# Indiana Department of Natural Resources
# Division of Forestry

## RESOURCE MANAGEMENT GUIDE

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| Harrison-Crawford State Forest | Compartment 24 Tract 6 |
| Forester Dwayne Sieg | Date 5-10-2013 |
| Management Cycle End Year 2029 | Management Cycle Length 16 years |

**Location**
Tract 6 is found in Harrison county, Sections 11 and 12, T4S, R2E, approximately 10 miles southwest of Corydon, Indiana.

**General Description**
This tract contains 178.2 acres. It is fully forested, with the exception of about 2 acres of permanent wildlife opening. Tract 6 is made up of a mosaic of cover types, stand ages, size classes and stocking levels. This mosaic is mostly due to past agricultural use. The primary cover type is oak-hickory saw timber which is mostly consolidated in area, The next most common cover type is advanced old field succession, located in several locations, having been at earlier times, fields. This type is mostly found on or along the top of the ridges in the tract or in the lower slope towards the northwest end of tract 6. The other cover types are much smaller in acreage. With the exception of a west slope area labeled as dry site oak-hickory and a cove site containing large saw timber size mixed hardwoods, these smaller areas are former field sites. These have either been planted into pine soon after acquisition or naturally succeeded into e. red cedar. Several natural factors have significantly impacted the tract over the past 10+ years, causing elevated amounts of mortality and weakened stems. These impacts show up greatly in black oak, yellow poplar and chestnut oak. Causes include too high stocking (oaks), repeated droughts (yellow poplar and possibly chestnut oak), normal longevity (especially black oak and possibly chestnut oak), and hurricane Ike blow downs from 2008 (variety of species, but noticeably affected chestnut oak).

**History**
Tract 6 is made up of 5 acquisitions, going back to the earlier days of the formation of the State Forest. In 1934, about 29.8 acres came from Gwartney (131.30) and around 18.2 acres from Brewster (131.37). In 1936, about 4.4 acres of the tract came from a purchase from Perry and Jesse Kintner (131.45). Another 34.7 acres that make up tract 6 was acquired in 1940 from Doolittle (131.106). The last 94.1 acres of this tract was bought in 1950 from Perry and Jesse Kintner. All of these acquisitions were portions of larger land purchases. A local resident (Clifford Lowe) recounts that a property employee occupied the former Kintner house for a time after the state acquired the ground. It is unknown when that building and surrounding structures were razed.

Most of the more gently sloping (and some not so gentle) areas of this tract had been cleared and farmed prior to state ownership. It was noted during the inventory and by examining the 1940 and 1949 aerial photos of the area that these fields were abandoned to farming gradually, with the more sloping grounds abandoned first. This is typical, since these sites were likely to have been less productive as a start and with poor

conservation farming practices, were depleted more rapidly than the more level sites. By the time the state acquired these parcels, the earlier abandoned farmed fields had at least partially succeeded into native hardwoods or e. red cedar.

The old aerial photos support the observation that much of the tract was even aged stand(s). Those photos particularly show this in the cove area containing the oak-hickory type as they indicate full canopy cover with indistinct crowns, creating a 'smooth' appearance in the forest cover at the time of the photos.

There are some records of the reforestation efforts on this tract, although not complete. Most tree planting took place in 1951 on the more recent Perry and Jesse Kintner parcel. Primary species planted were shortleaf (Source: Arkansas and Oklahoma 1949)and pitch pine (Source: New Jersey 1949). Also planted were jack pine (Source: Wisconsin 1947) and black locust (Source not documented). Of these species, no pitch or jack pine were noted at the time of the recent inventory, although old fallen trunks of (probably jack pine) were noted in the small field on the ridge next to the east property boundary (more on this later). It is guessed that the jack pine died out within the past 10-20 years. Black locust was not noted, but residuals may be present. The shortleaf plantings received significant mortality (from 'winter drying') as a result of the 3 severe winters in the late 1970s. There are small amounts of Virginia pine present in the Gwartney and Doolittle acquisitions, but any records of those plantings have yet to be located. In the 1950s, the Division of Fish and Wildlife started up a habitat improvement project on this State Forest with the objective of aiding the re-establishment of the wild turkey. During this effort, they built a pond on tract 6. This division returned in the late 1980s to create or renovate permanent wildlife openings with the same target species in mind. This tract had one of these openings created along its southern edge. Past the efforts in 1951, the next documented management for this tract was an inventory of the westernmost shortleaf pine stand and subsequent plan to release advanced oak regeneration in 1993. The oak regeneration had come in as a result of the partial opening of the pine stand which the winter drying mortality had caused. This plan was not pursued. In July 1994, the tract was visited. It was recommended that a harvest and partial removal of pine to release oak regeneration take place. The tract received its first tract wide inventory and management plan in July1998. That inventory indicated a total volume of 761,803 bd.ft. or a total of 4,280 bd.ft. per acre average. Board foot volume can be an indicator of species abundance. The top 5 species in the 1998- using this measurement, were white oak, chestnut oak, red oak, yellow poplar, and black oak.

**Landscape Context**

Approximately 75-80% of the land area within a 2.5 mile radius around the tract is owned by the State of Indiana, including most by the Division of Forestry and some by the Division of State Parks (O'bannon Woods SP). Most of the rest of this area contain single family residences with some being on family farms. Over half the cover of these private properties are forested. Otherwise, they contain open ground, most being grasslands for pasture and hay. This area also contains around 3 miles of the Indian Creek corridor, a very short length of the Blue River corridor and even a small amount of the Ohio River. Land use within this radius has been somewhat stable over the past

couple decades, although the numbers of residences have shown a slight increase and row crop production has decreased.

## Topography, Geology and Hydrology

This tract contains one of the higher elevation locations of the State Forest with its highest point being around 870 feet above sea level. The lowest elevation of the tract is at 560 feet, an overall change of 310 feet. Tract 6 is moderately sloping. Primary aspects would be northerly, but with significant areas facing westerly. One west facing slope is noticeably poor in productivity, due to its aspect, causing thin and dry soils. Primary subsurface bedrock will be sandstone, capped over limestone in the higher elevations. Typically, in this State Forest, limestone is the underlayment in the proximity of 650 feet elevation and lower. In the e. red cedar stand (at the lowest elevations), limestone bedrock is exposed in the severe erosion gullies (resulting from past agricultural use). No sign of karst features (caves, sinkholes) were noted during inventory. Tract 6 drains into a couple intermittent streams that, in turn. drain into Potato Run creek, a normally dry run channel that flows only after heavy rain events. Potato Run adjoins the tract for a short distance at its northwest extreme. Potato Run meets the Ohio River about 3.3 miles past this tract.

## Soils

**Corydon Stony Silt Loam (CoF)** 55 acres. Shallow, moderately steep to very steep, well-drained, stony soils on uplands. Surface layer is about 3 inches. Subsurface is about 6 inches thick. Subsoil about 9 inches thick. The depth to hard limestone bedrock is about 18 inches. High in organic matter and low in natural fertility. Runoff is rapid or very rapid. Soil type is characterized by limestone outcrops, with as much as 15% on benches which are deeper than 20 inches to bedrock.
Degree Slope: 20-60 %
Woodland Suitability Group: 3d7
Site Index: 65-75 (Upland oaks)
Growth range potential (Upland oaks): 155-220
Management concerns: Runoff and erosion

**Gilpin Silt Loam (GlD2, GlD3, GlE2, GpF)** 48.1 acres. Moderately deep, strongly sloping to steep, well-drained soils. Surface layer is very dark grayish-brown silt loam about 3 inches thick. Subsurface layer is pale brown silt loam about 9 inches thick. Subsoil is about 17 inches thick. Depth to hard sandstone and shale bedrock is about 29 inches. Moderate in organic matter. Available water capacity is low and permeability is moderate. Runoff is rapid to very rapid.
Degree Slope: 12-30 %
Woodland Suitability Group: 3o10 or 3r12
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Site Index: 70-80
Management Concerns: Runoff and erosion

**Tilsit Silt Loam (TlB2)** 14 acres Deep, gently sloping, modrately well drained soils on uplands. Fragipan in the lower part of the subsoil. Surface layer is dark yellowish-brown silt loam about 8 inches thick. Subsoil is about 38 inches thick. Depth to interbedded shale and sandstone bedrock is about 66 inches. Moderate in content of organic matter and low in natural fertility. Available water capacity is moderate and permeability is very slow. Runoff is medium.
Degree Slope: 2-6 %
Woodland Suitability Group: 3d9
Site Index: 70-80 (Upland Oaks)
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year

Management Concerns: Erosion, wetness early in spring, available water capacity, lack of moisture in mid and late summer if rainfall is below normal.

**Baxter Cherty Silt Loam (BeC2, BeD2, BeE2, BeF2, Cbsd3, BtD5), also**
**Baxter Silty Clay Loam ( BIC3)** 7.2 acres
The Baxter series consists mainly of deep well drained soils on uplands. These soils formed in loess, as much as 20inches and the underlying material is weathered bedrock. The surface horizon is 2 inches thick of a dark brown silt loam. The subsurface is 6 inches of a yellowish brown silt loam. The subsoil is 70inches of which the first 5 is a yellowish brown friable silty clay loam. The last 65inches is red firm to very firm cherty silty clay loam. The lower part has mottling and id 20-40 percent chert fragments. The available water capacity is high and the permeability is moderate.
Degree Slope: 0-35%
Site Index: 75
Growth Range Potential: 222
Management Considerations: runoff and erosion

**Haymond Silt Loam (Hm)** 6.7 acres Deep, nearly level, well-drained soils on bottom lands and in basins of sinkholes in uplands. Surface layer is dark-brown about 9 inches thick. Subsoil dark yellowish-brown about 17 inches thick. Underlying material is dark yellowish-brown stratified silt loam that contains less prominent layers of loam. Moderate in content of organic matter. Available water capacity is high, and permeability is moderate. Runoff is slow.
Degree Slope: 0%
Woodland Suitability Group: 1o8
Site Index: (95-105- no rating for upland oaks)
Growth range potential (Tulip poplar-no rating for oaks): 375-450 bd.ft./acre/year
Management Concerns: Flooding between December and June

**Crider Silt Loam (CrB2, CrC2, CsB3, CsC3, CtC2, CtC3)** 4.7 acres Deep, gently sloping and moderately sloping well-drained soils on uplands. Surface layer is dark-brown silt loam about 8 inches thick. Subsoil is about 62 inches thick. Moderate in content of organic matter and in natural fertility. Available water capacity is high and permeability is moderate. Typically, these soils are eroded. Runoff is medium to rapid.
Degree Slope: 2-12%
Woodland Suitability Group: 1o1
Site Index: 85-95 (Upland Oaks)
Growth range potential (Upland oaks): 300-375 bd.ft./acre/year
Management Concerns: Runoff and erosion

**Wellston Silt Loam (WeC2, WeC3, WeD2, WeD3)** 4.1 acres Moderately deep and deep, moderately sloping and strongly sloping, well draineds soils on uplands. Surface layer is about 9 inches thick and yellowish-brown. The subsoil is about 31 inches thick. Depth to hard sandstone bedrock is about 40 inches. Moderate in content of organic matter and low in natural fertility. Available water capacity is moderate or high, and permeability is moderate. Runoff ranges from medium to very rapid.
Degree Slope: 6-18 %
Woodland Suitability Group: 3o10
Site Index: 70-80 (Upland oaks)
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Management Concerns: Runoff and erosion

**Weikert-Berks Channery Silt Loam (WbF)** 3.3 acres Shallow, very steep, well-drained, channery soils on uplands. Surface layer is very dark grayish-brown and dark grayish-brown and about 8 inches thick. Subsoil is about 10 inches thick and is yellowish brown channery heavy silt loam and 35-50 % sandstone rock fragments. Depth to the interbedded hard sandstone and shale is about 18 inches. Moderate in content

of organic matter and low in available natural fertility. Available water capacity is very low, and permeability is moderately rapid. Runoff is very rapid.
Degree Slope: 35-60 %
Woodland Suitability Group: 5r14
Site Index: 45-53 (Virginia pine-no rating for hardwoods)
Growth range potential (Virginia or shortleaf pine-no rating for hardwoods): 75-200 bd.ft./acre/year

**Zanesville Silt Loam (ZaC2, ZaC3, ZaD2)** 3.3 acres Deep, moderately sloping and strongly sloping, well-drained soils on uplands. Avery firm fragipan in the lower part of the subsoil. Surface layer is very dark grayish-brown silt loam about 3 inches thick. The subsurface layer is about 5 inches thick and dark yellowish-brown. Subsoil is about 42 inches thick. The depth to sandstone bedrock is about 65 inches Moderate or low in content of organic matter and low in natural fertility. Available water capacity is high, and permeability is very slow. Runoff is medium to rapid.
Degree Slope: 6-18%
Woodland Suitability Group: 3d9
Site Index: 70-80 (Upland Oaks)
Growth range potential (Upland oaks): 185-260 bd.ft./acre/year
Management Concerns: Runoff and erosion. Fragipan limits the available water capacity.

**Hagerstown Silt Loam (HaC2, HaD2, HgC3, HgD3, HgE3)** 2.8 acres Deep, moderately sloping to moderately steep, well-drained soils on uplands. Surface layer is dark yellowish brown silt loam about 6 inches thick. The subsoil is about 46 inches thick. The depth to limestone is about 52 inches. Characteristically, this soil is eroded to severely eroded. Moderate in content of organic matter and medium in natural fertility. Available water capacity is moderate or high, and permeability is moderate. Runoff is rapid to very rapid.
Degree Slope: 6-25 %
Woodland Suitability Group: 1o1 or 1r2
Site Index: 85-95 (Upland Oaks)
Growth range potential (Upland oaks): 300-375 bd.ft. /acre/year
Management Concerns: Runoff and erosion

As can be seen above, tract 6 contains an above normal number of soil types and type subdivisions. Some of this variability has been influenced by nature (aspect, degree of slope, position), but the current condition (especially productivity) of some of these soils have been affected by past agricultural practices. Farming erosion scars are present over much of the upper slopes, but was/is quite pronounced in the northwestern lower slope area of about 15 acres, where large, deep gullies remain, some exposing the bedrock. However, in a testament to nature's resilience, even this scarred area is almost totally reforested. This location has succeeded, mostly naturally, with native eastern red cedar and some hardwoods. While the hardwood trees would not be considered very valuable, nevertheless, these trees and cedar have gone a good distance in stabilizing the former gullies and minimizing this site's contribution to soil loss and threat to water quality downstream. The pine plantings have stabilized and rehabilitated the old field sites in those locations. Over much of the tract that did not receive tillage, the trees exhibit productive qualities by their stocking, heights, and general appearances. One exception are the few acres labeled as 'Dry Site Oak-Hickory'. This mid slope, westerly aspect area exhibits (probably) naturally thinner, dry soils and consequentially, lesser stem size and tree heights.

**Access**
Primary access to tract 6 is achieved by following Cold Friday road south for about 1.7 miles to the ford over Potato Run creek, next to the bridge. After crossing the ford, one must enter through a gate and follow that forest access lane for about 1.5 miles to reach the nearest point of the tract. This same access lane follows the southern and southeastern boundary of the tract for another .6 mile. This lane has had improvements and crushed stone added over most of its length in the past few years. A secondary access to reach the northern tip of the tract would be to follow Kintner Road .8 mile south to another forest access lane. Follow that westerly for 1 mile to tract 6. This lane has also received drainage improvements and stone in recent years. It would provide adequate light truck passage. The tract can be reached from the south by following Cold Friday Road about 1.6 miles beyond the bridge. Take another forest access lane 1.4 miles to the southeastern tip of the tract. Much of the first length of this lane is passable, but the last ¼ mile or so needs drainage improvements, widening and stone to bring it up to reliable access. A last alternative is to go up Potato Run creek from the Cold Friday Road bridge, pick up another forest access lane and follow about 1 mile to the same spot described in the preceding route. This route is the least passable of the access lanes described. Significant work needs to be done to it to repair damage done by horse riding use and to make it usable year round by anything other than an ATV.

**Boundary**
Tract 6's boundaries are primarily topographic features, with the exception of its eastern boundary which is a property boundary segment of about .5 mile. This property boundary was briefly examined during the inventory. Much of its length is vague, although the old aerial photos show a fairly distinct usage change and perhaps tree line on some of it. During the examination, a wood post with turning barbed wire was observed in the proximity of the property corner. Traces of old fence and segments of former fence 'ridging' were seen along some of the line. The neighbor to the east (Clifford Lowe) thinks there should be a stone at the corner. During the inventory visit, no stone was found and there was a large amount of native stone present in the immediate area, creating a 'needle in the haystack' effect, if there is a stone there. This line will have to be more closely identified and marked before management activities take place in the nearby area of the tract. The remainder of the eastern border and a part of the southeastern border are access lane segments. The rest of the southwestern border is a northwesterly flowing drainage, terminating at Potato Run creek. A little over a quarter mile of the northern border is Potato Run creek, with the rest of that border being another tributary channel of Potato Run.

**Wildlife**
A Heritage Database Review was completed for this tract. If rare threatened or endangered species 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.

The inventory on this tract was done from November through early January. This season limited the amount of species present or active in the tract. Pileated woodpeckers were heard and seen, one male wild turkey was also observed. While the animals were not seen, there was plenty of sign of the white tail deer, including buck rubs and scrapes.

One sizeable area on a slope had been greatly stirred up by turkeys, foraging for acorns. It is expected that a typical array of wildlife species use this tract, including gray and fox squirrels, raccoon, gray fox, coyote, opossum, various species of songbirds, box turtles, snakes, etc. The habitat is somewhat varied, with early succession being the most limiting habitat. Thermal and nesting cover may be provided by the presence of red cedar and heavy limbed shortleaf and Virginia pines. A small pond, created by the Division of Fish and Wildlife, provides perennial water that does not otherwise exist in the tract, save a former farm building foundation that holds water.

Snags were tallied in this inventory for potential uses by wildlife. The following tables summarize guidelines and actual data with regard to the new strategy for consideration of the Indiana bat. The categories of optimal and maintenance guideline numbers were broken down by size class subcategory, but are inclusive of size classes above that. In other words, the maintenance guideline for number of snags in the 6" class and larger was 4 per acre, but of that number, 0.5 per acre should be 20"+ and 3 should be 10'-18" or greater. This was done because larger trees are more valuable and less common, and were given the greater importance when calculating total guideline numbers. **Live tree numbers only consider the 14 species of trees that the Bloomington Field office of the USFW service has identified as Indiana bat roost trees.**

Guidelines for preferred density of live and dead trees for use by Indiana bat:

| # of live trees | Guidelines Maintenance | Tract 2406 actual present |
|---|---|---|
| 12"-18" DBH class | 1,069.2 | 3,636 |
| 20" DBH and greater | 534.6 | 1,093 |
| Total | 1,603.8 | 4,729 |

| # snags | Guidelines Maintenance | Guidelines optimal | actual |
|---|---|---|---|
| 6" - 8" DBH class | 178.2 | 178.2 | 3309 |
| 10"-18" DBH class | 445.5 | 891 | 972 |
| 20" DBH and greater | 89.1 | 178.2 | 212 |
| Total | 712.8 | 1,247.4 | 4,493 |

These numbers show that live tree densities not only meet the maintenance guidelines, but exceed them significantly in both size class ranges. Snag densities greatly exceed the optimal guideline number in the smallest class range. They exceed the guidelines by a comfortable margin in the mid range and even exceed the range in the largest range by several trees. Post harvest TSI will contribute more snags to the tract.

**Communities**
A Heritage Database Review was completed for this tract. If rare threatened or endangered species 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.

There were 3 exotic plant species noted during the inventory. First was j. honeysuckle. Holdover from when there was a home or two within the tract, the plant has spread its presence over much of the ridge top area in tract 6. Fortunately, most plants seen were 'sprigs' and not the vine mats sometimes seen elsewhere. Nevertheless, the species needs to be monitored and controlled, if need be. There were a few sapling/small pole size ailanthus trees observed in the proximity of the barn site at the Perry Kintner homestead location. The last species noted in or near the tract was J. stilt grass, in association with the access road that has also served as a horse trail (likely vector for the species) for many years.

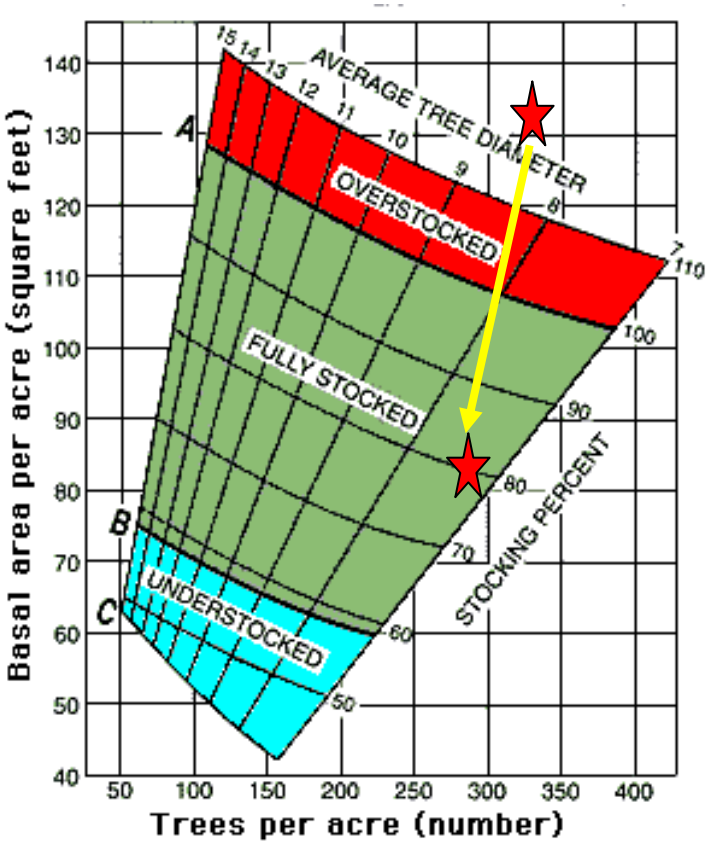
**Recreation**
The primary recreational use of this tract would be the horse trail that forms part of the southeastern border of the tract. Hunting would be the other such use of tract 6, although since it is a good distance from public roads, hunting pressure is expected to be comparatively less. Another likely recreational use might be mushroom hunting, although like hunting, the distance from public access points may limit this use, also.

**Cultural**
Cultural resources may be present on this tract, if present their location is protected. Adverse impacts to significant cultural resources noted will be avoided during any management or construction activities.

**Tract Subdivision Description and Silvicultural Prescription**
**Oak-Hickory Stratum (92.8 acres)** Approximately 52% of this tract's area was included as this type. The type extends almost the full width and depth of the tract. There is some variation of productivity, stocking, composition, heights, and size within the type, attributed mostly to position and aspect, but overall, it is a stand with better timber potential than commonly seen on this property. The oak component is strong, with white oak being the most numerous trees in the main canopy, followed by chestnut oak. The presence of other species falls dramatically after these two. The most impressive area of the stand is the central cove portion, particularly on the mid to lower east facing slope. Here, the forest exhibits definite even aged traits, indicating that there had been a heavy cut here to create the present stand. Besides the high percentage of similar size oak, common multiple stemmed (stump sprouted) oaks support the even aged idea, as well as the indistinct crowns or 'smooth' appearance on the 1940 and 49 aerial photographs. This stand is in excess of 73 years of age, using the older photo as evidence. It is estimated that the stand would be somewhere in the 80-100 year old range. This stand is way overstocked with an average of 133 sq.ft. of basal area per acre. This average is somewhat high compared to many, if not most oak-hickory areas with more than one sample plot containing basal area counts of 190-200 sq.ft. Tree heights are also greater than commonly seen on this State Forest. On the down side, there are

signs of the stratum deteriorating due to maturity. Black oak's presence, undoubtedly, has decreased over the past couple years. Mortality in this species was observed possibly more than any other in the stratum. The inventory tallied white ash heavily for harvest. This species faces almost certain destruction from the emerald ash borer and removing merchantable stems, now, will capture the volume before it is lost to the approaching epidemic. Besides selecting mature and overmature black oaks, and white ash, a harvest should provide thinning, release of desirable crop trees and removal of drought stressed yellow poplar. As the following Gingrich chart illustrates, a harvest will provide a desired future condition of a mid-range fully stocked stand of crop trees with more crown space. Increased crown space will allow residual canopy trees to develop larger crowns, increasing health, vigor, and growth rates, and better able to ward off stresses such as drought and insect attacks.

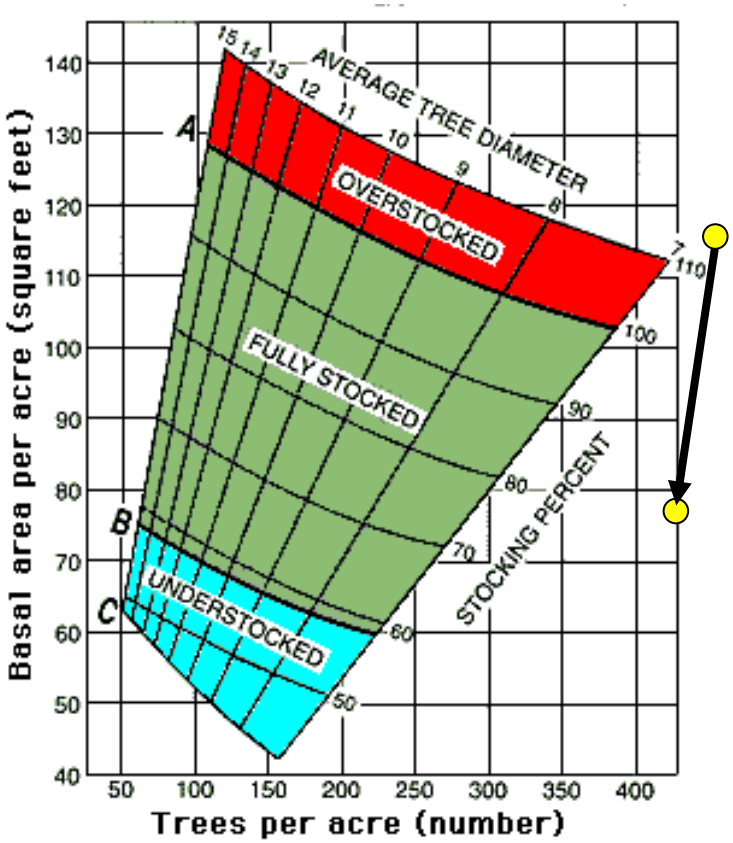
OAK-HICKORY STAND
STOCKING CHART
Compartment 24, tract 6




**Old Field Mixed Hardwoods (39.9 acres)** This cover type includes at least 7 distinct areas of the tract that were at various points in time, open or semi open fields, cleared and used by past residents for agricultural fields and/or pastures. This type also includes the land immediately around the Kintner homestead that had once been open for that

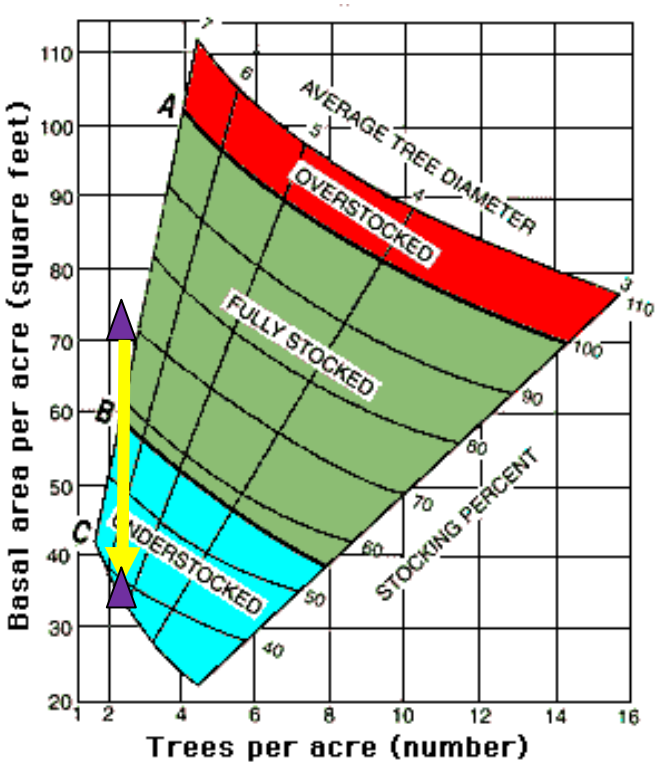
purpose. What makes these sites different from the other former fields is that they were allowed to reforest naturally, although at least some of them had contained pitch and jack pine and black locust plantings (which all appear gone, by now). Since abandonment took place at differing times, and since productivity of these sites varied at their time of abandonment, ages and sizes are varied, as are stocking, form, and species composition. Most share a common problem with desirable stem qualities and lacking in places of desirable species and adequate stocking. Sassafras has been a common occurrence in the type, but most have or are dying out. The oldest of the sites is the one at the bottom of the slope in the mid section of the tract. The youngest and possibly the most promising for oak is the one along the eastern property boundary on the ridge top. This area had been planted into jack pine (most likely), which died out 10-20 years ago and now contains a nice amount of advanced oak regeneration with a thin scattering of hardwoods that had grown up with the pines. The following stocking chart reflects averages for all of these old field sites, as well as the mixed mesic hardwood stratum described later. As can be seen, the numbers fall off the chart, but can illustrate that the present stands are overstocked and management through harvest and TSI is intended to bring the stocking down to a more desirable mid B level (fully stocked). The desired condition of the old field hardwood stands would be greatly reducing the non productive and poor quality trees that are taking up growing space to concentrate growth on desirable stock for timber production and to improve mast production.

**OLD FIELD AND REGULAR MIXED HARDWOODS**
**STOCKING CHART**
**Compartment 24, tract 6**



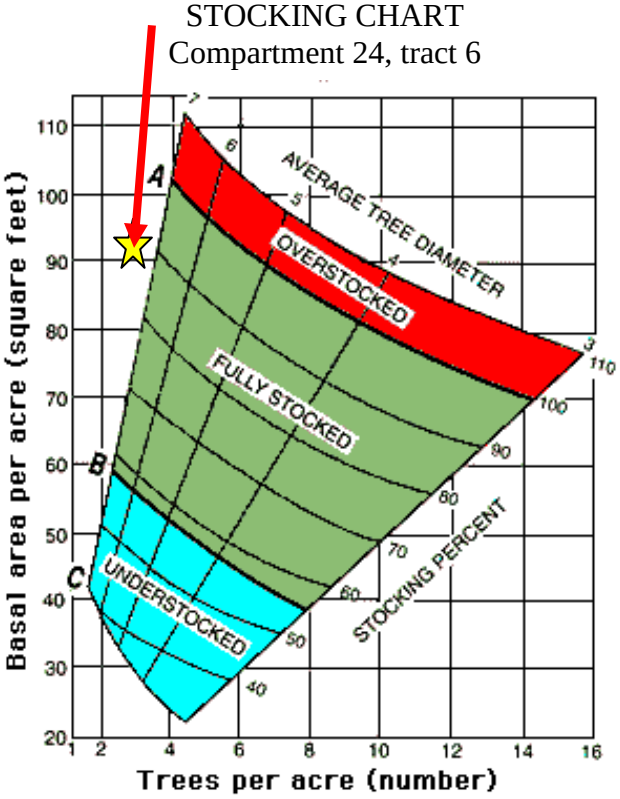
**Old Field Eastern Red Cedar (15.4 acres)** The red cedar stand lies at the NW corner of the tract, at the base of the hill and very near Potato Run creek. It is very obvious that this site was once farmed, as the worst gully erosion scarring found in tract 6 is found here. Some of these gullies expose the underlying limestone bedrock. The site is variable in productivity, though none of it would be considered highly productive, because of the past erosion. The cedar stems range mostly from pole to small saw timber. Within the area most heavily occupied by red cedar, there are scattered stems of low quality black, chinquapin, and even a few shingle oaks. Additionally, there were a few Virginia pine trees noted. Most likely, these would have been planted soon after acquisition of the property there. There is some advanced oak regeneration in the understory, in places. Almost half of this stratum is well into a transition from cedar into an oak-hickory type. This area would be the southeastern or uphill portion of the stand. There are quite a few wolfy trees present, residuals from the days this stratum served as semi open pasture. Ideally, silvicultural practices would call for some removal of the cedar to allow better invasion of oak species and convert to native hardwoods. Access to remove cedar would be challenging. Retention of the cedar would still provide benefit to the continuing stabilization of the old gullies and gradual reclamation of the site. Some stand improvement should be done in the described transitional area, by removing low value wolf trees where they compete with more desirable stems. The desired future condition of this stand is that the eroded area is fully stabilized and rebuilding productivity. This condition will be long term. The other desired condition is the restoration of the transitioning portion into an oak-hickory stand with optimum stocking and production of quality stems that add value to the tract and mast production.

OLD FIELD EASTERN RED CEDAR
STOCKING CHART
Compartment 24, tract 6



**Pine (12.6 acres)** This cover type is found, primarily in the planting on the ridge top at the south central part of the tract. A smaller planting with similar composition is located at the southeastern corner of the tract. Both of these plantings are almost totally shortleaf pine. Examination of the planting record indicates this, although some trees may have have misidentified during inventory as being red pine. The vigor and quality within these 2 sites appears good, although thinning would help to maintain this stratum. A natural thinning occurred during the severe winters of 1977-79, due to winter drying mortality in this non-winter hardy species (southern United States origin). This thinning allowed some of the pine stems to respond and reach a good size with some being around 20" DBH. Additionally, the temporary increase of sunlight to the forest floor allowed the establishment of a good amount of native oak regeneration. Unfortunately, timely release of these seedlings by removing more pine in the 1990s was not accomplished. The pine crowns have closed back in and the returned shade has greatly reduced the new oak component. There are scattered saw timber size hardwood trees that came up with the pine and are varying in form and vigor. Notably, yellow poplar is present, but several were noted to be suffering from drought stress. Currently, the 2 main stratums are very overstocked. The basal area is way off the Gingrich chart (see below). A planned harvest would reduce the stocking to a healthier mid B level (fully stocked). These plantings have served their purpose of stabilizing and rehabilitating old farm ground. If management emphasis is to convert the sites back to native hardwoods, then steps should be taken to systematically create the conditions to favor the competitive edge to oak being the main species in a future stand. This process may be started by thinning the pine stand, allowing sunlight to once again reach the forest floor, but provide partial shade to deter other likely competition to the oak. Yellow poplar would be the likely species to dominate if all of the pine was removed at one time. After thinning took place, the oak regeneration response should be evaluated about 5 years later. Plan another partial or total removal of the pine overstory, according to the level of success of the oak response observed. Some retention of a group or groups of these pines could be left to serve as thermal and nesting cover for various wildlife species, perhaps near the wildlife pond in the tract. There is a small residual stand of pine found near the eastern extreme of the tract. This stand is steadily deteriorating and could be removed when the tract is managed in a timber sale. The desired future condition of the pine cover type is to, over time, eliminate non-native pine from the tract in favor of native hardwood species, especially oaks. The exception to this is possible retention of small groups for wildlife benefit.

PINE
STOCKING CHART
Compartment 24, tract 6

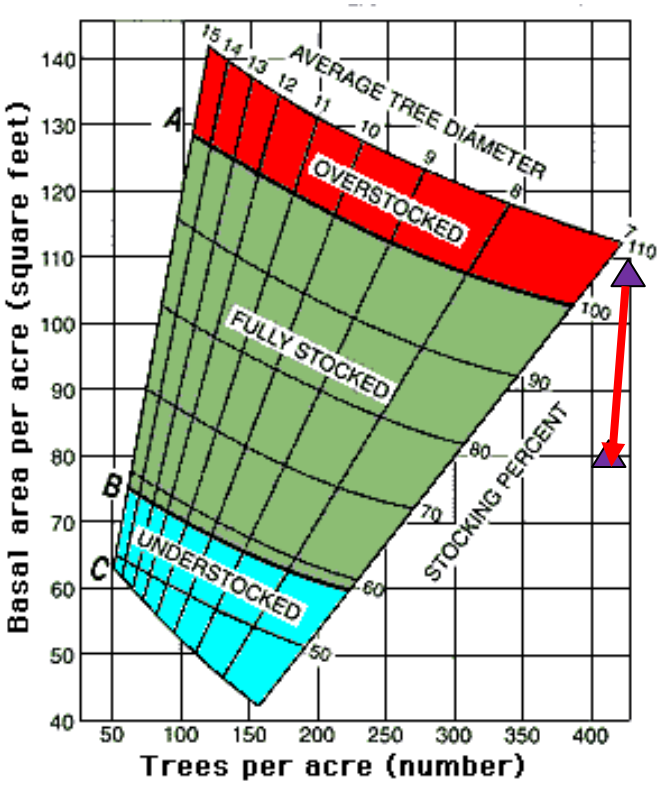



**Mixed Mesic Hardwoods (8.0 acres)** This stratum is located near the head of a north facing cove in the central part of the tract. This stratum differs from the old field mixed hardwoods stratum in that it exhibits none of the signs that it was formerly used for row cropping or open/semi-open pasture and, as a result, hosts much more productive and valuable timber. On hindsight, this stratum probably should have been separated from the old field mixed hardwood areas during inventory. See the stocking chart in that type's section, above. Stocking levels are high, average diameters are larger and tree heights are generally taller than the other areas of the tract. Additionally, there is more diversity in species composition than, say the oak hickory areas. This stratum exhibits need for management. Besides a high stocking level, there are signs that some of the trees are overmature and in decline. Particularly, yellow poplar is showing such signs, most likely aggravated by the series of droughts occurring here over the past 25 years. A harvest should concentrate on reducing stocking level and removing trees past their prime. The desired future condition of this stratum is a vigorous stratum of larger trees, contributing to the watershed protection and diversity of the tract.

**Dry Site Oak-Hickory (7.8 acres)** This type is located about mid slope on a westerly aspect near the eastern part of the tract. The timber in this type is mostly oak species with some hickories. Because of the aspect, the site is dry, almost to the point of being glade like. Tree stems are short and exhibit signs of slow growth. While there are some merchantable size trees in the type, there is little potential to produce quality timber. Minor amounts of trees could be removed during a harvest. The desired condition here is

to maintain a tree cover to contribute to watershed protection, provide mast and other wildlife habitat needs and produce limited amounts of timber.

DRY SITE OAK-HICKORY
STOCKING CHART
Compartment 24, tract 6




**Wildlife Opening (1.8 acres)** This opening was created in a ridge top area that had once been a farm field. Fish and Wildlife, Forest Wildlife section, performed the clearing work in the late 1980s. Primary objective was to improve habitat needs for brood production of the wild turkey. Permanent openings are minimal on the State Forest. Desired future condition is to maintain this opening as a permanent one for turkeys, and other species that may utilize it.

**Summary Tract Silvicultural Prescription and Proposed Activities**
A managed timber harvest should be prepared as soon as possible. This harvest would exercise several silvicultural techniques to provide an overall improvement to this fairly high potential tract. There is cause for sanitation work to pre-empt the losses of white ash trees due to the emerald ash borer by removing as many as possible. Sanitation selections would also remove sickly yellow poplar and black oak. Chestnut oak will also be evaluated and selections made to remove stressed and overmature stems, as well as salvaging blown down trees. Select other mature or overmature trees to regenerate areas or release retained crop trees by removing competing trees of lesser value. Favor single stem trees over multi stem trees where possible, particularly needed in the oak-hickory

stand described above. Create regeneration openings where groups of low stocked and/or low value trees are present. Such efforts would likely include old field areas that reverted to native hardwoods. The existing stands in these areas are generally poorly stocked with lower value species and the sites could provide more vigorous, better formed trees if given the chance. Remove pine during this operation in the stand at the southwest corner to provide a corridor that will serve as a main skid route to reach the hardwood stands beyond. Reduce stocking within that pine stand and the one at the southeast corner of the tract to stimulate growth of the advanced oak regeneration that remains. Follow up TSI should complete any regeneration openings, remove grape vine threats in desirable crop trees, and kill trees marked as cull that were not cut during harvest. It is important that whether before or after the harvest, but soon, the former pitch pine planting be treated to release the abundant advanced oak regeneration present. Kill ailanthus within the tract as soon as practical. If feasible, treat stilt grass in the immediate vicinity. Monitor j. honeysuckle through the upcoming years and treat forming vine mats.
Subsequent re-entry for management: This tract should be periodically checked for success and/or needs of the regeneration opening(s) about a year or two after creation and about every 4 years afterwards. Invasive efforts should be checked at the same time and follow up treatments done if needed. The next inventory and management plan should be done about 15 years after a harvest is completed

*Possible Impacts from Harvesting this Tract*
Soils-Proper adherence to the Indiana BMP standards, implemented for each timber sale on the state forest, will insure that soils will not be adversely impacted.
Hydrology-As described in the soils comment, proper use of BMPs will minimize effects to the hydrology related to this tract.
Wildlife-A harvest in tract 6 should not have long term adverse impacts to the wildlife using this area. Potentially, positive changes will be made that would benefit several species. A potential increase in snags, travel lanes created by skid trails, and increase in foraging habitat brought about by regeneration openings would be a benefit to the Indiana bat. The latter creation of early succession might invite use by cow birds, but this detriment should be offset by providing this otherwise lacking habit to a variety of species that use it, such as the yellow breasted chat and ruffed grouse. The flush of new growth that lasts a few years after a harvest would benefit white tail deer and other species that utilize such growth (notably black berry) for food and cover.
Recreation-The short term effect for this use would be that the horse trail would have to be closed during operations. There will be temporary visual impacts, due to the disturbance by harvesting. Over time, those impacts will disappear. Road improvements to better gain access will provide a side benefit of better drainage and tread for the trail and make more reliable access for any emergency needs to reach trail users.

**Proposed Activities Listing**

| *Proposed Management Activity* | *Proposed Date* |
|---|---|
| Establish property line | Winter 2013 |
| Oak regeneration release | Winter 2013 |

| | |
|---|---|
| Sell marked timber sale | Spring/summer 2013 |
| Ailanthus control | Late summer 2013 |
| Harvest | 2013-14 |
| Post harvest TSI | 2014-15 |
| Regeneration opening/invasive monitoring | 2017-2021 |
| Inventory/management plan | 2029 |

Harrison-Crawford State Forest
Compartment 24, Tract 6
February 2013

| | |
|---|---|
| Acres Commercial Forest: 176.4 | Basal Area ≥ 14 Inches DBH: 70.7 ft² |
| | Basal Area Cedar Sawtimber: 1.9 ft² |
| Noncommercial Forest: 0 | Basal Area < 14 Inches DBH: 44.2 ft² |
| Acres Permanent Openings: 1.8 | Basal Area Culls: 4.1 ft² |
| Acres Other:0 | Total Basal Area: 120.8sq.ft./ac. |
| Acres Total: 178.2 | Number Trees/Acre: 361 |

Stocking Level: A Level (Over stocked )
Calculated *Hardwood* Annual Growth: 266 bd.ft./acre/year

| SPECIES | LEAVE VOL. | HARVEST VOL. | TOTAL VOL BD.FT. |
|---|---|---|---|
| American beech | 3,220 | 00 | 3,220 |
| Black cherry | 00 | 4,930 | 4,930 |
| Black oak | 21,650 | 115,570 | 137,220 |
| Black walnut | 8,110 | 11,010 | 19,120 |
| Blackgum | 3,790 | 5,390 | 9,180 |
| Chestnut oak | 153,600 | 140,180 | 293,780 |
| Chinquapin oak | 1,800 | 00 | 1,800 |
| E. red cedar | 00 | 23,520 | 23,520 |
| Hackberry | 4,910 | 00 | 4,910 |
| N. red oak | 66,620 | 22,760 | 89,380 |
| Pignut hickory | 11,180 | 17,900 | 29,080 |
| Red maple | 00 | 1,660 | 1,660 |
| Scarlet oak | 2,550 | 17,280 | 19,830 |
| Shagbark hickory | 16,900 | 00 | 16,900 |
| Shortleaf pine | 23,490 | 16,670 | 40,160 |
| Shumard oak | 2,020 | 00 | 2,020 |
| Sugar maple | 18,070 | 10,310 | 28,380 |
| White ash | 8,650 | 43,560 | 52,210 |
| White oak | 367,340 | 83,210 | 450,550 |
| Yellow poplar | 63,170 | 137,890 | 201,060 |
| Totals | 777,070 | 651,840 | 1,428,910 |
| Totals/acre | 4,361 | 3,658 | 8,019 |

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http://www.in.gov/surveytool/public/survey.php?name=dnr_forestry

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.

Note: Some graphics may distort due to compression.