



Shawnee National Forest

Land and Resource Management Plan Monitoring and Evaluation Report Fiscal Year 2007

Copies of this report are available from:

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APPROVAL

I have reviewed the FY2007 Monitoring and Evaluation Report prepared by an interdisciplinary team of the Shawnee National Forest. The report meets the intent of the *2006 Shawnee National Forest Land and Resource Management Plan* and governing regulations. Report recommendations will be evaluated for potential action by the Forest Leadership Team.

This report is approved.

Richard Blume-Weaver (for)

HURSTON A. NICHOLAS
Forest Supervisor

Date:

Introduction

The Monitoring Implementation Guide provides guidance on how to implement the monitoring and evaluation requirements of the 2006 Shawnee National Forest Land and Resource Management Plan (Forest Plan). The guide contains the methodologies and protocols to be used in implementing Chapter 6 of the Forest Plan.

The guide is intended to be flexible and may be changed as new methodologies and techniques are developed. The document allows the application of adaptive management as monitoring techniques are implemented and the results are then evaluated in relation to the Forest Plan desired future condition. The guide uses information in the Forest Plan but is not part of the Forest Plan. Therefore, changes to this document are not considered to be an amendment to the Forest Plan.

Format

This document contains a section on each of the monitoring items listed on the monitoring matrix table in Chapter 6 of the Forest Plan, beginning with item #14. There may be appendices added at a later date to include field level data collection methods used for specific monitoring questions. Below is an explanation of each of the items shown for monitoring question.

Monitoring Driver

The reason for monitoring a particular Forest Plan item; NFMA, or other regulation.

Monitoring Question or Purpose

The question or purpose in the monitoring matrix table in Chapter 6 associated with a goal or objective from the plan in Chapter 4.

Priority

A value of high, medium, or low as assigned by the program manager who develops the question.

Method

Method A (more quantitative) or B (more qualitative):

Method A

Methods generally are well accepted for modeling or measuring the resource or condition. The cost of conducting these measurements is higher than other methods. These methods are often quantitative in nature.

Method B

Methods or measurement tools are based on a variety of techniques. Tools include project records, communications, on-site ocular estimates, or less formal measurements such as pace transects, informal visitor surveys, air photo interpretation, and other similar types of assessments. Reliability, accuracy, and precision are good, but usually less than with Method A. Method B monitoring is often qualitative in nature, but can still provide valuable information on the status of resource conditions.

Frequency of Monitoring

Describes the timing of data collection monthly, annually, etc.

Frequency of Evaluation

Describes how often data is evaluated, annually, every five years, every ten years etc.

Duration

The length of time data will be collected for a monitoring item.

Acceptable Variance

How much variance is allowed in a particular measurement, before considering other approaches or corrective measures.

Observations, Results, Trends

Observations of the monitoring period, results of monitoring, trends or comparisons observed from the previous monitoring period or over time.

Recommendations/Conclusions

Recommendations or conclusions identified based on monitoring/observations.

Corrective Measures

Steps and/or operations that may be considered if monitoring indicates an item is not within an acceptable level.

Data Storage

Which database or file is the appropriate location for the information.

Reporting Period

Frequency at which the information is reported: monthly, annually, every five years etc.

Personnel

Personnel positions needed to accomplish tasks associated with the monitoring question.

Responsible Individual

Position responsible for the monitoring item and the name of the person in the position.

Summary and Highlight of Findings:

Twenty four individual items were monitored in 2007. Numbers on the left correlate with the revised monitoring matrix from the 2006 Land and Resource Management Plan. One monitoring item can include multiple monitoring projects.

18) Watershed Resources: Soil Quality. Prescribed fire areas showed 100% vegetation cover. Trail construction and reconstruction showed effective reduction of soil erosion and sedimentation.

20) Threatened, endangered and sensitive species, and species with viability concerns:

a) Indiana Bat. 1 maternity colony monitored in Oakwood Bottoms appears to be stable. Of the 5 caves (1 on NF) and 5 mines (0 on NF) of wintering populations, Ellis Cave (on private land) had an estimated increase of wintering hibernacula of 20% from estimates in 2005.

Illinois wintering populations show an estimated decline of 1.1% from 2005-2006 estimates.

b) Gray bat. 1 individual found in a cave adjacent to the Forest.

c) Bald eagles. Removed from federal listing, added to RFSS list. Active nests maintained with successful hatching of juveniles.

d) Eastern woodrat. 72 woodrats were translocated to Forest sites. 42 new woodrats were identified during monitoring, indicating successful breeding.

e) Southeastern myotis. Cave gate installed at Equality to protect from human disturbance.

f) Henslow's sparrow. 5 singing males monitored in the Asby Tract and Turpin openlands. Nesting observed in unsurveyed areas.

g) Cerulean warbler. Thirty-six cerulean warblers were detected in three locations/ transects on the Forest as part of the annual Forest bird monitoring and a regional assessment. Two new locations with warblers were discovered as part of the cerulean warbler assessment work.

h) Mead's milkweed. Implemented prescribed fire and trimming of woody vegetation to improve 262 acres of habitat in four natural areas.

21) Identify and protect ecosystems and communities at risk of loss or degradation. Boundary marking and patrolling 80 natural areas has ensured protection from resource damage from unauthorized uses on all but a few. User-developed trails are "healing" and vegetation is growing back.

24) Invasive Species Control. Hand-pulling and propane-torching of garlic mustard at some locations has retarded seed dispersal. Propane-torching of Chinese yam at other locations is being monitored for success rates. Hand-control methods yielding effective, but extremely limited results.

25) Effective monitoring of MIS. Northern bobwhite was the primary species monitored. Implementation of management in larger openlands and oldfields on the Forest appears to have maintained or improved habitat and populations. Bird-monitoring transects in five openlands in 2007 detected approximately 29 singing male bobwhite in 4 large openlands. This is about a 50% increase over 2006 in these areas.

29) Forest Ecosystem Health—Oak-Hickory Forest-Type. New planting resulted in an increase of the oak-hickory forest-type by 345 acres.

30) Forest Ecosystem Health—Fire-dependent communities. 4150 acres of prescribed fire were completed in FY07.

34) Recreation Management—Road Infrastructure. 108 of 586.5 miles maintained.

35) Recreation Management—Licensed motorized vehicle use. 400 miles open seasonally or year-round.

39) Recreation—Heritage. 148 cultural resources recorded, 10 trail segments monitored as part of trails designation project, 29 Forest Priority Heritage Asset sites monitored, and 2 sites investigated for vandalism.

- 44) Land Adjustments—Recreation Benefits. Acquisition of 748 acres
- 45) Land Adjustments—Ecosystem Health. Of 748 acres acquired, 152 acres were reforested and remaining to recover from agricultural use
- 46) Land Adjustments—TES habitat. Of 748 acres acquired, 303 acres will improve protected habitat for timber rattlesnake and cerulean warbler and 485 acres will improve protected habitat for bird-voiced tree frog
- 47) Land Adjustments—Wetland and Floodplain Protection. Of 748 acres acquired, 635 acres expand wetland and floodplain ownership.
- 48) Land Adjustments—Heritage Resources. No sites recorded or anticipated.
- 49) Minerals. No leases, permits or contracts. Continue to monitor open market and well completions.

Watershed Resources

Soil resource quality (Item #18)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine effectiveness of regional soil quality standards in reducing soil productivity and functions. Implements Goal O: Soil, Water, Air Management in Chapter 4.

Priority: High___ Med x Low___

Method: B—Utilizes various measures to observe soil disturbance. Subjective analysis and documented observations of surface-disturbing practices. A walk-through observation method was adopted for the prescribed fire areas and trails.

Frequency of Monitoring: Annual

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: As indicated.

Observations, Results, Trends:

Prescribed fire was implemented in the following areas: Stoneface Research Natural Area (RNA), Cave Hill RNA, Dennison Hollow RNA, Inahgeh burn units, Bear Branch, and White Tract burn. In the prescribed burn areas, 100% plant cover was observed with minimal visible erosion or bare ground. Bare ground areas were rock outcrops.

Initial observation showed that new trail construction was effective at reducing soil erosion and sedimentation. Detailed results of this monitoring are included in the Trails EIS monitoring report for FY07.

A pre-activity soil disturbance assessment was conducted at Harris Branch.

Recommendations/Conclusions: Continue monitoring in the next FYs. Increase the number of sites visited. Implement a plot-system of data collection.

Corrective Measures: None indicated.

Data Storage: TERRA

Reporting Period: Annually

Personnel: Soil Scientist

Responsible Individual: John DePuy, Soil Scientist

Prepared by: John DePuy, Soil Scientist

Date: 9/23/2008

Biological Diversity and Wildlife and Aquatic Habitat
Threatened, endangered and sensitive species and species with viability concerns (Item #20)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine effectiveness of standards and guidelines in promoting recovery and contributing to viability. Implements Goal M: Wildlife, Fish and At-Risk Species Management in Chapter 4. (See Appendix B for additional information and additional species)

Priority: High X Med ___ Low ___

Method: A—Measures are quantitative in nature. B—Subjective analysis utilizing various measures. Utilizes reports regarding habitat condition and suitability.

Frequency of Monitoring: Annual

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: No variance from protection of species.

Observations, Results, Trends:

- **a) Indiana bats:** Overall populations of wintering Indiana bats within the Forest boundary and overall in Illinois declined slightly in 2007 (1.1%) compared to monitoring estimates made in 2005. However, overall populations for Indiana bats throughout their range in 2007 are estimated to have increased by 9.4%. One maternity colony monitored in Oakwood Bottoms appears to be stable. Of the 5 caves (1 on NF) and 5 mines (0 on NF) of wintering populations, Ellis Cave (on private land) had an estimated increase of wintering hibernacula of 20% from estimates 2005. Hibernacula for Indiana bats on the Forest and on adjacent private lands continue to be protected from human disturbances with gating and mine entrance stabilizations. These measures should protect the species from human disturbances and drastic changes in hibernaculum temperatures.
- **b) Gray bats:** The species continues to have a summer roost in one cave on private land within Forest boundaries. One individual of the species was found in another cave on private land adjacent to the Forest. The species is still known to utilize perennial streams and associated riparian areas on the Forest in the vicinity of that cave.
- **c) Bald eagles:** Removed from federal listing and added to the Regional Forest Sensitive Species list. Maintained active nests on both the national forest and private land in Alexander, Jackson, Union, Hardin, Pope, and Johnson Counties during 2004-2007. Successful hatching of juveniles in all five counties in the last five years.
- **d) Eastern woodrat:** In an effort to re-establish populations on the Forest, 72 woodrats were translocated from Arkansas and Missouri, as well as LaRue Pine Hills, Illinois to several sites primarily on the east side of the Forest during 2007. Approximately 42 new animals, including both males and females, were discovered in translocation areas in 2007—evidence that the reintroduction appears to be working and breeding populations have been established in at least 4 different areas (High Knob, Buzzards Point, Garden of the Gods and Pounds Hollow) on the Hidden Springs Ranger District.

- **e) Southeastern myotis:** This species has two known winter and summer colonies on the Forest in two of the caves on the east side. Both caves are protected from human disturbances during summer and winter use by cave gates. A cave gate was installed at Equality for the species in 2007. Both caves are being monitored annually for temperature and humidity.
- **f) Henslow's sparrow:** Preliminary results from monitoring in openlands in 2007 indicate that Henslow's sparrows continue to occur at relatively low numbers (approximately 5 signing males) in the Asby Tract and Turpin openlands. None were observed or heard on the Pennant Bar Ranch and West Openland routes on the Forest. The species did nest in unsurveyed areas on the Pennant Bar Ranch in unburned openlands. They may have decreased along survey routes following burning.
- **g) Cerulean warbler:** Thirty six cerulean warblers were detected in three locations/ transects on the Forest as part of the annual Forest bird monitoring and a regional assessment. The species was absent from a few historical monitoring locations in 2007, more abundant at some other historical sites, and located at two new locations. Overall, the species continues to be uncommon on the Forest, with populations primarily confined to the floodplains of three streams on the west side of the Forest (Mississippi Bluffs Ranger District): Cave and Cedar Creeks and the Big Muddy River.
- **h) Mead's milkweed:** Prescribed fire and trimming back resprouting woody vegetation were implemented on 262 acres to improve habitation for the federally listed Mead's milkweed. The four natural areas are Cave Hill RNA (119 acres), Stoneface RNA (36 acres), Dennison Hollow (25 acres), and Simpson Township Barrens Ecological Area (82 acres). No other active management occurred. Loss of habitat and lack of active management continue to be the greatest contributors to the threat of extirpation of this species in Illinois.

Recommendations/Conclusions:

- **a) Indiana bats:** Continue annual monitoring of hibernacula and maternity colonies. Expand use of data loggers to monitor cave temperature and human disturbance factors.
- **b) Gray bats:** Continue monitoring in conjunction with Indiana bats.
- **c) Bald eagles:** Continue to monitor populations and nesting sites.
- **d) Eastern woodrats:** Continue cooperative efforts with both the Illinois Department of Natural Resources and Southern Illinois University to monitor current populations and implement the recovery objectives of the Eastern woodrat recovery plan to reduce the threats of localized extirpation in the event of a catastrophic event and to improve genetic viability of the native populations.
- **e) Southeastern myotis:** Roosting numbers in both caves appear to be increasing since the gate installation and with favorable roosting temperatures in the cave. Continue monitoring.
- **f) Henslow's sparrow:** Recommend continued management of large openland areas and continued monitoring.
- **g) Cerulean warbler:** Continue to manage for large, hardwood overstory trees in the larger floodplains on the Forest and monitor with existing bird monitoring transects.
- **h) Mead's milkweed:** Continue monitoring plants and their habitat. Continue management practices, such as prescribed fire and tree and shrub removal.

Corrective Measures: None required.

Data Storage: NRIS, FACTS

Reporting Period: Annually

Personnel: Wildlife Biologists Steve Widowski and Rod McClanahan; Fisheries Biologist Mike Welker; Botanist Beth Shimp; Partners: Illinois Department of Natural Resources (IDNR), Southern Illinois University (SIU), Ball State University (BSU).

Responsible Individuals: Steve Widowski, Rod McClanahan, Wildlife Biologists,

Prepared by: Steve Widowski, Beth Shimp

Date: 9/22/08

Biological Diversity and Wildlife and Aquatic Habitat
Identify and protect ecosystems and communities at risk of loss or degradation (Item #21)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine if recreational practices or management activities are causing degradation to rare ecosystems or communities, or other resources. Implements Goal G: Special-Feature Management in Chapter 4.

- *Are natural area boundary marking and patrolling effective in eliminating/reducing adverse impacts from unauthorized uses?*

Priority: High X Med ____ Low ____

Method: B–Subjective analysis utilizing observations while patrolling.

Frequency of Monitoring: Annual

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: No variance from protection of natural area unique features.

Observations, Results, Trends: Boundary marking and patrolling of most of the natural areas has protected the areas from natural resource damage, except for a few. User-developed trails are “healing” and vegetation is re-establishing.

Prescribed fire was used in four natural areas (Cave Hill, Dennison and Stoneface RNAs and Simpson Township Ecological Area), improving habitat on 262 acres for the federally listed Mead’s milkweed and the associated barrens. Many other natural areas are being invaded by aggressive woody vegetation and invasive species. Rare community types are at risk of being lost without active management, including prescribed fire and selective tree and shrub removal. Glade and open barrens areas are quickly succumbing to successional species, losing rare and conservative species. Areas such as Massac Tower Springs and Snow Springs have hydrologic disturbances (over-shading and de-watering of the land by aggressive trees, shrubs and exotic species) that may lead to the near-future demise without active management.

Recommendations/Conclusions: Continue boundary marking and posting remaining natural areas and maintaining existing ones. Repair vandalized markings. Continue patrols and law enforcement, especially during heavy recreational use periods. Develop and distribute educational materials about the intrinsic values of natural areas. A brochure on natural areas should be developed to help in these efforts. Construct and erect natural area interpretive signs at identified entry points. Continue environmental analyses for active management in natural areas that would include the use of prescribed fire and selective tree and shrub removal.

Corrective Measures: None required.

Data Storage: FACTS

Reporting Period: Annually

Personnel: Botanists Beth Shimp and Susan Corey, Partners: IDNR, SIU.

Responsible Individuals: Beth Shimp and Susan Corey

Prepared by: Beth Shimp

Date: 9/23/08

Biological Diversity and Wildlife and Aquatic Habitat **Invasive species control** (Item #24)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine if standards and guidelines for the control of invasive species are effective. Implements Goal B: Ecosystem Management in Chapter 4. To determine if invasive and exotic species are adversely affecting forest ecosystem health and sustainability. Implements Goal K: Forest Ecosystem Health and Sustainability in Chapter 4.

- *Are hand-pulling and propane torching by hand effective measures of control of garlic mustard and Chinese yam in some locations?*

Priority: High X Med ___ Low ___

Method: B—Observations and reports regarding control and treatment effectiveness

Frequency of Monitoring: Annual

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: No variance from control of invasive species.

Observations, Results, Trends: Hand-pulling and propane torching of garlic mustard at some locations has retarded seed dispersal. Propane-torching of Chinese yam at other locations is being monitored for success rates. Both methods are locally effective, but completely inadequate for extent of control required Forest-wide.

Recommendations/Conclusions: Conduct an environmental analysis to determine the most effective management applications to eradicate various non-native plant species that threaten the integrity of native communities and natural areas. Continue partnerships with other agencies involved in the planning and implementation of accepted, practical methods of non-native invasive species eradication. Continue monitoring of treatment areas and eradication/control methods to determine effectiveness.

Corrective Measures: Consideration must be given to use of chemical control of invasive species. Analysis recommended above.

Data Storage: FACTS database

Reporting Period: Annually

Personnel: Wildlife Biologists Steve Widowski and Rod McClanahan; Fisheries Biologist Mike Welker; Botanists Beth Shimp and Susan Corey.

Responsible Individual: Beth Shimp, Botanist

Prepared by: Beth Shimp, Botanist

Date: 9/22/08

Biological Diversity and Wildlife and Aquatic Habitat Management indicator species (MIS) (Item #25)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine if the MIS list effectively portrays the elements of habitat and ecosystem quality, along with offering the potential to be effectively monitored. Implements Goal B: Ecosystem Management in Chapter 4.

- *Is management of larger openlands maintaining/improving habitat for Bob-white quail?*

Priority: High X Med ___ Low ___

Method: A—quantitative measurement, and B—Subjective analysis utilizing various measures. Utilizes reports regarding changes in habitat and ecosystem condition.

Frequency of Monitoring: Annual

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: No variance from protection of species.

Observations, Results, Trends: Of the five MIS, 2007 monitoring for northern bobwhite is reported here. Remaining MIS and other species reported in Appendix C. Northern bobwhite: Implementation of management in larger openlands and oldfields on the Forest appears to have maintained or improved habitat and populations. Bird monitoring transects in five openlands in 2007 detected approximately 29 singing male northern bobwhites in 4 large openlands. This is about a 50% increase over 2006 in these areas.

Recommendations/Conclusions: Northern bobwhite: Continue census data and site-specific bird point-count monitoring. Continue openland management.

Corrective Measures: None required.

Data Storage: HEP

Reporting Period: Annually

Personnel: Wildlife Biologists Steve Widowski and Rod McClanahan; Partners: IDNR.

Responsible Individual: Steve Widowski, Wildlife Biologist

Prepared by: Steve Widowski, Wildlife Biologist

Date: 9/22/08

Forest Ecosystem Health and Sustainability

Oak-hickory forest-type (Item #29)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine if the objective of maintaining the dominance of the oak-hickory forest-type is being achieved in selected treatment areas. Implements Goal K. Forest Ecosystem Health and Sustainability in Chapter 4.

- *What is the forest-wide trend in oak-hickory forest-type dominance?*

Priority: High___ Med X Low___

Method: A–Acres dominated by oak-hickory forest-type. Measures regeneration sample plots in timber harvest or ecosystem restoration sites. Measures Forest-wide distribution of oak-hickory forest-type through Forest-wide plot samples.

Frequency of Monitoring: Annual for management activities, every 5 years for forest-wide trends.

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: None indicated.

Observations, Results, Trends: 345 acres planted to predominantly oak and hickory species.

Recommendations/Conclusions: Management activities, such as landscape-scale prescribed burning, timber-stand improvement activities, and shelterwood harvesting methods, should all be employed as methods to reduce the understory competition of shade-tolerant species, and improve the establishment and growth of oak-hickory regeneration in the understories of forest stands. If these activities are not implemented, successional changes in species composition will continue to take place, would eventually result in changes in the forest overstory type classifications. This change in forest-type over time would result in reduced forest ecosystem health and would not maintain the oak-hickory forest ecosystem.

Corrective Measures: Implement landscape-scale prescribed burning, timber-stand improvement activities, and shelterwood harvesting methods.

Data Storage: FACTS, FS Veg, Forest Inventory and Analysis (FIA)

Reporting Period: 10 years

Estimated Costs: \$400 per acre planting costs, including all overhead costs.

Personnel: Natural Resources Program Manager Steve Hupe

Responsible Individual: Steve Hupe, Natural Resources Program Manager

Prepared by: Steve Hupe, Natural Resources Program Manager

Date: 9/20/08

Forest Ecosystem Health and Sustainability

Fire-dependent communities (Item #30)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine if the stability of fire-dependent communities is being maintained. Implements Goal K: Forest Ecosystem Health and Sustainability in Chapter 4.

- *(add particular annual monitoring questions here)*

Priority: High___ Med X Low___

Method: A—Acres of prescribed fire in fire-dependent communities; sample plots of vegetation within treatment areas. B—Observations and reports regarding habitat condition, vegetation response, and habitat condition and stability.

Frequency of Monitoring: Annual for management activities

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: None indicated.

Observations, Results, Trends: 4150 acres of prescribed fire were conducted.

Recommendations/Conclusions: Soil observations are reported in the soil section. Other acres were not included in monitoring in 2007.

Corrective Measures: None required.

Data Storage: FACTS, FS Veg

Reporting Period: 5 years

Personnel: Chris Peterson, Fire Management Officer

Responsible Individual: Chris Peterson, Fire Management Officer

Prepared by: Chris Peterson, Fire Management Officer

Date: 9/20/08

Recreation Management

Resource protection, safety and maintenance of road infrastructure (Item #34)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine if resources and road infrastructure are adequately protected based on maintenance requirements. Implements Goal N: Transportation System Management in Chapter 4.

Priority: High x Med ___ Low ___

Method: A—Number of miles in each road class meeting design and maintenance standards, number of miles reconstructed, and/or decommissioned. B—Observations and reports regarding road condition.

Miles of Roads Receiving Maintenance	
Road Level	Miles Maintained
1	15.0
2	13.7
3	70.4
4	5.6
5	3.3
Total	108.0

Miles of Roads Decommissioned = 1.0
Miles of Roads Added = 0.5

Updated Total Miles of Road after Decommissioning and Additions	
Road Level	Miles
1	186.5
2	258.2
3	129.3
4	9.1
5	3.4
New 2007 Total	586.5

Frequency of Monitoring: Annual

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: Maintenance Level Variations when vary by one level.

Observations, Results, Trends: Declining budget and reduced maintenance. Driver comfort affected. This trend anticipated to continue.

Recommendations/Conclusions: Routes heavily used by the public, mail carrier and school bus could be transferred to counties for their maintenance. Reduce maintenance of some roads and decommission more roads.

Corrective Measures: Optimize the use of maintenance funds. Reduce the maintenance level of some roads. Decommission or place into storage roads where possible.

Data Storage: INFRA

Reporting Period: Annual

Estimated Costs: Total Road Budget = \$396,218

Personnel: Kevan Paluso, Forest Engineer

Responsible Individual: Kevan Paluso, Forest Engineer

Prepared by: Kevan Paluso, Forest Engineer

Date: 9/26/08

Recreation Management

Licensed motorized vehicle use (Item #35)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine recreation opportunity for licensed motorized vehicle users. Implements Goal N: Transportation System Management.

Priority: High x Med ___ Low ___

Method: A - Number of miles in each road class open seasonally or year-round. Number of accidents or safety issues reported. B - Observations and reports regarding use of roads.

No accidents.

Miles of Road per maintenance level (road class) open seasonally or year round.	
Road Level	Miles
2	258.2
3	129.3
4	9.1
5	3.4
New 2007 Total	400.0

Frequency of Monitoring: Annual

Frequency of Evaluation: Every 5 years

Duration: Life of 2006 plan

Acceptable Variance: Maintenance level adjustments up or down by one level.

Observations, Results, Trends: Declining budget and reduced maintenance. This trend anticipated to continue. Budget reductions may result in a fewer miles of roads available.

Recommendations/Conclusions: Optimize the use of maintenance funds.

Corrective Measures: Transfer some roads to local counties who could maintain roads the Forest Service could not afford to continue to adequately maintain.

Data Storage: INFRA

Reporting Period: Annual

Estimated Costs: Total Road Budget = \$396,218

Personnel: Kevan Paluso, Forest Engineer

Responsible Individual: Kevan Paluso, Forest Engineer

Prepared by: Kevan Paluso, Forest Engineer

Date: 9/26/08

Recreation Management

Heritage resources (Item #39)

Monitoring Driver: 2006 Forest Plan, 36 CFR 219.24 and Section 106 of the National Historic Preservation Act of 1966 (NHPA)

Monitoring Question or Purpose: To determine if heritage resources are being adequately protected. Implements Goal F: Heritage Resource Management.

- Are the Standards and Guidelines in the Forest Plan adequate and effective in protecting heritage resources?
- Are significant heritage resources adequately protected from vandalism and other human or natural impacts?

Priority: High x Med ___ Low ___

Method: A—Number of preserved and protected heritage resources, priority heritage assets managed to standard. B—Vandalism or other reports regarding heritage resources.

Frequency of Monitoring: Annually

Frequency of Evaluation: Annually

Duration: Life of 2006 plan

Acceptable Variance: None.

Observations, Results, Trends: There are two independent origins of potential impacts to heritage resources located on the Forest: (1) management-related effects and (2) those brought about by public use.

During 2007, archaeological inventories were conducted as a result of 27 planned earth-disturbing activities covering approximately 4005 acres, and included projects such as prescribed burning and fire line construction; reforestation; special-use permits; and trail construction, reconstruction, and maintenance. As a result of these investigations, a total of 148 cultural resources were recorded and/or monitored in the survey areas. Of the 148 cultural resources (96 previously recorded and 52 new sites) included in this monitoring report, 71 were ineligible for inclusion on the NRHP. The remaining 77 sites are considered to be eligible for inclusion on the NRHP until proven otherwise.

One project that specifically calls for annual monitoring is the Hidden Springs Trails Designation Project. To date, monitoring has been conducted only on trail segments that have been constructed and/or reconstructed. Monitoring fieldwork included documenting unwanted and undesirable effects to heritage resources associated with trail construction and reconstruction (as a result of earth-disturbing activities such as bulldozing, water-bar construction, ditch construction, and graveling or any other activity that moves, removes, or otherwise disturbs archaeological sites). Eight trail segments in Lusk Creek and two trail segments in Bay Creek have been monitored for impacts to heritage resources during or after project-related construction or reconstruction activities. Of the ten heritage resources that were identified prior to construction activities, two were determined to be potentially eligible and both were successfully avoided during all trail construction/reconstruction activity. One new heritage resource was identified post-construction; however, it has been determined not eligible

for the NRHP and, therefore, does not require site protection (See FY07 TDP Monitoring Report for more information).

Twenty-nine sites were monitored because they are included in the Forest's Priority Heritage Asset list. Priority Heritage Assets are those heritage assets that are or should be actively maintained, and meet one or more of the following criteria: (a) the significance and management priority of the property is recognized through a special designation; e.g. listing on the National Register, State Register, etc; (b) the significance and management priority of the property is recognized through prior investment in preservation, interpretation, and use; (c) the significance and management priority of the property is recognized in an approved management plan; and/or (d) the property exhibits critical deferred maintenance needs, and those needs have been documented.

Sites included in the Forest's deferred maintenance list that were monitored during 2007 include NRHP-listed site Millstone Bluff, farmsteads associated with the community of Miller Grove, the prehistoric complex at Iron Mountain, several prehistoric village sites, rock shelters, rock art sites, and prehistoric mortuary sites. Although maintenance needs were identified at two sites, they were not identified as critical. No new vandalism or unplanned management activity had occurred at any of the twenty-nine sites there were monitored. (See FY07 Condition Reports for more information).

Two sites were investigated for vandalism in FY07. One site was on Forest Service property, but an assessment revealed only minimal illegal digging that had occurred in the distant past. The other site was located on U.S. Fish and Wildlife property, but was assessed and documented by FS personnel through an interagency agreement.

During 2007, the Heritage Program prepared an Archaeological Resource Protection Act (ARPA) Damage Assessment Report for the unauthorized excavation of a ridge-top prehistoric habitation site and chert workshop located on the Cypress Creek National Wildlife Refuge. A local vandal had excavated, removed, and damaged approximately 120.78 cubic meters of material remains of archaeological deposits containing evidence of human occupation, use and activity.

The estimated value of the damage was \$150,326.06. This amount includes the archaeological value of the damaged resource (what it would cost to conduct approved scientific excavations of a similar amount of archaeological deposits, analyze the results, document the findings, and curate the recovered archaeological remains (\$134,385.00), as well as the cost of restoration and repair, and additional informational signage at the site (\$15,941.06).

Recommendations/Conclusions: In summary, archaeological sites and other heritage resources are adequately protected during implementation of earth-disturbing land management activities. Current preservation legislation appears to adequately protect significant heritage resources and other sites that are eligible or potentially eligible for inclusion on the NRHP. There have been no unanticipated archaeological discoveries

It would also appear that traditional and moderate recreational use by our forest visitors does not pose an environmental threat. However, intentional vandalism at a particular class of sites is a resource protection problem on National Forest Systems lands, and other federal property (FWS). It is obvious we need to continue our efforts to involve the public in archaeological and historical resource protection programs. This can be done through outreach programs such as the very successful Passport in Time (PIT) as well as other conservation education programs such as More Kids in the Woods. Signage and heritage opportunity guides will also be an important part of this endeavor. Educating the public through programs like PIT and other

outreach projects is very beneficial. Not only are we able to reach the actual PIT participant volunteer, but also we benefit from good media coverage including both TV and printed news. Through this venue we are able to get the message across much more effectively and reach a much larger audience than would otherwise be the case. In addition, interpreted heritage resources such as Millstone Bluff with its strong preservation and anti-vandalism message, are able to reach large numbers of forest visitors. A well-educated and well-informed public is much more likely to make appropriate preservation decisions than otherwise. Large numbers of well-informed forest visitors also make it more difficult for treasure-seeking vandals to loot and destroy significant archaeological sites. Their very presence acts as a deterrent.

Corrective Measures: None required.

Data Storage: INFRA

Reporting Period: Annual

Personnel: Mary McCorvie, Forest Archaeologist

Responsible Individual: Mary McCorvie, Forest Archaeologist

Prepared by: Mary R. McCorvie and Heather Carey

Date: 9/02/08

Land Adjustment

Recreation enhancement (Item #44)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness.

- Does the land adjustment program progress toward consolidation of ownership, provide greater ease of public use, and enhance recreation benefits?

Priority: High_x Med___ Low___

Method: B—Estimate additional numbers of visits or capacity added, and qualitatively describe the recreational opportunity by the land adjustment.

Frequency of Monitoring: 5-7 years

Frequency of Evaluation: 5 years

Duration: Life of 2006 plan

Observations, Results, Trends: 748 acres acquired in FY07

- Colyer Farms I (Alexander Co.) - 252 total acres acquired 10/4/2006
- TNC/Qualls (Union Co.) - 303 total acres acquired 9/24/2007
- Colyer Farms II (Alexander Co.) - 233 total acres acquired 9/25/2007

Acquisition of Qualls tract increased access to Hutchins Creek (Candidate Wild and Scenic River) and the Bald Knob Wilderness, as well as providing a significant buffer to the Wilderness area. This buffer will enhance the visitor experience within the designated Wilderness by protecting the viewshed and reducing the visual and auditory impacts of non-compatible uses on adjoining lands. Acquisition and restoration of the two Colyer Farms tracts will provide increased wildlife-dependent recreational opportunities, including hunting (primarily waterfowl) and birding.

Recommendations/Conclusions – Continue to purchase lands to consolidate Wilderness Areas and in close proximity to Classified Wild and Scenic Rivers and general forest areas to provide visitor access and to improve visitor experience.

Corrective Measures: None required.

Data Storage: ALP (Automated Lands Program)

Reporting Period: FY07

Personnel: Lands Program Manager Ron Scott, Recreation Program Manager, District Recreation Personnel Ron Moore and Bob Monroe

Responsible Individual: Ron Scott, Lands Program Manager

Prepared by: Ron Scott **Date:** 9/2008

Land Adjustment**Ecosystem health** (item #45)**Monitoring Driver:** 2006 Forest Plan**Monitoring Question or Purpose:** To adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness.

- Does the land adjustment program progress toward consolidation of ownership, contribute to biodiversity and the health of the ecosystem?

Priority: High X Med ____ Low ____**Method:** A–Acres adjusted. B–Qualitatively describe the ecosystem benefit by the land adjustment.**Frequency of Monitoring:** Annually**Frequency of Evaluation:** 5 years**Duration:** Life of 2006 plan**Acceptable Variance:** None indicated.**Observations, Results, Trends:** 748 acres acquired in FY07

- Colyer Farms I (Alexander Co.) - 252 total acres acquired 10/4/2006
- TNC/Qualls (Union Co.) - 303 total acres acquired 9/24/2007
- Colyer Farms II (Alexander Co.) - 233 total acres acquired 9/25/2007

The number of acres of restoration or protection opportunity:

TNC/Qualls: ~ 150 acres – formerly cropland and planned for reforestation in FY08

Colyer I & II: ~ 485 acres; 152 acres reforested in FY07

Recommendations/Conclusions: None.**Corrective Measures:** None required.**Data Storage:** ALP**Reporting Period:** 5 years**Personnel:** Ron Scott, Lands Program Manager; Steve Hupe, Natural Resources Program Manager; other specialists.**Responsible Individual:** Ron Scott, Lands Program Manager**Prepared by:** Ron Scott, Lands Program Manager**Date:** 8/28/08

Land Adjustment

Threatened, endangered and sensitive species (TES) (Item #46)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness.

- Does the land adjustment program progress toward consolidation of ownership and provide better habitat for threatened, endangered and sensitive species?

Priority: High X Med ____ Low ____

Method: A—Acres adjusted. B—Qualitatively describe the benefit of the adjustment to TES.

Frequency of Monitoring: Annually

Frequency of Evaluation: 5 years

Duration: Life of 2006 plan

Acceptable Variance: No variance in protection of species.

Observations, Results, Trends: 748 acres acquired in FY07

- Colyer Farms I (Alexander Co.) - 252 total acres acquired 10/4/2006
- TNC/Qualls (Union Co.) - 303 total acres acquired 9/24/2007
- Colyer Farms II (Alexander Co.) - 233 total acres acquired 9/25/2007

The number of acres of TES habitat acquired: ~ 748 acres

TNC/Qualls (all) – Will improve protected habitat for timber rattlesnake and cerulean warbler

Colyer I & II (all) – Will improve protected habitat for bird-voiced tree frog

Recommendations/Conclusions: None.

Corrective Measures: None required.

Data Storage: ALP

Reporting Period: 5 years

Personnel: Ron Scott, Lands Program Manager; Steve Hupe, Natural Resources Program Manager; Steve Widowski, Wildlife Biologist.

Responsible Individual: Ron Scott, Lands Program Manager

Prepared by: Ron Scott, Lands Program Manager

Date: 8/28/08

Land Adjustment

Wetland and floodplain protection (Item #47)

Monitoring Driver: 2006 Forest Plan, Executive Order (EO) 11988 and 11990

Monitoring Question or Purpose: To adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness.

- Does the land adjustment program progress toward consolidation of ownership and expand protection of wetlands and floodplain and comply with EOs?

Priority: High X Med ____ Low ____

Method: A–Acres adjusted. B–Qualitatively describe the benefits of land adjustment to wetlands and floodplains.

Frequency of Monitoring: Annually

Frequency of Evaluation: 5 years

Duration: Life of 2006 plan

Acceptable Variance: None indicated.

Observations, Results, Trends: 748 acres acquired in FY07

- Colyer Farms I (Alexander Co.) - 252 total acres acquired 10/4/2006
- TNC/Qualls (Union Co.) - 303 total acres acquired 9/24/2007
- Colyer Farms II (Alexander Co.) - 233 total acres acquired 9/25/2007

Number of acres of wetland or floodplain acquired: ~ 635 acres (~ 150 acres at the TNC/Qualls tract and the entirety – 485 acres – of the Colyer I and Colyer II tracts).

Recommendations/Conclusions: None.

Corrective Measures: None required.

Data Storage: ALP

Reporting Period: Annual

Personnel: Ron Scott, Lands Program Manager; Steve Hupe, Natural Resources Program Manager; Steve Widowski, Wildlife Biologist; other specialists.

Responsible Individual: Ron Scott, Lands Program Manager

Prepared by: Ron Scott, Lands Program Manager

Date: 8/28/08

Land Adjustment

Heritage resources (Item #48)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To adjust land ownership within the Forest proclamation boundary to enhance public benefits and improve management effectiveness.

- Does the land adjustment program progress toward protecting heritage resources?

Priority: High__ Med____ Low____

Method: A—Acres and number of actual heritage sites. B—Estimate of potential heritage sites and qualitative description of the recreational enhancement by the land adjustment.

Frequency of Monitoring: Annually

Frequency of Evaluation: 5 years

Duration: Life of 2006 plan

Acceptable Variance: None indicated.

Observations, Results, Trends: None.

Recommendations/Conclusions: 748 acres acquired in FY07

- Colyer Farms I (Alexander Co.) - 252 total acres acquired 10/4/2006
- TNC/Qualls (Union Co.) - 303 total acres acquired 9/24/2007
- Colyer Farms II (Alexander Co.) - 233 total acres acquired 9/25/2007

of acres of actual or potential heritage sites: None (i.e., 0)

TNC/Qualls – Inventoried and no sites recorded.

Colyer I - Inventoried and no sites recorded.

Colyer II – Not inventoried, but no sites expected to be located on tract.

Corrective Measures: None required.

Data Storage: ALP

Reporting Period: Annual

Personnel: Ron Scott, Lands Program Manager; Mary McCorvie, Heritage Program Manager.

Responsible Individual: Ron Scott, Lands Program Manager

Prepared by: Ron Scott, Lands Program Manager

Date: 8/28/08

Mineral Resources

Mineral resources (Item #49)

Monitoring Driver: 2006 Forest Plan

Monitoring Question or Purpose: To determine the status of mineral exploration and development on the federal mineral estate.

- *Are EOI's and other requests for mineral leasing being processed within prescribed timeframes?*
- *Are all mineral operations being processed within prescribed time frames?*
- *Are mineral operations, including private, being inspected as prescribed?*
- *Have non-compliant operations been corrected in a timely matter?*

Priority: High__ Med X Low__

Method: A–Number of leases, permits, and/or contracts. B–Description of activities.

Frequency of Monitoring: Annually

Frequency of Evaluation: 5 years

Duration: Life of 2006 plan

Observations, Results, Trends: The Forest has received an Expression of Interest from the BLM to lease lands for oil/gas. This needs to be completed. With the increase in oil/gas prices and decrease in supply, the interest in the area may be moderate to high. However, with the lack of discovery of oil/gas, the interest is anticipated be low to moderate. There have been no other requests for other mineral operations.

Recommendations/Conclusions: Continue to monitor the open market and well completions.

Corrective Measures: None required.

Data Storage: None indicated.

Reporting Period: Annual

Personnel: Gretchen Moore, Minerals Program Manager.

Responsible Individual: Gretchen Moore, Minerals Program Manager

Prepared by: Gretchen Moore, Minerals Program Manager

Date: 8/28/08

Appendix A

Purpose and Scope of the Monitoring Report

A. Reasons for Evaluation and Monitoring

The Code of Federal Regulations 219.6 (a) requires periodic evaluations of changing conditions, science and other relevant information pertaining to land management planning. Three types of evaluations are required: comprehensive evaluations for plan development and revision, evaluations for plan amendment, and annual evaluations of monitoring information¹.

The monitoring and evaluation program is described in the 2006 *Shawnee National Forest Land and Resource Management Plan* (Plan)². According to 36 CFR 219.6 (a) (3) and (b) (2), the plan-monitoring program shall take into account financial technical capabilities; key social, economic, and ecological performance measures relevant to the plan area; and the best available science. In addition, the plan-monitoring program shall provide for:

- (i) Monitoring to determine whether plan implementation is achieving multiple-use objectives;
- (ii) Monitoring to determine the effects of the various resource-management activities within the plan area on the productivity of the land;
- (iii) Monitoring of the degree to which on-the-ground management is maintaining or making progress toward the desired conditions and objectives for the plan; and
- (iv) Adjustment of the monitoring program as appropriate to account for unanticipated changes in conditions.

If monitoring results indicate there is a significant difference between actual conditions and those estimated in the Plan, the report may recommend changes in performance or changes in funding or technical capabilities.

The annual monitoring report is a tool used to describe how public lands are being managed and how effectively the commitments made in the 2006 Forest Plan are being met. The monitoring report also serves as a reference for planning, evaluation of trends and effectiveness of management actions or conditions, and to make recommendations for additional research needs.

B. Background

1. Previous monitoring efforts/results/trends.

The 2006 *Shawnee National Forest Land and Resource Management Plan*, signed March 20th, 2006 is a revision of the 1992 Amendment and 1986 Land and Resource Management Plan. Monitoring and evaluation with public involvement of the previous plans demonstrated changes in ecological and social conditions significant enough to conduct an analysis on seven topics: watershed resources; biological diversity and wildlife and aquatic habitat; recreation management; forest ecosystem health and sustainability; mineral resources; wilderness, roadless areas, and wild and scenic rivers; and land-ownership adjustment.

¹ 36 CFR 219.6 (a); Code of Federal Regulations (7-1-07 edition)

² 2006: Shawnee National Forest Land and Resource Management Plan, pp. 95-106.

C. Annual Monitoring Program

The annual monitoring report as identified in the 2006 Plan, on page 95, will determine:

1. Compliance with legal and regulatory monitoring items.
2. Achievement of Forest Plan goals and objectives and desired future conditions.
3. Implementation of management prescriptions.
4. Management problems, issues, concerns and opportunities identified resulting from compliance.
5. If effects are occurring as predicted
6. If costs of implementation are as predicted, and
7. If changes are warranted in standards, guidelines or other direction.

This report is based on the annual monitoring activities identified in Table 6-2 Monitoring Matrix table, and includes a list and description of the corporate databases and other monitoring items.

D. Comprehensive Evaluation

Every few years, comprehensive evaluation of monitoring information will be conducted as described in 36 CFR 219.6 (a) (1): evaluation of current social, economic, and ecological trends that contribution to sustainability, as described in 36 CFR 219.10.

Appendix B

Threatened, Endangered, and Sensitive Animal Species

FY07 Monitoring Report

By Steve Widowski, Wildlife Biologist

There are three animal species listed by the U.S. Fish and Wildlife Service (USFWS) as threatened (T) or endangered (E) known to inhabit the Forest or areas in close proximity to the Forest: least tern (*Sterna albifrons*), gray bat (*Myotis grisescens*), and Indiana bat (*Myotis sodalis*). Twenty-eight Regional Forester sensitive (RFSS) animals are listed on the Forest as of January 16, 2007. Only 16 of these animals were listed as RFSS on the Forest in 2006. The bald eagle (*Haliaeetus leucocephalus*) was delisted by the USFWS as a threatened species on June 28, 2007. The species is listed as Regional Forester sensitive species following delisting.

Areas proposed for any management activity are inventoried to determine whether and how habitat for these species could be potentially affected by the proposed activity. In addition, species listed by the USFWS are monitored at varying intervals for occurrences at or near known locations.

Fauna

Indiana bat (*Myotis sodalis*) (Federal E):

Two relatively, large maternity colonies of Indiana bats were identified on the Forest by SIU researchers as part of on-going studies on Indiana bats on the Forest. Carter (2003) identified these colonies based upon mist-netting surveys, telemetry studies, and subsequent exit surveys at roosts in Oakwood Bottoms Greentree Reservoir and in the Upper Bluff Lakes area of the Forest in Union County, Illinois. One maternity colony of Indiana bats on the Forest (the colony at Oakwood Bottoms) was monitored by Shawnee wildlife biologists in 2007. Biologists found pregnant Indiana bats at locations similar to those identified for the area in Feldhamer et al. 2006. However, large maternity roost trees were not identified as part of the 2007 monitoring efforts due to limited monitoring timeframes as well bat exits from the roosts well after dark during survey days which did not allow for accurate roost exit counts. A summary of the results of the above monitoring work/study were as follows:

Survey Results

Five nights of mist netting resulted in the capture of 38 bats, consisting of 7 species (Table 1). This total included 5 Indiana bats (*Myotis sodalis*) which were all females, consisting of 4 post-lactating adults and 1 juvenile. Radio transmitters were applied to 2 adult female Indiana bats.

Radio telemetry provided the location of 5 roost trees, which proved to be roosts of other bats some nights and just the single bat on other nights (Figure 1, Table 2). The roost trees were found within ½ mile of the net sites, and were in the same general area as many of the roost trees from the 2006 study. All trees but one were large (17 – 25 in. dbh) Pin Oaks (*Quercus palustris*), the other being a 12 inch American elm (*Ulmus americana*).

Discussion

The Oakwood Bottoms Indiana bat maternity colony appears to be stable and essentially unchanged from previous years' monitoring efforts. The roosting locations changed very little from the 2006 locations. Exit counts were minimal which was partly due to a late fly out, which was well after dark on two nights. With such an abundance of roosting and foraging habitat Oakwood Bottoms proved to be very diverse with bat species.

The Illinois Department of Natural Resources and Southern Illinois University did conduct surveys of hibernacula in Southern Illinois in 2007. There are five caves and 5 mines within the boundaries of the Forest that have historically had Indiana bats wintering in them. Total populations of Indiana bats in the five mines have declined slightly overall in 2007 with populations in the five ranging from 23% declines to 80% increases. The one mine with largest population of Indiana bats including the largest in Illinois had only very small (2.5%) declines. Wintering Indiana bat populations in Illinois overall in 2007 were estimated to have decline 1.1% from population levels counted in 2005 and 2006. Illinois population level estimates for wintering Indiana bats for 2007 were approximately 54,000, about 10.5% of the total population of Indiana bats throughout its range.

Only one of the five caves that have historical wintering populations of Indiana bats is on National Forest land. Two of these five caves have protected gates on them, however there are currently no wintering Indiana bat populations in either as of 2007. Brasher Cave on National Forest does have an increasing winter and summer population of southeastern bats (RFSS) and a summer male colony of Indiana bats. Increases in southeastern bats in that cave have followed cave gating. There are currently no Indiana bats wintering in Brasher Cave. There is a good possibility that the original populations of wintering Indiana bats in that cave were misidentified and were most likely southeastern bats instead of Indiana bats. Wintering populations of Indiana bats in one of the four caves on private land, Ellis Cave, that is in very close proximity to National Forest, have increased by approx. 20% from estimates done in 2005. Winter populations of Indiana bats in Griffith Cave were not monitored in 2007. Populations were increasing in that cave from 2003-2005. Populations in the remaining two caves within Forest boundaries but on private land were not surveyed in 2007 but are thought to be declining.

One cave and four mines within the Forest boundary are known to have summer populations of male Indiana bats. These summer colonies were not monitored in 2007. Four of the five caves/mines with summer populations are in locations that are protected from public disturbance by gating.

Conclusions:

- Overall populations of wintering Indiana bats within the Forest boundary and overall in Illinois declined slightly in 2007 compared to monitoring estimates made in 2005. However, overall populations for Indiana bats throughout their range in 2007 are estimated to have increased by 9.4%. Hibernacula for Indiana bats on the Forest and on adjacent private lands continue to be protected from human disturbances with gating and mine entrance stabilizations. These measures should protect the species from human disturbances and drastic changes in hibernaculum temperatures.
- The Oakwood Bottoms maternity colony appears to be stable and essentially unchanged from previous years in which monitoring was conducted. While the colony has begun to use areas previously not documented, this is not surprising, nor a cause for any changes in management. Oakwood Bottoms is a large mature bottomland forest. Natural attrition of large trees within the area should provide a suitable supply of roosts for this colony into the future. The problems this area has had with flooding and insects have created a plethora of roosting resources over the years. Efforts are being planned for improving overall forest health. Few management efforts are necessary to create roosting resources for the Indiana bat as natural attrition should supply adequate roosting resources. More prolonged monitoring efforts of the Oakwood and Union County/Bluff Lake maternity colonies are planned in 2008.

- The Forest continues to develop a better understanding of the distribution of Indiana bats within the boundaries in partnership with SIU, IDNR, Unimin Specialty Minerals, and USFWS.
- Monitoring of hibernacula, maternity colonies, and bachelor colonies of Indiana bats should continue on the Forest at regular intervals as part of monitoring work for both IDNR and the Shawnee National Forest.
- Additional mist netting will help us identify and monitor Indiana bat summer populations on the Forest in maternity colony areas and in project areas within hardwood forest areas across the Forest.
- Mist-netting, although very labor intensive, has also added valuable information to our knowledge of the habitats and distribution of Forest bats. The use of mist-netting has proven valuable in determining the general presence of foraging and roosting bats in a given area.
- The use of data-loggers in a few caves and all mines that serve as hibernacula for Indiana bats to record temperature and human disturbance is expected to continue. This will then continue to provide an effective tool to monitor changes in environmental conditions that may help determine causes for population fluctuations and changes in habitat use.
- Forest management actions to date have not had any known, negative effects on Indiana bats. Standards and guidelines for management in both summer and winter habitats for Indiana bats on the Forest continue to be implemented as part of Forest management actions.

Recommendations:

- Recommend that the Forest continue efforts to monitor bat populations and roosting habitat use. The use of data loggers to monitor cave temperature and human disturbance factors could be expanded.
- Recommend that the Forest should continue to evaluate cave and mine-gating at several sites as a means of protecting fragile wintering habitat.
- Recommend entrance stabilization and gating at all mines on the Forest that have winter and/or summer Indiana bat populations.
- Recommend monitoring of all caves and mines on the Forest at some regular intervals for Indiana bat use especially with global warming possibly affecting external temperatures on the Forest in both summer and winter. This was done for many mines by SIU researchers in 2006.
- Recommend evaluation and addition of new standards and guidelines for Indiana bats as appropriate in cooperation with USFWS.
- Recommend that the Forest encourage volunteers from the Little Egyptian Grotto and Illinois Speleological Society to continue their efforts to help maintain a clean and healthy cave environment at several cave sites on the Forest.

Gray bat (*Myotis grisescens*) (Federal E):

The species continues to have a summer roost in one cave on private land within the Forest boundaries. One individual of the species was also found in one other cave on private land adjacent to the Forest in FY07. The species is still known to utilize perennial streams and associated riparian forests on the Forest in the vicinity of that cave. Two gray bats were captured in mist-netting monitoring efforts along Grand Pierre creek by Rod McClanahan, wildlife biologist on the Hidden Springs RD of the Forest in 2006. Summer mist-net surveying for that species is expected to continue for the species in 2008.

Conclusions:

- Species still occurs in small numbers on the Forest in historical locations in both summer and winter but appears not to be affected by management on National Forest.

Recommendations:

- Species should still be monitored in conjunction with surveys for Indiana bats in both summer habitats and winter roosting sites on the Forest especially in close proximity of the known summer roost cave.

Least tern (*Sterna albifrons*) (Federal E):

The species still nests on islands with sandbars in the Mississippi and Ohio rivers. It uses the major rivers as foraging habitats. The Forest has some properties in the Mississippi River Floodplain that could be possible nesting and foraging areas for the species. To date no nesting by least terns has been observed on National Forest. However the species was identified in FY08 nesting in the floodplains of the Mississippi River in Jackson, Union, and Alexander counties in close proximity to National Forest. This was due to extensive and prolonged river and floodplain flooding in the summer of 2008.

Conclusions:

- The species could be found utilizing the Forest in small numbers in the future as the Forest continues to acquire Mississippi River floodplains and restores forests and wetlands on these sites.

Recommendations:

- Periodically monitor bird populations on these newly acquired floodplain lands to monitor least tern use of the Forest.

Bald eagle (*Haliaeetus leucocephalus*) (Removed from Federal listing in June 2007 and added to the RFSS for the Forest on that date):

Bald eagles continued to maintain active nests on both the national forest and private land in Alexander, Jackson, Union, Hardin, Pope, and Johnson Counties during 2004-2007. Nesting success has not been monitored in 2007 but successful hatching of juvenile bald eagles has occurred in all five counties in the last five years. Illinois Department of Natural Resources Division of Natural Heritage occasionally does aerial monitoring of most nests when funding is available. The last known aerial survey of nests was done in 2003 by IDNR. There are approximately 5-6 nesting pairs of bald eagles on or immediately adjacent to the Forest in 2007. No specific monitoring of reproductive success was done at any of these locations but young eagles are commonly seen in the vicinity of all nesting locations including in 2007.

No monitoring was done at the winter roost-site at Atwood Ridge research natural area during the winter of 2007. The number of eagles using the area has historically peaked in December and slowly declined through mid-winter. All the birds leave the area by March.

Conclusions:

- Nesting bald eagles have increased on the Forest and throughout their range. With increasing nesting apparent in southern Illinois and adjacent states, we anticipate that the major rivers and reservoirs on or adjacent to the Forest will provide additional nesting habitat in the near future.
- Suitable winter roosting habitat is not limiting on National Forest adjacent to the Ohio, Mississippi and Big Muddy River floodplains.

- The 2006 Forest Plan no longer has a goal for nesting bald eagles since we have exceeded our 1992 Plan goal and nesting bald eagles continue to flourish in southern Illinois and on the Forest.

Recommendations:

- Recommend that both the Forest and the IDNR continue to monitor bald eagle populations and nesting sites throughout the Forest when funding is available.
- Continue to protect nesting and winter roosting habitats on the Forest with implementation of Forest Standards and Guidelines.

Eastern woodrat (*Neotoma floridana*) (RFSS):

Populations of the Eastern woodrat are declining in many parts of its geographic range. In Illinois, the Eastern woodrat is listed as endangered. The only known populations in the state are found on the Forest. Extensive research and annual monitoring of this population has continued since the early 1970's. Surveys conducted since then indicate two small but slightly expanding populations in upland and bottomland forest occur at LaRue Pine Hills Ecological Area and at Fountain Bluff near the Mississippi River. IDNR personnel surveyed the LaRue Pine Hills/Otter Pond and Horseshoe populations during 2002. The results of this survey initiated the preparation and approval of a recovery plan for the southern Illinois and the Forest.

A recovery plan detailing recovery objectives for the Eastern woodrat on the Forest was implemented in 2003. In an effort to re-establish populations of the Eastern woodrat on the Forest 72 woodrats were trans-located from Arkansas and Missouri, as well as LaRue Pine Hills, Illinois to several sites primarily on the eastside of the Forest during 2007. Approximately 42 new animals including both males and females were discovered in translocation areas on the Forest in 2007. This is evidence that the reintroduction appears to be working and breeding populations have been established in at least 4 different areas (High Knob, Buzzards Point, Garden of the Gods and Pounds Hollow) on the Hidden Springs Ranger District. Southern Illinois University continues to monitor populations in the reintroduction areas.

A Conservation Assessment was prepared for the species in 2002. The species is still threatened with localized extinctions because of the relatively small, localized population.

Conclusion:

- Populations of the Eastern woodrat (*Neotoma floridana*) on the Forest in both native population sites have moderately fluctuated in numbers during the past two decades. Populations currently appear to be stable. Their small size and relative isolation continue to make them very vulnerable to extirpation in the event of a catastrophic event. Reintroduction efforts are having success and should also be improving the genetic viability of the native populations.

Recommendations:

- Recommend that the Forest continue cooperative efforts with both the Illinois Department of Natural Resources and Southern Illinois University to monitor current populations and implement the recovery objectives of the Eastern woodrat recovery plan to reduce the threats to the species.

Eastern small-footed myotis (*Myotis leibii*) (RFSS):

The species has been observed in only one location on the Forest, the Fink Barrens Natural Area in Johnson County. It is suspected that it occurs in other rock outcrops and in some caves on the Forest but it is not easy to find. We have not collected the species as part of mist-netting efforts on the Forest since the mid-1990's. It was found in early 2006 by SIU mammalogists who found a pair under a rock. A conservation assessment was prepared for the species by the Region in 2001.

Conclusions:

- Roosting numbers for this species in rock outcrops and caves appear to be very low as the species has not been detected in mist netting efforts on the Forest.
- There is a good possibility that species may use other rock outcrops and some caves on the Forest, especially if their population increases in the future.

Recommendations:

- Continue monitoring for the species as part of mist-netting efforts for other bat species and as part of cave monitoring across the Forest especially in Johnson and Pope counties near the one known location.
- Take protective management actions if the species is discovered using other rock-outcrops and caves on the Forest as populations of the species increase.
- Implement conservation strategies for the species utilizing information in the conservation assessment on risks for the species.
- Implement and monitor project standards and guidelines that are developed for the species on a project by project basis based upon the conservation assessment information.

Southeastern Myotis (*Myotis austroriparius*) (RFSS):

This species has two known winter and summer colonies on the Forest in two of the caves on the eastside of the Forest. One additional population was discovered in equality cave as part of Forest survey efforts and preliminary information from our ISS partners in 2006. This population was again monitored in 2007. Both caves are protected from human disturbances during summer and winter use by cave gates. A cave gate was installed at Equality for the species in 2007. Both caves are being monitored annually for temperature and humidity. A conservation assessment for the species was prepared in 2001.

Conclusions:

- Roosting numbers for this species in both caves appear to be increasing since the gate installation and with favorable roosting temperatures in the cave.
- There is a good possibility that species may use other caves on the Forest as their population increases.

Recommendations:

- Continue monitoring for the species as part of cave monitoring across the Forest and as part of mist net surveys especially in Pope, Hardin, and Saline counties on the Forest.
- Take protective management actions if the species is discovered using other caves on the Forest as the species population increases.
- Implement conservation strategies for the species utilizing information in the conservation assessment on risks for the species.
- Implement and monitor Forest Plan standards and guidelines that were developed for the species based upon the conservation assessment information as part of Forest Plan Revision.

Henslow's sparrow (*Ammodramus henslowii*) (RFSS): Monitoring was done by members of the Cooperative Wildlife Research Unit at Southern Illinois University. Preliminary results from monitoring in openlands in 2007 indicate that Henslow's sparrows continue to occur at relatively low numbers (approximately 5 signing males) in the Asby Tract, and Turpin openlands and in 2007. None were observed or heard on the Pennant Bar Ranch and West Openland routes on the Forest in 2007. The species did nest in unsurveyed areas on the Pennant Bar Ranch in unburned openlands in 2007. They may have decreased along survey routes in 2007 following burning all the survey routes to maintain grassland habitats for the species.

Prescribed burning, continued shrub removal, grassland and herbaceous food plantings were done on the Pennant Bar Ranch, Turpin, Ashby, and West openlands in 2007. Cedar and autumn olive removal, burning and planting of some food plots and native grasses in the Kinkaid openland were done in 2007. Approximately a total of 1,290 acres were treated in five openland sites on the Forest to improve habitat for grassland and shrubland birds in 2007

Conclusion:

- Observations indicate that substantial shrub growth, including the invasion of autumn olives and Eastern red cedar can potentially have a lasting, adverse effect on populations of the Henslow's sparrow, a Regional Forester's Sensitive Species and state endangered species. Burning can have a short term negative effect the season immediately following burning as nesting and foraging cover is decreased.
- A Conservation Assessment was prepared for the species in 2001 for its range on National Forest in the Eastern Region of the Forest Service.

Recommendation:

- Recommend that the Forest manage large openland areas to benefit threatened and endangered species, as well as many grassland species that are declining in numbers.
- Forest plan standards and guidelines were developed for the species based upon the conservation assessment information as part of Forest Plan Revision.
- Continue to monitor openland bird species.

Cerulean warbler (*Dendroica cerulea*) (RFSS):

Bird monitoring was done in 2007 and cerulean warblers (23) were detected in three locations/ transects on the Forest as part of the annual Forest bird monitoring. This was done by the Cooperative Wildlife Research Lab (CWRL) at SIUC. The Forest also had the CWRL participate in a regional assessment of the species being done by the Northern Research Station of the Forest Service. A total of 13 cerulean warblers was detected at five different areas of the Forest as part of that assessment work. The species was absent from a few historical monitoring locations in 2007, more abundant at some other historical sites, and located at two new locations. Overall, the species continues to be uncommon on the Forest, with populations primarily confined to the floodplains of three streams on the west side of the Forest (Mississippi Bluffs Ranger District): Cave and Cedar Creeks and the Big Muddy River.

Conclusions:

- There have been no conflicts between the species and vegetation management actions on the Forest.
- There was a conservation assessment prepared for the species in 2000 and the biology and management of the species was reviewed and discussed as part of the species viability analysis for the Hoosier and Shawnee National Forests in 2002.
- Management that favors large overstory, hardwood trees with much mid and understory diversity appears to be best for the species.
- Species also appears to utilize large white oaks for nesting and foraging on the Forest.

Recommendations:

- Continue to manage for large, hardwood overstory trees in the larger floodplains on the Forest.
- Continue to manage for large white oaks across the Forest.
- Continue to monitor the species with existing bird monitoring transects and more concentrated monitoring in known habitat areas.
-

Migrant loggerhead shrike (*Lanius ludovicianus migrans*) (RFSS):

The species is rare on the Forest and within the Forest boundary. It is a species of grazed oldfields and pasture and cropfield edges. There is only one documented pair on the Forest—on the Pennant Bar Ranch. The species has not been observed at this historical location in 2007 nor in any of the managed openlands that have been monitored as part of the Forest monitoring. A conservation assessment was done in 2004 for the species on the Shawnee and Hoosier National Forests and their surrounding landscapes.

Conclusions:

- High quality habitats for the species are rare on the Forest except in a few openland areas of the Forest.
- Much is still unknown about the reasons for the decline of the species, especially in southern Illinois.

Recommendations:

- Continue to monitor shrike populations on the Forest in existing, managed openlands.
- Prepare a conservation management strategy for some existing openlands to benefit the species in accordance with information in the conservation assessment for the species.
- Forest plan standards and guidelines were developed for the species based upon the conservation assessment information as part of Forest Plan Revision.

Swainson's warbler (*Limnothlypis swainsonii*) (RFSS):

The species is only known historically from one location on the Forest, Cave Valley in Jackson County. A conservation assessment for the species was completed in 2005. The species is known to utilize giant cane stands for nesting and foraging as well as early successional, riparian and bottomland forests. Bird monitoring was done in Cave Valley as part of the bird monitoring program across the Forest. No Swainson's warbler's were detected in the Cave Valley monitoring transect in 2007.

Conclusions:

- More needs to be known on the habitat needs and management strategies for the species.
- Restorations of bottomland forests in the Mississippi floodplains on the Forest could benefit the species.
- More detailed surveys should be done for the species regularly in southern Illinois.

Recommendations:

- Continue to monitor for the species on the Forest especially in the Cave Valley area and in areas of bottomland forest restoration.
- Implement Forest Plan management strategies for the species in the CV (Cave Valley) management area of the Forest in accordance with the Forest Plan (2006).
- Consider restoration of giant cane in floodplain restorations where appropriate on the Forest.

Bird-voiced tree frog (*Hyla avivoca*) (RFSS):

It is a species that inhabits the forested and swampy floodplains of large rivers and streams that include stands of bald cypress and tupelo gum trees. On the Forest, populations occur in these habitats along the Big Muddy River, Mississippi River floodplain, and the floodplains of Bay Creek. These habitats are natural areas or research natural areas on the Forest and are generally protected from any adverse habitat alterations. A conservation assessment was completed for the species by SIU herpetologists in 2005.

Conclusion:

- The existing site-specific guidelines are expected to adequately protect the bird-voiced tree frog since known populations are located in natural areas and research natural areas of the Forest.
- The species may expand into restored wetlands and forests in the Mississippi River floodplain.

Recommendation:

- Monitor existing populations and restored floodplain forests and wetlands for the species in partnership with IDNR and SIU.
- Maintain and restore high-quality, bald cypress-tupelo swamp habitats across the Forest especially in the MO management area.
- Implement Forest plan standards and guidelines for the MO and NA management areas and for specific species that were developed based upon the conservation assessment information as part of Forest Plan Revision.

Timber rattlesnake (*Crotalus horridus*) (RFSS):

This species is common throughout the upland and bottomland hardwood Forests and rocky bluffs on the Westside of the Forest. The species also exists in small isolated populations in a few locations on the eastside of the Forest. Protection of known den sites and nearby hardwood forests are thought to be the best management for the species. A conservation assessment was prepared for the species by SIU herpetologists in 2005.

Conclusions:

- Populations of the species appear to be stable on the Westside of the Forest but relatively unstable and isolated on the Eastside.
- Protection of den sites and breeding females would appear to be the management strategy to maintain population viability of the species especially in isolated areas.
- More information needs to be known on population numbers to verify the above assumptions.

Recommendation:

- Implement and monitor site-specific standards and guidelines in the Forest Plan (p. 294) that were developed to protect the timber rattlesnake and its habitat based upon the conservation assessment for the species.
- Maintain oak-hickory forest and barrens habitats within 2-5 miles of known den sites on the eastside of the Forest and throughout upland and bottomland forests in Jackson, Union, and Alexander Counties.

Northern copperbelly water snake (*Nerodia erythrogaster neglecta*) (RFSS):

In 1996, in consultation with the USFWS, current guidelines for the management and protection of habitat for the copperbelly water snake were reevaluated. The Forest developed project and site-specific guidelines to protect the species and its habitat during management activities. A conservation assessment was prepared for the species by Southern Illinois University herpetologists in 2005.

Conclusion:

- The existing site-specific guidelines are expected to adequately protect the copperbelly water snake.

Recommendation:

- Maintain habitat quality for the species in wooded and permanent water bodies, such as sloughs, shallow, marshy edges of lakes and ponds, brushy ditches, and floodplain forests on National Forest in Johnson, Pope, Hardin, Gallatin, Massac, and Saline counties.
- Monitor populations of the species at some regular interval in partnership with IDNR in some of the known locations for the species on the Forest.

Bantam sunfish (*Lepomis symmetricus*) (RFSS):

This species occurs in Grantsburg Swamp, LaRue Swamp, the Cache River, and throughout the Clear Creek drainage in Union and Alexander Counties. A conservation assessment was prepared for the species by Southern Illinois University ichthyologists and completed in 2004.

Conclusions:

- This is a species of lowland sloughs, oxbows, lakes, ponds, and swamps with mud bottoms primarily in the southern United States.
- The majority of these areas are natural areas or research natural areas or protected by riparian filter strips on the Forest.
- Existing management on the Forest protects the species.

Recommendations:

- Implement Forest Plan site-specific and MO, CR, and NA standards and guidelines for the species (Forest Plan 2006, p. 294).
- Monitor populations of the species in partnership with IDNR and SIU.

Bluehead shiner (*Pteronotropis hubbsi*) (RFSS):

This species is known historically from only one location on the Forest, LaRue Swamp and adjoining Wolf Lake. The species was extirpated by a chemical spill in Wolf Lake and has never been reestablished despite efforts at reintroduction by SIU researchers and the Forest. A conservation assessment has been prepared for the species by Southern Illinois University ichthyologists and was completed in 2002.

Conclusions:

- The species has been extirpated from the Forest and southern Illinois and efforts to restore populations through reintroduction efforts have failed to date.
- The conservation assessment does not suggest further reintroductions until more information is known on the species life history.

Recommendations:

- Maintain high quality cypress and buttonbush swamp as suitable habitat for the species in the Pine Hills/LaRue Swamp RNA.
- Evaluate past reintroduction efforts for the species and coordinate any further reintroduction efforts for the species in Otter Pond with IDNR.

Carinate pillsnail (*Stenotrema hubrichti*):

This species is only known from one general location, Pine Hills Research Natural Area. A conservation assessment was prepared for the species by SIU invertebrate zoologists in 2005.

Conclusions:

- The entire population for this species occurs in one location on the Forest.
- The species appears very susceptible to extirpation due to its limited distribution.
- However it occurs in an RNA and is protected from adverse, unnatural modifications of its habitat.
- Implement Forest plan standards and guidelines (2006 Forest Plan, p. 293) that were developed for the species based upon the conservation assessment information as part of Forest Plan Revision.

Recommendations:

- Improve and/or maintain habitat for known populations of the species on the Forest in Jackson and Union counties, primarily in the Pine Hills RNA.

Spike and purple lilliput (*Elliptio dilatata* and *Toxolasma lividus*):

These two species of mussels are known from the Ohio River and its tributary streams. The spike is also known from the Mississippi River and its tributaries as well. The purple lilliput is a State of Illinois endangered species and the spike is a State of Illinois threatened species. They are both presumed to occur on the Forest in direct, perennial tributary streams to the Ohio River and the spike is also presumed to occur on the Forest in direct, perennial tributary streams to the Mississippi River. These tributaries are not negatively affected by any Forest actions.

A conservation assessment was prepared for the purple lilliput in 2003. There is currently no conservation assessment for the spike.

Conclusions:

- Both species are protected from adverse affects on their habitats on the Forest but not from actions on adjacent private lands that may negatively affect the species on the Forest.
- Both are still susceptible to adverse affects on their habitats from siltation from private land practices and any future reservoir impoundment of their stream habitats.

Recommendations:

- Implement Forest Plan site-specific and MO, CR, and NA standards and guidelines for the species (Forest Plan 2006, p. 294).
- Monitor populations of the species in partnership with IDNR and SIU.
- Prepare a conservation assessment for the spike.

Indiana, Kentucky, and big-claw crayfish (*Orconectes indianensis*, *O. kentuckiensis*, and *O. placidus*):

All three species are found in perennial stream systems on the eastside of the Forest. The Kentucky and big-claw crayfish are found in Big Creek. Big Creek on National Forest is a wild and scenic river candidate and a natural area. The Indiana crayfish is found in the Saline River drainage on the Forest in isolated populations.

Conclusions:

- Two of the three species are protected from adverse affects on their habitats on the Forest but not from actions on adjacent private lands that may negatively affect the species on the Forest.
- Indiana crayfish are most susceptible to adverse affects on their habitats since the Saline River watershed still includes some water pollution from historical coal mine operations.

Recommendations:

- Identify core populations of each species and monitor long-term trends in abundance.
- In streams known to contain these species, minimize stream impoundment, instream removal of gravel and cobble, and input of sediments or toxins from runoff.
- Prohibit the use of non-native crayfishes as fishing bait or inter-basin transfer of non-native crayfishes in streams containing known populations of the three species.

Illinois cave beetle, (*Pseudanophthalmus illinoisensis*), springtail (*Pseudosinella argentea*), cave obligate isopod (*Caecidotea beattyi*), millepede (*Ergodesmus remingtoni*), Bousfield's amphipod (*Gammarus bousfieldi*), Hubricht's cave flatworm (*Sphalloplana hubrichti*) and subtle cave amphipod (*Stygobromus subtilis*):

The subtle cave amphipod is known to occur in only one location within the Forest boundary, in Toothless Cave in Jackson County. The cave is protected from human intrusions by a gate installed and maintained by IDNR. A Conservation Assessment was completed for the species in 2002.

The other, relatively rare, cave invertebrates were identified by Dr. Julian Lewis as very likely occurring in caves on the Forest.

Cave resources are generally protected on the Forest

Conclusions:

- The subtle cave amphipod is only known from one cave within the Forest boundaries, the entrance to which is on private land.
- Not much is actually known about the distribution of the Illinois cave beetle, springtail, cave obligate isopod, millipede, Bousfield's amphipod, and Hubricht's cave flatworm in caves on the Forest.
- None of the above invertebrates are identified as threatened or endangered species in Illinois.

Recommendations:

- Work cooperatively with IDNR to maintain the habitat for the species and monitor populations in Toothless Cave and its watershed.
- Survey other caves that contain unoccupied, suitable habitat for all of the above species on the Forest.

Other Species of Viability Concern on the Forest that are not Federal T & E or RFSS include American woodcock, gray tree frog, northern bobwhite, red-headed woodpecker, river otter, spring cavefish, wood thrush, worm-eating warbler and yellow-breasted chat. The northern bobwhite (*Colinus virginianus*), wood thrush (*Hylocichla mustelina*), worm-eating warbler (*Helmitheros vermivorus*), and yellow-breasted chat (*Icteria virens*) are also management indicator species (MIS) on the Forest. Monitoring information for these four species will be reported in the General Fish and Wildlife Monitoring Report information, another monitoring report document.

American woodcock (*Scolopax minor*)

This species is an uncommon breeding bird species in early successional forest and oldfields across the Forest. It nests early in March and is not detected by our bird monitoring routes that are done in May and June. No specific monitoring was done for the species on the Forest in 2007. I observed the species nesting in oldfields on both the east and west side of the Forest in 2006 in late March. The species has also been observed using early successional forest patches for nesting that were former wildlife openings also on both sides of the Forest in 2006. 1290 acres of grasslands and oldfields were maintained in 2007. Approximately 400 acres of newly acquired fields were planted to bottomland and upland hardwood forests in the MO and CR management areas on the Mississippi Bluffs RD in 2007. More cropland and oldfield is scheduled for purchase and reforestation in these management areas in the future.

Conclusions

- Forest Plan implementation should maintain, existing early successional habitat for the species in CR, EH, LO, MH, MO, and WW management areas through prescribed burning and forest and openland management.
- Restoration work in the MO management area should provide nesting and wintering habitat for the species as these areas are planted and succeed to hardwood forest.

Recommendations

- Implement and monitor Forest Plan direction and standards and guidelines in the CR, EH, LO, MH, MO, and WW management areas.

Gray treefrog (*Hyla versicolor*)

The gray tree frog is a common species in mature upland and bottomland hardwood forest that include woodland pools or ponds and ditches. This describes approximately 70% of the Forest. No specific monitoring has been done for the species in 2007 but I have noted the species commonly on both sides of the Forest.

Conclusions

- Forest Plan implementation should maintain more than 70% of the Forest as mature, deciduous forests in the next ten years.
- Many small, fishless ponds occur across the Forest most of which were constructed as waterholes as part of the wildlife management program on the Forest of the 70's and early 80's.

Recommendations

- Implement and monitor forest plan direction in both upland and bottomland hardwood forests.
- Monitor woodland waterhole abundance with aerial photography and GIS.

Red-headed woodpecker (*Merlanerpes erythrocephalus*)

The red-headed woodpecker is a common, cavity-nesting bird species in oak-hickory forests in the MO and OB and some of the CR management areas on the Forest especially those with larger floodplains. Monitoring for the breeding populations of the species on the Forest as part of forest bird monitoring transects in 2005-2007 indicate that the species occurs in MO, OB and some LO management areas but is not commonly detected on any of the transect routes. I observed the species commonly at Oakwood Bottoms, the Big Muddy River floodplain, and at LaRue Swamp areas in the Floodplain in the OB, CR, and NA/MO management areas in 2006 and 2007.

Conclusions

- Snags are abundant across the forest but open, mature hardwood forests are uncommon. The OB and MO management areas in the Mississippi River floodplain areas of the Forest are strongholds for the species on the Forest in both summer and winter.
- Prescribed burning to maintain oak-hickory forests in both the upland and bottomlands and in the larger openlands should benefit the species.

Recommendations

- Implement and monitor standards and guidelines for snags and cavity nesting species and management direction for the OB, MO, LO, and CR management areas.
- Continue to monitor for species as part of Forest bird monitoring routes.

River Otter (*Lutra canadensis*)

The river otter is a common species in CR, MO, OB, and some of the NA management areas across the Forest. According to Illinois DNR, populations appear to be increasing in all areas.

Conclusions

- Management of the CR, MO, OB, and some of the NA management areas with wetlands benefit the species.

Recommendations

- Implement and monitor standards and guidelines for the species and management direction for the OB, MO, LO, and CR management areas in the Forest Plan.
- Rely on IDNR for monitoring information on the species.

Spring cavefish (*Forbesichthys agassizii*)

The spring cavefish is an uncommon species on the Forest, only occurring at a few relatively isolated spring and cave sites across the Forest. Most of these are in the NA management area and are relatively protected. A study was done for the species on the Forest and it indicated that the species is not common in any of the locations on the Forest due to habitat alterations in surrounding areas adjacent to the sensitive habitats (springs and karst areas) of the species.

Conclusions

- Species is uncommon but still occurs in historical locations on the Forest.
- Habitats within the watersheds for the species have been altered historically and only protected in recent times by Forest ownership and management.
- Both protection and monitoring of the known locations for the species on the Forest is necessary to maintain viability of the species.
- Acquisition and subsequent protection of known habitats on private lands adjacent to the Forest will benefit the species.

Recommendations

- Implement and monitor specific Forest Plan standards and guidelines for the species.

Issues:***LaRue Pine Hills road closure during snake migrations:***

The road was closed for two months in the spring and fall for reptile and amphibian migrations. No den surveys were conducted in 2007.

Recommendation:

- Recommend that the Forest continue the present road closure policy during the spring and fall snake migrations and the monitoring of both public and snake use within the closure area and at an associated den site.

General Conclusions and Recommendations

- Forest monitoring of possible species population changes as affected by project implementation did not reveal any significant adverse effects on any federally-listed endangered or threatened species, or any Regional Forester sensitive species. Direct habitat improvements were made in partnership with the National Wild Turkey Federation, Quail Unlimited, and private citizens. Forest Service personnel monitored the effects of these practices on openland habitats, openland bird species, and on associated eastern wild turkey and northern bobwhite quail populations.
- Direct population monitoring was done in cooperation with the IDNR, research staff and students of Southern Illinois University, and other cooperators. We expect these cooperators to continue working with us to monitor populations of endangered, threatened, and sensitive animal species on the Forest.

Threatened Plant Species, Item #20, by Beth Shimp***FLORA***

Mead's milkweed (*Asclepias meadii*), listed as threatened by the U.S. Fish & Wildlife Service (USFWS), is known to be present on the Forest. Plants listed as Regional Forester's Sensitive Species (RFSS) and other plants with viability concerns are discussed in the 2006 Forest Plan (Appendix H, pp. 292-293, 295; also, RFSS BE, Forest Plan Project File). Standards and guidelines for RFSS and State of Illinois-listed species are found in Chapter V, pp. 42-43. The latest RFSS list was signed by the Regional Forester on February 29, 2000, with a maintenance update on October 5, 2006. This list can be found at www.fs.fed.us/r9/wildlife/tes/docs/rfss__plants. The RFSS and SVE (Species with Viability Evaluations) list for the Forest is the same for this report as it was during the last monitoring and evaluation report, Appendix A.

Mead's milkweed:

During FY07, a Challenge Cost-Share agreement was continued between the Forest and the Morton Arboretum. Also contributing to the national recovery efforts for Mead's milkweed are the USFWS, Illinois Department of Natural Resources (IDNR), Illinois Nature Preserves Commission, Indiana Division of Nature Preserves and the Illinois Endangered Species Protection Board. The Forest botanist, co-workers and associated partners spent 30 working days collectively in management, monitoring and other field observations.

As presented in previous annual monitoring reports, the habitat for Mead's milkweed is markedly overgrown by encroaching trees and shrubs due to the lack of periodic fire. Three native sites and one introduced site were prescribed burned during March 4 and 5, 2007 for a total of 262 acres (Cave Hill RNA – 119 acres, Stoneface RNA – 36 acres, Dennison Hollow – 25 acres, and Simpson Township Barrens EA – 82 acres). No other active management took place at the native sites this fiscal year, with the exception of some minor trimming back of re-sprouting trees and shrubs that were shading populations. The loss of habitat continues to be the greatest threat to this species in Illinois. The lack of active management at these sites could eventually lead to the demise of this species on the Forest. Sites 1-5 were monitored during the growing season. One of the priority projects identified for FY07 included the planning of prescribed burns and tree and shrub removal within selected natural areas. This planning was partially completed with small prescribed burns and is continued in FY08 with an environmental assessment to complete landscape burns at these same sites.

Findings

The only federally listed plant species on the Forest is Mead's milkweed. Observations and research of the nation's Mead's milkweed populations by the leading expert on the species has led to the finding that populations exposed to repeated prescribed fires are more vigorous in morphological growth and are better candidates for sexual reproduction. The five sites on the Forest have lacked prescribed fire over the last several years but responded successfully to the March 2007 prescribed fires. Although tree and shrub removal enhances the habitat, this fire-dependent species will continue to decline in health and vigor until fire is again a part of its routine ecosystem management. The only remaining populations in the state are found within a small distance of each other at the Eagle Mountain Complex, on National Forest-managed lands.

Of the 5 known native sites on the Shawnee, Sites #2 and #5 occur in the Cave Hill RNA burn unit, which had not had prescribed fire since 1995. It was recently burned in March 2007. Site #5 is questionable as to the correct identification of a single plant found in 1991. The plant was reported but never seen at the site again. Sites #1 and #3 at Stoneface RNA had not had prescribed fire since 1993 but were also burned March 2007. Site #3 now has prolific woody growth, which was out-competing the native and re-introduced *Asclepias meadii*. Re-sprouting trees and shrubs have been clipped back annually, but without prescribed fire the efforts have been laborious and nearly futile. Site #4 at Dennison Hollow RNA has also been periodically maintained by cutting the immediate trees and shrubs with hand tools, but the surrounding habitat is being virtually ignored because of the laborious efforts; burned March 2007.

Site #1 = Stoneface lower; 2 = Cave Hill, 3 = Stoneface upper, 4 = Dennison, 5 = Cave Hill Fire Tower. Note: data may be incomplete in some cases.

Table 1. Number of native plant stems found. Number of flowering stems are in parenthesis. A “-” indicates that the site was unknown at the time. Data Not Available = NA; site was either not censused or data not accessible at the time of this report.

Fiscal Year	83	84	85	86	87	88
Site #1	8(2)	7(3)	6(2)	7(2)	9	7(2)
Site #2	8(1)	7	4	4	8	9(1)
Site #3	-	3	1	1	1	1
Site #4	-	-	-	-	-	-
Site #5	-	-	-	-	-	-
Total	16(3)	17(3)	11(2)	12(2)	18	17(3)

Fiscal Year	89	90	91	92	93	94
Site #1	3	5(1)	3	2	4	1
Site #2	6(1)	7(1)	5(1)	3	2	4
Site #3	0	2	2	1	2	1
Site #4	-	-	5(1)	14(1)	14(1)	11(4)
Site #5	-	-	-	-	-	-
Total	9(1)	14(2)	15(2)	20(1)	22(1)	17(4)

Fiscal Year	95	96	97	98	99	00
Site #1	0	0	1	1	1	0
Site #2	NA	1	NA	5	5	NA
Site #3	NA	1	1	0	0	NA
Site #4	NA	22(4)	14(6)	20(7)	20(4+)	5
Site #5	-	-	-	-	1	-
Total	20(2+)	24(4)	16(6)	26(7)	27(4+)	5

Fiscal Year	01	02	03	04	05	06
Site #1	0	NA	0	NA	0	0
Site #2	3	NA	0	NA	2	2
Site #3	1	NA	0	1	2	2
Site #4	12(2+)	NA	4	8	12(1)	15
Site #5	-	-	-	-	-	-
Total	16(2+)		4	8	16	19

Fiscal Year	07
Site #1	0
Site #2	4
Site #3	4
Site #4	30(1+)
Site #5	-
Total	38(1+)

Recommendations

Mead's milkweed plants and their habitat should continue to be monitored closely. The prescription for burning the plant's habitats will be updated, along with tree and shrub removal as needed. The Forest is involved in the national recovery effort of this species and should be making every effort possible to use the latest species discoveries and information to encourage and maintain populations with better health and vigor.

Appendix C

FY07 MIS population and habitat monitoring

Steve Widowski

Federal Regulations, 36 CFR 219.19(6), require that population trends of Management Indicator Species (MIS) be monitored to determine the effects of management activities on wildlife habitat and populations. MIS represent groups of fauna that depend upon the same habitat, and are used to determine the effects of forest management practices on wildlife.

The Forest identified five MIS during the planning process in the 2006 (2006 Forest Plan, 9.42). Habitat changes are monitored through the use of the Habitat Evaluation Procedure (HEP) and direct observations; populations are monitored by Forest Service personnel, through cooperative research studies with university researchers, and with assistance of the IDNR staff.

Habitat Accomplishments in 2007 on the Forest were 2,230 acres of wetland habitat improvement in the Oakwood Bottoms Greentree Reservoir (OBGTR). This is annual flooding of management units in OBGTR. The Forest also accomplished 1,290 acres of direct, habitat improvement for terrestrial wildlife primarily openland species and species favored by early successional forest management. These accomplishments are reported in the Wildlife Fish Reporting Program (WFRP) of the Forest Service for the Shawnee National Forest in fiscal year 2007. A total of \$550,457 direct and indirect National Forest expenditures and \$45,700 of funding from Forest partners were spent on or in support of these habitat accomplishments in 2007.

Habitat Evaluation Procedure (HEP) Models

No HHEP model data were collected in 2007. They were last done in 2003 and reported in the 2006 monitoring report information for Forest wildlife

Terrestrial and avian census

Population trends of MIS are also monitored by both direct and indirect population counts. Direct population censuses involve the use of established field-monitoring protocols such as call counts, covey counts, and point-census counts. Indirect population counts involve the use of harvest data for such species as white-tailed deer (*Odocoileus virginianus*)* and Eastern wild turkey (*Meleagris gallopavo*)*.

Call counts and covey counts are used to monitor bobwhite quail (*Colinus virginianus*)* populations; point-census counts are used to monitor other avian MIS. The point-census monitoring protocol developed by C. John Ralph is used to monitor MIS such as the Kentucky warbler (*Oporornis formosus*)* and the wood thrush (*Hylocichla mustelina*)*.

Call counts, covey counts, and point-census counts are done when possible in cooperation with the IDNR and/or university research staff. These counts are conducted along established survey routes to determine population trends.

Bobwhite call and covey counts:

Bobwhite quail populations have declined in Illinois by about 20 percent in the last 25 years including on the Forest. However, the implementation of management in larger openlands and oldfields on the Forest appears to have maintained or improved habitat and populations of the species on the Forest. Both habitat models (HEP-see the 2006 Forest Plan) and population data (Forest wildlife monitoring reports-2006, 2007) support this assumption for the Forest.

Bobwhite quail* call counts are generally done between June 15 and June 30, while covey counts are done between October 30 and 31. In 1998, the Illinois Natural History Survey reported the most significant increase in bobwhite quail population at the Pennant Bar Ranch since the restoration effort began in 1996. Dr. Scott Robinson reported that his 2002 bird census revealed that the encroachment of shrubs in many of the formerly open grass sections, and the lack of management to retain grass cover, has contributed to significant declines in the bobwhite quail population at the Pennant Bar Ranch.

The Cooperative Wildlife Research Laboratory conducted bird monitoring transects in five openlands in 2007 as part of bird monitoring across the Forest. Approximately 29 singing male bobwhite quail were detected in 4 large openlands monitored in 2007. This is about 50% than were detected in 2006 in these areas.

Conclusions:

- The continuing long-term downward trend in quail populations as documented in the 1999 Monitoring Report is undoubtedly due to declining amounts and quality of habitat related mainly to intensified agricultural practices. The continuing decline in bobwhite quail populations at the Pennant Bar Ranch is probably due to a lack of management (i.e., prescribed fire) and conversion of former grassy areas to shrubland.
- Recent management including prescribed fire and planting of food plots and native grasses appears to have resulted increases in local populations of bobwhites.
- According to John Roseberry, "In the Shawnee counties, we have the additional problem of maturing forest cover becoming too thick for quail. When you stop and think about it, these counties now offer relatively little in the way of quail habitat. The hilly portions are either in mature forest or fescue pasture and the flat portions are intensively row-cropped."
- Oldfields in the overall landscapes in the vicinity of the sampled openlands appear to be declining. They are either being cropped, have succeeded to forest, or are being developed.

Recommendation:

- Recommend that the Forest continue to rely on census data from the IDNR and site-specific bird point-count data to determine the effects of management on bobwhite quail populations.
- Recommend continuing openland management actions across the Forest in the larger openland areas.
- Recommend continued monitoring to determine the population trends of northern bobwhites on the Forest.

Eastern wild turkey populations:

Forest Service personnel did not conduct any direct population monitoring of the Eastern wild turkey* in 2007. We did get harvest data from IDNR for 2007, and overall harvest for wild turkeys statewide has increased including in counties that include National Forest. It has increased in 2007 with 1,587 wild turkeys harvested in the counties (Alexander, Union, Jackson, Johnson, Massac, Pope, Saline, Hardin, and Gallatin) that include the Shawnee National Forest. This is 8.2% decrease in harvest for those same counties when compared to 2006 harvest information.

Conclusion:

- Harvest data available from the IDNR indicates that wild turkey reproduction was generally poor for several years prior to 1998 but has since rebounded and harvest continues to increase and/or level off at fairly large numbers compared to pre-1998.

- Turkey harvest information is a measure of both populations and weather during harvest periods. In 2007, the first part of the spring turkey season was beset by cool, wet weather that is not the best for hunters and harvests.

Recommendation:

- Recommend that the Forest continue to rely on harvest data from the IDNR and its management recommendations to determine management effects on Eastern wild turkey populations.
- Continue to manage to maintain or improve habitats for the wild turkey in partnership with IDNR and National Wild Turkey Federation (NWTf).

Gray squirrel ,whitetail deer and wood duck populations:

Forest Service personnel did not conduct any direct population monitoring of gray squirrel (*Sciurus carolinensis*)*, whitetail deer (*Odocoileus virginianus*)*, or wood duck (*Aix sponsa*)* populations in 2006.

However, the Forest did get some information from Illinois DNR on deer population estimates for 2007 for the counties that include the Shawnee National Forest (see above same counties for turkey information). Population estimates of 15-45 deer per square mile are the range for counties that include Shawnee National Forest with highest densities in Union, Johnson, Pope, and Hardin counties. Deer densities above 20 deer per square mile can indicate deer over-population problems on native forests vegetation. No large-scale deer over-populations problems on native vegetation have been identified on the Forest to date.

Conclusion:

- Gray squirrel numbers are dependent upon annual hard mast crops and fluctuate widely dependent upon mast availability each year.
- Wood duck populations and harvest in Illinois continue to increase as wood duck numbers continue to increase throughout the Mississippi Flyway. Harvest in wetlands on the Forest is also often dependent upon water conditions and bottomland hardwood mast availability during the fall and early winter.
- White-tailed deer populations and harvest in southern Illinois continue to increase as deer populations continue to increase.
- All three of these former MIS and important game animals on the Forest are somewhat dependent upon annual mast crops. Populations of all three populations are stable to increasing on the Forest.

Recommendation:

- Recommend that the Forest continue to rely on census data from the IDNR and its management recommendations to determine the effects of management on populations of these three species.
- Manage to maintain oak-hickory forests.
- Continue to work with Illinois DNR to provide opportunities for continued white-tailed hunting harvest on National Forest to assist in control of deer numbers to manageable levels for the ecosystems.

Point-census counts

Point census counts are done during the last week in May and the entire month of June. Bird monitoring was completed across the Forest in 2007 on 21 permanent transect routes by the Cooperative Wildlife Research Laboratory (CWRL) at Southern Illinois University at Carbondale and on 5 Cerulean Warbler assessment routes.. All of the 21 routes were former routes done by

Dr. Scott Robinson and his colleagues at the University of Illinois during his studies and monitoring on the Forest.

The following data were collected from the bird monitoring transects on the five management indicator species and brown-headed cowbirds on the Forest in 2007:

- 76-Yellow-breasted chats, primarily males were detected on 7 different bird transects across the Forest including four of five openland areas that were surveyed. Chats per route average was 10.8 compared to 11.4 in 2006.
- 29-Northern bobwhite quail singing males were detected on 4 different bird transects across the Forest on 4 of the 5 openland areas that were surveyed. Birds per route average was 7.25 in 2007 versus 19.3 in 2006.
- 104-Scarlet tanagers, primarily males were detected on 17 different bird transects across the Forest, including all of the transects that included hardwood forests. The highest detection on any single transect route was 17 individuals. Birds per route average was 6.1 in 2007 versus 6.8 in 2006.
- 119-Wood thrushes, primarily males were detected on 16 different transect routes. . The highest detection on any single transect route was 15 individuals. An additional 42 wood thrushes were identified on 5 cerulean warbler assessment routes across the forest with 14 the highest detection on any of the five routes. Birds per route average was 7.4 and 8.4 (cerulean assessment routes) in 2007 versus 8.4 in 2006.
- 128-Worm-eating warblers, primarily males were detected on 16 different transect routes. The highest detection on any single transect route was 20 individuals. An additional 22 worm-eating warblers were identified on 5 cerulean warbler assessment routes across the forest with 9 the highest detection on any of the five routes. Birds per route average was 8.0 and 4.4 (cerulean assessment routes) in 2007 versus 8.9 in 2006.

Conclusion:

1. All five MIS still occur commonly across the Forest and in the majority of the locations where they occurred during earlier monitoring efforts across the Forest. Population of most forest birds were found throughout the forest on most of the upland transects. Floodplain forests contained populations of a few species not found in the uplands. A few upland species were rare or absent in floodplains.
2. Three species of MIS associated with mature, hardwood forest including 2 species of viability concern decreased slightly in detection compared to monitoring of the same areas in 2006.
3. The total yellow-breasted chats detected were down slightly compared to those monitored in 2006.
4. A few species deserve special attention. Cerulean Warblers were absent from most of the eastern Shawnee National Forest and only occurred at higher population densities in the Cave/Caney/Cedar Creek census area where they are one of the most abundant species in floodplain forests. In 2007, a total of 23 cerulean warblers, primarily singing males were detected on 3 of the 17 monitoring routes containing hardwood forests primarily in transect routes that included floodplain forests. No Swainson's Warblers were detected, adding to evidence that this species is extinct in Illinois.
5. CWRL will be analyzing trends of the bird species from the monitoring data and reporting these in their completed monitoring reports, some of which are due in 2008.
6. A total of 137 brown-headed cowbirds were detected on 20 of the 21 transect routes across the forest. This is an average detection of 6.9 birds/route compared to 5.3 birds/route in 2006. This is an increase from 2006 monitoring. The highest detection on any single transect route was 16 individuals in the Bean Ridge upland forest area. Cowbirds were detected on all but one of the 17 forested routes run in 2007. Cowbirds were also detected

on all four of openland monitoring routes run in 2007. They commonly occur across the Forest and appear to have increased slightly in 2007 compared to 2006.

7. Few if any disturbance-dependent birds were detected along forested monitoring transects. They were only found in any abundance along openland routes. These data suggest that these species will not be able to persist without some form of active management. For this reason, we continue to recommend that newly acquired in-holdings with openings large enough for Henslow's sparrows and northern bobwhites be maintained as openlands and managed for these species. Pennant Bar Ranch is a prime example of an openlands site that contains significant populations of virtually every openlands species of concern.

Recommendation:

Recommend that the Forest continue to utilize point-census counts as a valuable tool to monitor avian MIS populations. University research personnel, cooperators, and volunteers will continue to play a vital role in the overall monitoring of MIS. The Forest has started a partnership in 2005 with the Cooperative Wildlife Research Laboratory at Southern Illinois University at Carbondale to continue our bird monitoring, annually at least through 2008.