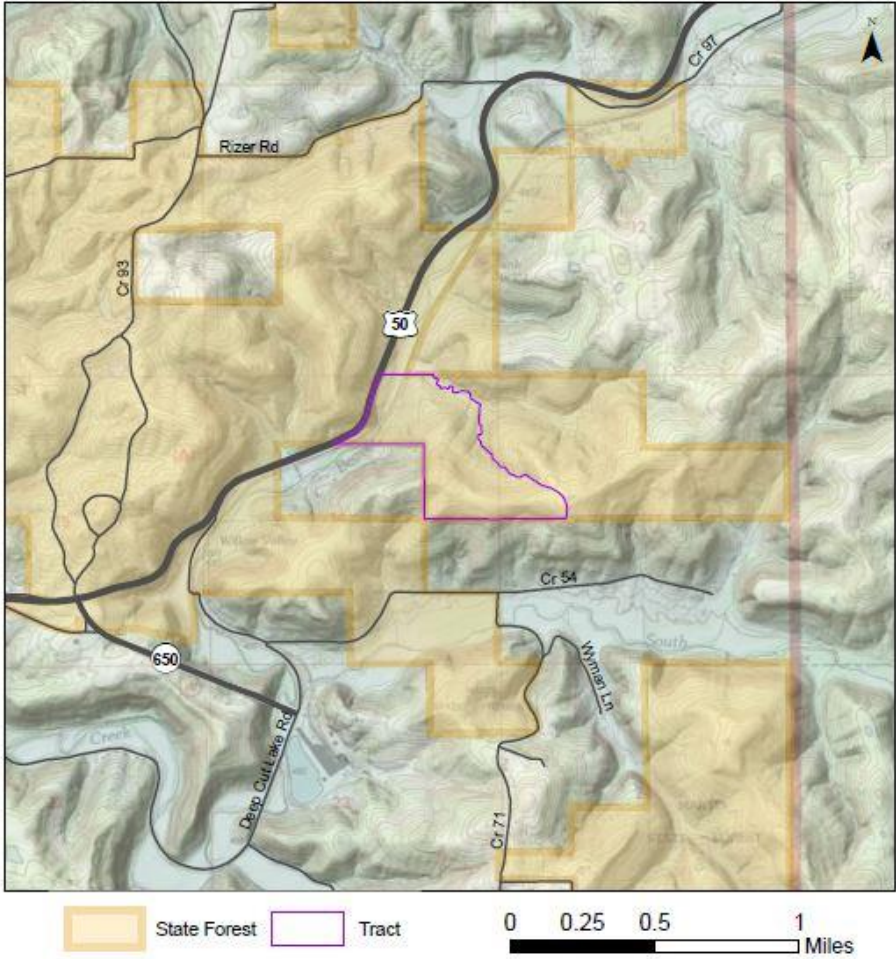
Wildlife: Activities prescribed for this tract will maintain habitat for wildlife and even enhance habitat for some species that require a range of forested habitat for example closed canopy and early successional through management. Also, for bats the number of snags will increase with the TSI and prescribed fire within the tract.

Recreation: Recreation within the tract will be temporally suspended during active forest management for public safety.

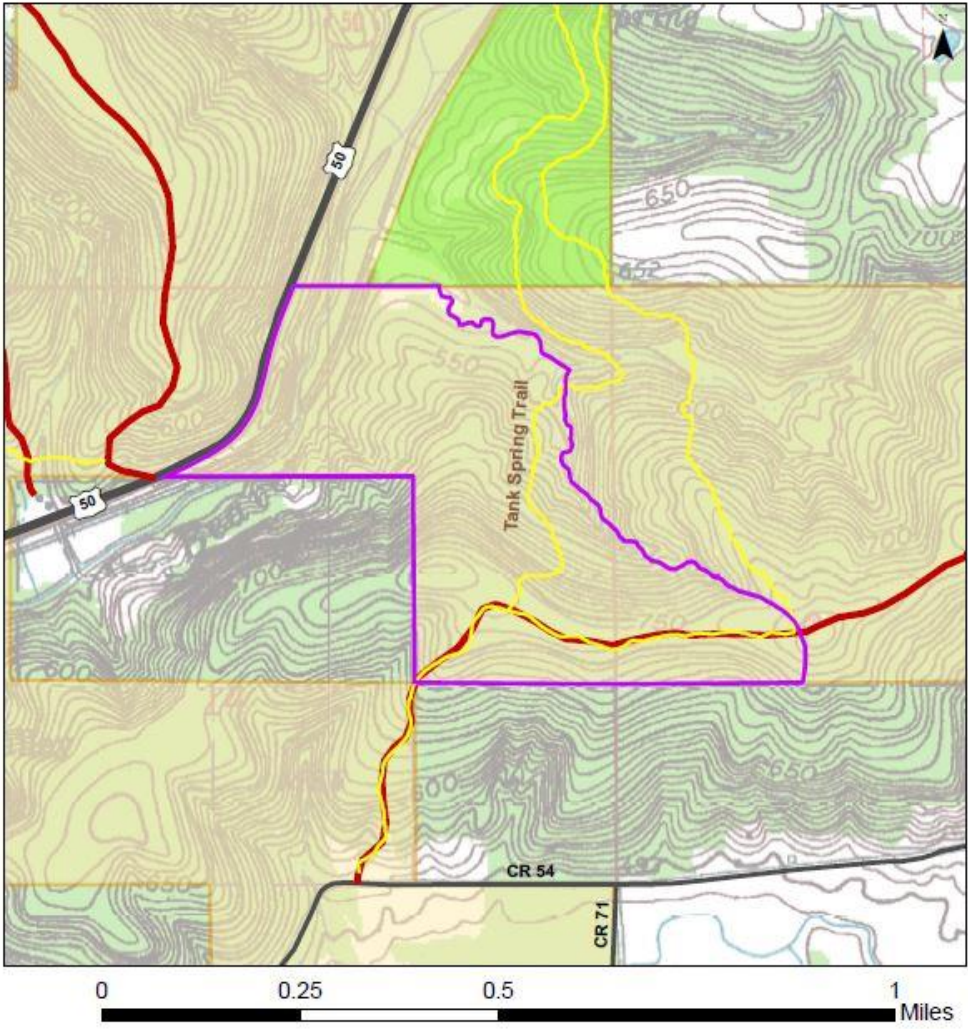
Proposed Activities Listing

<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Pre- Harvest TSI/Treat invasives	Summer/Fall 2023-2024
Timber Harvest	2023-2026
Post-Harvest TSI Including Invasives	1-2 Years after Harvest
Prescribed Fire Regime	At least 1Year after TSI
Regeneration opening monitoring	3 years post-harvest-2041
Inventory and Write new Guide	2040-2042

Location Map
Compartment 6 Tract 4

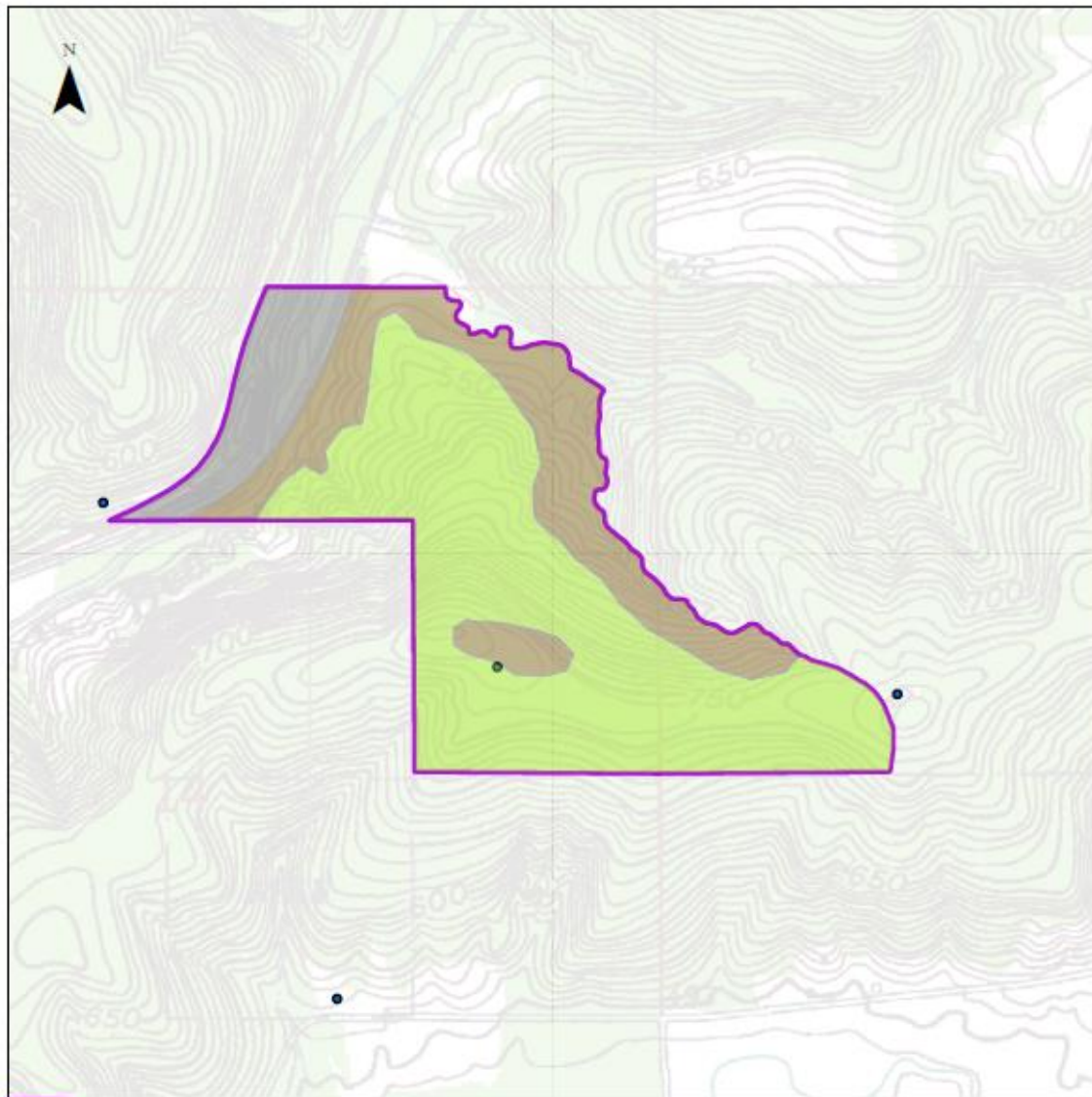


Martin State Forest
Compartment 6 Tract 4
Tract Map



- Recreation Trail
- Fire Lane
- Tract boundary
- Nature Preserve
- State Forest

Martin State Forest Compartment 6 Tract 4 Cover Types Map



Tract Boundary

Wildlife Ponds

CoverType

Mesic Oak-Hickory

Mixed Hardwoods

Non-forest

0 0.13 0.25
Miles