

Land and Resource Management Plan
Monitoring and Evaluation Report
Fiscal Years 1998 and 1999

Hoosier National Forest

Brown, Crawford, Dubois, Jackson, Lawrence, Martin, Monroe, Orange, and Perry
Counties

Responsible Official:

Kenneth G. Day, Forest Supervisor

For more information contact:

Regis Terney, Land Management Planner
Hoosier National Forest
811 Constitution Avenue
Bedford, IN 47421
Office: 812-275-5987
FAX: 812-279-3423
TDD: 812-275-7817
Website: www.fs.fed.us/r9/hoosier

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INTRODUCTION

The Forest Plan, as amended in 1991 provides guidance to ensure that National Forest System (NFS) lands in Indiana are managed to provide forest ecosystems that enhance biological diversity on a regional scale and provide high quality recreation opportunities. We are committed to forest activities that lie lightly on the landscape and helping people understand why we manage NFS lands. Our mission is to continue to make it possible for people to enjoy the values and benefits the Forest provides through responsible resource management tailored to meet public desires.

Projects included here are the on-the-ground application of management practices and guidance to move toward the desired future condition identified in the Forest Plan. Annual programs of work are determined by the final budget for any given year. The annual program of work lists the projects and budgets necessary to accomplish those projects based on site-specific environmental analysis, and includes monitoring activities to help evaluate the quality of Forest Plan application.

The purpose of monitoring is to determine how well the Forest Plan is being carried out. It provides a check to review if Forest Plan guidance is realistic management direction. Monitoring also enables us to learn if objectives identified in the Forest Plan are being achieved using the Plan guidance. The National Forest Management Act [36 CFR 219.12(k)] requires monitoring and evaluation on an on-going basis. The attached narrative describes monitoring results for fiscal years (FY) 1998 and 1999.

PROGRAM ACCOMPLISHMENTS

Outputs [219.12(k)(1)]

Compare goods and services with those projected on pages 2-14 and 2-15 of the FEIS, Management Attainment Report (MAR) and Timber Sale Program Information Reporting System (TSPIRS).

Fiscal Year '98 Management Attainment Report - Resource Accomplishments

| MAR Code | MAR Descriptions | Unit of Measure | 1998 Target | 1998 Accomp. | 1999 Target | 1999 Accomp. |
|-----------------|--|------------------------|--------------------|---------------------|--------------------|---------------------|
| 9.0 | Noxious Weed Treatment | Acres | 0.0 | 0.0 | 15.0 | 0.0 |
| 11.2 | LRMP Monitoring/Evaluation | Reports | 0.0 | 0.0 | 1 | 1 |
| 11.3 | LRMP Revisions/New Cmp | Plans | 0.0 | 0.0 | 1.0 | 0.0 |
| 13.0 | Soil & Water Resource Improvement | Acres | 13.0 | 30.0 | 20.0 | 26.3 |
| 13.3 | Rvrn Strm R/C Unt Scl Inv | Miles | 0.0 | 4.0 | 0.0 | 0.0 |
| 16.0 | Fire Protection Capability | Dollars | 0.0 | 174,404 | 0.0 | 0.0 |
| 16.2 | Fuels Treatment | Acres | 2,400.0 | 3,718.0 | 450.0 | 460.0 |
| 17.1 | Volume Offered, New | 1000 Bd Ft | 0.0 | 89.0 | 0.0 | 0.0 |
| 17.2 | Volume Offered, Salvage Sale Fund | 1000 Bd Ft | 0.0 | 13.0 | 0.0 | 0.0 |
| 19.0 | Reforestation | Acres | 35.0 | 44.0 | 80.0 | 75.0 |
| 20.0 | Timber Stand Improvement | Acres | 0.0 | 0.0 | 50 | 50 |
| 21.0 | Trail Const. and Reconst. | Miles | 0.0 | 0.0 | 0.0 | 28.0 |
| 26.0 | Seasonal Capability Available | Persons At One Time | 1,560,000.0 | 1,560,000.0 | 1,560,000 | 1,560,000 |
| 31.0 | Land Ownership Adjustment (not Exch.) | Acres | 0.0 | 476.2 | 523.0 | 386.32 |
| 32.1 | Land Exchange | Acres | 0.0 | 86.2 | 0.0 | 135.76 |
| 33.0 | Land Line Location | Miles | 0.0 | 3.7 | 5.0 | 2.7 |
| 34.0 | Rights-of-Way Acquisitions | Cases | 0.0 | 2.0 | 2.0 | 0.0 |
| 41.0 | Youth Conservation Corps Participation | Enrollee Wks | 0.0 | 32.0 | 0.0 | 40.0 |
| 43.0 | Senior Community Service Employees | Enrollee Hours | 0.0 | 40,557.3 | 0.0 | 38,385.75 |
| 44.0 | Volunteers in NF Programs | Enrollee Years | 0.0 | 8.1 | 0.0 | 2.18 |
| 44.1 | Hosted Program | Enrollee Years | 0.0 | 10.5 | 0.0 | 0.0 |
| 57.0 | Motor Vehicle Accidents | Incidents | 0.0 | 3.0 | 0.0 | 0.0 |
| 60.3 | Wildlife Habitat Inventory | Acres | 0.0 | 3,000.0 | 3,000.0 | 3,000.0 |
| 60.4 | TE&S Species Habitat Inventory | Acres | 0.0 | 3,500.0 | 3,500.0 | 2,500.0 |
| 60.5 | Stream Aquatic Biota Inventory | Miles | 0.0 | 112 | 0.0 | 53.0 |
| 60.6 | Lake Aquatic Biota Inventory | Acres | 0.0 | 9.5 | 0.0 | 0.0 |

| MAR Code | MAR Descriptions | Unit of Measure | 1998 Target | 1998 Accomp. | 1999 Target | 1999 Accomp. |
|----------|---|-----------------|-------------|--------------|-------------|--------------|
| 61.9 | Heritage Inventory | Acres | 0.0 | 643.0 | 643.0 | 408.0 |
| 62.3 | Trails Available - Total | Miles | 0.0 | 196.6 | 0.0 | 203.1 |
| 62.5 | Rec Special Use Permits | Permits | 0.0 | 15.0 | 15.0 | 11.0 |
| 63.2 | Recreation Use - Total | 1000 Visits | 0.0 | 525.0 | 0.0 | 525.0 |
| 64.3 | Wilderness Trail Available | Miles | 0.0 | 36.3 | 0.0 | 36.3 |
| 65.2 | Heritage Sites Evaluated | Sites | 0.0 | 3.0 | 3.0 | 10.0 |
| 65.3 | Heritage Sites Interpreted | Sites | 0.0 | 2.0 | 2.0 | 8.0 |
| 65.4 | Heritage Sites Preserved/Protected | Sites | 0.0 | 10.0 | 10.0 | 15.0 |
| 66.2 | Wildlife Habitat Restored/Enhanced | Acres | 600.0 | 596.0 | 130.0 | 20.0 |
| 68.4 | Inland Fish Lakes Restored/Protected | Acres | 5.0 | 8.5 | 5.0 | 7.0 |
| 72.6 | TES Terrestrial Habitat Rest/Enhanced | Acres | 75.0 | 100.0 | 0.0 | 0.0 |
| 72.9 | Biological Assessment/Evaluation | Tasks | 0.0 | 30.0 | 0.0 | 20.0 |
| 77.4 | Volume Offered, New | 1000 Cu. Ft. | 1,620.0 | 178.0 | 0.0 | 0.0 |
| 77.5 | Volume Offered, Salvage Sale Fund | 1000 Cu. Ft. | 1,620.0 | 26.0 | 0.0 | 0.0 |
| 77.8 | Volume Sold | 1000 Bd Ft | 0.0 | 335.4 | 0.0 | 69.1 |
| 77.9 | Volume Sold | 1000 Cu. Ft. | 0.0 | 671.8 | 0.0 | 138.4 |
| 79.1 | Volume Harvested- Total | 1000 Bd Ft | 0.0 | 5,728.0 | 0.0 | 1,322.0 |
| 79.2 | Volume Harvested - Total | 1000 Cu. Ft. | 0.0 | 11,455.0 | 0.0 | 2,203.0 |
| 82.6 | Class II Watersheds | Watersheds | 0.0 | 0.0 | 0.0 | 8.0 |
| 84.7 | Geologic Management Areas Admin. | Areas | 0.0 | 19.0 | 0.0 | 19.0 |
| 84.8 | Geologic Permit/Report Doc. | Documents | 0.0 | 0.0 | 0.0 | 1.0 |
| 89.1 | Landownership Administration | Cases | 0.0 | 6.0 | 0.0 | 4.0 |
| 89.2 | Gen. Special Use Applications Processed | Permits | 0.0 | 16.0 | 10.0 | 15.0 |
| 89.3 | Authorizations Admin. to Standard | Permits | 0.0 | 55.0 | 55.0 | 55.0 |
| 89.4 | Authorizations Administered - Total | Permits | 0.0 | 176.0 | 0.0 | 166.0 |
| 90.1 | Land Line Maintenance | Miles | 0.0 | 0.0 | 0.0 | 6.25 |
| 91.2 | Roads Maintained - Total | Miles | 85.0 | 85.0 | 105.0 | 105.0 |
| 91.3 | Roads Obliterated | Miles | 1.0 | 7.0 | 1.0 | 1.0 |
| 91.4 | Roads Fully Maintained | Miles | 0.0 | 21.0 | 0.0 | 0.0 |
| 92.1 | Law Enforcement Incidents | Incidents | 0.0 | 334.0 | 0.0 | 104.0 |
| 92.2 | Law Enforcement Coop. Agreements | Agreements | 0.0 | 3.0 | 0.0 | 4.0 |
| 93.2 | Road Reconstruction | Miles | 1.0 | 0.0 | 0.0 | 0.5 |

Comparison of Key Indicators

The following table includes key indicators identified in the Final Environmental Impact Statement for the Forest Plan (p. 2-14 and 2-15). Only direct effect indicators of the Forest Plan are listed.

| Key Indicator | Unit of Measure | Est. 1991-2001 | 1991 Output | 1992 Output | 1993 Output | 1994 Output | 1995 Output | 1996 Output | 1997 Output | 1998 Output | 1999 Output |
|-------------------------------|-----------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Recreation Visitor Days (RVD) | | | | | | | 230 | 510 | 510 | 525 | 525 |
| Dispersed | MRVD | 267 | | | | 301 | | | | | |
| Developed | MRVD | 120 | | | | 208 | | | | | |
| Trail Construction | | | | | | | | | | | |
| Hiking | Miles | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Horse | Miles | 40 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bike | Miles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Multiple-use | Miles | 0 | 0 | 0 | 0 | 3 | 8.6 | 7.5 | 22 | 0 | 6.5 |
| Trail Reconst. (all) | Miles | 0 | 0 | 0 | 33.4 | 0 | 0 | 0 | 51.5 | 28.1 | 28.0 |
| Vegetation maintained | | | | | | | | | | | |
| Forest Openings ¹ | Acres | 4,000 | 657 | 459 | 350 | 509 | 322 | 480 | 650 | 439 | 290 |
| Barrens Maint. | Acres | 1,131 | 18 | 40 | 140 | 40 | 60 | 0 | 83 | 0 | 0 |
| Wetlands Construc | | | | | | | | | | | |
| Lakes/Ponds | Acres | 120 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Marsh/Waterhole | Acres | 15 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 20 | 0 |
| Vegetation Regen. | | | | | | | | | | | |
| Hardwood 0-9 | Acres | 4,853 | 0 | 0 | 0 | 57 | 0 | 0 | 150 | 44 | 76 |
| Pine 0-9 | Acres | 94 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Timber Harvested | | | | | | | | | | | |
| Sawtimber | MMBF | 26 | 0 | 0.042 | 0.019 | 0.395 | 0.159 | 0.114 | 0.67 | 3.839 | 0.903 |
| Roundwood | MMBF | 17 | 0.025 | 0.078 | 0.040 | 0.706 | 0.127 | 0.066 | 1.13 | 1.839 | 0.373 |
| Total | MMBF | 43 | 0.025 | 0.120 | 0.059 | 1.101 | 0.286 | 0.180 | 1.89 | 5.728 | 1.322 |
| Roads Const./Reconst. | Miles | 140 | 0.25 | 3.50 | 1.00 | 0.10 | 0.60 | 7.90 | 10.90 | 1.0 | 1.0 |

¹ To prevent forest openings from converting to forest, we must maintain each forest opening on a cycle of 3 to 5 years. To carry out the Forest Plan objective of 4,000 acres of forest openings, we should maintain 800 to 1,300 acres of forest openings a year. As shown in this table over the last 6 years, we maintained 300 to 700 acres of forest openings a year; therefore based on the 3 to 5 year cycle, we are maintaining 1,500 to 2,100 acres of forest openings.

Timber Sale Program Information Reporting System

Timber Sale Program reports provide summaries from the information in the Timber Sale Program Information Reporting System (TSPIRS). The final report for Fiscal Years 1998 and 1999 have not been released by the national office at this time.

However, some information can be provided on timber sales performed over the past three years.

| | 1997 | 1998 | 1999 |
|---------------------------------|------|------|------|
| Timber Sales up to \$300 | 61 | 54 | 46 |
| Timber Sales from \$301-\$2,000 | 4 | 0 | 1 |

Costs [219.12(k)(3)]

Quantitatively compares actual cost of applying management practices with Forest Plan estimates.

Congress funded our land acquisition program. Land acquisition costs were \$733,000 in 1998, and \$1,593,000 in 1999. For the Forest Plan budget, we did not estimate land acquisition funds.

As shown on line 8 of the following table entitled: Forest Plan Budget Estimates versus Costs, we were funded by Congress at 77 percent of the Forest Plan in 1998 and 85 percent of Forest Plan in 1999 in total regular Forest Service funds. Total Regular funds is the best comparison for the Forest Plan cost estimates because the Forest Plan cost estimates did not include land acquisition funds or the Senior Community Service Program. In 1990, we estimated \$4,800,000 as the regular USDA Forest Service funds necessary to carry out the Forest Plan (all figures have been adjusted for inflation based on Gross National Product Implicit Price Deflator index). In National Forest System funds for operation and maintenance, we received about 90 percent of the Forest Plan estimate (line 4 of following table). However, in construction we received only 12 percent in 1998 and 17 percent in 1999 (line 3 of following table). The Forest Plan estimate assumed more recreation improvements in trails and developed campgrounds.

With the low level of funding, we are unable to fund the recreation and vegetation investments we projected in the Forest Plan. To reduce fixed costs, we reduced the number of personnel from the Forest Plan estimate of 1991. Under this reduced budget, we shifted funds away from timber and recreation investments; although, we maintained or enhanced the forest ecosystems with actions in ecosystem restoration, special use management, trail maintenance, soil protection, and recreation resource maintenance.

One example of cost reduction is recreation management. To manage the recreation program, the plan estimate was about \$1,890,000 per year. However, the recreation funding was about \$1,000,000 in 1998 and \$900,000 in 1999. We reduced our expectations for recreation investment. Recreation personnel use these funds to: operate campgrounds; protect heritage resources; maintain trails; manage wilderness resources; and reconstruct recreation sites and trails. With creative management, the use of concessionaires, partners, and volunteers, we were able to cover fixed costs, and

able to fund: rest room supplies, trail maintenance contracts, trail reconstruction contracts, and materials.

Another example of cost reduction is timber management. In the Forest Plan, we estimated an annual budget of about \$830,000. We use these funds to do timber sale planning, reforestation, timber stand improvement, timber road construction, and administrative overhead. Our timber budget for 1998 was \$442,000 and 1999 was \$627,000. Our reduced budget follows from the size of our timber program.

Forest Plan Budget estimates versus Costs in thousand of dollars

| Budget Item | Forest Plan Budget est. in 1998 dollars | FY 98- Allocation 1998 dollars | Percent Plan funded in 1998 | Forest Plan Budget est. in 1999 dollars | FY 99- Allocation 1999 dollars | Percent Plan Funded in 1999 |
|---|---|---------------------------------------|-----------------------------|---|---------------------------------------|-----------------------------|
| Total National Forest System funds (Operation and maintenance) | \$3,426 | \$3,090 | 90% | \$3,475 | \$3,153 | 91% |
| Total Fire funds | \$102 | \$176 | 173% | \$104 | \$215 | 207% |
| Total Construction funds (Road, trail, recreation) | \$1,174 | \$146 | 12% | \$1,191 | \$205 | 17% |
| Land Acquisition Administration | \$0 | \$115 | | \$0 | \$93 | |
| <i>Total Appropriated Funds (sum of above)</i> | <i>\$4,702</i> | <i>\$3,527</i> | <i>75%</i> | <i>\$4,770</i> | <i>\$3,666</i> | <i>77%</i> |
| Total Permanent Appropriations (Recreation fee, Salvage etc.) | 0 | \$89 | | 0 | \$290 | |
| Total Trust Fund (KV, Reforestation, and other) | \$81 | \$45 | 56% | \$82 | \$182 | 222% |
| Total Regular Forest Service | \$4,783 | \$3,661 | 77% | \$4,852 | \$4,138 | 85% |
| Total Other funds (Senior Community Service Program and others) | 0 | \$260 | | 0 | \$253 | |
| Grand Total without land acquisition dollars | \$4,783 | \$3,921 | 82% | \$4,852 | \$4,391 | 90% |
| Lands acquisition dollars | \$0 | \$618 | | \$0 | \$1,500 | |
| Total All Funds | \$4,783 | \$4,539 | 95% | \$4,852 | \$5,891 | 121% |

Research [36 CFR 219.28(a)]

Review and update research activities on the Forest. Find out if the needs in the Forest Plan (pages 3-4 to 3-7) are being addressed, and are appropriate. Identify additional research needs based on monitoring and evaluation and on changing societal needs.

Below we list research needs in ***bold italics*** (Forest Plan, pp. 3-4 to 3-7). For each research need the corresponding research activities conducted during FY 1998 and 1999 are underlined. Research conducted in other years is included as well. As shown, most research needs recognized in the Forest Plan are being addressed, many through partnerships with other entities. Some research studies are still in progress, and continue to be monitored annually as the studies progress.

Hoosier National Forest Research Activities:

Need: Ecological Classification System

Gillespie, A. Using GPS unit to locate ELTPs on Pleasant Run Purchase Unit and using digital elevation models to map units. [on-going]

Jose, Shibu. 1994. Compensatory mechanisms of central hardwood forest communities in a changing environment. West Lafayette, IN: Purdue University. 207 p. M.S. thesis.

Leppert, Charles Edward. 1994. Spatial and thematic analysis of an ecological classification system for the Hoosier National Forest. West Lafayette, IN: Purdue University. 142 p. M.S. thesis.

Rudy, William J. 1993. The influence of landscape patterns of plant species diversity, Pleasant Run Unit, Hoosier National Forest. Bloomington, IN: Indiana University. 111 p. M.A. and M.S. thesis.

Van Kley, James Edwin. 1993. An ecological classification system for the central hardwood region: The Hoosier National Forest. West Lafayette, IN: Purdue University. 436 p. Ph.D. thesis.

Van Kley, James Edwin; Parker, George R.; Franzmeier, Donald P.; Randolph, J.C. [1994]. Field guide for the ecological classification system of the Hoosier National Forest and surrounding areas of Indiana. [Bedford, IN]: U.S. Department of Agriculture, Forest Service, Hoosier National Forest. 79 p.

Need: Native Plant and Animal Community Research

3DE Group of BHE Environmental, Inc. 1998. Inventory of rare plants in the Buzzard Roost Area, Tell City Ranger District of the Hoosier National Forest. Project 1008.01. Approx 300 p.

Adaskaveg, J.E.; Gilbertson, R.L. 1997. MSA foray 1996 - Indiana. *Inoculum* 48(3):5-7.

Backs, Steven E. Insect biomass in different vegetation types. [Data collected, report pending]

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- Ehman, Jeff. 1997. Estimating carbon budgets for the Hoosier National Forest. Indiana University.
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- Jackson, B. 1993. A review of Bachman's sparrow habitat in Indiana. Indiana Department of Natural Resources, Indianapolis, IN. 80 p.
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- Jenkins, Michael A.; Parker, George R. 1997. Changes in down dead wood volume across a chronosequence of silvicultural openings in southern Indiana forests. In: Pallardy, Stephen G.; Cecich, Robert A.; Garrett, H. Eugene; Johnson, Paul S., eds. Proceedings, 11th Central Hardwood forest conference; 1997 March 23-26; Columbia, MO. Gen. Tech. Rep. NC-188. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 162-169.
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- Lewis, Julian J. 1997. preliminary inventory report on invertebrates in caves in Hemlock Cliffs Area. (p. 105-109).
- Lewis, Julian J. 1997. The cave fauna of the Blue River area. 130 p.
- Lewis, Julian J. 1997. Inventorying invertebrates in the Little Blue River Area.
- Liddle, Thomas D. 1995. Ecology and observed biota of selected caves in the Hoosier National Forest, Indiana. 36 p.
- Linnel, Bill. 1997. DNA variation in Kentucky coffee tree, redbud, and honey locust. Michigan State Univ.
- Madej, Robert F.; Johnson, Scott A.. 1993. Allegheny woodrat monitoring program - 1993; An assessment of the distribution of the Allegheny woodrat in Indiana: search for new localities. pp. 1-26
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Fischer, Burnell C.; Pennington, Stephen G; Tormoehlen, Barbara. 1993. Public involvement in Indiana forestry. *Journal of Forestry*. 91 (7): 28-31.

Frieder, Julie; Sarnat, Jeremy. 1992. Hoosier National Forest; An application of fiscal impact analysis. Indiana University. pp 1-36

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Weigel, Dale R. 1993. Tree regeneration response to group selection harvesting on the Crane Division, Naval Surface Warfare Center. West Lafayette, IN: Purdue University. 64 p. M.S. thesis.

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Weigel, Dale R.; Johnson, Paul S. 1998. Stump sprouting probabilities for southern Indiana oaks. Technical Brief. TB-NC-7. U.S. Department of Agriculture, Forest Service, North Central Research Station. 6 p.

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Need: Global Warming

Hoelscher, Laura, ed. 1998. Report of the eastern midwest climate change workshop. 1998. June 29-30; Indianapolis, IN. Bloomington, IN: Indiana University and West Lafayette, IN: Purdue University. 46 p.

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Research Needs not currently addressed:

Four research needs recognized in the forest plan are currently not being addressed as active research. They include uneven-aged management of central hardwoods; controlling problem plants; controlling lone star ticks, and associated lyme disease; and acid deposition (rain, snow, fog, dry fallout). As research opportunities arise to address these needs, studies will be undertaken.

Additional research being done on the forest includes:

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Aquilani, Steven; LeBlanc, David C.; Morrell, Thomas. 1998. The effects of prescribed surface fire on ground and shrub-nesting nearctic migrants at Fork Ridge, Hoosier National Forest, 1996 and 1997. Final Report. 53 p.

Heikens, Alice Long. 1995. The response of three southern Indiana barrens to prescribed fire and/or removal of woody species. 4 p.

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Adams, Thomas Forrest. 1992. The influence of slope aspect and position on spatial and temporal properties of soils in southern Indiana. West Lafayette, IN: Purdue University. 76 p. M.S. thesis.

Ehman, J. Estimation of carbon budgets in old clearcuts on Hoosier National Forest. [In progress.]

Moss, R. 1994. Pate Hollow water quality study. pp. 1-37.

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Lafayette, IN: Purdue University. 134 p. M.S. thesis.

Willard, Dan. 1997. Salt Creek watershed erosion. Indiana University.

Cultural Heritage

Sieber, Ellen; Munson, Cheryl Ann. 1994. Looking at history Indiana's Hoosier National Forest region, 1600 to 1950. Bloomington and Indianapolis, IN: Indiana University Press. 131 p.

GIS and GPS Technology

Gustafson, Eric J.; Crow, Thomas R. 1998. Simulating spatial and temporal context of forest management using hypothetical landscapes. Environmental Management. 22 (5): 777-787.

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Jasumback, Tony; Luepke, Doug; McCullough, Rich; Weigel, Dale. 1997. Wide area GPS enhancement (WAGE) evaluation. Tech Tips 9771-2327-MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Technology and Development Program. 4 p.

Johnston, Jerry J.; Weigel, Dale R.; Randolph, J.C. 1997. Satellite remote sensing an inexpensive tool for pine plantation management. Journal of Forestry. 95 (6): 16-20.

Management Prescriptions [36 CFR 219.12(k)(2)]

Document measured prescriptions and effects. Determine if management prescriptions and guidance are being applied and followed. Conduct one interdisciplinary field review per district.

1998 INTERDISCIPLINARY FIELD REVIEW

On November 4, 1998 the Hoosier Operations and Strategy Team and several specialists conducted the annual Forest monitoring trip. The trip focused on trails. Three areas were inspected to determine compliance with the forest plan and the monitoring and evaluation program. The three areas were the German Ridge trail northwest of the German Ridge camp, a small section of the German Ridge trail north of Krausch Hill, and the westernmost section of the Oriole West trail. These trails represented old rehabilitation, new rehabilitation, and no treatment. The trails were inspected visually by hiking and mountain biking using the trail inspection form from the Trails Implementation Schedule.

The following people attended: Russ Christensen, Ken Day, Jim Denoncour, Tom Krueger, Randy Lutz, Sue Peterson, Ronnie Roark, Ross Taylor, Regis Terney, and Les Wadzinski.

Findings: The German Ridge trail segment with old rehabilitation treatment was found to be holding up quite well. The newly rehabilitated German Ridge segment was also found to be in good condition with a few observations and recommendations. These include: loose gravel posed some problem for the bike, a few places with large #2 rock need to be capped with finer material, get rid of root wads and mud balls for visual purposes, remove hazard trees, designate/mark the existing route west of the camp to connect the two trails, install more drainage structures west of the camp, and install a few signs at points of confusion.

The German Ridge segment by Krausch Hill was not treated, but found to be in good shape. There was some discussion about the need to harden the trail or not. One perspective is to harden in order to allow vehicular access to repair problem areas further back in. Another perspective is to leave alone and access the problem areas only during dry weather.

The group then visited Oriole trail to inspect a test area. There had been numerous complaints from the public about large rock on this trail. A segment was recently capped with 93's, a very fine mix. It appeared to be a good solution to the problem.

Conclusions: The group agreed that improving drainage with dozer work and hardening the trails with gravel was probably the best known method to deal with impacts from multiple use. Also, it was felt that with time and use the loose gravel will sink in and harden up, and quickly cease to be a concern. It was also unanimous that coarse rock should not be used as the tread surface, rather, it should be capped with a fine mix. There was agreement that single sized, clean rock such as the 7's was not desirable, but rather a mix with fines was preferable. The various properties of 53's and 73's were discussed, with the coarser rock holding better on a slope but with the finer mix offering a smoother tread surface. There was also some discussion about experimenting with custom mixes to achieve an optimal surface and eliminate the typical variations coming from the same stockpile. Overall the group found the trails to be in compliance with the Forest Plan.

1999 INTERDISCIPLINARY FIELD REVIEW

On Wednesday November 17, 1999 the Hoosier Operatoins and Strategy Team along with Regional Office employees Cheri Ford, Steve Kessler, and Don Pearson conducted an interdisciplinary team monitoring trip to the Roland Riparian Restoration project. The purpose of the field review was to determine if mitigation measures were being applied and followed as described in the Environmental Assessment.

The following people attended: Bette Buchheit, Ken Day, Jim Denoncour, Cheri Ford, Steve Kessler, Pam Kruse, Brad Lidell, Wilma Marine, Pat Merchant, Cid Morgan, Don Pearson, Ross Taylor, and Les Wadzinski.

Pat Merchant provided an overview of the restoration project. The project started in late October and was only partially complete in that only one of four restoration areas has been completed through a cooperative effort with the IDNR Division of Fish and Wildlife. Mitigation measures of mulching and seeding to protect soil and water resources after the levee construction are complete for that area. The review team felt that this was a good project and that mitigation measures were properly applied. The review team also visited the locations for the three remaining levee and wetland restoration sites.

FY 1998 Site Specific Project Decisions

| DECISION | DATE | COUNTY |
|--------------------------------------|----------|----------------------|
| Fuel Hazard Reduction Pile & Burn | 10/23/97 | Jackson Co. |
| Hilderbrand SUP Trail | 1/09/98 | Jackson Co. |
| Murphy SUP Trail | 1/09/98 | Lawrence Co. |
| Brownstown Office Exchange | 1/09/98 | Jackson Co. |
| Warren Alexander SUP | 3/02/98 | Perry Co. |
| Buried Water Line SUP | 4/15/98 | Crawford, Perry Co. |
| Temporary Road SUP | 6/03/98 | Monroe Co. |
| Sanders Exchange | 6/03/98 | Orange, Crawford Co. |
| Openings | 7/22/98 | All HNF Counties |
| Concessionaire Mgmt | 7/14/98 | Monroe and Perry Co. |
| Maumee-Poke Patch Salvage Project II | 7/16/98 | Jackson Co. |

FY 1999 Site Specific Project Decisions

| DECISION | DATE | COUNTY |
|--|----------|---------------------|
| Special Use Permit - Access Trail | 10/16/98 | Orange Co. |
| Special Use Permit - Telephone Line | 1/12/99 | Lawrence Co. |
| Road Access | 2/09/99 | Lawrence Co. |
| Prescribed Burn - Paoli Experiment Station | 2/16/99 | Orange Co. |
| Thompson Exchange | 3/26/99 | Jackson Co. |
| Pioneer Wagon Works | 3/26/99 | Jackson, Orange Co. |
| Reforestation Tree Planting | 4/15/99 | Perry Co. |
| Forest Openings Maintenance | 6/28/99 | All HNF Counties |
| Pipe Replacement Grouse Hollow Lake Dam | 7/21/99 | Lawrence Co. |
| Road Use Permit | 9/20/99 | Orange Co. |

Adjacent Lands [36 CFR 219.7(f)]

Consider effects of National Forest planned management on land, resources, and communities adjacent or near the National Forest and conversely, the effects on National Forest management from activities on nearby lands managed by other public land agencies or under the jurisdiction of local government. To be addressed from a perspective of current and emerging issues.

There is an interrelationship between the effects of National Forest management on nearby privately owned lands, and the effects of activities on nearby privately owned lands on National Forest management. This is particularly the case in south central Indiana, where NFS land is interspersed with private or other public lands.

Because of the limited amount of public land in Indiana, there are many demands for its use. According to the Indiana Statewide Comprehensive Outdoor Recreation Plan (SCORP) only 3 percent of the state is in public ownership and but a fraction of an acre is available per capita of public land for recreation. Of the public ownership in Indiana, 31 percent is within the Hoosier NF. The impact of this concentration of visitors obviously affects adjacent lands as well as providing benefits and opportunities to our neighbors.

The scattered landownership pattern of the Hoosier results in many neighbors whose activities effect National Forest management. Current demands that affect National Forest management on adjacent lands include: trail use, land prices, trespass, small forest products, other special uses, community development, and flood control.

Trail use -- In concert with the Forest Plan, demand for special use trails and permits to conduct events on NFS lands remains high. Most trail riding requests are for horse-riding events, but requests are also received for mountain bike events. A Fee Demonstration Program went into effect in 1998. On the Hoosier NF this program entailed requiring a trail use permit for all horse and bike riders on forest trails. The permits could be purchased as daily tags or as an annual trail use tag. This requirement has curtailed some users from recreating on NFS lands but the impact has been minimal. The reduction in some users visits to the forest may not have offset the trend for increased use. According to some adjacent businesses such as outfitters and private horse camps, the program may have impacted their customer base. However, most of these businesses have continued to expand and add improvements and appear to be booked to capacity every weekend during the recreation season.

Land Prices and Real Estate – Most realtors when advertising private land for sale mention if the land borders NFS land. People usually consider adjacent NFS land desirable even though the public land usually does not increase land values.

During 1998, the former Brownstown Office site and buildings were exchanged to the Brownstown Central Consolidated Schools. This real estate transaction provided much needed room for expansion to a local school district's administrative staff, ensured on-going use of this facility, and provided funds for additions to the Hoosier NF.

Trespass -- Trespass from NFS land to private land occurs inadvertently on a continual basis. Only a fraction of National Forest property boundaries are marked and identifiable. As a result, people using the Forest often wander onto private lands without realizing that they have trespassed. Local landowners complain about an increasing apathy on the part of these trespassers for attention to boundaries and a wanton disrespect for private landowner rights.

There is also the potential for private landowners to inadvertently trespass with land practices or use onto NFS land. As the numbers of neighbors increase through parcel subdivision, the likelihood of trespass also increases. Off-road vehicle use continues to be a problem as adjacent landowners illegally ride from their property onto NFS land. Efforts to apprehend these trespassers are extremely difficult since they do not access the Forest by public points but the damage they do to the forest resource can be substantial.

Typically, during the course of surveying and marking National Forest System land boundaries, encroachments and trespasses are found. Currently, we are attempting to resolve 8 of these cases using the Small Tracts Act authority, some are just small area's of yards, while others involve substantial improvements such as homes.

Resources permitting, we address these trespasses on a case-by-case basis.

Small forest products -- Frequent requests for small forest products include plant collection, grapevine collection, houselogs, fence posts, and other miscellaneous products. These requests may be granted or denied depending on how they fit within the Forest Plan guidance. Resource specialists determine the best locations and restrictions to be imposed. As appropriate, permittees pay a fee for the small forest products, commensurate with their value.

Other special uses -- Occasionally we authorize private enterprises to have the use of NFS land. One example are the concessionaire permits at Hardin Ridge, Indian/Celina Lakes and Tipsaw Lake Recreation Areas. These provide jobs and income to local people as well as services to NFS visitors in a cost-efficient manner. Other examples are private drives to access in-holdings or utility rights-of-way to develop rural areas. Permittees uphold permit requirements and pay a fee to the United States for the use of NFS land. They are granted non-exclusive use of the land. See the "Provide for Human and Community Development" section for special uses monitoring information.

One use of NFS land with a significant impact on the rural community is the Perry County transfer station and recycling center is located on NFS land near Branchville. This site was operated under a special use permit until it could be transferred to the County in a land exchange in FY 2000.

Community development -- Community development and private land management also affects the National Forest. Development and subdivision of private parcels increases the number of people adjacent to NFS land, thus increasing the potential for direct use by neighbors. Louisville, Kentucky and Bloomington, Indiana are two large cities that continue to expand. Commuters preferring to live in a more rural area are creating a demand for more home and development construction in the Forest area. Economic development, primarily in the vicinity of the Tell City Ranger District, has the potential to greatly change the demographics of Perry and Crawford counties. These developments include:

A Riverboat casino has gone in within 25 miles of the Tell City Ranger District. The casino is a big attraction which has increased development in the area by bringing in money and jobs. Although the casino is their destination, it is likely that some visitors will use the recreational facilities on NFS. Use patterns are still being established and monitoring has yet to determine the effect on NFS land.

Ohio River Scenic Byway – This 981-mile route, of which only a portion crosses NFS lands in three states, was nominated as a National Scenic Byway in 1996, but it has evolved in the last couple years into a growing tourist attraction. Brochures are now printed with loop tours off the byway through the Hoosier NF as well as other rural communities north of the river. Kiosks and signage have begun to go up with a unique logo for the route and in 1999, Indiana developed a partnership with the states of Ohio and Illinois to extend the route at each end through its

neighboring states. Promotional feature stories have now appeared in most Midwest media markets and the route is drawing more visitors to the area. Key to the route's attraction are the rolling hills and scenic overlooks on the Hoosier NF.

Perry County small industries -- Several small industries have constructed facilities in Perry County, drawing employment, and in turn residents to that area. Influx to the area has been on a steady incline, and has the potential to result in more visitors with greater variety of demands on the NFS land base.

Toyota plant -- Toyota has constructed a major facility within commuting distance to much of the Hoosier National Forest. The plant has provided employment to rural residents already living in the area as well as attracting more residents and development. In 1999, Toyota announced it would double the size of the current facilities so more jobs and expansion are expected. Adjacent satellite industries will also attract more people to the area thus increasing demands on National Forest System lands.

Steel plants -- AK Steel constructed a major steel mill in Spencer County, near the Tell City unit. The Wopaka Foundry in Perry County near Troy, IN now employs a significant number of people. The impact of these plants on the National Forest has not been determined.

Holiday World and Splashing Safari -- This growing amusement park is the oldest theme park in continuous operation in the nation. In recent years its popularity has grown and the park has put significant money into expansion and construction. Each year they've open a major new ride, and the number of visitors continues to spiral upwards. Hotels, restaurants and other tourist accommodations are springing up to accommodate these visitors. Many of these tourists will also camp on the Forest or visit other Forest areas during their trip to the amusement park.

West Baden Hotel Renovation -- The West Baden Springs Hotel has long been of interest to people from around the world. It was an architectural wonder when it was built shortly after the turn of the century. Historic Landmarks Foundation sponsors tours of the site including the ongoing renovations and the restoration of the hotel grounds. The tours have been very popular and helped in raising money for the project. In addition to the outstanding architecture, the dome encloses some fabulous artwork and a beautiful atrium. Cook, Inc. has funded most of the renovations for the hotel's current owner, Historic Landmarks Foundation. The property is being marketed in the hope that the new owner will finish the restoration and bring back visitors and affluence to the area. West Baden and French Lick were once popular resorts known for their hot springs and wonderful accommodations. A major fire and the 1930 depression played roles in the demise of this once famous landmark.

Flood Control -- Other than streams, creeks, and rivers, there are few natural bodies of water within the boundary of the Hoosier National Forest. Most of the existing lakes and ponds were designed primarily for flood control with recreation as a secondary use. Many of the dams are located above private lands. It is critical that these structures are sound and are within guidelines to ensure safety to those who live below the structures. Floods and storm damage resulted in higher risk situations, and in June of 1997, \$2.4 million were received to renovate Forest dams including: Springs Valley, Celina, Saddle Lake, and U-38 dam, all located on the Tell City Ranger District. The work has been ongoing through 1998, 1999, and 2000, including new access routes to Celina and U38 dams, new valves for Celina and U-38 Lake, spillway for Saddle Lake, and earthwork to stabilize the structures.

Demand [36 CFR 219.10(g)]

The Forest Supervisor shall review the conditions on the land covered by the plan at least every 5 years to determine whether conditions or demands of the public have changed significantly.

When we amended the Forest Plan in 1991, we emphasized the many demands for the National Forest. Demand for National Forest System resources was displayed and discussed in depth in the Draft Environmental Impact Statement Appendix B (p. 4-4 to 4-5) and in the Forest Plan Amendment (p. 3-3 to 3-4). The forest interdisciplinary team (ID team) estimated demands for dispersed recreation, developed recreation, timber, young forest, openings and shrubland, core areas, backcountry, and natural-appearing forest. Demand was estimated for each in order to address the management challenges of land ownership patterns, recreation use, oil and gas exploration, and biological diversity. The following demand and supply table shows the Forest Plan estimates for 1995 (an approximate midpoint of the Plan life), and for the year 2005 to show future demand trends.

FOREST PLAN DEMAND AND SUPPLY

| <i>Benefit</i> | <i>Projected Demand For 1995</i> | <i>Projected Demand For 2005</i> | <i>Projected Supply From Forest Plan</i> |
|--|----------------------------------|----------------------------------|--|
| Dispersed Recreation (Rec. Visitor Days - RVDs) | 272,000 | 347,502 | 267,000 |
| Developed Recreation (RVDs) | 120,000 | 168,315 | 120,000 |
| Timber (Million Board Feet) | 19.0 | 22.4 | 4.4 |
| Young Forest (Acres of 0-19 hardwood, 0-9 pine, or reverting openings) | 23,400 | 23,400 | 14,100 |
| Openings and Shrubland (Acres of maintained openings, red cedar, barrens, & utility corridors) | 6,300 | 6,300 | 5,800 |
| Core Areas (Acres) | 96,000 | 96,000 | 32,000 |
| Backcountry (Acres) | 78,000 | 78,000 | 53,000 |
| Natural-appearing Forest (Acres) | 185,000 | 185,000 | 96,000 |

As reported earlier in this report, recreation visitor days exceeded our expectations in 1998 and 1999 (525,000 actual versus 387,000 projected). Demand for other benefits has not changed appreciably since estimates were made in the Forest Plan Amendment.

Some people believe that controversy about national forest decisions demonstrates changes in demand. As stated in the April 8, 1991 Record of Decision (ROD) public concerns could not be completely resolved. Some forest users will continue to be dissatisfied with management direction (ROD, p. 17).

As evidence of this, in 1998 the Forest received five administrative appeals on proposed projects. The issues raised in these appeals included planning process issues such as National Forest Management Act, range of alternatives, purpose and need, cumulative effects, economic costs and benefits, and public involvement, as well as on-the-ground concerns such as potential impacts on reptiles and herps, Indiana bat, and migratory birds, and visual, monitoring, safety, and survey objections. The 1998 appeals were on German Ridge Restoration, Maumee Poke Patch project and the Sanders land exchange. The Regional Forester remanded the Maumee Poke Patch project back to the Hoosier to further analyze the impacts of the project on the endangered Indiana bat.

In 1999 three appeals were received on the forest opening project and two appeals were received on land exchange proposals. One appeal was for the Thompson Exchange and one for the Pioneer Wagon Works Exchange.

The planning process provides for people dissatisfied with project decisions to comment, appeal, and if still not satisfied, take legal recourse. In both 1998 and 1999 the Forest was involved in litigation on Plan implementation.

The ongoing debate over management of the Forest has not resulted from changes in demand, but a continuation of the debate over values. Society's values however, are part of what shapes management of the Forest, so we continue to analyze what people are telling us and what they want from their public lands.

The next section of this report is organized by Forest Plan goal. The appropriate regulations are referenced for each.

Protect and Manage Ecosystems

Restocked Lands [36 CFR 219.12(k)(5)(i)]

Assure lands are adequately restocked as specified in the Forest Plan (App. B, B-11 to B-13).

Reference: Annual National Forest Management Act (NFMA) Stocking Report.

Methodology: Certification for hardwood stands involved going to the particular stands and doing a walk through, observing the predominant species in the stand, and recording the percent stocked. Hardwood stand certification is based on a walk through and visual observation, no plots are taken. Seedling counts are taken on 1/750-acre plots at about one plot per acre. Examiners are trained by the Forest silviculturist to ensure information is collected consistently.

Criteria for judging acceptability: Decisions are based on the information collected.

Results: In FY 1998 and 1999, there were no stocking reports done.

Forest Plan met: Yes.

Roland Restoration Project – Tree Planting

Methodology: This report is based on observations of the Roland restoration project completed in T2N, R2W section 17 and 18 (compartment 67). The Forest silviculturist inspected the trees planted in the area in 1998 and to inventory surrounding stands for base line data. In 1998 we planted approximately 2,000 seedlings of various species with the purpose of increasing the species diversity in the area. Of the 2,000 seedlings planted, tree shelters were placed on eight percent of the trees. The area was planted without any site preparation.

Results: The first observation was not seedling survival but the tremendous amount of use in the area by wildlife. Upon reaching the area, the silviculturist flushed over ten great blue heron, green heron, kingfisher, numerous wood ducks and what was the surprise for the day, four white egrets. Without making detailed bird counts, it is obvious the wetland is being well-used and is functioning well.

Seedling survival was extremely low for seedlings outside the tree shelters. In the area sampled, the survival rate outside the tree shelters was less than five percent. Within the tree shelters, the survival rate was considerably higher was 75 percent. Based on the survival rate of seedlings planted in shelters versus non-shelters, if we are going to continue planting wetland areas they need to have some form of protection from deer predation and from surrounding vegetative competition. The deer predation was so severe in the area that on many of the tree shelters the tops have been chewed in an attempt by the deer to get at the seedlings. We should continue to use the 4-foot shelters.

Height growth appears to be adequate in the shelters. Since the tree shelters are biodegradable they should only last another four years and then begin to break down and thus they should not need to be manually removed.

Forest Plan met: Yes. The shelters were systematically placed on every 7th tree until they ran out, so some of all species were planted in shelters. Therefore, although more sparse than intended, the area will have some tree cover.

Recommendations: In future plantings to improve survival it would be best to have planting furrows prepared prior to planting in addition to using the tree shelters. With a survival rate of 75 percent we hope to maintain the number of seedlings planted from 50 to 300 seedlings per acre.

Insects and Disease [36 CFR 219.12(k)(5)(iv)]

Discover, report, and evaluate areas of infestations. Coordinate with State and Private Forestry (S&PF) and appropriate state agencies.

Methodology: The first observations of an outbreak of Introduced sawfly were made in 1996. Since that time, stands were monitored throughout the Forest for further signs of the sawfly. In 1998 and 1999, campgrounds in the Tell City area were checked for signs of the insect. Visual observations are made regularly in these pine stands.

Results: In 1999, there were no outbreaks on the Forest. There were outbreaks on private land in Spencer County that caused moderate to heavy defoliation, but no sightings on NFS lands.

Forest Plan met: Yes.

Recommendations: It appears that we can expect to have insect outbreaks thus the need to continue to monitor. At present this insect is not a problem.

Soil and Water [36 CFR 219.27(a)(1)(2)(4),(b)(5),(e),(f)]

Forest Plan Appendix J and K.

Monitor to ensure implementation and effectiveness of soil mitigation and protection measures are applied to all management activities.

Reference to relevant laws and handbooks: 36 CFR 219.27 (a) (1) & (2) & (f).
Forest Service Handbook (FSH) 2309.18 section 3.12b - Exhibit 02.
FSH 2509.22 section 6.34 -Exhibit 8.
Draft R9 Supplement, FSH 2509.18, Chapter 2.
Draft Indiana Forestry Best Management Practices Guidelines (08/30/96)

Mogan Ridge (West) Burn - Post Burn Monitoring

Standard: During a prescribe burn, we need to limit the amount of mineral soil exposed. The standard is, the entire forest floor (leaf litter, humus, etc) down to mineral soil should not be consumed by fire for over 50 contiguous square feet, or more than 5 percent of the area. Determine if minimum threshold values for soil disturbance are being met. (Draft R9 Supplement, FSH 2509.18 [9/27/90])

Acceptable Criteria: The entire forest floor down to mineral soil should not be consumed by burning, over more than 50 contiguous square feet, or more than 5 percent of a project area.

Methodology: On March 25 -29, 1998 the prescribed burn was carried out. The post burn ground cover assessment was conducted on April 2, 1998. The entire forest floor down to mineral soil should not be consumed by burning, over more than 50 contiguous square feet, or more than 5 percent of a project area. (Draft R9 Supplement, FSH 2509.18 [9/27/90]).

The methods used to complete the assessment were the Point Transect Method for Discrete Variables. Described in R5 interim directive for FSH 2509.18 Section 2.2, rev. draft September 1991.

Other methods used were Effective Ground Cover transect. One transect was taken in a northwest to southeast direction, 325 - 145 degree azimuth, which resulted in the transect running at a slight angle across the contour. The transect was on the upper midslope position of southwest side of Kuntz Ridge. This gave a good representative sample of the ground conditions.

Postburn data was taken at about every 10th pace. At each 10th pace a 1 inch square area at the boot tip was evaluated as to whether or not soil cover (organic material, living vegetation, or rock fragments >3/4 inch diameter) will effectively dissipate the energy of falling raindrops. More than 50 percent of the square is a yes, less than 50 percent is a no. One hundred paces equals 100 percent, therefore, 100 minus the number of points indicating bare ground equals the percent of the area having effective ground cover.

Results: After the burn, 89 percent of the area had effective soil cover. There were no observations made where all organic material was burned from the soil.

Forest Plan met: Yes. Minimum soil quality standards for soil erosion and severely burned soil were exceeded.

Salt Creek Salvage Sale.

On September 10, 1998 the soil scientist reviewed payment unit 6 (then closed) on the Salt Creek Salvage Sale. He checked the main haul road to assure that water diversion structures number and spacing were meeting the minimum standards.

Methodology: Access roads, log landings, skid trails, stream crossings, and streamside management zones were monitored to ensure that practices were implemented to protect the soil and water resources. The mitigation measures were effectively controlling erosion based on the lack of eroded soil in the small depressions and no evidence of channeling between measures.

Results: The soil and water protection measures including waterbar spacing and water diversions were correctly constructed and installed.

Forest Plan met: Yes, the construction technique, the number, and the adequacy of the waterbars installed met or exceeded standards.

Hickory Ridge Trail section

This project is a multiple use trail rehabilitation. The purpose of the project was to bring a portion of this multiple use trail to the minimum trail standard.

In August 1998, the soil scientist reviewed about one half mile of the trail rehabilitation completed at that time. Dozer work was complete to regrade the trail tread, repair and install water diversions, and stabilize the trail tread with gravel.

Methodology: Slope gradient, water diversion number, angle, and spacing were checked against the required trail standard.

Results: The soil and water protection measures, waterbar spacing and water diversions, were correctly constructed and installed.

Forest Plan met: Yes, the construction technique the number and the adequacy of the waterbars installed met standards.

Midwest Trail Riders (MTR) Permit Trail

Methodology: Trail construction standards as described in Appendix B of the Environmental Assessment for Midwest Trail Ride, Inc., dated March 14, 1996, were checked for implementation and effectiveness. Specific trail standards checked were: cross drain (waterbar) spacing and construction, gravel hardening in wet areas, and intersecting of rogue trails.

Trail A and B were inspected on March 11, 1999.

Results: Trail B cross drain spacing for the most part was implemented. Construction of the cross drains did not meet the implementation standard. Cross drains just built with native soil materials and not re-enforced with eight inch round or square treated posts. Gravel or rock was also not used. The earthen cross drains were wearing through and will need to be reshaped. The process of reshaping and cleaning out (maintenance) will continue to entrench the trail tread. Two rogue trails blocked with brush were not adequately blocked and were receiving enough use to show wear.

Trail A is the main trail that leaves the camp so it receives a lot of use. It crosses the floodplain of an unnamed intermittent stream. During the wet season and when the area is receiving a lot of rain, this area of the trail floods. Water moving across the trail has a fairly strong current. The trail is trenching in this area and needs to be specifically engineered. A suggestion is to dig out the soil and replace with construction fabric and various gravel sizes. This should "storm proof" the trail and allow it to hold up against "trenching". MTR loop "A" runs up to a pine ridge. The cross drains near the switchbacks are not constructed according to standard and need to be reconstructed and the switchbacks hardened. Along Trail A there is a parallel trail that goes down to an old house site. This trail is not an approved part of the trail permit and needs to be closed. The remainder of Trail A has adequate cross drains but they have not been constructed to standard.

The MTR Trail Construction Standards (Appendix B of EA for MTR, Inc. Special Use Application) are not being implemented. An adequate number of cross drains have been located correctly but they have not been constructed with the right materials. This is causing the cross drains (waterbars) to be worn through. Because hardening is not being implemented, "trenching" is occurring on certain portions of the trail. Reshaping, cleaning out the waterbars and pushing in the "trenches" will allow the water to move off the trail but this activity also keeps the soil in the trails and on the cross drains in a loosened condition which makes it more susceptible to erosion.

Criteria for being acceptable: Environmental Assessment for MTR, Inc. Special Use Application, Appendix B - MTR Trail Construction Standards.

Forest Plan met: No.

Caves and Karst [36 CFR 219]

Conduct surveys to begin development of six cave management plans; begin ecological inventories.

Legal or Regulation Reference: Federal Cave Resources Protection Act of 1988 (FCRPA), 36 CFR 290, Forest Plan Appendix I

Methodology: Identify areas where caves and karst features may be found. Systematically visually inspect potential areas to locate caves and karst features and then map each feature. Conduct various inventories to determine cave values and management recommendations.

Results: This program depends on caver volunteers to do the actual base level inventories and cave mapping. Their accomplishments in the past two years include:

FY98 – There are 98 caves on the Hoosier, two additional ones were located, completed inventories of the cave resources in four caves, completed and had one cave management plan approved by the Hoosier National Forest. Completed cleanup work at Wesley Chapel Gulf during Take Pride in America Day.

FY99 – There are 106 caves on the Hoosier, eight additional ones were located, completed inventories of the cave resources in one cave, three cave management plans have been drafted, and 14 caves were nominated for significance under the Cave Resources Protection Act. A draft management plan was completed for the Wesley Chapel Gulf area. The Hoosier National Forest / Indiana Karst Conservancy committee received the Eastern Region Honor Award for Environmental Protection for

“the continued inventory and evaluation of the karst resource on the Hoosier National Forest”. The cleanup work at Wesley Chapel Gulf was continued during Take Pride in America Day. In addition, 20 tons of garbage and debris were removed from the sinkholes at Wesley Chapel Gulf.

Forest Plan met: We continue to work on acquiring locations, mapping interiors, listing resource values, and writing individual management plans (Forest Plan Appendix I). The basic inventories must be completed before we write individual cave management plans, so only a few of these have been initiated. The plan does not specify a time frame for completion.

Recommendations: Caves recommended for significance are required to be verified. When verification is complete, those caves that meet the significance criteria will be designated as such.

Vegetative Management [36 CFR 219.15 and 219.27(b)]

Monitor Plant Collection Activities on the Hoosier National Forest

Methodology: From 1993 through 1999, plant collecting has been allowed by permit on the Hoosier National Forest in M.A. 2.4, 2.8, 6.2, and 6.4. Permittees could collect any plant that is not on the list of excluded species. They have been required to tell us specifically what plants they will collect and a general location where they collect those plants. Permits were sold for \$10 regardless of how many species were collected or volume taken. In 1997 ginseng and goldenseal were added to the list of plants which could **not** be collected on NFS lands. This was in conjunction with the State of Indiana banning collecting on their lands due to concerns that populations of these plants, if collections continued, were no longer sustainable.

Results: In 1998, the number of permits dropped to 14 from a high of 529 permits in 1996. Without being able to collect ginseng and goldenseal, few collectors bothered to get a permit. In 1999, no permits were issued. With few permits issued and to eliminate confusion between plant collecting regulations on NFS and state lands, permits are no longer issued. Without the pressures of collecting, the hope is that the plant populations will rebound and botanists will monitor how long it will take the plant populations to recover.

We have not seen resource impacts from collection of cones, fruits, and mushrooms. There has been no indication of large, commercial interests collecting on the Hoosier. Because of this, we will continue to allow collection of these products without restrictions.

Monitor the proposed Buzzard Roost project area

Methodology: Conduct pre-treatment monitoring for birds, reptiles, and amphibians in the Buzzard Roost project area.

Results: A forest biologist conducted pre-treatment monitoring in 1998, in the area of the proposed Buzzard Roost project. He monitored for birds and amphibians in the vicinity of the Oriole-east trail. This trail was chosen because it runs through treated and untreated portions of the project area, and also through pine stands, upland forests, moist forests, and barrens. For a project like the one proposed for the Buzzard Roost area, it is important to have baseline information on species of concern. Information gathered on birds during this informal survey can also be used as Forest Plan monitoring for several management indicator species.

For bird monitoring, a point count survey route was established using the Oriole-east multiple use trail. The survey began from the point where the trail forks along the Perry/Crawford County line about 3/4 mile west of Deuchars, Indiana. Monitoring sites were at approximately 1,000-foot intervals heading counter-clockwise around the loop of the trail, the first being 500 feet from the fork. In total, there were 22 monitoring points around the loop. The plots were established according to recommendations made by Thompson (in prep.). The plots were of unlimited radius. Each point was visited twice during the breeding season (June) for five minutes each time for greater efficiency. The species heard or seen and their numbers were recorded for each site.

A total of 43 species were observed during the two survey visits made to each site and two additional were observed at other times during June. Seven of the ten most frequently observed species in the Buzzard Roost area were also among the ten most frequently seen during the Hoosier's Forest-wide surveys of 1991 to 1993: Acadian flycatcher, red-eyed vireo, American crow, tufted titmouse, worm-eating warbler, ovenbird, and scarlet tanager (Thompson, in prep.). Of note, although the brown-headed cowbird was among the top ten species on the Forest-wide survey, it was found only six times at Buzzard Roost. The complete list of plot data may be found in **Appendix A**.

A survey for reptiles and amphibians was conducted in the headwaters of Mill Creek from Jeffries Cemetery along a portion of the Oriole-east trail. As a result of a four-hour timed search for herps, only four species of amphibians were found: green frog, northern cricket frog, southern leopard frog, and long-tailed salamander. The listing of numbers of each species may also be found in **Appendix A**.

Research Natural Areas (RNA's) and Special Areas (SA's) and Potential Candidates [36 CFR 219.25]

Monitor exotic plants in RNA and Special Areas

The Forest Service has worked cooperatively with IDNR, Division of Nature Preserves, to monitor invasive plants in special areas across the Forest. While invasive plants were found in virtually every site on the Forest, the sites shown below had populations of concern because they were either very important natural features threatened by invasive plants, or had an exceptionally "heavy" invasive plant population. The following preliminary results were reported:

| <i>Area Name</i> | <i>Invasive Species</i> |
|------------------------------------|--|
| Plaster Creek Seeps | reed canary grass |
| Deam Wilderness | garlic mustard, autumn olive, Hosta, Japanese honeysuckle, Microstegium, myrtle |
| Clover Lick Barrens | crown vetch, potato vine, autumn olive, day lily, Japanese honeysuckle, sweet clover, Microstegium, bush honeysuckle |
| Carnes Mill | Japanese honeysuckle, moneywort, Microstegium, unknown ground cover |
| Pioneer Mothers | garlic mustard, Japanese honeysuckle, bush honeysuckle |
| Rockhouse Hollow | autumn olive, Japanese honeysuckle, Microstegium, bush honeysuckle |
| Oil Creek Cliffs/Peter Cave Hollow | garlic mustard, Microstegium |
| Boone Creek Barrens | Lespedeza sp., garlic mustard, sweet clover, Microstegium |
| Buzzard Roost | garlic mustard, Japanese honeysuckle |

IDNR, Division of Nature Preserves also separated the above invasive plants into three categories: most threat; medium threat; and least threat, as follows:

Most -- garlic mustard, crown vetch, potato vine, Japanese honeysuckle, sweet clover, Microstegium, bush honeysuckle, and reed canary grass.

Medium -- autumn olive, Lespedeza sp., and moneywort.

Least -- teasel, day lily, Hosta, multiflora rose, Johnson grass, and periwinkle.

Trail Width/Depth -

Methodology: A monitoring point was established along the trail through the glade on April 5, 1995 to collect data on the trail width and depth. A piece of 1/2" diameter rebar was placed on each side of the existing trail a few meters off the trail itself to serve as permanent markers. Photos were taken of the trail as well. Note - monitoring was only established for the glades since we could not find an evident trail in the seeps.

| <u>Results:</u> | Date | Width | Depth |
|-----------------|---------------|---------------|-------|
| | April 5, 1995 | 23.6" | 4.3" |
| | April 1996 | Not monitored | |
| | April 1, 1997 | 19.7" | 4.7" |

Photos do not show that the trail is any more evident than it was in 1995.

Recommendations: The trail is not getting wider, but it is getting a bit deeper. Width and depth should continue to be monitored to see if this is a continuing trend.

Management Indicator, Federal Threatened, Endangered, and Regionally Sensitive Species of Concern [36 CFR 219.9]

Monitor bald eagle activities near Lake Monroe, in coordination with USDI Fish and Wildlife Service (USFWS).

Methodology: The Brownstown District initiated informal consultation with the USFWS in 1993 to ensure protection of nesting and roosting bald eagles on NFS lands near Lake Monroe. We issued closure orders to protect areas surrounding the nest and winter roost site, and monitored to determine the effectiveness of the closure orders.

Winter roost site:

Winter roost site - In 1998, the closure order was lifted when it was determined the winter roost site was no longer being used.

Bald eagle nest site:

IDNR - Division of Fish and Wildlife coordinates monitoring of bald eagle nests. In 1998, one nest on the Forest had eagles reported near it on each of the three dates the nest was checked. To our knowledge, no chicks were fledged in 1998. However, in 1999, one chick was fledged from the same nest. This nest site is still protected by the closure order. The IDNR no longer bands eagle chicks, but the nests are still checked 2-3 times (March, April, June) by helicopter to determine how many chicks are produced.

Monitor populations of butternut (*Juglans cinerea*), a Regional Forester's Sensitive Species.

Methodology: All live butternut trees (approximately seven are known on the forest) are to be monitored using the butternut monitoring form: dbh, percent of live crown, and fruits produced.

We monitored one of these trees near Hemlock Cliffs in FY 1999. The tree was infected, not doing well but was still alive.

Fish and Wildlife [36 CFR 219.19]

Coordinate with IDNR Division of Fish and Wildlife in monitoring fish populations in "selected waters" and wildlife populations in forest areas.

Controlling Aquatic Plants

Methodology: The Forest Service has implemented projects designed to control overabundant aquatic plants in Forest waterbodies. The following is a status report on the success of the projects.

Project 1: Use of grass carp to control aquatic plants in small fishing ponds.

Tripliod grass carp were stocked into 5 small fishing ponds on the Hoosier National Forest to control aquatic plants. Grass carp are herbivorous fish that eat submergent and floating-leaved species. The project would be considered successful, if after five years, grass carp maintained the aquatic vegetation at less than 25% coverage of the pond.

Results: Each pond was visited during July and/or August in 1998 and 1999, and a visual estimation was made of plant cover and plant community composition.

Henderson Pond - Ten grass carp were stocked in this pond in 1994 to control watershield, (*Brasenia schreberi*). No change in plant cover or composition was observed through 1999. Henderson Pond was restocked with 18 grass carp in May 1999 in order to evaluate the grass carp for an additional five years. A very slight decrease (~10 percent decrease) in coverage was noted in August 1999, three months after the fish were restocked. However, this decrease could be attributed to the grass carp, or to the lowered levels of the pond (the drop tube was leaking and the pond level was about 8"-10" below normal).

White Oak Pond - Grass carp were stocked in White Oak Pond in 1996 to control American lotus, (*Nelumbo lutea*). Prior to stocking the grass carp, 80 percent of the pond surface was covered by American lotus. By September 1997, the grass carp had thinned the lotus coverage to about 20 percent, and in 1998 and 1999 there were just a few lotus plants present. Grass carp were successful at controlling lotus. Submergent plants were present in small numbers around the pond edge (*Potamogeton* spp.).

Maines Pond - Grass carp were stocked in Maines Pond in 1996 to control American lotus, (*Nelumbo lutea*). Prior to stocking the grass carp, 70 percent of the pond surface was covered by American lotus. By September 1997, the grass carp had thinned the lotus coverage to about 15 percent, and in 1998 and 1999 there were just a few lotus plants present. Grass carp were successful at controlling lotus. Watershield (*Brasenia schreberi*) established around the margin of the pond after the lotus disappeared. Grass carp are not controlling the watershield. Submergent plant species are present in small numbers around the pond edge (*Potamogeton* spp., *Najas* spp.).

Sulphur Pond - Grass carp were stocked in Sulphur Pond in 1996 to control watershield (*Brasenia schreberi*). It covered 70 percent of the pond's surface. No change has occurred to the watershield since the grass carp were stocked.

Timberlake Pond - Grass carp were stocked in Timberlake Pond in 1996 to control watershield (*Brasenia schreberi*). It covered 70 percent of the pond's surface. No change has occurred to the watershield since the grass carp were stocked.

Recommendations and Summary: Grass carp were useful in controlling excessive amounts of American lotus in these small fishing ponds. Grass carp may prove to be a useful tool for controlling American lotus in other small fishing ponds on the Forest. Grass carp have not had an effect on the excessive watershield coverage on the ponds to date. We will continue to monitor Henderson, Sulphur, and Timberlake for changes.

The drop tube at Henderson Pond needs to be repaired to maintain water levels at normal pool.

Population of Game Animals

IDNR biologists collect information on several game species in the Hoosier National Forest area. To some extent these game populations can be used as barometers of the health of other wildlife. The following chart indicates a general trend in turkey populations as indicated by the spring harvest of gobblers. IDNR records 1999 as the 17th consecutive year for an increase in harvest numbers. Biologists believe that the populations in many areas are now at long term habitat carrying capacity.

TURKEY HARVEST INFORMATION

| Year | Reported Harvest | % 1 Year old | Avg. Weight | % 2 Year old | Avg. Weight | % 3+ Years | Avg. Weight |
|------|------------------|--------------|-------------|--------------|-------------|------------|-------------|
| 1988 | 905 | 45% | 15.4 | 39% | 20.7 | 16% | 21.8 |
| 1989 | 1,359 | 20 | 15.5 | 63 | 20.7 | 17 | 22.2 |
| 1990 | 1,505 | 31 | 15.2 | 41 | 21.0 | 28 | 21.9 |
| 1991 | 2,318 | 25 | 15.5 | 53 | 21.1 | 22 | 22.2 |
| 1992 | 2,531 | 38 | 15.1 | 43 | 20.8 | 19 | 22.2 |
| 1993 | 3,500 | 18 | 15.9 | 60 | 20.9 | 22 | 22.4 |
| 1994 | 3,741 | 41 | 15.2 | 37 | 21.2 | 22 | 22.4 |
| 1995 | 4,706 | 28 | 15.6 | 55 | 20.6 | 18 | 22.1 |
| 1996 | 4,859 | 24 | 15.6 | 53 | 21.6 | 23 | 22.7 |
| 1997 | 5,790 | 21 | 15.7 | 56 | 21.5 | 24 | 22.7 |
| 1998 | 6,384 | 22 | 15.5 | 51 | 21.1 | 28 | 22.5 |
| 1999 | 6,548 | 25 | 15.5 | 49 | 21.1 | 26 | 22.6 |

Roadside gobbling counts are conducted by IDNR - Fish and Wildlife along certain roads on NFS lands. The results are shown below for routes on USFS land. A DNR Biologist concluded brood production was below average during the 1996 summer season. Each route was driven twice with 15 stops along the route between 2-20 April, 1998 and between 7-23 April, 1999.

ROADSIDE GOBBLER COUNTS

| County/Area | 1998 Total Turkeys Heard/ Seen | 1999 Total Turkeys Heard/ Seen | Total Heard per stop in 1996 | Total Heard per stop in 1997 | Total Heard per stop in 1998 | Total Heard per stop in 1999 |
|---|--------------------------------|--------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Jackson, Brown, Monroe/ <i>Hickory Ridge Area</i> | 32/8 | 22/0 | 1.13 | 0.67 | 1.40 | 0.80 |
| Perry County/ <i>Oriole - St Croix Area</i> | 13/0 | 13/0 | 0.80 | 0.87 | 0.47 | 0.47 |
| Lawrence and Orange/ <i>Lost River East Area</i> | 18/2 | 31/0 | 0.60 | 0.73 | 0.60 | 1.27 |
| Martin and Orange/ <i>Lost River West Area</i> | 13/5 | 47/1 | 1.47 | 0.47 | 0.53 | 2.53 |
| Orange County/ <i>Lick Creek Area</i> | 7/1 | 23/0 | 0.53 | 0.60 | 0.27 | 0.87 |

FURBEARING ANIMALS – South central Indiana

(South central Indiana Region contains all NF counties as well as an additional four counties)

The information for the 1998-99 season is not available at this time.

| Season | # Pelts Sold | Muskrat | Raccoon | Red Fox | Grey Fox | Mink | Opossum | Skunk | Beaver | Coyote | Weasel | % collected Statewide |
|---------|--------------|---------|---------|---------|----------|------|---------|-------|--------|--------|--------|-----------------------|
| 1996-97 | 10,212 | 1,763 | 7,580 | 99 | 93 | 124 | 394 | 8 | 112 | 39 | 0 | 4.61% |
| 1997-98 | 7,485 | 1,052 | 6,213 | 42 | 51 | 34 | 39 | 0 | 46 | 8 | 0 | 2.53% |

Statewide in the 1997-98 season 27,367 pelts were purchased/collected: 29% were in the northeast region of the state, 14% in the southwest region. Total value statewide of pelts was \$2,064,987. Of that amount, \$58,260 was paid in the south central region.

RUFFED GROUSE DRUMMING COUNTS

Drumming counts are conducted by IDNR - Fish and Wildlife along certain roads on NFS lands. The results are shown below for routes on USFS land. Grouse populations are declining due to habitat changes from advancing forest succession. Parallel declines may also be expected in other early forest successional birds such as woodcock and rufous-sided towhees. Each route was driven twice with 30 stops along the route between 2-21 April, 1998 and 7-23 April, 1999.

| County/Area | 1997 Grouse Heard/ Seen | 1997 Total Drums | 1998 Grouse Heard/ Seen | 1998 Total Drums | 1999 Grouse Heard/ Seen | 1999 Total Drums |
|---|-------------------------|------------------|-------------------------|------------------|-------------------------|------------------|
| Jackson, Brown, Monroe/Hickory Ridge Area | 3/0 | 6 | 6/0 | 13 | 1/0 | 2 |
| Perry County/ Oriole - St Croix Area | 1/0 | 1 | 0/0 | 0 | 1/0 | 2 |
| Lawrence and Orange/ Lost River Area | 15/0 | 27 | 14/2 | 29 | 8/0 | 16 |
| Martin and Orange/ Lost River Area | 1/0 | 1 | 4/0 | 6 | 24/0 | 41 |
| Orange County/ Lick Creek Area | 2/1 | 3 | 2/0 | 2 | 0/0 | 0 |

Trends from drumming count indices - grouse heard per stop per year

| County/Area | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Jackson, Brown, Monroe/Hickory Ridge Area | 0.40 | 0.33 | 0.67 | 0.47 | 0.13 | 0.13 | 0.07 | 0.20 | 0.13 | 0.13 | 0.20 | 0.27 | 0.07 |
| Perry County/ Oriole - St Croix Area | 0.20 | 0.07 | 0.21 | 0.13 | 0.07 | 0.13 | 0.13 | 0.07 | 0.07 | 0.07 | 0.07 | 0.00 | 0.07 |
| Lawrence and Orange/ Lost River Area | 0.27 | 0.33 | 0.27 | 0.37 | 0.40 | 0.27 | 0.33 | 0.40 | 0.47 | 0.33 | 0.53 | 0.53 | 0.40 |
| Orange County/ Lick Creek Area | 0.33 | 0.47 | 0.73 | 0.47 | 0.53 | 0.40 | 0.40 | 0.40 | 0.40 | 0.20 | 0.07 | 0.07 | 0.00 |

Protect our Cultural Resources

Cultural and Heritage Resources [36 CFR 219.24]

Project reviews to ensure mitigation and protection measures are correctly applied for ground disturbing activities.

Legal/Regulations Reference: Antiquities Act of 1906; National Historic Preservation Act of 1966 as amended; Executive Order 11593; Archaeological Resources Protection Act of 1979; 36 CFR 219, 296, 800.

Methodology: Methods include literature reviews, field inspections, and surface and subsurface investigations. Using original site forms and associated sketch maps we make a site condition assessment. Any change is noted in these permanent records. If applicable we develop, recommend, and implement mitigation measures.

Acceptable Criteria: Project areas are inspected for the presence of historic and prehistoric properties prior to project implementation. Potentially significant properties are protected. Discovery of unrecorded resources is brought to the attention of the forest archaeologist.

Results: In 1998, a prehistoric site located within the Pine Salvage area was monitored after the sale was closed. The mitigation measures recommended the fallen timber be removed by pulling cable to ensure minimal ground surface disturbance while providing better access to the site so it could be more thoroughly investigated. Due to the wet ground conditions, however, the purchaser did not cut that portion at all. In fact the buffered area established around the site to exclude mechanized timber harvest was completely omitted from the sale. The site condition is the same as it was after the timber blew over.

In 1999, the National Register of Historic Places listed Rickenbaugh House (12 Pe 784) was monitored for historic and prehistoric artifacts during construction of a drainage swale along its east side. The archaeological component of the site was previously investigated and the area was monitored during construction to document additional materials or features, if encountered. No features were identified, and all artifacts were collected at that time. This building was monitored at many times during the year as Phase I of the rehabilitation was completed.

No additional project monitoring was conducted.

Recommendations: Continue to monitor projects in the vicinity of potentially eligible properties to ensure protection measures are implemented.

Forest Plan met: Yes.

Monitor several National Register listed sites and potentially significant sites to ensure resource protection, forest-wide.

Legal or Regulation Reference: Antiquities Act of 1906; National Historic Preservation Act of 1966 as amended; Executive Order 11593; Archaeological Resources Protection Act of 1979; 36 CFR 219, 296, 800.

Methodology: Methods include literature reviews, field inspections, surface and subsurface investigations. Using original site forms and associated sketch maps we make a site condition assessment. Any change is noted in these permanent records. If applicable we develop, recommend, and implement mitigation measures.

Acceptable Criteria: New resource damage does not occur and vandalism does not increase, i.e. deterioration/collapse of significant buildings is avoided and rockshelters are not looted. Steps are taken to protect sites through public education, signing and law enforcement activities.

Results: During the Ball State University rockshelter project in FY 1998, seven rockshelters were monitored. One of those (Indian Cave) was further investigated through archaeological excavation. No looting was noted, and only one rockshelter showed evidence of vandalism (carved peace sign). Some of these shelters were documented through Global Positioning System (GPS) technology.

Also in FY 1998, the Thomas and Roberts Family Cemetery (formerly known as Lick Creek Cemetery) was monitored. A local boy scout troop removed brush to clear out the cemetery. The troop also removed the large stone monument which depicted inaccurate information.

The Rickenbaugh House was monitored as well in 1998, and a partner (Lincoln Hills RC&D) received a grant to begin its rehabilitation.

One prehistoric (12 Lr 200) and one historic site (12 Or 184) were also monitored during 1998. No new disturbance was noted.

In FY 1999, the Ball State University rockshelter project monitored approximately 5 rockshelters. A limited degree of past looting activities were observed, although no recent disturbance was noted. These shelters were documented through Global Positioning System (GPS) technology.

The Thomas and Roberts Family Cemetery (formerly known as Lick Creek Cemetery) was monitored on the 1999 Take Pride in America Day. A group of volunteers removed brush to clear out the cemetery.

There was one report in 1999, of an individual potentially looting artifacts from rockshelters in Mogan Ridge. Limited surveillance by law enforcement did not result in confirmation of illegal activity. Six rockshelters (12 Pe 98, 12 Pe 100, 12 Pe 522, 12 Pe 841, 12 Pe 854, and 12 Pe 855) were visited to assess their condition. No new evidence of looting was observed.

At least one historic site was monitored by Forest Service engineering technicians in 1999, during the roads GPS project (12 Pe 795). No new disturbance was noted.

Forest Plan met: Yes.

Recommendations: Continue to monitor significant and potentially significant sites throughout the Forest to ensure their protection.

Provide for a Visually Pleasing Landscape

Visual Quality Objectives [36 CFR 219.21]

Monitor project design and execution to ensure visual quality objectives (VQO's) are met.

Legal/Regulation Reference: 36 CFR 219.21 (f), Forest Plan (p.2-15 to 2-16)

Methodology: Inspect projects that affect landform, water, vegetation, and structures; furthermore, compare effects to Forest Plan criteria.

Acceptable Criteria: Meet the VQO's stated in the Forest Plan

Results: Projects that potentially affect the VQO's include soil and water improvements, wildlife opening maintenance, prescribed burns, trail maintenance, trail construction, and recreation construction. All projects inspected in 1998 and 1999 met the assigned VQO.

Forest Plan met: Yes

Recommendations: Continue to follow VQO principles on all projects and coordinate with forest landscape architect.

Provide for Recreation in Harmony with Natural Communities

Wilderness Management [36 CFR 219.18]

Monitor Wilderness Resources according to Wilderness Implementation Schedule (WIS).

Legal or Regulation Reference: 36 CFR 219.18, Forest Service Manual (FSM) 2320, FSH 2309.19 R9 Supplement 1, Forest Plan (pp. 2-36 through 2-39).

Methodology: Visual observation of limits of acceptable change (LAC) indicators per the WIS monitoring schedule.

Acceptable Criteria: Limits for acceptable change (LAC) standards as developed for the Charles C. Deam Wilderness.

Results: All areas monitored were within LAC standards. However, in 1998, some trails were located in the flood plain of Lake Monroe and, when the water was high, users made their own trails around the flooded areas. Trails subject to flooding should be moved to higher ground to prevent illegal use and to protect the environment. In 1999, all areas monitored were within LAC standards.

Forest Plan met: Yes.

Recommendations: Continue to follow WIS and LAC standards.

Garlic mustard monitoring in the Deam Wilderness

Methodology: Roads in the Deam Wilderness area were inventoried for garlic mustard for the fourth year.

Results: In FY98, we pulled approximately 200 plants along the Tower Ridge Road east of the entrance to the Blackwell Horse Camp. The population appears to be getting smaller, however, an additional 20 plants were located and pulled on the south side of the road down in the ravine, which is a new location.

In FY99, the sites in the vicinity of the Blackwell Horse Camp were examined on April 14, May 12, May 18, and June 1, 1999 and no garlic mustard plants were located.

Recommendations: The site will continue to be monitored in FY00 to determine if the plant is still present.

Recreation Facilities [36 CFR 219.21(C)]

Monitor public feedback to trailhead, campground, sign, and restroom designs and function, including accessibility.

Legal or Regulation Reference: 36 CFR 219.21(c), FSM 2300, Forest Plan (pages 2-17 and 2-18)

Methodology: Public comment is obtained from phone-ins, letters, Congressional inquiries, the "Serving People" customer survey cards, and personal contacts at Brooks Cabin, district offices, and field contacts. Comments are also occasionally found on bulletin boards or in the form of graffiti.

Acceptable Criteria: There is no standard regarding this type of public feedback. However, each comment is evaluated and action taken if warranted.

Results: In FY 1998, the national customer comment cards yielded excellent response numbers and a timely feedback by those responsible for tabulating them. Most of the comments were positive and complemented good service or nice facilities. However, complaints were also received and were followed up on for resolution. Suggestions were also evaluated and acted upon as appropriate. For example, calls for better parking at the Nebo Trail resulted in a safer parking lot. Another example was the installation of an accessible loading facility at the Hardin Ridge boat ramp. Also, 1998 was the first year of the recreation fee demonstration program and yielded many complaints. The most common issue was that of disagreeing with the concept of having to pay a fee to use public facilities. However, the fee requirements were relaxed for children in response to suggestions to make the program more family friendly. Another issue that arose was the use of gravel on trails. Again, in response to public input, the gravel mix was changed to a finer grade to meet the desires of trail users.

The Forest management team focused on trails for the annual monitoring trip. The German Ridge trail was reviewed, and segments of old treatment, new treatment, and no treatment were compared. Overall the trail was found to be in good condition.

Forest Plan met: Partially. As a result of scarce resources, the recreation program is not functioning at full level. Most notably, there is a backlog regarding replacement or rehabilitation of aging facilities, non-accessible facilities, and degraded trails.

Recommendations: Consider additional changes to the recreation fee demonstration project after analyzing input from the fee demonstration national comment card. Continue to pursue capital investment funds to improve facilities. There was no common thread about any particular issue although there were many separate comments about facilities and policy. Some folks wanted more opportunities such as trails and campground amenities, or had suggestions about how we could improve things such as better maps and better directions to trails. Positive comments were also received regarding enjoyable recreation experiences. All suggestions and comments were reviewed and analyzed to determine if further action was necessary. For example, signs directing people to trail heads have been installed, and a detailed trail map was developed along with recreation and trail information on the website. Complaints were followed up with a phone call or letter outlining corrective action as appropriate.

Trails [36 CFR 219.21(G)]

Trail use monitoring on selected trails. Evaluate the type and amount of use.

Legal or Regulation Reference: 36 CFR 219.21

Methodology: We estimate amount, timing, and type of use by season through observation of vehicles at trailheads, litter along trails, trail impacts, and number of people encountered along the trails.

Acceptable Criteria: For trails in the Charles C. Deam Wilderness, acceptable use criteria is based on limits of acceptable change (LAC) social indicators for trails. We have no formal specific use criteria for forest-wide trails; however, we use the following general criteria: use must be high enough to justify keeping the trail on the system, yet not so high that severe resource damage occurs or undue user conflict occurs. This criteria is influenced by site specific conditions such as soil types, topography, weather, and use type.

Results: In FY 1998, use appeared to remain constant from FY 1997 in spite of the new fee program. The introduction of the recreation fee demonstration project has the potential to provide additional information about use. However, because the program started late in the year, and because of the initial learning curve in getting people to buy the permits, the first year's tally is not felt to be reliable. The Ogala Trail continues to show little signs of use. Illegal ATV use appears to be picking up at German Ridge, Oriole, Youngs Creek, and Lick Creek. In 1999, there were 1,188 annual tags sold and 6,378 daily tags to horse and bike users.

Forest Plan met: Yes. Generally, Forest trail use is within moderate levels, with sporadic high use periods at some locations. Trail conditions have now been upgraded in most areas where work was needed to sustain the levels of use and to provide environmental protection.

Recommendations: Pursue a Challenge Cost Share with Indiana University to obtain specific use data on trail use.

Provide for a Useable Landbase

Land Ownership

Report land status changes by County, District, and Management Area

Land Acquisition Cases by County and District

FY 1998

| COUNTY | DISTRICT | ACREAGE | VALUE (\$) | Management Area |
|--------------|------------|------------|------------------|-----------------|
| Crawford | Tell City | 295 | \$299,423 | 2.4, 2.8, 8.2 |
| Jackson | Brownstown | 180 | 211,500 | 2.8 |
| Monroe | Brownstown | 1 | 2,500 | 6.2 |
| TOTAL | | 476 | \$513,423 | |

FY 1999

| COUNTY | DISTRICT | ACREAGE | VALUE (\$) | Management Area |
|--------------|------------|------------|--------------------|-----------------|
| Brown | Brownstown | 316 | \$1,500,000 | 2.4 |
| Martin | Tell City | 65 | 50,500 | 2.8 |
| Orange | Tell City | 6 | 9,000 | 2.8, 7.1 |
| TOTAL | | 387 | \$1,559,500 | |

Land Exchange and other Adjustments by County and District

FY 1998

| COUNTY | DISTRICT | ACREAGE | VALUE (\$) | Management Area |
|--------------|------------|--------------|-----------------------|-----------------|
| Crawford | Tell City | -80.00 | \$92,500 ¹ | 2.8 |
| Jackson | Brownstown | -4.56 | 325,000 ² | -- |
| Orange | Brownstown | +86.25 | 78,000 ³ | 6.4 |
| Orange | Tell City | -3.56 | ⁴ | 2.8 |
| Perry | Tell City | -0.45 | 448 ⁵ | 2.8 |
| TOTAL | | -2.32 | | |

¹ - Land Exchange – federal land value

² - Sisk Act Exchange – received value of administrative site in exchange for land; money will be used to purchase additional land.

³ - Land Exchange – private land value – also received cash equalization payment of \$14,500 to equalize values.

⁴ - Title Claim – resolved error from USA deed; no value determined.

⁵ - Small Tract Act – two cases; resolved errors in surveys.

FY 1999

| COUNTY | DISTRICT | ACREAGE | VALUE (\$) | Management Area |
|--------------|------------|---------------|----------------------|-----------------|
| Brown | Brownstown | 0 | \$5,000 ¹ | 6.2 |
| Jackson | Brownstown | 36 | 253,000 ² | 2.4, 2.8 |
| Lawrence | Brownstown | -0.417 | 417 ³ | 2.8 |
| Orange | Tell City | -40 | 28,000 ⁴ | 2.8 |
| TOTAL | | -4.417 | | |

¹ - Small Tract Act Exchange – equal land value of \$2,500 each and equal acreage of 1.39 on each side.

² - Land Exchanges (2) and Title Claim – land exchange with private land value of \$25,000 plus cash equalization payment of \$3,000 to equalize values; land exchange with private and federal land values of \$112,500 and \$108,500 plus cash equalization payment of \$4,000 to equalize values; title claim to resolve deed error, no value determined.

³ - Small Tract Act – resolved error in survey.

⁴ - Land Exchange – federal land value of \$28,000.

FY 98 and 99

Land Adjustment Changes and Total NFS land by Management Area

| Management Area | Acreage added in FY98 | Acreage added in FY99 | Total NFS land |
|-----------------|-----------------------|-----------------------|----------------|
| 2.4 | 177 | 412 | 16,600 |
| 2.8 | 140 | -32 | 100,365 |
| 5.1 | 0 | 0 | 12,953 |
| 6.2 | 1 | 0 | 20,355 |
| 6.4 | 86 | 0 | 24,900 |
| 7.1 | 0 | 2 | 6,205 |
| 8.1 | 0 | 0 | 88 |
| 8.2 | 74 | 0 | 12,802 |
| 8.3 | 0 | 0 | 630 |
| 9.2 | 0 | 0 | 1,586 |
| Total | 478 | 380 | 196,484 |

Provide for Human and Community Development

Payments to Counties

Each year counties containing NFS land receive income from two funds: Payments in lieu of taxes (PILT) and 25 percent fund monies. The 25 percent fund is a federal revenue sharing fund comprised of 25 percent of all revenues collected on NFS land from activities such as camping fees, special use permit fees, and timber sales. The funds are returned to the states annually and then distributed to counties based on NFS acreage within each county. The funds must be used for schools and roads.

PILT monies compensate county governments for private property taxes forgone due to public ownership. These payments are also made to counties based on ownership of federal lands within the counties. Each year the amount of dollars distributed differs based on the amount of dollars appropriated by the U.S. Congress. In 1998, PILT returns were 71 cents per entitlement acre and 71 cents per acre from 25 percent fund payments for a total payment to counties of \$1.42. Entitlement lands include NFS lands except for tax exempt lands (but not donated lands) acquired from State or local governments. FY 1999 payment information is not available at this time.

FY 1998 Payments in lieu of taxes (PILT) and 25 percent fund monies

| County | Actual Acres | Entitlement Acres | PILT | 25% Fund | Total |
|---------------|---------------------|--------------------------|------------------|------------------|------------------|
| Brown | 17,749 | 16,962 | \$12,648 | \$12,517 | \$25,165 |
| Crawford | 23,090 | 22,875 | 16,270 | 16,284 | 32,554 |
| Dubois | 411 | 411 | 305 | 290 | 595 |
| Jackson | 22,859 | 22,683 | 16,014 | 16,121 | 32,135 |
| Lawrence | 15,795 | 15,795 | 11,180 | 11,139 | 22,319 |
| Martin | 9,077 | 9,077 | 6,426 | 6,401 | 12,827 |
| Monroe | 18,997 | 18,996 | 13,513 | 13,397 | 26,910 |
| Orange | 30,062 | 29,980 | 21,360 | 21,201 | 42,561 |
| Perry | 58,058 | 58,059 | 41,021 | 40,944 | 81,965 |
| TOTAL | 196,098 | 195,625 | \$138,737 | \$138,294 | \$277,031 |

Special Uses and Outstanding Rights

Methodology: Monitor utility construction, maintenance work and road permit construction and maintenance.

Results: Jackson Co REC cut brush on their right-of-way (ROW) with no impact to soils.

Hoosier Energy replaced 72KV power line towers on their ROW and reconstructed access roads into the McKensie Ridge area in FY 98. The roads are actually in better shape now than before the work was done. The roads were blocked to access with posts to protect the soil. Hoosier Energy also cut brush on their ROW on the Northwest side of the Tell City RD and in Orange County. After the ROW

was cleared, 4x4 truck traffic increased. Fencing must be done to reduce the use and potential impact to the ROW. A plan to fence access will be completed in 1999 for work in FY 2000.

The Branchville transfer station was also monitored in this period. A concrete apron and a building has been added to the site. All work was neatly done and included fencing and a drainage diversion ditch was added to the north perimeter. This property is proposed for a land exchange in FY 2000 to trade the station site to Perry County in exchange for a forested site.

Orange County Rural Electric Company (REC) side trimmed their 40 foot ROW in the Springs Valley area in FY 1999 from Pine Valley store on Route 37 to SR 145. The line crossed several scattered federal tracts. The work was done prior to April 1, 1999, to avoid impacts to Indiana bat habitat.

Recommendations: Special uses staff will work with the various companies, especially Hoosier Energy and the gas pipeline companies as a result of the monitoring points above. They will replace waterbars and keep the 4x4 trucks and all-terrain vehicles (ATV) off ROWs as best they can. FY 99 saw a big increase in the impacts from trucks and ATVs on ROWs with significant rutting on many. Discussions with companies have resulted in agreements to install fences and gates at road crossings on federal land. The companies have agreed to pay for this but may require several months to get them all installed.

Soil and Water [36 CFR 219.27(f)]

Monitor special uses closely during earth-disturbing activities for compliance with soil and water guidance, to insure that mitigation measures are working. Inspect on-going special uses in frequency as specified in FSM or FSH direction.

Legal or Regulation Reference: 36 CFR Part 200 (221.10 Access by permit, 251.50 Special Uses), Forest Plan Appendix K

Methodology: We measure special use authorization and outstanding rights use of NFS land by three management attainment reporting accomplishment indicators:

| <i>Code</i> | <i>Description</i> | <i>98 Accomp.</i> | <i>99 Accomp.</i> |
|-------------|--|-------------------|-------------------|
| 89.2 | General Special Use Applications Processed | 16 | 15 |
| 89.3 | Authorizations Administered to Standard | 55 | 55 |
| 89.4 | Authorizations Administered in Total | 176 | 166 |

Acceptable Criteria:

1. Meet National Environmental Policy Act (NEPA) regulations for notification and environmental analysis. Use proper level of decision based on level of controversy and impacts. Meet handbook and manual direction for permit administration and inspection schedule.
2. Monitor special uses closely during earth-disturbing activities for compliance with Forest Plan guidance (Forest Plan Appendix K), to insure that mitigation measures are working. Inspect on-going special uses in frequency as specified in FSM or FSH direction.
3. Monitor the application of pesticides on outstanding rights lands for accomplishment of objectives, to prevent damage to non-target organisms, to prevent contamination of soil and water, and to ensure applications are made according to proper specifications.

Results:

1. Work was completed in 1998 on waterline construction for Dubois Water Inc, East Fork Water Inc, and Patoka Water Inc. There were minimal soil impacts as the trenches were smoothed and seeded.
2. Two temporary road permits (Breedlove and Gardner) were issued and closed with no problems in 1998, and two more temporary road permits (Vogel and Ash) were issued in 1999. One is nearing completion of the closing work. The other is a new permit that will not close until 2000. Two FLPMA permits were issued for driveways with construction specifications.
3. Route 66 slump repair. The earth portion of the work was completed in 1998 with finishing work extending into 1999.
4. In 1999, Hoosier Energy side trimmed the ROW in the Maines Pond area. Orange County REC also side trimmed their ROW and cut a few trees in the Springs Valley area to reclaim the 40 foot ROW. All cutting was done before April 1, 1999, due to Indiana bat concerns. The sawlogs were sold to a local logger after the Forest Service was reimbursed for their value. All other slash from the cutting was chipped and an inspection noted that visual concerns were mitigated.

In addition to those reviews above, a field review was done on August 24, 1999 of a few road and trail permits. The Rob Haubry road was reviewed first. This road will be used under prescriptive rights without a permit. The road crosses private land, then a short segment (1/8 mile) of NFS land and then enters the Ash property. Mr. Ash plans to cut and remove timber from his 66-acre tract. He owns the land with his two brothers and plans to sell the tract to the Forest Service after the logging is finished. We agreed that no blading would be done to the FS segment of road and only gravel would be added to the drainage crossing and as needed in low spots. An illegal pipe gate would be removed from NFS land. One 12" DBH hickory with a rotten center and two inches of holding wood would be flush cut at the ground to avoid having to widen the road just west of the illegal gate.

A review of the Vogel road was done the same day. The Vogel road has a good road base with #2 rock. He will be required to add #73 rock to the road surface for a four-foot width as the crushed rock was bladed off or buried by the trucks during hauling. Forest Service staff will contact ANR gas pipeline to fence the right of way at the county road. The trail access will be improved with rock (at government expense) for the 200 feet or so from the county road to the Vogel road, and gated at the county road. We will ask ANR gas to fence this corridor to keep horses off the gas pipeline. Rock will be added to some wet spots north on the trail.

The last permit reviewed this day was the Midwest Trail Riders (MTR Inc) permit section that ran beyond the Grouse Hollow dam access road. There was no sign of trail maintenance work being done since our March and April inspections. Several waterbars were breached. The first waterbar that had held and remained in tact, caught 4 inches of loose soil. Reviewers sunk into this mud with the brief rain from the morning. MTR Inc. was invited to accompany a Hoosier NF team on an inspection trip and be given 30 to 60 days to do the work or the FS will do the work under clause IV, D.& E. This clause states that the FS may do corrective work at the cost of the permittee. The performance bond of \$5,400 may also be used under VIII, Additional clause A. A larger performance bond is recommended. We noted that the native surface trails at MTR did not hold up as well as the gravel-surfaced trails. Horse riders had worn a trail across the Grouse Hollow dam. We agreed that riprap across the top of the dam would discourage use. This can be done when the dam is repaired.

Forest Plan met: Most permittees are conscientious and meet or exceed the requirements of the Forest Plan.

Recommendations: Focus efforts to bring permittees under compliance. Concentrate efforts on updating records of utility companies to properly show ROW widths; check against deeds for possible

upgraded utilities that require new permits to be issued. A plant survey will be done in the area of the Hoosier Energy Transmission line in the spring or summer. Waterbars will also be needed on the right-of way in the travel route.

Nondiscrimination

Monitor special uses for compliance with nondiscrimination requirements such as the Title VI law.

Legal or Regulation Reference: Civil Rights Act of 1964 Title VI prohibits discrimination on the basis of race, color, religion, sex, or national origin

Methodology: With all permittees who have the public using their permit area, we conduct pre-award nondiscrimination reviews. They are notified of their responsibility. Assurance statements Form 1700-1 will be signed by all "direct service" providers.

Acceptable criteria: Permittees must agree to comply; otherwise, we do not issue permit.

Results: All permittees agreed to sign assurance statements. There have been no complaints by the public concerning Title VI rights violations.

Forest Plan met: Yes.

Recommendations: Continue to monitor Title VI regulations with recreational type permits as the priority since the risk are greatest in this area for violating nondiscrimination rights, especially with new permittees.

Pesticide Use [36 CFR 219.27(a)(12)]

Monitor the application of pesticides on outstanding rights lands for accomplishment of objectives, for prevention of damage to non-target organisms, for contamination of soil and water on NFS lands, and to ensure applications are made according to proper specifications.

Jackson County REMC sprayed only their powerlines with outstanding ROWs in 1998. They used a combination of triclopyr and glyphosate. Work was done in the fall to minimize visual impacts and was done with a fall formulation which mimics fall color change rather than going quickly from green to brown. This powerline was hydro-axed in 1997 so the regrowth was short in height and only affected broadleaf vegetation. Good groundcover filled in after the treatment as sunlight stimulated grasses and forbs.

In 1999, Southern IN REMC sprayed only their powerlines with outstanding rights ROWs and used a combination of triclopyr and glyphosate. Hoosier Energy sprayed part of their outstanding rights ROW after brush cutting - cut surface spray, with a very effective kill of target species and minimal visual impact. In 1999, Hoosier Energy side trimmed the ROW in the Maines Pond area.

Air Quality [36 CFR 219.27(a)(12)]

Monitor prescribed burns for adequacy of smoke management practices per burning plans.

In 1998 the Forest prescribe burned 3,519 acres and had good smoke dispersal documented on all areas. In 1999, we prescribe burned 233 acres, again with good smoke dispersal on all burns. There were no observed or reported smoke management problems from the public related to any of the burns done in 1998 or 1999.

Health and Safety

Monitor the effluent discharge at the Hardin Ridge Recreation area according to the National Pollution Discharge Elimination System (NPDES) permit requirements

Legal or Regulation Reference: NPDES, State of Indiana, and Monroe County

Methodology: Licensed operator collects and tests as required by NPDES permit.

Acceptable Criteria: Pass NPDES requirements

Results: All NPDES requirements were met.

Forest Plan met: Yes.

Recommendations: During FY 2000 continue working closely with concessionaire and monitor to meet NPDES permit requirements.

Check bacteria levels at public swimming beaches.

Legal or Regulation Reference: 36 CFR 219.21(c)

Methodology: Check five times each 30-day period and once each week for two weeks before beach is open to public, per state standards.

Acceptable Criteria: Meet state standards for bacteria

Results: State standards were met.

Forest Plan met: Yes.

Recommendations: Continue testing to meet state standards.

Handle Hazardous Material Spills Properly

Methodology: Have people on the Forest trained in recognizing and dealing properly with hazardous material spills.

Results: On January 27, 1999 the Forest became aware of a hydraulic oil spill from a CONEX container used for storing explosives near the Warren Alexander Special Use permit area. The CONEX is on

private property adjacent to NF land in part of the old Mulzer Quarry at Derby, IN. It had been spilled on January 24th. A recovery team was on site and had the spill cleaned up by the afternoon of January 27th.

Recommendations: The spill was handled expeditiously. Continue to monitor for HAZMAT concerns.

Conclusion

We carried out the fiscal years 1998 and 1999 Monitoring and Evaluation Program to learn if our project activities and other resource uses are consistent with Forest Plan guidance. This program also provided an opportunity to evaluate if that guidance meets the goals and objectives established in the Forest Plan.

Meeting Forest Plan objectives is dependent on the level of funding allocated to the Hoosier National Forest. Within this allocation and congressional direction, it is the responsibility of our personnel to emphasize a balanced mix of projects that are environmentally sound and provide benefits to both society and to our ecosystems. We developed many projects in partnerships with individuals and organizations.

I have reviewed this Monitoring and Evaluation Report for the Hoosier National Forest for Fiscal Years 1998 and 1999. Our deficiencies are noted. We will ensure that corrective action is taken where appropriate. I am satisfied that management activities accomplished during Fiscal Years 1998 and 1999 were consistent with Forest Plan guidance, except where noted, and that the guidance provides solid direction in meeting the goals and objectives set forth in the Forest Plan.

Also this report documents our review of the conditions of Hoosier National Forest System lands. Since we replaced the plan in 1991, I have not observed any significant changes in conditions or demands. Therefore, I recommend that we continue the current course of carrying out the Forest Plan.

This meets the intent of both the Forest Plan (Chapter 5), and the National Forest Management Act planning regulations (36 CFR 219).

KENNETH G. DAY
Forest Supervisor

Date

Appendices

Appendix A - Species observed in plots taken in the Buzzard Roost Project Area