TM 903 Date: 6/24/2008

RESOURCE MANAGEMENT GUIDE

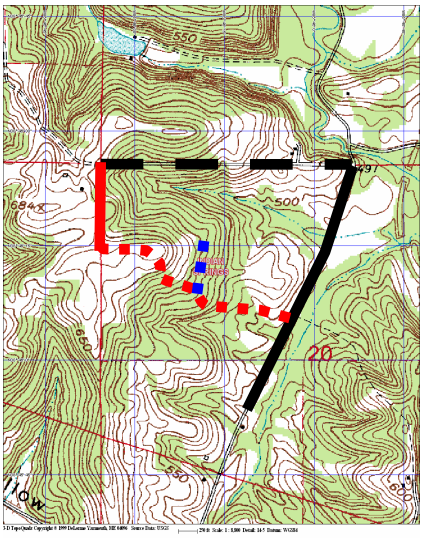
Compartment: 1 Tract: 1A Acreage: 110
County: Martin Section: 20 Township: 4N Range: 3W

FORESTER'S NARRATIVE

By: Andrew S Fox and Abe Bear

(Describe the area / timber / wildlife - Present stand, soils, regeneration potential, condition, timber types, private boundaries, forest protection, etc.)

ROADS AND BOUNDARIES:



Access to this tract is excellent due to the fact that it is bounded by county roads on two sides and a firelane makes up the southern border of the tract. Wadsworth Lane (indicated by the black dashed line on the map to the right) is a gravel road that is maintained by Martin County, and makes up the northern border to this tract. Wadsworth Lane intersects with Indiana Springs Road (solid black line on map) to make up the northeastern corner of the track. Indian Springs Road is a well maintained paved county highway that runs along the eastern border of this and the adjoining tract to the south (C1T1B). Firelane 1C (red dashed line on map) forms the southern boundary of the tract as it extends west/northwest from Indian Springs Road. It dead ends at a fence line on the western edge of the tract. The fence line (solid red line on map) that intersects with firelane 1C makes up the western border of the tract as it runs north and south. The fence line is relatively easy to identify as there is a private agricultural field that borders the state property to the west. In addition, old bits of fencing (which were flagged pink at the time of inventory) were found in mature trees along the line. Evidence of where firelane 1C ran all the way to the northwest corner of the tract is still visible along the fence line as well. Another firelane (blue dashed line on map above) was found extending north from firelane 1C for about 1,000 feet before dead-ending in the tract. Most likely this second firelane was originally used as a logging skid trail or haul road and has been kept up since.

TRACT DESCRIPTION:

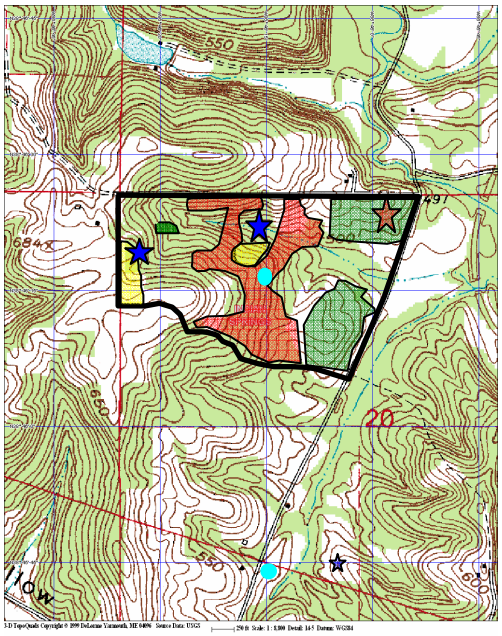
There was not much of special merit found on this tract except for a couple of items. In the northeast corner of the tract what appeared to be a very shallow wildlife pond approximately 1/20 of an acre in size was noticed. No mention of this pond was found in any previous inventory or harvest records, which may suggest the possibility of a sink hole, but is unlikely.

Some down cutting of drainages was noticed at the time of inventory which raised some concern. The most affected drainages were atop the ridge which parallels the western border, and one or two along the northern border where culverts pass under Wadsworth Lane. The down cutting of the drainages is more than likely the result of excessive runoff from agricultural fields adjoining the tract to the west, and lack of up keep of the culverts. It would be wise to install some erosion control measures in these areas to

prevent further erosion damage.

Grapevines were noticed throughout the tract. In areas near regeneration openings and blow downs, they were growing excessively and impeding growth of desirable trees. Before any future harvest, grapevine TSI should be conducted in order to reduce mortality as well as to improve stand vigor and quality. Fire damage was only noticed in a couple of areas, but seemed to be light, as severely damaged trees were removed in previous harvests.

Invasive plants are a major problem on this tract, especially in regeneration openings. Some of the invasive species noticed on the tract were autumn (Russian) olive, Asian bush honeysuckle and Japanese vine honeysuckle. The major infestations of these plants are found along the eastern border of the tract near Indian Springs Rd, with some of them occurring as far as 1,000 feet from the road side. There is a regeneration opening about 2-5 acres in sizes that runs parallel to the road and is being choked with the invasives. Some of the autumn olive bushes found here are over 10 feet tall. TSI to remove the infestations could be conducted in conjunction with grapevine TSI projects.



Timber on the tract appeared to be in one of two stages, either mature saw-timber with heavy shade tolerant regeneration in the understory, or that of young sapling to pole size classes. Over all in the tract there was found to be a volume of 149,200 bd. ft. in harvest stock and 366,400 growing stock for a total volume of 515,600 bd. ft. (4,687 per acre). Of this the oak/hickory species made up 47% of the total volume, while the yellow-poplar, pine, and beech/maple types contained 35%, 6%, 6% of the total volume. Of the pole size class pine and oak/hickory types are the most prevalent at 24% and 14% of the pole sized volume. Yellow-poplar as a single species also seemed to be a major component of the pole size class having 8% of the volume.

There are at least four general timber types/components noticed on this tract, of which several could probably be broken down into many, more specific types. The four types include an oak/hickory component (shown in red on the map above), some pine plantations (shown as green), a yellow-poplar component (shown as yellow), and finally a hardwood mixture (non-shaded areas).

The oak/hickory type was found mostly along the side-slopes of the ridges in the tract. Within this component of the tract most of the timber was in the mature to overly mature state with several pockets of mortality occurring. It was often noticed during the inventory that a strong Paw-paw component was growing underneath the dominant oak/hickory timber. The Paw-paw was usually dense enough to severely restrict any other reproduction and as such an understory TSI operation 5-7 years prior to any harvest is advisable in order to try and establish desirable regeneration.

The pine plantations on this tract consisted of a mix of several different species including red pine, Virginia pine and Scotch pine. Most of these stands have become stagnant in the pole size class and have experienced major blow own damage in the past couple of years as result. Some of these blow downs are upwards of 2.5 acres in size and have become natural regeneration openings. These areas could use a TSI operation to establish crop trees and help control the grapevine and invasive species that are now established.

The yellow-poplar component has become established in some old regeneration openings and in

abandoned agricultural sites. As the poplar has matured, other species such as maple and ash have begun to find their place into the canopy.

The final timber type, the hardwood mixture, is mostly comprised of early successional tree species found in or around old agricultural sites, regeneration openings, or large blow downs. One opening along the eastern portion of the tract (marked by a red star on the map above) was about 2.5-5 acres in size, and showed promising signs of abundant black walnut regeneration. Many of these openings are in dire need of TSI to not only establish/release crop trees but to also control invasive plant species. The other regeneration openings, or at least what appeared to be, are indicated on the map above by blue stars.

SOILS: (Soil maps on file in the Property office).

There are six different soil types found on this tract. **Wellston-Berks-Gilpin complex, 18-70 percent slopes** comprises the most acreage**.** 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 second most common soil type found on this tract is the **WeC2-Wellston silt loam, 6 to 12 percent slopes, eroded.** This is a 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.

The next thee soil types comprise about the same acreage and are all found relativity close together in the flood plain along Indian springs road. The first of these soil types is the **Zanesville silt loam, 2 to 6 percent slopes.** 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 is medium. Organic matter content in the surface layer is 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 next soil type, **Wakeland silt loam, frequently flooded**, is a nearly level, deep, somewhat poorly drained soil on floodplains. It is flooded for brief periods. Available water capacity is high and permeability is moderate. Surface runoff is slow, and organic matter content is moderate in the surface layer.

Next, we have **Birds Silt Loam (Bk), Frequently Flooded**. This nearly level, deep, poorly

drained soil is on broad bottom land. It is flooded for long periods of time and is subject to ponding. The surface layer is dark grayish brown, mottled silt layer about six inches thick. The underlying material to a depth of 60 inches is gray and light brownish gray, mottled and friable silt loam. In a few areas the soil has less clay between depths of 10 and 40 inches. Available water capacity is high, while permeability is moderately slow. Surface runoff is slow. During the winter and spring months the water table is often near or above surface, making logging operations difficult if not impossible. The erosion hazards for this soil type are slight, due to the frequent ponding and flooding. The woodland orientation symbol for this soil is 5W, and the site index for Pin Oak is around 90.

Found along the east side of the tract in the flood plain along Indian Springs Rd., is **Markland Silt Loam, 1 to 5 percent slopes**. This nearly level and gently sloping, deep, moderately well drained soil is on the lacustrine terraces. Typically the subsurface is brown silty loam about 5 inches thick. The subsoil is about 30 inches thick it is yellowish brown, very firm clay and silty clay. The underlying material to a depth of 60 inches is light yellowish brown silty clay loam that has thin strata of silt in the loam. The available water capacity is moderate with slow permeability. Surface run off is medium, while the organic matter content is moderate in the surface layer. The woodland orientation symbol for this soil type is 4C while the site index for White Oak is 75. Logging operations are acceptable with best management practices as the erosion classification for this soil is slight, and the water table in the winter and spring months is 3-6 feet below the surface.

The final soil type found on this tract is **Zanesville silt loam, 6 to 12 percent slopes, eroded (ZaC2).** This 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 but 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.

There are one or two other soil types found on this tract but they are so small in size that it is impractical to map them at this time.

(Info obtained from USGS Soil Survey Of Martin County, IN, 1988)

HISTORY:

This tract was obtained by the state of Indiana in the late 1960's from the United States Forest Service, as part of a transfer of lands between the two entities. The United States Forest Service Obtained the land from Alves and Winifred Kreitzer in 1942. At the time of the transfer from the United States Forest Service this tract was managed in a unified manor with what is now C1T1B. When combined, the two totaled approximately 168 acres.

It appears that an inventory of the unified tract was conduct in August of 1979. At the time of inventory there was approximately 2,335 Bd Ft. /acre of volume and a basal area of 85.71 sq. ft. per acre.

The unified tract was split into its current designations of C1T1A and C1T1B on June 11, 1985. The dividing line of the two sub-tracts is the firelane (1C) that runs east and west through the larger unified tract. C1T1A then consisted of approximately 110 acres, leaving 58 acres to C1T1B.

In 1985 forester Jim Lauck conducted an inventory of C1T1A, in which there was found to be around 324,967 Bd. Ft. total volume. Lauck recommended an improvement harvest be conducted to remove damaged and over mature stems. In April of 1989, 505 trees were sold for a sum of $27,586.00 to Estin-Martin Logging. In conjunction with this harvest several openings were made for regeneration

purposes.

RECREATION AND WILDLIFE:

The accessibility to this tract is a great asset for those that are looking for recreation activities on this tract. Unfortunately the only forms of recreation available on this tract are hiking and hunting. The hiking can be tough at times though, with the large amount of brush/thorny underbrush throughout much of the tract. Hunting, on the other hand, should be quite enjoyable. The several different habitat types provide for many popular game species.

As noted above the variety of habitat types such as oak/hickory forests and pine plantation blowdowns on this tract make it ideal for a diverse array of wildlife species. Some of the wildlife noted at the time of the inventory were red-tailed hawk, crows, white-tailed deer, wild turkey, eastern box turtles, and many species of song birds. While these were the species directly observed, it is very likely that this tract is also used by striped skunks, raccoons, opossums, many squirrels, reptiles including snakes and salamanders and many, many others. An inquiry was submitted to the Natural Heritage Database to determine whether or not there was a presence of threatened or endangered plant or wildlife species present on the tract, the results of which came back negative (map on file in property office).

In February of 2000 an application to install a wildlife opening along with a wildlife pond along the western edge of the tract was approved, but due to staffing changes in the Division of Fish and Wildlife, neither project was implemented.

WATERSHED:

The dominant flow of this tract is to the east, but all slope aspects, except to the west, are present. The northern and southern borders of this tract run along two finger ridges that extend east from a large flat ridge that parallels the western border of the tract. A large gully has formed between the two finger ridges, which carries water from this tract off to the east. Towards the eastern border of the tract the gully widens and forms a sizable flood plain as it nears a large drainage just east of the tract. Water from this tract flows east for a little more than a quarter mile after leaving this tract, at which point it empties into Sulfur Creek. Sulfur Creek flows south for approximately four tenths of a mile where it empties into Indian Creek. Indian Creek flows south/southwest for a several miles until it dumps into the East Fork of the White River, which is the major watershed for the region.

SURROUNDING LANDSCAPE:

The area surrounding this parcel is a mix of forest and agriculture land. NSWC Crane, which is heavily wooded, is approximately 1 mile west of the tract. The area between this tract and CRANE is mostly wooded making this part of a much larger block of forestland. The land south and east of the tract is roughly equally forest and small agricultural fields.

Compartment: 1	**Tract: 1a**	**Stand: 4 (Oak/Hickory)**	**N Red Oak 70; Yellow-poplar 89**
County: Martin	**Section: 20**	**Township: 4N**	**Range: 3W**

Comercial Forest	56	**Average Site Index**	
Non-commercial Forest	0	**Average Annual Growth**	
Recreational Use	0	**Total Basal Area**	118
Permanit Openings	0	**B.A.-Trees > 14"**	56
Other Openings	0	**B.A.-Trees < 14"**	62
Total Acres	56		

Species	**Saw Timber Harvest**	**Saw Timber Leave**	**Saw timber Total**
Yellow-poplar	36,600	56,000	92,600
White Oak	12,100	41,800	53,900
Black Oak	16,600	36,700	53,300
Northern Red Oak	8,600	29,400	38,000
Pignut Hickory	13,400	16,700	30,100
Shagbark Hickory	3,300	11,900	15,200
Sugar Maple	6,700	5,800	12,500
Scarlet Oak	6,700	2,100	8,800
White Ash	-	5,100	5,100
Black Walnut	-	4,300	4,300
American Beech	-	2,700	2,700
Red Maple	1,800	-	1,800
Totals (tract)	105,800	212,500	318,300
Total (per acre)	1,889	3,795	5,684
Percent Oak/Hickory	57%	65%	63%
Percent Beech/Maple	8%	4%	5%
Percent Yellow-poplar	35%	26%	29%

Indiana Division of Forestry
Forest Resource Management
Wildlife Review Checklist – Revised May 2007

Date of Review:	June, 2008		
State Forest:	Martin State Forest		
Inspected By:	Andrew Fox		
Compartment:	1	**Township:**	4 North
Tract(s):	1A	**Range:**	3 West
Total Acres:	110	**Section(s):**	20

1. Does the Natural Heritage Database identify any Endangered, Threatened or Rare species or "significant areas" documented from this tract or nearby?

   Bobcat observations have been made within ¼ mile of the tract. While bobcat could be present on this tract that's not likely given the tract's topography.

2. Describe the vegetative cover/land use matrix within a 2.5 mile radius of this tract:

   a. A majority of the land within the matrix area is __ publicly owned, X privately owned. (mark one)

   b. Which of the following land cover types are present in the matrix area (mark all that can be easily identified as present from aerial photos, use two marks to identify the most prevalent type)?

      _XX_ Closed-canopy forest
      _X__ Brushy/early successional areas
      _X__ Open fields
      _X__ Open water
      _X__ Developed areas

   C. Does tract contain any habitat/habitat type, which is otherwise missing or poorly represented within the 2.5 mile radius matrix area? Yes/No

   No

   If yes, explain:

   D. Has the land use pattern within the matrix area shown obvious significant change within the last 15 years? Yes/No

   No

   If yes, explain:

3. Have there been documented sightings or other evidence of current or recent past (20 years) occurrences of rare, threatened or endangered species within this tract?

No

4. List the expected short term (<5 years) and long term (>5 years) effects the proposed forest resource management activities will have on the following habitat types within this tract:

   A. Closed canopy forest

      Short term: Minimal effect on closed canopy forest over most of the tract. In regeneration openings the effect will be significant.

      Long term: No long term effect on the majority of the tract. Effect on regeneration openings will be significant for ~20 years.

   B. Understory woody vegetation

      Short term: There will be a short term increase in ambient light in the understory where single-tree selection is practiced. This will lead to short term increased growth rates for the understory woody vegetation. In regeneration openings this effect will be substantial.

      Long term: Long term effects will only be seen in the openings, where the understory vegetation will continue to grow at a much faster growth rate.

   C. Herbaceous vegetation

      Short term: Depending on how much the canopy was opened, both growth rates and density of vegetation could increase. Greatest impact will be in regeneration openings, where growth rates, density and species composition could change significantly.

      Long term: No long term effect over most of the tract. Significant effect in openings will last until canopy closure.

   D. Streams, Lakes and Ponds

      Short term: Very little sedimentation may occur in ephemeral drainage crossings.

      Long term: None

   E. Subterranean None

5. List any conditions that would suggest that the management proposal for this tract would require further evaluation by any additional wildlife management specialists?

   N/A

6. Were any additions, changes or amendments made to the proposed forest resource management activities specifically to enhance or protect wildlife populations or wildlife habitat?

   No

If yes, explain:

Additional Comments:

Evidence of the following species were either observed or heard during the field review of tract(s):
Deer, frogs, turtles, squirrels, etc.

References cited: Natural Heritage Database

ADDENDUM TO ADDRESS INDIANA BAT MANAGEMENT STRATEGY

(Discuss any adjustments to management activities that are needed to comply with guidelines.)

GUIDELINES--

- *3 live trees per acre 20+ inches DBH and (an additional) 6 live trees per acre 11+ inches DBH (of species with desired characteristics.(i.e. – shagbark, shellbark and bitternut hickory, black, green and white ash, shingle, post, white and northern red oak, slippery and American elm, black locust, eastern cottonwood, silver maple and sassafras).*
- *5 snags per acre 9+ inches DBH and (an additional) 1 snag per acre 19+ inches DBH.*

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 C7T3 are listed below.

Live Roost Trees per Acre

Size Class	Actual Number	Recommended Number
≥ 11 inch	9.3	9
≥ 20 inch	1.7	3

Snags per Acre

Size Class	Actual Number	Maintenance Level	Optimal Level
≥ 5 inch	3.4	4	7
≥ 9 inch	1.5	3	6
≥ 20 inch	0.1	0.5	1

Based on the tract inventory, a deficiency of 1.3 trees per acre exists in live roost trees ≥ 20 inches dbh. A portion of this deficiency (.3 trees per acre) can be corrected by leaving 20 inch and greater cull trees. The remainder of the deficiency could be corrected by marking one fewer of the preferred trees per acre in the 20 inch and greater class. A deficiency also exists in the snag product group. This deficiency will most likely be made up through the TSI work done both before and after a harvest.

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.)

The most pressing silvicultural measure to be taken on this tract is the TSI and crop tree release of regeneration areas and blow downs. At the same time of this operation a grapevine and invasive species control operation should be conducted. Undesired stems, vines and invasives (mostly bush honeysuckle and autumn olive) should be cut and/or treated with an herbicide to prevent sprouting. This project should be completed prior to any harvesting that would increase light levels and spur increased growth of vines and invasives.

A timber harvest should be scheduled for the next 5-7 years, in conjunction with a harvest on adjacent tract 1b. The harvest should target the overly mature trees on the tract as well as those of poor quality and low vigor. In the areas of mortality and/or blowdown, regeneration openings should be considered. A post harvest TSI operation should be conducted after the harvest is completed in order to help insure the establishment of desired regeneration. Also after the harvest is completed any at-risk log yards and skid trails should be planted to native grass mixtures that will help control erosion.

If scheduling allows, the tract should be assessed for possible shelterwood treatment in any mature oak-hickory stands. This assessment should occur at least five years before harvest and would seek to find stands with advanced oak regeneration present. Treatment would consist of understory/midstory removal, primarily by chemical control; and to a lesser extent, girdling of unwanted or competing trees in larger size classes. Prescribed fire may also be used to help control unwanted species in these areas.

A final matter that should be considered is the installation of erosion control practices to prevent further down cutting of the drainages by runoff from adjoining agricultural fields to the west. One possibility for such control would be the use of rip-rap to slow the velocity of the runoff.

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

You **must** indicate "Martin C1 T1A " 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.