Indiana Department of Natural Resources
Division of Forestry
DRAFT

RESOURCE MANAGEMENT GUIDE
Ferdinand-Pike State Forest

Location
Tract 04 of Compartment 06 is found in Section 2, T5S, R3W in Clark Township in Perry County, Indiana. It is approximately 1.5 miles south of the intersection of 145 and I-64.

General Description
This tract is approximately 161 acres, of which 51 acres is pine and 110 are hardwoods.

History
The entire 161 acres was acquired from Robert and Evelyn Leinenbach and William and Frosta Lehmkuhler in June 1950. In 1973, Bill Hahn inventoried the tract with 58 acres in hardwoods and the remainder in pine. A tree planting was completed in 1977 and consisted of 1,000 red pine, 1500 red oak and 1000 yellow poplar. The red pine was planted in the eroded area, the red oak was planted in the upper dryer areas of the slopes and yellow poplar was planted on the more moist lower slopes. Doug Brown completed a Resource Management Guide in 1990. At this time, the tract had about 60 acres of pine and the tract had a total of 425,221 board feet of which 151,416 board feet was available for harvest.

Landscape Context
A mix of forestland and agricultural lands surrounds this tract. The majority of the agricultural land is to the north, northwest. Forest dominates the majority of the surrounding areas. Residential areas consist of farms and rural homes. The nearest town is St. Meinrad, about six miles to the southwest. There is little home or business development occurring in this area.

Topography, Geology and Hydrology
This tract is a mixture of ridgetops, slopes and bottoms. Ridge fingers extend from the northwest corner and extend toward the center of the tract. An intermittent stream meanders along the southern boundary line. It travels in the tract for about 1,000 feet. Three drainages empty into the stream.

Soils
This tract contains the following soil types: Adyeville-Wellston-Deuchars silt loam, Adyeville-Tipsaw-Ebel complex, Apalona silt loams, Ebel-Deuchars-Kitterman complexes, Gatchel loam.

AbvD2--Adyeville-Wellston-Deuchars silt loams, 8 to 20 percent slopes, eroded

This soil covers 40.3 acres of the tract and forms narrow ribbons on the lower to mid slopes. The Adyeville soils are somewhat excessively drained, have a watertable at a depth greater than 40 inches and are on sideslopes on uplands. Slopes are 8 to 20 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low or moderate organic matter content (1.0 to 3.0 percent). Permeability is moderate in the most restrictive layer above bedrock. Available water capacity is low (4.1 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 5.5. Bedrock is at a depth of 20 to 40 inches.

The Wellston soils are well drained, have a watertable at a depth greater than 40 inches and are on sideslopes on uplands. Slopes are 8 to 20 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low or moderate organic matter content (1.0 to 3.0 percent). Permeability is moderate in the most restrictive layer above 60 inches. Available water capacity is moderate (8.8 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 6.0. Bedrock is at a depth of 40 to 60 inches. Site index is 81 for Red oak.

The Deuchars soils are moderately well drained, have a seasonal high watertable at 2.0 to 3.0 ft. and are on sideslopes on uplands. Slopes are 8 to 20 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low or moderate organic matter content (1.0 to 3.0 percent). Permeability is slow (.06 to 0.2 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (9.0 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 6.5. Bedrock is at a depth of 60 to 80 inches. Site index is 90 for Red oak.

AccG--Adyeville-Tipsaw-Ebal complex, 20 to 50 percent slopes, very rocky

The Adyeville soils are somewhat excessively drained, have a watertable at a depth greater than 40 inches and are on sideslopes on uplands. Slopes are 20 to 50 percent. The native vegetation is hardwoods. The surface layer is very fine sandy loam has moderate Or high organic matter content (2.0 to 6.0 percent).
Permeability is moderate in the most restrictive layer above 60 inches. Available water capacity is low (4.0 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 5.5. Bedrock is at a depth of 20 to 40 inches.

The Tipsaw soils are somewhat excessively drained, have a watertable at a depth greater than 40 inches and are on sideslopes on uplands. Slopes are 20 to 50 percent. The native vegetation is hardwoods. The surface layer is very fine sandy loam has moderate or high organic matter content (3.0 to 8.0 percent). Permeability is moderate in the most restrictive layer above 60 inches. Available water capacity is low (3.3 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 5.5. Bedrock is at a depth of 20 to 40 inches. Site index is 70 for Black oak.

The Ebal soils are moderately well drained, have a seasonal high watertable at 2.0 to 3.0 ft. and are on sideslopes on uplands. Slopes are 20 to 30 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderate or high organic matter content (2.0 to 6.0 percent). Permeability is very slow (< 0.06 in/hr) in the most restrictive layer above bedrock. Available water capacity is moderate (7.2 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 5.5. Bedrock is at a depth of 50 to 80 inches. Site index is 80 for Black oak.

AgrC2--Apalona silt loam, 6 to 12 percent slopes, eroded

This moderately well drained soil has a seasonal high watertable at 2.0 to 3.0 ft. and is on sideslopes on uplands. Slopes are 6 to 12 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low or moderate organic matter content (1.0 to 3.0 percent). Permeability is very slow (< 0.06 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (7.2 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 4.5 to 6.0. Bedrock is at a depth of 72 to 100 inches. Site index is 60 for Black and White oak.

AgrC3--Apalona silt loam, 6 to 12 percent slopes, severely eroded

This moderately well drained soil has a seasonal high watertable at 1.5 to 2.5 ft. and is on sideslopes on uplands. Slopes are 6 to 12 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low organic matter content (0.5 to 2.0 percent). Permeability is very slow (< 0.06 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (6.4 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 4.5 to 6.0. Bedrock is at a depth of 72 to 100 inches. Site index is 60 for Black and White oak.

EabD2--Ebal-Deuchars-Kitterman complex, 12 to 24 percent slopes, eroded

The Ebal soils are moderately well drained, have a seasonal high watertable at 2.0 to 3.0 ft. and are on sideslopes on uplands. Slopes are 12 to 24 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low or moderate organic matter content (1.0 to 3.0 percent). Permeability is very slow (< 0.06 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (7.5 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 5.5. Bedrockis at a depth of 50 to 90 inches. Site index is 80 for Black oak

The Deuchars soils are moderately well drained, have a seasonal high watertable at 2.0 to 3.0 ft. and are on sideslopes on uplands. Slopes are 12 to 24 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low or moderate organic matter content (1.0 to 3.0 percent). Permeability is slow (.06 to 0.2 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (9.0 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 6.5. Bedrock is at a depth of 60 to 80 inches. Site index is 90 for Red oak.

The Kitterman soils are moderately well drained, have a seasonal high watertable at 1.0 to 2.0 ft. and are on sideslopes on uplands. Slopes are 12 to 24 percent. The native vegetation is hardwoods. The surface layer is channery silty clay loam has moderate or high organic matter content (2.0 to 10.0 percent). Permeability is slow (.06 to 0.2 in/hr) in the most restrictive layer above 60 inches. Available water capacity is low (4.1 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 4.5 to 5.5. Bedrock is at a depth of 20 to 40 inches.

EabD3--Ebal-Deuchars-Kitterman complex, 12 to 24 percent slopes, severely eroded

The Ebal soils are moderately well drained, have a seasonal high watertable at 2.0 to 3.0 ft. and are on sideslopes on uplands. Slopes are 12 to 24 percent. The native vegetation is hardwoods. The surface layer is silty clay loam has moderately low organic matter content (0.5 to 2.0 percent). Permeability is very slow (< 0.06 in/hr) in the most

restrictive layer above 60 inches. Available water capacity is moderate (6.7 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 5.5. Bedrock is at a depth of 50 to 80 inches. Site index is 80 for Black oak.

The Deuchars soils are moderately well drained, have a seasonal high watertable at 2.0 to 3.0 ft. and are on sideslopes on uplands. Slopes are 12 to 24 percent. The native vegetation is hardwoods. The surface layer is silt loam has moderately low organic matter content (0.5 to 2.0 percent). Permeability is slow (.06 to 0.2 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (8.3 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 3.5 to 5.5. Bedrock is at a depth of 60 to 80 inches. Droughtiness and water erosion are management concerns for crop production. Site index is 90 for Red oak.

The Kitterman soils are moderately well drained, have a seasonal high watertable at 1.0 to 2.0 ft. and are on sideslopes on uplands. Slopes are 12 to 24 percent. The native vegetation is hardwoods. The surface layer is channery silty clay loam has moderate organic matter content (2.0 to 5.0 percent). Permeability is slow (.06 to 0.2 in/hr) in the most restrictive layer above 60 inches. Available water capacity is low (3.2 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 4.5 to 5.5. Bedrock is at a depth of 20 to 40 inches. Site index is 65 for Black oak.

GacAW--Gatchel loam, 0 to 2 percent slopes, occasionally flooded, very brief duration

This somewhat excessively drained soil has a watertable at a depth greater than 40 inches and is on floodplains. Slopes are 0 to 2 percent. The native vegetation is hardwoods. The surface layer is loam has moderate moderately low organic matter content (1.0 to 3.0 percent). Permeability is slow (.06 to 0.2 in/hr) in the most restrictive layer above 60 inches. Available water capacity is moderate (6.1 inches in the upper 60 inches). The pH of the surface layer in non-limed areas is 5.6 to 7.3.

Access

Foot access to this tract is theoretically possible on the northwest and southeast corners where 0604 adjoins other state property. There is currently no public or management access set up for vehicles. If permission can be granted from the neighbor, access would be easiest across private property from the south side of the tract. However management access could be made possible from any side if permission is obtained. Suggested management activities in this guide are dependent on obtaining access to the tract.

Boundary

This tract is surrounded on four sides by private property. State property adjoins only at the northwest and southeast corners. The lines have been had extensive work done by property personnel. Corner stones have been found on each of the corners. Signs, fencing, flagging and tree lines are all found along the boundary lines.

Wildlife

Wildlife noted in the tract included deer, squirrels, songbirds, crows, a Downy Woodpecker, Mourning doves, and a Rough Green Snake. This particular tract is fairly distant from the nearest road with only foot traffic possible. Its limited accessibility may

contribute to a higher usage and value in terms of wildlife habitat. Additionally, there were two wildlife ponds noted within the tract to provide further wildlife benefits.

Inventory results show that there are nearly twice as many legacy trees as required in the 11"+ size class but somewhat of a deficiency in the 20"+ size class. Snags also show a deficiency in the 19"+ size class, but the 5"+ and 9"+ classes both exceed desired maintenance level. Cavity trees all exceed maintenance and optimal levels. These numbers are pretty good considering that 32% of this tract consists of pine timber type which is not a legacy tree species and typically does not reach sizes of 19"+ DBH. Pine management is an option in this tract, which would include conversion from pine to hardwoods. That could help provide more larger legacy and snag trees in the long term. In the short term, the legacy and snag deficiencies suggest management should avoid cutting legacy tree species 20"+. Snags are routinely left in place during management; additional snags could be created during TSI if there are sufficient live trees in the desired size classes available for TSI.

Communities

A Natural Heritage Database review was obtained 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.

Vine honeysuckle was noted in six plots within the tract. Grapevine density ranged from none to few throughout the tract. No other exotic-invasive species were seen. Overall this tract seems to be in good shape, probably due in part to the lack of roads or trails adjoining the tract.

Recreation

This tract contains no recreational facilities, trails, roads, etc. Although the tract is landlocked by private property, it is doubtful that this has discouraged hunters due to the firelane that wanders through both Tract 03 and 06 adjoining this tract. It appears that the neighbors also utilize this tract for hunting or other uses.

Cultural

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

RESOURCE MANAGEMENT GUIDE

TM 901, 902, 903, 904

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State Forest:	Ferdinand	**Forester:**	J. Winner
Compartment:	6	**Date:**	8/1/2011
Tract:	4		

INVENTORY SUMMARY

Commercial Forest Acreage:	161.00	**Average Site Index:**	78
Non-Commercial Forest:	0.00	**Average Annual Growth:**	0
Recreation Use Acreage:	0.00		
Permanent Openings:	0.00	**BA (Trees > 10"):**	59.00
Acreage in Other Uses:	0.00	**BA (Trees < 10"):**	30.40
TOTAL AREA:	161.00	**Total BA / Acre**	89.40

(Estimated Tract Volumes for Commercial Forest Area - Bd. Ft., Doyle Rule)

Species	Growing Stock	Harvest Stock	Total Volume
SYC	4020	870	4890
BIH	2720	0	2720
BLC	4180	0	4180
BLG	1020	1100	2120
BLO	29310	51410	80720
ERC	0	450	450
WHP	45370	127300	172670
REO	3190	8640	11830
PIH	23530	7730	31260
POO	1640	0	1640
REM	0	7230	7230
REP	1250	0	1250
SCO	3630	5200	8830
SUM	0	1150	1150
VIP	12590	53270	65860
WHA	0	4300	4300
WHO	176560	69280	245840
YEP	96730	78150	174880
TRACT TOTALS:	405740	416080	821820

TRACT TOTALS:	405740.00	416080.00	821820.00
PER ACRE TOTALS:	2520.12	2584.35	5104.47

Tract Subdivision Description and Silvicultural Prescription

Pine

Approximately 51 acres (32%) of the tract is classified under the pine stratum. This includes Eastern White pine (54% of total volume) and Virginia pine (20% of total volume). Other non pine species account for the remaining 29% of sawtimber volume within the stratum). Red pine is also present in the tract, but none was contiguous enough to fall within the pine stratum. In other words, the Red pine is very broken up and natural succession to hardwoods is taking place. The inventory data estimates the tract contains a total of 293,990 Bd. Ft (5,760 Bd. Ft./Acre) of pine volume. Harvest volume was estimated to be 4,400 Bd. Ft. per acre, a total of 224,550 bd. ft. Residual volume would then be 1,360 Bd. Ft. per acre, a total of 69,440 Bd. Ft.

Such a high harvest volume makes sense considering that most of the pine identified as harvest during the inventory would have been marked as an opening rather than a thinning. The recommendation for management here is to create openings within the pine where practical. Creating openings within the pine not only creates wildlife habitat but also will facilitate conversion to hardwoods which should improve the legacy tree and snag deficiency in the long term. This is due to the fact that pines are not desirable legacy tree species. Planted pine stands have historically been unmanaged or undermanaged leading to stagnation. Therefore they are unlikely to grow into larger size classes needed for larger snags. Additionally, thinning pine is less practical to implement and can cause remaining pine to be susceptible to wind or storm related damage. Openings will need to be completed after the harvest with TSI. Enrichment planting may be desirable depending on the oak regeneration present in the existing pine stands to be harvested. Some pine stands selected for openings did not include any noticeable oak regeneration, but did have a large number of Yellow poplar. This is typical for pine stands, and we would expect to get a major component of Yellow poplar as regeneration in these areas. Whether we should work for oak regeneration with planting or otherwise will depend on the existing regeneration present as well as slope, aspect, and soils.

Hardwoods

Approximately 110 acres (68%) of the tract consists of commercial hardwoods. The inventory data estimates the hardwood stratum contains 4,800 Bd. Ft./Acre of sawtimber volume, a total of 528,490 Bd. Ft. Harvest volume was estimated to be 1,760 Bd. Ft./Acre, a total of 193,340 Bd. Ft. Residual volume was estimated to be 3,050 Bd. Ft. per acre, a total of 335,150 Bd. Ft. The attached stocking guide illustrates that the current number of trees and basal area in this stratum corresponds to an 84% stocking. The trees selected for harvest in the inventory would reduce this stocking to 68%. Mixed oaks appear to be in the majority here. The breakdown of the harvest volume shows a significant portion from Black oak, White oak, and Yellow poplar, with other assorted species contributing a smaller portion a volume to the total figure. Refer to Harvest/Leave Summary Report for complete species breakdown.

There is a need for some management of both the pine and hardwoods in this tract. Dieback and stress in Yellow poplar and Black oak was noted scattered throughout the tract. This is typical of other tracts in the area. Black oak with recent mortality were seen in a few plots. Overall, the hardwood stands included mixed oak and hickory, White oak, Yellow poplar, and then generally mixed hardwoods. Prescriptions during the inventory varied across the entire gamut of options. Some hardwood areas have insufficient stocking or size for a harvest, other areas need a thinning, and some areas

were selected for a hardwood opening. Openings were selected in some areas for reasons that included the presence of advanced oak regeneration, mature timber (usually with no or poor regeneration present), and stress or disease related mortality. Several plots had mention of potential for understory TSI to promote oak regeneration. Any openings that are created would need TSI to complete them.

SPECIFIC PRACTICES FOR ACCOMPLISHMENT

(tree planting, TSI, harvest, special product sales, wildlife habitat work, erosion control, unique areas, recreation, etc.)

Year Planned	Practice	Year Accomplished
2012	Timber Harvest	
2013	TSI	
2027	Re-Inventory	

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