RESOURCE MANAGEMENT GUIDE
Ferdinand State Forest Compartment 3, Tract 4
October, 2008

Location

Compartment 3 Tract 4 is located in Dubois County in parts of Section 3 and 4 Township 3 south, Range 3 west. It is located approximately 3 miles southwest of Birdseye.

General Description

Tract 4 consists of 76.6 acres. It has a range of cover types from open areas, edge, mixed pine, and hardwoods. There is also a small wildlife pond in the center of the tract.

History

The Division of Forestry acquired this tract in 1943 from the Chervenak family. This area was most likely open and farmed pre-1950.

The area was planted with pine in the early 1950's. Species ranged from eastern white pine, red pine, shortleaf pine, pitch pine, and Virginia pine. There are no official planting records available.

The tract was cruised in 1982. The average BA was 97.27 with 139.4 MBF on site. 76.5 MBF contained in eastern white pine, 24.4 MBF in red pine, 18 MBF in shortleaf pine, and 14.3 MBF in yellow popular. A thinning was recommended either to accelerate the transition to hardwoods or to determine if the area was best suited for eastern white pine.

In 1983 24.1 MBF in 492 (491 white pine and 1 yellow poplar) trees were sold to Leroy Lewis. This area covered about 4.5 acres south of the firelane. The stumps of the harvest were treated later that year. During logging operations the tract and surrounding area was damaged by a severe windstorm.

In 1987, a second harvest occurred north of the road. Kenny Jackson harvested approximately 40 MBF in 490 eastern white pine trees. This area covered about 3.2 acres north of the firelane. In March of 1988, the harvest area was then burned in preparation for oak planting. Twenty-two hundred red oaks (*Quercus rubra*) were planted on the harvest site in April of 1988. This was followed up with TSI in 1999 to control competing vegetation and vines.

In 2001, 20 acres of pine were harvested north of firelane 12. The sale had 58 MBF in 588 trees. The majority of sale was shortleaf pine with 37 MBF in 263 trees.

In 2003, the area received post-harvest TSI. Two regeneration openings were created. In addition, vine control and thinning was performed to reduce undesirable species.

Finally in 2004 the area received some spot herbicide treatment in the harvest opening to control exotic species like vine honeysuckle.

Landscape Context
This tract is bordered on the west by adjacent tracts of the Ferdinand State Forest. Both public and private land surrounds the area around the tract. Agriculture also has a strong presence in this area. There are an increasing number of residential areas popping up across the landscape. This trend will only increase with time.

Topography, Geology and Hydrology
The slopes on the tract range from gentle to steep. There is a ridge top that runs east-west along the center of the tract with fingers meeting the north-south boundaries. The underlying geology of this area is most likely sandstone or siltstone

There are a number of ephemeral drainages in the low-lying areas of the tract. There is also a small wildlife pond located just north of the firelane in the center of the tract.

Soils
Zanesville Silt Loam (ZnC2) is the most dominant soil on the tract and is found on 36 acres on tract. It has 6 to 12 percent slopes. This moderately sloping soil is deep and well drained. It is on ridgetops and upper parts of side slopes along natural drainageways. This soil has moderate available water capacity and is slowly permeable. Surface runoff is medium. The surface layer has moderate organic matter content and is friable. Depth to a seasonal high water table ranges from 2 to 3 feet during the months of December through April. A very firm and brittle fragipan at 24 to 32 inches, restricts the downward movement of roots. The soil is in capability subclass IIIe and woodland suitability subclass 3o and a site index of 68 for northern red oak. It has only slight management concerns in terms of erosion, equipment limitations, seedling mortality, and windthrow.

Gilpin Silt Loam (GlD2) is found on 15 acres of the tract. It has 12 to 18% eroded slopes. This strongly sloping soil is moderately deep and well drained. It is found on side slopes along drainage ways and hillsides. It is ranked as moderate as erosion hazards and equipment limitations and slight with seedling mortality and windthrow. This soil has low available water capacity and is moderately permeable. Surface runoff is rapid. The surface layer has moderate organic matter content and is friable. The soil is in capability subclass IVe and woodland suitability subclass of 2r and a site index of 80 for northern red oak.

Gilpin Silt Loam (GlD3) is a severely eroded soil that is found on 14 acres of the tract. This strongly sloping soil is moderately deep and well drained. The soil is on uplands. It is on 12-18% side slopes along drainage ways. Rock outcrops are in some areas. Inclusions of other soils make up about 15-20 percent of the soil. The soil has a low available water capacity and is moderately permeable. Surface runoff is very rapid. The surface layer has low organic matter content and is friable. This soil is in capability subclass of VIe, a woodland suitability subclass of 2r and a site index of 80 for northern red oak. This soil has moderate limitations with both erosion and equipment and only slight with seedling mortality and windthrow.

Wellston Silt Loam (WeC2) is a moderately sloping soil that is found on 5 acres of the tract. It is deep and well drained with 6 to 12 percent slopes. This soil is on narrow ridgetops and sideslopes along drainageways. This soil has high available water capacity and is moderately permeable. Surface runoff is medium. The surface layer has moderate organic matter content and is friable and easily tilled. The soil is in capability subclass of IIIe, woodland suitability subclass of 2o and a site index of 71 for northern red oak. Wellston has only slight hazard with erosion, equipment limitation, seedling mortality, and windthrow.

Tilsit Silt Loam (TlB) is a gently sloping soil that is found on 4 acres of the tract. It is deep and moderately well drained with 2 to 6 percent slopes. This soil is on ridgetops and on the uplands. This soil has moderate available water capacity and is slowly permeable. Surface runoff is medium. The surface layer has moderate organic matter content and is friable and easily tilled. Depth to a seasonal high water table ranges from 1.5 to 2.5 feet during the months of January to April. A very firm and brittle fragipan at a depth of 20-28 inches, restricts the downward movement of roots. The soil is in capability subclass of IIe, a woodland suitability subclass of 3o, and a site index of 70 for northern red oak. Tilsit has only slight hazard with erosion, equipment limitation, seedling mortality, and windthrow.

Gilpin Silt Loam (GlE) is a moderately steep soil found on 2 acres of the tract. It is moderately deep and well drained with 18 to 25 percent slopes. This soil is on uplands. It is on hillsides and sharp breaks along drainageways. Inclusions of other soils make up 10-12 percent of the soil and can include rock outcrops. The soil has low available water capacity and is moderately permeable. Surface runoff is rapid. The surface layer has moderate organic matter content and is friable. The soil is in capability subclass Vle , a woodland suitability subclass of 2r and a site index of 80 for northern red oak. This soil has moderate limitations with both erosion and equipment and only slight with seedling mortality and windthrow.

Gilpin-Berks complex, (GoF) is a moderately steep soil found on 1 acres of the tract. This soil consists of moderately steep to very steep Gilpin and Berks soils that are moderately deep and well drained with 20-50% slopes. These soils are on hillsides and are in the uplands. This soil is rated as severe for both erosion hazards and equipment limitations and only slight for seedling mortality and windthrow. Individual areas of this soil are 50 percent Gilpin soils and about 35 percent Berks soils. The soils in this unit have low available water capacity and are moderately permeable. Surface runoff is very rapid. The surface layer has moderate organic matter content and is friable. The complex is in capability subclass of Vlle, while the Gilpin part is in woodland suitability subclass 2r and the Berks part is in woodland suitability subclass of 3f. The complex has a site index of 80 for northern red oak.

Access

The access to this tract is very good. A county road runs along side the eastern border. Firelane 12 runs east west through the center of the tract.

Boundary
The tract is partially bordered on the east by a county road. The northern section of the east boundary is a private residence. The property line in this area has no visible evidence. The southern border on the property has remnants of fencing and is bordered by a privately owned agricultural field. The southwest corner follows a natural drainage along the western boundary to the southwest corner. The western boundary borders adjacent tracts of the state forest. Privately owned woodland and agricultural fields border the north boundary. There are remnants of a barbed wire fence along this boundary.

Wildlife
A Natural Heritage Database search was conducted and any management activities will take those species and their habitat requirements into consideration.

The tract provides a number of suitable habitats for a variety of different animals. Animals such as turkey, deer, squirrels, songbirds, raccoons, lizards, and frogs were observed on the tract. The tract contains closed canopy forest, pine stands, water features, and edge habitat from the recent harvests. The drainages provide habitats for various amphibians and reptiles. Finally, the wildlife pond in the center of the tract provides a stable water source for the wildlife occupying the tract.

In terms of Indiana Bat Habitat, 689.4 live trees of desired species with a DBH of 11"+ are recommended. There are presently only 140 inventoried leaving the tract with a deficit of 550. 229.8 live trees with a 20+" DBH are recommend, there are currently only 4 of these trees inventoried. There is a deficit of 226 trees of desired species.

As far as for snags, 459.6 of 9+" DBH trees are recommended. Currently 323 are present with a deficit of 137. In the 19+" DBH, 76.6 trees are recommended for tract. There are currently only 13 of desired species.

The low level of desired species in both live and standing dead trees is a concern. The primary cause of this deficit is due to the fact the much of the tract is either mixed pine or the beginning stages of hardwoods. Any regeneration efforts on the tract should be directed toward desired species. Furthermore, snag creation should be considered in the future as these species mature.

Cultural Features
Cultural resources may be present on the tract but their location is protected. Adverse impacts to significant cultural resources will be avoided during any management or construction projects.

Communities
The Natural Heritage Databases did not identify any rare, threatened or endangered plants or plant communities on or nearby the tract. There were several exotics noted on the tract including vine honeysuckle, multi flora rose, and Japanese stilt grass. Grapevine, which

can be damaging to crop trees, was observed. Pockets of Japanese Stilt grass were found in patches along firelane 12. A vine TSI would be very beneficial for the tract. Exotics, predominantly vine honeysuckle were the most extreme in the recent pine sale areas. It is questionable if mechanical or chemical treatment would be successful in these areas.

Recreation
There are no developed recreational facilities within tract. The tract is bisected by firelane 12. The firelane is closed to both ATV's and horses but is open to foot traffic. The primary use of the tract is hunting. There are several deer stands located inside of the tract. Hikers may also use the area, as the firelane connect the tract to several other tracts owned by the state forest.

Tract Subdivision Description and Silvicultural Prescription

Overall
Across the 76.6 acres on the tract, there were 422,390 bf with an average BA of 76.2. This averages to be about 5,514 bf/ac. Out of that, 295,110 bf were tallied as harvest and 121,360 bf as leave. The tract is just over the B line with about a 68% stocking level.

Mixed Hardwood
About 35 acres of the tract is composed of mixed hardwoods. There are about 4,146 bf/ac. The average BA is 66.8 with the average DBH of 7.6". It is currently about 63% stocked. Both Yellow Popular and Red Maple are the most dominant trees and make up about 23% each of the total composition. It is likely that many of these stands will grade into yellow popular as time progresses.

One area of special concern on the tract is the oak plantation on the west end of the tract. Invasive exotics and competing species have repopulated the area. Revisiting the area for TSI would be very beneficial.

Pine
About 35 acres of the tract is composed of pine. There are about 7,495 bf /ac. The average BA is 91.9 and the average DBH is 8.0". It is approximately 82% stocked. The pine subdivision is a mixture of eastern white pine, red pine, Virginia pine, short leaf pine, and loblolly pine. The area has been subjected to several windstorms, which have taken a heavy toll on the pine. The eastern white pine makes up about 60% of the volume and is the best in terms of quality, despite having patches of white pine tip weevil damage. In 1996, much of the Virginia pine was lost to wind throw. A sale on the northern half of the tract has accelerated the pines transition to hardwoods, whereas the southern half has only received a light thinning and has a greater build up of large fuel complexes from windthrow.

The pine stands that are present on the tract are of poor quality. Because of overcrowding, many of the pines have developed small crowns. Thinning the stand is not an option due top their increased susceptibility of windthrow. Harvesting the remaining

over story pines would be the best option. This would accelerate the stands natural transition to hardwoods, and reduce the volatile fuel load on the forest floor.

Many sections of these stands are transitioning over to hardwoods, more specifically to yellow popular along the southern half. The amount of acreage in this designation will decrease drastically over the next 15-20 years.

Yellow Popular
About 3 acres of the stand is composed of Yellow Popular. Although this tree is very common on the mixed hardwood sites, it creates a very dense and notable stand near the east end of the tract. The stand averages about 5,722 bf/ac with about 75% of that being yellow popular. This early successional tree shows great promise as a future timber tree on this tract. The amount of acres in this specific designation will increase drastically over the next 15-20 years.

Open
About 3 acres of the stand fell into the subdivision of open. These points fell in the center of past sales that are actively regenerating to mixed hardwoods. They are not yet producing board feet. The average DBH is 4.8" and the BA is 22.8. It is currently about 68% stocked. They are currently regenerating with various oaks, white pine, and yellow popular. This area is densely populated with vines and exotics. Any control actions at this point would be futile until the regeneration starts to shade out the vines and exotics. Performing a TSI of undesirable species should be done at this time.

Summary Tract Silviculture Prescription and Proposed Activities
The main prescription for the tract is TSI. There is a presence of various exotics across the tract such as multi flora rose, vine and bush honey suckle. There is also a presence of grapevine, which has been known to deform crop trees. In addition, many understory or badly formed species, such as American beech and Virginia pine, should be TSI'd to favor other hardwoods when able.

The oak plantation on the west side of the tract also requires some special attention. It should receive a follow-up intensive TSI to reduce the number of competing species and vine control. The Japanese stilt grass located along the firelane may also be treated at this time.

Finally, the remaining white pine should be marked in 2009 on the southern half of the tract. The harvest would have to be careful to avoid disturbing the sensitive features and the wildlife pond in the center of tract. Timing of the harvest should also coincide with any removals scheduled for compartment 03 tract 03.

In prior harvests, firelane 12 has been used as a skid trail and an opening was made at the firelane entrance for a logging yard. Future harvests should reutilize these areas. The firelane needs some minor clearing, and the water bars should be evaluated to determine if they require any maintenance. This may be done in 2008

The previously harvested sections on the north side of the tract will be TSI'd in 5 years, in the spring/summer of 2012. The vines in this area are currently unmanageable, but will subside when the stand reaches closed canopy conditions. The southern half of the tract should receive a post harvest TSI at this time as well to reduce exotics, vines, and undesirable regeneration. Regeneration should be favored toward species that provide habitat for the Indiana Bat.

Subsequent post harvest TSI's should be performed every 3-5 years to mitigate both exotics and vines and direct regeneration.

The area may then be recruised in 2022.

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