Clark State Forest **Compartment:**16 **Tract:** 07
Forester: Will Davis **Date:** June 2023 **Acres:** 112
Management Cycle End Year: 2043 **Management Cycle Length**: 20

Location

Compartment 16, Tract 7, also known as 6301607, is in Clark County, Indiana. This tract is in Section 31, Section 32, and briefly in Section 29 of T1N R6E. This tract is approximately 4 miles east from Borden, Indiana, and approximately 1 mile northwest of the Deam Lake State Recreation Area.

General Description

This tract has four different cover types: dry oak-hickory, mesic oak-hickory, mixed hardwoods, and beech maple. The dominant overstory species in the tract is chestnut oak with other notable overstory species being yellow poplar, white oak, sugar maple, and Virginia pine. Most of this tract has high stocking of sawtimber size trees. The invasive species presence throughout the tract overall is low, with only a few high-density areas. The regeneration is truly mixed in this tract with the four most prevalent species being: chestnut oak, American beech, yellow poplar, and sugar maple. Management of this tract will aim to lower the stocking through a timber harvest and timber stand improvement (TSI) in locations throughout to improve conditions for growth and advancement of oak and hickory.

History

- 1939 – Land acquired from Roerk
- 1940 – Land acquired from Jackson
- 1941 – Land acquired from McClellan
- 1951 – Land acquired from Thomas
- 1955 – Aerial photograph was taken showing the tract entirely forested
- 1960 – Aerial photograph was taken showing the tract entirely forested
- 1969 – Land acquired from the Clark County Board of Commissioners
- 1987 – Land acquired from Heath
- 1987 – Forest inventory completed for the State Forest Inventory Program
- 2023 – Forest inventory and resource management guide completed by Will Davis

Landscape Context

This tract is surrounded by Clark State Forest. The landscape is generally all forested and used for forestry activities. About 1 mile to the southeast is Deam Lake State Recreation Area. Approximately 0.5-1 mile to the northwest, there are residential homes, agricultural fields, and some private forest land.

Topography, Geology and Hydrology

6301607 consists of a large ridge that is at its highest point along the eastern portion of the tract. To the west, the terrain is more gradual than compared to the east. The tract is in the Muddy Fork watershed. There are several drainages within the tract which terminate in Dry Fork, a mapped intermittent stream. The entire tract could be defined as moderate to steep with most of the tract being western facing slopes.

6301607 is in the Mississippian Borden mapped bedrock formation. The formations constituting the Borden Group are the New Providence Shale, the Spickert Knob, and the Edwardsville. The Borden Group is composed dominantly of gray argillaceous siltstone and of shale. Fine-grained sandstone is common. Interbedded limestones form discontinuous lenses and facies that are minor except for the interval of the Floyds Knob Limestone Member at the base of the Edwardsville Formation.

General riparian management zone (RMZ) guidelines will be implemented in these areas in accordance with the 2022 Indiana Logging and Forestry Best Management Practices Field Guide.

Soils

BcrAW (8.3 Ac) – Beanblossom silt loam, 1 to 3 percent slopes, occasionally flooded, very brief duration

This nearly level, deep, well-drained soil is found along alluvial fans and flood plain. It is well suited to trees. Management planning should consider wet times of year. This soil has not been evaluated for site index.

CtwB (5 Ac) – Crider-Bedford-Navilleton silt loams, 2 to 6 percent slopes

This gently sloping, deep, well-drained soil is on ridgetops in the uplands. It is well suited to trees. Crider has a site index of 90 for white oak and 98 for yellow poplar. Bedford has a site index of 70 for white oak and 90 for yellow poplar. Navilleton has not been evaluated for site index.

GgbG (36Ac) – Gilwood-Brownstown silt loams, 25 to 75 percent slopes

This moderately to very steep, moderately deep, well-drained complex is on side slopes in the knobs. It is suited to trees. The hazard of erosion is the main management concern that should be considered when implementing Best Management Practices for Water Quality. Brownstown has a site index of 50 for black oak and Gilwood has not been evaluated.

GmaG (46.4 Ac) – Gnawbone-Kurtz silt loams, 20 to 60 percent slopes

This moderately to very steep, moderately deep, well-drained complex is found on side. It is well suited to trees. The hazard of erosion and equipment limitations are main management concerns. These should be considered when planning management activities and implementing Best Management Practices for Water Quality. Kurtz has a site index of 60 for Northern red oak and Gnawbone has not been evaluated.

KxkC2 (16.8 Ac) – Knobcreek-Navilleton silt loams, 6 to 12 percent slopes, eroded

This moderately sloping, deep, well-drained complex is on side slopes in the uplands. It is well suited to trees. Erosion hazards are the main management concern that should be considered during implementation of Best Management Practices for Water Quality. Knobcreek has a site index of 76 for Northern red oak and 86 for yellow poplar and Navilleton has not been evaluated for site index

Access

The access to 6301607 is by fire lane, which also serves as portions of the Tree Lane Loop Horse Trail and Dry Fork Loop Horse Trail. The fire lane runs along the northeastern boundary of the

tract and is accessible by vehicle from Tree Lane, a dead-end road off Bartle Knob Road. Dry Fork Loop Horse Trail runs through the interior of the tract and exits the tract at the southwestern tip.

Boundary

6301607 is surrounded by Clark State Forest. The tracts that border it are as follows: 6301606 to the north, 6301514 to the east, 6301608 to the south, 6301609 to the southwest, and 6301605 to the northwest. The western portion of the tract is bordered by Dry Fork and the southeast portion is bordered by an ephemeral stream. The following are the boundary features for each cardinal direction of the tract: the northern border consists of a drainage between two ridges, the eastern border is the Tree Lane Loop Horse trail, the southern border is a drainage between two ridges, and the western border is Dry Fork.

Ecological Considerations

This tract contains diverse vegetation and wildlife resources conducive to providing habitat for a variety of wildlife species. Habitat types include oak-hickory, mixed hardwoods, some conifers scattered throughout, and riparian areas. Evidence of several species of wildlife were noted at the time of inventory including white-tailed deer, eastern box turtles, multiple types of lizards, black rat snakes, garter snakes, and a variety of woodpeckers and songbirds.

The Division of Forestry has developed compartment level guidelines for important wildlife structural habitat features such as snags and legacy trees. Snags are standing dead or nearly dead 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, which provides habitat for many ground-dwelling species and contributes to healthy soils. Legacy trees are live trees of a certain species and diameter class, that have potential future value to various wildlife species, if retained in the stand. Current assessments indicate the abundance of these habitat features meet or exceed recommended maintenance levels.

The invasive species observed within the tract were: Japanese stilt grass, Japanese honeysuckle, bush honeysuckle, oriental bittersweet, and multi-flora rose. The most prevalent invasive species found was Japanese stilt grass. These invasive species are more prevalent near the streams and along the horse trails. Invasive species management could target these areas or a particular species, such as bush honeysuckle.

A formal Ecological Review process, which includes a search of Indiana's Natural Heritage Database, is part of the management planning process. If Rare, Threatened, or Endangered species were found to be associated with this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the population viability of those species or communities.

Recreation

The main recreational use in this tract is likely horse riding on Tree Lane Loop Horse Trail and Dry Fork Loop Horse Trail. These are horse trails that are commonly used by horse riders due to their proximity to Deam Lake State Recreation Area. Other likely uses of the tract include hiking, hunting, and foraging.

Cultural

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 activities.

Tract Subdivision Description and Silvicultural Prescription

The current forest resource inventory was completed in June of 2023 by Forester Will Davis. 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	1,830	203,560
Yellow Poplar	605	194,950
White Oak	847	169,050
Northern Red Oak	223	51,940
Scarlet Oak	182	44,480
Sugar Maple	614	41,160
Pignut Hickory	415	30,470
Virginia Pine	320	28,580
American Beech	285	25,350
Black Oak	78	23,130
American Sycamore	19	12,780
Blackgum	78	9,290
Shagbark Hickory	63	12,040
Black Cherry	26	7,490
Bitternut Hickory	55	5,380
Red Maple	32	3,170
Black Walnut	27	2,300
White Ash	9	2,180
Sassafras	37	860
Totals:	**5,745**	**868,160**

For the purposes of this resource management guide, this tract was divided into four cover types based on forest composition: dry oak-hickory, mesic oak-hickory, mixed hardwoods, and beech-maple.

Dry Oak-Hickory, 34 Acres

This cover type is the second largest portion of the tract at approximately 30% of the tract acreage. It is dominated by chestnut oak growing as well as the conditions allow. The percent stocking is estimated at 92% classifying it as fully stocked. Chestnut oak makes up 65% of the total volume for this cover type with Virginia pine next at 7%. Overstory mortality is low, and the trees are

generally healthy. The dominant regeneration in this cover type tends to be American beech, sugar maple, red maple, pignut hickory, chestnut oak, Northern red oak, and black oak. There is oak regeneration, and with forest management could continue to be prominently an oak-hickory cover type. The most prominent understory trees in these areas are chestnut oak, black oak, Northern red oak, yellow poplar, pawpaw, spice bush, American beech, sugar maple, and red maple. Overall, the herbaceous layer is moderate, being more present on the lower slopes and less on the upper slopes. Invasive species in this cover type is moderately low with Japanese stilt grass being the species most observed (mostly in the lower areas along drainage ditches or streams).

The goal is to retain this as an oak-hickory cover type. To do this, the oak and hickory will need a competitive advantage by the removal of less desirable shade tolerant species. A mid-story removal is recommended due to most of the mid-story being undesirable. This could be completed by chemical methods, mechanical methods, or through prescribed fire. Fire intervals of 2 – 5 years could assist with reducing shade tolerant species and benefit a wide variety of wildlife species while providing diverse structure.

An improvement harvest is recommended for this cover type. The goal is to lower the basal area to 60-80. The timber harvest would remove between 100,000 - 150,000 board feet using silviculture systems such as oak shelterwood, single tree selection, or patch cuts.

Invasive species control is recommended to minimize spread.

Dry Oak-Hickory Data (trees >11”DBH):

Species	**# Sawtimber Trees**	**Total Bd. Ft.**
Chestnut Oak	1,713	177,940
Virginia Pine	215	20,230
White Oak	85	17,130
Black Oak	65	15,110
Pignut Hickory	57	11,200
Yellow Poplar	16	9,330
Scarlet Oak	28	9,170
Northern Red Oak	36	6,520
Sugar Maple	109	4,170
Shagbark Hickory	9	1,650
Totals:	**2,333**	**272,450**

Mesic Oak-Hickory, 24 Acres

This cover type is the third largest portion of the tract at approximately 21% of the tract acreage. White oak is prevalent in this cover type growing as well as the conditions allow. The stocking is estimated at 112% classifying it as overstocked. White oak makes up 53% of the total volume for this cover type with northern red oak next at 15%. Overstory mortality is low, and the trees appear generally healthy. The dominant regeneration in this cover type tends to be American beech, sugar maple, sassafras, pignut hickory, white oak, Northern red oak, and scarlet oak. There is oak regeneration, and with forest management the cover type could continue to be prominently an oak-

hickory cover type. The most prominent understory trees are white oak, Northern red oak, scarlet oak, yellow poplar, American beech, sugar maple, pawpaw, spice bush, and sassafras. Overall, the herbaceous layer is moderate, being more present on the lower slopes and less on the upper slopes. Invasive species are moderately low with Japanese honeysuckle being the species most observed.

Mesic Oak-Hickory Data (trees >11"DBH):

Species	**# Sawtimber Trees**	**Total Bd. Ft.**
White Oak	681	124,220
Northern Red Oak	160	34,230
Scarlet Oak	127	22,050
Pignut Hickory	279	10,970
Yellow Poplar	25	9,830
Chestnut Oak	37	8,730
Black Oak	13	8,020
Shagbark Hickory	45	6,790
Black Cherry	22	5,120
Virginia Pine	57	3,500
American Beech	102	2,340
Totals:	**1,548**	**235,800**

White oaks of decent quality are prevalent in this cover type. With the percent stocking being overstocked, there are some nice trees. The understory is composed of more shade tolerant species that are creating competition for more desirable species. The goal is to retain this oak-hickory cover type for the foreseeable future. To do this, the oaks and hickories will need a competitive advantage by the removal of less desirable shade tolerant species. A mid-story removal is recommended due to most of the mid-story being undesirable and can be completed by chemical methods, mechanical methods, or through prescribed fire.

An improvement harvest is also recommended for this cover type. The goal is to lower the basal area to 60-80. The timber harvest would remove an estimated 100,000 - 125,000 board feet. Silvicultural methods used could be oak shelterwood, single tree selection, or patch cuts.

Invasive species control is recommended to minimize spread.

Mixed Hardwoods, 44 Acres

This cover type is the largest portion of the tract, encompassing approximately 40% of the tract acreage. The stocking for this cover type is estimated at 74% classifying it as fully stocked. The cover type is dominated by decent quality yellow poplar with white oak and sugar maple respectively being the next closest species. Yellow poplar makes up 55% of the total volume for this cover type. White oak makes up 9%, and sugar maple 8% of the total volume. The dominant regeneration is American beech, yellow poplar, sugar maple, and red maple. The prominent understory trees are yellow poplar, pawpaw, spicebush, American beech, sugar maple, and red maple. The mortality in this cover type was overall moderately high. The mortality observed consisted of downed logs and snags (mainly white ash). The white ash mortality is damage caused

from the emerald ash borer. The invasive species presence was also overall moderately high. The most prominent invasive species to note in these areas was Japanese stilt grass.

Mixed Hardwoods Data (trees >11"DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Yellow Poplar	549	171,890
White Oak	81	27,700
Sugar Maple	388	25,230
American Beech	148	17,200
Chestnut Oak	54	13,620
Scarlet Oak	22	9,450
American Sycamore	15	8,330
Blackgum	72	7,650
Northern Red Oak	22	7,380
Bitternut Hickory	55	5,380
Pignut Hickory	71	5,080
Virginia Pine	48	4,850
Shagbark Hickory	9	3,600
Black Cherry	4	2,370
Black Walnut	27	2,300
Red Maple	13	2,100
Sassafras	37	860
Totals:	**1,615**	**314,990**

An improvement harvest is recommended for this cover type. The goal is to lower the basal area to 60-80 and promote a diverse, healthy cover type. An improvement harvest could remove an estimated 100,000 - 150,000 board feet from this cover type.

A selective harvest with some mid-story removal is recommended throughout to increase the presence of oak and hickory. Patch cuts could be used to promote young forest habitat and promote less shade tolerant species. An oak shelterwood harvest could be used in areas where sufficient oak and hickory are present.

Invasive species treatments are recommended for areas of high presence and where timber harvest or TSI increase light reaching the ground.

Beech-Maple, 10 Acres

This cover type is the smallest portion of the tract at approximately 9% of the tract acreage. The percent stocking is 59% barely classifying it as fully stocked. Sugar maple is prevalent in this cover type growing as well as the conditions allow. Sugar maple makes up 26% of the total volume for this cover type with American beech next at 13%. Overstory mortality is low, and the trees are generally healthy. The dominant species are sugar maple, American beech, American sycamore, and yellow poplar. The most prominent understory trees are American beech, sugar maple, and

red maple. Overall, the herbaceous layer is at a moderate level, being more present on the lower slopes and less on the upper slopes.

Invasive species presence in these areas is moderate with Japanese honeysuckle being the species most observed.

Beech-Maple Data (trees >11"DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Sugar Maple	117	11,760
American Beech	35	5,810
American Sycamore	4	4,450
Yellow Poplar	31	3,900
Northern Red Oak	5	3,810
Scarlet Oak	5	3,810
Chestnut Oak	26	3,270
Pignut Hickory	8	3,220
White Ash	9	2,180
Blackgum	6	1,640
Red Maple	19	1,070
Totals:	**265**	**44,920**

A light improvement timber harvest could be conducted throughout this cover type. The timber harvest could remove an estimated 15,000 - 20,000 board feet from this cover type. The goal is to maintain a diverse, healthy cover type, and improve the presence of oak and hickory, where possible.

An improvement timber harvest using single tree selective and patch cuts is recommended for this cover type. An oak shelterwood harvest may be possible in certain locations to promote oak and hickory species.

Invasive species control is recommended for high presence areas and areas where the timber harvest or TSI increase the amount of light reaching the ground.

Summary Tract Silvicultural Prescription and Proposed Activities

Management recommendations are to begin with preharvest invasive species control to reduce seed producing populations and less pervasive invasive species. Preharvest TSI could be utilized to reduce midstory shade tolerant species and improve conditions for oak regeneration. This could be accomplished mechanically or chemically. A timber harvest is recommended to lower the basal area, improve conditions for regeneration, and possibly expand current oak-hickory cover types, where applicable. The timber harvest would remove an estimated 315,000 and 445,000 board feet. Silvicultural systems that could be utilized include single tree selection, group selection/canopy gaps, patch cuts, and oak shelterwood. Postharvest TSI and follow up invasive species control is

recommended to complete any openings; release trees not released through the harvest and address any invasive species needed.

Other considerations

Regeneration evaluation – Three to five years after the completion of the timber harvest, a regeneration inspection will be performed to ensure that desired regeneration is occurring within the harvest area. If deemed unsatisfactory, mitigations will be made.

Timber stand improvement (TSI) – TSI could be performed post-harvest. TSI is prescribed to complete regeneration openings, remove species inhibiting desirable regeneration, and address problem occurrences of invasive species.

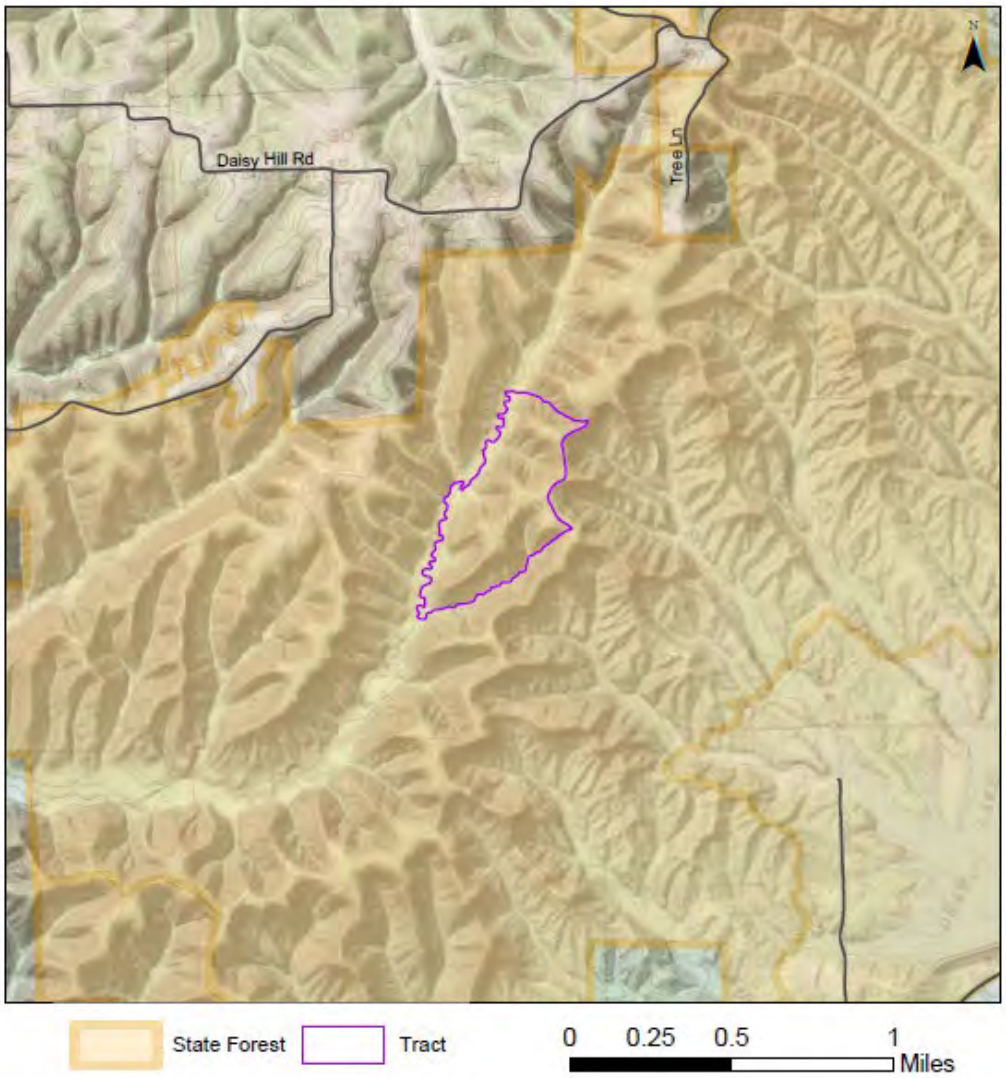
Best management practices (BMP) – During and after completion of the proposed management activity, BMPs will be implemented and monitored to minimize soil erosion.

Guide revision – This tract should receive another inventory and management guide approximately 20 years following the completion of this inventory.

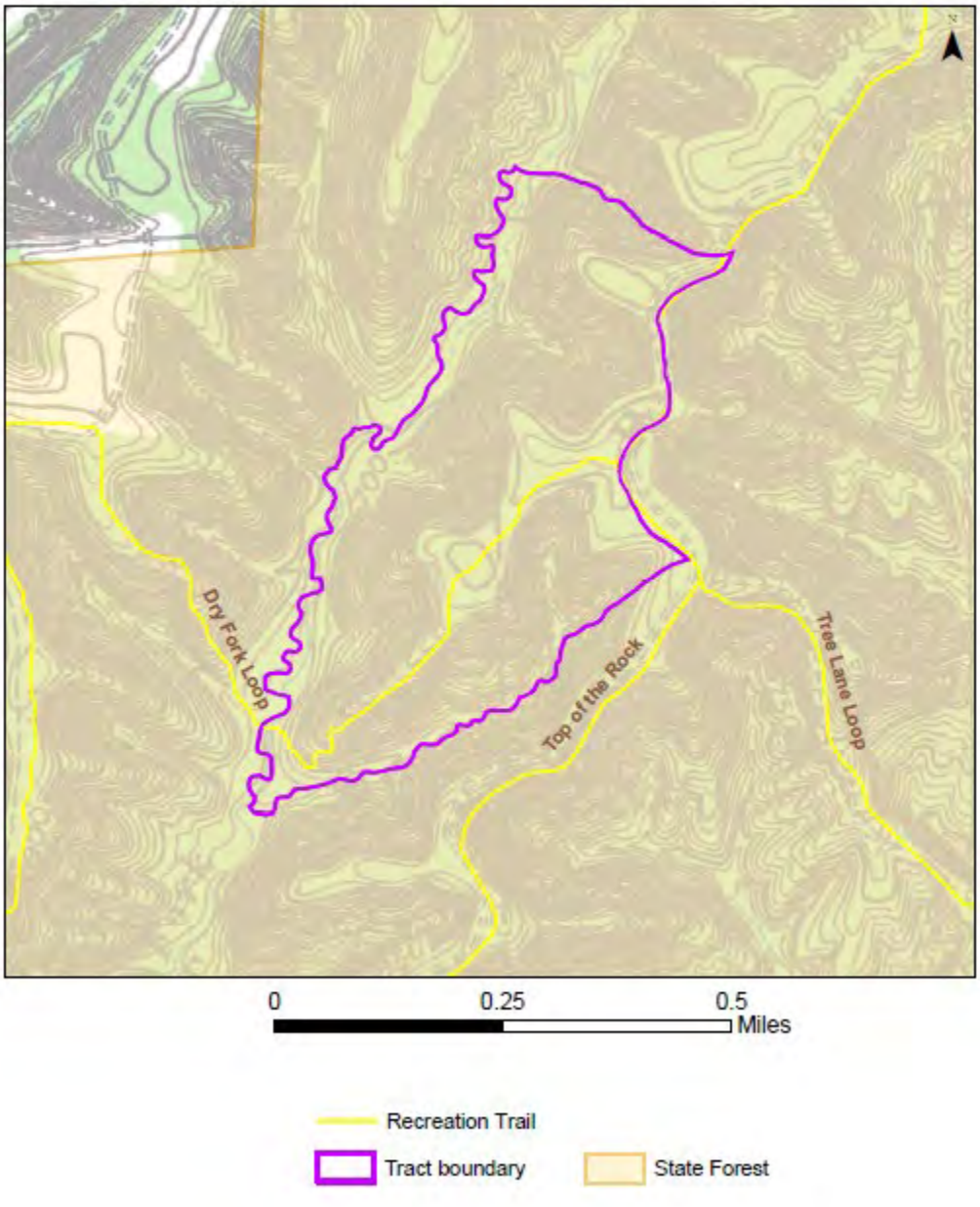
Prescribed fire – A prescribed fire regime may be started within this tract to reduce the abundance of shade tolerant species in the midstory and assist with the control of invasive species.

Proposed Management Activity	Proposed Date
Pre-harvest invasive species work	2024-2025
Pre-harvest timber stand improvement	2024-2025
Timber Harvest	2025-2026
Post-harvest timber stand improvement	Within 2 years of harvest
Post-harvest invasive species work	Within 2 years of harvest
3-year regeneration opening review	Within 3 years of harvest
Prescribed fire	2025+
Next forest inventory	2044

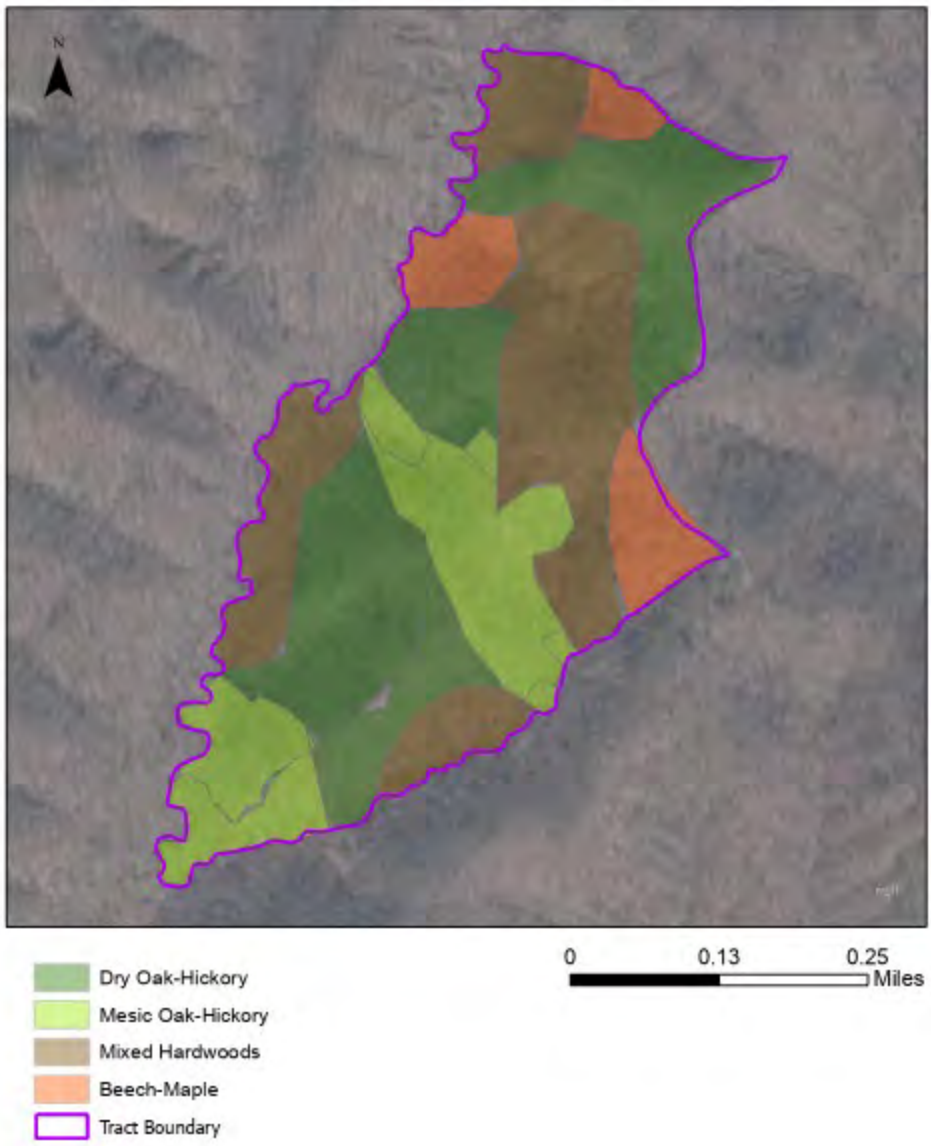
Clark State Forest
Location Map
Compartment 16 Tract 7



Clark State Forest
Compartment 16 Tract 7
Tract Map



Clark State Forest
Compartment 16 Tract 07
Cover Types Map



Clark State Forest	Compartment: 16	Tract: 8
Forester: Dustin Alwine & Will Davis	Date: 9/8/2023	Acres: 113
Management Cycle End Year: 2043	Management Cycle Length: 20 years	

Location
Compartment 16 Tract 8, also known as 6301608, is in Clark County, Indiana, approximately 1 mile west of Deam Lake State Recreation Area and 3 miles east of Borden, Indiana. More specifically, it is located predominately in the southeast corner of Section 31, T1N R6E. 6301608 also has small portions in Section 6 in T1S R6E and Section 32 in T1N R6E.

General Description
This tract has two different cover types: dry oak-hickory and mixed hardwoods. The dominant overstory species are chestnut oak with Virginia pine and yellow poplar also having a notable presence in the overstory. Most of this tract has high stocking with medium quality trees. The invasive species presence is overall very low with only a few high-density areas. The regeneration is mostly mixed throughout. There are some pockets of oak-hickory regeneration, but the majority of the regeneration is shade-tolerant species such as American beech or sugar maple. Management of this tract will aim to lower the stocking via a timber harvest and potential timber stand improvement (TSI) activities in locations throughout to improve the growth of the oaks and hickories. The main goal is to promote the growth of oak and hickory species in areas where it is possible to do so.

History
- 1940 – Land acquisition from Hamilton & Jennie Jackson
- 1951 – Land acquisition from Delrue & Clara Thomas
- 1966 – Land acquisition from Homer & Dorothy Hostettler
- 1987 – Land acquisition from Charles David Heath
- 1987 – Inventory completed for State Forest Inventory Program
- 2023 – Forest inventory completed by Alwine
- 2023 – Resource Management Guide started by Alwine
- 2024 – Resource Management Guide completed by Davis

Landscape Context
Most of the surrounding landscape near this tract is forested land, a majority of which is part of Clark State Forest. Deam Lake State Recreation Area is located approximately 1 mile east of the tract. There are some small areas of agriculture fields and residential sites within 1 mile of the tract, they are less than 5 percent of the land area.

Topography, Geology and Hydrology
The terrain varies from extreme slopes in the deep ravines to relatively flat along the ridgetops and the bottoms near the stream. The two dominant topographic features are the ridgetop that runs the eastern boundary and the drainage that runs the western boundary. The whole tract consists of ridges and fingers that slope downward from this ridgetop to the stream. A lot of these sloping ridges are very broken with high slopes. More than half of this tract has slopes over 45 percent.

6301608 is located entirely in the Muddy Fork watershed. The western border stream is the Dry

Fork which is a mapped 1-mile water stream. There are multiple ephemeral streams that flow between the ridges down to Dry Fork. Dry Fork flows approximately 2 miles until it reaches Muddy Fork. General riparian management zone (RMZ) guidelines will be implemented in these areas in accordance with the 2022 Indiana Logging and Forestry Best Management Practices Field Guide.

Soils

BcrAW- Beanblossom silt loam, 1 to 3 percent slopes, occasionally flooded, very brief duration, 8.5 acres

This nearly level, deep, well-drained soil is found along alluvial fans and flood plain. It is well suited to trees. Management planning should consider wet times of year. This soil has not been evaluated for site index.

CtwB- Crider-Bedford-Navilleton silt loams, 2 to 6 percent slopes, 0.1 acres

This gently sloping, deep, well-drained soil is on ridgetops in the uplands. It is well suited to trees. Crider has a site index of 90 for white oak and 98 for yellow poplar. Bedford has a site index of 70 for white oak and 90 for yellow poplar. Navilleton has not been evaluated for site index.

GgbG- Gilwood-Brownstown silt loams, 25 to 75 percent slopes, 42 acres

This moderately to very steep, moderately deep, well-drained complex is on side slopes in the knobs. It is suited to trees. The hazard of erosion is the main management concerns that should be considered when implementing Best Management Practices for Water Quality. Brownstown has a site index of 50 for black oak and Gilwood has not been evaluated.

GgfD- Gilwood-Wrays silt loams, 6 to 18 percent slopes, 9.3 acres

This gently to moderately sloping, moderately deep, well-drained complex is found on side slopes of the uplands knobs. The hazard of erosion is the main management concerns that should be considered when implementing Best Management Practices for Water Quality. Wrays has a site index of 70 for white oak and 90 for yellow poplar and Gilwood has not been evaluated.

GmaG- Gnawbone-Kurtz silt loams, 20 to 60 percent slopes, 46 acres

This moderately to very steep, moderately deep, well-drained complex is found on side. It is well suited to trees. The hazard of erosion and equipment limitations are the main management concerns. These should be considered when planning management activities and implementing Best Management Practices for Water Quality. Kurtz has a site index of 60 for northern red oak and Gnawbone has not been evaluated.

KxkC2- Knobcreek-Navilleton silt loams, 6 to 12 percent slopes, eroded, 2.0 acres

This moderately sloping, deep, well-drained complex is on sideslopes in the uplands. It is well suited to trees. Erosion hazards are the main management concern that should be considered during the implementation of Best Management Practices for Water Quality. Knobcreek has a site index of 76 for northern red oak, and 86 for yellow poplar and Navilleton has not been evaluated for site index.

SolC2- Spickert-Wrays silt loams, 6 to 12 percent slopes, eroded, 5.2 acres

This moderately sloping, deep, moderately well-drained soil is found on side slopes in the uplands and knobs. It is well suited to trees. A fragipan is present at 20 to 36 inches that inhibits drainage. Erosion hazards are a management concern that should be considered when implementing Best Management Practices for Water Quality. Spickert has a site index of 60 for white oak and 100 for yellow poplar and Wrays has a site index of 70 for white oak and 90 for yellow poplar.

Access

Access to 6301608 is by fire lane, which also serves as the Top of the Rock Horse Trail. Top of the Rock Horse Trail runs the entire eastern boundary of the tract and is accessible by vehicle. Access to Top of the Rock Horse Trail is by fire lane, which also serves as the Tree Lane Loop Horse Trail which is accessed from the day use parking area.

Boundary

6301608 is an interior tract within Clark State Forest. The boundary on the western to northwest side follows a stream for approximately 1-mile with tracts 6301607 and 6301609 on the other side. The southern border is delineated by a large ravine separating it from 6301702. The ridgetop and Top of the Rock Horse Trail make the eastern boundary line with 6301801 and 6301516 as eastern neighbors.

Ecological Considerations

6301608 contains diverse vegetation and wildlife resources conducive to providing habitat for a variety of wildlife species. Habitat types include oak-hickory, mixed hardwoods, scattered Virginia pine, and riparian areas. Evidence of several species of wildlife was noted at the time of inventory including white-tailed deer, eastern box turtles, multiple types of lizards, black rat snakes, garter snakes, and a variety of woodpeckers and songbirds.

The Division of Forestry has developed compartment level guidelines for important wildlife structural habitat features such as snags and legacy trees. Snags are standing dead or nearly dead 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, which provides habitat for many ground dwelling species and contributes to healthy soils. Legacy trees are live trees of a certain species and diameter class, that have potential future value to various wildlife species, if retained in the stand.

In the compartment that includes this tract, inventory data indicate snag densities exceed Division of Forestry (DoF) targets in all size classes. At the largest size class (>=19" dbh) inventoried density exceeds even the "optimal" target. Additionally, legacy tree densities exceed DoF compartment-level targets in all size classes.

The invasive species located within the tract were: Japanese stilt grass and Japanese honeysuckle. The most prevalent invasive species was Japanese stilt grass. The invasive species were more prevalent near the streams and along the horse trails. Invasive species management could target these areas or a particular species such as Japanese stilt grass.

A formal Ecological Review process, which includes a search of Indiana's Natural Heritage Database, is part of the management planning process. If Rare, Threatened, or Endangered species were found to be associated with this area, the activities prescribed in this guide will be conducted

in a manner that will not threaten the population viability of those species or communities.

Recreation
The main recreational opportunity is likely horseback riding. Top of the Rock Horse Trail runs along the eastern ridgetop in the tract. The Tree Lane Loop Horse Trail enters the tract for a short portion on the northeastern edge. Other likely recreational opportunities include hunting, wildlife viewing, and foraging.

Cultural
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 activities.

Tract Subdivision Description and Silvicultural Prescription
The current forest resource inventory was completed in the summer of 2023 by Forester D. Alwine. A summary of the estimated tract inventory results is in the table below.

Tract Summary Data (trees >11”DBH):

Species	# of Trees	Total Bdft
Yellow poplar	1,634	455,580
Chestnut oak	1,206	167,040
Virginia pine	1,011	156,110
Northern red oak	196	81,230
Black oak	171	59,510
American beech	254	40,090
White oak	140	39,380
Sugar maple	537	35,200
American sycamore	42	33,180
Red maple	460	26,430
Scarlet oak	94	23,900
Pignut hickory	91	16,430
Blackgum	32	14,460
Shagbark hickory	46	11,840
Sweetgum	61	10,710
American elm	159	10,260
Basswood	9	530
Total	6,143	1,181,880

For the purposes of this resource management guide, this tract is divided into two management cover types based on forest composition: dry oak-hickory and mixed hardwoods.

Dry oak-hickory, 85 acres

The dry oak-hickory cover type is located on the upper slopes and ridge tops. It is over stocked with the primary species being chestnut oak. There is no previous record of timber harvesting being conducted in this cover type during the state's ownership; therefore, there are some very large trees present. Most of the larger trees are located on the lower slopes and deep drainages. Several trees were measured during the inventory over 30 inches in diameter. The quality of the timber is overall average, and the majority of the chestnut oaks have typical form for that species. Virginia pine is aging out of this cover type, with windthrown mortality being common. With the absence of fire on these slopes, this cover type is attempting to convert to a more mixed hardwoods forest with the main regeneration being sugar maple and American beech.

Cover Type Summary Data (trees >11"DBH):

Species	# of Trees	Total Bdft
Chestnut oak	1,206	167,040
Virginia pine	330	41,990
Northern red oak	92	34,990
Black oak	101	18,690
White oak	105	15,950
Scarlet oak	62	13,790
Yellow poplar	19	7,350
Pignut hickory	52	7,160
Sugar maple	46	3,330
American beech	33	4,270
Red maple	24	1,790
Shagbark hickory	7	1,050
Basswood	9	530
Total	2,086	317,930

The goal is to keep this as an oak-hickory cover type for the foreseeable future. To do this, the oak and hickory species will need a competitive advantage by the removal of less desirable shade tolerant species. A mid-story removal is recommended due to most of the mid-story being undesirable. This could be completed by chemical methods, mechanical methods, or prescribed fire. Fire intervals of 2-5years could assist with reducing shade tolerant species and benefit a wide variety of wildlife species while providing diverse habitat structure. An improvement harvest is also recommended for this cover type to reduce the average basal area to 60-80. This harvest could remove between 100,000 – 150,000 board feet from this cover type. This could be accomplished through the combination of a shelterwood, single-tree selection, or patch-cut openings. Invasive species control is recommended for the high presence pockets and in areas where the timber harvest or TSI creates larger openings allowing high quantities of light to reach the ground.

Mixed hardwoods 28, acres

The mixed hardwoods cover type is along the drainages of this tract and on the lower slopes. This cover type is fully stocked with the dominant overstory species being yellow poplar. There is no record of a timber harvest being conducted in this cover type during the state's ownership; therefore, there are some larger trees present. Given the amount of time these trees have been allowed to grow, and higher quality sites located in deep ravines, there are also high-quality trees present. During inventory, the forester measured several yellow poplar and Northern red oak at or above 100 feet in height and 30+ inches in diameter. The regeneration in this cover type is more diverse than the dry oak-hickory, with additional species like spicebush and pawpaw being common. The most common regeneration is American beech, sugar maple, and yellow poplar. Yellow poplar regeneration is most prevalent in areas where mortality has allowed a greater amount of light to enter the forest.

Cover Type Summary Data (trees >11"DBH):

Species	# of Trees	Total Bdft
Yellow poplar	1,615	448,230
Virginia pine	681	114,120
Northern red oak	104	46,240
American beech	221	35,820
Black oak	70	40,820
Sugar maple	491	31,870
Pignut hickory	39	9,270
American sycamore	42	33,180
Red maple	436	24,640
White oak	35	23,430
Scarlet oak	32	10,110
Blackgum	32	14,460
Shagbark hickory	39	10,790
Sweetgum	61	10,710
American elm	159	10,260
Total	4,057	863,950

An improvement harvest is recommended for this cover type with the goal of reducing the average basal area to 60-80. In this cover type, health and diversity should be priority. An improvement harvest could remove between 300,000 – 350,000 board feet from this cover type. In areas where it is feasible to transition to an oak-hickory cover type, a selective harvest and a mid-story removal can be used. A selective harvest along with patch-cut openings could be used to promote and improve the cover type. A shelterwood harvest could be used throughout this cover type in areas where oak species presence and oak species regeneration allow. Invasive species control can be conducted for the high presence pockets and is recommended in areas where the harvest or TSI creates larger openings allowing high quantities of light to reach the ground.

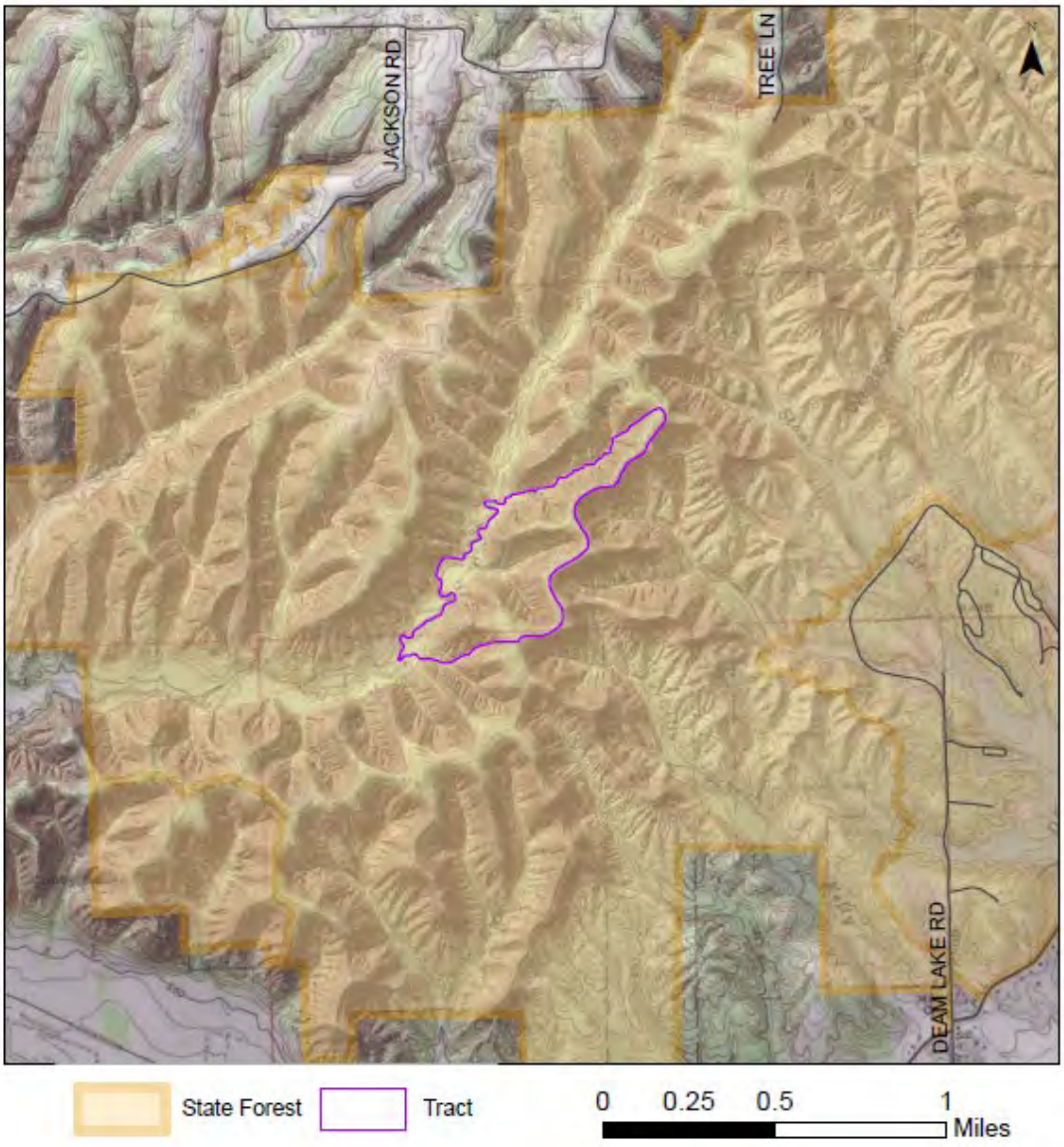
Summary Tract Silvicultural Prescription and Proposed Activities

Management recommendations in this tract could begin with pre-harvest invasive species control

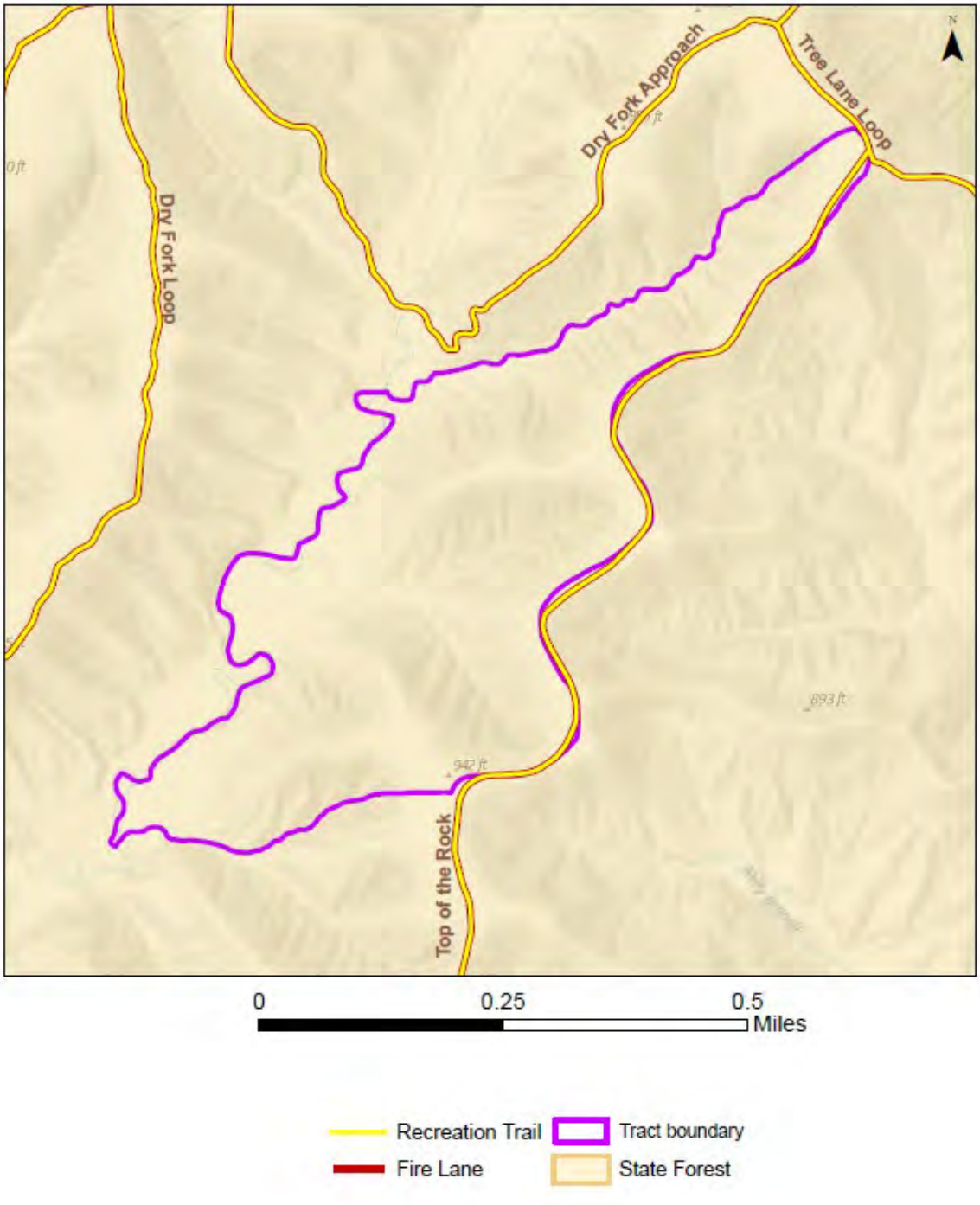
in the higher presence pockets. This control could be used to limit seed producing populations or reduce less pervasive invasive species. Pre-harvest TSI could be utilized to promote desirable regeneration such as oak or hickory species. A timber harvest is recommended to lower the basal area, improve regeneration conditions, or to transition an area of the tract from one cover type to another. An improvement harvest could remove between 400,000 and 500,000 board feet from the tract. This could be accomplished using single-tree selection, a shelterwood, or patch-cut openings. Post-harvest TSI, prescribed fire, and invasive species control could be used to promote and ensure the success of the tract.

Proposed Management Activity	**Proposed Date**
Pre-harvest invasive species work and TSI	2025-2026
Timber Harvest	2025-2027
Post-harvest TSI and invasive species work	Within 2 years of harvest
3-year regeneration opening review	Three years after harvest
Prescribed fire regime	2026+
Next forest inventory	2043

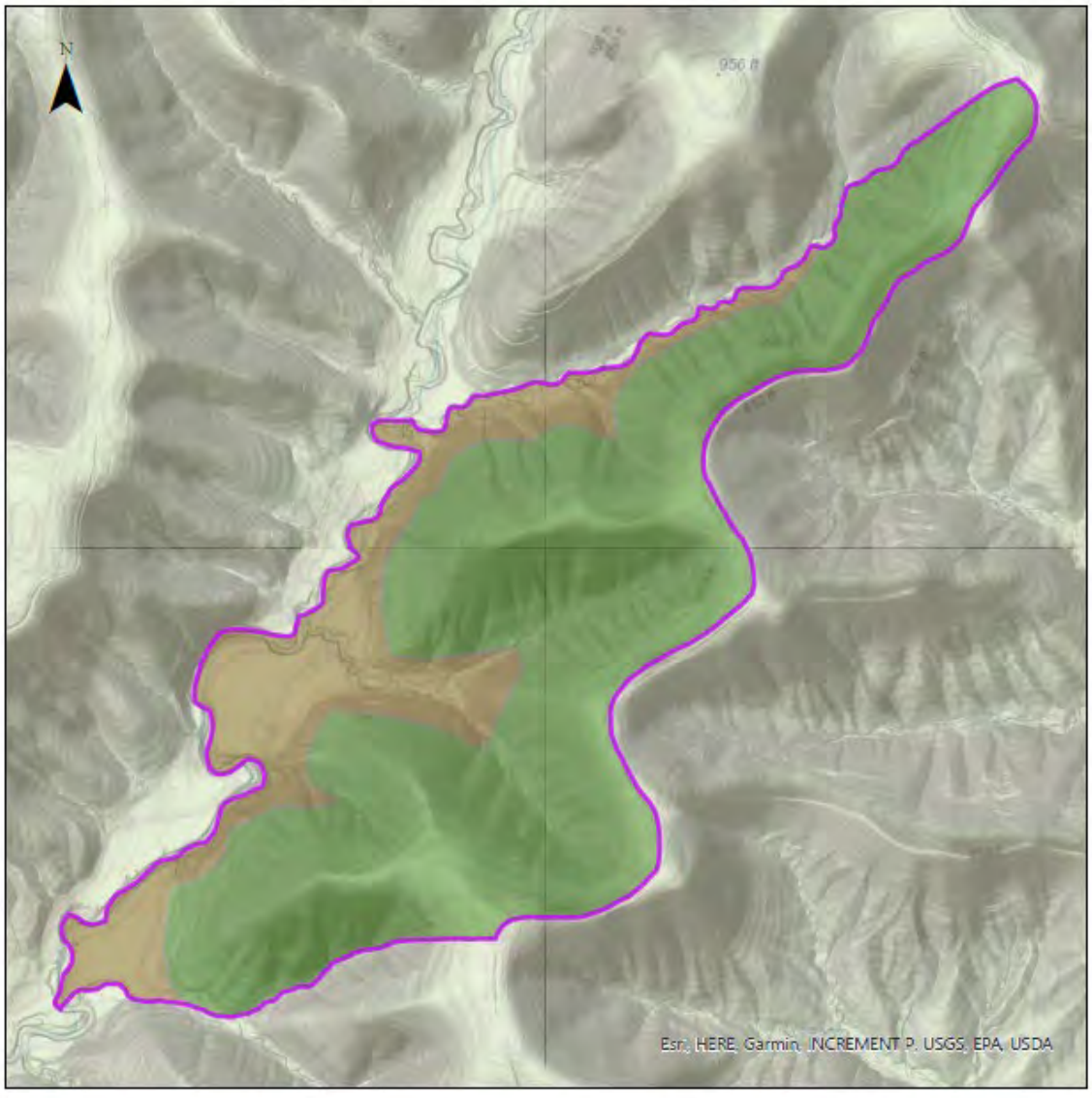
Clark State Forest
Location Map
Compartment 16 Tract 8



Clark State Forest
Compartment 16 Tract 8
Tract Map



Clark State Forest
Compartment 16 Tract 8
Cover Types Map



0 0.13 0.25
Miles

Dry Oak-Hickory
Mixed Hardwoods
Tract Boundary

Clark State Forest **Compartment:**15 **Tract:** 14
Forester: Will Davis **Date:** June 2023 **Acres:** 109
Management Cycle End Year: 2043 **Management Cycle Length**: 20

Location

Compartment 15, Tract 14 (6301514) is in Clark County, Indiana. The vast majority of the tract is in Section 33 of Township 1N, Range 6E with a small portion being in Section 29. The tract is approximately 4 miles east of Borden Indiana, and 0.5 miles northwest from Deam Lake State Recreation Area.

General Description

This tract has two cover types, dry oak-hickory, and mixed hardwoods. This tract is primarily dry oak-hickory. The most dominant overstory tree in the tract is the chestnut oak. Other overstory trees worth noting are the: northern red oak, white oak, black oak, scarlet oak, black walnut, pignut hickory, shagbark hickory, mockernut hickory, yellow poplar, American beech, sweetgum, black gum, Virginia pine, red maple, and sugar maple. Most of this stand has high stocking with large high-quality trees. Overall, the invasive species presence throughout the tract is low, with only a few high-density areas. The regeneration is truly mixed in this tract with the four most prevalent tree species being: chestnut oak, American beech, yellow poplar, and sugar maple.

History

- 1940 – Land acquired from Guernsey
- 1941 – Land acquired from McClellan
- 1944 – Land acquired from Hostettler
- 1951 – Land acquired from Thomas
- 1951 – Land acquired from the Clark County Auditor
- 1955 – Aerial photograph was taken showing the tract entirely forested
- 1960 – Aerial photograph was taken showing the tract entirely forested
- 1965 – Land acquired from Gutermuth
- 1969 – Land acquired from the Clark County Board of Commissioners
- 1975 – Forest inventory and resource management guide completed by Philip Wagner
- 1986 – Inventory completed for State Forest Inventory Program
- 2023 – Forest inventory and resource management guide completed by Will Davis

Landscape Context

This tract is surrounded entirely by Clark State Forest property. The landscape is generally all forested and used for forestry activities. About 0.5 miles to the southeast is Deam Lake State Recreation Area. Approximately a mile to the northwest, there is a residential area, agricultural farms, and some private forest land.

Topography, Geology and Hydrology

6301514 consists of three large ridges that climb up to the western portion of the tract and slope downward to the eastern portion of the tract. The tract could be defined as moderate to highly steep with the steepest portion being in the western part of the tract.

6301514 is in the Mississippian Borden mapped bedrock formation. The formations constituting the Borden Group are the New Providence Shale, the Spickert Knob, and the Edwardsville. The Borden Group is composed dominantly of gray argillaceous siltstone and of shale. Fine-grained sandstone is common. Interbedded limestones form discontinuous lenses and facies that are minor except for the interval of the Floyds Knob Limestone Member at the base of the Edwardsville Formation.

6301514 is in the northeast portion of the Muddy Fork Watershed. There is one mapped stream located on the eastern border of the tract, Stone Branch. There are several smaller drainages within the tract which feed Stone Branch. Stone Branch flows southeast into Deam Lake. Big Run then flows south-southeast out of Deam Lake, eventually into Muddy Fork. General riparian management zone (RMZ) guidelines will be implemented in these areas in accordance with the 2022 Indiana Logging and Forestry Best Management Practices Field Guide.

Soils

BcrAW (5.2 Ac) - Beanblossom silt loam, 1 to 3 percent slopes, occasionally flooded, very brief duration
This nearly level, deep, well-drained soil is found along alluvial fans and flood plain. It is well suited to trees. Management planning should consider wet times of year. This soil has not been evaluated for site index.

CtwB (2.3 Ac) - Crider-Bedford-Navilleton silt loams, 2 to 6 percent slopes
This gently sloping, deep, well-drained soil is on ridgetops in the uplands. It is well suited to trees. Crider has a site index of 90 for white oak and 98 for yellow poplar. Bedford has a site index of 70 for white oak and 90 for yellow poplar. Navilleton has not been evaluated for site index.

GgbG (33.4 Ac) - Gilwood-Brownstown silt loams, 25 to 75 percent slopes
This moderately to very steep, moderately deep, well-drained complex is on side slopes in the knobs. It is suited to trees. The hazard of erosion is main management concerns that should be considered when implementing Best Management Practices for Water Quality. Brownstown has a site index of 50 for black oak and Gilwood has not been evaluated.

GgfD (1.4 Ac) - Gilwood-Wrays silt loams, 6 to 18 percent slopes
This gently to moderately sloping, moderately deep, well-drained complex is found on side slopes of the uplands knobs. The hazard of erosion is main management concerns that should be considered when implementing Best Management Practices for Water Quality. Wrays has a site index of 70 for white oak and 90 for yellow poplar and Gilwood has not been evaluated.

GmaG (55.9 Ac) - Gnawbone-Kurtz silt loams, 20 to 60 percent slopes
This moderately to very steep, moderately deep, well-drained complex is found on side. It is well suited to trees. The hazard of erosion and equipment limitations are main management concerns. These should be considered when planning management activities and implementing Best Management Practices for Water Quality. Kurtz has a site index of 60 for Northern red oak and Gnawbone has not been evaluated.

KxkC2 (8.0 Ac) - Knobcreek-Navilleton silt loams, 6 to 12 percent slopes, eroded
This moderately sloping, deep, well-drained complex is on sideslopes in the uplands. It is well suited to trees. Erosion hazards are main management concern that should be considered during implementation of Best Management Practices for Water Quality. Knobcreek has a site index of 76 for Northern red oak and 86 for yellow poplar and Navilleton has not been evaluated for site index.

Access
The access to 6301514 is by fire lane, which also serves as the Tree Lane Loop Horse Trail. Tree Lane Loop runs along the western boundary of the tract. Tree Lane Loop is accessible by vehicle via Tree Lane, which is a dead-end road off Bartle Knob Road.

Boundary

The State Forest tracts that border 6301514 are as follows: 6301606 to the north, 6301513 to the northeast, 6301512 to the southeast, 6301516 to the south, 6301608 to the southwest, and 6301607 to the west. The southeast portion of the tract is bordered by Stone Branch Creek. The following are the boundary features for each cardinal direction of the tract: the northern border consists of the fire lane/Tree Lane Loop Horse Trail, the eastern border consists of three ridges and Stone Branch Creek, the southern border is a ridge and the fire lane/Tree Lane Loop Horse Trail, and the western border consist of three ridges and the fire lane/Tree Lane Loop Horse Trail.

Ecological Considerations

This tract contains diverse vegetation and wildlife resources conducive to providing habitat for a variety of wildlife species. Habitat types include dry oak-hickory, mixed hardwoods, some conifers scattered throughout, and riparian areas. Evidence of several species of wildlife were noted at the time of inventory including white-tailed deer, Eastern box turtles, multiple types of lizards, black rat snakes, garter snakes, and a variety of woodpeckers and songbirds.

The Division of Forestry has developed compartment level guidelines for important wildlife structural habitat features such as snags and legacy trees. Snags are standing dead or nearly dead 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, which provides habitat for many ground-dwelling species and contributes to healthy soils. Legacy trees are live trees of a certain species and diameter class, that have potential future value to various wildlife species, if retained in the stand.

Current assessments indicate the abundance of these habitat features meet or exceed recommended maintenance levels.

The invasive species located within the tract were: Japanese stilt grass, Japanese honeysuckle, bush honeysuckle, oriental bittersweet, tree of heaven, and multi-flora rose. The most prevalent invasive species found was Japanese stilt grass. These invasive species are more prevalent near the streams and along the horse trail. Invasive species management could target these areas or a particular species, such as tree of heaven.

A formal Ecological Review process, which includes a search of Indiana's Natural Heritage Database, is part of the management planning process. If Rare, Threatened, or Endangered species were found to be associated with this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the population viability of those species or communities.

Recreation

The main form of recreation in this tract is likely horse riding on Tree Lane Loop Horse Trail. The trail is commonly used by riders due to its proximity to Deam Lake State Recreation Area. Hikers can also be found using this trail for various nature and wildlife viewing ventures. Hunting and foraging are also available in the tract.

Cultural

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 activities.

Tract Subdivision Description and Silvicultural Prescription

The current forest resource inventory was completed in June of 2023 by Forester W. Davis. 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.
Chestnut Oak	3,047	506,830
White Oak	323	99,540
Yellow Poplar	323	93,200
Black Oak	151	38,940
Sugar Maple	410	22,120
Scarlet Oak	81	19,570
Northern Red Oak	56	17,920
Virginia Pine	39	17,580
American Beech	122	17,570
Blackgum	162	12,560
Shagbark Hickory	45	9,230
White Ash	23	5,830
Red Maple	91	5,730
Pignut Hickory	10	4,730
Sweetgum	6	4,400
Red Elm	51	3,190
Mockernut Hickory	22	1,560
Totals	**4,962**	**880,500**

For the purposes of this resource management guide, this tract is being divided into two cover types based on forest composition: dry oak-hickory and mixed hardwoods.

Dry Oak-Hickory, 72 Acres

This cover type is the dominant portion of the tract at approximately 66% of the tract acreage. It is dominated by chestnut oak growing as well as the conditions allow. Percent stocking is estimated at 88% classifying it as fully stocked. Chestnut oak makes up about 87% of the total volume for this cover type with white oak being the next closest at only 7%. Overstory mortality is low, and the trees are generally healthy. The dominant regeneration in this cover type is American beech, chestnut oak, sugar maple, and yellow poplar. There is enough oak regeneration that, with forest management, these areas could continue to be prominently oak-hickory. The most prominent understory trees in these areas are sugar maple, pawpaw, spice bush, and American beech. Overall, the herbaceous layer calculates to a moderate level, being more present in the lower slopes and less present on the upper slopes. Overall, invasive species presence is low with Japanese stilt grass being the most common (mostly in the lower areas along drainage ditches or streams).

Dry Oak-Hickory Data (trees >11"DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Chestnut Oak	2,902	462,580
White Oak	187	44,390

Dry Oak-Hickory Data (trees >11"DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Black Oak	140	36,000
Yellow Poplar	38	17,860
Virginia Pine	39	17,580
Scarlet Oak	70	13,920
Blackgum	125	6,120
Northern Red Oak	10	5,940
Red Maple	91	5,730
White Ash	10	4,730
Pignut Hickory	10	4,730
Sugar Maple	103	4,450
Red Elm	42	960
Total	**3,767**	**624,990**

This cover type is dominated by decent quality chestnut oak trees. There are some nice trees and stocking is on the higher end of fully stocked. The understory is composed of more shade tolerant species that are creating competition for more desirable species. The goal is to retain this as an oak-hickory cover type. To do this, the oaks and hickories will need a competitive advantage by the removal of less desirable shade tolerant species. A mid-story removal is recommended due to most of the mid-story being undesirable and can be completed by chemical methods, mechanical methods, or with prescribed fire. If prescribed fire is used, the area could be periodically burned to ensure the mid-story is controlled improving condition for oak and hickory advancement.

An improvement harvest is also recommended for this cover type. The goal is to bring down the basal area to 60-80. This could be accomplished by a shelterwood harvest, single tree and group selection/patch cut harvest, or a combination. Invasive species control is recommended for the high presence areas and areas where the timber harvest activity creates larger openings.

Mixed Hardwoods, 37 Acres

The mixed hardwoods cover type were the smaller portion of the total tract, encompassing approximately 34% of the total tract acreage. The mixed hardwoods proved to be the more diverse cover type and the volume is more spread out compared to the dry oak-hickory cover type. The dominant overstory species in these sections was yellow poplar with white oaks and chestnut oaks coming in at a close second. American beech and sugar maple also have a presence in the overstory. The stocking for this cover type is estimated at 68% which is considered fully stocked. The mortality in these areas was overall moderate to moderately high, the invasive species presence in these areas was overall moderately low, even though, there were more patches in this cover type compared to the dry oak-hickory cover type. The most prominent invasive species to note in these areas were Japanese stilt grass and oriental bittersweet. Yellow poplar tends to be the most prominent regeneration that was spotted in these areas. Other notable regeneration in these areas include chestnut oak, white oak, sugar maple, American beech, and sassafras.

Mixed Hardwoods Data (trees >11"DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Yellow Poplar	285	75,340
Chestnut Oak	145	44,250
White Oak	136	55,150
Sugar Maple	307	17,670
American Beech	122	17,570

Mixed Hardwoods Data (trees >11"DBH):

Species	# Sawtimber Trees	Total
Northern Red Oak	46	11,980
Shagbark Hickory	45	9,230
Blackgum	37	6,440
Scarlet Oak	11	5,650
Sweetgum	6	4,400
Black Oak	11	2,940
Red Elm	9	2,230
Mockernut Hickory	22	1,560
White Ash	13	1,100
Total	**1,195**	**255,510**

Stocking is towards the lower end of fully stocked. The overstory is truly mixed with yellow poplar being the most prominent in most areas of this cover type. A light timber harvest could be conducted for improvement throughout this cover type. The goal is to promote a diverse, healthy cover type or to transition to an oak-hickory cover type where possible.

A selective harvest and a mid-story removal is recommended throughout for possible transition to an oak-hickory cover type. A selective harvest along with regeneration openings could be used to promote and improve the cover type. A shelterwood harvest could be used throughout if needed to promote oak growth in this cover type. Invasive species control is recommended for the high presence areas and in areas where larger opening may occur through the timber harvest.

Summary Tract Silvicultural Prescription and Proposed Activities

Management recommendations in this tract could begin with preharvest invasive species control that could be used to limit seed producing populations or reduce less pervasive invasive species. Pre-harvest timber stand improvement (TSI) could be utilized to help promote oak regeneration. A harvest is recommended to lower the basal, improve regeneration conditions, or to transition an area of the tract from one cover type to another. The harvest is estimated to remove 225,000 – 300,000 board feet. This could be accomplished using single tree selections, group selection/patch cuts, shelterwood harvests, or a combination. Post-harvest TSI is recommended to complete any opening or release not accomplished through the timber harvest.

Other considerations

Regeneration evaluation – Three to five years after the completion of the timber harvest, a regeneration inspection will be performed to ensure that desired regeneration is occurring within the harvest area. If deemed unsatisfactory, mitigations will be made.

Timber stand improvement (TSI) – TSI could be performed post-harvest. TSI is prescribed to complete regeneration openings, remove species inhibiting desirable regeneration, and address problem occurrences of invasive species.

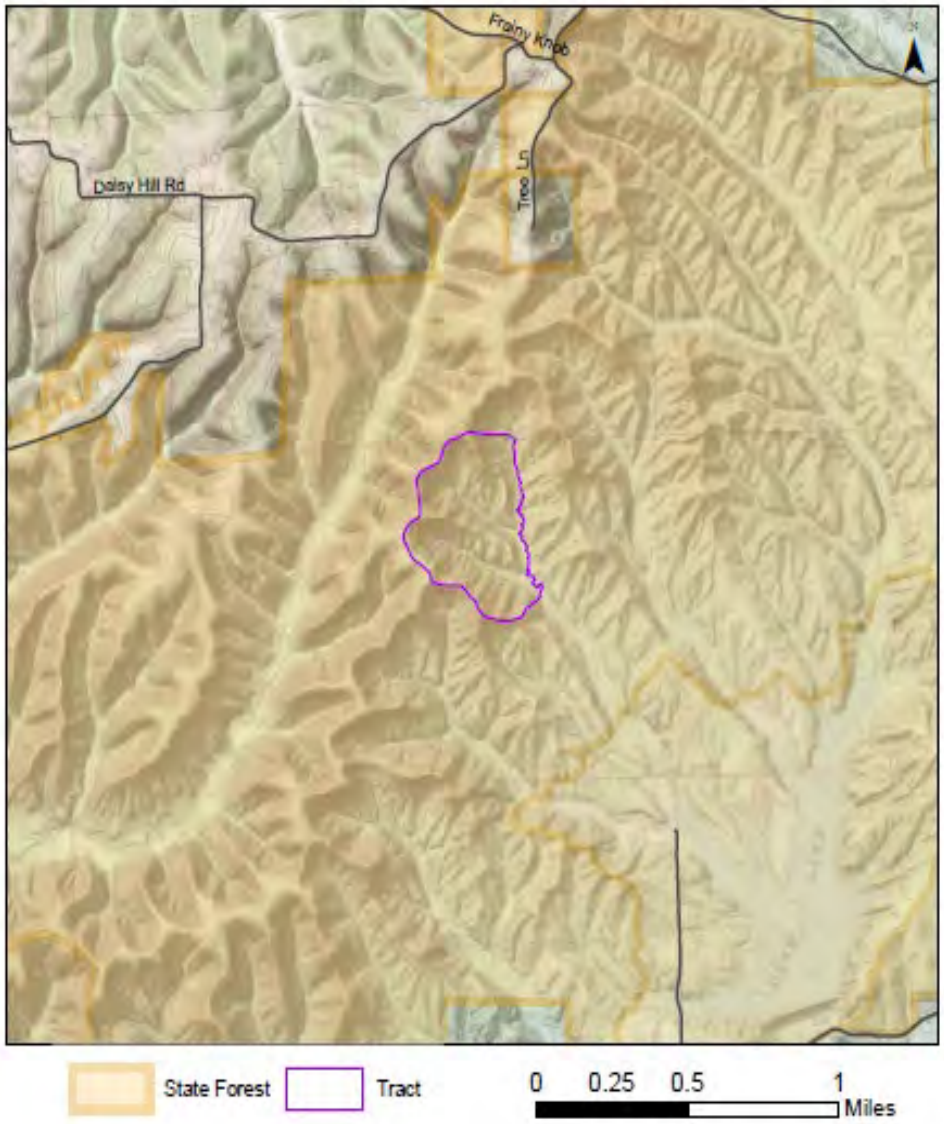
Best management practices (BMP) – During and after completion of the proposed management activity, BMPs will be implemented and monitored to minimize soil erosion.

Guide revision – This tract should receive another inventory and management guide approximately 20 years following the completion of this inventory.

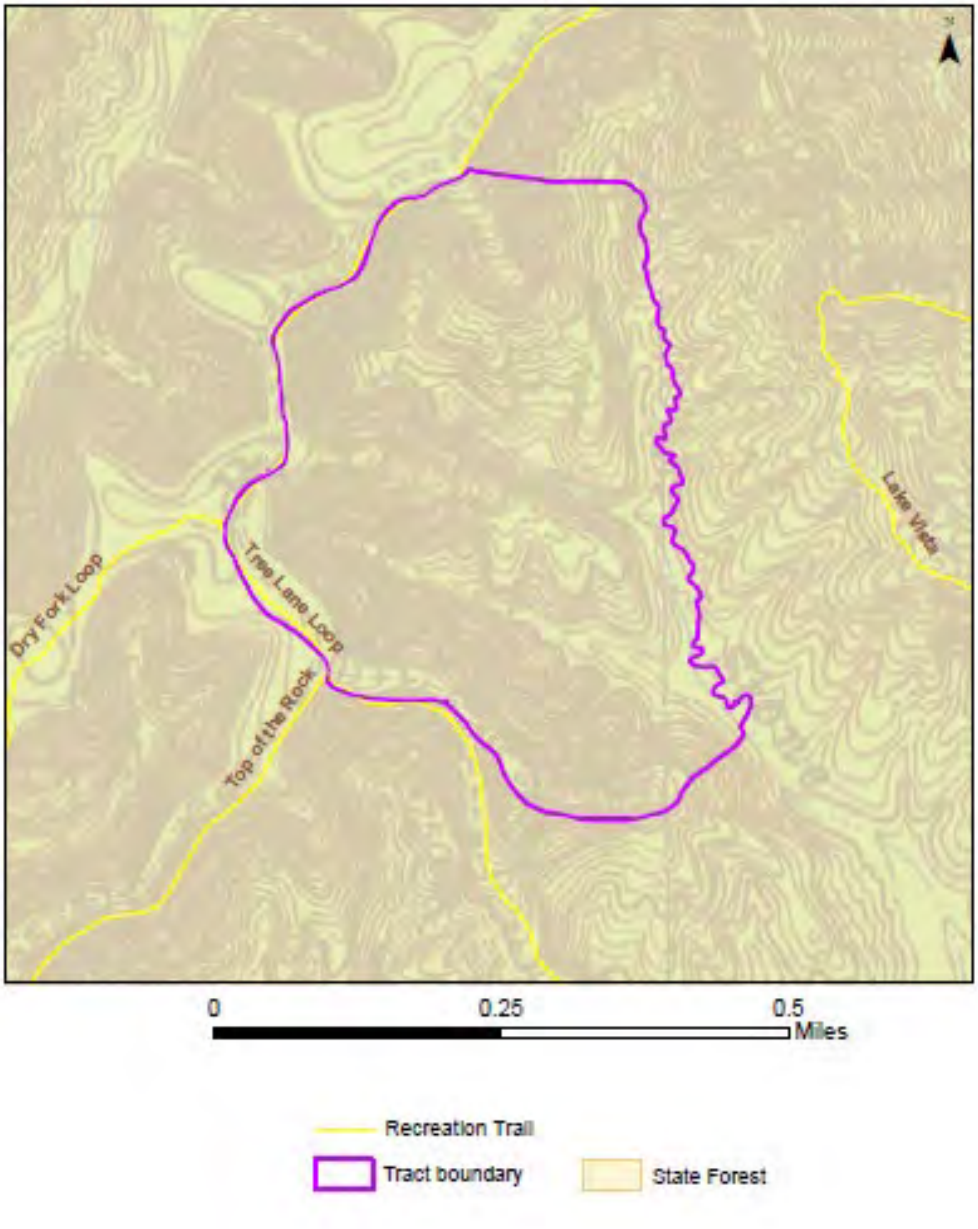
Prescribed fire – A regime of prescribed fire may be started within this tract to reduce the abundance of shade tolerant species in the midstory and to help control invasive species as well as to promote a more open forest structure.

Proposed Management Activity	**Proposed Date**
Invasive species control and preharvest TSI	2024-2025
Timber Harvest	2025-2026
Postharvest TSI and invasive species control	Within 2 years of harvest
Postharvest regeneration and planting inspections	First 3-10 years postharvest
Prescribed fire regime	2025+
Re-evaluate tract	2044

Clark State Forest
Location Map
Compartment 15 Tract 14



Clark State Forest
Compartment 15 Tract 14
Tract Map



Clark State Forest
Compartment 15 Tract 14
Cover Types Map