

**Resource Management Guides  
Clark 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 Clark State Forest.

Compartment 4 Tract 1  
Compartment 4 Tract 2  
Compartment 4 Tract 3  
Compartment 7 Tract 1 & 2 (amendment to original RMG)

**To submit a comment on this document, go to:**

[www.in.gov/dnr/forestry/8122.htm](http://www.in.gov/dnr/forestry/8122.htm)

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

<http://www.in.gov/dnr/forestry/3634.htm>.

Note: Some graphics may distort due to compression.

Clark State Forest  
Forester: Alwine/Bartlett  
Tract Acreage: 171.8  
Management Cycle End Year: 2039

Compartment 4      Tract 1  
Date: September 4, 2019  
Forested Acreage: 168.6  
Management Cycle Length: 20

### **Location**

Compartment 4, tract 1, also known as 6300401, is located within Clark County, Indiana north of Liberty Knob Road and northeast of Taylor Road. More specifically in the Henryville Quadrangle within Section 16, T2N, R6E. The tract is located around 3 miles north of New Liberty, IN and around 4 miles west of Underwood, IN.

### **General Description**

This tract is comprised of four main cover types: dry oak-hickory, mesic oak-hickory, mixed hardwoods, and young oak-hickory. The dominant overstory tree species include white oak and chestnut oak, depending on the topography. Past management in this tract is evident from old stumps and different age class forests. Invasive species were observed near the wetter areas and along sections of Taylor Road. The main recreational activity is hunting. Illegal ATV use was observed and addressed. Management in this tract should focus on releasing crop trees and removing invasive species to prevent their expansion. In addition, some midstory work is needed to facilitate the growth of the oak and hickory species which are currently being suppressed by shade tolerant species.

### **History**

- Land acquisition from Emma Richey in 1941
- Land acquisition from Charles Richey in 1941
- Land acquisition from I H Hardin & Bessie Hardin in 1942
- Land acquisition from Day Vern in 1962
- Inventory completed in 1974
- Resource Management Guide written in 1975
- Timber harvest conducted in 1975
- Timber harvest conducted in 1984
- Inventory completed for State Forest Inventory Program in 1986
- Inventory completed by Alwine/Bartlett in 2019
- Resource Management Guide written by Alwine in 2019

This tract's boundary was changed in 2019 and now includes land that was historically in two tracts, 6300401 and 6300402.

### **Landscape Context**

The area southwest of the tract is forested tracts of Clark State Forest. There are some scattered residential homes to the north and east with agricultural fields. The land use of the surrounding area is expected to remain the same.

### **Topography, Geology and Hydrology**

The terrain in this tract is variable. It has a central ridge that runs north and south through the tract. The rest of the terrain is made up of side slopes and drainages flowing down from the main ridge.

On the western side, there are flatter areas made up along the stream and lake. The bedrock in this area is siltstone with a sub lithology of sandstone, shale, and limestone.

This tract is located within the Big Ox Creek watershed. Little Ox Creek flows along the western border of this tract and a large portion of the water in this tract flows into this creek. Little Ox Creek feeds a lake located partially in the tract on the northern side. An estimated 3.2 acres of this lake is in the tract. Taylor Road, a gated management road, eventually leads to the upper region of this lake located on state forest. Little Ox Creek flows into Big Ox Creek approximately 2 miles northeast of the tract. The water in the eastern half of the tract flows out in multiple ephemerals and one mapped intermittent stream. These waterways eventually flow into Big Ox Creek. General Riparian Management Zone (RMZ) guidelines will be implemented in these areas in accordance with the Indiana Logging and Forestry Best Management Practices.

### **Soils**

BcrAW- Beanblossom silt loam, 1 to 3 percent slopes, occasionally flooded, very brief duration, 5.5 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.

ComC- Coolville silt loam, 6 to 12 percent slopes, 2.2 acres

This moderately sloping, deep, moderately well drained soil is on side slopes in the uplands. It is well suited to trees. Erosion hazards are concerns that should be considered during implementation of Best Management Practices for Water Quality. This soil has a site index of 66 for northern red oak.

ConC3- Coolville-Rarden complex, 6 to 12 percent slopes, severely eroded, 4.5 acres

These moderately sloping, deep, moderately well drained soils are found on side slopes in the uplands. It is well suited to trees. Erosion hazards are concerns that should be considered during implementation of Best Management Practices for Water Quality. Coolville has a site index of 66 for northern red oak and Rarden has a site index of 71 for black oak.

ConD- Coolville-Rarden complex, 12 to 18 percent slopes, 6 acres

These strongly sloping, deep, moderately well drained soils are found on side slopes in the uplands. It is well suited to trees. Erosion hazards are concerns that should be considered during implementation of Best Management Practices for Water Quality. Coolville has a site index of 66 for northern red oak and Rarden has a site index of 71 for black oak.

GmaG- Gnawbone-Kurtz silt loams, 20 to 60 percent slopes, 114 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 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.

PcrC3- Pekin silt loam, 6 to 12 percent slopes, severely eroded, 1.1 acres

This moderately sloping, deep, well-drained soil is found on side slopes adjacent to drainage ways on alluvial terraces. It is well suited to trees and has a site index of 70 for white oak and 85 for yellow poplar.

SoaC2- Spickert silt loam, 6 to 12 percent slopes, eroded, 7 acres

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

StaAQ- Steff silt loam, 0 to 2 percent slopes, rarely flooded, 3 acres

This nearly level, deep, moderately well drained soil is on bottom land. It is flooded for brief periods, mainly in winter and spring. It is well suited to trees and has a site index of 88 for black oak and 107 for yellow poplar.

StdAH- Stendal silt loam, 0 to 2 percent slopes, frequently flooded, brief duration, 1.5 acres

This nearly level, deep, somewhat poorly drained soil is on bottom land along small streams. It is well suited to trees. Seasonal wetness limits equipment and should be considered when planning management activities. This soil has a site index of 90 for pin oak and yellow poplar.

StmC- Stonehead silt loam, 6 to 12 percent slopes, eroded, 16.2 acres

This moderately sloping, deep, moderately well drained soil is on narrow ridgetops and side slopes in the uplands. It is well suited to trees and has a site index of 90 for northern red oak.

WedB2- Weddel silt loam, 2 to 6 percent slopes, eroded, 1.8 acres

This gently sloping, deep, moderately well drained soil is found on shoulders and summits in the till plains. It is well suited to trees and has a site index of 65 for white oak and 75 for yellow poplar.

WhcD- Wellrock-Gnawbone silt loams, 6 to 20 percent slopes, 2.6 acres

This strongly sloping, deep, well-drained soil is on side slopes in the uplands. It is well suited to trees. Erosion hazards are a management concern that should be considered when implementing Best Management Practices for water quality. Wellrock has a site index of 90 for yellow poplar and 70 for white oak. Gnawbone has not been evaluated for site index.

Water (small lake mainly on private), 3.2 acres located on the state forest

**Access**

Access to this tract is attained via Taylor Road. Taylor Road becomes a gated fire lane shortly after entering state forest land and provide direct access to the western side of the tract.

**Boundary**

This tract has both state forest and privately owned lands bordering it. To the west, Little Ox Creek provides the boundary between this tract and 6300214. The southwestern portion of the tract is bordered by 6300402 with a drainage between two ridges. The remainder of the borders along this tract, are with private landowners.

## Ecological Considerations

This tract contains diverse vegetation and wildlife resources conducive to providing habitat for a variety of wildlife species. Cover types include: mesic oak-hickory forest, dry oak-hickory forest, mixed hardwoods, riparian areas, and open water.

The Indiana DNR Forestry Division has constructed a set of division level standards 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 become down coarse woody debris (DWD) contributing to the nutrient cycling. DWD decomposes providing nutrients for remaining and new vegetative growth as well contributing to the complexity of the forest floor.

	Maintenance Level	Inventory	Available Above Maintenance
Snags 5"+	688	1,051	363
Snags 9"+	516	611	95
Snags 19"+	86	170	84

Snags in this tract met maintenance levels for all three size classes. Management in this tract should attempt to either maintain or increase snag densities within the tract.

Invasive species observed were not a major concern. They are mainly found along the access road and fire lanes. Species observed include Japanese honeysuckle, oriental bittersweet, autumn olive, Japanese stilt grass, multiflora rose, Asian bush honeysuckle, and Chinese bush clover. Currently, these species are not prevalent away from the road or fire lanes. It is recommended they be treated prior to any harvesting activity.

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 in this tract is limited, there are no trails, and the only vehicle access is Taylor Road to the gated fire lane and parking area. Multiple hunting stands were observed during the inventory suggesting hunting as the main use.

## 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 Prescriptions

The current forest resource inventory was completed in 2019 by foresters Alwine and Bartlett. An overview of the inventory results is located below. Only trees larger than 11 inches DBH are included in volume summaries.

Species	Sawtimber Trees	Total Bd. Ft.
White oak	3,541	595,832
Chestnut oak	2,529	312,584
Virginia pine	674	93,067
Scarlet oak	506	70,812
Pignut hickory	169	26,133
Black oak	84	13,151
Shagbark hickory	34	3,709
Red maple	34	3,203
Sweetgum	34	3,203
Blackgum	17	2,023
American sycamore	17	1,517
Total	7,638	1,125,236

This tract was divided into four management cover types based on overstory composition. Below are the general stand descriptions.

**Descriptions:**

*Dry Oak-Hickory, 63 acres*

This is a fully stocked stand located on the ridge tops and upper slopes within this tract. The percent stocking is around approximately 92%. The most dominant tree is chestnut oak making up around half of the volume and basal area within the stand. Other common overstory tree species include: Virginia pine, white oak, pignut hickory and scarlet oak. Although not represented in the inventory, some post oak was noted in this stand. Due to the relatively high stocking in this cover type, quality of individual trees is poor. The regeneration in this stand is primarily maple and beech. There are small areas with oak regeneration, but it is not common. Roundleaf greenbrier is also very common within this tract, at times making it hard to traverse. The only invasive species noted in this stand were Japanese stilt grass and some scattered multiflora rose.

Trees per Acre: 132	Percent Stocking: 92% (fully stocked)
Basal Area: 111	Volume per Acre: 6,140 board feet

Species	Volume per acre
Chestnut oak	2,985
Virginia pine	1,184
White oak	1,111
Scarlet oak	444
Pignut hickory	260
Black oak	128
Blackgum	28
Stand Totals	6,140

*Mesic Oak-hickory, 86 acres*

This cover type makes up most of the tract. It is fully stocked with a percent stocking of 93%. White oaks make up over 70 percent of both the volume per acre and basal area per acre within this stand. In general, the overstory trees have good form, but the crown sizes are smaller because of the high density of trees. The midstory in this tract is like that of the dry oak-hickory stand in that it is mainly beech and maple with small, scattered pockets of oak regeneration. Japanese stilt grass along the drainages was the only invasive species observed.

Trees per Acre: 119	Percent Stocking: 93% (fully stocked)
Basal Area: 115.7	Volume per Acre: 8,698 board feet

Species	Volume per acre
White oak	6,758
Chestnut oak	1,270
Scarlet oak	429
Pignut hickory	97
Black oak	54
Shagbark hickory	49
Red maple	41
Stand Totals	8,698

*Mixed hardwoods, 17 acres*

This cover type is understocked and found mostly near Taylor Road. It includes the riparian area near the stream, the flood plains, some partially open spots west of Taylor Road, and a small pocket of blow down. The stand is extremely variable ranging from larger, scattered trees near the stream to brushy areas to Virginia pine and sweetgum. Where there is regeneration, it is mainly red maple and American beech. Much of this stand does not have a well-defined overstory and midstory. Most of the invasive species within this tract are found in this cover type. The invasive species should be addressed.

Trees per Acre: 44	Percent Stocking: Understocked
Basal Area: 33.3	Volume per Acre: 1,497 board feet

Species	Volume per acre
Virginia pine	615
Scarlet oak	491
Sweetgum	263
American sycamore	128
Stand Totals	1,497

*Young oak-hickory, 2 acres*

This cover type is a small area of pre-commercial stems created by use of regeneration openings during the 1984 timber harvest. Trees in this cover type are less than ten inches in diameter. The percent stocking in this stand is around 110% making it overstocked. Most of the stems are in

decline due to the high density. Also, due to the young age of this stand, there is very little tree growth beneath the canopy.

Species	Trees per acre
White oak	171
Scarlet oak	118
Black oak	77
Chestnut oak	14
Virginia pine	38
Black cherry	30
Stand Totals	447

**Silvicultural Prescriptions:**

*Dry Oak-Hickory, 63 acres*

This cover type would benefit from management that lowered the overstory stocking while attempting to shift the midstory from beech and maple to more upland oak and hickory species like chestnut oak and pignut hickory. To lower the density of the overstory, an improvement harvest is recommended. This harvest will aim to release crop trees on 2 to 3 sides to improve space and sunlight penetration to the forest floor. Crop trees should be chosen based on the quality of the tree. Crop trees should be oak and hickory species with good form and healthy crowns. Group selection or patch-cut openings should be utilized to address areas of low stocking or where Virginia pine has reached maturity or declining. An estimated 75,000 -110,000 bdft will be removed from this cover type. Following the harvest timber stand improvement (TSI) should be implemented to deaden culls, release crop trees not released by the harvest, complete regeneration openings, and address invasive species. Invasive species should be treated prior to the harvest as well.

To treat the midstory, the current maple and beech needs to be removed. This could be done either chemically, mechanically, or culturally (prescribed burns). Chemical applications will follow forest certification standards. Likely, the most cost-effective way to target an area like this would be to start a prescribed fire regime. This could work to decrease shade tolerant midstory species, reduce fuel loads, and provide site conditions needed for upland oak species. Once established, this prescribed fire regime should be on a 5 to 7 year cycle, or as needed.

*Mesic Oak-hickory, 87 acres*

Prescribed management in this cover type will be like the dry oak-hickory. The main difference between them is crop tree species. White oak should be the dominant crop tree in this cover type. Other oaks and hickories with good form and vigor should also be considered for crop trees. An improvement harvest utilizing single tree and group selection or patch-cut openings is recommended. An estimated 160,000 – 215,000 bdft will be removed from this cover type. TSI will follow the harvest with the same intent as with the dry oak-hickory. Invasive species should be treated prior to the harvest.

Midstory treatments will also be necessary to encourage oak and hickory regeneration. Using a prescribed fire regime will reduce the number of shade tolerant species improving survival for oak



and hickory. An oak shelterwood should also be consider as a silvicultural option in this cover type.

*Mixed hardwoods, 17 acres*

Currently, this stand does not have the stocking to support a harvest. TSI is recommended to address invasive species, damaged areas from wind, and promote species like oaks, hickory, yellow-poplar, and hard maples. Invasive species treatment should be the focus of this work to reduce and minimize spread. Prescribed fire in this cover type is not practical due to elevated moisture of the soils. However, it could serve as a fire break if fire were used in the dry oak-hickory and mesic oak-hickory cover types.

*Young oak-hickory, 2 acres*

This cover type is pre-commercial. A pre-commercial thinning is recommended to release the quality oaks present. Crop trees should be released on two to three sides to provide space to mature. This work can be performed during post-harvest TSI, which will increase the density of snags and down coarse woody debris. A few small patches of Japanese stilt grass in this tract should be treated to minimize spread.

Other considerations

**Regeneration evaluation** – Three to five years following the completion of the timber harvest, a regeneration evaluation 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 shall be performed within two years of timber harvest completion. TSI is prescribed to complete regeneration openings, remove species inhibiting desirable regeneration, and address problem occurrences of invasive species.

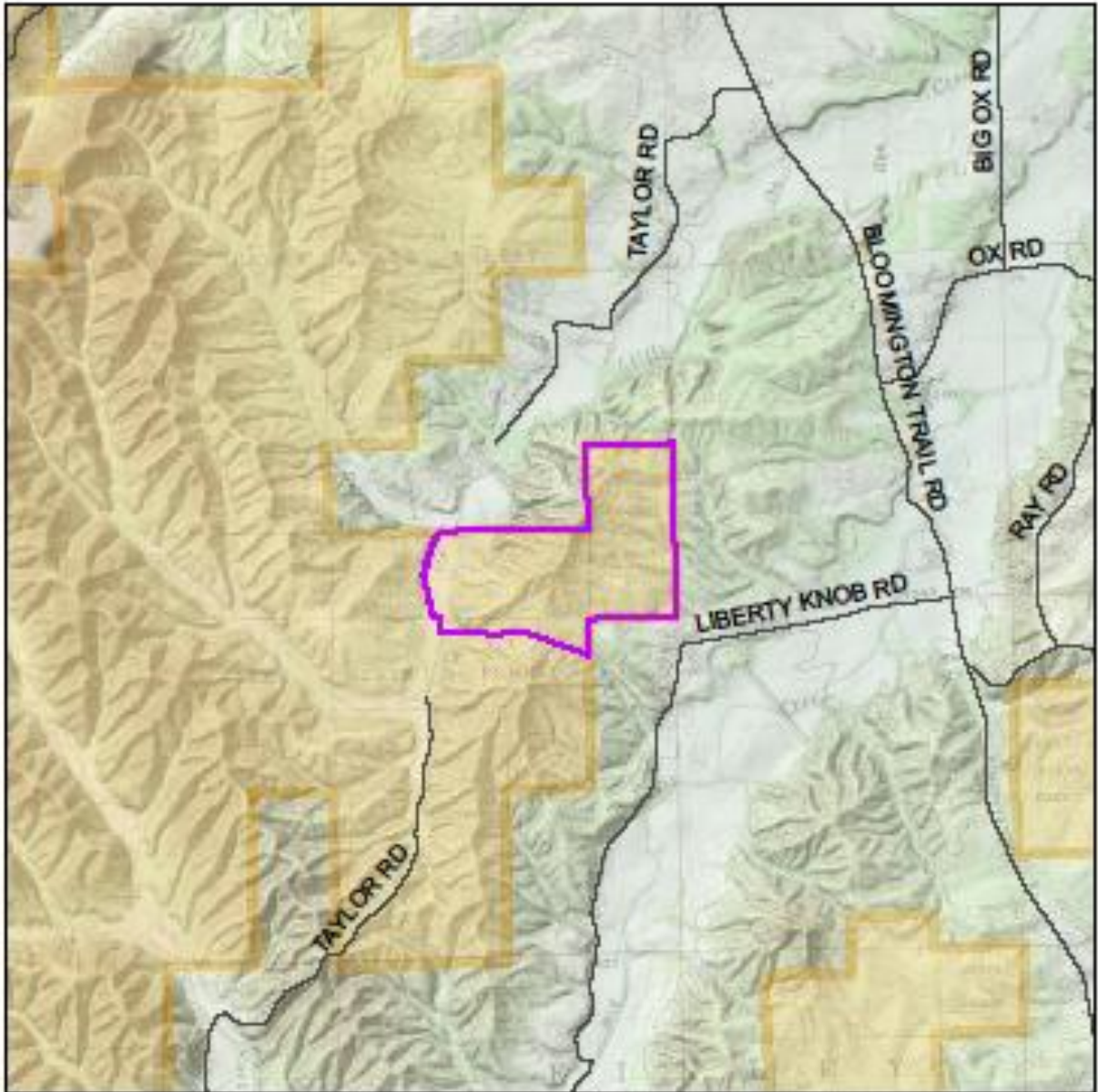
**Best management practices (BMP)** – During and after completion of the proposed management activity, BMPs will be implemented in order to minimize soil erosion.

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

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


<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Invasive species management	2020-2021
Improvement harvest	2021-2024
Thinning in Young Oak-Hickory Stand	2021-2022
Post-harvest TSI	2024-2027
Prescribed fire regime	2024+
Re-evaluate tract	2039

# Compartment 4 Tract 1



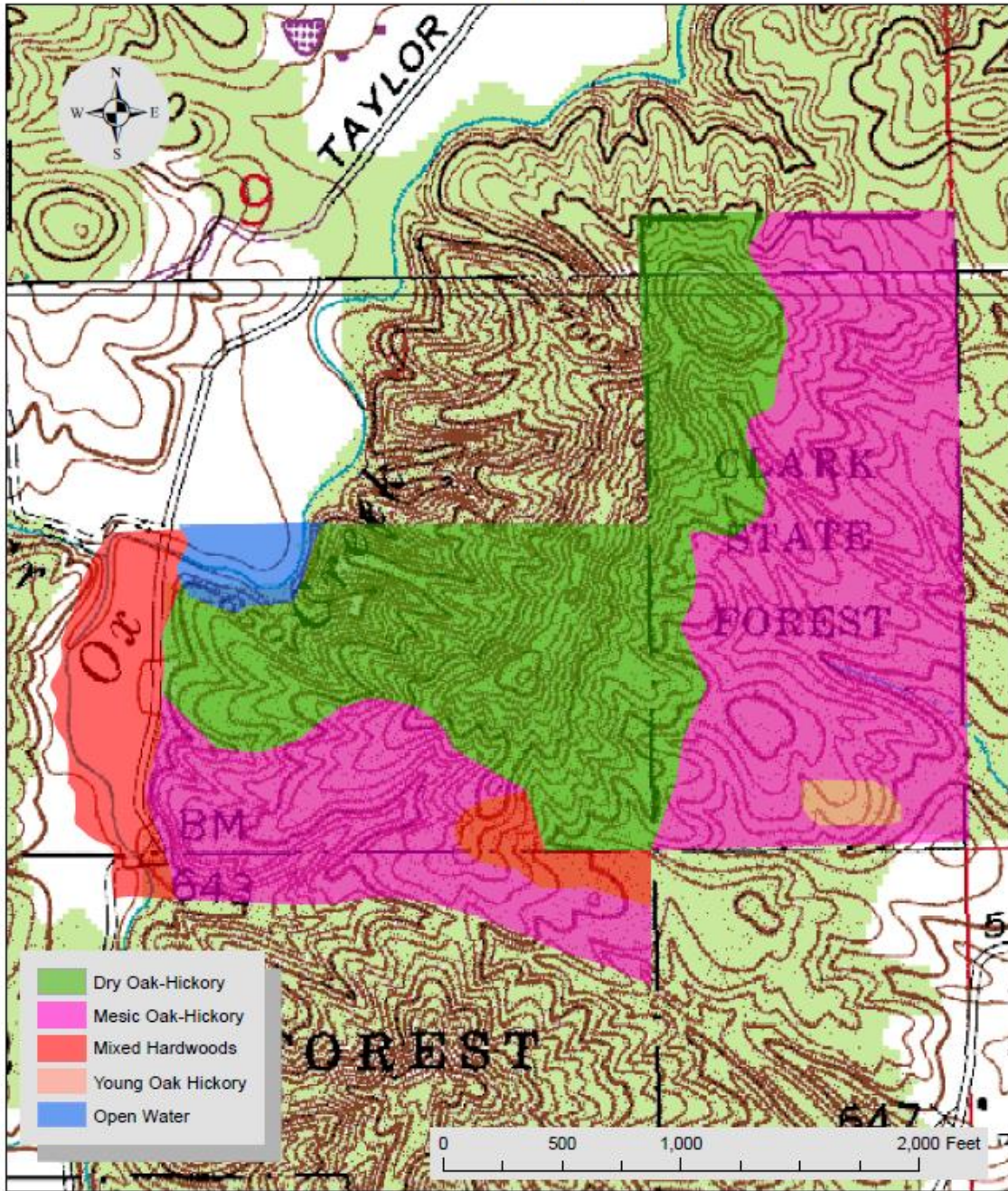
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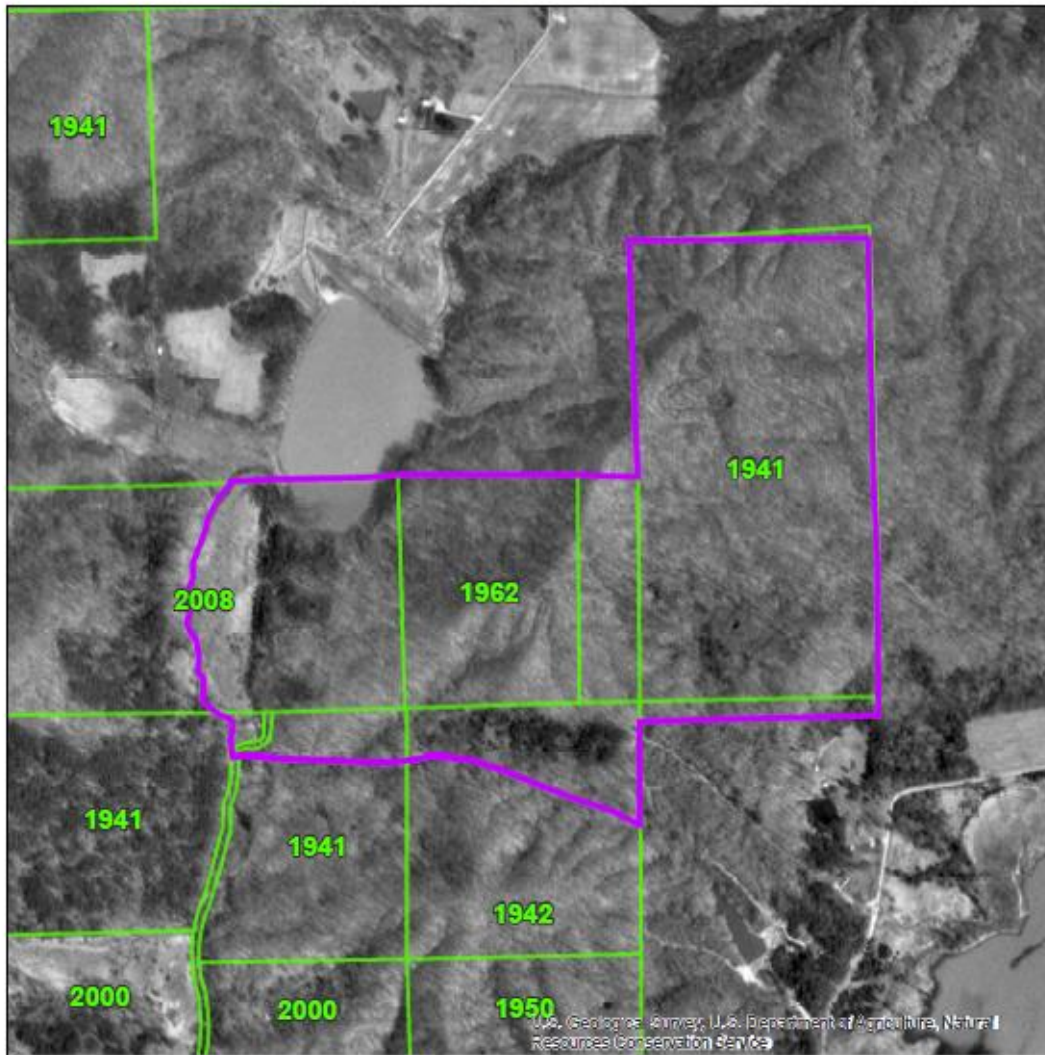




Clark State Forest  
Compartment 4 Tract 1  
Stand Map



# Clark State Forest Compartment 4 Tract 1 Land Acquisition Map



Basemap is 1998 aerial photo.



Clark State Forest  
Forester: Bartlett  
Tract Acreage: 98.8 acres  
Management Cycle End Year: 2039

Compartment 4      Tract 2  
Date: September 2019  
Forest Acreage: 98.8  
Management Cycle Length: 20 years

### **Location**

Compartment 4 tract 2, also known as 6300402, is located in Scott County, Indiana. More specifically in section 16, township 2 north, range 6 east in the Henryville quadrangle. This tract is approximately 6 miles southwest of Scottsburg, Indiana.

### **General Description**

This is a forested tract comprised of mixed hardwoods and dry oak-hickory cover types. The mixed hardwoods cover type is located along the stream to the west side of the tract. Most of the tract is dry oak-hickory cover type. There are invasive species within the tract on old skid trails and near the western stream. Treatment of these invasive species should be relatively easy due to accessibility with a UTV sprayer.

### **History**

1941 – Land acquired from Richey  
1942 – Land acquired from Hardin  
1950 – Land acquired from Heacock  
1974 – Timber inventory completed\*  
1975 – Timber sale  
1986 – Timber cruised for new state inventory program  
1988 – Line ran for adjacent timber sale  
2019 – Forest inventory completed by Dustin Alwine and Ryan Bartlett  
2019 – Resource management guide completed by Ryan Bartlett

*\* A past management guide was on file but contained no date. This guide was likely written after the inventory in 1974 and before the timber sale in 1975.*

### **Landscape Context**

This tract is bordered by Clark State Forest on three sides. The land east of this tract is privately owned and forested. There are some scattered residential homes with agricultural fields located in the surrounding area. The land use of the surrounding area is expected to remain the same.

### **Topography, Geology and Hydrology**

This entire tract is a knob and its surrounding slopes. Much of the tract is steep but there is a main ridgeline that makes access and management possible.

The underlying bedrock is siltstone with a sub-lithology of shale, sandstone, and limestone.

Water that flows down the east side of the tract's main ridge empties into Big Ox Creek. Water that travels down the west facing slopes joins Little Ox Creek. Little Ox Creek eventually feeds into Big Ox Creek. This entire tract is within the Big Ox Creek watershed. General Riparian Management Zone (RMZ) guidelines will be implemented in these areas in accordance with the Indiana Logging and Forestry Best Management Practices.

## **Soils**

### BcrAW- Beanblossom silt loam, 1 to 3 percent slopes, occasionally flooded, very brief duration, 3.7 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.

### ComC- Coolville silt loam, 6 to 12 percent slopes, 0.3 acres

This moderately sloping, deep, moderately well-drained soil is on side slopes in the uplands. It is well suited to trees. Erosion hazards are concerns that should be considered during implementation of Best Management Practices for Water Quality. This soil has a site index of 66 for northern red oak.

### ConD- Coolville-Rarden complex, 12 to 18 percent slopes, 7.1 acres

These strongly sloping, deep, moderately well-drained soils are found on side slopes in the uplands. It is well suited to trees. Erosion hazards are concerns that should be considered during implementation of Best Management Practices for Water Quality. Coolville has a site index of 66 for northern red oak and Rarden has a site index of 71 for black oak.

### GmaG- Gnawbone-Kurtz silt loams, 20 to 60 percent slopes, 83.1 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 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.

### SoaC2 – Spickert silt loam, 6 to 12 percent slope, eroded, 2.7 acres

This deep to very deep, moderately well-drained soil occurs on hills underlain with siltstone. This soil has a site index of 60 for white oak and 100 for yellow-poplar.

### StaAQ- Steff silt loam, 0 to 2 percent slopes, rarely flooded, 0.2 acres

This nearly level, deep, moderately well-drained soil is on bottom land. It is flooded for brief periods, mainly in winter and spring. It is well suited to trees and has a site index of 88 for black oak and 107 for yellow poplar.

### StmB2 – Stonehead silt loam, 2 to 6 percent slopes, eroded, 0.6 acres

This deep or very deep, moderately well-drained soil occurs on hill summits underlain with shale or siltstone. This soil has a low pH and a site index of 90 for a northern red oak.

### StmC – Stonehead silt loam, 6 to 12 percent slopes, 1.4 acres

This deep or very deep, moderately well-drained soil occurs on the shoulders and backslopes of hills underlain with shale and siltstone. This soil has a low pH and a low erosion hazard. The site index for northern red oak in this soil is 90.

## Access

Access to this tract is good. Taylor Road provides access to the gated fire lane which travels along the western border of the tract. There are multiple locations along the road for management access.

Previous skid trails exist on all the main ridges within the tract providing access to the tract interior.

## Boundary

This tract shares boundaries with other tracts of Clark State Forest as well as private property. The entire eastern side of the tract and a portion of the southern boundary are adjacent to private property. The remainder of the tract is surrounded by tracts 6300213, 6300214, 6300401, and 6300403.

## Ecological Considerations

This tract contains diverse vegetation and wildlife resources when considering age, type, and structure, that is conducive to providing habitat for a variety of wildlife species. Habitat types include: oak-hickory canopy, mixed hardwood canopy, and riparian areas.

The Indiana DNR Forestry Division has constructed a set of division level standards 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 down and then contribute 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.

	Maintenance Level	Inventory	Available Above Maintenance
Snag 5"+ DBH	395	573	178
Snag 9"+ DBH	296	573	277
Snag 19"+ DBH	49	85	36

Inventory data for compartment 4 tract 2 shows that maintenance levels were met for all size classes. The prescribed management will maintain or enhance the relative abundance of these features.

Invasive species were scarce within the tract. If identified, priority should be given to the control of ailanthus, Amur cork, and Amur honeysuckle. During forest inventory, Japanese stilt grass was observed on the existing skid trails and some of the ephemeral drainages. On the eastern boundary of the tract there were scattered multiflora rose and autumn olive. These should be managed with a situational approach and their location relative to riparian areas shall be considered when planning their management.

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

## Recreation

Recreation in this tract is limited, there are no trails in the area. Illegal ATV use was observed and addressed. The primary use of this tract is likely hunting.

## 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

The current forest resource inventory was completed in August 2019 by foresters Alwine and Bartlett. A summary of the estimated tract inventory results is located below. Only trees larger than 11 inches DBH are included in volume summaries.

Species	# Sawtimber Trees	Total Bd. Ft.
Chestnut oak	2,470	359,138
White oak	1,679	262,314
Scarlet oak	99	19,859
Pignut hickory	98	13,634
Yellow poplar	89	9,386
Black walnut	97	8,003
Virginia pine	79	8,003
Sugar maple	39	4,150
Red maple	29	2,964
<b>Total:</b>	<b>4,679</b>	<b>687,450</b>

This tract was divided into two cover types. Below is a general tract description and silvicultural prescription.

## Tract Subdivision Description and Silvicultural Prescription

### Descriptions:

#### Mixed hardwoods – 4 acres

A small area near the stream on the western portion of the tract was classified as mixed hardwoods. There were few trees in these inventory plots, and a greater diversity of invasive species observed. The regeneration within this stand was almost entirely beech and maple.

Trees per Acre: 38	Percent Stocking: 51% (under stocked)
Basal Area: 70	Volume per Acre: 4,775 board feet

Species	Volume per Acre
Yellow poplar	1,517
Virginia pine	1,296
Black walnut	1,289



Sugar maple	673
Total:	4,775

Dry Oak-Hickory – 95 acres

The remainder of the tract is classified as a dry oak-hickory cover type. Most of the volume in this stand is white oak and chestnut oak. There are areas where there is abundant oak regeneration, but shade tolerant species such as beech and maples make up a large portion of the understory.

Trees per Acre: 116	Percent Stocking: 82% (fully stocked)
Basal Area: 106	Volume per Acre: 7,104 board feet

Species	Volume per Acre
Chestnut oak	3,878
White oak	2,832
Scarlet oak	215
Pignut hickory	147
Red maple	32
Total:	7,104

**Silvicultural Prescriptions:**

Mixed Hardwoods – 4 acres

At this time, the only management prescribed is invasive species management. This management could be performed via a foliar treatment following forest certification guidelines. Most of this area is accessible by a UTV sprayer.

Dry Oak-Hickory – 95 acres

An improvement harvest utilizing single tree selection is prescribed. The goal of this management strategy is to release and promote the growth of quality crop trees while removing poor quality competitors. Crop trees shall be selected based on health, form, and vigor. Crop trees should be released on two - three sides.

Group and patch-cut selection openings are prescribed for areas that have desirable regeneration and a declining overstory. The goal of this management is to establish the regeneration as the stand's future overstory. An estimated 80,000 – 175,000 bdft will be removed in this cover type.

Areas that have high quality seed trees and non-desirable regeneration are ideal locations to install a shelterwood. The goal of this management is to create areas with partial shade to promote the regeneration of oak species. A treatment of the shade tolerant midstory is highly recommended for this management strategy. The midstory may be treated with either a chemical, mechanical, and/or cultural methods.

A prescribed fire is a cost-effective way to decrease the abundance of beech and maple in the midstory. Taylor Road to the west and the ridgeline to the east provide excellent firebreaks to assist with this management option.

Other considerations

**Regeneration evaluation** – Three to five years after the completion of the timber harvest, a regeneration evaluation 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 shall be performed within two years of timber harvest completion. 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 in order to minimize soil erosion.

**Guide revision** – This tract should receive another inventory and management guide 20 years following the completion of the timber harvest.

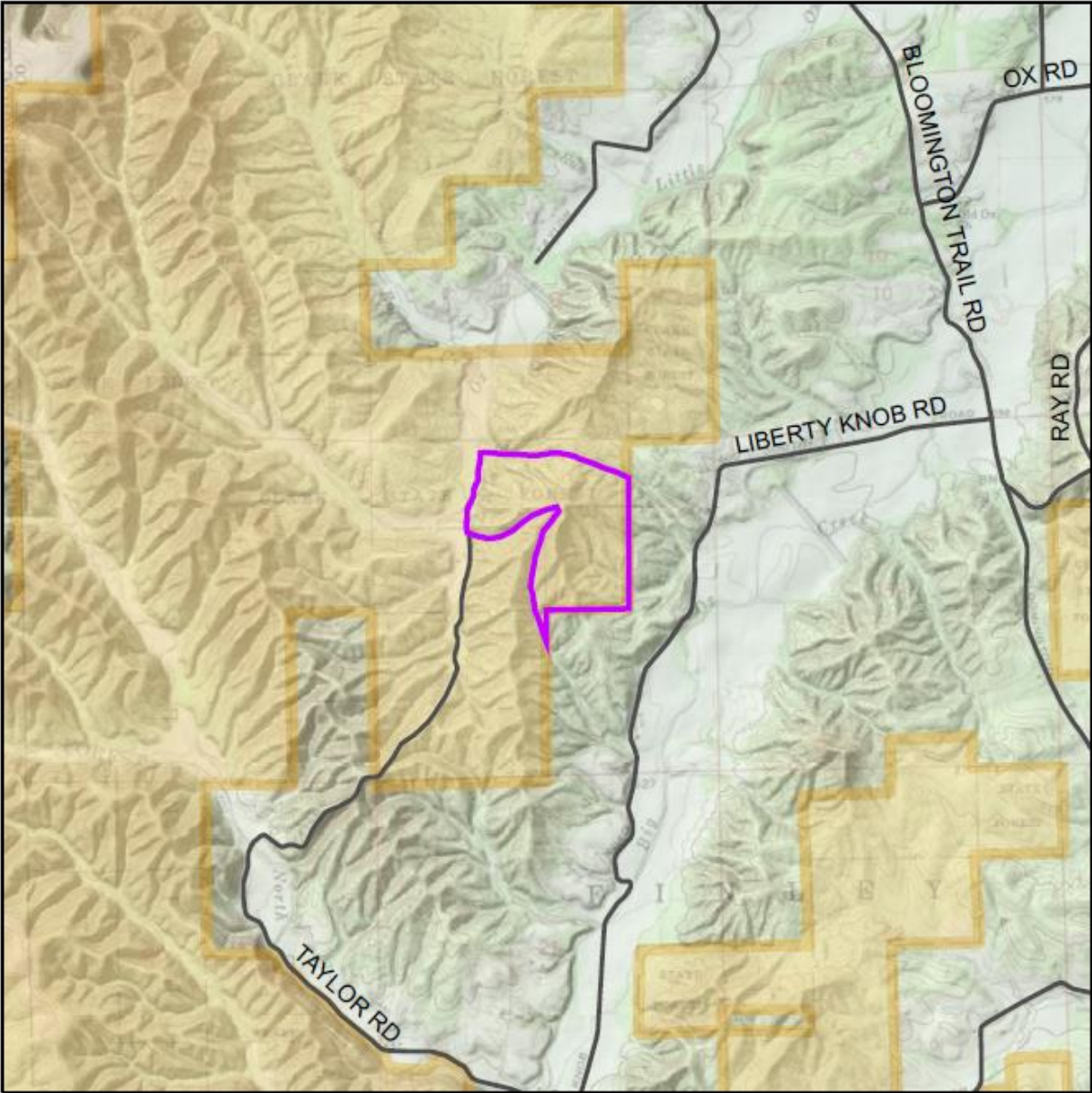
**Prescribed fire** – A regime of prescribed burns may be started within this tract to reduce the abundance of the shade tolerant species in the midstory and to help control invasive species.

**Invasive species management**


The area along the old skid trails is prescribed to have invasive species management performed. Invasive species lessen as you move more interior to the tract, but Japanese stilt grass is established along the main ridge and drainages. While their presence is not numerous: multiflora rose, autumn olive, and other discovered invasive species along the stream to the west will be treated as well.

<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Invasive species management	2020 – 2022
Timber marking and sale	2020 – 2022
Prescribed fire regime	2021+
Regeneration evaluation	2026 – 2028
Inventory and resource management guide	2039

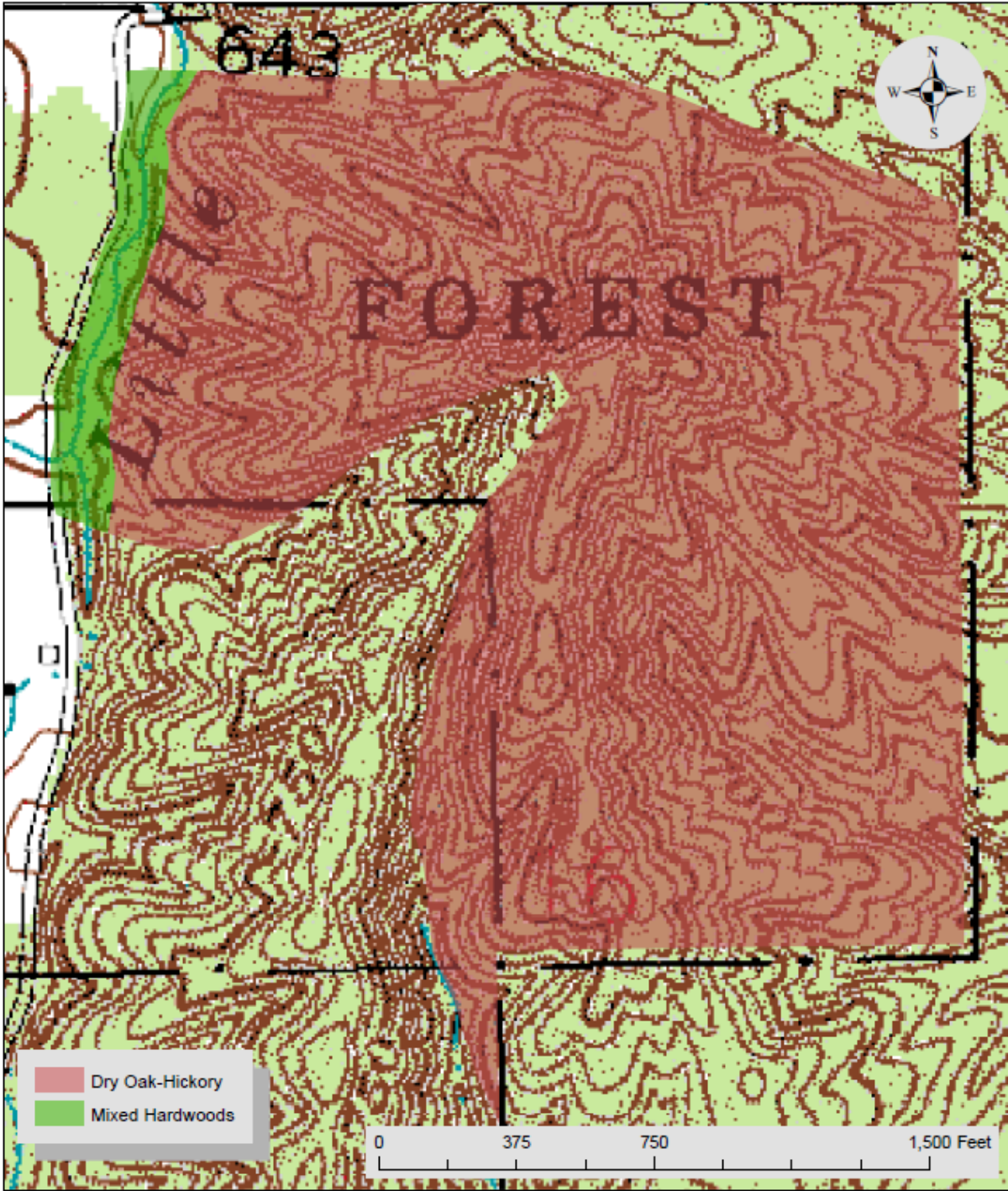
# Compartment 4 Tract 2



 State Forest

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 Miles

Clark State Forest  
Compartment 4 Tract 2  
Stand Map



Clark State Forest  
Forester: Bartlett  
Tract Acreage: 138  
Management Cycle End Year: 2040

Compartment 4      Tract 3  
Date: January 2020  
Forested Acreage: 138  
Management Cycle Length: 20

### **Location**

Compartment 4 tract 3, also known as 6300403, is located in Scott County, Indiana. More specifically in Section 16, Township 2 North, Range 6 East. This tract is located approximately 7 miles northwest of Henryville, Indiana.

### **General Description**

This tract is composed of three cover types: mixed hardwoods, mesic oak-hickory, and dry oak-hickory. The dry oak-hickory is located on the ridge tops and steeper slopes, the mesic oak-hickory on the moderate slopes, and the mixed hardwoods occur in the low areas of the tract. Most of the trees within the tract are chestnut oak and white oak. The tract has several areas that would benefit from a pre-commercial thinning (i.e., timber stand improvement (TSI)).

### **History**

1941 – Land purchased from Weaver  
1974 – Forest inventory completed  
1975 – Timber harvest; 35,600 bd. ft. sold  
1986 – Forest inventory completed  
1994 – Timber harvest; 79,206 bd. ft. sold to Babcock & Sons  
1999 – Timber harvest; 27,952 bd. ft. sold to Worley Lumber  
2000 – Land purchased from Just and Bledsoe  
2018 – Forest inventory completed by inventory intern Steffek  
2019 – Tract boundaries changed to include former tract 6300414  
2019 – Resource management guide completed by Bartlett

### **Landscape Context**

This tract is bordered by Clark State Forest on the north and west sides. The land on the east and south sides are privately owned forestland. There are some scattered residential homes with agricultural fields located in the surrounding area. The land use of the surrounding area is expected to remain the same.

### **Topography, Geology, and Hydrology**

This tract contains some steep slopes, but most of the tract is accessible for forest management. A narrow ridge bisects the tract from north to south. There is a fire lane that provides access to the top of the ridge. Smaller ridges stem from the main ridgetop provides management access to the entire tract.

The underlying bedrock is siltstone with a sub-lithology of shale, sandstone, and limestone.

Water that flows down the east side of the tract's main ridge empties into Big Ox Creek. Water that travels down the west facing slopes joins Little Ox Creek. Little Ox Creek eventually feeds into Big Ox Creek. This entire tract is within the Big Ox Creek watershed. General Riparian



Management Zone (RMZ) guidelines will be implemented in these areas in accordance with the Indiana Logging and Forestry Best Management Practices.

### **Soils**

#### BcrAW- 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.

#### ConD- Coolville-Rarden complex, 12 to 18 percent slopes

These strongly sloping, deep, moderately well-drained soils are found on side slopes in the uplands. It is well suited to trees. Erosion hazards are concerns that should be considered during implementation of Best Management Practices for Water Quality. Coolville has a site index of 66 for northern red oak and Rarden has a site index of 71 for black oak.

#### GmaG- 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.

#### WhcD- Wellrock-Gnawbone silt loams, 6 to 20 percent slopes

This strongly sloping, deep, well-drained soil is on side slopes in the uplands. It is well suited to trees. Erosion hazards are a management concern that should be considered when implementing Best Management Practices for water quality. Wellrock has a site index of 90 for yellow poplar and 70 for white oak. Gnawbone has not been evaluated for site index.

### **Access**

Access to this tract is good. Taylor road borders the tract to the west and continues onto state property as a fire lane. There are multiple locations along the road for management access. Previous skid trails exist on all the main ridges within the tract and provide great access to the interior.

### **Boundary**

The southern and eastern edges of the tract are adjacent to private property. The remainder of the tract is surrounded by Clark State Forest tracts: 6300213, 6300215, and 6300402.

### **Ecological Considerations**

This tract contains diverse vegetation and wildlife resources (age, type, structure) conducive to providing habitat for a variety of wildlife species. Habitat types include oak-hickory canopy, mixed hardwood canopy, and riparian areas.

The Indiana DNR Forestry Division has constructed a set of division level standards 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 down and then contribute 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.

	Maintenance Level	Inventory	Available Above Maintenance
Snag 5"+ DBH	551	1,383	832
Snag 9"+ DBH	413	557	143
Snag 19"+ DBH	69	73	4

Snag densities met the state minimal level guidelines for all three size classes. Management in this tract should work to maintain or improve snag densities.

Very few invasive species were observed. The past skid trails throughout the tract have Japanese stilt grass present. The low areas near the streams likely have some invasive species present. Along Taylor Road there is multiflora rose, Japanese honeysuckle, and oriental bittersweet. These occurrences could easily be treated with a UTV and sprayer due to their location.

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

### Recreation

Taylor Road, to the west of this tract, leads to Taylor Road fire lane which is one of Clark State Forest's accessible hunter trails. The main recreational use within this tract is hunting.

### 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

This forest resource inventory was completed in June 2018 by inventory intern Gary Steffek. A summary of the estimated tract inventory results is located below. Only trees larger than 11 inches DBH are included in volume summaries.

Species	# Sawtimber Trees	Total Bd. Ft.
Chestnut oak	2,898	229,218
White oak	2,208	221,490
Red maple	414	35,742
Black oak	140	31,464
Pignut hickory	139	12,834
Scarlet oak	137	8,418

American beech	136	7,728
Blackgum	43	4,554
Yellow poplar	39	4,140
Virginia pine	28	3,450
Sugar maple	14	2,346
Totals	6,196	561,384

This tract is divided into three management cover types. Below are general types descriptions and silvicultural prescriptions proposed.

**Descriptions and Prescriptions:**

Mixed hardwoods – 11 acres

This stand is found along the stream on the western side of the tract and two ravines on the southern and eastern side of the tract. Most of the volume comes from red maple. The regeneration in this stand is primarily beech and maple. This stand is under stocked, and a harvest is not recommended at this time.

Trees per Acre: 104	Percent Stocking: 59% (under stocked)
Basal Area: 68	Volume per Acre: 3,595 board feet

Species	Volume per Acre
Red maple	1,232
White oak	799
Chestnut oak	783
American beech	221
Yellow poplar	192
Black oak	121
Pignut hickory	115
Blackgum	77
Sugar maple	55
Total:	3,595

Invasive species management should be performed along the western portion of the tract. A UTV with a tank sprayer is recommended to treat the small abundance of invasive species.

Mesic oak-hickory – 32 acres

This stand is located on the moderately steep side slopes. Most of this stand’s volume is white oak. The regeneration is primarily beech and maple, but some scattered oak seedlings were found in this stand. This stand is fully stocked, but a stand wide harvest is not prescribed at this time.

Trees per Acre: 84	Percent Stocking: 68% (fully stocked)
Basal Area: 86	Volume per Acre: 4,777 board feet

Species	Volume per Acre
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White oak	3,093
Chestnut oak	836
Black oak	508
Scarlet oak	99
American beech	68
Blackgum	65
Pignut hickory	48
Red maple	34
Sugar maple	26
Total:	4,777

This stand should be reevaluated in the future to determine if a timber harvest should be prescribed. A pre-commercial thinning is prescribed for this stand to release high quality stems and crop trees from competition. These selected crop trees should be chosen based on form, quality, and species. Crop trees should be released on at least three sides where possible. The competing trees should be sold if they are of merchantable size.

A prescribed fire is recommended in this stand to reduce the abundance of regenerating beech and maples while encouraging the regeneration of oak and hickory species.

Dry oak-hickory – 95 acres

This stand makes up most of the tract and is located on the ridgetops and steeper slopes. This stand has multiple areas of high-quality regeneration that is heavily crowded. A previous harvest seems to have targeted this stand and regeneration is white oak, chestnut oak, and scarlet oak. In the areas that are not regenerating to oak, the regeneration is primarily beech and maple. This stand is fully stocked, but a stand wide timber harvest is not recommended at this time. However, some timber may be removed along the main ridge during management activities conducted in 6300402.

Trees per Acre: 85	Percent Stocking: 62% (fully stocked)
Basal Area: 77	Volume per Acre: 3,762 board feet

Species	Volume per Acre
Chestnut oak	2,441
White oak	907
Pignut hickory	115
Red maple	112
Black oak	84
Scarlet oak	55
Virginia pine	48
Total:	3,762

A pre-commercial thinning is prescribed to release the regenerating oak species from competition. Most of these trees are not of merchantable size, but this stand is overcrowded. Crop trees should be selected and released from competition. If these competitors are of merchantable size, they should be sold. Crop trees should be selected based on quality, form, and species. Crop trees should aim to be released on at least three sides where possible.

Prescribed fire is recommended in the areas of this stand that do not currently have desirable regeneration. The goal of this fire is to encourage the regeneration of oak and hickory species while reducing the amount of beech and maple.

Other considerations

**Timber stand improvement (TSI)** – TSI shall be performed to release desired crop tree, improve snag density, improve sunlight, and address invasive species.

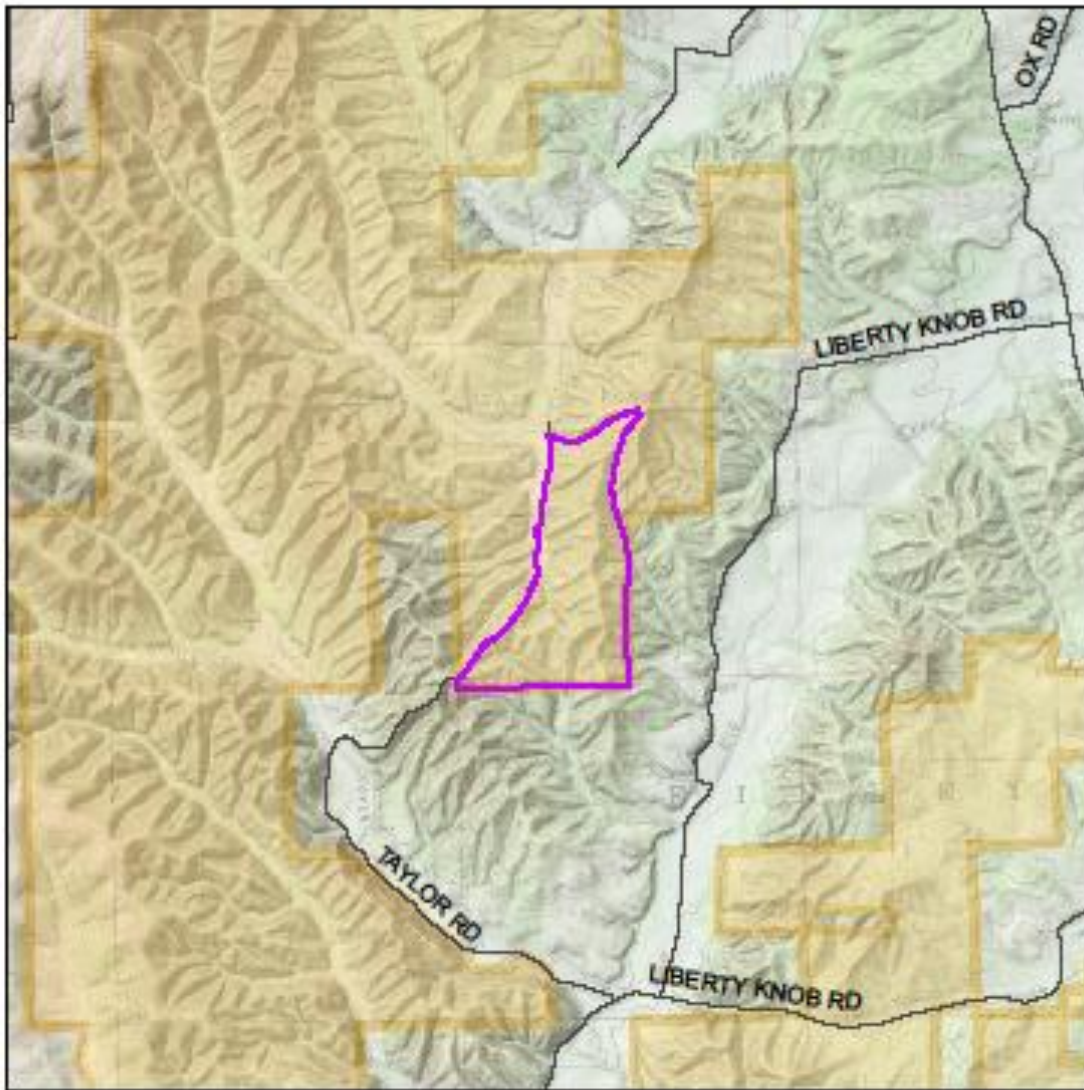
**Guide revision** – This tract should receive another inventory and management guide 15 - 20 years following the next management activity (e.g., harvest or TSI).

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


**Adjacent tracts** – It may be necessary to remove some trees during management activities conducted in 6300402. This would be along the main ridge line that provides access to 6300402.

<u>Proposed Management Activity</u>	<u>Proposed Date</u>
Pre-commercial thinning	2020-2021
Invasive species management	2020-2021
Prescribed fire regime	2020+
Inventory and resource management guide	2040

# Compartment 4 Tract 3

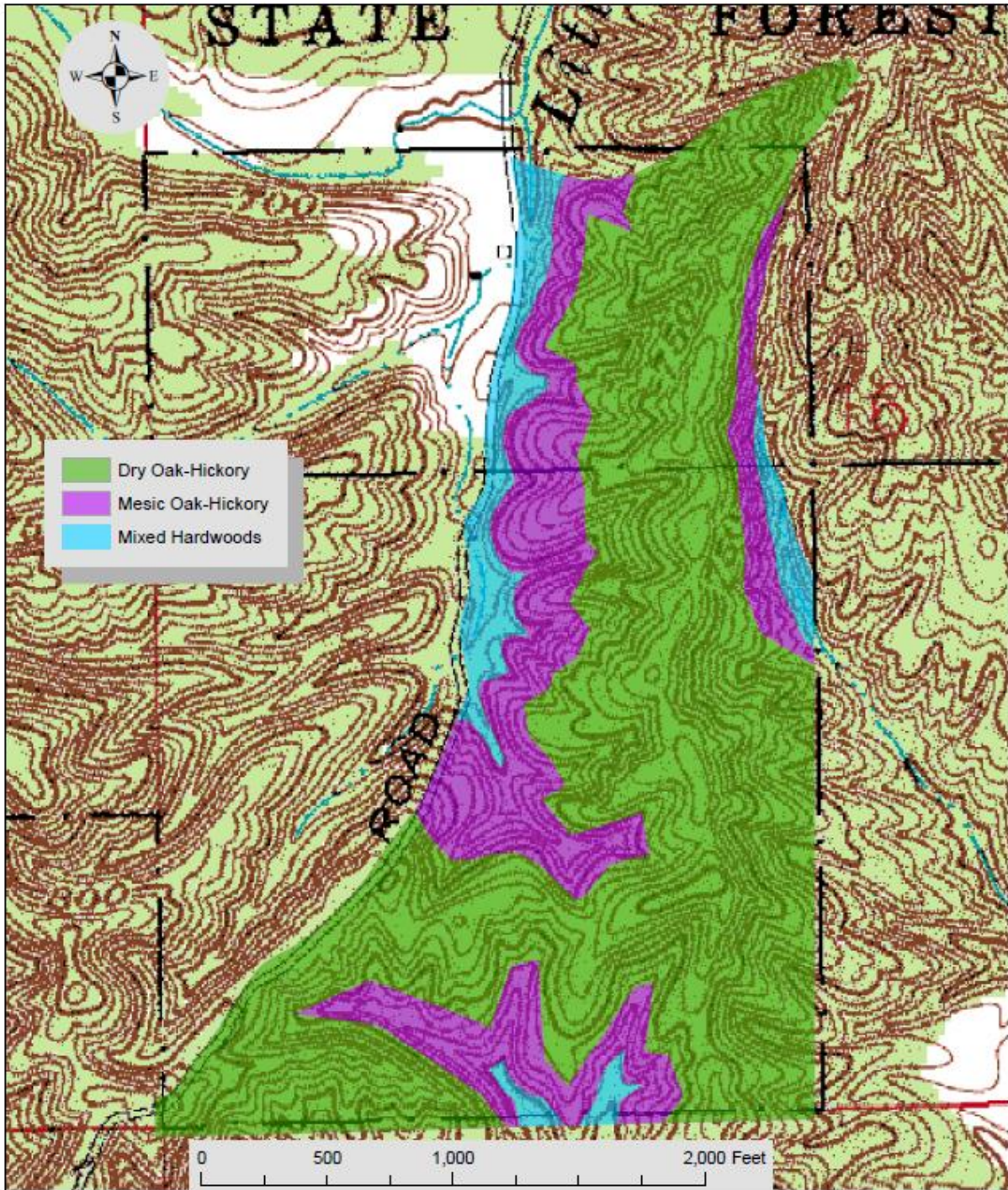


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# Clark State Forest Compartment 4 Tract 3 Stand Map



**Clark State Forest  
Compartment 7 Tracts 1 and 2  
Resource Management Guide Amendment  
September 20, 2021**

This amendment is written to adjust the silvicultural prescription prescribed in the 2018 resource management guides for the oak-hickory portions of compartment 7 tracts 1 and 2. The original prescription and this amendment share the same goal of ensuring the future cohort maintains its composition of primarily oak and hickory species.

The 2018 resource management guides for these tracts prescribed post-harvest timber stand improvement (TSI), which included the removal of the shade tolerant understory species. However, with the right environmental conditions use of prescribed fire could be a more efficient cost-effective way to achieve this goal. Both tracts have a large component of mesic oak-hickory cover type with a regenerating beech and maple understory. Additionally, 6300702 has an approximately 30-acre oak shelterwood which was part of a recent timber harvest. Prescribed fire should be used in the oak-hickory dominated portions of these tracts to help lower the density of understory shade tolerant species and lower post-harvest fuel loads. The prescribed fire should also serve to lower the concentration of some of the invasive species which have a low tolerance to fire such as, ailanthus, oriental bittersweet, Japanese honeysuckle, and smaller Amur cork trees. These tracts have a network of existing fire lanes and skid trails which could serve as fire breaks. Special care would be taken with smoke management due to the proximity to the horse campground, the IDNR Conservation Officer's District 8 Office, and I-65.