Indiana Department of Natural Resources
Division of Forestry
RESOURCE MANAGEMENT GUIDE

Harrison-Crawford State Forest	Compartment: 29	Tract: 19
Daniel Martin	Date: 05/17/2023	Acres: 73
Management Cycle End Year: 2043	Management Cycle Length: 20 Years	

Location
Tract 19, also known as 6342919, is in Section 13, T4S, R2E, in Harrison County, approximately 7.5 miles southwest of Corydon, IN. The tract can be accessed from Cold Friday Road.

General Description
The tract consists of mesic oak-hickory, mixed hardwoods, and dry oak hickory cover types with most of the acreage being mesic oak-hickory. The tract is located on a slope with the flat ridge top being the northern border of the tract. There are several drainages located throughout the tract.

History
- 1934 Two separate land acquisitions.
    - The west side of the tract was purchased from Kintner.
    - The southeast and northern parcel was purchased from Brewster.
- The southwest corner of this tract was planted to pine. There is no record of when the planting occurred, likely dating circa 1930's.
- 1957 The eastern portion of the tract was purchased from Doolittle.
- 2002 Forest inventory completed, and management guide written.
- 2002 Timber harvest conducted with tract 6342920.
- 2023 Forest inventory completed, and management guide written.

Landscape Context
The surrounding landscape is primarily managed forests owned and managed by the Indiana Department of Natural Resources (IDNR). To the east The Nature Conservancy owns a 114.5-acre parcel that is managed by the IDNR Division of Nature Preserves.

Topography, Geology and Hydrology
This tract primarily consists of a southward facing slope leading to a perennial stream named Cold Friday Hollow. Cold Friday Hollow eventually drains into the Ohio River. Located in the tract are various karst features which will be buffered according to the 2022 Best Management Practices (BMP) field guide.

Soils
This tract consists of seven (7) different soil types.

21 acres of Caneyville-Haggatt-Knobcreek silt loams, karst, hilly, eroded.
1 acre Deuchars-Apalona-Wellston silt loams, 6 to 12 percent slopes, severely eroded
2 acres Deuchars-Apalona-Wellston silt loams, 6 to 12 percent slopes, eroded.

22 acres Gilpin-Tipsaw-Ebal complex, 18 to 35 percent slopes, stony
23 acres Caneyville-Rock outcrop complex, 25 to 60 percent slopes
2 Vertrees-Crider-Caneyville complex, karst, rolling, severely eroded.
2 Kintner loam, 1 to 3 percent slopes, occasionally flooded, very brief duration.

The Caneyville-Rock outcrop contains the dry oak-hickory cover type which will mainly be avoided during management activities.

Access
A gravel fire lane off Cold Friday Road provides direct access to the tract. Additional gravel may be warranted depending on the nature of the management activity and time of year. There is an unmaintained fire lane in the southern portion of the tract that could be improved but should be considered an old roadbed rather than a fire lane at present.

Boundary
This tract is surrounded by IDNR property. Natural features (i.e., drainages), fire lanes, or trails serve as boundaries to delineate this tract from neighboring tracts.

Ecological Considerations
This tract is a typical south facing slope with oak habitat. There are small areas of mixed hardwoods and dry oak-hickory which provide different habitat needs for both game and non-game species. During the inventory squirrels (*Sciurus spp.*), white-tailed deer (*Odocoileus virginianus*) and eastern wild turkey (*Meleagris gallopavo*) were observed, and various signs of reptiles, amphibians and birds were present.

The Division of Forestry has developed compartment level guidelines for important wildlife structural habitat features such as snags. Snags 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	292	465	173
9" + DBH	219	465	246
19" + DBH	36.5	121	84

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
A small section of the Cypress Bog horse trail serves as the northern tract boundary, slightly dipping into the tract. Sections of the fire lane along the northern tract boundary serves as the Cypress Bog horse trail as well. There is a small section of the Turkey Ridge horse trail that touches the southernmost corner of the tract. Hunting also occurs in this tract. During the collection of field data for the forest inventory hunters were observed. During management activities this tract and portions of the trails within the tract will be temporarily closed for public safety. They will reopen following the management activity.

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

** Office use only**
In the southwest corner of the tract there appeared to be a historic site due to bridge remains observed.

Tract Subdivision Description and Silvicultural Prescription

Stand 1: Mesic Oak-Hickory – 52 acres.
This cover type makes up most of the tract acreage and is fully stocked. White oak is the dominate tree species making up 59% of the total volume, the next most abundant species is pignut hickory which only accounts for 10% of the total volume within this cover type. Mortality of white ash and red oak were noted throughout the cover type, there were varying degrees of mortality in black oak and white oak as well. Oak regeneration was observed throughout the stand.

The objective of this cover type is to provide for multiple economic and ecological services specifically a quality hardwood forest, dominated by oak and hickory, while providing hard mast and early to mid-seral habitat for wildlife.

Given the mortality observed, oak regeneration, and current stocking level an improvement harvest is recommended to capture mortality and remove low quality trees to release the oak regeneration in the understory and other future crop trees. The harvest would not change the composition of the cover type and the majority of the volume would remain in white oak. Many declining ash trees would be removed while those not exhibiting signs of decline and possibly having resistant to the Emerald ash borer would be retained.

In areas with particularly vigorous oak regeneration or an inadequate quality overstory a group selection opening may be applied. These openings would provide early successional habitat (i.e., young forest habitat) in addition to the release of the 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 these trees to become part of the canopy.

Not all low quality or understory trees will be removed during a timber harvest. For this reason,

post-harvest timber stand improvement (TSI) is recommended to reduce shade tolerant species and favor oak as to not alter the composition of the cover type. TSI can include cutting, girdling, and herbicide application to low value trees. Herbicide use would follow forest certification standards as well as herbicide labels. During post-harvest TSI any invasive species, if not already treated prior to the harvest, can also be treated.

Another silviculture tool often used to reduce understory competition and improve germination of oak and hickory is prescribed fire. Prescribed fire could be used during the dormant season to reduce shade tolerant species and improve conditions more favorable for oak and hickory establishment or advancement.

Stand 2: Mixed Hardwoods – 13 acres.
This cover type is fully stocked and is the second largest cover type in the tract. Predominantly located in the southern portion of the tract in the lower slope area near Cold Friday Hollow stream. This cover type is varied with the most abundant species being red oak making up only 18% of the total volume in the cover type. This area appears to be stagnant and growing in the remnants of a pine plantation that has mostly declined.

A harvest is recommended to liquidate the remaining pine converting composition of the cover type to a more native mixed hardwood cover type. The remaining cover type would be harvested to remove the low quality and stagnant trees. This effort would keep the mixed hardwoods composition unchanged.

TSI is also recommended to address any unwanted stems not removed during the harvest and address any invasive species.

Stand 3: Dry Oak Hickory – 8 acres.
This cover type occupies the least area of the tract. It consists of thin soils, exposed rock and generally poor growing conditions. Eastern red cedar and American sycamore are the two predominate tree species. Due to the slow and poor growing sawtimber present tree removal would be limited. Some removal of stagnant or dying trees may occur but given the cover type is already on the low end of being fully stocked, the composition would remain the same.

TSI is also recommended but would largely be limited to invasive species and vine control.

The current forest resource inventory was completed on 5/17/2023 by Forester Daniel Martin. A summary of the estimated tract inventory results is in the table below.

Tract Summary Data (trees >11" DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
American Elm	19	1,180
American Sycamore	89	17,750
Bitternut Hickory	15	2,290
Black cherry	62	6,390
Black Oak	66	22,300
Black Walnut	57	10,100
Chestnut Oak	40	6,700
Chinkapin Oak	139	6,100
Eastern Red cedar	288	25,730
Northern Red Oak	128	41,260
Pignut Hickory	377	37,880
Post Oak	19	5,970
Shagbark Hickory	69	9,720
Sugar Maple	526	44,360
Virginia Pine	61	6,530
White Ash	95	13,740
White Oak	1,028	230,560
Yellow Poplar	106	18,180
Total:	3,184	506,740

Summary Tract Silvicultural Prescription and Proposed Activities

Due to the current condition of the tract, an improvement harvest is recommended. This harvest could be undertaken as early as 2023. Overall, the tract volume would be reduced an estimated 25-45%. Most of this reduction would occur utilizing a single tree selection harvest with larger regeneration openings being created by group selection/patch cuts. TSI is recommended before the harvest to address invasive species. TSI following the harvest would focus on completion of established openings, unmerchantable trees not removed through the harvest and remaining invasive species. Due to the proximity and similar cover types, this harvest should occur at the same time as compartment 29 tract 20 (6342920). This would minimize entry into the area for management activities while reducing impacts on recreation, wildlife, hydrology, and other concerns mentioned in this management guide.

This harvest will not change the overall composition of the tract. Non-native low-quality pine would be the only tree species greatly reduced and the tract will remain forested.

BMPs are contractual and will be administered throughout any management activity (i.e., timber harvesting) to ensure activities have minimal impacts to the soils. Soil disturbance will largely be confined to the log yard and main skid trails. BMPs will ensure water quality is not permanently affected, like Cold Friday Hollow. Snags and coarse woody debris will remain at viable levels for wildlife after harvest and the harvest will not adversely affect the wildlife. If group selection

is used the openings would create early successional habitat for various wildlife present in the tract.

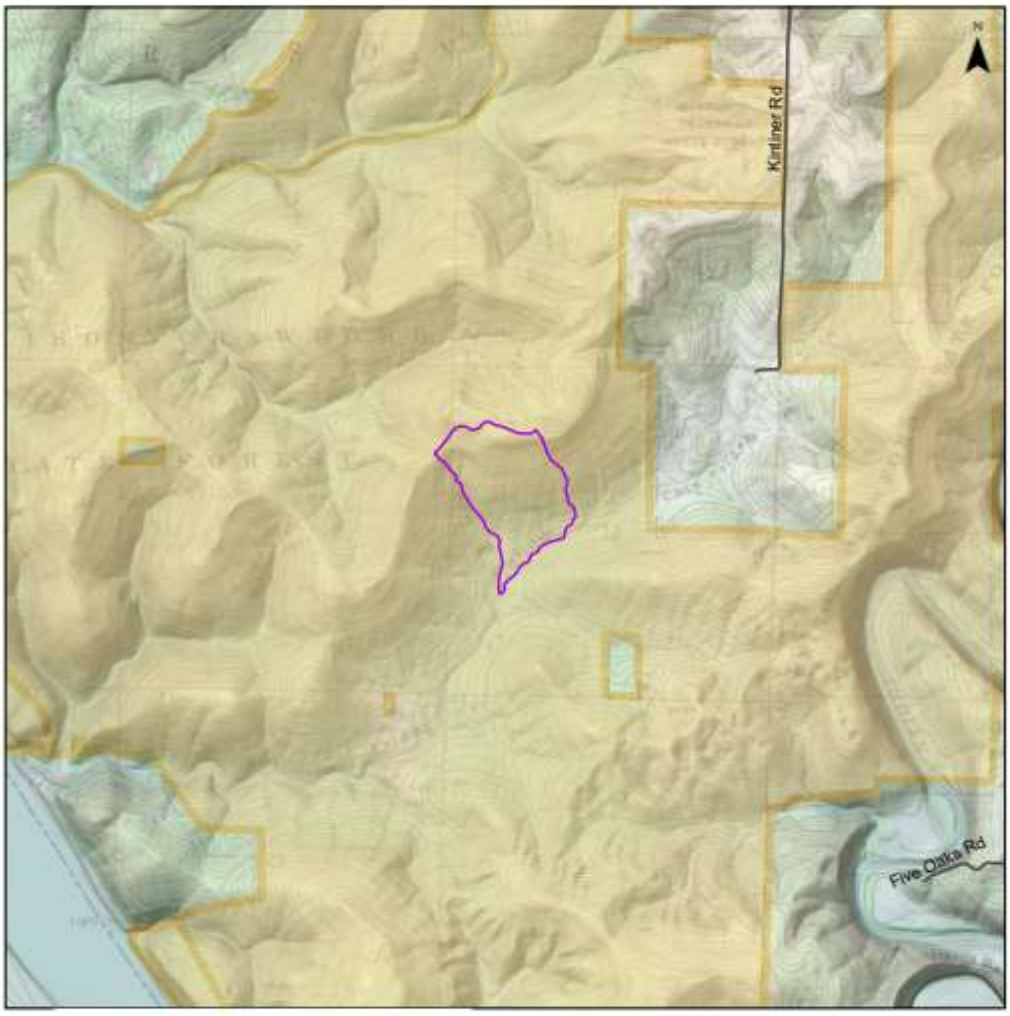
During the harvest, a section of the Cypress Bog horse trail would be temporarily closed. However, this closure would only occur from November 16th to April 1st and would not affect most of the spring, summer and fall recreation. Hunting opportunities should be improved by the maintenance of early successional habitat and the recruitment of hard mast producers such as oak and hickory to provide deer, turkey, and small mammal browse.

Following the harvest, post-harvest TSI should be completed, and the tract monitored to ensure proper regeneration and growth is occurring. In 20 years the tract should be visited for another forest inventory and new management guide.

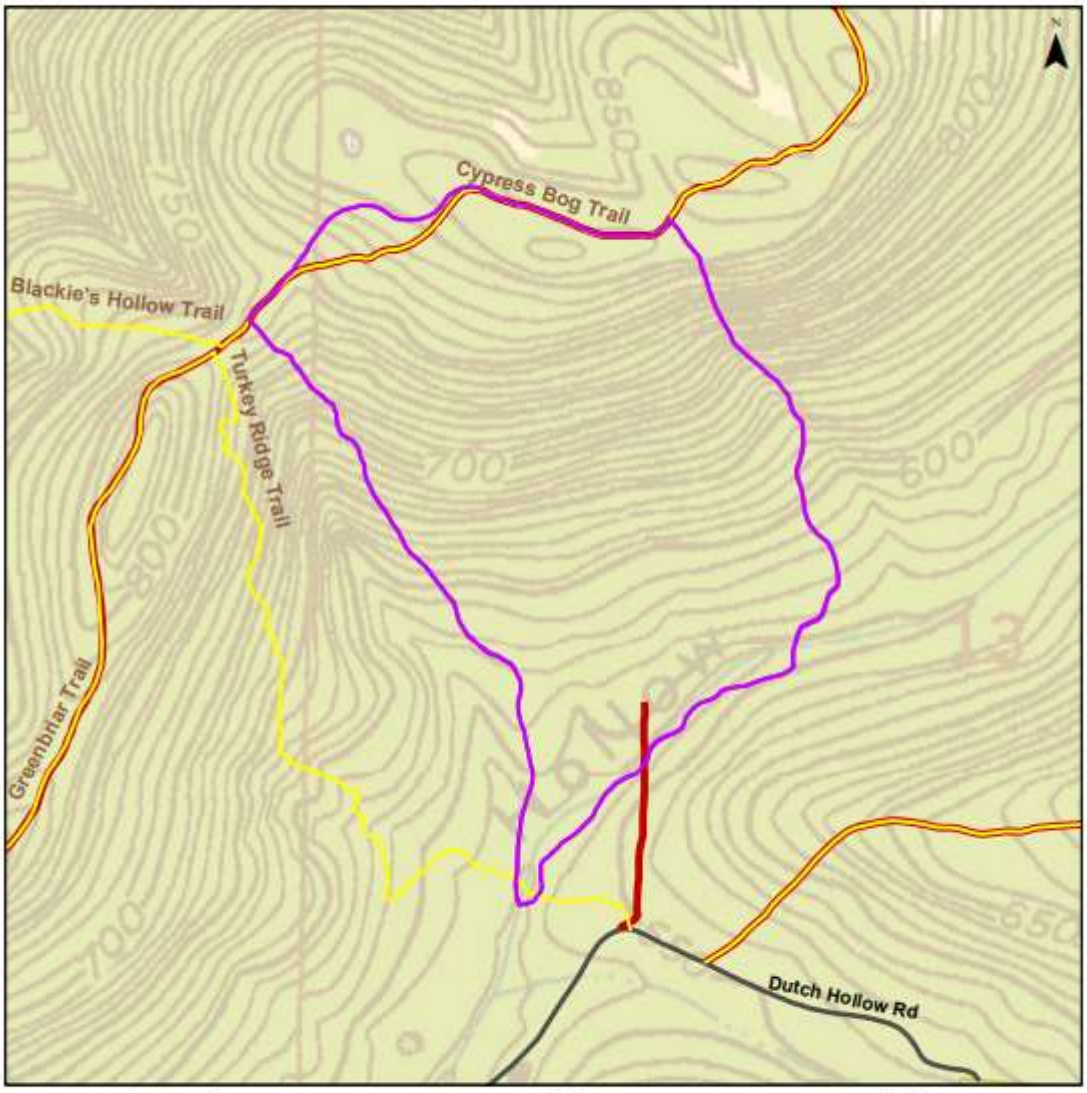
Proposed Activities Listing

Proposed Management Activity	***Proposed Date***
Management Guide	2023
Access Improvements	2023 - 2024
Treat Invasive Species	2023-2025
Mark Harvest	2023-2028
Sell Timber	2024-2028
Post-Harvest FSI	One to two years after harvest
Monitor regeneration openings	Three to five years after harvest
Re-Inventory	2043
Write new Management Plan	2043

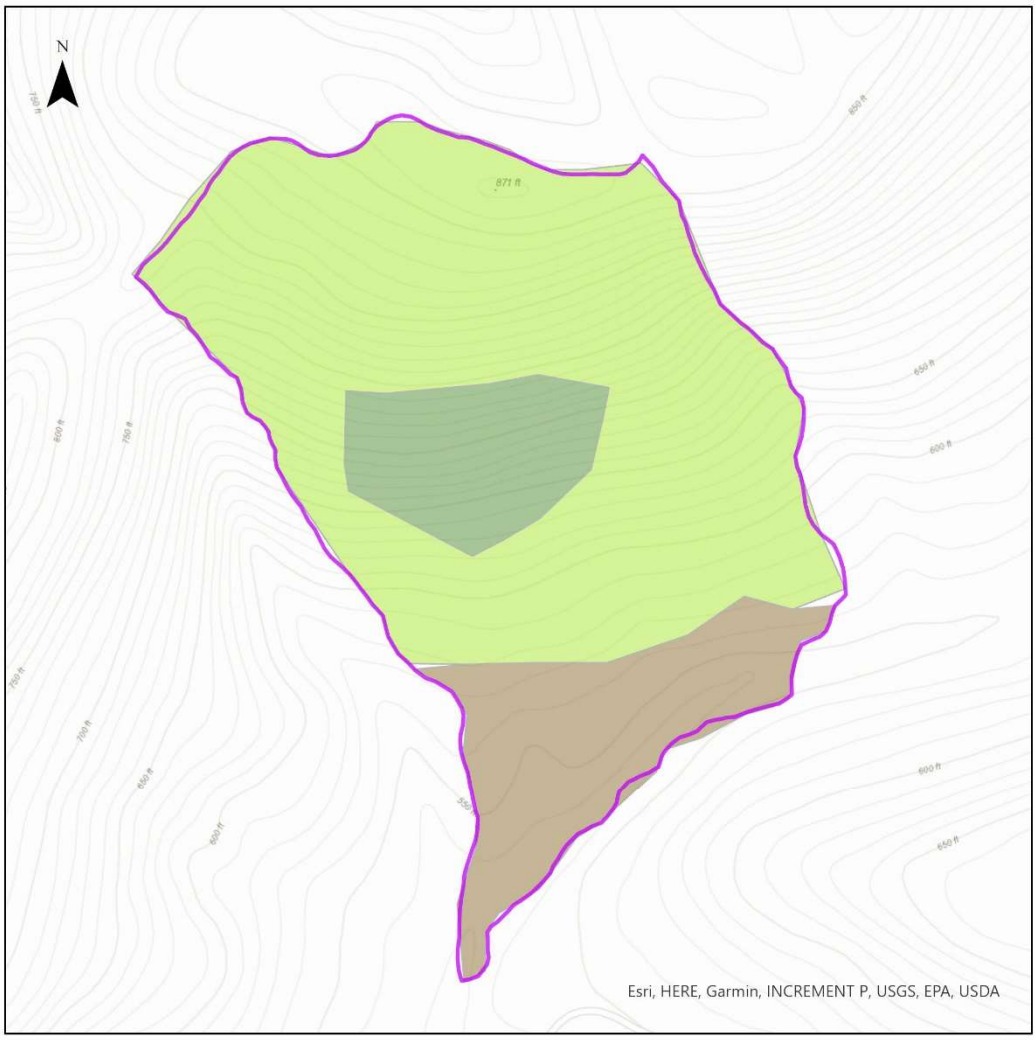
Harrison-Crawford State Forest
Location Map
Compartment 29 Tract 19



Harrison-Crawford State Forest
Compartment 29 Tract 19
Tract Map



Harrison-Crawford State Forest
Compartment 29 Tract 19
Cover Types Map



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Cover Types

- Dry Oak-Hickory
- Mesic Oak-Hickory
- Mixed Hardwoods

Indiana Department of Natural Resources
Division of Forestry
RESOURCE MANAGEMENT GUIDE

Harrison-Crawford State Forest	Compartment: 29	Tract: 20
Forester: Daniel Martin	Date: 05/19/2023	Acres: 96
Management Cycle End Year: 2043	Management Cycle Length: 20 Years	

Location
Tract 20, also known as 6342920, is in Section 13, T4S, R2E, in Harrison County, approximately 7.5 miles southwest of Corydon, IN. It can be accessed from Cold Friday Road.

General Description
The tract consists of mesic oak-hickory, mixed hardwoods, and shortleaf pine cover types with most of the acreage being mesic oak-hickory. The tract is primarily located on a southeastern aspect with a flat ridge top area being the northern border of the tract. There are several ephemeral drainages located throughout the tract.

History
- 1934 The west and southernmost tip was purchased from Brewster.
- 1936 The east portion of tract was purchased from King.
- 1950 The northern most portion of the tract was purchased from Kintner.
- 1951 The northern area was planted with shortleaf pine, jack pine, scotch pine, pitch pine and black locust.
- 2002 Forest inventory completed, and management guide written.
- 2002 Timber harvest conducted along with tract 6342919.
- 2023 Forest inventory completed, and management guide written.

Landscape Context
The surrounding landscape is primarily managed forests owned and managed by the Indiana Department of Natural Resources (IDNR). Directly bordering the tract to the east, The Nature Conservancy owns a 114.5-acre parcel that is managed by the IDNR Division of Nature Preserves.

Topography, Geology and Hydrology
The northern area of the tract consists of a flat area where the pine was planted. Following the tract south there is southward facing slope leading to a perennial stream named Cold Friday Hollow that eventually flow into the Ohio River. Located in the tract are various karst features and a small water body which will be buffered according to the 2022 Best Management Practices (BMP) field guide.

Soils
There are eight (8) unique soil types in this tract.

9 acres of Apalona-Zanesville silt loams, 2 to 6 percent slopes
17 acres Deuchars-Apalona-Wellston silt loams, 6 to 12 percent slopes, severely eroded
5 acres of Ebal-Gilpin-Wellston silt loams, 10 to 22 percent slopes, eroded
33 acres of Gilpin-Tipsaw-Ebal complex, 18 to 35 percent slopes, stony
19 acres Caneyville-Rock outcrop complex, 25 to 60 percent slopes
6 acres of Caneyville-Haggatt-Knobcreek silt loams, karst, hilly, eroded
5 acres Caneyville-Haggatt-Knobcreek complex, karst, hilly, severely eroded
2 acres Kintner loam, 1 to 3 percent slopes, occasionally flooded, very brief duration

Access
A gravel fire lane from Cold Friday Road provides access to the tract. Additional gravel may be warranted depending on the nature of the management activity.

Boundary
The eastern border of this tract borders The Nature Conservancy property. There was a Division of Forestry survey completed in the 1980's to determine this property line. At that time, monumentation at either end of this line and wood fence posts were installed along the southern part of the line. All other tract borders are interior to the state and defined by natural features (e.g., drain ravines, streams, trails, etc.).

Ecological Considerations
The majority of the tract consists of typical south facing slope oak habitat. There are small areas of mixed hardwoods and pine. Some features resemble that of a forest glade but limited. These habitat features provide different habitat needs for both game and non-game species. During the inventory squirrels (*Sciurus spp.*), white-tailed deer (*Odocoileus virginianus*), and eastern wild turkey (*Meleagris gallopavo*) were observed, and various signs of reptiles, amphibians, and birds were present. The ridge top that was planted to 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. Snags 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	384	1268	884
9"+ DBH	288	993	705
19"+ DBH	48	102	54

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
A small section of the Cypress Bog horse trail serves as the northern tract boundary. This trail is also a fire lane. Hunting occurs in this tract. This inventory was taken during the spring turkey hunting season and hunters were seen in the tract. During management activities this tract and portions of the trail within the tract will be temporarily closed for public safety. They will reopen following the management activity.

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

** Office use only**
There are at least two homesites located in the tract. What looked like a retaining wall is on a drainage near a northern homesite. There was also thought to be a homesite in the southeast corner of the tract but there was no evidence found.

Tract Subdivision Description and Silvicultural Prescription

Mesic Oak Hickory – 73 acres.
This cover type makes up most of the tract acreage and is fully stocked. White oak makes up 51% of the available volume, black oak is the next most abundant species accounting for 11% of the volume in this cover type. Mortality of white ash, red oak and black oak were noted throughout the stand. Oak regeneration was seen throughout the stand.

The objective of this cover type is to provide for multiple economic and ecological services specifically a quality hardwood forest, dominated by oak and hickory, while providing hard mast and early to mid-seral habitat for wildlife.

Given the mortality observed, oak regeneration, and current stocking level an improvement harvest is recommended to capture some of the mortality and remove low quality trees to release the oak regeneration in the understory and other future crop trees. The harvest would not change the composition of the site and the majority of the volume would remain in white oak. Many declining ash trees would be removed from the overstory. Healthy ash with no signs of decline would remain for possible resistance.

In areas with particularly vigorous oak regeneration or an inadequate quality overstory a group selection opening may be applied. These openings would provide early successional habitat (i.e.,

young forest habitat) in addition to the release of the 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 these trees to become part of the canopy.

Not all low quality or understory trees will be removed during the timber harvest. For this reason, post-harvest timber stand improvement (TSI) is recommended to reduce shade tolerant species and favor oak as to not alter the composition of the cover type. TSI can include cutting, girdling, and herbicide application to low value trees. During post-harvest TSI any invasive species, if not already treated prior to harvest, can also be treated. Herbicide use would follow forest certification standards as well as herbicide labels.

Another silviculture tool often used to reduce understory competition and improve germination of oak and hickory is prescribed fire. Prescribed fire could be used during the dormant season to reduce shade tolerant species and improve conditions more favorable for oak and hickory establishment or advancement.

Mixed Hardwoods – 16 acres.
This cover type is fully stocked and is the second largest cover type in the tract. The total acreage of this cover type is from three similar areas within the tract, two areas in the northern half surrounding the pine and a third area along the stream in the far southern portion of the tract. This cover type is dominated by yellow poplar which makes up 66% of the volume and has eastern red cedar as the second most abundant species by volume at 15% of the available volume.

A harvest in this cover type would not change the species composition and would remain mixed hardwoods. The field grown, and stagnant yellow poplar would largely be the target for removal to improve the overall health and vigor of the cover type. Due to the natural understory present, yellow poplar, maple, and beech are expected to regenerate naturally.

TSI is also recommended in this cover type to remove any unwanted stems not removed during the harvest and control any invasives present.

Conifer – 7 acres.
This stand is highly over stocked with non-native shortleaf pine. The pine will most likely not be liquidated and instead thinned to bring stocking down. Where oak and other hardwood regeneration is present (mainly in the transition zone from pine to another cover type) single tree and group selective cutting will be used to release the native hardwoods. TSI will also be conducted throughout the cover type to promote native species where possible.

Water – < 1 acre
This is a small drainage pond that will be buffered following 2022 BMP field guide.

The current forest resource inventory was completed on 5/19/2023 by Forester Daniel Martin. A summary of the estimated tract inventory results is in the table below.

Tract Summary Data (trees >11"DBH):

Species	# Sawtimber Trees	Total Bd. Ft.
Black cherry	32	6,680
Blackgum	48	5,900
Black oak	253	71,500
Blue ash	60	4,670
Chestnut oak	183	42,160
Chinkapin oak	142	11,870
Eastern redcedar	137	14,350
Northern red oak	164	27,080
Persimmon	48	4,980
Pignut hickory	463	55,600
Post oak	48	7,830
Red maple	18	1,520
Scarlet oak	53	15,900
Shagbark hickory	53	10,070
Shortleaf pine	338	39,590
Sugar maple	530	44,810
White ash	86	10,340
White oak	1,473	327,320
Yellow Poplar	379	99,440
Total:	4,508	801,610

Summary Tract Silvicultural Prescription and Proposed Activities

Due to the current condition of the tract, an improvement harvest is recommended. This harvest could be undertaken as early as 2023 or 2024. Overall, the tract volume would be reduced 35-55%. Most of this volume would come from a single tree selection harvest with larger regeneration openings created by group selection/patch cuts. TSI is recommended before the harvest to address invasive species. TSI following the harvest would focus on completion of established openings, unmerchantable trees not removed through the harvest and remaining invasive species. Due to the proximity and similar cover types, this harvest should occur at the same time as compartment 29 tract 19. This would minimize entry into the area for management activities while reducing impacts on recreation, 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 what cover types are currently present.

BMPs are contractual and will be administered throughout any management activity (i.e., timber harvesting) to ensure activities have minimal impacts to the soils. Soil disturbance will largely be confined to the log yard and main skid trails. BMPs will ensure water quality is not permanently affected, like Cold Friday Hollow.

Snags and coarse woody debris will remain at viable levels for wildlife after harvest and the harvest will not adversely affect the wildlife. If group selection is used the openings would create early successional habitat for various wildlife present in the tract.

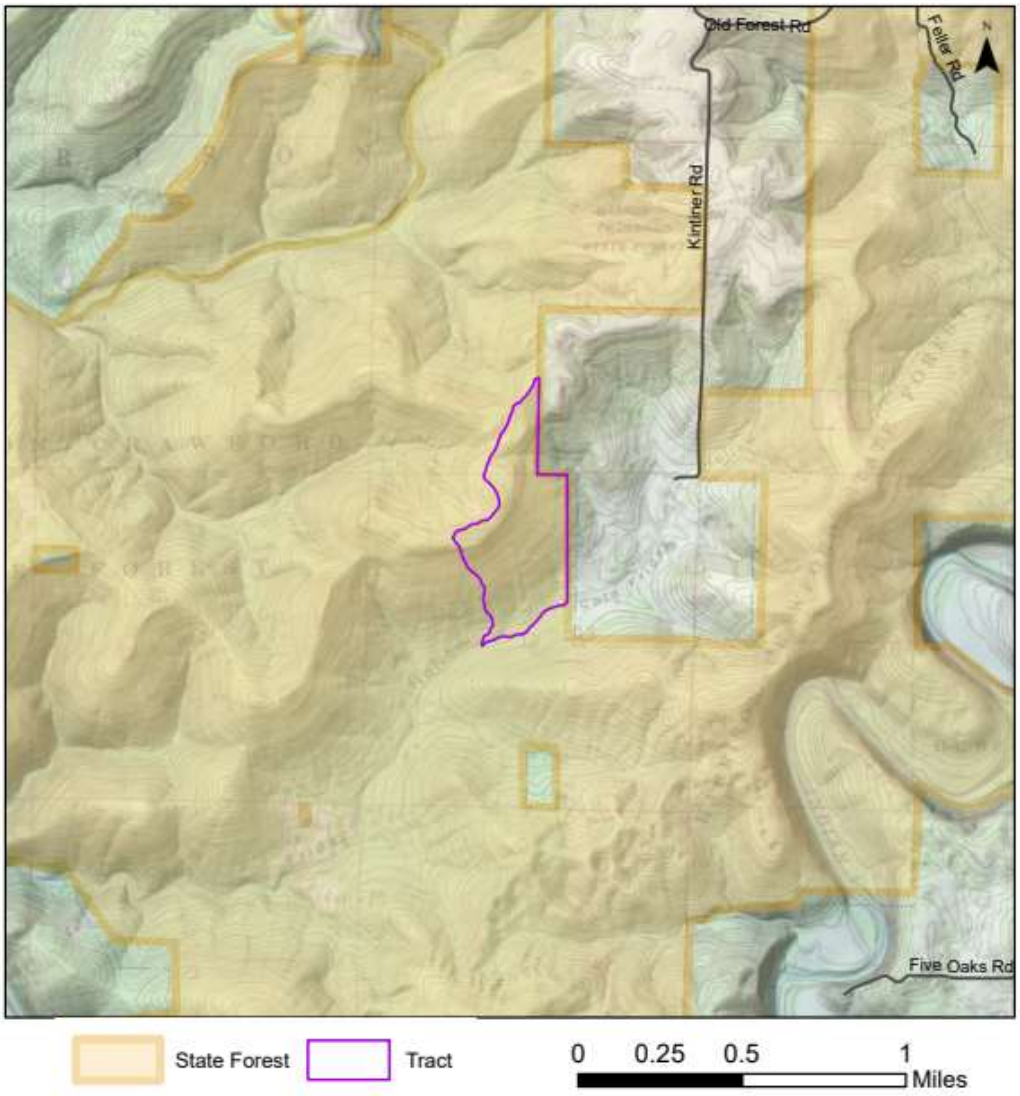
During a timber harvest, a section of the Cypress Bog horse trail would be temporarily closed. However, this closure would only occur from November 16th to April 1st and would not affect most of the spring, summer and fall recreation. Hunting opportunities should be improved by the maintenance of early successional habitat and the recruitment of hard mast producers such as oak and hickory to provide deer and small mammal browse.

Once the harvest is complete, post-harvest TSI should be conducted, and the tract 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 tract should be revisited for another inventory and a new management guide can be created.

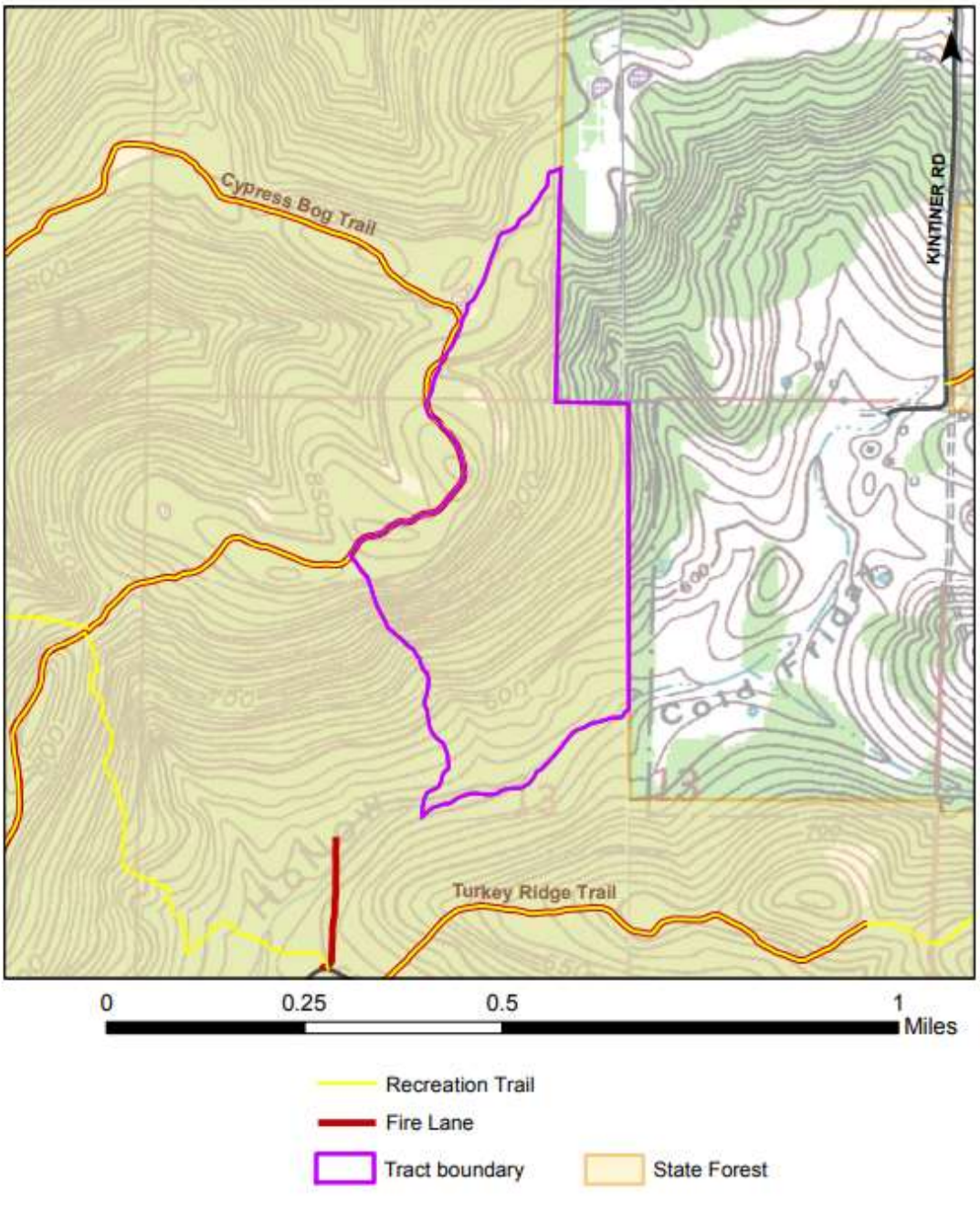
Proposed Activities Listing

Proposed Management Activity	*Proposed Date*
Management Guide	2023
Access Improvements	2023 - 2024
Treat Invasive Species	2023-2025
Mark Harvest	2023-2028
Sell Timber	2024-2028
Post-Harvest FSI	One to two years after harvest
Monitor regeneration openings	Three to five years after harvest
Re-Inventory	2043
Write new Management Plan	2043

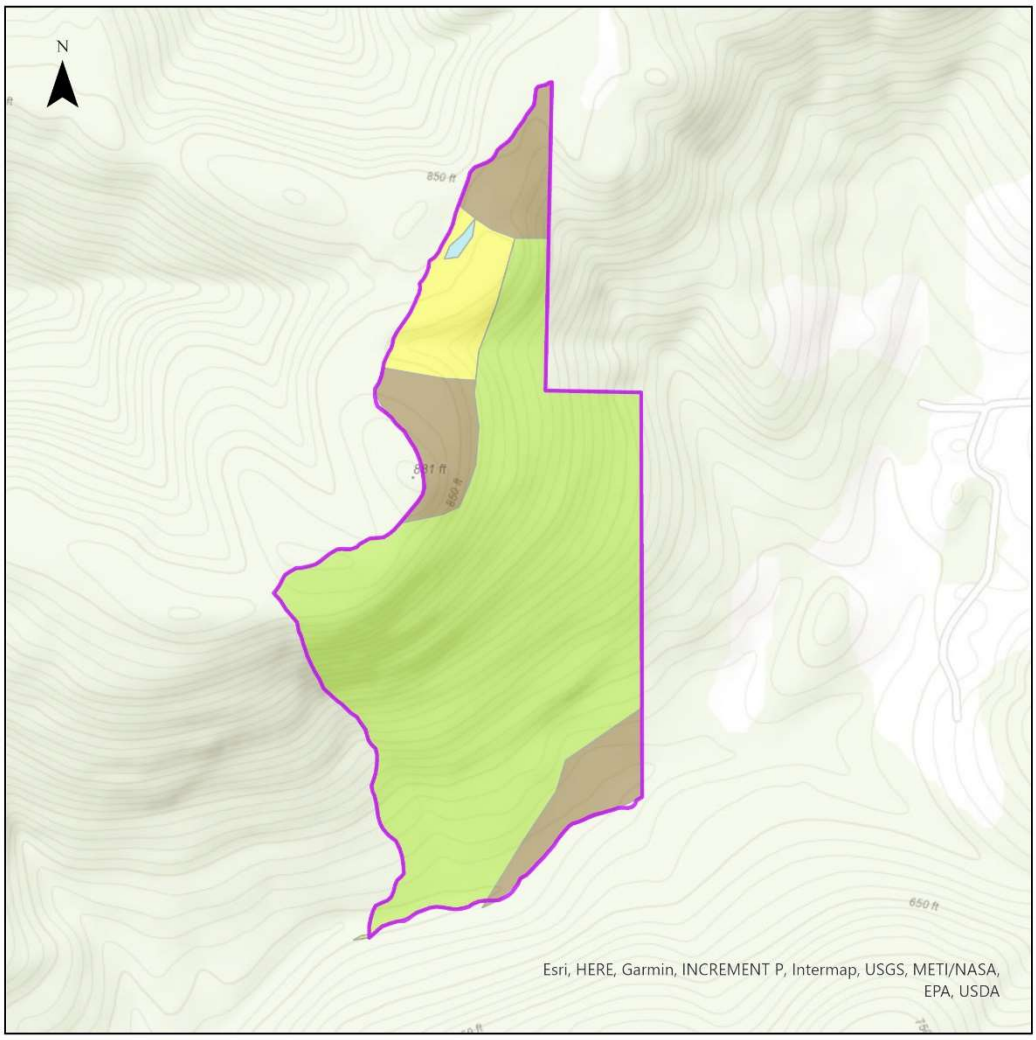
Harrison-Crawford State Forest
Location Map
Compartment 29 Tract 20



Harrison-Crawford State Forest
Compartment 29 Tract 20
Tract Map



Harrison-Crawford State Forest
Compartment 29 Tract 20
Cover Types Map



0 0.13 0.25 Miles

Cover Types

- Mesic Oak-Hickory
- Mixed Hardwoods
- Conifer
- Water