

**Resource Management Guides  
Harrison-Crawford State Forest  
30-day Public Comment Period (November 20 – December 19, 2023)**

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 23 Tract 7  
Compartment 23 Tract 10  
Compartment 23 Tract 9 (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  
Wayne Werne  
Management Cycle End Year: 2043

Compartment: 23  
Date: 8/21/2023  
Management Cycle Length: 20 Years

Tract: 07  
Acres: 89

### **Location**

Tract 7, also known as 6342307, is in section 7, T4S, 3E, in Harrison County, approximately 6 miles southwest of Corydon, Indiana. It can be accessed off Kintner Road.

### **General Description**

The tract consists of mesic oak-hickory, conifer (in separate stands of old field cedar areas and planted Virginia pine), mixed hardwood, and non-forested (but reforesting) cover types with most of the acreage being mesic oak-hickory. The areas currently covered in cedar were previously open farmland as evidenced by the 1940's aerial photos. The tract is primarily located on north and east aspects and some relatively flat areas as well.

### **History**

- 1935 - Majority of tract acreage was purchased from James and Isabell Whitworth.
- 1973 - Forest inventory and short management guide was completed by Steve Winicker showing an estimated volume of 2,287 board feet (bdft) per acre.
- 1981 - Timber sale conducted by Russ Dotzauer, which included tract 6342303 totaled 109,000 bdft. An estimated 58,000 bdft was from tract 6342307. Primary species were northern red oak, black oak, American beech, and white oak. Sale was sold to Barks Lumber Co. for \$0.16 per foot.
- 2010 - Forest inventory and management guide completed by Christine Martin showing 4,102 bdft per acre of hardwoods and 581 bdft per acre of cedar totaling 4,683 bdft per acre.
- 2023 - Forest inventory and management guide completed.

### **Landscape Context**

The landscape surrounding this tract is primarily hardwood forest with some agricultural crop and pastureland found on nearby private lands. Some residential housing is located to the west along Kintner Road, but the area is rural in nature with little additional development.

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

This tract contains mostly gently sloping hillsides with a northeasterly aspect, and some relatively flat areas on the southwestern tip on the ridgetop. Karst topography underlies this area, which leads to numerous closed and occasional open sinkholes being present. There is a small wildlife pond on the west side of the tract near the Adventure Trail. The watershed of this tract drains to the north and east into intermittent drainages that empty into Indiana Creek a short distance to the south. Located in the tract are various karst features which will be buffered according to the 2022 Best Management Practices (BM) field guide.

### **Soils**

The following soils are found on the tract in approximate order of importance.

**GpF Gilpin-Berks complex, 18-30% slopes** Upland oak SI is 70-80, Yellow-poplar SI is 70-80,

est. growth is 185-260 bd. Ft/ac/yr. for oaks and for yellow-poplar.

**HaE2 Hagerstown silt loam, 18-25% slopes, eroded** Upland oak SI is 85-95, Yellow-poplar SI is 90-105, est. growth is 300-375 bd. Ft/ac/yr. for oaks and 335-450 bd. Ft/ac/yr. for yellow-poplar.

**HaD2 Hagerstown silt loam, 12-18% slopes, eroded** Upland oak SI is 85-95, Yellow-poplar SI is 90-105, est. growth is 300-375 bd. Ft/ac/yr. for oaks and 335-450 bd. Ft/ac/yr. for yellow-poplar.

**CsC3 Crider soils, 6-12% slopes, severely eroded** Upland oak SI is 85-95, Yellow-poplar SI is 90-105, est. growth is 300-375 bd. Ft/ac/yr. for oaks and 335-450 bd. Ft/ac/yr. for yellow-poplar.

**Gu Gullied land** Virginia pine SI is 53-72, est. growth is 100-200 bd. Ft/ac/yr.

**ZaC3 Zanesville silt loam, 6-12% slopes, severely eroded** Upland oak SI is 70-80, Yellow-poplar SI is 85-95, est. growth is 185-260 bd. Ft/ac/yr. for oaks and 300-375 bd./ ft/ac/yr. for yellow-poplar.

**CoF Corydon stony silt loam, 20-60% slopes** Upland oak SI is 65-75, Yellow-poplar SI is 80-90, est. growth is 155-220 bd. Ft/ac/yr. for oaks and 260-335 bd. Ft/ac/yr. for yellow-poplar.

### **Access**

Access to this tract is via fire lane 502 off Kintner Road up the hill through tract 6343001 to where it tees into a recently maintained section of fire lane to the north along the ridgetop. This fire lane runs north-south along the ridgetop and terminates at the southwestern tip of tract 6342307. There is an old wildlife opening at the southwestern corner of this tract that could be used for a log yard.

### **Boundary**

The northern boundary of this tract is an intermittent drainage that separates it from tract 6342303 to the north, and a portion of the northeastern boundary is private property, though there was little physical evidence of this boundary noted. The western boundary is private property. The southern boundary is another intermittent drainage that divides it from tract 6342309 to the south. And the eastern boundary is a more substantial intermittent drainage that flows south to Indian Creek, beyond which is tract 6342306 to the east.

### **Ecological Considerations**

This tract represents typical upland forest habitat, in addition to a component of old field successional habitat, with cedar, some pine, and smaller hardwoods. Consequently, it likely receives use from a typical assemblage of common game and nongame wildlife species such as white-tailed deer, eastern wild turkey, squirrels, songbirds, snakes, box turtles, and others. Hard mast food sources are provided by the oak-hickory stand, but another habitat component would come from the advanced old field stands with cedar, pine, and denser small hardwoods. These stands provide denser cover for bedding areas, especially during the winter months.

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

Snags	Maintenance Level	Inventory	Available Above Maintenance
5"+ DBH	356	2352	1996
9"+ DBH	267	574	307
19"+ DBH	45	86	42

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

A Natural Heritage Database Review is part of the management planning process. If Rare, Threatened, or Endangered communities were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

### Recreation

The Adventure Trail skirts through part of the western side of this tract. Based on field observations it is likely there is unauthorized horse riding on this section of the Adventure Trail. It was noted that unauthorized horse trails were identified nearby, which are being addressed. Numerous deer stands were found in this tract indicating a persistent use of this area for hunting. For public safety, use of the trail and hunting would be altered or temporarily altered within the tract during active management.

### Cultural

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

### Tract Subdivision Description and Silvicultural Prescription

There are four cover types/stands in this tract consisting of mesic oak-hickory, conifer, mixed hardwoods, and non-forested. Their descriptions and management recommendations are outlined below.

#### Stand 1: Mesic Oak-Hickory – 53.7 acres

This stand covers about 2/3 of the tract and occupies the more sloping ground generally in the middle of the tract that had not been previously cleared for farming.

The total estimated volume of the stand (10,224 bdf/acre) is composed primarily of white oak (4,180 bdf/acre), black oak (1,509 bdf/acre), pignut hickory (967 bdf/acre), and northern red oak (850 bdf/acre). The remaining 25% of the volume consists of sugar maple, shagbark hickory, yellow-poplar, and various other hardwood species.

Of the 10,224 bdf per acre an estimated range of 4,000 – 5,900 bdf per acre is harvestable. This would remove an estimated 74 square feet of basal area, which would leave the residual stand with 53 square feet of basal area. Stocking would drop from 105% to an estimated 40% with the following management recommendation.

The desired future condition of this area is a healthy vigorous stand of predominantly oak and hickory species to continue to produce hard mast food sources for wildlife and quality hardwoods. To accomplish this, dying, declining, and/or low-quality trees would be selected for harvest to allow the most vigorous and best quality trees to remain and continue to grow and reseed the area. Group selection or patch-cut openings created during the harvest would allow for the less shade tolerant species to establish a new cohort of seedlings for the future. Retaining shade intolerant tree species, like oak and hickory, while minimizing transition to shade tolerant species such as beech and maple is the goal. Ideally, creating enough sunlight to allow the advancement, establishment, and recruitment of oak and hickory species in the understory.

Since the last harvest in this stand was 42 years ago, and because it also currently contains a high volume of both harvestable material and residual growing stock, the recommendation would be to rank this stand as a medium to high priority for conducting a harvest. Any timber sale would primarily include this entire stand as well as trees from the other stands in this tract. The majority (67%) of the estimated harvest volume for stand 1 would be contained in white oak, black oak, and sugar maple, with pignut hickory, yellow-poplar, and various other species making up of the remainder of the harvest volume. A timber sale in this stand would produce a range of between 215,000 to 315,000 board feet total.

Most of the stand would be harvested under a single tree selection routine with larger group or patch cut openings targeting groups of low-grade trees or multiple large trees growing together. When possible, selection should favor releasing future crop trees. The residual stand should be heavier to white oak, with a lesser component of other oak and hickory species, as well as mesophytic species for diversity. Application of a prescribed burn in this stand would help reduce the shade tolerant under and midstories that are dominating many of our forest understories in the absence of disturbance. Use of fire during the dormant season on a 3-5 year cycle would improve conditions aiding regenerating and recruiting the more fire tolerant oaks and hickories.

Post harvest timber stand improvement (TSI) should be performed to reduce residual cull or small pole-sized trees not removed during the harvest, as well as thin where necessary, complete any regeneration openings, and treat the understory to reduce shade tolerant species. A few individual ailanthus saplings were observed scattered around the upper slopes. These should be treated prior to the harvest.

### **Stand 2: Conifer – 22.8 acres**

This stand could be further divided into two distinctly different stands. The major cover type (18.5 acres) is old field cedar, which consists of previously cleared areas in the east and central portion of the tract used for agricultural purposes. This area has vegetated back to mostly cedar,

but also has a minor hardwood component. The large size of some of the scattered hardwood trees implies part of this may have been used for pasture with scattered trees rather than farm fields. The other minor cover type is a small stand (4.3 acres) of Virginia pine which was planted in another formerly cleared agricultural area on the southwestern tip of the tract. No inventory plots fell within the Virginia pine stand, so the numbers presented here only represent the old field cedar stand, but all parameters would be noticeably different with the larger densely stocked pine versus the smaller cedar intermixed with small hardwoods.

The total estimated stand volume (7,724 bdf/acre) is composed primarily of eastern redcedar (3,366 bdf/acre), yellow-poplar (1,779 bdf/acre), and black oak (1,633 bdf/ac). The remaining 12% of the volume consists of red maple, scarlet oak, white ash, and various other species. It should be noted that the volume of cedar is figured using a cedar log scale that results in a higher than Doyle volume and includes trees down to 6" DBH as sawtimber volume.

Of the 7,724 bdf per acre an estimated range of 3,500 – 6,500 bdf per acre is harvestable. This would remove an estimated 81 square feet of basal area, which would leave the residual stand with 51 square feet of basal area. Stocking would drop from 100% to an estimated 50% with the indicated management. The drastic reduction in stocking is a direct result of removing the majority of the major component species (i.e., cedar) intentionally to open the area for hardwood regeneration. These figures do include cedar as figured according to the cedar log scale. A timber sale in this stand would produce a range of between 50,000 to 150,000 board feet total – but mostly cedar according to the cedar scale rather than the Doyle log scale.

The desired future condition of this area is a healthy stand of predominantly hardwood species to promote more mast producing species for wildlife and quality hardwoods. Currently it contains an abundance of cedar, which is overstocked and transitioning out due to mortality from overcrowding and being overtopped by hardwoods in the stand. The cedar is also shading the understory, preventing recruitment and establishment of new hardwoods. Therefore, it is proposed to mostly liquidate the cedar and pine to favor – the hardwoods that have already become established – many of which are desirable oak species. This proposed management will also have the added effect of creating early successional habitat (i.e., young forest) where mostly open areas interspersed with hardwood trees would be the resultant cover for about a decade. Eventually, the area would transition to a native hardwood stand of larger trees with natural succession. In the meantime, the early successional vegetation would provide diversity of habitat to many species of wildlife that utilize this type of habitat. Transitioning this stand to a temporarily more open habitat would also allow for more shade intolerant species like oak and hickory to potentially regenerate, though yellow-poplar would likely be the dominant hardwood regenerating. The cedar could be included with a tract wide harvest or sold separately as a cedar harvest.

The vast majority (80%) of the harvest volume for stand 2 would be contained in eastern redcedar, with black oak and a few scattered hardwoods making up the remainder. Much of the harvest volume tallied in this stand is represented by eastern redcedar due to use of the cedar scale. A separate cedar sale could be undertaken to achieve optimal management, as most of this cedar would be removed to encourage poplar and the oak regeneration that is usually found in the understory of such stands. Ultimately, this site should be completely converted to hardwoods

due to recovery of the site from former agricultural activities and erosion. Timber harvest and post-harvest TSI should concentrate on releasing any oak regeneration – mostly with follow-up TSI. Finally, TSI would remove any leftover competing trees and allow a new stand of poplar and oak to establish itself and grow here. Any ailanthus present should also be treated.

### **Stand 3: Mixed hardwoods – 9.3 acres**

This stand was found along the drainage forming the north boundary of the tract and wrapping around on the hillside on the western side of the tract. The total estimated volume of the stand (8,485 bdf/acre) is composed primarily of sugar maple (3,468 bdf/acre), yellow-poplar (2,693 bdf/acre), and American beech (1,504 bdf/acre). The remaining 10% of the volume consists of northern red oak and shagbark hickory.

Of the 8,485 bdf per acre an estimated range of 2,200 – 3,200 bdf per acre is harvestable. This would remove an estimated 56 square feet of basal area, which would leave the residual stand with 63 square feet of basal area. Stocking would drop from about 115% to an estimated 45% with the indicated management.

The desired future condition of this area is a healthy, vigorous, and diverse stand of mixed mesophytic species adapted to the site to continue to produce quality hardwoods. To accomplish this, dying, declining, and/or low-quality trees would be selected for harvest to allow the most vigorous and best quality trees to remain and continue to grow and reseed the area. Openings created from harvesting would allow for the less shade tolerant species to establish a new cohort of seedlings for the future.

Since the last harvest in portions of this stand was 42 years ago, and because it currently contains a moderate volume of harvestable material and high volume of residual growing stock, the recommendation would be to rank this stand as a medium to high priority for conducting a harvest. The majority of harvest volume for stand 3 would be contained in American beech, sugar maple, and shagbark hickory. A timber sale in this stand would produce a range of between 23,000 to 30,000 board feet total. Most of the stand would probably be harvested under a single tree selection routine with larger group or patch cut openings targeting groups of low-grade trees or multiple large trees growing together. When possible, selection should also favor releasing future crop trees.

Post harvest TSI should be performed to eliminate any residual cull or small pole-sized trees not cut during the harvest, as well as thin where necessary, complete any regeneration openings, and reduce vines where present. As always, any ailanthus present should also be treated and eliminated. A few individual ailanthus saplings were found scattered around the upper slopes, and the previous plan noted some larger trees growing in this stand in places as well.

### **Stand 4: Non-forested – 3.2 acres**

This stand is technically classed as “non forested” but is a former open wildlife area that is transitioning to young forest habitat. It is in the southwestern tip of the tract and is surrounded by the formerly described planted Virginia pine. Historically, this whole section of the ridgetop was cleared for agriculture and later planted to pine, with some of that area either cleared or maintained as a semi-permanent wildlife opening. Since the maintenance of these wildlife

openings across the forest was ceased almost 20 years ago, these areas are now growing back to early successional hardwoods.

This small stand is dominated with submerchantable and pole sized yellow-poplar with some red maple mixed in, as well as some Virginia pine from the neighboring stand. There were only a handful of merchantable Virginia pine trees tallied in this stand during the inventory. The desired future condition of this area would be either to include it as part of a regeneration opening along with the adjacent Virginia pine during a timber sale, and potentially to be used as a log yard location. The area could continue to be maintained as a wildlife opening by setting succession back or allowed to continue to develop into a mature hardwood stand as it currently is doing. Some TSI could be accomplished in this area to favor the oaks, and the better-quality stems of other species, as well as control any invasive species establishing in the area.

*The current forest resource inventory was completed in June 2023 by Wayne Werne.  
A summary of the estimated tract inventory results is in the table below.*

**Tract Summary Data (trees >11”DBH):**

<b>Species</b>	<b># Sawtimber Trees</b>	<b>Total Bd. Ft.</b>
American beech	82	17,978
Black oak	452	113,386
Black walnut	49	6,853
Chinkapin oak	54	6,942
Eastern redcedar	810	71,200
Honeylocust	12	2,937
Northern red oak	211	53,044
Persimmon	29	1,602
Pignut hickory	396	153,489
Post oak	51	4,450
Red maple	43	3,204
Scarlet oak	26	5,785
Shagbark hickory	237	35,066
Sugar maple	524	74,048
Virginia pine	22	1,869
White ash	118	12,816
White oak	778	232,735
Yellow-poplar	339	89,356
<b>Total:</b>	<b>4233</b>	<b>786,760</b>

**Summary Tract Silvicultural Prescription and Proposed Activities**

Since the last harvest in this stand was 42 years ago, and because it currently contains a high volume of both harvestable material and residual growing stock, the recommendation would be to rank this stand as medium to high priority for conducting a timber harvest. Due to the current condition of the stand, an improvement harvest is recommended and could be undertaken as early as this year. Overall, the tract volume would be reduced by an estimated 35-55% depending on whether the cedar component is included in a hardwood timber sale or sold separately. A marked sale in this tract would produce an estimated total volume of between 250,000 - 350,000



bdf of hardwood and 40,000 - 80,000 bdf of cedar, if included.

Utilizing numbers from the last inventory in 2010, this tract has shown a very high growth rate of approximately 320 bdf per acre per year over the last 13 years, indicating its productivity potential. With the application of the proposed management, this tract should continue to exhibit high and potentially greater growth and productivity by favoring the healthiest and best quality trees for a residual stand, while removing the declining trees.

Most of the tract would probably be harvested under a single tree selection routine with larger group or patch cut openings targeting groups of low-grade trees or multiple large trees growing together. The old field cedar areas would be harvested under a group selection or shelterwood routine to remove the cedar and encourage the hardwoods. When possible, selection should also favor releasing future crop trees. The residual stand should be heavier to white oak, with a lesser component of other oak and hickory species, as well as mesophytic species. Application of a prescribed burn would help to reduce the shade tolerant under and midstories present, and aid in regenerating and recruiting the more fire tolerant oaks and hickories.

Post harvest TSI should be performed to eliminate any residual cull or small pole-sized trees not cut during the harvest, as well as thin where necessary, complete any regeneration openings, and treat the understory to eliminate shade tolerant species in favor of oaks and other more desirable species. Any ailanthus present should also be treated and eliminated. Several individual ailanthus stems were found scattered in portions of this tract and should be treated prior to the harvest.

Due to the proximity of similar stand types, this harvest could occur at the same time as tract 6342309 and possibly 6342310. This would minimize entry into the area for management activities to ensure the least effect on recreation, wildlife, hydrology, and other concerns mentioned in this plan.

Management activities will not intentionally remove snags, with a few exceptions of large recently dead trees or storm damage when possible, so the timber sale will not negatively impact that component significantly. Creation of more snags in this size class could be undertaken by girdling large cull trees in a post-harvest TSI operation.

Additionally, management activities involving a timber sale should not affect this habitat long-term from the perspective of any wildlife utilizing it due to the maintenance of a forested habitat on the tract. There may be some conversion of cedar or the old field area to temporarily open areas that will be allowed to succeed into native hardwoods, and this would change the character of the tract over time but will not change it permanently to a non-forested cover type. Creation of regeneration openings and/or conversion of portions of the old field area into openings will create early successional habitat that will be beneficial to certain groups of wildlife dependent upon this habitat. Likely, early successional habitat created with such management will also benefit a wider segment of wildlife species that preferentially utilize such habitat for feeding and cover more so than later successional stage habitat.

Since this tract does not border a major stream, there should be no disruption of any potential travel corridors by forest management activities. The habitat on this tract in the context of the

surrounding landscape does not represent any special component that would be used more preferentially or exclusively by wildlife for traveling or dispersion, as riparian habitat might be, or as forest in a non-forested landscape might be. The small pond found in this tract would provide a valuable water source for wildlife during dry periods, and also represent good habitat for reptiles and especially amphibians.

Since this tract represents a component of contiguous forest, it is possible that forest management activities might disrupt any forest interior species by creating edge habitat for generalist species to “invade” the area. This would possibly occur if regeneration openings were put in place that offered a habitat preferred by such generalist species which might move in and start using such habitat. In the context of the surrounding landscape, this tract represents a moderate chunk of forest in a matrix of surrounding forest land.

BMPs 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, and implementation of these BMPs will be contractually required of loggers.

Snags and coarse woody debris will remain at viable levels for wildlife after harvest and the harvest will not adversely affect the wildlife.

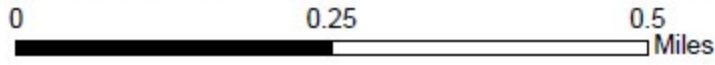
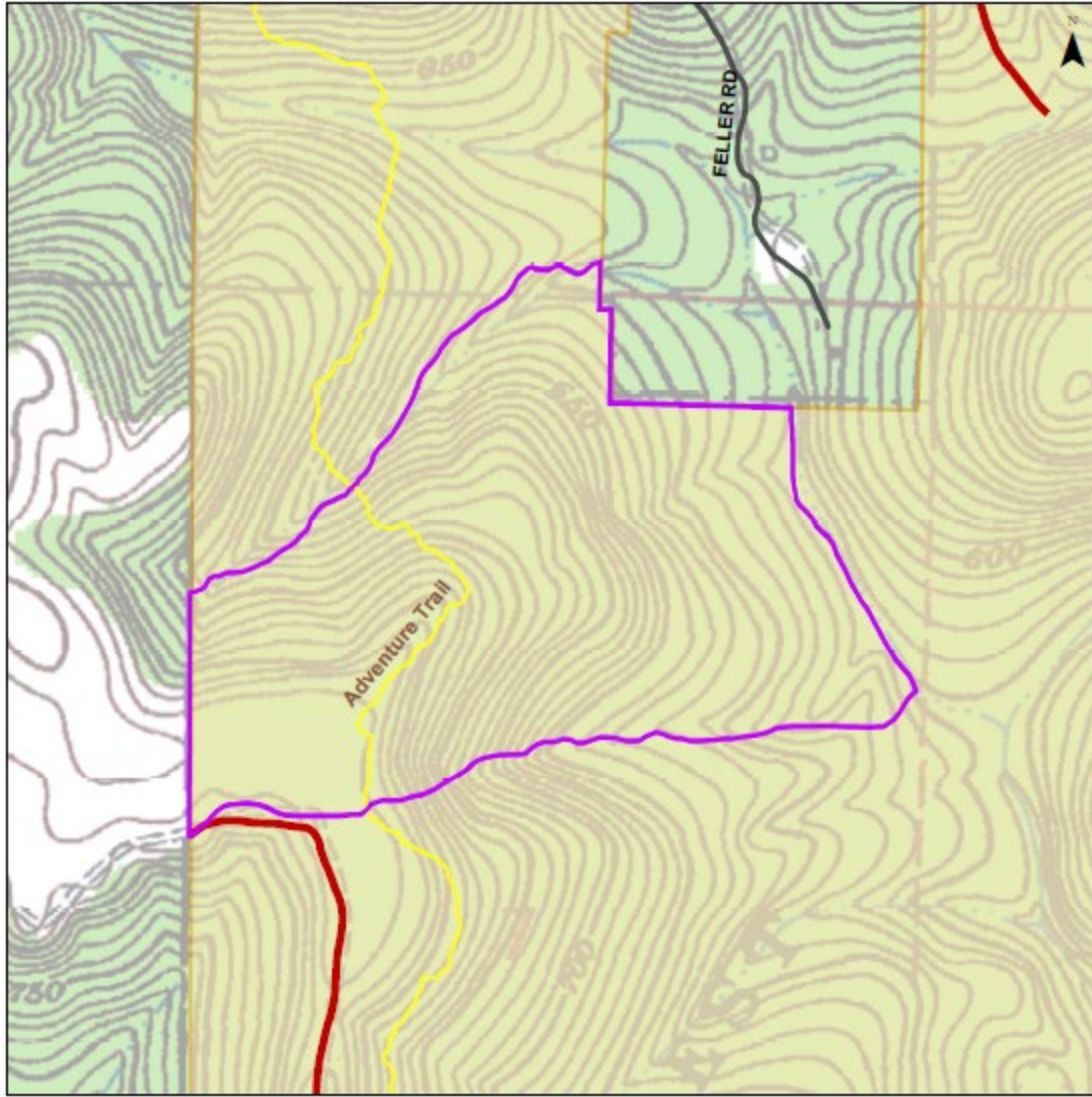
During the harvest, part of the Adventure trail would have to be shut down. However, under current restrictions, this closure would only occur from November 16<sup>th</sup> to April 1<sup>st</sup> and would not affect most of the spring, summer, and fall recreation. Hunting opportunities should be improved by the maintenance of early successional habitat and the recruitment of hard mast producers such as oak and hickory which provide food sources for a wide variety of native wildlife.




Once the harvest is complete, post-harvest TSI should be conducted and then the stand should be revisited for regeneration opening and post-harvest checks in 3-5 years to ensure proper regeneration and growth is occurring. In about 20 years, the stand should be revisited for another inventory and a new management guide can be created.

### **Proposed Activities Listing**

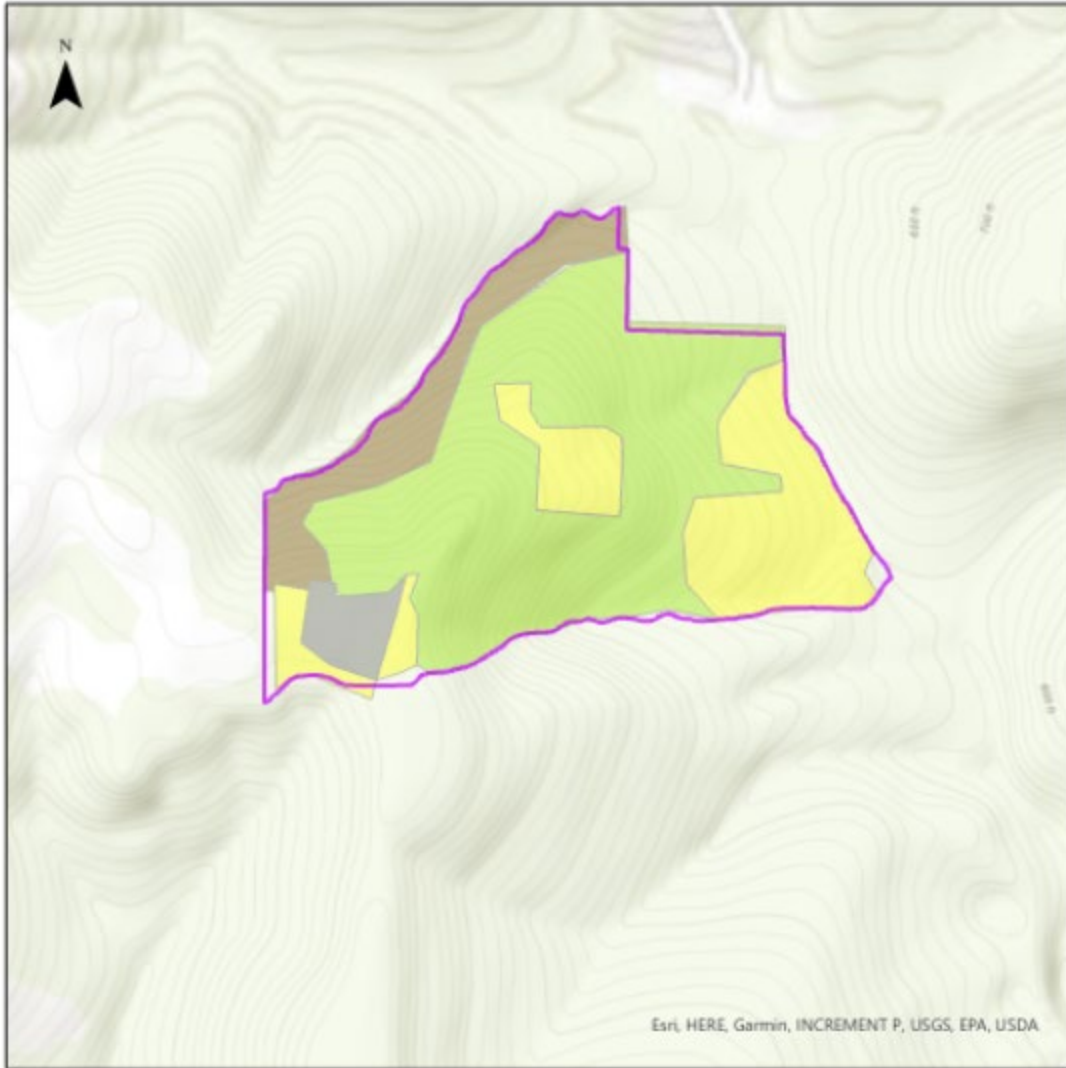
<i>Proposed Management Activity</i>	<i>Proposed Date</i>
Management Guide	2023
Mark Harvest	2023-2025
Sell Timber	2024-2025
Possible prescribed burn	2024-2025
Post harvest TSI	2025-2026
Monitor regeneration openings	Three to five years after harvest
Re-Inventory	2043
Write new Management Guide	2043

Harrison-Crawford State Forest  
Compartment 23 Tract 7  
Tract Map

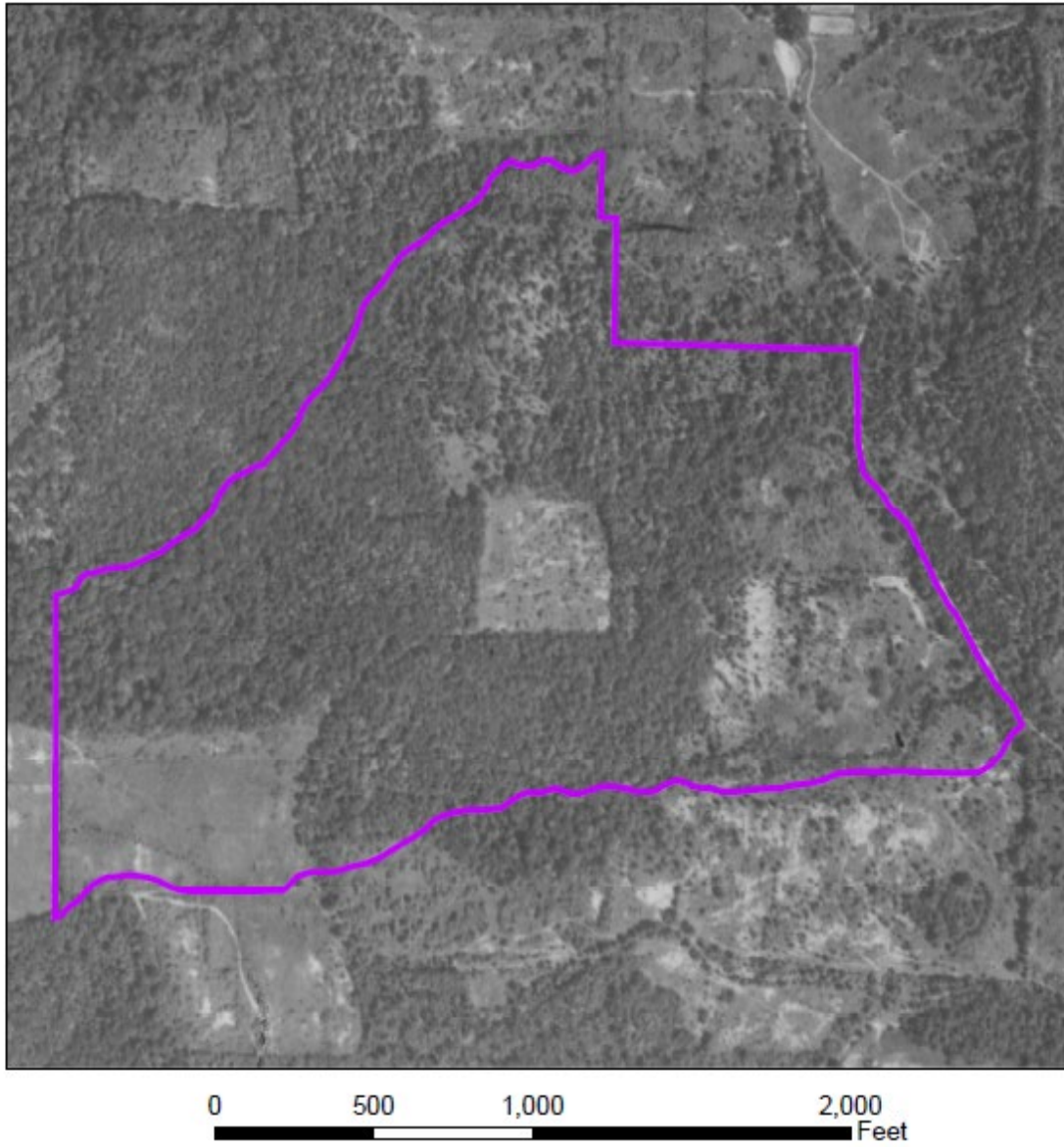


-  Recreation Trail
-  Fire Lane
-  Tract boundary
-  State Forest

# Harrison-Crawford State Forest Compartment 23 Tract 07 Cover Types Map



Harrison-Crawford State Forest  
Compartment 23 Tract 7  
Historical Aerial Photography



Basemap is a 1940 aerial photo.

Harrison Crawford State Forest  
Wayne Werne  
Management Cycle End Year: 2043

Compartment: 23  
Date: 8/15/2023  
Management Cycle Length: 20 Years

Tract: 10  
Acres: 110

### **Location**

Tract 10, also known as 6342310, is in section 7, T4S, 3E, in Harrison County, approximately 6 miles southwest of Corydon, Indiana. It can be accessed off Kintner Road.

### **General Description**

The tract consists of mesic oak-hickory, conifer (in separate stands of old field cedar areas and planted Virginia pine), mixed hardwood, and non-forested (but reforesting) cover types with most of the acreage being mesic oak-hickory. The areas currently covered in cedar were previously open farmland as evidenced by the 1940's aerial photos. The tract is primarily located on north and east aspects and some relatively flat areas as well.

### **History**

- 1936 - Majority of tract acreage was purchased from Albert Kingston.
- 1936 - Western portion of tract was purchased from FG and Lizzie Godfrey.
- 1951 - Remaining northern portion was purchased from William and Alice Pinaire.
- 1973 - Forest inventory and short management guide completed by Steve Winicker showing estimated volume of tract at 1,345 board feet (bdft) per acre.
- 1991 - Timber sale conducted in this tract along with tract 6342311 totaling 167,000 bdft, made up primarily of black oak, chestnut oak, northern red oak, and white oak. An estimated 64,000 bdft was from tract 6342310. Sale was sold to Phil Etienne for \$0.21 per foot.
- 2010 - Forest inventory and management guide completed by Christine Martin showing 4,860 bdft per acre of hardwoods and 1,245 bdft per acre of cedar totaling 6,105 total bdft per acre on this tract.
- 2023 - Forest inventory and management guide completed.

### **Landscape Context**

The landscape surrounding this tract is primarily hardwood forest with some agricultural crop and pastureland found on nearby private lands. Some residential housing is located to the west along Kintner road, but the area is rural in nature with little additional development.

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

This tract contains mostly gently sloping hillsides with a northeasterly aspect. There are some relatively flat areas on the western tip on the ridgetop and along the drainage on the eastern side of the tract that also contain a series of sinkholes. Karst topography underlies this area, which leads to numerous closed and occasional open sinkholes being present. The watershed of this tract drains to the north and east into intermittent drainages that empty into Indiana Creek a short distance to the south. Located in the tract are various karst features which will be buffered according to the 2022 Best Management Practices field guide.

### **Soils**

The following soils are found on the tract in approximate order of importance.

**HaD2 Hagerstown silt loam, 12-18% slopes, eroded** Upland oak SI is 85-95, Yellow-poplar SI is 90-105, est. growth is 300-375 bd. ft/ac/yr. for oaks and 335-450 bd. ft/ac/yr. for yellow-poplar.

**CsC3 Crider soils, 6-12% slopes, severely eroded** Upland oak SI is 85-95, Yellow-poplar SI is 90-105, est. growth is 300-375 bd. ft/ac/yr. for oaks and 335-450 bd. ft/ac/yr. for yellow-poplar.

**Gu Gullied land** Virginia pine SI is 53-72, est. growth is 100-200 bd. ft/ac/yr.

**GpF Gilpin-Berks complex, 18-30% slopes** Upland oak SI is 70-80, Yellow-poplar SI is 70-80, est. growth is 185-260 bd. ft/ac/yr. for oaks and for yellow-poplar.

**CoF Corydon stony silt loam, 20-60% slopes** Upland oak SI is 65-75, Yellow-poplar SI is 80-90, est. growth is 155-220 bd. ft/ac/yr. for oaks and 260-335 bd. ft/ac/yr. for yellow-poplar.

**ZaC3 Zanesville silt loam, 6-12% slopes, severely eroded** Upland oak SI is 70-80, Yellow-poplar SI is 85-95, est. growth is 185-260 bd. ft/ac/yr. for oaks and 300-375 bd. ft/ac/yr. for yellow-poplar.

### **Access**

Access to this tract is via fire lane 502 off Kintner Road up the hill through tract 6343001 to where it tees into a recently maintained fire lane to the north along the ridgetop. This fire lane runs north-south along the ridgetop and touches the western tip of tract 6342310. There is also a log yard at the southwestern corner of this tract that was used for a timber sale in neighboring tracts 2311 and 2312.

### **Boundary**

The northern boundary of this tract is an intermittent drainage that separates it from tract 6342309 to the north. The western boundary is a short section of fire lane that divides it from tract 6343001 to the west. The southern boundary is a downward sloping ridge delineated by an old skid trail used by a neighboring timber sale that divides it from tract 6342311 to the south. And the eastern boundary is a more substantial intermittent drainage that flows south to Indian Creek beyond which is private property to the east.

### **Ecological Considerations**

This tract represents typical upland forest habitat, in addition to a component of old field successional habitat, with cedar, some pine, and smaller hardwoods. Consequently, it likely receives use from a typical assemblage of common game and nongame wildlife species such as white-tailed deer, wild turkey, squirrels, songbirds, snakes, box turtles, and others. Hard mast food sources are provided by the oak hickory stand, but another habitat component would come from the advanced old field stands with cedar, pine, and denser small hardwoods. These stands provide denser cover for bedding areas, especially during the winter months.

The Division of Forestry has developed compartment level guidelines for important wildlife structural habitat features such as snags, which are standing dead or dying trees.

Snags provide value to a stand in the form of habitat features for foraging activity, den sites, decomposers, bird perching, and bat roosting. Snags eventually contribute to the future pool of downed woody material. Downed woody debris provides habitat for many species and contributes to healthy soils.

Snags	Maintenance Level	Inventory	Available Above Maintenance
5"+ DBH	440	2783	2343
9"+ DBH	330	876	546
19"+ DBH	55	99	44

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

A Natural Heritage Database Review is part of the management planning process. If Rare, Threatened, or Endangered communities were identified for this area, the activities prescribed in this guide will be conducted in a manner that will not threaten the viability of those species.

### **Recreation**

The Adventure Trail skirts through a short stretch of the western tip of this tract. Based on field observations there is likely unauthorized horse riding on this section of Adventure Trail. It was noted that unauthorized horse trails were identified nearby, which are being addressed. Numerous deer stands were found on this tract indicating a persistent use of this area for hunting.

### **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**

There are four cover types/stands in this tract consisting of mesic oak-hickory, conifer, mixed hardwoods, and non-forested. Their descriptions and management recommendations are outlined below.

#### **Stand 1: Mesic Oak-Hickory – 72.9 acres**

This stand covers about 2/3 of the tract and occupies the more sloping ground generally in the middle of the tract that had not been cleared for farming in the past.

The total volume of the stand (11,498 bdf/acre) is composed primarily of white oak (3,897 bdf/acre), black oak (2,115 bdf/acre), northern red oak (1,505 bdf/acre), and pignut hickory (1,371 bdf/acre). The remaining 15% of the volume consists of yellow-poplar, chestnut oak, sugar maple, white ash, and various other species.

Of the 11,498 bdf per acre an estimated range of 4,000 – 5,000 bdf per acre is harvestable. This would remove an estimated 65 square feet of basal area, which would leave the residual stand



with 71 square feet of basal area. Stocking would drop from 110% to an estimated 60% with the following management recommendations.

The desired future condition of this area is a healthy vigorous stand of predominantly oak and hickory species to continue to produce hard mast food sources for wildlife and quality hardwoods. To accomplish this, dying, declining, and/or low-quality trees would be selected for harvest to allow the most vigorous and best quality trees to remain and continue to grow and reseed the area. Group or patch cut openings created from harvesting would allow for the less shade tolerant species to establish a new cohort of seedlings for the future. Retaining shade intolerant tree species (like oak and hickory) while minimizing transition to shade tolerant species (like beech and maple) would be the goal here. Ideally, creating enough sunlight to allow advancement, establishment, and recruitment of oak species into the understory.

Since the last harvest in this stand was 32 years ago, and because it also currently contains a high volume of both harvestable material and residual growing stock, the recommendation would be to rank this stand as a medium to high priority for conducting a harvest. Any timber sale would primarily include this entire stand as well as trees from the other stands in this tract. The majority (72%) of the harvest volume for stand 1 would be contained in black oak, white oak, northern red oak, chestnut oak, and pignut hickory with yellow-poplar, sugar maple, white ash, and various other species making up of the remainder of the harvest volume. A timber sale in this stand would produce a range of between 290,000 to 365,000 board feet total.

Most of the stand would be harvested under a single tree selection routine with larger group or patch cut openings targeting groups of low-grade trees or multiple large trees growing together. When possible, selection should favor releasing future crop trees. The residual stand should be heavier to white oak, with a lesser component of other oak and hickory species, as well as mesophytic species. Application of a prescribed burn primarily in this stand would help reduce the shade tolerant under and midstories that are dominating many of our forest understories in the absence of disturbance. Use of fire during the dormant season on a 3-5 year cycle would improve conditions and aid in regenerating and recruiting the more fire tolerant oaks and hickories.

Post harvest timber stand improvement (TSI) should be performed to reduce any residual cull or small pole-sized trees not removed during the harvest, as well as thin where necessary, complete any regeneration openings, and treat the understory to reduce shade tolerant species in favor of oaks and other more desirable species. Any ailanthus present should also be treated.

### **Stand 2: Conifer – 27.5 acres**

This stand could be further divided into two distinctly different stands. The major cover type (23.7 acres) is old field cedar, which consists of previously cleared areas in the east and north used for agricultural purposes that has regrown back to mostly cedar, but also some hardwood components. The other minor cover type is a small stand (3.8 acres) of Virginia pine which was planted in another previously cleared agricultural area on the western tip of the tract. No inventory plots fell within the Virginia pine stand, so the numbers presented here only represent the old field cedar stand, but all parameters would be noticeably different with the larger densely stocked pine versus the smaller cedar intermixed with small hardwoods.

The total stand volume (8,983 bdft/acre) is composed primarily of eastern redcedar (6,442 bdft/acre) and yellow-poplar (1,395 bdft/acre). The remaining 13% of the volume consists of black oak, Shumard oak, American beech, and chinkapin oak. It should be noted that the volume of cedar is figured using a cedar log scale that results in a higher than Doyle volume and includes trees down to 6" DBH as sawtimber volume.

Of the 8,983 bdft per acre an estimated range of 5,000 – 7,000 bdft per acre is harvestable. This would remove an estimated 96 square feet of basal area, which would leave the residual stand with 48 square feet of basal area. Stocking would drop from 130% to an estimated 40% with the indicated management. The drastic reduction in stocking and volume is a direct result of removing the major component species of cedar intentionally to open the area up for hardwood regeneration. These figures do include cedar as figured according to the cedar log scale. A timber sale in this stand would produce a range of between 150,000 to 195,000 board feet total – but mostly cedar according to the cedar scale rather than the Doyle log scale.

The desired future condition of this area is a healthy vigorous stand of predominantly hardwood species to promote more mast producing species for wildlife and continue to produce quality hardwoods. Currently it contains an abundance of cedar, which is overstocked and transitioning out due to mortality from overcrowding and being overtopped by the hardwoods in the stand. The cedar is shading the understory, preventing recruitment and establishment of new hardwoods. Therefore, it is proposed to mostly liquidate the cedar and pine to favor hardwoods that have already established – many of which are desirable oak species. This proposed management will also have the added effect of creating early successional (i.e., young forest) habitat where mostly open areas interspersed with hardwood trees would be the resultant cover for about a decade. Eventually, the area would transition to a native hardwood stand of larger trees with natural succession. In the meantime, the early successional vegetation would provide diversity of habitat to many species of wildlife that utilize this type of habitat. Transitioning this stand to a temporarily more open habitat would also allow for more shade intolerant species like oak and hickory to potentially regenerate here, though yellow-poplar would likely be the dominant hardwood regenerating. The cedar could be included with a tract wide harvest or sold separately as a cedar harvest.

The vast majority (92%) of the harvest volume for stand 2 would be contained in eastern redcedar, with a few scattered hardwoods making up the remainder. Much of the harvest volume tallied in this stand is represented by eastern redcedar due to use of the cedar scale. A separate cedar sale could be undertaken to achieve optimal management, as most of the cedar would be removed to encourage poplar and oak regeneration that is usually found in the understory of such stands. Ultimately, this site should be completely converted to hardwoods due to recovery of the site from former agricultural activities and erosion. Timber harvest and post-harvest TSI should concentrate on releasing any oak regeneration – mostly with follow-up TSI. Finally, TSI would reduce any remaining trees competing with desired residual trees and allow a new stand of poplar and oak to be established. Any ailanthus present should also be treated and eliminated.

**Stand 3: Mixed hardwoods – 7 acres**

This stand was found in a couple of pockets along the drainage forming the north boundary of the tract. The total volume of the stand (6,518 bdf/acre) is composed primarily of sugar maple (1,417 bdf/acre), yellow-poplar (1,325 bdf/acre), and eastern redcedar (839 bdf/acre). The remaining 45% of the volume consists of pignut hickory, northern red oak, blackgum, black oak, and various other species.

Of the 6,518 bdf per acre an estimated range of 3,000 – 4,000 bdf per acre is harvestable. This would remove an estimated 67 square feet of basal area, which would leave the residual stand with 43 square feet of basal area. Stocking would drop from about 90% to an estimated 40% with the indicated management. These figures do include cedar as figured according to the cedar log scale.

The desired future condition of this area is a healthy, vigorous, and diverse stand of mixed mesophytic species adapted to the site to continue producing quality hardwoods. To accomplish this, dying, declining, and/or low-quality trees would be selected for harvest to allow the most vigorous and best quality trees to remain and continue to grow and reseed the area. Group or patch cut openings created from harvesting would allow for the less shade tolerant species to establish a new cohort of seedlings for the future.

Since the last harvest in portions of this stand was 32 years ago, and because it currently contains a high volume of harvestable material, the recommendation would be to rank this stand as a medium to high priority for conducting a harvest. The majority of harvest volume for stand 3 would be contained in sugar maple, eastern redcedar, and pignut hickory. The remaining 45% would be contained in blackgum, American beech, and various other species. A timber sale in this stand would produce a range of between 21,000 to 28,000 board feet total. Most of the stand would probably be harvested under a single tree selection routine with larger openings targeting groups of low-grade trees or multiple large trees growing together. When possible, selection should also favor releasing future crop trees.

Post harvest TSI should be performed to reduce any residual cull or small pole-sized trees not removed during the harvest, as well as thin where necessary, complete any regeneration openings, and reduce vines where present. Any ailanthus present should also be treated.

**Stand 4: Non forested – 2.6 acres**

This stand is technically classed as “non forested” but is a formerly open wildlife area that is transitioning to a young forest. It is in the southwestern tip of the tract and is surrounded by the formerly described planted Virginia pine. Historically, this whole section of the ridgetop was cleared for agriculture and later planted to pine, with some of that area either cleared or maintained as a semi-permanent wildlife opening. Since the maintenance of these wildlife openings across the forest was ceased almost 30 years ago, these areas are now growing back to early successional hardwoods.

This small stand is dominated with submerchantable and pole sized yellow-poplar with some white ash and northern red oak mixed in, as well as some Virginia pine from the neighboring stand. There were no merchantable trees tallied in this stand during the inventory. The desired

future condition of this area would be either to include it as part of a regeneration opening along with the adjacent Virginia pine during a timber sale, and potentially to be used as a log yard location. Or the area could be allowed to continue to grow into a mature hardwood stand as it currently is doing. Some TSI could be accomplished in this area to favor the oaks, and the better-quality stems of other species, as well as control any invasive species establishing in the area.

*The current forest resource inventory was completed in July 2023 by Wayne Werne. A summary of the estimated tract inventory results is in the table below.*

**Tract Summary Data (trees >11”DBH):**

<b>Species</b>	<b># Sawtimber Trees</b>	<b>Total Bd. Ft.</b>
American beech	33	4,950
Bitternut hickory	21	1,760
Black cherry	54	2,640
Blackgum	55	5,610
Black oak	540	194,480
Chestnut oak	307	48,620
Chinkapain oak	66	8,470
Eastern redcedar	1932	106,040
Northern red oak	463	135,190
Pignut hickory	876	123,860
Sassafras	21	2,640
Scarlet oak	4	2,200
Shagbark hickory	101	12,320
Shumard oak	24	7,590
Sugar maple	408	40,040
Sycamore	7	2,640
White ash	107	25,740
White oak	1010	339,360
Yellow-poplar	538	95,480
<b>Total:</b>	<b>6567</b>	<b>1,158,630</b>

**Summary Tract Silvicultural Prescription and Proposed Activities**

Since the last harvest in this stand was 32 years ago, and because it also currently contains a high volume of both harvestable material and residual growing stock, the recommendation would be to rank this stand as a medium to high priority for conducting a harvest. Due to the current condition of the stand, an improvement harvest is recommended and could be undertaken as early as this year. Overall tract volume would be reduced 35-50% depending on whether the cedar component is included in a hardwood timber sale or not. A marked sale in this tract would produce an approximate total volume of between 350,000 to 450,000 board feet of hardwood and 50,000 to 100,000 board feet of cedar if it were included.

Utilizing numbers from the last inventory in 2010, this tract has shown a very high growth rate of approximately 340 board feet per acre per year over the last 13 years, indicating its productivity potential. With the application of the proposed management, this tract should continue to exhibit high and potentially greater growth and productivity by favoring the healthiest and best quality

trees for a residual stand, while removing the declining trees.

Most of the tract would probably be harvested under a single tree selection routine with larger group or patch cut openings targeting groups of low-grade trees or multiple large trees growing together. The old field cedar areas would be harvested under a group selection or shelterwood to remove the cedar and encourage the hardwoods. When possible, selection should also favor releasing future crop trees. The residual stand should be heavier to white oak, with a lesser component of other oak and hickory species, as well as mesophytic species. Application of a prescribed burn would help reduce the shade tolerant under and midstories present, and aid in regenerating and recruiting the more fire tolerant oaks and hickories.

Post harvest TSI should be performed to eliminate any residual marked cull or small pole-sized trees not cut during the harvest, as well as thin where necessary, complete any regeneration openings, and treat the understory to eliminate shade tolerant species in favor of oaks in areas where regeneration is present and other more desirable species. Any ailanthus present should also be treated.

Due to the proximity and similar stand types, this harvest could occur at the same time as tract 6342309 and possibly 6342307. This would minimize entry into the area for management activities to ensure the least effect on recreation, wildlife, hydrology, and other concerns mentioned in this plan.

Management activities will not intentionally remove snags, with a few exceptions of large recently dead trees or storm damage when possible, so the timber sale will not negatively impact that component significantly. Creation of more snags in this size class could be undertaken by girdling large cull trees in a post-harvest TSI operation.

Additionally, management activities involving a timber sale should not affect this habitat long-term from the perspective of any wildlife utilizing it due to the maintenance of a forested habitat on the tract. There may be some conversion of cedar or the old field area to temporarily open areas that will be allowed to succeed into native hardwoods, and this would change the character of the tract over time but will not change it permanently to a non-forested cover type. Creation of regeneration openings and/or conversion of portions of the old field area into openings will create early successional habitat that will be beneficial to certain groups of wildlife dependent upon this habitat. Likely, early successional habitat created with such management will also benefit a wider segment of wildlife species that preferentially utilize such habitat for feeding and cover more so than later successional stage habitat.

Since this tract does not border a major stream, there should be no disruption of any potential travel corridors by forest management activities. The habitat on this tract in the context of the surrounding landscape does not represent any special component that would be used more preferentially or exclusively by wildlife for traveling or dispersion, as riparian habitat might be, or as forest in a non-forested landscape might be. The small ponds found nearby on neighboring tracts would provide a valuable water source for wildlife during dry periods, and also represent good habitat for reptiles and especially amphibians.

Since this tract represents a component of contiguous forest, it is possible that forest management activities might disrupt any forest interior species by creating edge habitat for generalist species to “invade” the area. This would possibly occur if regeneration openings were put in place that offered a habitat preferred by such generalist species which might move in and start using such habitat. In the context of the surrounding landscape, this tract represents a large chunk of forest in a matrix of surrounding forest land.

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, and implementation of these BMPs will be contractually required of loggers.

Snags and coarse woody debris will remain at viable levels for wildlife after harvest and the harvest will not adversely affect the wildlife.

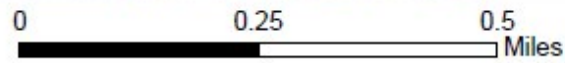
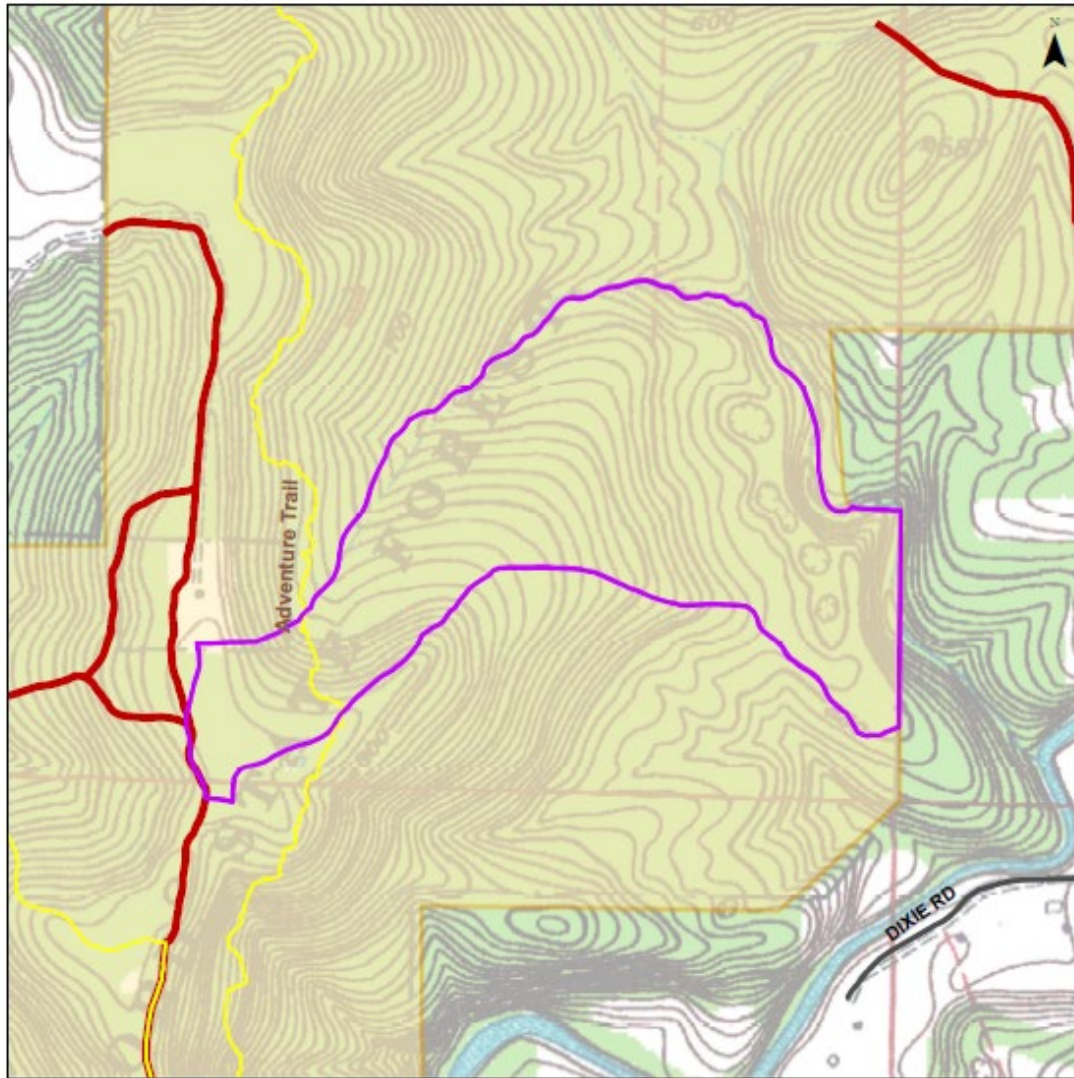
During the harvest, part of the Adventure trail would have to be shut down. However, under current restrictions, this closure would only occur from November 16<sup>th</sup> to April 1<sup>st</sup> and would not affect most of the spring, summer, and fall recreation. Hunting opportunities should be improved by the maintenance of early successional habitat and the recruitment of hard mast producers such as oak and hickory which provide food sources for a wide variety of native wildlife.

Once the harvest is complete, post-harvest TSI should be conducted and then the stand should be revisited for regeneration opening and post-harvest checks in 3-5 years to ensure proper regeneration and growth is occurring. In about 20 years, the stand should be revisited for another inventory and a new management guide can be created.

### **Proposed Activities Listing**

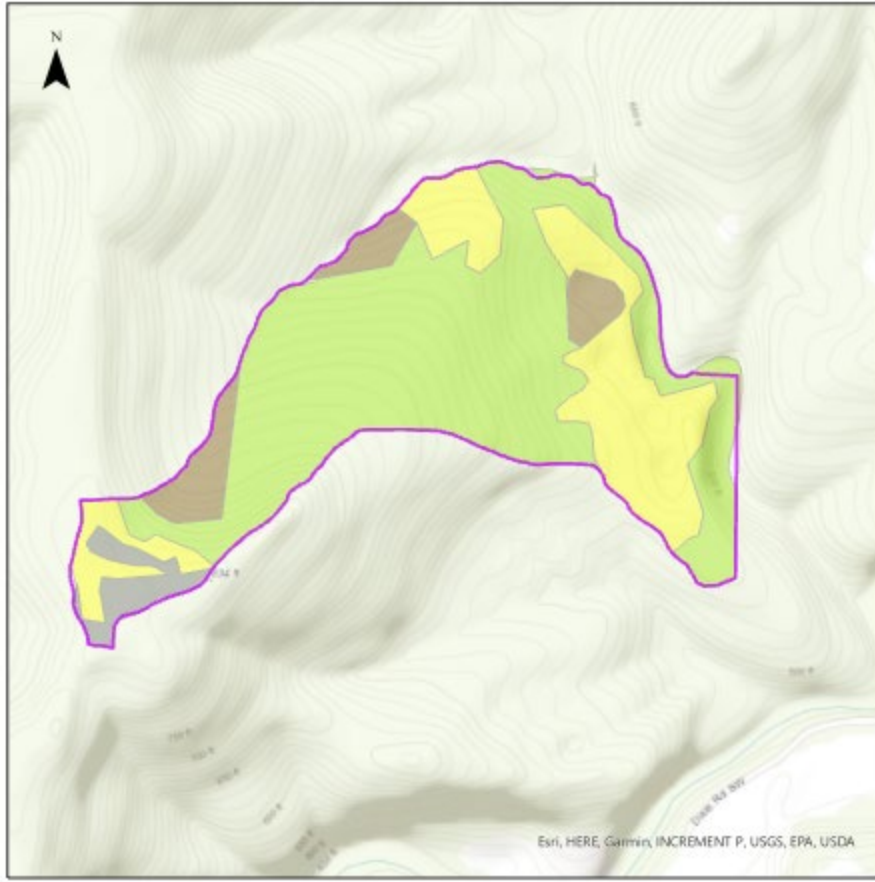
<i>Proposed Management Activity</i>	<i>Proposed Date</i>
Management Guide	2023
Mark Harvest	2023-2025
Sell Timber	2024-2025
Possible prescribed burn	2024-2025
Post harvest TSI	2025-2026
Monitor regeneration openings	Three to five years after harvest
Re-Inventory	2043
Write new Management Plan	2043

# Harrison-Crawford State Forest Compartment 23 Tract 10 Tract Map



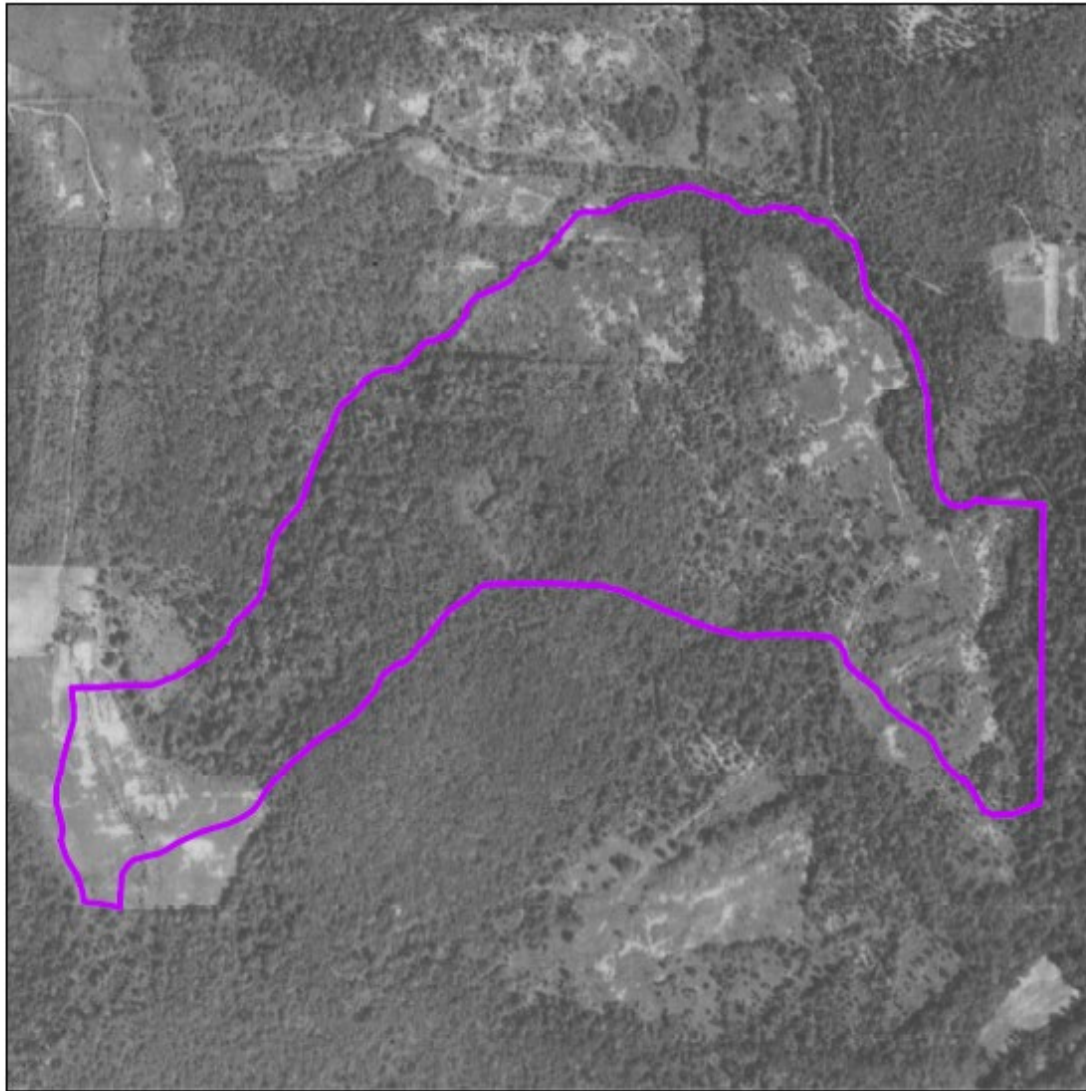
- Recreation Trail
- Fire Lane
- Tract boundary
- State Forest

# Harrison-Crawford State Forest Compartment 23 Tract 10 Cover Types Map





Harrison-Crawford State Forest  
Compartment 23 Tract 10  
Historical Aerial Photography



0 500 1,000 2,000 3,000  
Feet

Basemap is a 1940 aerial photo.

**Harrison-Crawford State Forest  
Compartment 23 Tract 9  
Resource Management Guide (repost)  
November 7, 2023**

**This Harrison-Crawford State Forest RMG was previously posted for a 30-day public comment period. Because 5 or more years has 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.**

Link to original RMG:

[https://www.in.gov/dnr/forestry/files/fo-HCSF\\_C23T9\\_02132014.pdf](https://www.in.gov/dnr/forestry/files/fo-HCSF_C23T9_02132014.pdf)

Compartment 23 Tract 9 (repost)

Identified as 6342309 [https://www.in.gov/dnr/forestry/files/compmaps/fo-HC\\_CT\\_Boundaries.pdf](https://www.in.gov/dnr/forestry/files/compmaps/fo-HC_CT_Boundaries.pdf)

Since the original inventory and resource management guide for this tract was completed in 2014, a reassessment was completed in anticipation of upcoming management activities. Very little has taken place to change the conditions of this tract in the ensuing years since the original guide was formulated. There has been some (but not substantial) natural mortality of standing trees dying and some windthrow mortality noted as well. The 1.1-acre wildlife opening noted in the plan located at the northwestern corner of the tract is no longer open and has grown back into an area of small early successional tree species.

One thing of note that has occurred is the decline and death of the white ash component of the tract. Although there are still some live ash trees present, the emerald ash borer (EAB) has moved through the general area and has caused many of the ash trees present to decline or die. Smaller regenerating ash all seem unaffected as of yet due to size and lack of preference by the EAB, but 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 2014 was recorded as about 21,000 board feet total, of which 18,000 had been tallied as harvest volume, and 3,000 had been tallied as residual. Likely most of both categories 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 small size classes as recommended for habitat for use by the Indiana bat and slightly below target numbers for the largest size class, but this addition of dead ash trees will further increase those snag densities on this tract.

Another change on this tract in the last 9 years since the original 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 120 board feet per acre per year. Using this estimation, and assuming it remained constant, this would have added about 100,000 board feet to the total volume of the tract. If one assumes all the ash from the original inventory period died, this results in an estimated overall gain of 80,000 board feet across this tract. 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 a higher residual volume after any such timber sale.

Additionally, the limited access noted in the 2014 plan has been improved from the south, extended the fire trail originating off Kintner Road and opening it up farther along the ridgetop to the north to directly give access to tract 6342309 on the west side of the tract. This was done in 2022 to give better timber sale access to neighboring tract 6343001.

An ecological review was completed for this amended RMG.