TM 902 Date: 7/22/2008

RESOURCE MANAGEMENT GUIDE

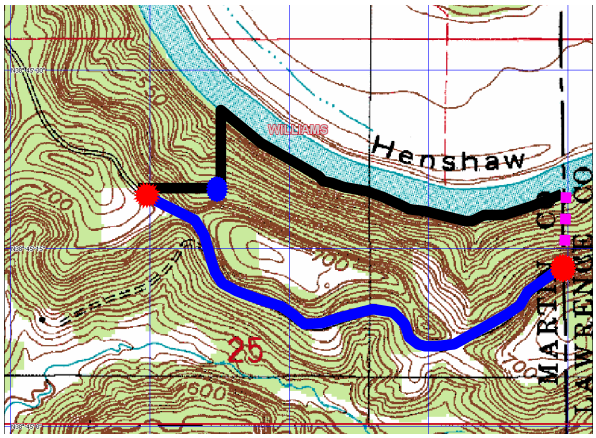
Henshaw Bend Nature Preserve

Compartment: 3	Tract: 1	Acreage: 71	
County: Martin	Section: 25	Township: 4N	Range: 3W

FORESTER'S NARRATIVE

By: Andrew S. Fox and Abe Bear

ROADS AND BOUNDARIES:



This tract only has two boundary lines that are clearly visible - the East Fork of the White River along most of the northern border and Williams Road to the south. Both the eastern and western boundaries are vague as there is nothing that clearly defines them, except for a couple of metal signs in the southern corners (red dots on map to the left). The sign found in the southeast corner of the tract was attached to a metal fence post that stood about two feet high just off of Williams Road, and was nearly illegible due to oxidation. The sign in the southwest corner of the tract was actually not found but the post that held it was. It is believed that a nearby tree that had blown down crushed the sign itself. Both of these signs should be replaced and marked more clearly.

From the post in the southwest corner the property line runs east for about 744 feet where another metal sign is supposed to be located (blue dot on map), but was not found during the inventory, most likely because of the dense understory growth. The line then turns north and runs to the White River, about 625 feet away. These two lines were not flagged at the time of the inventory due to the large amount of understory growth which made it nearly impossible to run a true line with the hand compass.

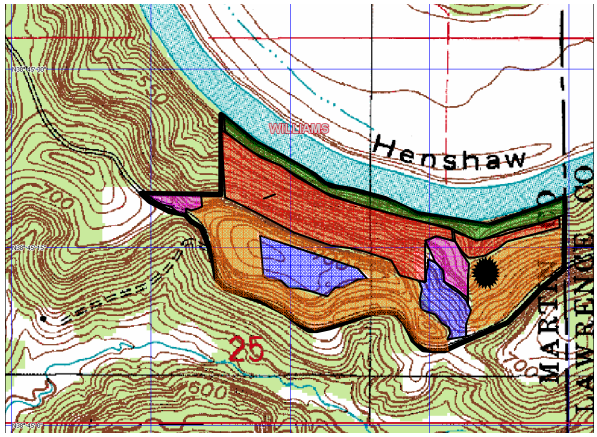
From the sign in the southeast corner of the tract a line was traversed and flagged pink (pink dotted line on map above) all the way to the White River which is about 610 feet to the north. The White River makes up the tracts northern border for roughly 3,145 feet between the western and eastern property lines.

Williams road, (Blue line on map above) which makes up the southern border of the tract, is a gravel road that is semi-frequently used. It is fairly narrow, but would still provide good access for recreation and forest management activities.

TRACT DESCRIPTION:

The topography and layout of this tract basically makes it into one north facing side slope that runs down to the white river. Williams Road runs parallel to, or on top of, the ridge that makes up this tract and as such the resulting aspects are mostly to the north. There are a few points where Williams Road runs just to the south, of the top of the ridge line, giving some southern aspects. There is an approximate drop in elevation of about 255 feet over about 750 of distance from Williams road north to the White River. From the top of the ridge to the Williams Road there is only a distance of about 220 feet at the longest point.

Grapevines were found in many parts of this track, with the highest concentrations being in the regenerated field sights. Asian/Amur (bush) honeysuckle was also found in many parts of the tract. No mature plants of the invasive were found but the plants present were spread across much of the tract, and could cause problems with natural stand growth in the future. One final thing that should be removed from the tract is a hunting stand (marked by black dot on map below) that has been placed on the property and is most likely still in use.



Another note that should be made this tract is the large amount of blow downs that were noticed on the tract. The top of the ridge in this tract seemed to be especially hard hit, as it appeared that there was just one long blow down along western edge of the ridge top. This may partially be due to the fact that the floodplain on the opposite site of the river is relatively clear due to agriculture, and as a result storm winds coming from the north are not slowed down any before they hit the ridge top of this tract.

Timber over most of the tract is in the medium to large saw log size class, with a couple of regenerating field sights that are dominated by medium sized pole trees. On the western half of the tract the understory was very thick and consisted mostly of pawpaw. The thick understory is due to an abundance of sun light from a timber harvest on the adjacent tract of private land, as well as from numerous large blow downs. On most of the eastern half of the tract the understory was sparse.

Overall, there was found to be an approximate volume of 443,090 Bd Ft of merchantable sawtimber. Of this volume the oak/hickory species made up 51% while the beech/maple and yellow-poplar species made up 11% and 24% of the volume.

During the inventory five different timber types was noticed throughout the tract. These timber types are shown on the map above and to the right, by color coding. They include a mature oak/hickory type (orange), an early successional hardwood mixture (blue), a mature bottomland mixture (green), a beech/maple component (Red), and a mature yellow-poplar component (pink).

The mature oak/hickory portion of the stand is located on the side slopes of the eastern half of the tract as well as the ridge top. Most of the trees in this timber type were in the medium to large saw log size class, and hold a total volume of about 202,760 Bd Ft. Of the volume in this timber type the oak/hickory species hold 52% of the total volume while the beech/maple and yellow-poplar species contain 5% and 22%. It was in much of this timber type that an understory and regeneration were absent.

The beech/maple component of the tract holds a volume of approximately 81,500 Bd Ft, almost all of which is again in the medium to large saw log size classes. Of the 81,500 Bd Ft that makes up this timber type the oak/hickory species makes up 31% of the volume while the beech/maple and yellow-poplar species made up 24% and 28%. The lower percentage of the beech/maple species than the others in this timber type is explained by a lower number of larger trees that maintained dominance over the other species.

The first of the hardwood mixture timber types is that of the early successional hardwoods. This timber type was found on the relatively wide flat benches and top of the ridge in this tract. Many of the species included in this mixture included sassafras, yellow-poplar, and black cherry. This timber type contained an approximate volume of 75,360 Bd Ft of which yellow-poplar was by far the largest component of with 61% of the volume. The oak/hickory species contained 21% of the volume. In many portions of this timber type canopy cover, though not very tall, was quite thick blocking nearly all regeneration.

The bottomland mixture timber type found on this tract was found near the shore of the White River. This timber type consisted of mature sycamore, basswood, black walnut, boxelder, hackberry, and

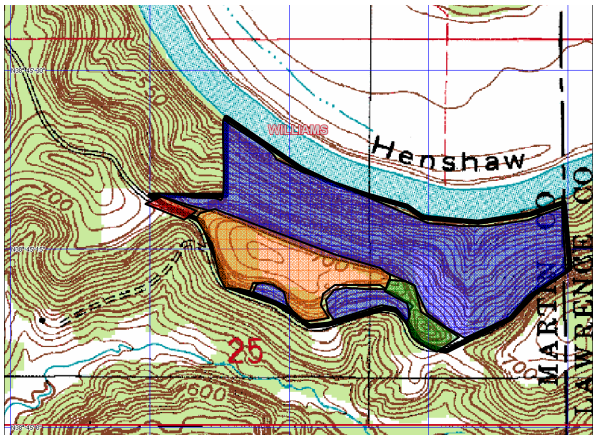
several other species. This timber type holds a volume of 47,650 Bd Ft. Again oak/hickory are the most abundant species of this timber type with 43% of the stand volume, but yellow-poplar holds 28% and surprisingly black walnut held 14% of the volume.

The final timber type that was noticed on this tract could probably be lumped in with the hardwood mixture timber type in all reality. On the other hand it while these areas probably have the same origin as the hardwood mixture timber type (i.e. regenerating farm field), the mature yellow-poplar type was more mature. It appeared that the yellow-poplars had been allowed more time to mature and therefore take over dominance in these stands.

SOILS:

There are four different soil types found on this tract of which the **Wellston-Berks-Gilpin complex, 18-70 percent slopes** comprises the most of the acreage(blue on the map below). Individual areas are usually about 47 percent Wellston soil, 25 percent Berks soil and 18 percent Gilpin soil, but the mix of soil types is so intricate that it's impractical to map them separately. These well-drained soils are found on most of the side slopes and are characteristically deep to moderately deep. The surface layer is typically silt or channery silt loam and the subsoil, which is roughly 36" deep, is silt loam (Wellston), channery silt loam (Gilpin) or channery loam (Berks). Available water capacity is very low in the Berks soil, low in the Gilpin soil and high in the Wellston soil. Permeability is moderate to moderately rapid, and surface runoff is rapid to very rapid. Organic matter content in the surface layer is moderate to moderately low. Erosion hazards are moderate to severe on these soils, but can be compensated for by using gentle grades for skid trails and by installing water bars and outsloping the roads to remove water. Site indices for these soils are 70 to 80 for Northern Red Oak and 90 to 95 for Yellow Poplar.

The smallest soil type **Zanesville silt loam, 6 to 12 percent slopes, eroded (ZaC2),**is found in the far west corner of the tract (red on the map) Zanesville is found on some ridgetops and upper side slopes. It is a moderately sloping, deep, well to moderately well drained soil. The surface layer is a five-inch thick layer of brown silt loam. The subsoil layer, about 39 inches thick, is friable silt loam over a silty clay loam. This is underlain by a silt loam fragipan, which restricts root penetration and downward water movement. This restriction to water movement often results in saturated soil conditions in the winter and spring. Available water capacity is moderate, and permeability is moderate above and slows within the fragipan. Surface runoff is rapid, requiring measures such as water turnouts and bars to properly remove water from roads and yards. The organic matter content is moderate in the surface layer. Erosion hazards and equipment limitations are slight for this soil; however, winter/spring logging may be restricted due to the saturated soil conditions. Site index for Northern Red Oak on this soil is fairly low at 68.



The third soil type found on this tract is the **Zanesville silt loam, 2 to 6 percent slopes** (orange on the map). It is a gently sloping, deep, well drained to moderately well drained soil found on the ridgetops. The surface layer is an eight-inch thick brown silt loam underlain by a roughly three-foot thick silty clay loam subsoil. A firm fragipan, which restricts root penetration, exists in the lower part of the subsoil. In some areas, the lower portion of the subsoil is extremely acid. Available water capacity is moderate and permeability is moderate above the fragipan and slow in the fragipan. This slow permeability restricts downward water movement through the soil and often results in the soil being saturated in the winter and spring. Surface runoff and organic matter content in the surface layer are moderate. Erosion hazards and equipment limitations are slight for this soil; however, winter/spring logging may be restricted due to the

saturated soil conditions. Site index for Northern Red Oak on this soil is fairly low at 68.

The final soil type found on the tract is **WeC2-Wellston silt loam, 6 to 12 percent slopes, eroded** (green on the map). This is moderately sloping, deep, well-drained soil found on some ridgetops and side slopes. The surface layer is typically a three to six-inch thick layer of grayish brown silt loam. The subsoil is around 42 inches and is a friable silt loam. Available water capacity is high and permeability is moderate. Surface runoff is rapid, requiring measures such as water turnouts and bars to properly remove water from roads and yards. The organic matter content is moderate in the surface layer. Erosion and equipment use hazards are slight on this soil. Site index is 71 for Northern Red Oak and 90 for Yellow Poplar.

HISTORY:

Two separate families owned this tract in the 1930's and sold the land to the United States Forest Service in the 1940's. James and Laura Marshal sold their farm to the USFS on August 19, 1940, and William and Katie Gerkin sold theirs on March 3, 1941. The United States Forest Service held on to the land for about thirty years. On October 29, 1968 a trade of lands between the USFS and the Indiana Division of Forestry included this tract.

Since the state obtained this tract only a few silvicultural activities have been preformed. In March of 1972 an inventory was conduct on the tract. The inventory reported an approximate merchantable volume of 184, 968 Bd Ft. This prompted a timber harvest which was conducted in 1974. The harvest included 246 trees with a total volume of approximately 74,620 Bd Ft which was sold to William N. Heckard for $8,954.40. In March of 1984, 235 hawthorn trees were planted around a permanent lag yard atop the ridge in the tract. In December of 1987, another inventory was conducted. This inventory showed there to be an approximate volume of 461,391 Bd Ft. The large increase in volume is partially due to a large increase in amount of commercial forest area. The second inventory also called for a timber harvest to be preformed in the year 1995. However, in 1995 the tract was designated as a Nature Preserve and all silvicultural activities ceased.

RECREATION AND WILDLIFE:

General Description

In compliance with the Nature Preserve status, the only form of recreation permitted is hiking. There is plenty of hiking to be done though. This tract offers some nice views of the East Fork of the White River, large mature trees, rock outcrops and some challenging elevation changes. Because of the elevation changes, depending on where you hike on this tract any level of hiking difficulty is possible.

Wildlife on this tract are abundant and numerous. Some of the species that were noted during the inventory are: white-tailed deer, wild turkey, eastern fox squirrel, numerous song birds, large birds of prey, and several others. It is assumed that many more animals inhabit this tract as well. One reason for this is the diversity of habitat available. Habitat types range from the dry ridge top/upslope, oak/hickory timber types to the mixture of bottomland hardwoods

The White River itself lends more wildlife diversity as several of the river's inhabitants also use the shores along this tract. Some of these species are considered threatened and endangered and are shown to have inhabited or have used the tract, according to a natural heritage database report. Some of the T&E species include the bald eagle, the lake sturgeon, Tippecanoe darter, and spotted darter along with others (map on file in property office).

Ecological Review and Specific Habitat Guidelines

The Indiana Division of Forestry Ecological Resource Review sets standards for the Number of snags of various size classes and the number of Indiana Bat Live Roost Trees per acre. These guidelines are compartment level standards. The results for C3T1 are listed below.

Live Roost Trees per Acre

Size Class	Actual Number	Recommended Number
≥ 11 inch	13.50	9
≥ 20 inch	2.76	3

Snags per Acre

Size Class	Actual Number	Maintenance Level	Optimal Level
≥ 5 inch	8.6	4	7
≥ 9 inch	3.9	3	6
≥ 20 inch	0.3	0.5	1

Deficiencies exist in live roost trees greater than 20 inches in diameter and snags greater than 20 inches in diameter. It is important to remember that these are compartment wide standards and we have only examined Tract 1 above. These deficiencies may be corrected when examining the entire compartment. In order to correct them on a stand level, it would be necessary to recruit trees of desired species into the ≥ 20 inch size class and to create snags by girdling selected trees. Due to the Nature Preserve status of this tract, no girdling will be done. It is expected that the live roost tree deficiency will be remedied as trees naturally grow.

WATERSHED:

The basic water flow off this tract is to the north off the main ridge that makes up this tract, and straight into the East Fork of the White River. There is a small portion along the very southern edge of the tract that flows to the south into a major drainage. This drainage flows east/southeast for about a quarter mile where it joins another large drainage to form an un-named creek. This creek then flows east for approximately three quarters of a mile where it empties into the White River.

SURROUNDING LANDSCAPE:

This parcel is part of a larger forested block. Martin State Forest includes several hundred acres of contiguous woodland to the south. The east and west sides are bordered by private woodland. On a larger scale, the landscape is generally forested, but contains smattering of agricultural fields used both as pasture and row crops.

TM 903 Date: 7/22/2008

RESOURCE MANAGEMENT GUIDE

Compartment: 3	Tract: 1	Acreage: 71	
County: Martin	Section: 25	Township: 4N	Range: 3W

SILVICULTURAL PRESCRIPTION

By: Andrew S. Fox and Abe Bear

(Describe silvicultural practices needed [if any] - harvest, TSI, tree planting, wildlife habitat, erosion control, natural regeneration, etc.)

Due to the Nature Preserve designation on this tract, the recommendations focus more on preservation than forest management. The most immediate need is the eradication of the invasive bush honeysuckle. Without attention, this will take over the understory and choke out any native plant regeneration. The honeysuckle should be controlled via a foliar application of 1-4% glyphosate based herbicide in late fall or early spring. These dates take advantage of the early bud break and late leaf drop of bush honeysuckle, allowing native and desirable plants to go unscathed.

Another priority is the posting of State Forest signs at the corners and along the boundaries. Currently the tract is poorly marked which may lead to unintentional trespass and deter would be recreational users.

To submit a comment on this document, click on the following link:
http://www.in.gov/surveytool/public/survey.php?name=dnr_forestry

You **must** indicate "Martin C3 T1" 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.

Indiana Division of Forestry Tract-level - Ecological Resource Review

Date of Review:	12-10-08		
State Forest:	Martin		
Forester:	Abe Bear		
Compartment:	3	**Township:**	4 N
Tract(s):	1	**Range:**	3 W
Total Acres:	71	**Section(s):**	25

1. Tract-level Habitat Overview

Using readily available resources (aerial photos, area maps, GIS, personal knowledge, etc.), estimate the proportion of each cover/habitat type within **1 mile** of tract center.

Habitat/cover type	0%	0 < 1%	1-10%	11-50%	51-90%	>90%	Unknown
Closed-canopy deciduous/mixed forest	☐	☐	☐	☒	☐	☐	☐
Pine/conifer plantations or natural stands	☐	☐	☒	☐	☐	☐	☐
Early successional forest (≤ 20 years old)	☐	☐	☒	☐	☐	☐	☐
Shrub-scrub or old field	☐	☐	☐	☐	☐	☐	☐
Grasslands/hayfield	☐	☐	☐	☐	☐	☐	☐
Cropland, pastures, feedlots	☐	☐	☐	☒	☐	☐	☐
Open water (lakes, ponds, rivers, streams, etc.)	☐	☐	☒	☐	☐	☐	☐
Riparian areas	☐	☐	☒	☐	☐	☐	☐
Developed areas	☐	☐	☐	☐	☐	☐	☐
Other:	☐	☐	☐	☐	☐	☐	☐

1.1. Consider whether the proposed management activities for the tract would significantly alter the relative proportion and availability of habitat/cover types throughout the assessment area. Consider both short- and long-term changes and conditions. Discuss in the tract Resource Management Guide the possible impacts on habitat/cover types that would be completely converted or significantly reduced due to the proposed management activities. Consult with DoF Forest Wildlife Specialist, if necessary.

1.2. Consider whether the proposed management activities would significantly disrupt travel/dispersal corridors or create isolated habitat units separated from larger units of similar habitat. This is especially important when species of special conservation need have been observed in the area and could be affected by such habitat fragmentation. If applicable, address these considerations in the Resource Management Guide, including short- and long-term impacts. Consult with DoF Forest Wildlife Specialist, if necessary.

1.3. Consider whether the proposed management activity will increase the likelihood that specialist interior forest species would be affected by generalist species using forest edge habitats. Where practical, avoid situations where the perimeter of proposed regeneration (or permanent) openings would be located within 200 feet of maintained forest edges. Maintained edges include those between forest and terrestrial habitats maintained to not naturally revert into forest, such as agricultural fields, developed areas, "daylighted" permanent roads, or maintained utility right-of-way corridors. **Consult with DoF Forest Wildlife Specialist if the proposed management activity will include one or more regeneration or permanent openings totaling ≥ 5 acres within 200 feet of maintained forest edges.**

1.4. Where applicable, discuss in Resource Management Guide compliance with guidelines regarding cover types affected by proposed activities, such as the use of Best Management Practices where open water and riparian areas occur.

2. Structural Habitat Features (Snags, Cavity Trees, and Roost Trees)

	YES	NO
2.1. Were structural habitat features included in tract inventory?	☒	☐
2.2. If done, did structural habitat feature inventories meet or exceed all compartment-level guidelines?	☐	☒
2.3. Are inventory summaries for structural habitat features included in this tract's management file?	☒	☐

If "no" is checked in any box above, provide an explanation in tract Resource Management Guide. If "no" is checked for **2.2**, consider if further tract-level management is necessary and address in tract Resource Management Guide.

3. Special Habitats

Are any special habitats present within or near tract? (check if 'yes')

- ☒ Permanent wetlands and pools (typically annual inundation; not including created "wildlife ponds")
- ☐ Seasonal/ephemeral wetlands and pools
- ☐ Wildlife ponds (created)
- ☐ Springs/seeps
- ☐ Sinkholes, caves, or other karst features
- ☐ Ledges, rock outcrops, cliffs, talus slopes
- ☐ Other:

For each special habitat present, refer to appropriate guidelines in DoF Procedure Manual and address management/planning considerations in the tract Resource Management Guide. If impacts are unavoidable, describe possible short- and long-term impacts and how these may be mitigated. Also, be sure to document the location of each special habitat.

4. IDNR Natural Heritage Database Review

	YES	NO
4.1. Was a Natural Heritage Database review done?	☒	☐
4.2. If a review was done, has there been recent (≤ 20 years) documented evidence of plant or animal species listed as endangered, special concern, threatened, or rare within or near this tract?	☒	☐
4.3. Are the results of the Natural Heritage Database search included in this tract's management file?	☒	☐

If "no" is checked for **4.1** or **4.3**, provide an explanation in tract Resource Management Guide. If "yes" is checked for **4.2** and species, habitats, or communities of special conservation need could be affected by management activities, address this in the Resource Management Guide in terms of possible short- and long-term impacts. Include how you will address the conservation for each of these species/habitats/communities while planning for management activities.

5. Non-native Invasive Species

In the table below, list all non-native invasive species that were observed during inventory or are known to exist within or near this tract. Consider level of management needed for each species, address management/monitoring in the tract Resource Management Guide, and map occurrences.

	Management Actions (check all that apply)			
Species	**Immediate Management Required**	**Monitoring/ Re-evaluation Recommended**	**Addressed in Management Guide?**	**Mapped?**
bush honeysuckle	☒	☐	☒	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐
	☐	☐	☐	☐

6. Other Species Or Sign Observed During Inventory:

Comments/Notes: