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Forest Service

Hoosier National Forest Monitoring & Evaluation Report Fiscal Years 2011 -2014

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

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Forest Service

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PURPOSE/SCOPE OF REPORT

Introduction

The annual monitoring and evaluation report is required by the National Forest System Land Management Planning Rule 36 CFR 219.11 (2000). It is also required by the Hoosier's Land and Resource Management Plan (*Forest Plan*) (USDA FS 2006) which was signed by Regional Forester Randy Moore on January 11, 2006. The Monitoring Program is described in Chapter IV of the *Forest Plan*.

Forest wide and project specific monitoring is an ongoing program that has been occurring since the current *Forest Plan* was signed in 2006. The documentation however has not been completed since fiscal year 2010. This is the fifth Monitoring and Evaluation Report compiled under the 2006 Hoosier National *Forest Plan* with the first being completed in FY 2006. This report will document monitoring that occurred in Fiscal years 2011, 2012, 2013, and 2014. Project specific monitoring and monitoring for the national Best Management Practices (BMP) Program are also included.

The Monitoring and Evaluation Report contains three major sections: Purpose/Scope of Report, Specific Monitoring Activities for Fiscal Years 2011 through 2014, and Findings, which is under the Specific Monitoring Activities. Specific Monitoring Activities by Fiscal Year includes what monitoring was done; why it was done; who did it; how and when it was done; and finally what was learned from the results.

Monitoring Program

The *Forest Plan* describes three levels of monitoring:

- Monitoring Implementation–Determines if prescriptions, projects, and activities are implemented as designed and in compliance with *Forest Plan* goals and guidance.
- Monitoring Effectiveness–Determines if prescriptions, projects, and activities are effective in meeting management goals and direction.
- Validation Monitoring–Determines if the initial data and assumptions used in developing the Plan were correct or if there is a better way to meet forest planning regulations, policies, and goals.

Table 4.2 of the *Forest Plan* (USDA FS 2006) contains the items to be monitored organized by Forest goal.

Monitoring Guide

The Monitoring and Evaluation Guide was completed in July 2007 and is posted to the Forest Internet page (http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_017413.pdf). The Monitoring Guide provides guidance on how to accomplish monitoring of the items listed in Table 4.2 of the *Forest Plan*.

Annual Monitoring Activities

Annual monitoring activities are selected from the Monitoring and Evaluation Guide and included in the annual program of work for the Hoosier National Forest. Monitoring activities are commensurate with what projects and activities are being implemented on the Forest. As an example timber harvesting has increased on the Hoosier since implementation of the 2006 Forest Plan began. Therefore much of the monitoring conducted is aimed at measuring the impacts of that activity.

Additionally, the National Best Monitoring Practices (BMP) program was introduced in a letter from Deputy Chief Leslie Weldon on April 30, 2012. The National BMP Program integrated water resource protection into management activities conducted nationwide. The Program will allow the Agency to document compliance with nonpoint source pollution at local scales. The program was phased in during Fiscal Year (FY) 2013 and FY 2014 with full implementation beginning with a two-year reporting cycle in FY 2015 and FY 2016. The Hoosier selects BMPs for monitoring while considering ongoing activities and monitoring needs. This is in addition to monitoring requirements included in the Forest Plan.

SPECIFIC MONITORING ACTIVITIES BY FISCAL YEAR

Monitoring That Occurred - ANNUAL BREEDING BIRD SURVEY (FY2011-2014)

The Hoosier has a multi-year participating Agreement with Purdue University Department of Forestry and Natural Resources to conduct point-count surveys at nine areas on the Hoosier National Forest.

The breeding bird survey responds to *Forest Plan* goal “Maintain and Restore Sustainable Ecosystems” and the two questions “What are the population trends of management indicator species?” and “How will diversity be affected by various mixes of resource outputs and uses?”

The breeding bird survey responds to three of Region 9’s Courageous Conservation goals (USDA FS 2005):

- Protect ecosystems across boundaries
- Walk the talk for sustainability
- Revolutionize effectiveness and efficiency

Point-count surveys were conducted at nine areas on the Forest during May-June 2011 and May-June 2012 by Purdue University (Dunning and Riegel 2012). Additional surveys were conducted in 2013 and 2014. They conducted two replicate point counts at each of 25 points in each area. Surveys were 10 minutes in length during which the number, identity, and behavior of all birds seen and heard were recorded. Biologists gathered the data using techniques similar to previous field seasons (described in Winslow 2000, Dunning and Bondo 2003, Dunning 2003) and the survey protocol described in Dunning and Rea (2001).

FINDINGS

The areas sampled in 2012 were the same ones sampled in 2010. Similar to previous years, Dunning and Riegel (2012) state, “The results of the 2012 monitoring season emphasize that the Hoosier National Forest supports sizeable populations of bird species associated with mature eastern deciduous forest. While the health and viability of these populations cannot be assessed without demographic studies, it is clear that many species of forest birds are widespread throughout the National Forest. The list of common species includes many neotropical migrants, a group of management concern. The continued presence of several locally rare, potentially breeding species, such as Black-and-white Warbler, Black-throated Green Warbler is encouraging.”

The 2012 survey showed that many neotropical migrants were among the common species noted, including two *Forest Plan* Management Indicator Species (MIS) - Acadian flycatcher and wood thrush. The number of Yellow-billed Cuckoos observations (116) represents a continued increase from the 2010, 2008 and 2006 surveys. Approximately 45% of all observations consisted of eight species: Acadian Flycatcher, American Crow, Eastern Wood-Pewee, Ovenbird, Red-eyed Vireo, Scarlet Tanager, Tufted Titmouse, and Wood Thrush. Table 3 (below) shows the percent of the species that were most represented in the total count, the percent of the total count and the number of observations.



Survey results from the 2013 report shows that 75 different species were observed. The ten most observed species are displayed in Table 3. The Black-billed Cuckoo (*Coccyzus erythrophthalmus*) and the Black-and-white Warbler (*Mniotilta vaira*), relatively rare species associated with mature forest were also observed during the survey. However, the number of observations (14) is less than in previous years, 31 in 2011 and 43 in 2009, but is similar to 2007 (13). Cerulean Warbler (*Setophaga cerulean*), were detected 14 times similar to 2011 and 2007, but less than 2009 when 46 were recorded. Overall results of the survey show a 8.9 percent increase in the total number of detections when compared to surveys from 2009 and 2011. The total cannot be compared to results from 2012, because a different set of study points were observed.

Table 3: Most recorded species from the 2012 and 2013 Breeding Bird Survey reports.

Species	2012 % (# observations)	2013 % (# observations)
Acadian flycatcher (<i>Empidonax virescens</i>)	5.4% (379)	6.6% (582)
American Crow (<i>Corvus brachyrhynchos</i>)	4.1%*	5.1% (452)
Blue-gray Gnatcatcher (<i>Polioptila caerulea</i>)		3.4% (300)
Eastern Wood-Pewee (<i>Contopus virens</i>)	5.6% (395)	5.9% (519)
Northern Cardinal (<i>Cardinalis cardinalis</i>)		3.3% (337)
Ovenbird (<i>Seiurus aurocapilla</i>)	4.9% (342)	3.7% (326)
Red-eyed Vireo (<i>Vireo olivaceus</i>)	9.5% (667)	9.1% (808)
Scarlet Tanager (<i>Piranga olivacea</i>)	6.3% (443)	4.6% (406)
Tufted Titmouse (<i>Baeolophus bicolor</i>)	4.6% (320)	5.8% (512)
Wood thrush (<i>Hylocichla mustelina</i>)	4.5 % (317)	4.4% (390)

*Number of observations not recorded

Monitoring That Occurred - COMPLIANCE WITH FOREST PLAN GUIDANCE (FY12)

Chapter 4 of the Forest Plan addresses guidance and compliance with the *Forest Plan* in this question “Is this Forest complying with guidance outlined in *Forest Plan*?” The question addresses all eight of the *Forest Plan* goals.

The question addresses one of Regions 9’s Courageous Conservation goals:

- Protect ecosystems across boundaries
- Connect citizens to the land
- Walk the talk for sustainability

The monitoring responds to the 2007 Forest Service Strategic Plan Goals:

- Restore, Sustain, and Enhance the Nation’s Forests and Grasslands
- Maintain basic management capabilities of the Forest Service.

Forest personnel conducted monitoring of numerous timber sales and restoration projects checking for adherence to *Forest Plan* guidance. Monitoring occurred at different times throughout the year, but was done after completion of the project.

FINDINGS

The Forest Leadership Team monitored the Tower and Plock Timber Sales. The skid and log roads had been closed and water bars and other mitigation measures were in place and functioning properly. The seeding had not taken hold due to the drought that was occurring. Once moisture conditions improved the area was reseeded as needed. There were no other reported concerns associated with timber sales.

Mitigation and operating standards in planning documents should not be so restrictive that they preclude the ability of forest personnel to establish acceptable skid trails and log landings. It is also important that personnel designing skid trails and log landings on-site work with other Resource Specialists in locating these to reduce environmental impacts as much as possible and to jointly develop and implement mitigation measures.

Monitoring That Occurred - HERITAGE MONITORING (FY2011- 2014)

Annual heritage monitoring is done at various times throughout the year by Hoosier personnel. Table 1 displays the number monitoring sites that met requirements and the number of sites monitored for each question being addressed. The heritage resource monitoring responds to the *Forest Plan* goal "Protect our Cultural Heritage." More specifically it responds to the two questions "Are mitigations and protection measures correctly applied for ground disturbing activities?" and "Are heritage resources being damaged by vandalism?"

The heritage monitoring responds to one of Region 9's Courageous Conservation goals:

- Connect citizens to the land.

Table 1: Heritage Monitoring Questions and Results

Question to be addressed (units)	FY2011	FY2012	FY2013	FY2014
Are mitigation and protection measures correctly applied for ground disturbing activities (# of sites or projects meeting/# sites or projects monitored)	9/9	6/6	26/26	18/18
Are heritage resources being damaged by vandalism? (# of sites)	0	0	1	0

FINDINGS

Sites are being protected by the operating procedures and site-specific mitigation measures applied during project implementation. Sites that have been flagged for protection were avoided and newly discovered sites are recognized and protected during project implementation. Personnel turnover and discovery of sites during implementation complicates the process.

In Fiscal year 2013 one site was looted by individuals. Forest Law Enforcement personnel assisted and an assessment of damages was conducted under the Archaeological Resources Protection Act. No further investigation occurred.

No other incidents were noted. Impacts from illegal use of all-terrain vehicles on National Forest Systems lands continue to be a concern.

Monitoring That Occurred - INSECT SURVEYS (FY2011- 2014)

Surveys for emerald ash borer (EAB) (*Agrilus planipennis*) were conducted in the summers of 2011, 2012, and 2014 by Hoosier National Forest personnel. General insect monitoring is also conducted by the Indiana Department of Natural Resources (DNR), Division of Plant Pathology and Entomology. Much of the work is being completed using both Indiana DNR and Forest Service personnel. Survey results are being collected and analyzed by Indiana DNR.

Insect surveys respond to *Forest Plan* goal “Maintain and Restore Sustainable Ecosystems” and the questions “Are insect and disease population levels compatible with objectives for restoring or maintaining healthy forest conditions?” and “To what extent is Forest management controlling undesirable occurrences of fire, insect, and disease outbreaks?”

The insect surveys respond to one of Regions 9’s Courageous Conservation goals:

- Protect ecosystems across boundaries

The surveys respond to the 2007 Forest Service Strategic Plan Objective:

- Reduce adverse impacts from invasive and native species, pests, and diseases

During November of 2010 trees in the Hardin Ridge delimitation area (defined by IDNR) were inventoried. It was determined that less than two percent of trees inside the area were ash.

Beginning in March through May of 2011, one-hundred twenty-seven trees were marked and injected with Tree-age (ememectin benzoate). Additionally in the spring of 2012 one-hundred fifty-eight trees were also injected, including some on private lands.



Emerald Ash Borer

Also in the spring 2012, purple panel traps were set and trap trees were girdled on the southern border of the delimitation area.

Hoosier personnel monitored the perimeter of the treated area in 2013 by installing purple panel traps. No monitoring of this area occurred in fiscal year 2014 due to the spread of Emerald Ash borer into Crawford, Orange, and Perry Counties.

FINDINGS

The SLAM, or Slow Ash Mortality, treatments are a multi-agency, multi-year, and multi-faceted effort to slow the rate at which ash trees succumb to emerald ash borer. Efforts conducted in one fiscal year are collected and analyzed in subsequent years. With the spread of EAB into other Indiana counties, the DNR has reprioritized the efforts.

Monitoring That Occurred - LAND ACQUISITION (FY2011- 2014)

The Hoosier *Forest Plan* prioritizes land acquisition and adjustments to consolidate Forest ownership; provide access to existing National Forest System Land and water; and to protect or enhance threatened and endangered species habitat or other special areas (USDA Forest Service, 2006). The acreage of the Hoosier National Forest cited in the 2006 *Forest Plan* was 199,150 acres, which has increased over the eight years of *Forest Plan* implementation. Table 2, show the figures for FY 11 through FY 14.

Land acquisition reports are completed at the close of each fiscal year. The reports use data found in the deed records and other information that is on file in the Supervisor's Office in Bedford. The data is gathered by Hoosier personnel.

Changes in Hoosier ownership responds to the *Forest Plan* goal:

- Provide a useable landbase.

Table 2: Land Acquisition totals by Fiscal Year.

	FY2011	FY2012	FY2013	FY2014
Total acres	37	1	16	455
Management Area(s)	2.8	8.2	2.8	6.2 & 8.2
County	Orange	Lawrence	Crawford	Brown & Orange
Acquisition method(s)	Purchase	Purchase	Exchange	Purchase
Total deed acreage	202,871	202,872	202,888	203,499

FINDINGS

Land acquisitions have helped consolidate ownership providing better user access to the National Forest. The Hoosier gained 509 acres bringing the total deeded ownership by the US Government to 203,499 acres (as of 9/30/2014).

The Hoosier National *Forest Plan* places a high priority on consolidating Forest ownership to provide access to existing public land and to protect or enhance threatened and endangered species habitat or other special areas.

The Hoosier gained 103 acres in Management Area (MA) 2.8 which is managed as general forest with area of old forest and scattered openings with a variety of plant species. Ninety acres were gained in MA 6.2 which is managed to provide opportunities for solitude and a feeling of closeness to nature. The remaining acres (366) were in MA 8.2 which includes designated Special Areas designed for the protection, perpetuation, and restoration of special feature or values. A land exchange in Fiscal Year 2013, under authority from the Weeks Act exchanged approximately 377 acres in MA 2.8 and 50 acres in MA 2.4 for an estimated 442 acres in MA 2.8. Management Area 2.4 is managed for the protection and enhancement of water-based recreation opportunities, visual quality, and riparian values.

Monitoring That Occurred - ROAD MONITORING (FY2012- 2014)

Monitoring of roads responds to several of the *Forest Plan* Goals including:

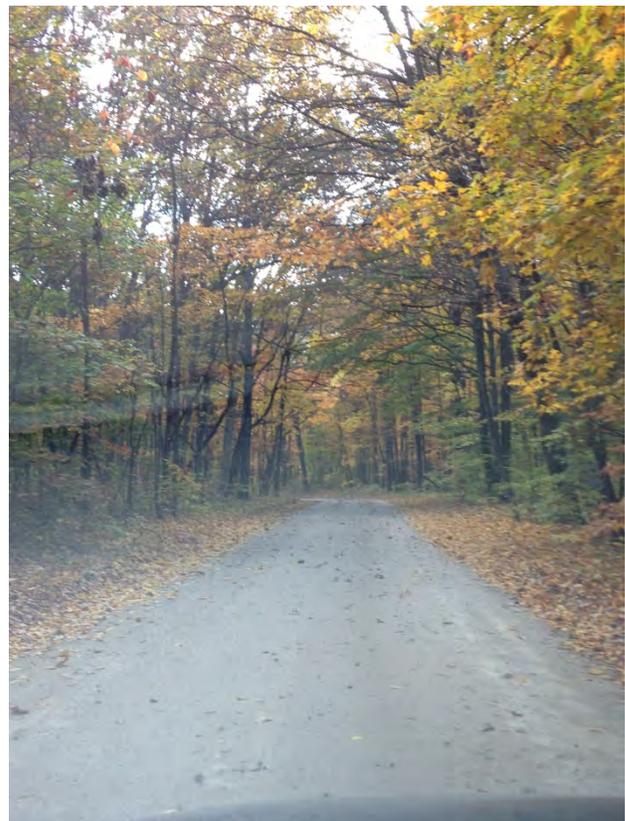
- Maintain and Restore Watershed Health
- Provide for Recreation Use in Harmony with Natural Communities
- Protect Ecosystems across boundaries
- Connect citizens to the land.

This monitoring also responds to the 2007 Forest Service Strategic Plan Goals, including:

- Restore, sustain, and enhance the nation's Forests and Grasslands
- Maintain basic management capabilities of the Forest Service.

Specifically monitoring of roads responds to the following questions from Chapter 4 of the *Forest Plan*:

- Are mitigation and protection measures correctly applied for ground disturbing activities?
- Is trail use planned and implemented to protect land and other resources, promote public safety, and minimize conflicts with other users of the NFS lands?



The Forest maintains many miles of roads. Roads are divided into maintenance depending on their construction standards. Maintenance levels vary from 1 to 5, though only levels 1 through 4 are applicable on the Hoosier. All road monitoring is completed by Hoosier personnel.

FINDINGS

Sixty-one miles of Forest roadways were monitored in 2012; 52 miles in FY 2013; and 25 miles in FY2014. Roads were reviewed to check conditions due to heavy use; extended hot and dry conditions (in 2012); monitor previous activities and mitigations; remove hazard trees; inspect bridges; and more. No corrective actions were identified as needed as a result of the monitoring.

Monitoring That Occurred - SOIL AND WATER MITIGATION MEASURES

Forest personnel collected baseline water samples from selected streams during early spring FY 2012.

Why This Monitoring

SOIL AND WATER MITIGATION MEASURES (FY12, FY 13, FY 14)

The water quality monitoring responds to the *Forest Plan* goal “Maintain and Restore Watershed Health.” The monitoring questions it responds to are “To what extent is Forest management affecting water quality, quantity, flow timing, and the physical features of aquatic, riparian, or wetland ecosystems?” and “Have the soil and water mitigation and protection measures been effective as applied to all management activities?”

The monitoring responds to one of Region 9’s Courageous Conservation goals:

- Protect ecosystems across boundaries

The survey responds to the 2007 Forest Service Strategic Plan Goal:

- Restore, Sustain, and Enhance the Nation’s Forests and Grasslands

Additionally, national forests are required to monitor Best Management Practices of soil and water mitigation. Activities are selected annually that will meet requirements of the *Forest Plan* goals stated above.

Best Management Practices monitoring for implementation and effectiveness, occurred in 2013 and 2014. Activities monitored in 2013 included:

- Chemical use near waterbodies
- Completed road and/or waterbody crossing construction or reconstruction

Activities considered in 2014 were:

- Use of Prescribed fire

All monitoring was completed by Forest personnel.

The review of soil and water mitigation measures and Best Management Practices was completed by Forest personnel. Monitoring work on the Lacy Mine Bioreactor is being completed by United States Geologic Survey.

The monitoring was completed in the spring of FY 2012. Additional monitoring of Best Management Practices occurred in 2013 and 2014. Site visit, with analysis and discussion of project implementation and effectiveness occurred for each practice.

FINDINGS

Monitoring of the Lacy Mine bio-reactor is being done under Forest Service CERCLA authority as a three-year treatability study. Monitoring in FY2011 showed very little data as the flow into the North Bioreactor has been more consistent. There has been very little dilution effect except during the late winter thaw.

Management of Best Management practices required site visits by personnel. Required elements were considered and analyzed. Reports show that for the Chemical Use Near Waterbodies the implementation practices were marginally followed. Adjustments in application and handling were noted and addressed for future projects. Overall the treatment was deemed effective.

To address the Best Management Practice related to Completed Roads and/or Waterbody Crossing Construction or Reconstruction a special use road in the Pleasant Run area of the Forest was monitored. There were concerns with implementation related to soil piles left behind. These were noted and will be addressed in future project implementation. Overall effectiveness of the project and applied mitigation was good.

Monitoring in 2014 considered the Use of Prescribed Fire. Implementation of the project was “mostly” met, while effectiveness objectives were felt to be fully met.

Additional Best Management Practices were monitored in 2014. The only information that is recorded in the database of record is regarding the Use of Prescribed Fire. The Hoosier needs to seek better methods of conducting and assuring that the monitoring information gathered is recorded properly.

Monitoring That Occurred - TIMBER SALE ALLOWABLE SALE QUANTITY (ASQ) (FY2011- 2014)

The Timber Sale ASQ monitoring responds to the *Forest Plan* goals of “Provide for Human and Community Development” and “Provide a Useable Landbase.” The question addressed from Chapter 4 of the Forest Plan being responded to is: “Are timber sales meeting *Forest Plan* ASQ?”

Timber Sale ASQ monitoring responds to the following Region 9 Courageous Conservation goals:

- Protect ecosystems across boundaries
- Connect citizens to the land.

This monitoring also responds to the 2007 Forest Service Strategic Plan Goal:

- Provide and Sustain Benefits to the American People

Fiscal Year 2011 timber harvest totals were 3,868 CCF. This is approximately 40 percent of the average annual harvest allowed in the *Forest Plan*.

Forest personnel reported a FY 2012 harvest level of approximately 4,755 CCF or 41 percent of the annual allowable harvest level permitted in the *Forest Plan*. This is below the average annual harvest allowed in the *Forest Plan* of 9,612 CCF/year.

Timber harvest totals in Fiscal year 2013 were estimated at 7,846 CCF. This is approximately 82 percent of the average annual harvest allowed in the *Forest Plan*.

Fiscal Year 2014 harvest levels were approximately 7,444 CCF, or 77 percent of the annual allowable harvest level permitted in the *Forest Plan*. The annual harvest rates continue to be below the amount allowed in the *Forest Plan*.

Hoosier personnel completed the analysis by accessing the timber sale records for the Fiscal Year.

FINDINGS

The allowable sale quantity for the Forest as stated in the *Forest Plan* is 9.612 MMCF for the first decade of plan implementation. Converting that to CCF would be an average of 9,612 CCF per year which is above the actual amount harvested in those fiscal years monitored shown in this report.

Annual harvest percentages have increased over the past two years rising to 82 percent of the annual permitted ASQ in Fiscal Year 2013 and 77 percent in 2014. The Hoosier has worked to rebuild the timber program on the Forest to move towards a range of resource related desired conditions stated in the *Forest Plan*. As more projects are offered a more consistent pool of interested contractors aids our ability to successfully implement timber harvest projects.

The Hoosier National Forest has not approached anticipated harvest limits since the implementation of the current *Forest Plan*.



Monitoring That Occurred - TRAIL MONITORING (FY2011- 2014)

The Forest monitors trails annually. There are over 260 miles of trails on the Forest available for hiking, biking, and horseback riding.

Monitoring of trails responds to the Forest Plan Goals including: Maintain and Restore Watershed Health, and Provide for Recreation Use in Harmony with Natural Communities. Specifically monitoring of trails responds to the following questions: “Are mitigation and protection measures correctly applied for ground disturbing activities”; and “Is trail use planned and implemented to protect land and other resources, promote public safety, and minimize conflicts with other users of the NFS lands?”

This monitoring responds to the following Region 9 Courageous Conservation goals:

- Protect Ecosystems across boundaries
- Connect citizens to the land

The monitoring also responds to the 2007 Forest Service Strategic Plan goal:

- Provide and Sustain Benefits to the American People

The monitoring was completed by Hoosier personnel at various times and locations throughout the year.

FINDINGS

One hundred and thirty-one miles of trail were monitored in 2012. During that review 1.2 miles of the Mogan Ridge West trail was identified to have concerns with soil erosion. The erosion problems were mitigated by constructing rolling dips and hardening the impacted trail area.

Monitoring That Occurred - WOODCOCK SURVEY (FY2011- 2014)

Hoosier personnel conducted biennial American woodcock (*Scolopax minor*) singing ground surveys on the Forest in the springs of 2012 and 2014. Twenty-four different routes were surveyed.

The woodcock survey responds to *Forest Plan* goal “Maintain and Restore Sustainable Ecosystems.” The survey responds to the question “What are the population trends of management indicator species?” The American woodcock is one of five management indicator species (MIS) identified in the *Forest Plan*.



American Woodcock

The American woodcock survey responds to three of Region 9’s Courageous Conservation goals:

- Protect ecosystems across boundaries
- Walk the talk of sustainability

The survey responds to the 2007 Forest Service strategic plan goal (USDA FS 2007):

- Restore, Sustain, and Enhance the Nation’s Forests and Grasslands

The surveys were conducted between April 10 and April 30 using the rangewide Woodcock Singing Ground Survey developed by USDI Fish and Wildlife Service. The surveys began 22 minutes after sunset. Survey routes were approximately 3.6 miles in length with 10 equally spaced stops. Survey personnel recorded the number of individual peenting woodcock at each survey stop.

FINDINGS

2012

A total of 24 peenting woodcock were heard on 25 routes. This equates to 0.96 peenting woodcock heard per route surveyed. Though the Hoosier’s surveys shows a small decline, the average number of singing woodcock has remained stable for the past 10 years (Cooper and Rau 2012). However, because this is only the fourth measurement, it remains difficult to determine a trend because of the fluctuation over the four measurement years. The fluctuation may be in part a response to the addition of new surveyors with less experience and an addition in the number of routes being considered.

2014

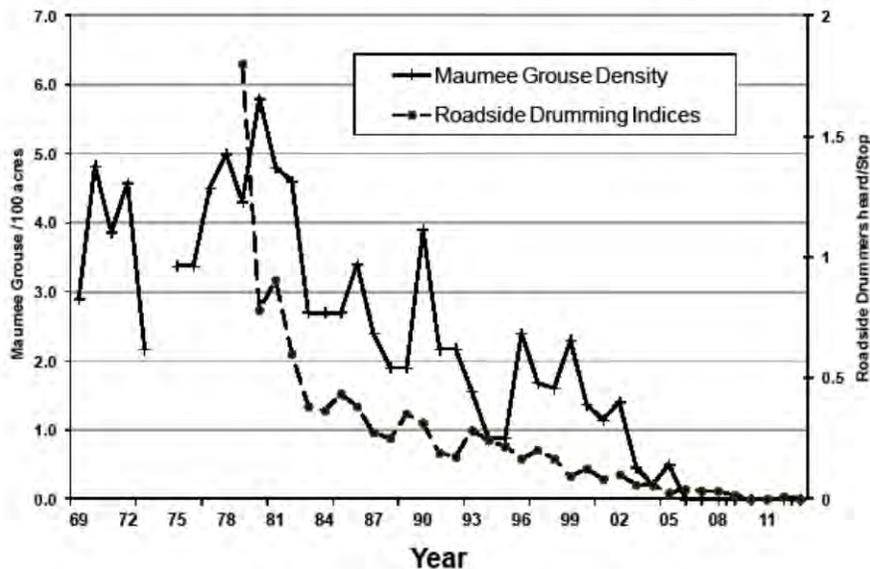
Fifteen peenting woodcock were heard on 11 routes. This equates to 0.6 peenting woodcock heard per route surveyed and is above the statewide breeding average of 0.21 woodcock heard per route. This number is, however, below the regional breeding index of 2.57 birds per route recorded by Cooper and Rau in 2014. The 2014 surveys were the fifth effort to monitor woodcock populations on the Hoosier. The 2014 results depict a decrease from the 2012 survey. It is important to note that three routes were added since the beginning of the survey in 2006.

Additional Findings

The IDNR, Division of Fish & Wildlife coordinated surveys of ruffed grouse (*Bonasa umbellus monticola*) breeding populations during the spring of 2011, 2012, and 2013 on the Hoosier (Backs 2011, Backs 2012, Backs 2013). The 2011 report found that, “For the second time (two consecutive years) since the roadside counts were initiated in 1953, no male ruffed grouse were heard along the roadside drumming routes” (Backs 2011). The 2013 report also revealed that “No drumming male ruffed grouse were heard...”

However, the 2012 report showed that two male ruffed grouse were heard along the roadside drumming routes. ...[O]ne on a traditionally conducted control route and the other on a newly re-established route” (Backs 2012). Backs (2012) concluded “Ruffed grouse population levels are projected to drop below “viable population levels” within the next few years in portions of their existing range in south-central Indiana unless some intervention (e.g. timber harvests of sufficient intensity) or sizable natural disturbances occur across the forested landscape to create early successional forest habitats.” (Figure 1). Indiana Department of Natural Resources is taking steps to ban hunting of ruffed grouse.

Figure 1. Indiana Grouse Population Trends



Hoosier Personnel have participated in the Spring Wildflower Foray since 2005. Three hikes occur on the Forest and the monitoring results of those hikes have been recorded over time. The specific hikes include the Wild Hyacinth Hike, Waldrip Cabin Hike, Hayes Trail, and Pate Hollow. The Wild Hyacinth and Waldrip Cabin hikes have been going since 2005. The Pate Hollow hike began in 2010 and Hayes Trail hike in 2011. Nonnative invasive species are recorded on all of the hikes.



Garlic mustard (*Alliaria petiolata*)

The Wild Hyacinth and Waldrip Cabin hikes have been going since 2005. The Pate Hollow hike began in 2010 and Hayes Trail hike in 2011. Nonnative invasive species are recorded on all of the hikes. Chickweed, either clammy or common (*Cerastium glomeratum* and *Stellaria media* respectively), has been recorded at one time in all the hike locations. Dandelion (*Taracacum officinale*) and garlic mustard (*Alliara petiolate*) are found in the majority of areas as well. The Forest has a Forestwide program for treating nonnative invasive plant species using herbicides.

Potential Monitoring Needs

Monitoring data collected this year and in subsequent years will support the Forest’s ability to evaluate current social, economic, and ecological conditions and trends.

Monitoring *Forest Plan* compliance and implementation will indicate if initial projections in the plan were adequate to meet the goals considered.

Monitoring of MIS identified in the plan will show how well the *Forest Plan* is helping to improve and maintain viable habitat for the five MIS species identified.

Overall, monitoring will help determine if activities need to be adjusted or strengthened halfway through the planning period to meet *Forest Plan* goals and objectives.

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