Indiana Department of Natural Resources
Division of Forestry

Resource Management Guides
Harrison-Crawford State Forest
30-day Public Comment Period (August 5, 2024 – September 3, 2024)

The Indiana State Forest system consists of approximately 160,251 acres of primarily forested land distributed across the state. These lands are managed under the principle that we're stewards of this land for the future. This work is guided through legislation and comprehensive scientific national and international forest certification standards which are independently audited to help insure long-term forest health, resiliency, and sustainability.

Resource management guides (RMGs) are developed to provide long-term, scientific forest management planning tailored to each forest compartment (300-1,000 acres in size) and tract (10 - 300 acres in size). There are 1,590 tracts across the state forest system statewide. Annually, 50-100 tracts are reviewed, and these guides are developed based on current assessments. Through science-based management practices, we prescribe management actions on select tracts every 15-25 year, diversifying the forested landscape and sustaining ecosystems.

The RMGs listed below and contained in this document are part of the properties annually scheduled forest inventories under review for Harrison-Crawford State Forest.

Compartment 4 Tract 1
Compartment 14 Tract 4
Compartment 18 Tract 1
Compartment 31 Tract 1 (repost)

To submit a comment on this document, go to:

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

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

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

Note: Some graphics may distort due to compression.

Harrison Crawford State Forest	Compartment 04	Tract 01
Forester: Daniel Martin	Date: 11/21/2022	Acres: 80
Management Cycle End Year: 2043	Management Cycle Length: 20 years	

Location
The tract (6340401) is a satellite property 5 miles south of Marengo, Indiana, west of State Road 66 in Liberty Township in Crawford County, Indiana. The tract is in the SW ¼ of NW ¼, NW ¼ of SW ¼ of Section 24 T2S R1E.

General Description
There are four cover types on this tract: mesic oak-hickory, old field mixed hardwoods, shortleaf pine, and Virginia pine

History
- 1952 parcel is acquired from Cornelison as a self-subsistence farm.
- Circa 1953 pine was planted.
- 2006 Forest inventory completed but no management guide was written.
- 2022 Forest inventory and management guide completed.

Landscape Context
The landscape surrounding this tract is primarily residential/agriculture to the east and forest land. The private forest land surrounding this tract has evidence of management (i.e., timber harvests).

Topography, Geology and Hydrology
There are two ravines that drain east to west into a mapped intermittent stream in the northwest corner of the tract. The stream feeds into Bogard Creek. Karts features are typical for this area, these features will be protected according to the 2022 Best Management Practices (BMP) field guide.

Soils
37 acres are Tipsaw-Adyeville complex which is a somewhat excessively drained.

3 acres are Haymond silt loam which are well drained.

28 acres are Wellston silt loam which is well drained.

12 acres are Apalona silt loam which is moderately well drained.

Access
Access to this tract is limited. The tract is surrounded by private land on all sides. There is a state easement for management access only. Maintenance is required for future management activities. However, it may be possible to gain management access through the adjacent private landowner.

Boundary
The eastern boundary of this tract is farm fields and residential lawn. The north, west and south boundaries are met with private forest land. Fencing in trees was observed as well as a capped

rebar in the northwest tract corner that was established by Primavera. This was close to a historic cornerstone. A capped rebar was also found in the southwest corner established by Primavera.

Ecological Considerations

This tract includes typical upland oak and hickory components as well as pine components. These features provide different habitats for a variety of game and non-game species such as white-tailed deer, wild turkey, squirrels, songbirds, snakes, box turtles, and others**.** Oak and hickory likely provide most of the hard mast food source whereas the denser cover of the pine would provide both physical and thermal cover for bedding areas particularly in the winter.

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 in all diameter classes.

This tract as well as neighboring private lands have ailanthus, there is not a large component nor big trees but will likely continue to spread if not controlled. No other invasive species were observed during the inventory.

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

There are no designated recreational trails or facilities in this tract. The main use of recreation in this tract would be neighbors possibly hunting or foraging.

Cultural

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

Tract Subdivision Description and Silvicultural Prescription

Mesic Oak-Hickory – 40 acres

This cover type accounts for half of the tract acreage. It is found on slopes near the two major ravines and contains 56% of the tract volume. The most abundant species is white oak at 33% of the tract volume (152,160 board feet (BDFT)) and 51% in this cover type. The species with the second highest volume in this tract is northern red oak at 49,840 BDFT, and closely behind is black oak at 46,320 BDFT representing 17% and 15% of the tract volume respectively. The understory had some component of oaks but was dominated by shade tolerant species such as sugar maple and American beech.

The objective for this cover type is to maintain the oak-hickory status, dominated by oak and hickory.

Due to current conditions and stocking levels, an improvement harvest is recommended to remove trees or multiple trees to improve spacing and available sunlight. The harvest would leave a similar species composition to what is currently present with most of the cover type remaining white oak. Group selection, patch-cuts, or oak shelterwood could be utilized where appropriate. Openings would promote recruitment of oak as well as provide young forest habitat. Openings should be large enough to achieve regeneration of desirable species and should coincide with the release of advance regeneration when possible. It is estimated that 5-15% of the cover type acreage may have regeneration opening treatments.

Any low quality or understory trees not removed during the harvest would require post-harvest timber stand improvement (TSI). This would reduce the presence of shade tolerant species where appropriate favoring oak and other desirable species. TSI may include cutting, girdling, and herbicide application to low value trees not removed through the harvest to ensure management objectives are achieved. Prescribed fire could be used to improve conditions making the site more favorable toward sustaining and promoting oak and hickory. Prescribed fire would reduce the presence of understory shade tolerant species, like maple and beech, while promoting ground conditions more favorable for seedling germination and establishment. TSI would also include managing invasive species that were not treated prior to the harvest.

Virginia pine – 25 acres

The Virginia pine is overstocked, representing 79% of the total volume in the cover type. Complete removal (i.e., stand conversion) of the nonnative pine is recommended to allow native hardwoods to regenerate. TSI would be required to complete the opening removing any remaining poor formed pine.

Shortleaf Pine – 7 acres

Shortleaf pine makes up 91% of the total volume in this cover type. This cover type is less overstocked and of better quality than the Virginia pine. A selective harvest is recommended

utilizing single tree or group selection to allow the more vigorous trees to advance. TSI would remove any stems not removed during the harvest.

Mixed Hardwoods – 8 acres

This cover type is in multiple upslope areas where pine was not planted. This cover type is likely similar in age to the planted pine, old field areas left to advance naturally into mixed hardwoods. Most of the volume in this cover type is from yellow poplar making up 40% of the total volume in the cover type. A selective harvest utilizing single tree and group selection would remove low quality and slow growing trees from the overstory to allow the understory to advance. TSI would remove any additional stems necessary.

The current forest resource inventory was completed on 8/3/22 by Foresters Daniel Martin and Wayne Werne. A summary of the estimated tract inventory results are located in the table below.

Tract Summary Data (trees >11"DBH):

Species	**# Sawtimber Trees**	**Total BDFT**
Bitternut Hickory	27	1,520
Blackgum	20	1,760
Black Oak	233	46,320
Black Walnut	74	3,440
Chinkapin Oak	104	10,240
Northern Red Oak	235	49,840
Pignut Hickory	212	25,840
Post Oak	27	1,520
Red Maple	67	4,480
Scarlet Oak	47	3,280
Shortleaf Pine	365	82,240
Sugar Maple	16	1,360
Virginia Pine	670	43,840
White Oak	795	152,160
Yellow Poplar	139	24,960
Total:	3,031	452,800

Summary Tract Silvicultural Prescription and Proposed Activities

Due to the current condition of the tract, an improvement harvest is recommended within the next 5 years. Overall, the tract volume would be reduced 30-50%. Most of this would occur using single tree or group selection with larger patch cut openings targeting groups of low-grade trees or multiple trees growing together. It is recommended that TSI be implemented following the harvest to accomplish a variety of tasks, including completion of any marked openings, snag creation, control of invasive species, and girdling low grade cull trees not removed through the harvest.

Landscape forest patterns will remain forested. However, if the non-native Virginia pine is removed through a conversion to hardwood species, then early successional forest habitat would replace the poor-quality pine.

The management activities prescribed in this plan should have minimal impact on the soils within the tract. Some soil disturbance is likely during harvesting, but this should be confined to landings and main skid trails. These areas would be properly closed out in accordance with the 2022 BMP field guide to minimize the impact of management activities on soils.

Hydrology should not be permanently affected by management of this tract. Water quality and yield should not be altered if BMPs are followed during harvest. BMP use will be contractually required of management operators.

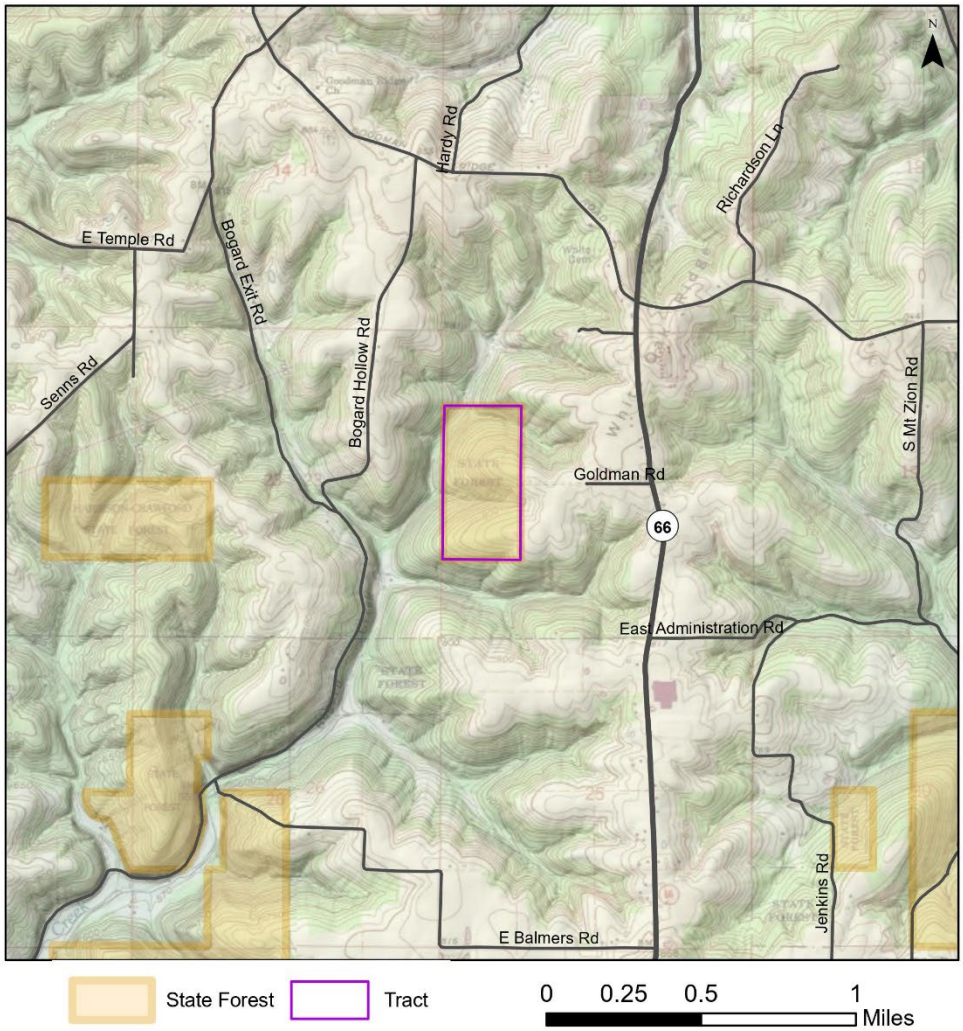
Wildlife in this tract should not be adversely affected. Snags and coarse woody debris should remain at viable levels in the stratum and should continue to provide habitat for the Indiana bat and other species. Young forest habitat is likely to be created through management activities which benefits a plethora of wildlife.

Given the type and amount of recreation that is carried out on this tract, impacts will be minimal. Hunting opportunities should be improved by the maintenance of young forest habitat and the recruitment of hard mast producers such as oak and hickory to provide deer and small mammal browse.

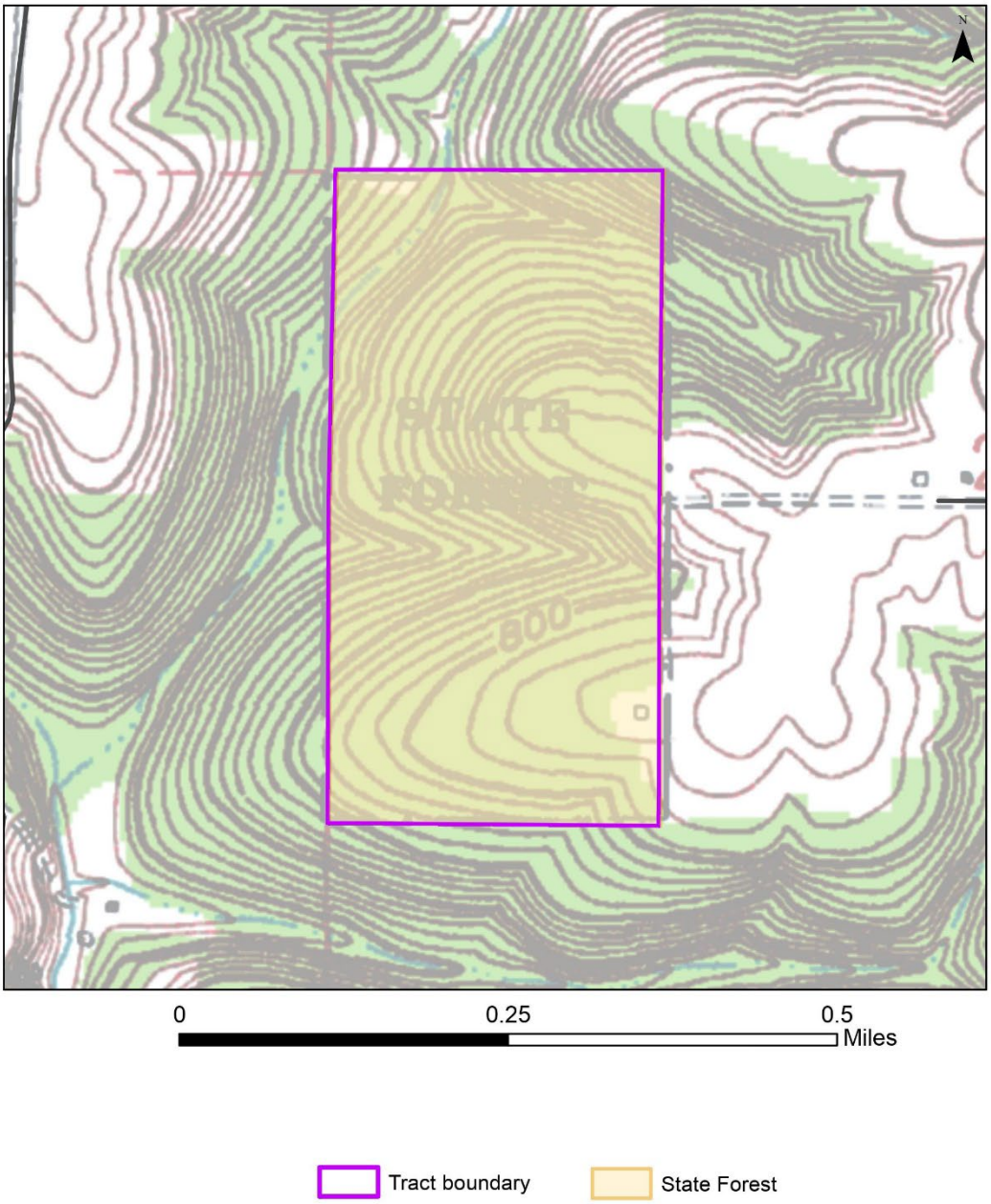
Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Fire lane maintenance	2023-2025
Pre-harvest invasive species work	2023-2025
Timber harvest	2023-2026
Post-harvest TSI	One to two years after harvest
3-year regeneration opening review	Three years after harvest
Next forest inventory	2043

Harrison-Crawford State Forest
Location Map
Compartment 4 Tract 1



Harrison-Crawford State Forest
Compartment 4 Tract 1
Tract Map



Harrison-Crawford State Forest
Compartment 4 Tract 1
Cover Type Map

0 0.1 0.2 0.4 Miles

Legend

Type

- Oak Hickory
- Old Field Mixed Hardwoods
- Shortleaf pine
- Virginia pine
- Tract Boundaries

Harrison-Crawford State Forest	Compartment: 14	Tract: 4
Forester: Dwayne Sieg, Whitney Irion	Date: February 23, 2018	Acres: 86.8
Management Cycle End Year: 2037	Management Cycle Length: 20	

Location
Tract 4, also known as 6341404, is in Crawford County, Indiana. It lies within Section 21, T3S, R2E. It is a little over 3 miles northeast of Leavenworth, Indiana.

General Description
The field inventory was completed in October 2017 by foresters Dwayne Sieg and Whitney Irion. The cover type is oak-hickory. The lower to mid slopes are more productive sites, with the upper slopes and ridge lines drier. Overall, the timber is in fair to good health and quality, but mortality in the white ash due to the emerald ash borer was present during the inventory. Some white oak mortality was noted. Evidence indicates that at one time, the very south end and the far northeast end had been farmed for a time (est. less than 5 acres). That practice and the rocky, thinner soils has left those areas at a lower productivity level. The 1940 aerial photo shows the entire tract reforested. That photo also revealed areas that did not show individual treetops, indicating that these locations contained young tree growth at that time and that the tract had likely been heavy logging a few years (early 1930s?) before the photo was taken. There was a noticeable difference in timber composition from the northern (better) part and the southern portion. This condition is likely due to separate ownerships in the past and resulting differences in their uses of the land. Even though the overall quality lessens in the southern half of the tract, it still has timber with good potential for a variety of natural resource benefits.

History
- 1966 Land acquisition (deed record 131.206) from the Wyandotte Cave Co. and F.M. Rothrock Co. The acquisition total acreage was 1,174 acres.
- 1973 (September) The first tract inventory/management plan completed by Steve Winicker. Average per acre BA was 84 sq.ft., average volume per acre was 1,074 board feet (BDFT) with a tract total of 97,090 BDFT. The top five species, by volume, were: white oak, black oak, n. red oak, hickories, and sugar maple.
- 1982 The first managed timber harvest (Russ Dotzauer) that combined this tract with tracts C14T1 and C14T5 (adjacent), with 81,494 BDFT removed, total. The top five species removed, by volume, were: black oak, n. red oak, white, oak, yellow poplar, and pignut hickory.
- 2017 Field inventory and management guide. Most of the white ash had died due to the emerald ash borer.

Landscape Context
Most of the immediate area around tract 4 is forested and most of that is part of the Harrison-Crawford State Forest. What is not forested are mostly single-family residences and farmland, especially pastureland. Within a half mile of the tract is the I-64 corridor, a commercial stone quarry, a cell tower, Wyandotte Caves, and a privately owned horse riders' campground. Carefree, Indiana, is 2.5 miles west and Leavenworth, Indiana, 3.25 miles southwest of the tract. Land use has remained constant over the past 30 years.

Topography, Geology and Hydrology
The primary aspect is northwesterly with lesser areas facing southeasterly and south. The topography is moderate. The overall change in elevation is about 300 feet. The ridge top is underlain with sandstone. A low sandstone outcropping of about .3 mile in length is in the northwestern portion of the tract. Beneath the sandstone is limestone with sinkholes and other karst features may be known to occur. Tract 4 is part of the Sharps Creek watershed that flows into the Wyandotte Lake which then drains into the Blue River, about 2 miles downstream from the tract. Sharps Creek, an intermittent stream, forms the western boundary of this tract. This stream only flows for short periods during heavy rain events. For most of the year, it is a dry creek bed.

Soils
Wellston Silt Loam (WhfC2, WhfD2, WhfD3) Degree Slope: 0-50%. Deep. Well drained. Site Index: 81 for N. Red Oak. Runoff is medium to rapid.
Tipsaw-Adyeville complex, Degree Slope: 25-75%. Moderately deep, somewhat excessively drained. Site Index: 70 for Black Oak.
Corydon stony silt loam, Degree Slope: 20-60%. Site Index: 71 for Black Oak. Well drained.
Apalonia Silt Loam (AgrA. AgrB, AgrC2, AgrC3) Degree Slope: 0-12%. Site Index: 60 for White Oak. Very deep, moderately well drained.
Adyeville Very Fine Sandy Loam (AbqE2, AciE) Degree Slope: 8-60%. Site Index: 70 for Black Oak. Moderately deep, somewhat excessively drained.

Access
Current access into the tract is by foot, with no direct vehicle access. Historically, the tract was reached by dirt roads running either up the Sharps Creek valley from SR 62 and Wyandotte Cave Road at the southeast, crossing the Sharps Creek in multiple locations, or from the west via Scott Hill Road. The latter access road may be improved to provide management access. A suitable crossing or timber bridge may be required to further access the interior of the tract.

Boundary
The northern tract boundary is a property boundary. It is marked by an old fence line, that leads to a fence intersection and a survey rebar at the tract's NE corner. From that intersection south, for .17 mile, it forms the tract's eastern boundary (also a portion of a property boundary) and is marked with carsonite posts. The property line continues south and outside of the tract. About 464 ft. south of the tract boundary is another survey rebar, established during a survey for the neighboring ownership. The SE tract boundary separates tract 4 from the adjacent tract 5 (also known as 6341405) as it follows a ridgeline south southwesterly for a distance, then follows an ephemeral drain that eventually enters Sharps Creek. The boundary then follows Sharps Creek, upstream to where it meets the northern boundary to make up the rest of the southern and the western extent of the tract.

Ecological Considerations
Tract 4 is expected to host a typical assemblage of wildlife species found in mature upland forests in the region, including whitetail deer (*Odocoileus virginianus*), box turtles (*Terrapene carolina*), pileated woodpeckers (*Dryocopus pileatus*), turkeys (*Meleagris gallopavo*), gray squirrels (*Sciurus carolinensis*), a variety of songbirds, gray fox (*Urocyon cinereoargenteus*),

coyotes (*Canis* latrans), and others. The predominance of oaks and hickories should provide an ample hard mast and habitat for most of these animals as well as insect species such as moths that provide food sources for a variety of the wildlife found here.

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

This tract consists of oak-hickory cover types which provides hard mast for various wildlife. Early succession habitat is lacking. No invasive exotic plants were observed during the field inventory. The emerald ash borer is an invasive exotic insect species and is present throughout the tract and had mostly eliminated the ash by the time the field inventory was completed in 2017. Greenbrier is a significant presence in the dry oak-hickory cover type.

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
There are no recreation facilities, including trails, found within this tract. Recreational use may include hunting, caving, and foraging.

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

Tract Subdivision Description and Silvicultural Prescription
The whole tract is classified as an oak-hickory cover type. There are differences within the type, mostly due to position on slope. Areas with a higher moisture gradient (northerly aspect, lower-mid slopes) generally contain larger, better growing trees than the drier sites on the upper slopes and ridgelines. The two subdivisions are labeled mesic oak-hickory and dry oak-hickory.

<u>Mesic Oak-Hickory (63.5 Acres)</u>
This subdivision contains the areas with higher moisture gradients and considered more productive. The northwestern slopes have good stem characteristics with the highest concentration of quality timber. The basal area averages around 109 ft^2/acre. It is about 89% or fully stocked according to the Gingrich chart. About 69% of the BDFT volume and 30% of the

trees are white oak, by far the highest species presence in the sawtimber size trees. However, sugar maple has the most prevalent numbers of stems in the smaller diameter classes. This stand needs an improvement harvest to maintain and encourage vigor. As typical elsewhere on the state forest, the black oak trees are overmature and fading out of the stand. A harvest would capture much of its volume before it is lost to mortality. Similarly, red and scarlet oaks are dying out and should be scrutinized for condition and selected for harvest if needed. There is a presence of yellow poplar in the stand, but much of it showed signs of drought stress and should be considered during a harvest. The quality white oak trees should be released from competition and thinned where needed. The more southern portion of this stand showed some remaining degradation from land practices prior to state ownership. Group selection or patch cut openings are recommended to start new groups of trees where groups show little vigor or promise for advancement. Any areas that might have ample advanced oak regeneration present should be priority for overstory removal.

Dry Oak-Hickory (23.3 Acres)

This subdivision includes most of the ridgeline and upper southerly facing slopes, as well as a few acres of lower productivity at the southern tip of the tract. From a stocking and volume standpoint, the dry oak-hickory cover type might not have been separated from the previous mesic oak-hickory cover type as they are reasonably similar. However, the overall quality of the trees and tree heights are reduced. There are a couple or more somewhat extreme locations where the tree growth is noticeably poor. While less noticeable, fire damage was observed in the tract and more so in this cover type. Although white oak remains the main sawtimber size species in this cover type, the presence of black oak does increase. As observed in the mesic oak-hickory cover type, this species is slowly dropping out, having reached its longevity for the site. Removals in a harvest would select the overmature black oak and other trees, lower quality, poorly formed, crowded, and defective trees. Openings would occur where some of these criteria encompass groups of trees to promote regeneration or advancement of regeneration while at the same time providing young forest habitat.

Prescribed fire may be a possible tool to reduce shade tolerant species and encourage oak and hickory regeneration. However, it is not recommended until access for necessary equipment and manpower to the tract has been improved.

A summary of the estimated tract inventory results is located in the table below.

Tract Summary Data (trees >11”DBH):

Species	# Sawtimber Trees	Total BDFT
White Oak	2,300	486,380
Black Oak	338	86,760
Red Oak	200	60,770
Pignut Hickory	255	35,310
Yellow Poplar	116	24,390
Sugar Maple	75	14,980
E. Redcedar	55	6,340
Bitternut Hickory	34	6,100

Shagbark Hickory	50	3,780
Blackgum	15	3,220
Chinquapin Oak	19	2,450
Total:	3,457	744,030

Summary Tract Silvicultural Prescription and Proposed Activities
Most of the tract is ready for a harvest. A harvest would practice uneven-age management, mainly utilizing single-tree selection and group selection/patch cut openings. However, an oak shelterwood harvest is possible in this tract, an even-aged management practice. Such a harvest would be designed to remove lesser quality, overmature trees, as well as release or thinning to encourage better health and vigor in the residual stands. Scrutinize health and vigor in trees, especially black, red, and scarlet oaks, and yellow poplar. Individuals showing decline or over maturity should be selected for removal. Other possible removals include less desirable trees to improve spacing, vigor and overall health of the tract. Areas selected for regeneration openings might be where concentrations of trees have reduced productivity or presence of desirable trees species. Should any sufficient size area(s) that contain adequate advanced oak regeneration be located, create regeneration openings to encourage a new oak stand(s). The harvest is estimated to remove between 250,000 and 350,000 BDFT from this tract. Prior to marking a harvest, improvements to the access road west of the tract will be required.

Due to the proximity and similar cover types, this harvest could occur at the same time a harvest is scheduled in compartment 14 tract 5 (6341405). This combination would minimize time spent during management activities to ensure the least effect on wildlife, hydrology, and other concerns mentioned in this plan.

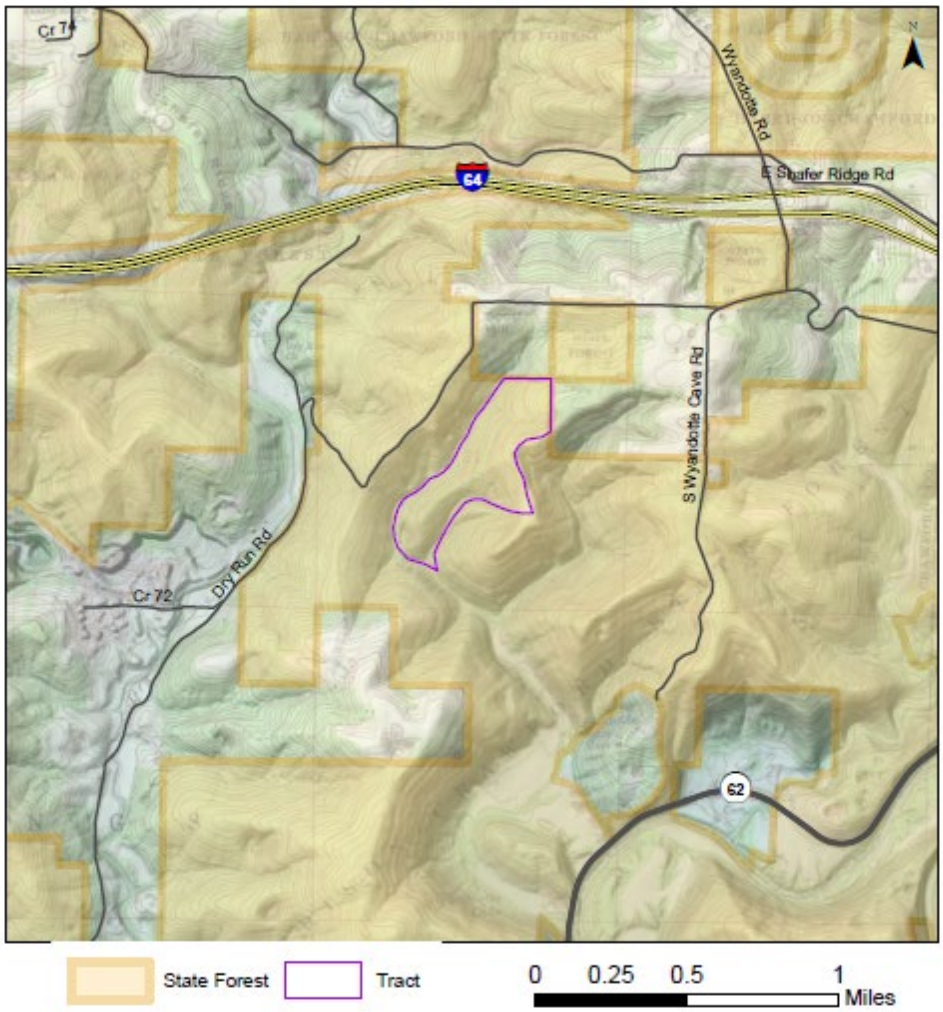
This harvest will not change the overall composition of the tract. The entire tract will remain forested with the cover types that are currently present. Any negative impacts to wildlife would be minimal and temporary. Regeneration openings would be temporary and would provide young forest areas, an important habitat type that is missing from this tract.

The best management practices (BMP) will be followed throughout the harvest to ensure any management activities impact to soils is limited. Soil disturbance will largely be confined to the log yard and main skid trails. The BMPs will also ensure water quality is not permanently affected. Sharps Creek does not appear on the Indiana impaired waters list. Any caves or sinkholes will be avoided by skidding activities. Following these BMPs standards will be contractually required of management operators.

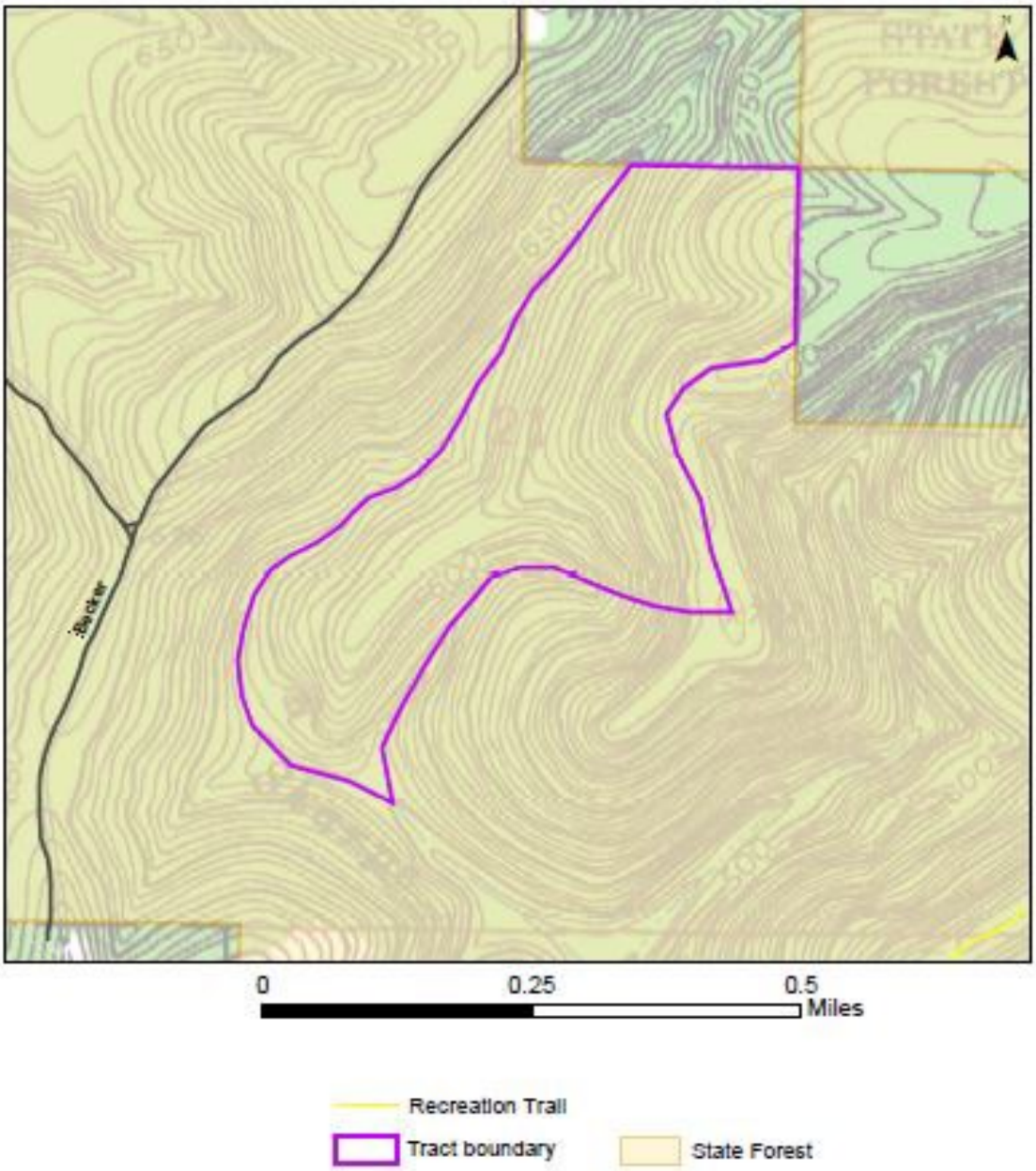
Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Fire lane maintenance	2025-2027
Timber harvest	2027-2028
Post-harvest timber stand improvement	2029-2031
3-year regeneration review	3-year following harvest
Next forest inventory	2037

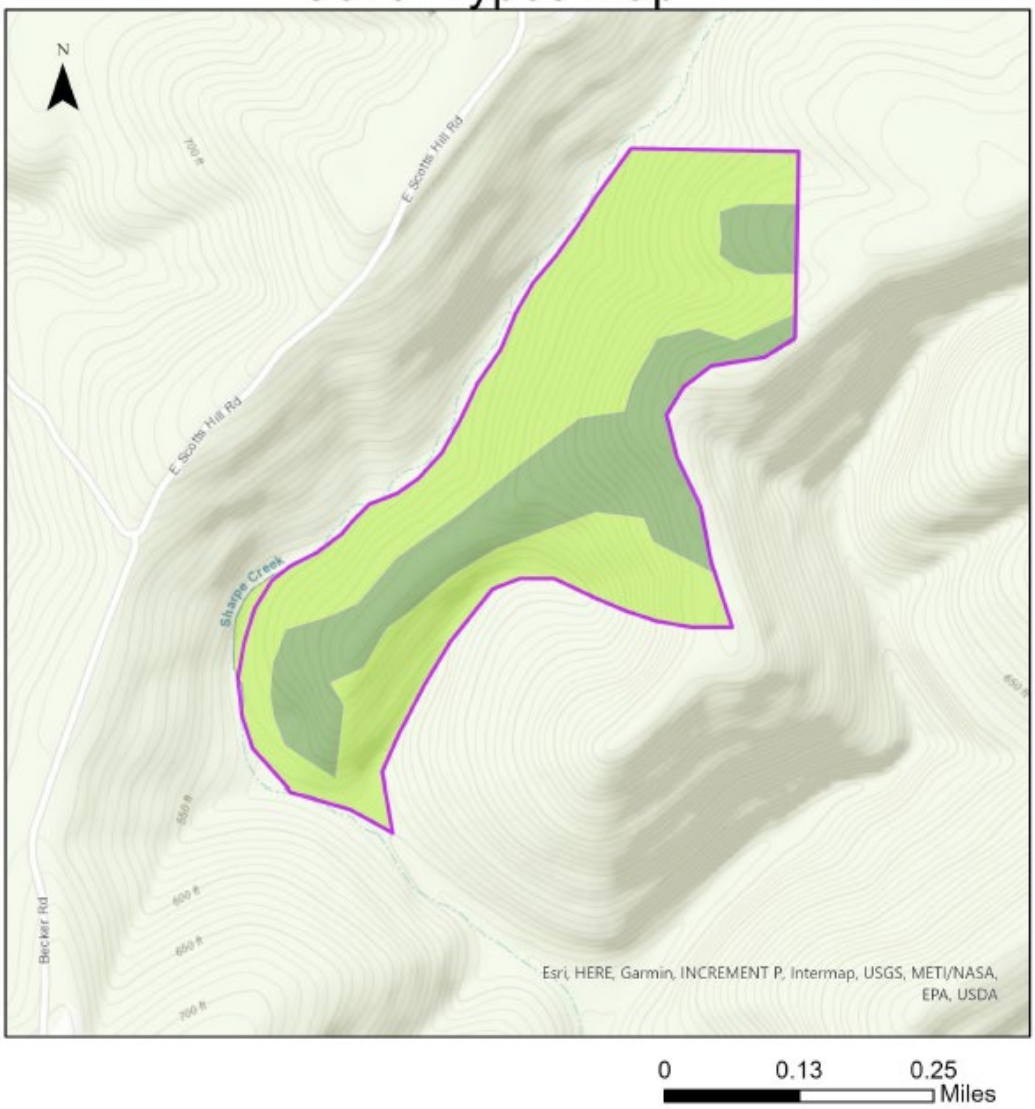
Harrison-Crawford State Forest
Location Map
Compartment 14 Tract 4



Harrison-Crawford State Forest
Compartment 14 Tract 4
Tract Map



Harrison-Crawford State Forest
Compartment 14 Tract 4
Cover Types Map



0 0.13 0.25 Miles

Cover Types

- Dry Oak-Hickory
- Mesic Oak-Hickory

Harrison-Crawford State Forest	Compartment: 18	Tract: 01
Forester: Daniel Martin	Date: 9/15/23	Acres: 76
Management Cycle End Year: 2043	Management Cycle Length: 20 years	

Location
Tract 1, also known as 6341801, is located west of State Road 62, approximately 2 miles east from Leavenworth, Indiana, in Crawford County. The tract lies one tenth of a mile west of State Road 62. The tract is in the NE ¼ of Section 4, T4S R2E, and NW ¼ of Section 5, T4S R2E.

General Description
There are two cover types: mesic oak-hickory and mixed hardwoods. It consists of southerly and easterly facing slopes. The eastern facing slope leads into a bottomland area. Most of this bottomland area was once farmland and has since transitioned to a closed canopy hardwood forest under state ownership.

History
- 1939 Western half of this tract was purchased from Hiser. The 1940 aerial photo shows numerous canopy gaps and distinct tree crowns which suggests much of this parcel had been cut over not long before acquisition.
- 1968 The remainder of the tract acreage was purchased from Hockman.
- 1985 Division of Forestry surveyed a portion of the western boundary line.
- 2000 Timber stand improvement (TSI) completed, mainly vine control within the bottomland part of the tract.
- 2009 Forest inventory and resource management guide written by Dieter Rudolph.
- 2023 Forest inventory and resource management guide written by Daniel Martin.

Landscape Context
This tract is surrounded on three sides by private ownership. The surrounding private land holdings appeared to be a combination of forest, agriculture, and residential uses.

Topography, Geology and Hydrology
The hill located in the middle of this tract creates most of the topography in the tract although there are other various slopes throughout. This hill is steep on the southern edge of the tract. The eastern facing slope of the hill which leads to Dry Run Creek is more gently sloping. Various karst features are present and will be buffered in accordance with the 2022 Best Management Practices (BMP) field guide.

Soils
44 acres of Corydon stony silt loam, 20 to 60 percent slopes.
17 acres of Tipsaw-Adyeville complex, 25 to 75 percent slopes.
7 acres of Markland silt loam, 12 to 18 percent slopes, eroded.
3 acres of Haggatt silt loam, 12 to 18 percent slopes, eroded.
2 acres of Haggatt silty clay loam, 12 to 18 percent slopes, severely eroded.
1 acre of Alford silt loam, 2 to 6 percent slopes, eroded.
1 acre of Apalona silt loam, 6 to 12 percent slopes, eroded.
1 acre Markland silty clay loam, 12 to 18 percent slopes, severely eroded.

Access
Access to this tract is currently limited. There is a small parking area next to SR 62, located in neighboring Compartment 18 tract 5 (6341805). From the parking area, an eroded old roadbed leads west through tract 5 and into tract 1. The old roadbed will require maintenance for future management access.

Boundary
The tract's north, west and southern boundaries are all private property lines. Line and corner evidence were found on these boundaries. The northernmost three corners consisted of a white oak with corner fence evidence, cornerstone, and a concrete monument previously set by the state during a survey. The southern boundary has various fence posts as well as survey rebar previously established by the state surveyor.

Ecological Considerations
Most of this tract consists of mesic oak-hickory cover type which provides hard mast for various wildlife. The other cover type present is mixed hardwoods which further diversifies food sources and had a denser understory which wildlife could use as potential cover.

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 in all diameter classes.

There are various invasive species present such as ailanthus and multiflora rose. Both species were observed throughout the tract. However, ailanthus was most prevalent on the side slopes and multiflora rose in the bottomland area. Pre and post-harvest invasive species work is recommended to reduce their presence within the tract.

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 primary recreation use is hunting. There are no developed recreation trails or other facilities within the tract. The Bridge Loop horse trail runs along the shared tract boundary with the neighboring tracts. This loop is part of the larger Wyandotte Cave horse trail. For public safety, recreational activities would be temporarily altered within the tract during active management.

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

Tract Subdivision Description and Silvicultural Prescription

General
There are two cover types in this tract consisting of oak-hickory and mixed hardwoods. They have varying degrees of maturity and harvest history, neither has had management activities (i.e., timber harvest) conducted since state ownership.

Throughout the tract, single-tree and group selection/patch-cut openings may be an option for several reasons, such as the overstory suffering from mortality, vigorous natural regeneration, or areas of poor-quality trees. These canopy gaps and openings will provide early successional habitat in addition to the release of desired trees. Between 5-15% of the tract would have these openings as they would need to be large enough to achieve the desired effect of both habitat and regeneration with adequate sunlight long enough to allow regenerating trees to become part of the canopy.

Not all low quality or understory trees are removed during a timber harvest. For this reason, post-harvest TSI is recommended to reduce poor quality or competing trees and favor oak or other desired species.

TSI can include cutting, girdling, and herbicide application to low value poorly formed trees. Herbicide use would follow forest certification standards as well as herbicide labels. If a prescribed fire were used as a silvicultural tool, burning would occur during the dormant season. Smoke management would be a concern due to State Road 62 and nearby rural residences. During post-harvest TSI any remaining invasive species noted should be treated.

The current forest resource inventory was completed on 9/8/2023 by Forester Daniel Martin. A summary of the estimated tract inventory results are located in the table below.

Tract Summary Data (trees >11"DBH):

Species	# Sawtimber Trees	Total BDFT
American Sycamore	11	7,560
Black Cherry	32	4,220
Black Oak	226	68,200
Black Walnut	90	11,110
Eastern red cedar	188	11,480
Northern red oak	329	104,250
Pignut Hickory	513	66,560
Post oak	257	27,220
Red Elm	25	1,830
Shagbark Hickory	169	26,150

Shumard Oak	210	28,780
Sugar maple	773	95,080
White Ash	25	1,040
White Oak	599	150,820
Yellow Poplar	354	75,640
Total	3,801	679,940

Mesic Oak Hickory – 46 acres

This cover type makes up most of the tract acreage. This cover type is fully stocked, with white oak having 26% of the volume. The second most abundant species, northern red oak, constitutes 22% of the volume in this cover type. Many red oaks on the south and eastern slopes seem to be mature and declining in health. Maple and beech regeneration was abundant throughout the cover type and is outcompeting oak within the shaded areas.

Given the current stocking level and conditions an improvement harvest is recommended to remove some of the overstory, low quality, and declining trees to encourage white oak regeneration. Post-harvest TSI is recommended to reduce the abundance of sapling maple and beech trees present in areas where advanced oak regeneration may be found. The composition of the overstory would still primarily be oak species, however, many of the overmature red oaks would be removed, potentially replaced with white oaks. White oak would remain the most abundant species by leaving seed trees in the overstory, allowing for their ample regeneration.

Mixed Hardwoods – 30 acres

This area is primarily at the base of the hill and along the drainages. This cover type is fully stocked, almost overstocked. It mainly consists of lowland, open grown hardwoods. Yellow poplar has the most volume in this stand, making up 28% of the stand's total volume. Sugar maple is close behind, making up 24% of the stand's volume. Mortality and stagnant trees are present throughout this cover type. There is ample regeneration of various hardwoods throughout the understory, primarily sugar maple. However, if the canopy is opened it is likely that yellow poplar and American sycamore will also thrive.

Summary Tract Silvicultural Prescription and Proposed Activities

Due to the current condition of the tract, an improvement harvest is recommended and could be undertaken as early as 2024. The overall tract volume would be reduced 28-48%. Most of this would occur under a single tree selection harvest with group selection or patch cut openings being created. An oak shelterwood is possible in the oak-hickory cover type. TSI is recommended both before and after the timber harvest to treat invasive species and to remove unmerchantable trees not removed through the harvest. A harvest is not expected to change the composition of the tract. The entire tract will remain forested.

Due largely to access and proximity, but also topography, natural features, a sizeable area of pine needing management, and otherwise similar cover types, a timber harvest in the near adjacent portions of tract 5 and 6 could be included with a harvest in tract 1.

BMPs will be followed throughout the harvest to minimize impacts to the area. Soil disturbance will largely be confined to the log yard and main skid trails. The BMPs will also ensure water quality is not permanently affected. The following of these BMPs will be contractually required of management operators.

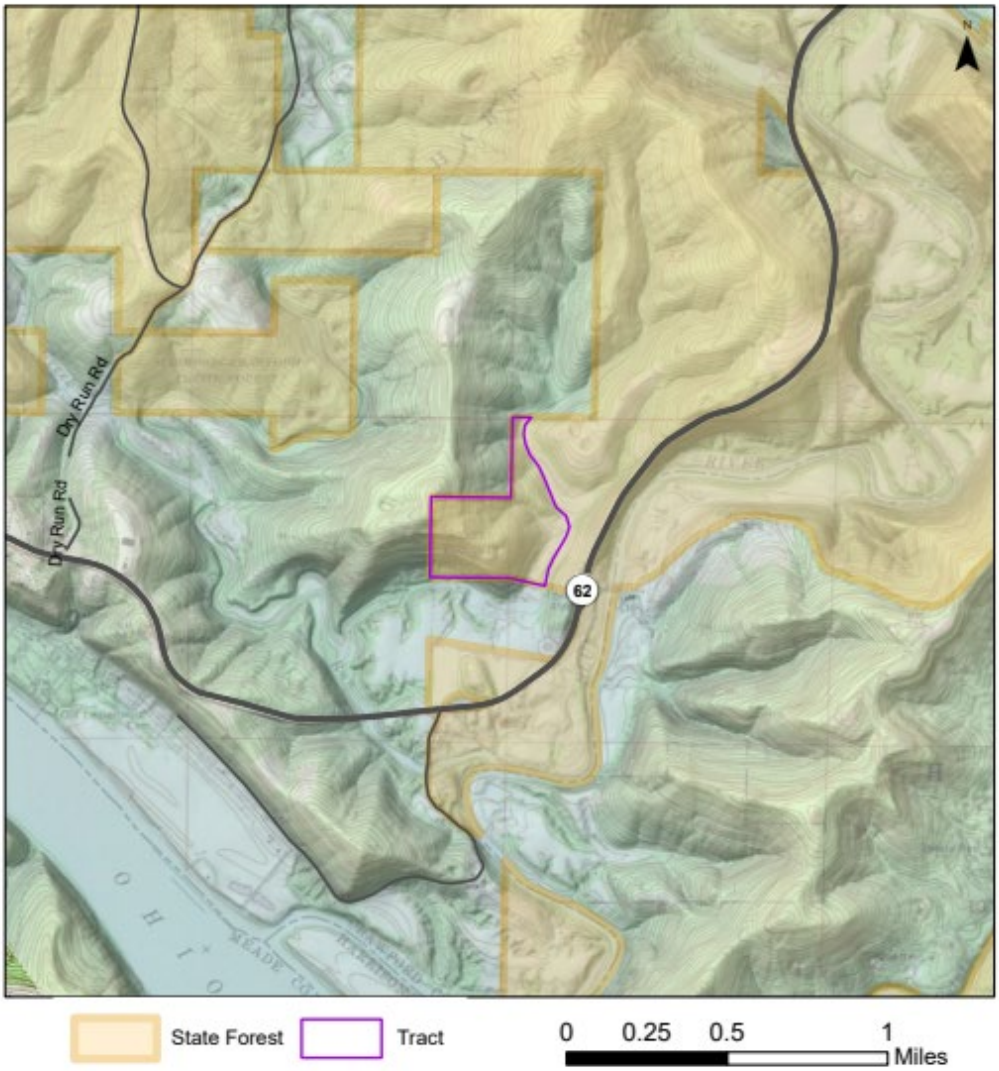
Hunting opportunities should be improved by the maintenance of early successional habitat and the recruitment of hard mast producers such as oak and hickory to provide deer and small mammal browse.

Once the harvest is complete, post-harvest TSI is recommended to complete any openings, address low quality trees not removed during the harvest, and follow up on invasive species. The tract should be revisited for regeneration opening monitoring and post-harvest checks within 3 years to ensure regeneration and growth are occurring. In 20 years, the stand should be re-inventoried, and a new management guide written.

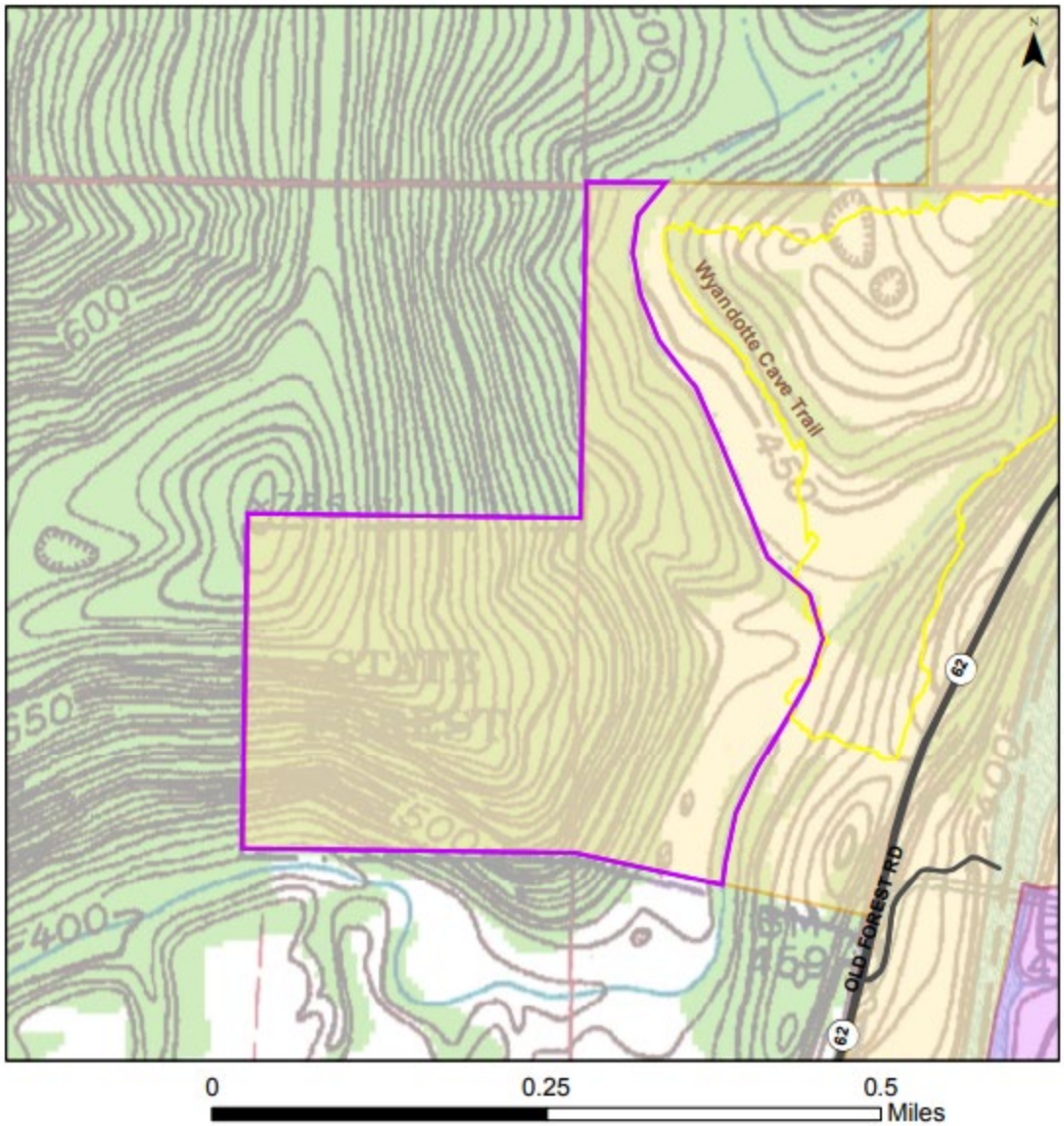
Proposed Activities Listing

Proposed Management Activity	***Proposed Date***
Fire lane maintenance	2024-2027
Pre-harvest invasive species work	2024-2027
Timber harvest	2024-2028
Post-harvest TSI	One to two years after harvest
3-year regeneration opening review	Three years after harvest
Next forest inventory	2043

Harrison-Crawford State Forest
Location Map
Compartment 18 Tract 1



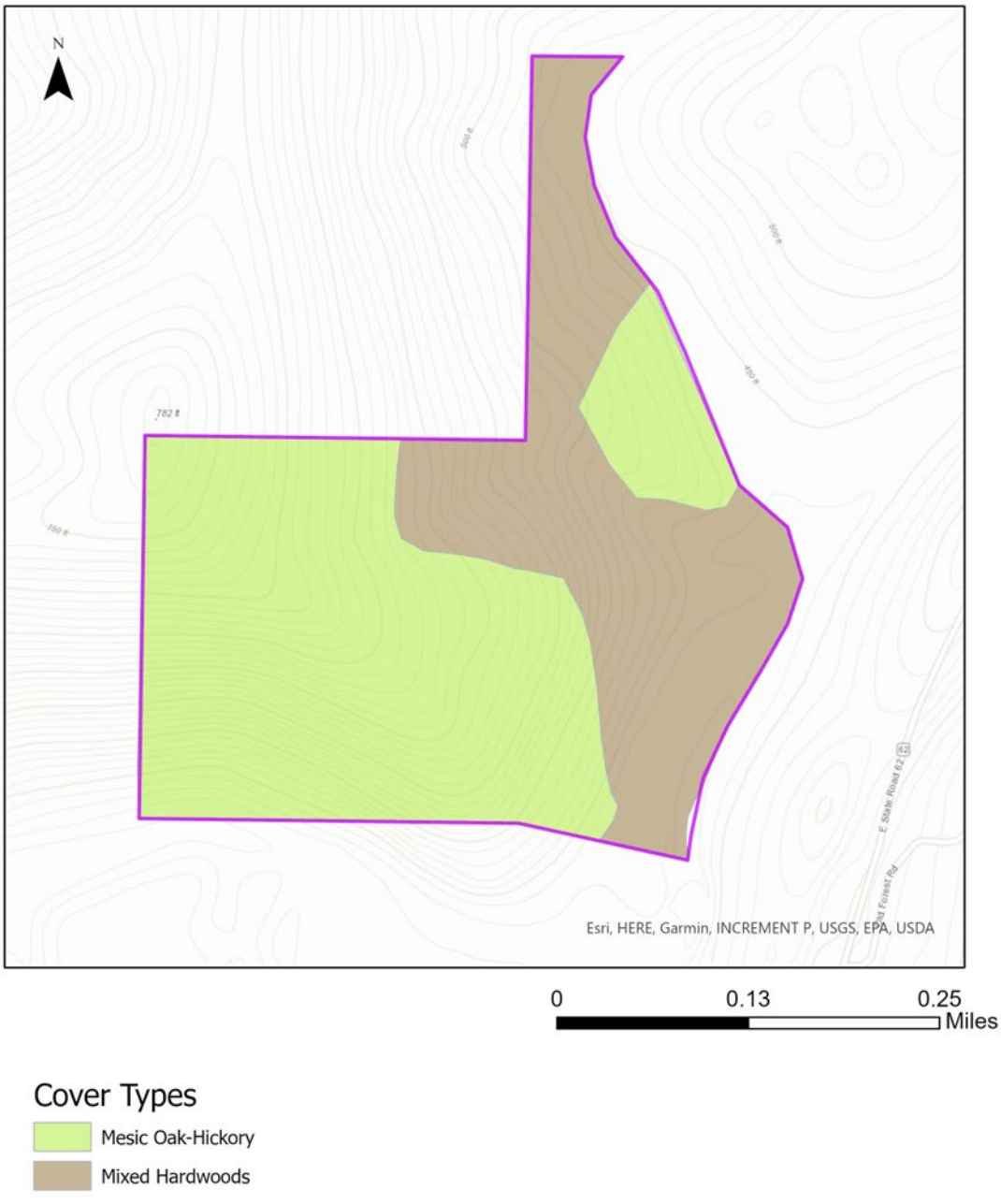
Harrison-Crawford State Forest
Compartment 18 Tract 1
Tract Map



0 0.25 0.5 Miles

Recreation Trail
Tract boundary
State Park
State Forest

Harrison-Crawford State Forest
Compartment 18 Tract 1
Cover Types Map



The Harrison-Crawford State Forest resource management guide (RMG) listed below was previously posted for a 30-day public comment period. Because 5 or more years have elapsed since the last comment period with no prescribed management activities initiated, the original RMG is being reposted for public comment. The tract has been reviewed and any amendments to the original RMG addressed below.

Harrison-Crawford State Forest
Compartment 31 Tract 1
Resource Management Guide (repost)
July 23, 2024

Link to original RMG:
https://www.in.gov/dnr/forestry/files/fo-HCSF_C4T6_7_C5T4_C14T9_C31T1_03182019.pdf

Compartment 31 Tract 1 (repost)

Identified as 6343101 https://www.in.gov/dnr/forestry/files/compmaps/fo-HC_CT_Boundaries.pdf

Since the original inventory and resource management guide (RMG) development was completed in 2017, little has changed. A reassessment was done in anticipation of upcoming management activities. There has been some (but not substantial) natural mortality of standing trees dying and some windthrow mortality noted as well.

One thing of note that has occurred is the decline and death of the white ash component of the forest. Although there are still some live ash trees present, the emerald ash borer has moved through the general area and has caused many of the trees present on the state forest as a whole to either decline or die. Smaller regenerating ash seem unaffected currently, likely due to size and lack of preference by the EAB. Most larger trees have been affected. There are some scattered trees around the forest that might show some resistance to EAB because they still have full live crowns while other surrounding ash have been killed by EAB.

On this tract, that mortality would have resulted in a decrease of standing volume of white ash, which in 2016 was estimated at 283,000 board feet total, of which all had been tallied as harvest volume. Likely the total volume of ash will be much reduced. The other impact of this mortality is that snags in larger size classes will have increased as well. Prior to the EAB killing wave, there were already sufficient numbers of snags in all size classes as recommended for habitat for use by the Indiana bat, but this addition of dead ash trees will further increase those snag densities on this tract.

Another change on this tract since the recent inventory would be the increase in standing volume due to growth of the stand in the absence of any harvest removals. The estimated growth rate based on previous inventories was estimated to be about 220-250 board feet per acre per year. Using this estimation, and assuming it remained constant, this would have added

an estimated 380,000 to 425,000 board feet to the total volume of the tract. If one assumes all the ash from the original inventory period died, this would still result in an overall gain of 100,000 to 150,000 board feet across this tract from growth of other tree species. The impact of this overall increase in volume from growth would be that the tract would possibly have a higher harvest volume once marked for a timber sale, and also a higher residual volume after any such timber sale.

No change in silvicultural prescriptions is warranted.

A follow up Ecological Review process was conducted.