FISCAL YEAR 2013
MONITORING AND EVALUATION REPORT FOR THE LAND AND RESOURCE MANAGEMENT PLAN

OZARK- ST. FRANCIS NATIONAL FORESTS

Baxter, Benton, Conway, Crawford, Franklin, Johnson, Logan, Madison, Marion, Newton, Pope, Searcy, Stone, Van Buren, Washington, Yell, (Ozark National Forest) Lee, and Phillips (St. Francis National Forest) Counties in Arkansas

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

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Forest Supervisor's Certification

I have evaluated and endorsed the monitoring results and recommendations presented in this Monitoring and Evaluation (M&E) Report. This report documents progress made during the 8th year since the 2005 Revised Land and Resource Management Plan (Forest Plan) came into effect in September of 2005. Monitoring and evaluation are important tools in determining if management direction contained in the 2005 Forest Plan is effective in achieving the desired conditions for the Ozark-St. Francis National Forests, if program priorities and objectives are being accomplished, and if the Plan standards (design criteria) adequately guide project implementation.

I have directed that the actions necessary to respond to the recommendations in this report be implemented. I have considered funding requirements necessary to implement these actions.

Reggie Blackwell — **9/15/2014**

REGGIE BLACKWELL — Date

Forest Supervisor

FISCAL YEAR 2013
MONITORING AND EVALUATION REPORT FOR THE REVISED LAND AND RESOURCE MANAGEMENT PLAN

OZARK-ST. FRANCIS NATIONAL FORESTS

I. INTRODUCTION

The 2005 Revised Land and Resource Management Plan (RLRMP) for the Ozark-St. Francis National Forests (OSFNFs) provides broad, strategic direction for managing the land and its resources. The Forest Plan direction provides a framework to guide management decisions and actions. Over time, it is necessary to assess progress toward achieving the desired conditions, meeting the objectives, and adhering to the design criteria in the Forest Plan. A cycle of adaptation is formed when management direction in the Forest Plan is implemented, reviewed, and then adjusted in response to knowledge gained through monitoring and evaluation. Monitoring is conducted by Forest Service resource specialists; Forest Service research scientists; universities; state, federal, and resource agencies; and other cooperators. Persons who contributed data, assisted in compilation of data, or helped to prepare this Monitoring and Evaluation Report (M&E Report) are listed in Appendix A.

PURPOSE OF THE MONITORING AND EVALUATION (M&E) REPORT

The 2005 Forest Plan was completed under the 1982 National Forest Management Act planning regulations (36 CFR 219). These regulations specify that forest plan "implementation shall be evaluated on a sample basis to determine how well objectives have been met and how closely management standards and guidelines have been applied. Based upon this evaluation, the interdisciplinary team shall recommend to the Forest Supervisor such changes in management direction, revisions, or amendments to the forest plan as are deemed necessary." Thus, the purpose of the M&E Report is to identify needed changes to management on the Ozark-St. Francis National Forests (OSFNFs) utilizing the results of monitoring and evaluation. Monitoring helps to track progress toward achievement of Desired Conditions (Forest Plan, pages 1-18 through 1-49) and Plan Objectives (Forest Plan, pages 2-7 through 2-78); implementation of Design Criteria (Forest Plan, pages 3-1 through 3-38); and occurrence of environmental effects as predicted. Monitoring indicates whether OSFNFs management is addressing plan priorities. The evaluation of monitoring results allows the Forest Supervisor to initiate actions to improve compliance with management direction where needed, improve cost effectiveness, and determine

if any amendments to the Forest Plan are needed to improve resource management. About every five years, all of the information collected in the M&E reports is accumulated into a comprehensive evaluation report that results in periodic updates of the Forest Plan.

ORGANIZATION OF THE MONITORING AND EVALUATION REPORT

The Monitoring and Evaluation Report is structured similarly to the Forest Plan because the M&E Report evaluates implementation and effectiveness of the Forest Plan. The Monitoring Report covers effectiveness in achieving desired future conditions of ecological communities and management areas.

The M&E Report also reports on progress toward achieving goals and objections within each resource area program on the Forests. Recommendations are made throughout the report to improve management as well as future monitoring methods.

This M&E Report reflects the eighth year under a new Forest Management Plan. It should also be pointed out that many of the Desired Future Conditions and the resultant objectives and priorities do not have time frames prescribed. This was done in order to have a Plan that reflected the reality of changing conditions such as budget, capacity, weather, etc.

The Forests fully recognize that under current conditions it affects approximately 20% to 30% of the forest land base over a 10-year cycle. As a result of these conditions some of the monitoring results appear to be very short of the Desired Future Conditions for a particular community, management area, or program. However, as the Forests continue to implement the RLRMP those shortfalls should become less and the Desired Future Conditions should begin to become more abundant on the Forests.

TRACKING CHANGES IN VEGETATION AND OTHER WILDLIFE HABITAT PARAMETERS

Changes in vegetation and other wildlife habitat components are reported and monitored in two ways. The first reporting method shows changes by ecological community. This is done to evaluate health of the community and its ability to provide for plants and animals that are tied to the community. It is important to track these changes to assess potential effects on wildlife populations.

The other tracking method is to report progress by management area. Each management area contains an emphasis and desired future condition statement. Changes in conditions are monitored to evaluate progress toward the desired results. Tracking these changes is important to help in planning strategies to address any deficiencies noted.

II. AREA OF ANALYSIS

Location

The Ozark-St. Francis National Forests include approximately 1.2 million acres of federally managed public land. The Ozark National Forest (NF) is located primarily in Northwest Arkansas; the St. Francis NF is located in eastern Arkansas next to the St. Francis and Mississippi Rivers, about 50 miles southwest of Memphis, Tennessee (Figure 1).

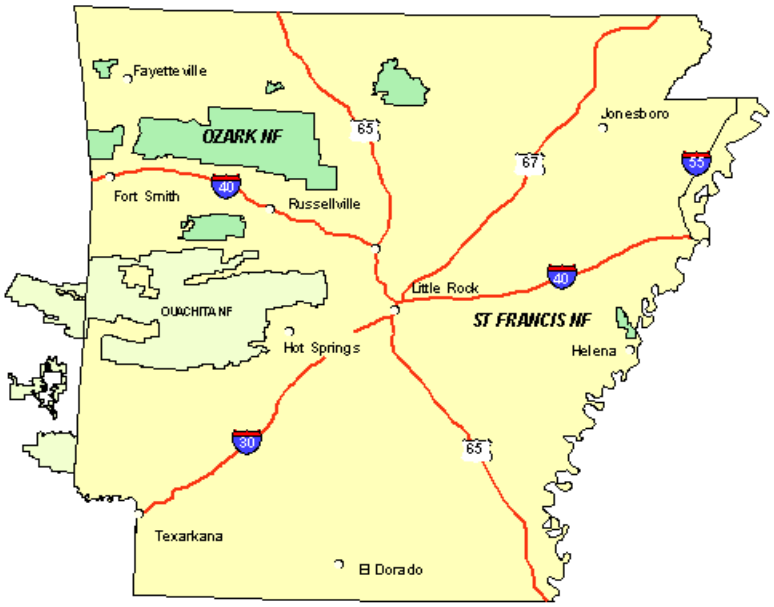

Figure 1: Vicinity Map of the Ozark-St. Francis National Forests.

The Ozark NF was established on March 6, 1908, by presidential proclamation. The Ozark NF is located within Baxter, Benton, Conway, Crawford, Franklin, Johnson, Logan, Madison, Marion, Newton, Pope, Searcy, Stone, Van Buren, Washington, and Yell Counties. Diverse flora in the region includes more than 500 species of trees and woody plants. Hardwoods occupy approximately 72% of the Ozark NF with oak-hickory types being dominant.

The St. Francis NF takes its name from the St. Francis River, one of the rivers forming the Forest's eastern boundary. The discoverer of the river is unknown, as is the origin of the name St. Francis. Most of the Forest is situated in the hilly Crowley's Ridge section, but some is in low bottomlands along the rivers. The St. Francis NF was established November 8, 1960. The St. Francis NF is located in Lee and Phillips Counties. Vegetation in this area grows on high quality sites and includes bottomland hardwood forests in low areas, and an upland hardwood forest that is similar to Appalachian Mountain forests.

Although two separate national forests, the OSFNFs are managed by one Supervisor's Office, located in Russellville, Arkansas.

III. Analysis

Major Forest Communities

Dry Oak Forest and Woodland - Approximately 358,382 Acres

In general, current conditions in the Dry Oak Forest and Woodland Communities are overly dense and burned less often than in previous periods. The goal is to restore this community to a more open condition dominated by oaks in the overstory with midstory that is sparse and a diverse understory made up of herbaceous and woody species.

Figure 2 is located on the Big Piney Ranger District (RD) and shows an example of a stand nearing desired future conditions for this dry oak woodland site.

Figure 2: Pilot Rock vicinity, Big Piney Ranger District - Example of a Stand Nearing Desired Future Conditions for this Dry Oak Woodland Site.

Prescribed Fire

Fire is important in maintaining desired condition in the Dry Oak Forest and Woodland Community. The number of acres burned in this community has ranged from 9,506 in 2011 to 28,833 in 2008 (Table 1). The percentage burned has averaged around 4.8% annually. This is far less than the desired 20%-30% level to maintain desired conditions. However, most of the burns have occurred in the growing season (Figure 3).

Table 1: Burning in the Dry Oak Forest and Woodland Community from 2006 to 2013.

Burning in Dry Oak Forest and Woodland Community			
Year	**Total Acres Burned**	**% of Total Community Burned**	**Acres and % Burned in Growing Season**
2006	15,508	4.3	6,066 (39%)
2007	20,572	5.7	8,817 (43%)
2008	28,833	8.0	23,737 (82%)
2009	17,942	5.0	13,104 (73%)
2010	17,642	4.9	5,154 (29%)
2011	9,506	2.6	5,917 (62%)
2012	12,872	4.0	1,574 (12%)
2013	13,108	3.7	2,301 (18%)
8 Year Total	135,985	38.2	
8 Year Average	16,998	4.8	

Figure 3: Prescribed Burn in a Dry Oak Woodland Site.

Management Implications and Recommendations

The desired fire return interval in this community is two to seven years. At current, some areas are treated on this interval but most of the community is burned on a much longer interval, if at all. If this trend continues, many acres in this community will not be treated often enough to meet desired conditions. The volume of burning in this community should be increased.

Vegetation Management

Abundance of Mature Forest (>70 years)

There is a high percentage of this community over 70 years old. Acres over 70 years old have increased from 315,302 (88%) in 2006 to 324,898 (91%) in 2013.

Management Implications and Recommendations

Management direction for this community is to maintain over half of the stand acres in mature age classes. This direction is being met. There is no need to change direction to meet mature forest conditions.

However the implication of having too much of the Forests reaching biological maturity at one time is that the Forests will likely have serious forest health problems in this community in a few years.

Abundance of Mature Woodland (>70 years)

Forest Service databases indicate that 1,685 acres (.5%) over 70 years old were thinned in this community type in 2013. These treatments help produce the desired woodland condition. In addition to stands thinned by timber sales, many stands in this community were “thinned” by a severe ice storm in January of 2009. An effort to prescribe burn many of the stands has increased the amount of woodland condition above what is tracked through timber sales.

Management Implications and Recommendations

Plan direction is to maintain over half of the mature acres in this community in woodland condition. Woodland condition has not yet been restored. To create it, more thinning in mature stands is needed. This would also improve forest health and insure sustainability of this community.

Abundance of Old Growth Condition (110+)

There are 48,366 acres in the 110+ Age class for 2013. This represents 14% of the community acres. There are a large number of acres poised to move into this age class within the next 20 years.

Management Implications and Recommendations

Plan direction is to maintain around 25% of this community in old growth conditions. With current age class structure and rates of regeneration, the amount of stand acres of the age to qualify as old growth condition will be achieved in the near future. To achieve true old growth conditions, the

amount of thinning and prescribe fire will need to be increased. No change in plan direction is needed to achieve old growth goals in this community type.

Abundance of Regenerating Forest (0 - 10 years)
Databases managed by the Forests indicate there were 802 acres in the 0 - 10-year age class in this community type in 2013.

Management Implications and Recommendations
This amount of regeneration is insufficient to maintain this community type over the long term. It is recommended that it be made priority to provide more regeneration cutting in this community type. There is no need to change plan direction but there is a need to follow the current direction.

Note: The Ice Storm of 2009 may have created some areas in this community that will regenerate naturally. Future timber sale analysis should identify the extent of this situation.

Abundance of Regenerating and Young Forest Combined (0 – 40 years)
There were 13,465 acres, comprising 3.8% of the community in the 0 – 40-year age class in 2013.

Management Implications and Recommendations
The desired amount of regenerating and young forest in this community type is around 25% with 6% being in the 0 – 10-year age range. This shows that there has been a long term lack of regeneration cutting in this forest community. It will take many years of regenerating at the appropriate rates to fix this age class imbalance. An opportunity is presented for forest managers to start regenerating more stands in this community type.

Abundance of Mid-Aged and Mature Forest that is in Open Canopy Condition (>40 years; 61 – 80 BA)
About .5% (1,859 acres) of the mid aged and mature forest in this community was thinned in 2013. At this rate, 5% would be thinned in a decade.

Management Implications and Recommendations
There are opportunities for creating more regeneration areas and thinning within the community. This is needed for restoration and forest health goals. A major problem in accomplishing thinning in this community is a result of markets and timber prices fluctuating and, therefore, demands fluctuating over time. The Forests should increase thinning as markets allow.

SHORTLEAF PINE-OAK FOREST AND WOODLAND - APPROXIMATELY 297,409 ACRES

The difference in Pine-Oak Forest and Pine-Oak Woodland is the density of the trees. Pine-Oak Forest has a high density of trees with canopy closures of 80% - 100%. Pine Woodland has tree densities with canopy closure of less than 80%. Forests tend to grow on sites with more productive soil and more moisture available than woodlands. Figure 4 is located on the Mt. Magazine RD and shows an example of a stand nearing desired future conditions for this pine-oak woodland site.

Figure 4: Gum Tree Vicinity, Mt. Magazine RD - Example of a Stand Nearing Desired Future Conditions for this Pine-Oak Woodland Site.

Shortleaf Pine Oak Forest - Approximately 28,982 acres

Abundance of Regenerating Forest

Forest Service databases show that 400 acres of shortleaf pine- oak forest are in the 0 – 10-year age class in 2013. This equates to .1% of the community. Desired condition for this community, as listed in the RLRMP, is to have at least 8% in regeneration (0 - 10 years old).

Management Implications and Recommendations

It is recommended that the Forests start regenerating at least 8% in this community on suitable acres. Future environmental assessments (EAs) should be evaluated to make sure this is being done.

Abundance of Mature Forest (>70 years)

There is a moderate percentage of this Shortleaf Pine Oak Forest Community over 70 years old. In 2013, the number of acres over 70 years old has increased to 11,879 acres or 41% of the community.

Management Implications and Recommendations

The amount of Pine-Oak Forest over 70 years old will continue to increase due to ageing of stands in the 41 – 70-year old age classes. The Forests should start regenerating this community at rates recommended in the plan. That rate is around 8%.

Prescribed Fire

As illustrated in Table 2, the number of acres burned in this community in 2013 was 1,657. This is 5.7% of the community. Twenty seven percent (27%) of the burns were in the growing season. In previous years, a higher percentage was in the growing season.

The amount of burning in this community is far less than the desired 20 - 30% level to maintain desired conditions.

Table 2: Burning in the Shortleaf Pine Oak Forest Community from 2006 to 2013.

Burning in Shortleaf Pine Oak Forest Community			
Year	**Total Acres Burned**	**% of Total Community Burned**	**Acres and % Burned in Growing Season**
2006	498	1.7%	162 (33%)
2007	1,133	3.9%	291 (26%)
2008	2,072	7.1%	1,047 (51%)
2009	1,405	4.8%	1,061 (76%)
2010	2,514	8.6%	158 (6%)
2011	1,728	5.9%	162 (9%)
2012	1,544	5.3%	51 (3%)
2013	1,657	5.7%	447 (27%)
8-Year Total	12,551	43.0%	
8 Year Average	1,569	5.4%	

Management Implications and Recommendations

The desired fire return interval in this community is two to five years. At current burning rates, very few acres in this community would be treated often enough to meet desired conditions. The volume of burning in this community should be increased as budgets allow. The ratio of growing season burning should be continued.

Shortleaf Pine Oak Woodland (267,861 acres)

Fire helps maintain the Shortleaf Pine Oak Woodland Community. Table 3 shows the number of acres burned in this community in 2013 was 12,184. The percentage burned was 4.6%. This is far less than the desired 20 - 30% level to maintain desired conditions. About 17% of the acres were burned in the growing season.

Table 3: Burning in the Shortleaf Pine Oak Woodland Community from 2006 to 2013.

Burning in Shortleaf Pine Oak Woodland Community			
Year	**Total Acres Burned**	**% of Total Community Burned**	**Acres and % Burned in Growing Season**
2006	12,849	4.3%	2,185 (17%)
2007	17,052	5.7%	2,651 (16%)
2008	20,418	6.9%	11,287 (55%)
2009	15,370	5.2%	11,751 (76%)
2010	20,122	6.8%	1,557 (8%)
2011	11,817	4.4%	3,092 (26%)
2012	17,478	6.5%	1,055 (6%)
2013	12,184	4.6%	2,062 (17%)
8 Year Total	127,290	44.4%	23,889 (19%)
8 Year Average	15,911	5.6%	3,413 (28%)

Management Implications and Recommendations

The desired fire return interval in this community is two to five years. At the current fire interval, very few acres in this community would be treated often enough to meet desired conditions. The volume of prescribed burning in this community should be increased as funding allows. Increased thinning in this community should allow for money to be collected to pay for prescribed burning.

Vegetation Management

Abundance of Mature Forest (>70 years)

Forest Service databases indicate that 1,219 acres over 70 years old (about 1%) in this community type were thinned in 2013. At this rate, 10% of this community would be thinned in a 10-year period. In addition to stands thinned by timber sales, some stands in this community were “thinned” by a severe ice storm in January, 2009. These treatments help produce the desired Pine-Oak Woodland condition.

Management Implications and Recommendations

This rate of thinning is well below the RLRMP desired level of more than 40%. Additional thinning needs to be prescribed to create needed amounts of woodland condition for forest health and sustainability.

Abundance of Old Growth Condition (110+)
The Forests' databases indicate there are 11,611 acres in age classes needed to qualify as old growth condition, comprising 4% of the community.

Management Implications and Recommendations
The desired amount of stand acres of ages over 109 years old is about 15% of this community type. Currently, 4% is in this condition. This is below desired levels. The large amount of acres in the 71 - 100-year old age class should allow for development of older conditions within a few years to satisfy old growth age requirements in this community type. To satisfy all old growth requirements, increased rates of burning in this community will be needed.

Abundance of Regenerating Forest (0 - 10 years)
The amount of 0 – 10-year age class in this community has gone down from 15,018 (5.6%) in 2006 to 3,522 (1.3%) acres in 2013. The current level of this community type in the 0 – 10-year age class is further from the desired condition than it was eight years ago.

Management Implications and Recommendations
Desired levels of regeneration in this community type are around 8%. It appears that regeneration levels in this community have been close to desired levels in the recent past but have lagged behind since 2006. The Forests should resume regeneration levels around the 8% per decade level.

Abundance of Regenerating and Young Forest Combined (0 – 40 years)
The amount of 0 – 40-year old age class declined from 92,481 acres (35%) in 2006 to 62,655 acres (23.4%) in 2013. This is slightly below the desired range at present but without more regeneration cutting over the next 10 years, a trend toward long-term deficit will develop.

Management Implications and Recommendations
Desired level of 0 – 40-year age class is between 30% - 35%. The current level of 23.4% is below target levels. The Forests should continue regenerating at the 8% per decade level.

Abundance of Mid-Aged and Mature Forest that is in Open Canopy Condition (>40 years; 61 – 80 BA)
In 2013, in this community, 1,219 (0.5%) acres were thinned that were over 40 years old. If this level of thinning were done for the entire decade, it would equal 5% being thinned.

Management Implications and Recommendations

Desired condition is that most stand acres 40 years old or older in this community type are in a thinned condition. Current rates of thinning fall below desired levels. Managers should start thinning more acres in this age class and community type.

DRY-MESIC OAK FOREST - APPROXIMATELY 444,518 ACRES

Prescribed Fire

Prescribed burning in the Dry-Mesic Oak Forest Community has ranged from 13,395 acres (3%) in 2006 to 33,175 acres (7%) in 2008 (See Table 4). The annual average has been 22,816 acres (5.1%). A little less than half of the burning has been done during the growing season.

Table 4: Burning in the Dry Mesic Oak Forest Community from 2006 to 2013.

Burning in Dry-Mesic Oak Forest Community			
Year	**Total Acres Burned**	**% of Total Community Burned**	**Acres and % Burned in Growing Season**
2006	22,388	5.0%	8,280 (37%)
2007	28,699	6.5%	12,739 (44%)
2008	33,175	7.0%	27,082 (82%)
2009	23,440	5.0%	19,837 (85%)
2010	25,193	5.7%	12,391 (49%)
2011	13,395	3.0%	7,618 (57%)
2012	21,180	4.8%	3,161 (15%)
2013	15,054	3.4%	2,458 (16%)
8 Year Total	182,524	41.0%	73,729 (40%)
8 Year Average	22,816	5.1%	10,533 (46%)

Management Implications and Recommendations

The desired fire return interval in this community is two to seven years. At the current fire interval, a small percentage of acres in this community would be treated often enough to meet desired conditions. The volume of prescribed burning in this community should be increased as budgets allow. It appears that the amount of growing season burns is high, which is desirable considering past burn history. If thinning and regeneration efforts were increased as is needed for sustainability of this forest community, it could generate KV (timber sale) funds to reforest and prescribe burn.

Vegetation Management

Abundance of Mature Forest (>70 years)

In 2013, there were 403,063 acres (91%) in mature condition. This is well above the goal of at least half of the community being in mature condition.

Management Implications and Recommendations

Mature forest habitat type is in ample supply. There is no concern that it will be in short supply any time soon. However, it shows there is an imbalance of age classes and serious forest health problems will develop before a balanced age class can be developed. The Forests should take action to start working on this problem. EAs that evaluate management of timber and wildlife habitat should be reviewed to make sure regeneration is being prescribed at rates that will balance age classes in accordance with RLRMP direction.

Abundance of Mature Woodland (>70 years)

There were approximately 2,281 acres (0.5%) thinned in 2013 to establish or maintain a mature woodland condition in this community type. If this rate of treatment is repeated for 10 years it will affect about 5% of the community. The 2009 ice storm did some natural thinning in this community as well.

Management Implications and Recommendations

The RLRMP lists a desired condition for this community type with most of the mature stands in a thinned condition. The current rate of thinning is falling short of the desired condition. Much more thinning needs to be done in this community type for forest health and sustainability.

Abundance of Old Growth Condition (110+)

In this community type, there are 76,034 acres (about 17%) in age classes needed to qualify as old growth condition.

Management Implications and Recommendations

The desired amount of old growth condition for this community type is 20%. Considering current stand ages, the amount of forest over 110 years old should increase significantly over the life of the RLRMP. Older forest should increase but unless burning and thinning dramatically increase, the amount that is treated to create true old growth condition may be limited to well below the 20% desired level.

Abundance of Regenerating Forest (0 - 10 years)

In 2013, only 848 acres (0.2%) of this community was regenerated. At this rate, 2% of this community will be regenerated in a 10-year period.

Management Implications and Recommendations

This level of regeneration, around 2% in a 10-year period, is less than half the amount desired for this community type (at least 6%). There should be more regeneration cutting in this community in the future to sustain healthy conditions within the Dry-Mesic Forest and Woodland Community. EAs that evaluate management of timber and wildlife habitat should be reviewed to make sure regeneration is being prescribed at rates that will balance age classes in accordance with RLRMP direction.

Abundance of Regenerating and Young Forest Combined (0 – 40 years)
Within the age class range 0 – 40, there are 24,534 acres comprising about 5.5% of the community type.

Management Implications and Recommendations
The 10-year rate of regeneration would be about 2%. The desired level of 0 – 40-year aged acres is around 25%. Current regeneration levels in this community are well below levels needed to improve health and sustainability of this important community on the Ozark NF. More regeneration cutting should be planned in this community type. The Forests should take action to start working on this problem. A schedule to regenerate many of the stands over 70 years within the next 50 years should be developed and carried out.

Abundance of Mid-Aged and Mature Forest that is in Open Canopy Condition (>40 years; 61 – 80 BA)
In 2013, there were 2,379 acres thinned to create an open canopy condition in this community. There are 417,961 acres in age class >40. These thinning projects affect less than 1/2 of 1% of the area within this community. At this rate, less than 5% of the mid-aged and mature stand acres will have been thinned in 10 years, which is the length of time these treatments are effective.

Management Implications and Recommendations
RLRMP direction is to maintain most of the mid-aged and mature acres of Dry-Mesic Oak Forest Community in a thinned condition. There is a need for more thinning in this community for forest health and sustainability purposes.

MESIC HARDWOOD FOREST - 7,000 ACRES

Total abundance of the Mesic Hardwood Forest
This forest community occurs on less than 1% of the Forests. Monitoring set up in the RLRMP calls for monitoring changes in community acres.

The RLRMP states that we should monitor trends in total community acres for this community.

Management Implications and Recommendations
There are no known management implications that can be derived from this item. Since the acres in this community type are static, it is recommended that this monitoring item be dropped.

RIPARIAN FOREST – APPROXIMATELY 11,484 ACRES

No new acres have been identified to add to this community. Information gathered for this report came from the Forest Service Activity Tracking System (FACTS) and age class distribution came from the Ozark NF GIS database.

Management Implications and Recommendations

Identify any stands that qualify for moving to this community as they are found.

LOESS SLOPE FOREST COMMUNITY - APPROXIMATELY 16,484 ACRES

Vegetation Management

Abundance of Mature Forest (>70 years)

The amount of this community type over 70 years old is at 11,541 acres (70%) in 2013.

Management Implications and Recommendations

The desired level of mature forest in this community is around 60%. This indicates there is more than enough of this forest condition. It also indicates that it would be desirable to begin regenerating some of the mature forest.

Abundance of Old Growth Condition (110+)

The amount of this community type over 110 years old has increased from 0 acres in 2005 to 677, 4% of the community acres in 2013.

Management Implications and Recommendations

The desired level of old growth condition for this community type is 15%. Considering that 70% of this community is in the 70 – 100-year old age class, the Forests are on track to achieve this goal in the next couple of decades.

Abundance of Regenerating Forest (0 - 10 years)

Forest Service databases show there were 201 acres regenerated from 2006 to 2013. This represents 1.2% of this community type. If the same rate of forest regeneration is repeated over the next 10 years, there would only be about 1.5% of the community type regenerated in the 10- year period.

Management Implications and Recommendations

The desired level of 0 – 10-year age class is at least 5%. The lack of regeneration cutting in this community is problematic and should be addressed as soon as possible. Regeneration cuts should be scheduled in this community.

Abundance of Regenerating and Young Forest Combined (0 – 40 years)
The amount of 0 – 40-year age class is at 3,801 acres (23%) in 2013.

Management Implications and Recommendations
The desired level of regenerating and young forest is about 20%. This equates to around 5% each 10-year period. Regeneration at a higher rate may be needed for a couple of decades to avoid major forest health problems due to an overabundance of timber 70+ years.

Abundance of Mid-Aged and Mature Forest that is in Open Canopy Condition (>40 years; 61 – 80 BA)
In 2013, there were 12,638 acres (77%) of this community type over 40 years old. Of these acres, only 141 were thinned. This is 0.8% of this age class. At that rate of thinning, 8% would be thinned in a 10-year period.

Management Implications and Recommendations
Thinning is important to promote growth of overstory and understory as well as to promote oak regeneration. Forest managers should provide thinned conditions on a continuous basis in this community.

Prescribed Fire
There was an active prescribed burning program in this community type in the first five years under the RLRMP, however, no acres in this community type were burned in from 2011through 2013.

Management Implications and Recommendations
The Forests should continue to monitor burning in this community type. Future burning should be at a 5- to 10-year interval or justify the purpose for burning at a more frequent rate.

BOTTOMLAND AND FLOODPLAIN FOREST - APPROXIMATELY 2,563 ACRES

Vegetation Management

Abundance of Mature Forest (>70 years)
Mature forest is found on 1,327 acres based on age class distribution. Mature forest comprises 52% of the community.

Management Implications and Recommendations
The desired condition is to have approximately 65% of this community in mature condition. With low regeneration rate desired in this type, this goal should be achieved in the future.

Abundance of Regenerating Forest (0 - 10 years)
Currently, there is no acreage in the age class for 1 – 10 years.

Management Implications and Recommendations
A careful plan of regeneration should be implemented.

Abundance of regenerating and young forest combined (0 – 40 years)
Within the age class range 0 – 40, there are 271 acres, comprising 11% of the community.

Management Implications and Recommendations
Desired condition in regeneration and young forest for this community type is approximately 20%. Current levels are close to desired levels.

Abundance of Old Growth Condition (110+)
In this community type, there are no acres in age classes needed to qualify as old growth condition.

Management Implications and Recommendations
It will take time to achieve the growth condition goals in this community type. Low regeneration levels will allow this goal to be achieved.

LOBLOLLY PINE FOREST - APPROXIMATELY 11,210 ACRES

Monitoring is done to follow progress of this forest community. Since this community is outside its natural range on the OSFNFs, mature stands are to be converted to the appropriate native forest type for the site.

Management Implications
Older age classes of loblolly pine should be converted to native species the next time the compartments they are in are treated.

RARE AND SPECIAL COMMUNITIES

GLADES AND BARRENS

The ranger districts are keeping hard copy maps of glades and barrens. The Big Piney Ranger District has identified 11 acres of glade. The Sylamore Ranger District is currently working on several glade restoration projects. This district is also working in collaboration with The Nature Conservancy (TNC) on a glade assessment. During fiscal year 2013, we accomplished 349 acres of glade restoration.

Management Implications and Recommendations
An electronic database would make analyzing and managing glades much easier.

MONTANE OAK FOREST

This community is located on the top of Mount Magazine. Approximately 3/4 of the community acres are in burn units and 1/4 is in a special use area devoted to communication towers. The portion in burn unit is progressing toward desired future condition with the areas nearest fire lines at desired conditions.

Management Implications and Recommendations

This area is progressing toward desired conditions. Some thinning may be needed to speed up recovery from past fire suppression. Current burning rates appear to be appropriate for restoration and maintenance of this community.

SINKHOLE AND DEPRESSION PONDS

No new occurrences of this community type were added in fiscal year 2013. All areas of the community are being protected at this time. No special treatments are prescribed for this community.

Management Implications and Recommendations

An electronic database would make tracking depression ponds much easier. A database should be developed as funds allow.

SEEPS AND FENS

No new occurrences of this community type were added in fiscal year 2013. All areas of the community are being protected at this time. No special treatments are prescribed for this community.

Management Implications and Recommendations

Development of a Rare Communities Database would also be of benefit in tracking this community.

CANEBRAKES

The ranger districts keep records of canebrakes. During fiscal year 2013, we accomplished 60 acres of canebrake restoration.

Management Implications and Recommendations

Development of a Rare Communities Database would also be of benefit in tracking this community. When the database is developed the following items will be tracked:

- Number of occurrences and acreage of this community type.
- Percent of occurrences or acreage at desired conditions.
- Treatments accomplished.
- Acres added to GIS layer for this community.

CAVES, MINES, AND KARST

A cave closure order was issued recently due to the threat of white-nose syndrome (WNS). Find more information on this closure order in the White-Nose Syndrome portion of this document on Page 79.

Management Implications and Recommendations

A closure order was issued in order to protect bats from WNS.

EMERGENT WETLANDS

No database is being kept on emergent wetlands. A ponds database is kept and ponds are managed in a way to protect emergent wetlands.

Management Implications and Recommendations

The Forests' fisheries biologist should evaluate if a special database is needed for this community or if management of ponds and riparian zones covers this special community.

NATIVE GRASSLANDS

In 2013, the OSFNFs restored 630 acres of native grasslands.

Management Implications and Recommendations

The Forests have been aggressive in converting fescue pastures to native warm season grasslands. We anticipate restoring an additional 600 acres of native grasslands in the next 5 years.

BOTTOMLAND DEPRESSION

The ranger districts have not identified new occurrences of this community type. Currently, all areas of the community are being protected. No special treatments are prescribed for this community type.

Management Implications and Recommendations

Development of a Rare Communities Database would also be of benefit in tracking this community.

MANAGEMENT AREAS (MA)

3A – PINE WOODLAND MA - APPROXIMATELY 97,629 ACRES

Vegetation Management

Abundance of Mature Forest (>70 years)

In 2006, there were 49,347 acres in mature condition (approximately 50%) of the management area. In 2013, there were 56,158 acres in mature condition, representing approximately 58% of the MA.

Management Implications and Recommendations

A goal in this MA is to have a balanced age class distribution. The Forests should ensure regeneration efforts continue in this management area.

Abundance of Mature Forest and Woodland in Burned Condition

Since pine woodland is featured in this MA, it is important to have an active thinning and burning program. A burning frequency of 2 - 5 years is ideal to perpetuate the featured community. Table 5 shows that 5,568 acres or 5.7% of this MA was burned in 2013. The average annual amount of burning in this MA in the last 8 years is 7,330 acres. If this rate was carried out for 10 years, it would meet the minimum frequency on 38% of the acres in the MA. This is short of meeting the amount on burning needed to provide 60 % of this MA in woodland condition.

Management Implications and Recommendations

Burning of 10% of this MA in 2013 shows that the Forests were targeting this management area with the burn program, but the number of acres burned was below the recommended level. Additional burning is recommended for the MA.

Table 5: Prescribed Burning Acres in Management Areas from 2006 to 2013.

Prescribed Burning in Management Areas				
Management Area	**2006-13 ac**	**2006-13 %**	**2013 ac**	**2013 %**
3A - Pine Woodland	58,640	60%	5,568	5.7%
3B - Oak Woodland	48,506	31%	9,960	6.4%
3C - Mixed Forest	68483	19%	12,825	4.2%
3D - Oak Decline Areas	13,874	20%	4	0%
3E - High Quality Forest	44,749	21%	2,070	3.1%
3F - Old Growth Area	2,345	46%	19	0.4%
3G - Crowley's Ridge	3,848	34%	0	0%
3I - Riparian Corridors	2,559	22%	30	0.3%

Abundance of Mature Woodland (>70 years)

Forest Service databases show that 277acres of timber over 70 years was thinned in this MA in 2013. This amounts to about 0.5% of the mature timber in the MA. If this rate were repeated the next nine years, it would result in around 5% of the MA being commercially thinned. Recent ice storms may have affected the amount needing commercial thinning.

Management Implications and Recommendations

Stand examinations are needed to determine the amount of thinning still needed after ice storms and wind damage.

3B – OAK WOODLAND MA - APPROXIMATELY 154,704 ACRES

Vegetation Management

Abundance of Mature Forest (>70 years)
In 2006, there were 119,234 acres in mature condition, approximately 77% of the MA. In 2013, the number of acres had increased to 131,362 representing 85% of the MA.

> **Management Implications and Recommendations**
> With only 15% of this MA at 70 years old or younger, it is obvious that more regeneration should be prescribed. This would provide for a continuing flow of young healthy stands to feed into the community over time. If this does not happen, there will be serious forest health problems develop in this MA in the future.

Abundance of Mature Woodland (>70 years)
There were 591 acres of mature timber thinned in this MA in 2013. This represents only 0.4% of the mature timber in this MA. Some stands have received wildlife stand improvement treatments that do the same thing as a thinning, however, the timber is not sold so the acres do not get calculated as a thinning treatment. The ice storm of 2009 essentially "thinned" a large portion of this management area although the total number of acres thinned by this disturbance event has not yet been assessed. Assessments are done as an area is analyzed on a regular 10-14 year order of entry.

> **Management Implications and Recommendations**
> Desired conditions for this MA are to manage about 60% of the woodland community acres in oak woodland condition. It is unknown at this time exactly how much of this MA is in woodland condition due to thinning and results of the ice storm and red oak borer activity. Future timber management assessments will need to evaluate conditions and prescribe the appropriate amount of thinning to provide for desired conditions.

Abundance of Mature Forest and Woodland in Burned Condition
There were 9,960 acres burned in this MA in 2013. This represents 6.4% of the MA. A burning frequency of 2-7 years is recommended to sustain oak forests and woodlands. At this frequency (14%-50%) of the 60% desired to be in woodland would need to be burned annually.

> **Management Implications and Recommendations**
> Management should increase burning in this MA. With woodlands being featured, an aggressive burn program is needed.

3C – Mixed Forest MA - Approximately 360,401 acres

Vegetation Management

Abundance of Mature Forest (>70 years)
In 2006, there were about 238,662 acres (approximately 66% of the MA) in mature condition. By 2013, the amount had increased to 268,154 acres (approximately 76% of the MA).

> **Management Implications and Recommendations**
> The desired condition is to provide for a balanced age class distribution in the Mixed Forest MA. At this time, there is an over abundance of older timber. The Forests should start regenerating in this MA at about 8% per decade.

Abundance of Thinned Mature Forest (>70 years)
There were approximately 2,221 mature acres thinned in the MA in 2013. This is 0.8% of the mature forest in this MA. At this rate, 22,221 acres (8%) would be thinned in 10 years of plan implementation. The desired condition of this MA includes stands thinned at regular intervals to provide for health and sustainability.

> **Management Implications and Recommendations**
> This rate of thinning does not meet the desired condition of maintaining well thinned stands to reduce stress on trees. A more aggressive thinning regime should be implemented.

Abundance of Regenerating Forest (0 - 10 years)
In 2013, there were only 910 acres of regeneration harvest implemented in this MA. If the regeneration is successful, this will increase the area of regenerating forest by less than 3/10 of 1% within this MA on an annual basis. In a 10-year period, less than 3% would be regenerated.

> **Management Implications**
> This level of regeneration cutting would not lead to most trees being regenerated at an appropriate rotation age. Increased regenerating cutting should be implemented in this MA. There is no need to change plan direction at this time but there is a need to follow plan direction.

3D – Oak Decline Restoration - Approximately 67,691 acres

Vegetation Management

Abundance of Mature Forest (>70 years)
In 2013, there were 55,891 acres in the over 70 age class. This is 83% of the management area.

Abundance of Thinned Mature Stands (>70 years)
There were 667 acres (1.2%) of "over 70 years old" commercially thinned in this MA in 2013.

Management Implications and Recommendations
Due to stand changes from natural events, the amount of thinning needed in this MA must be evaluated stand by stand. The need for thinning is dependent on the stand age, tree density, species composition, and regeneration present in the stand as well as the expected response from prescribed burning.

Abundance of Regenerating Forest (0 - 10 years)
There were a total of 16 acres (0.02%) of regeneration cuts done in the Oak Decline MA in 2013. This continues the trend of little regeneration being prescribed in this MA. If this trend continues most acres in this MA will not be regenerated before the desired rotation age.

Management Implications and Recommendations
This rate of treatment falls short of desired goals of restoring this community to productive forest or woodland habitat. Hopefully, much of the MA will be restored or regenerated by fire. If not, the rate of thinning and regeneration cutting should be increased appropriately in the near future.

3E – HIGH QUALITY FOREST - APPROXIMATELY 214,358 ACRES

Abundance of Mature Forest (>70 years)
In FY2013, there were about 165,986 acres in mature condition (representing approximately 77% of the MA based on age class distribution).

Management Implications and Recommendations
There is a need to balance age classes in this MA. An emphasis in this MA is to manage the timber resource to maximize timber production. Managers should be regenerating at least 11% of the suitable acres in this MA every 10 years. This would eventually balance the age classes.

Abundance of mature thinned forest (>70 years)
There were approximately 1,240 acres of over 70 years old thinned in FY2013. At this rate, about 7% of the mature stands would be thinned in a 10-year period.

Management Implications and Recommendations
This rate of thinning will not sustain growth and vigor in the MA. This is the primary purpose of the MA. To maintain stand vigor and health, an active thinning regime should be implemented for the rest of the planning cycle.

Abundance of Old Growth Condition
In this MA, there are 52,470 acres of timber stands over 100 years in age. These acres comprise about 24% of the total MA.

Management Implications and Recommendations
This MA has a short rotation age assigned. Maximum length of rotation is listed as 110 years old. It will take many entries to return overaged stands to young, fast-growing stands. Increased regeneration cutting should be emphasized in the MA following RLRMP direction.

Abundance of Regenerating Forest (0 - 10 years)
There were 414 acres in regeneration cuts in the High Quality Forest MA in 2013. At this rate, about 4,900 would be regenerated in the first 10 years of RLRMP implementation.

Management Implications and Recommendations
The goal of maintaining vigor and growth in stands will not be maintained by letting timber stands get old and decadent. Following RLRMP direction, an emphasis on regeneration should be followed in this MA if any progress toward a high quality forest products area is to be realized.

3F – OLD GROWTH MA - APPROXIMATELY 5,062 ACRES

Table 6 shows the following age class distribution present on designated Old Growth MAs on the Ozark-St. Francis National Forests. Only 18% of this MA is less than 71 years old. Mature age classes (71-100) represent 54% of the MA. Old growth ages represent 28% of the MA. Succession will provide for ages needed to meet old growth goals.

Table 6: Age Class for Old Growth Management Areas on the OSFNFs in 2013.

Age Class of Old Growth Management Areas		
Age Class (Years)	**Acres**	**Percentage**
1 to 10	0	0%
11 to 40	195	4%
41 to 70	707	14%
71 to 100	2,735	54%
101+	1,428	28%

Figure 5 shows that progress toward old growth age classes is being made. Thinning and periodic fire are needed to provide ecological old growth condition. In 2013, only 52 acres or about 1% of the MA was thinned. Only 19 acres were burned.

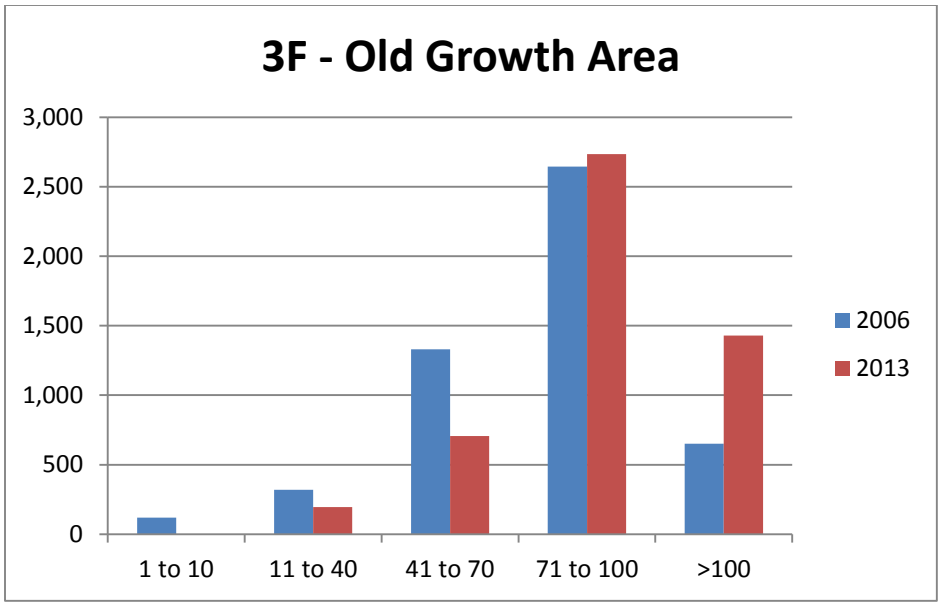

Figure 5: Comparison of Old Growth MA Age Class Distribution in 2006 and 20013

Management Implications and Recommendations

Old growth should be thinned and burned to old growth guidance levels. At each entry, densities should be evaluated and treatments prescribed.

3G – Crowley's Ridge Upland Hardwood MA - Approximately 11,443 acres

For monitoring of this MA, see monitoring for the Loess Slope Community (Page 15). They are the same area.

3H – Mississippi River Bottomland Hardwood MA- Approximately 3,573 acres

For monitoring of this MA, see monitoring for the Bottomland and Floodplain Forest (Page 16). They are the same area.

3I – Riparian Corridors MA - Approximately 11,484 acres

The 2006 and 2013 age class distribution for lands inside the Riparian Corridors MA show the age classes are increasing with little regeneration cutting in this MA. There were three acres of regeneration cutting in this MA in 2013.

Management Implications and Recommendations

No change in direction is needed at this time.

2E – WEDINGTON UNIT URBAN RECREATION AREA MA - APPROXIMATELY 10,467 ACRES

Table 7 shows age class distribution for the Wedington Unit Urban Recreation Area.

Table 7: Age Class for Wedington Unit Urban MA on the Ozark-St. Francis NFs in 2013.

Wedington Unit Urban Recreation Area Management Area		
Age Class (Years)	**Acres**	**Percentage**
1 to 10	0	0
11 to 40	580	6
41 to 70	1,307	12
71 to 100	3,768	36
101+	4,812	46

There were no acres thinned or regenerated in this MA from 2006 to 2013.

Management Implications and Recommendations

Wedington is to be managed under a woodlands prescription. It is important to thin stands to create or sustain woodland conditions. Forest plan direction for treatments should be followed. There is no need to change plan direction at this time.

FOREST MANAGEMENT INDICATOR SPECIES (MIS)

TERRESTRIAL MANAGEMENT INDICATOR SPECIES

Terrestrial Management Indicator Species (TMIS) have been selected to help monitor the effects of management practices on all species across the forests. They are representative of species that require similar habitats to occupy. These species are monitored so that the entire range of species does not have to be monitored.

Table 8 is a summary of the TMIS monitoring on the OSFNFs.

Table 8: Monitoring Methods and Trends for Terrestrial Management Indicator Species.

Monitoring Methods and Trends for Terrestrial Management Indicator Species				
Common Name	**Ozark**	**St. Francis**	**Trend Evaluation Method**	**Trend**
Northern Bobwhite	X		Woodland, early seral forest type, and age class distribution; R8 Bird survey	Prescribed fire, WSI, openings, pond construction and wildlife opening conversion to warm grass have increased since 2005
Prairie Warbler	X		North American Breeding Bird Survey/ R8 Bird survey & Habitat Capability data	Population trend is downward but habitat capability on the Forests still remains good
Yellow-breasted Chat		X	North American Breeding Bird Survey/ R8 Bird survey & Habitat Capability data	Species population trend is increasing slightly; seral habitat capability on the St. Francis NF will continue to be monitored
Brown-headed Nuthatch	X		North American Breeding Bird Survey/ R8 Bird survey & Habitat Capability data	Currently poor quality habitat, however, RLRMP implementation should improve this species habitat
Northern Parula	X	X	North American Breeding Bird Survey/ R8 Bird survey & Habitat Capability data	Population trend and habitat are increasing slightly
Acadian Flycatcher	X	X	North American Breeding Bird Survey/ R8 Bird survey & Habitat Capability data	Population trend is increasing slightly
Rufous-crowned Sparrow	X		Habitat Capability data	Habitat for this species has been improved over much of the top of Mt. Magazine
Cerulean Warbler	X	X	North American Breeding Bird Survey/ R8 Bird survey & Habitat Capability data	Slight increase in the population trend
Ovenbird	X		Local searches/ R8 Bird surveys & Habitat Capability data	Slight decrease in the population trend while habitat is steady to increasing
Red-headed Woodpecker	X		North American Breeding Bird Survey/ R8 Bird surveys & Habitat Capability data	Population trends continue to reflect no change or a very slight increase. Habitat is rare and increasing slowly

Table 8 (Continued): Management Indicator Species Monitoring Methods and Trends.

Monitoring Methods and Trends for Terrestrial Management Indicator Species				
Common Name	**Ozark**	**St. Francis**	**Trend Evaluation Method**	**Trend**
Scarlet Tanager	X		North American Breeding Bird Survey/ R8 Bird surveys & Habitat Capability data	Population trends continue to reflect a steady to increasing population. Habitat changing little
Pileated Woodpecker	X	X	North American Breeding Bird Survey/ R8 Bird surveys & Habitat Capability data	Population trends continue to reflect little change. Habitat quality changing little
Whitetail Deer	X	X	Habitat capability to support an average of 11.7 deer per square mile after 10 years (hunter checks)	Habitat capability still remains above the Plan projection
Black Bear	X		Hunter checks and bait station surveys	Habitat capability still remains above the Plan projection
Wild Turkey	X	X	Annual Wild Turkey Brood Survey	Brood indicates population decline, but Habitat capability on the forest still remains good

Species Requiring Early Seral or Early Successional Habitats

Some species were chosen as MIS species because their habitat requirements help indicate effects of management on restoration of pine and oak woodland and native grasslands. These species include the northern bobwhite, the prairie warbler, and the yellow-breasted chat. Table 9 shows timber treatments used in 2006 - 2013 that improve wildlife habitat conditions for these species.

Table 9: Timber Treatments that Improve Wildlife Habitat Conditions from 2006 to 2013.

Ozark-St. Francis NF Timber Treatment Acres by Type 2006-2013						
Year	**Clear Cut**	**Shelterwood**	**Seed Tree**	**Thin**	**Salvage**	**Total**
2006	0	881	32	5,752	208	6,873
2007	0	784	0	5,283	619	6,686
2008	0	1,317	324	5,852	0	7,493
2009	0	674	292	4,505	2,860	8,331
2010	0	1,440	210	7,632	1,367	10,649
2011	0	789	176	5,364	514	6,843
2012	0	2,163	223	6,556	1,082	10,024
2013	80	1,812	357	7,044	396	9,689
Totals	**80**	**9,860**	**1,614**	**47,988**	**7,046**	**66,588**

Expected trends in these habitats are evaluated in terms of tracking the amount of early seral forest type and age class distribution (Figure 6). Table 10 shows the acres of types of treatments completed from 2006 – 2013 that would benefit these species.

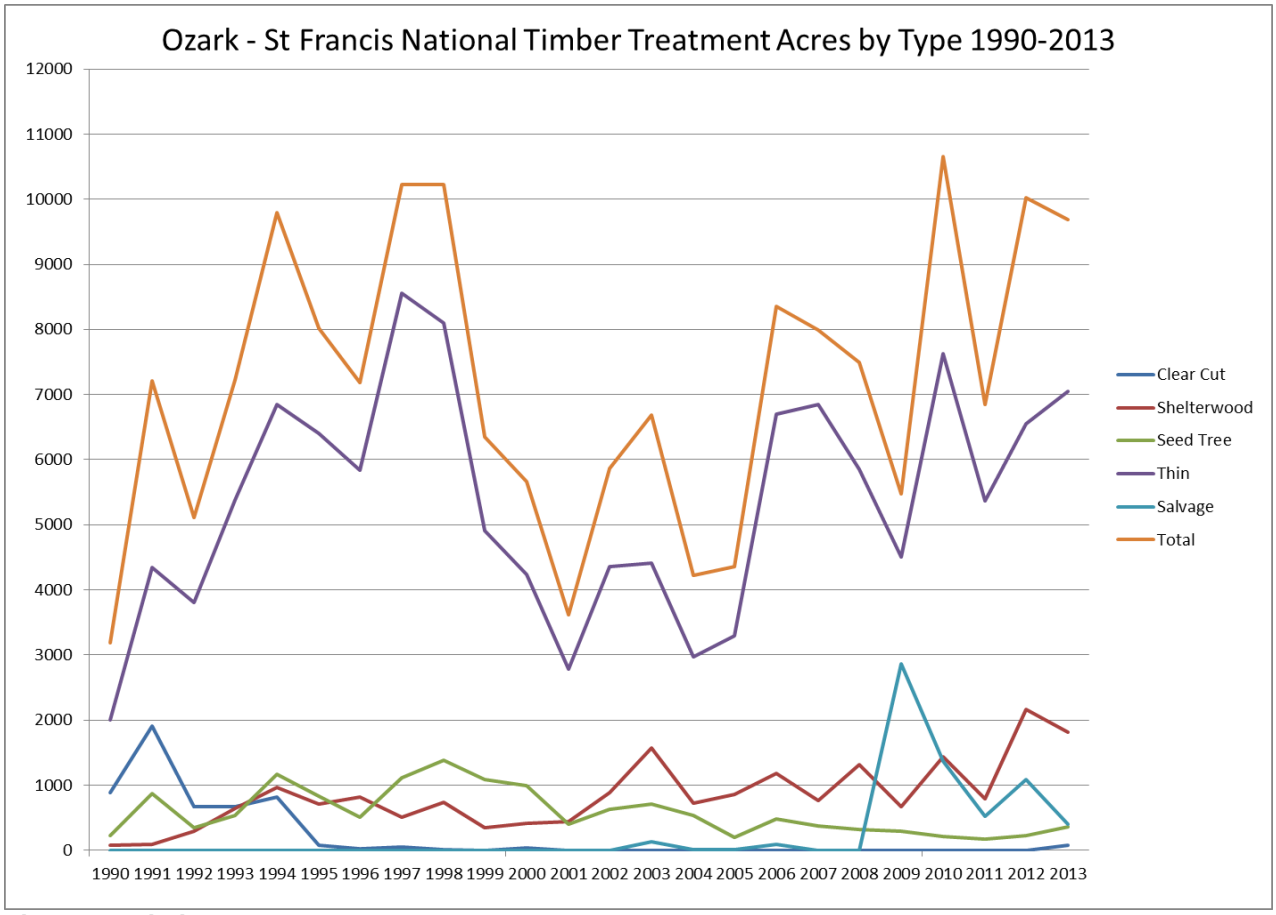

Figure 6: Timber Treatments, 1990-2013.

Table 10: Early Seral Habitat Improvements (Bobwhite, Turkey, Prairie Warbler, Yellow-Breasted Chat.

Early Seral Habitat Improvements					
Treatment					
Year	Prescribed burning (acres)	Wildlife Stand Improvement (acres)	Native grass establishment (acres)	Wildlife opening construction and maintenance (acres)	Pond construction/ reconstruction (ponds)
2006	41,665	709	786	1,620	8
2007	71,614	1,427	800	1,891	24
2008	68,286	408	916	1,677	24
2009	63,038	10,548	402	2,284	1
2010	65,058	982	314	2,384	3
2011	38,351	1,416	500	1,305	0
2012	47,630	1,953	623	1,365	3
2013	43,275	8,501	850	2,222	0

NORTHERN BOBWHITE

Historically, quail thrived on lands that are now OSFNFs due to the significant amount of oak savanna, oak woodland, and glade habitat that was maintained by periodic fire.

Breeding Bird Survey (BBS): Based on the data available, the northern bobwhite in Arkansas-Central Hardwoods has shown a sustained decrease in the population trend since 1967 in the BBS (Figure 7).

R8Bird: R8Bird data from Ozark-St. Francis NFs has also shown a downward trend (Figure 8).

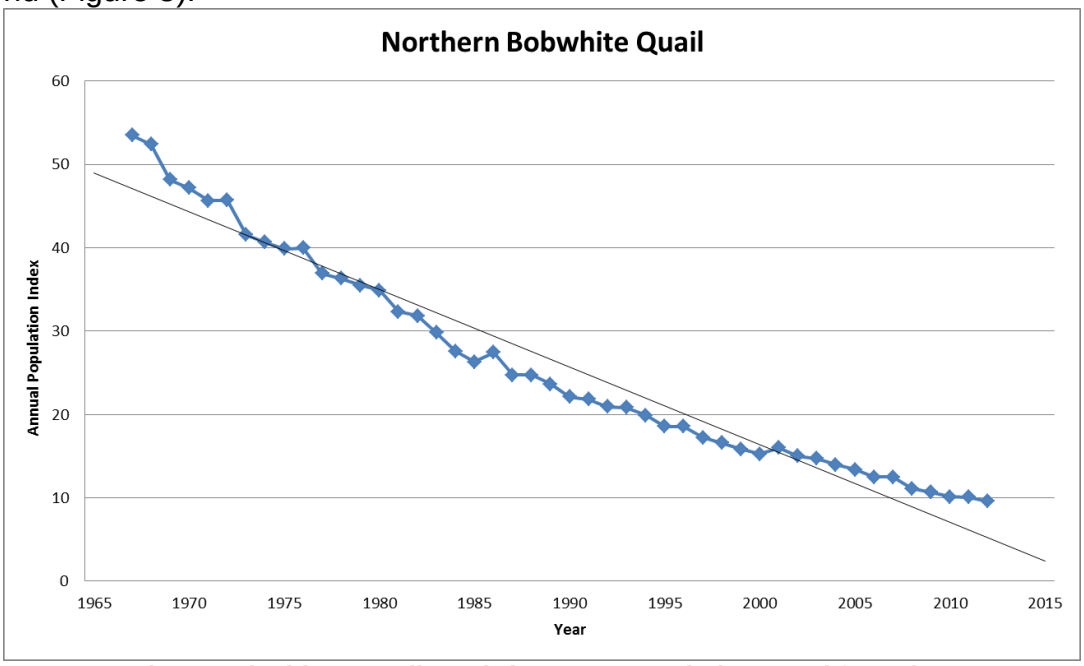

Figure 7: Northern Bobwhite Breeding Bird Survey population trend for Arkansas- Central Hardwoods for 1967 – 2012.

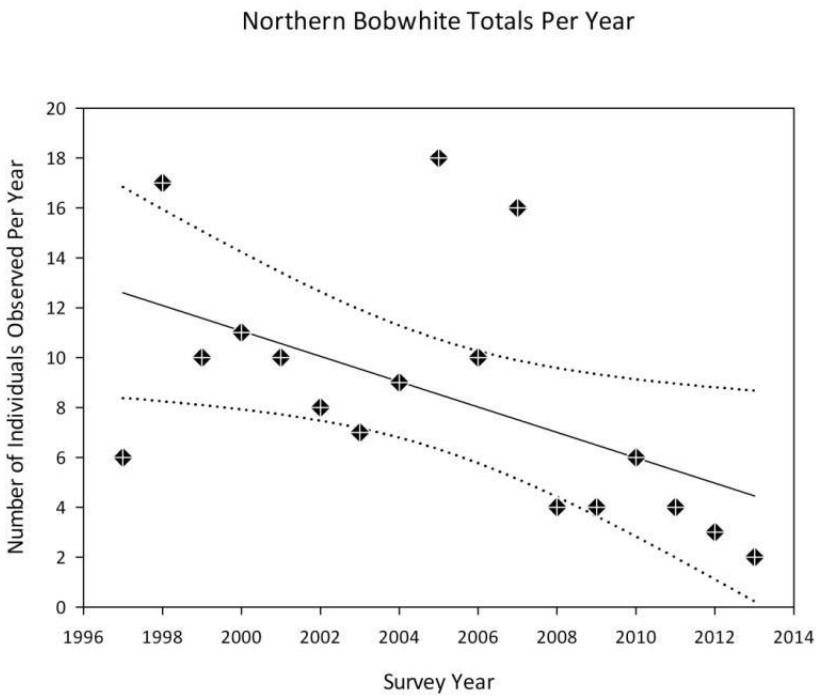

Figure 8: Numbers of Northern Bobwhite (*Colinus virginianus*) observations (diamonds) recorded during the R8BIRD point-count surveys conducted in the OSFNFs from 1997 through 2013.

Management Implications and Recommendations

Habitat needs for northern bobwhite should be met over time on the Forests. This species requires quality early seral or woodland habitat of which there is little currently provided forest-wide. Continued plan implementation will increase this habitat in the future. Continue implementing Forest Plan.

PRAIRIE WARBLER

Prairie warbler was chosen as a MIS to help indicate the effects of management on the early successional component of forest communities. As a Neotropical migrant, the prairie warbler is an international species of concern. This species uses early successional habitats such as regenerating old fields, pastures, and young forest stands. The vegetation selected may be deciduous, conifer, or mixed types. Habitats with scattered saplings, scrubby thickets, cutover or burned over woods, woodland margins, open brushy lands, mixed pine and hardwood, and scrub oak woodlands are most often selected. Optimal habitat conditions for this species are even-aged regenerating forests of stand size or larger. Monitoring in the Ozark-Ouachita physiographic province shows a declining trend for this species.

Breeding Bird Survey (BBS): Prairie Warbler BBS trend results for the Arkansas-Central Hardwoods show a long term declining trend (Figure 9).

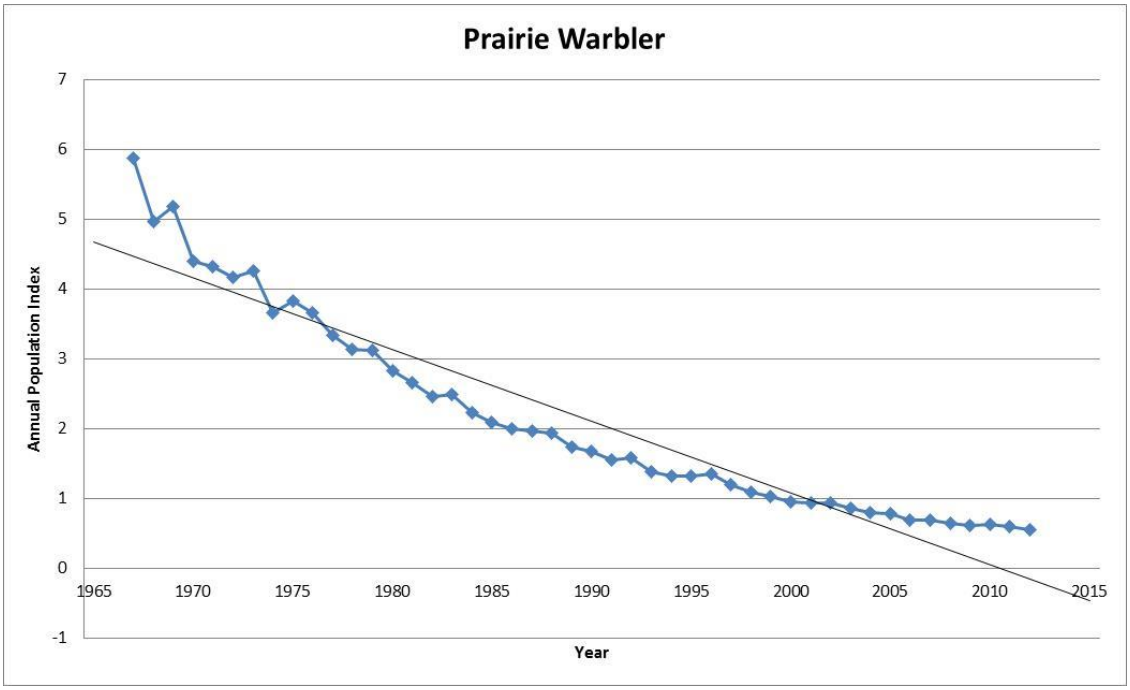

Figure 9: Prairie Warbler Breeding Bird Survey population trend for Arkansas- Central Hardwoods for 1967 – 2012.

R8Bird: R8Bird point data (Figure 10) for 1997-2013 shows a downward trend.

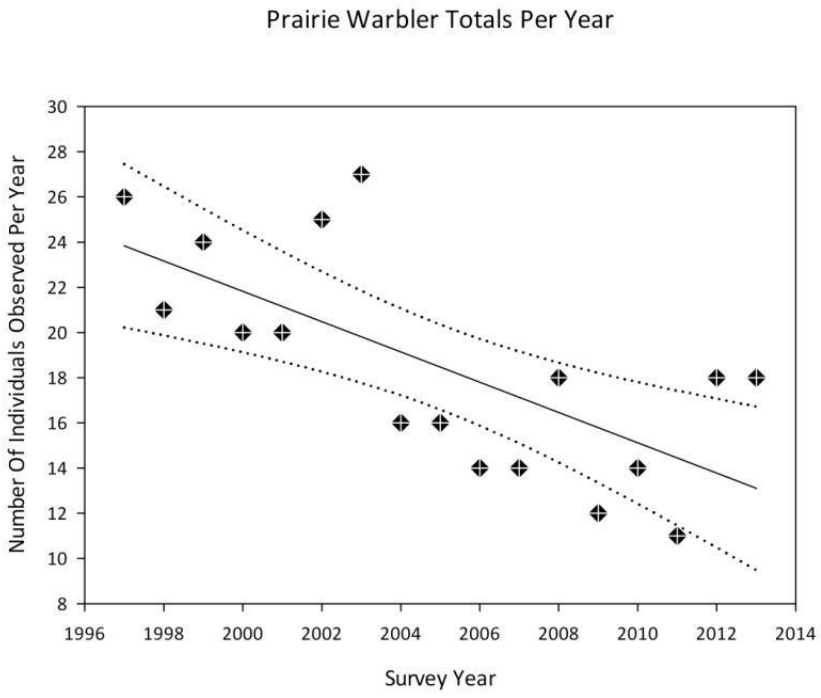

Figure10: Numbers of Prairie Warbler (*Dendroica discolor*) observations recorded during R8BIRD surveys conducted in the OSFNFs from 1997 through 2013.

Based on the data available, the prairie warbler is in a downward trend. These data are in agreement with the BBS data for the Arkansas Central Hardwoods and the same downward trend that is indicated throughout the prairie warbler's range nationwide.

Management Implications and Recommendations

The prairie warbler appears to be in significant decline and should benefit from full implementation of the RLRMP. It is recommended that the Forests increase regeneration cutting to recommended levels in the RLRMP to sustain forest communities and provide habitat for early seral species such as prairie warbler. Creation of woodland habitat also benefits this species and should also be provided as funding allows.

YELLOW-BREASTED CHAT

Yellow-breasted chat was selected to represent species needing early seral habitat conditions on the St .Francis NF. It occupies regenerating forests in small and large patch sizes. Potential populations will be evaluated by tracking the amount of early seral habitat maintained on the St. Francis NF as well as monitoring population trends on the St. Francis NF for this unique avian species. Figure 11 shows the distribution of the age class habitat on the St. Francis NF in 2013. Yellow-breasted chat habitat in the 0-10 year age class is less than 3% of the forested acres on the St. Francis NF in 2013.

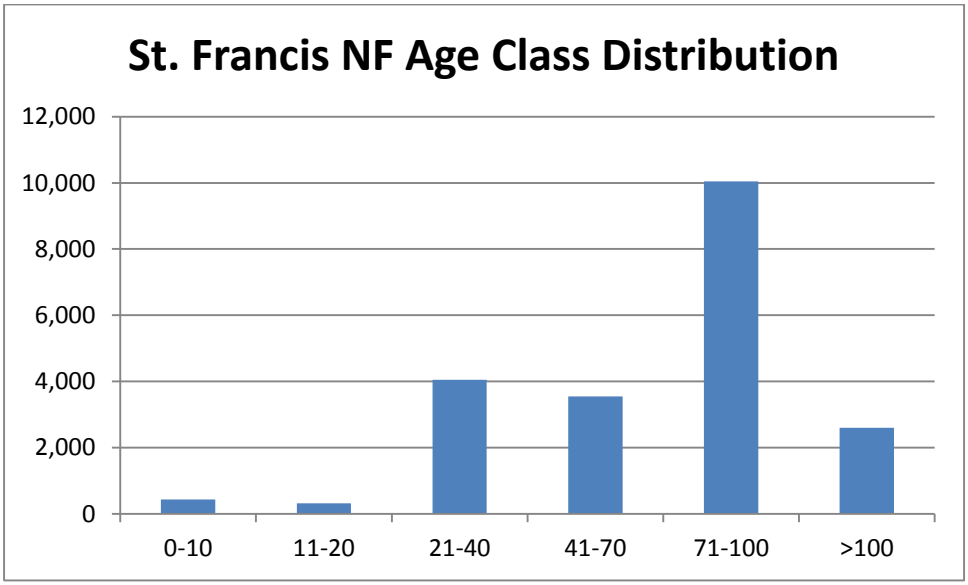

Figure 11: Distribution of Yellow-breasted Chat Habitat on the St. Francis NF in 2013.

The St. Francis NF has had very few (less than 500 acres) regeneration cuts in the last 10 years. These cuts have all occurred in the last three years. There is very little quality habitat for this species on the St. Francis NF at the current time.

Treatments that provide habitat for this species have declined on the St. Francis NF in recent years. Point counts on the Forests over the last five years have shown an increasing trend.

R8Bird: R8Bird point data (Figure 12) for 1997-2013 shows an increasing population.

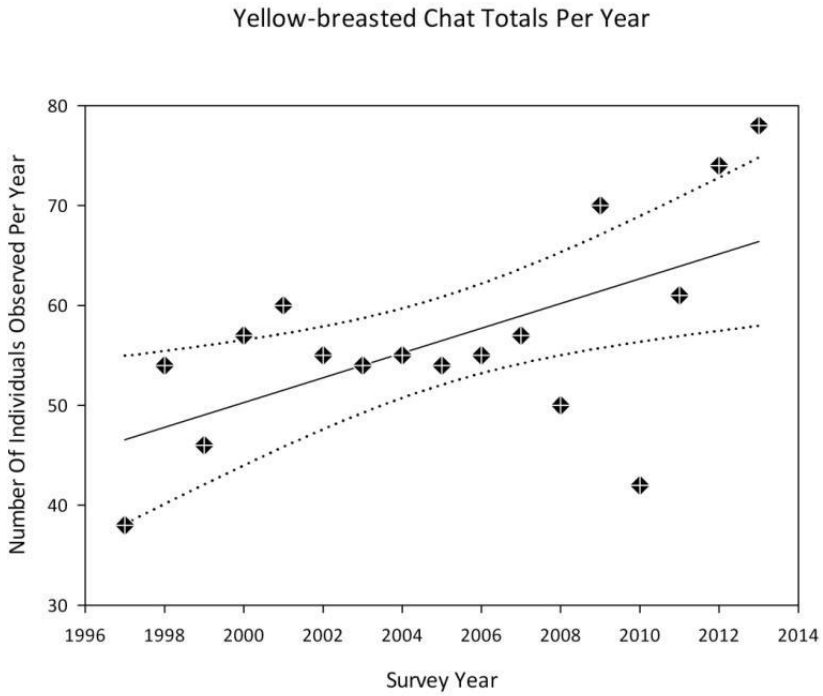

Figure 12: Numbers of Yellow-breasted Chat (*Icteria virens*) observations (diamonds) recorded during R8BIRD point-count surveys conducted in the OSFNFs, 1997 – 2013.

Management Implications and Recommendations

Providing early seral habitat on the St. Francis NF should be made a priority. This would benefit species dependent upon early seral habitat and overall forest health.

Species Requiring Pine Woodland Habitats

BROWN-HEADED NUTHATCH

Brown-headed nuthatch was chosen to represent species needing pine woodland condition. Potential populations will be evaluated by tracking the amount of pine woodland condition on the Forests. This species is currently rare on the Forests. It may take quite a while for brown-headed nuthatches to spread into suitable habitats.

R8Bird point data (1997 – 2013) and population trend will be used to address changes in their condition. Since the RLRMP encourages pine and oak woodland

and work has been done on several districts to increase the number of acres where the woodland condition is the goal, the population trend for this species should continue to increase.

However, based on the data available, the brown-headed nuthatch has shown an increasing population trend on the Forests in the R8Bird data since 1997 (Figure 13). It has not been found during the Breeding Bird Surveys within the Arkansas Central Hardwoods.

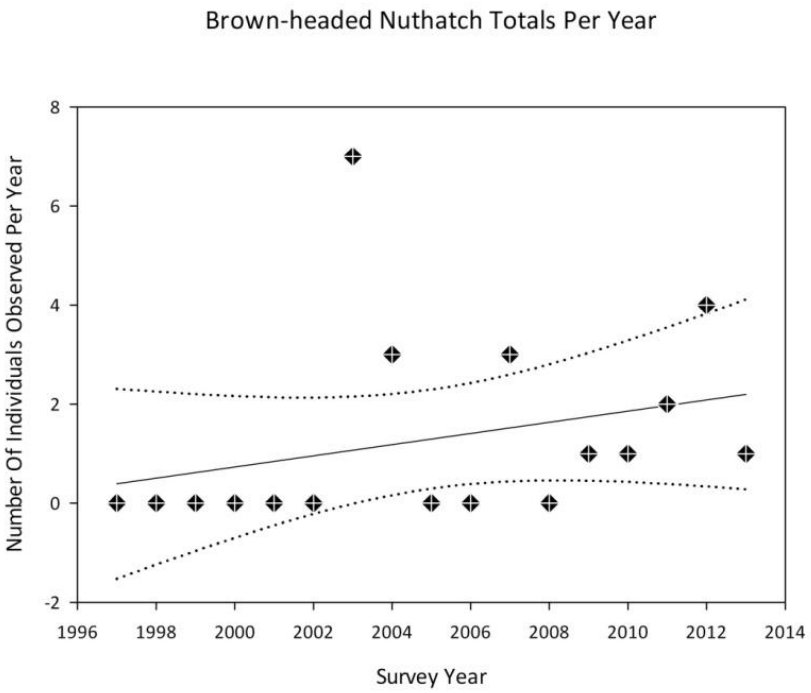

Figure 13: Numbers of Brown headed Nuthatch observations (diamonds) recorded during R8BIRD point-count surveys conducted in the OSFNFs 1997 - 2013.

Management Implications and Recommendations

The brown-headed nuthatch is a fairly rare bird species on the Forests in part due to poor habitat quality but implementation of the RLRMP should help increase the available acres in quality woodland habitat for this species. No change is warranted at this time.

Species Requiring Riparian Forest Habitats

NORTHERN PARULA

Northern parula was chosen to represent species needing riparian forest condition. They are common summer residents along the Forests' wooded rivers and streams. Potential populations will be evaluated by tracking mature riparian habitat on the Forests.

Breeding Bird Survey: BBS Data for the northern parula in the Arkansas Central Hardwoods has shown a stable to declining population trend in the Breeding Bird Survey since 1967 (Figure 14).

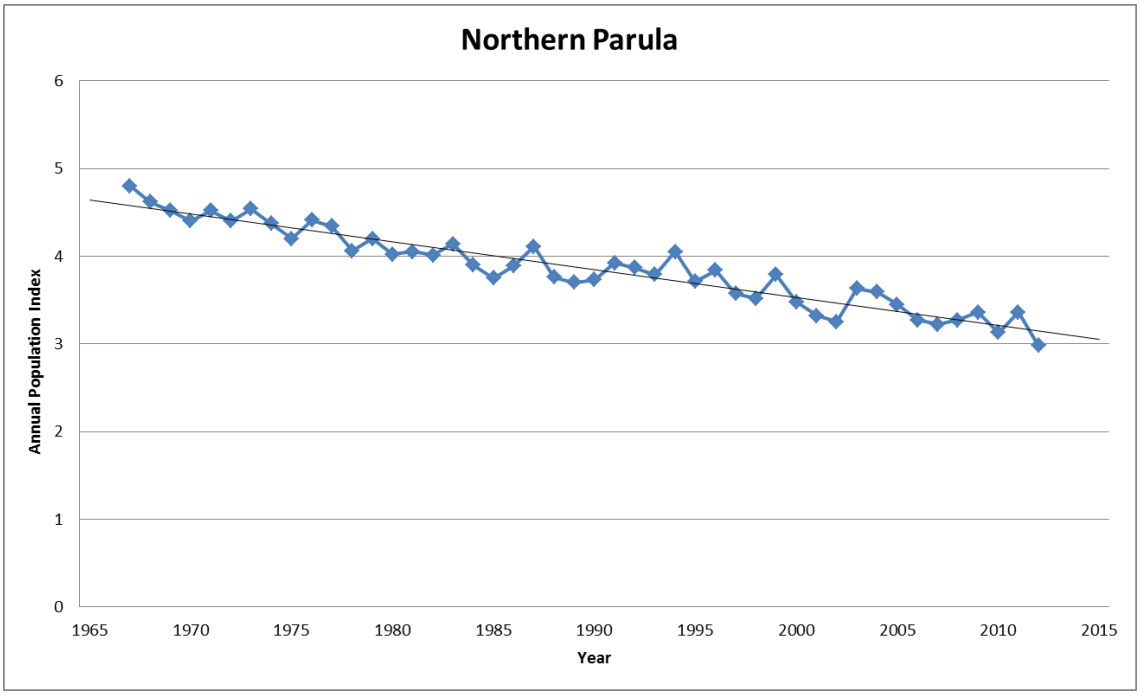

Figure 14: Northern Parula Breeding Bird Survey population trend for Arkansas- Central Hardwoods for 1967 – 2013.

R8Bird: R8Bird points have shown an increasing population trend on the Forests since 1997 (Figure 15). Population trends continue to remain good for this species on the Forests. This should continue with the full implementation of the RLRMP.

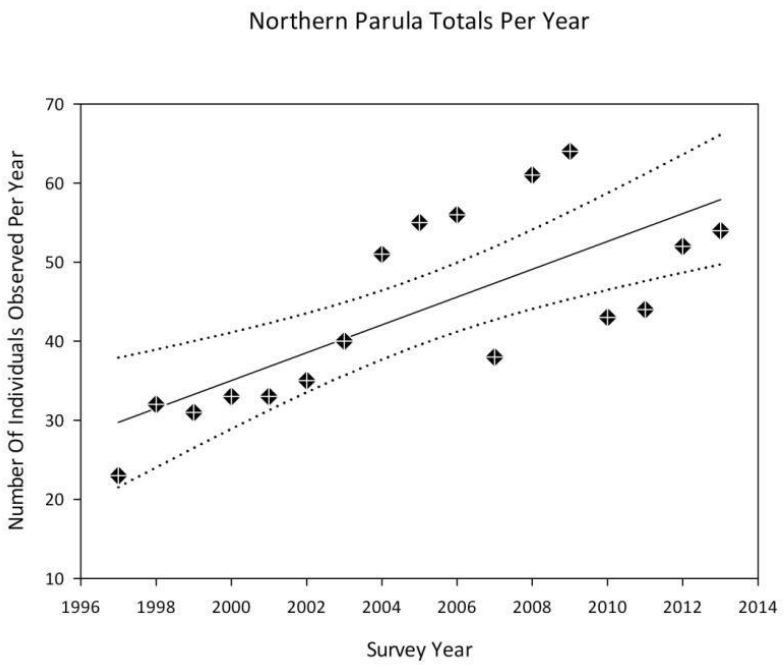

Figure 15: Numbers of Northern Parula observations recorded during R8BIRD point-count surveys conducted in the OSFNFs, 1997 - 2013.

Management Implications and Recommendations

Northern parula is relatively abundant in parts of the Forests where suitable habitat occurs. Habitat for this avian species will continue to be monitored. No change is warranted at this time.

Species Requiring Mid-Aged to Mature Forest Habitats

ACADIAN FLYCATCHER

Acadian flycatcher was chosen to represent species needing mid-aged to mature forest stages of Loess Slope Forest found on Crowley's Ridge of St. Francis NF.

Breeding Bird Survey: Based on the data available, the Acadian flycatcher in the Mississippi Alluvial Valley has shown a steady increasing population trend since 1966 in the BBS (Figure 16). This is in comparison to the R8Bird points (Figure 17) which continues to show an increase population trend on the Forests since 1997.

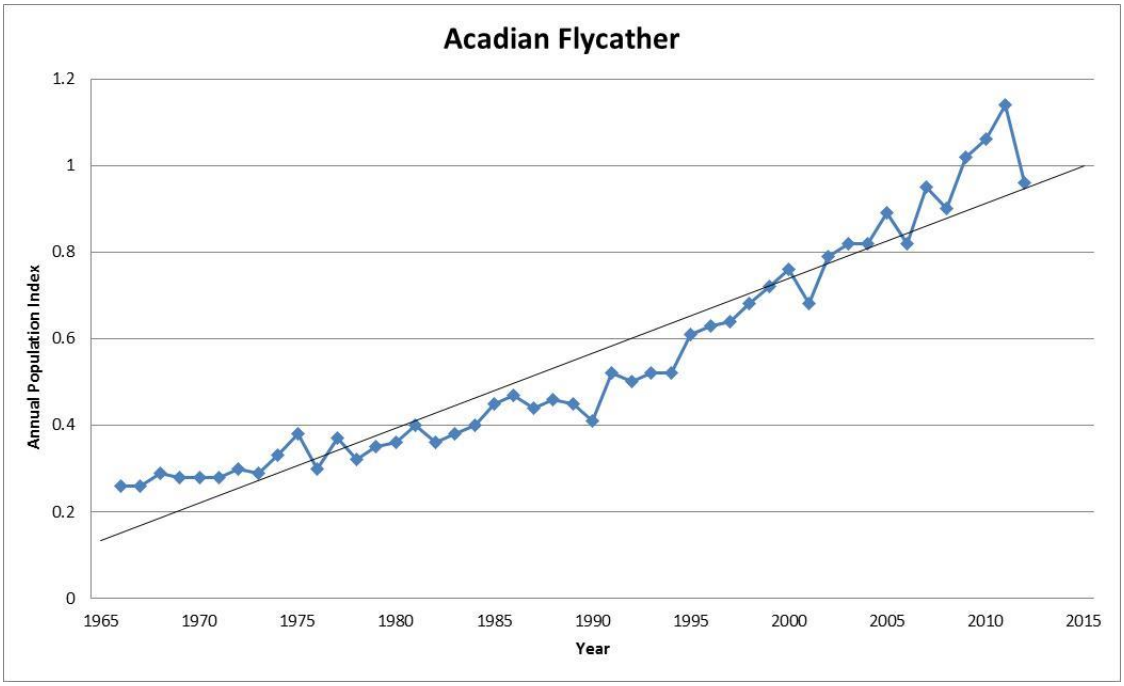

Figure 16: Acadian Flycatcher Breeding Bird Survey Population Trend for Mississippi Alluvial Valley for 1966 - 2012.

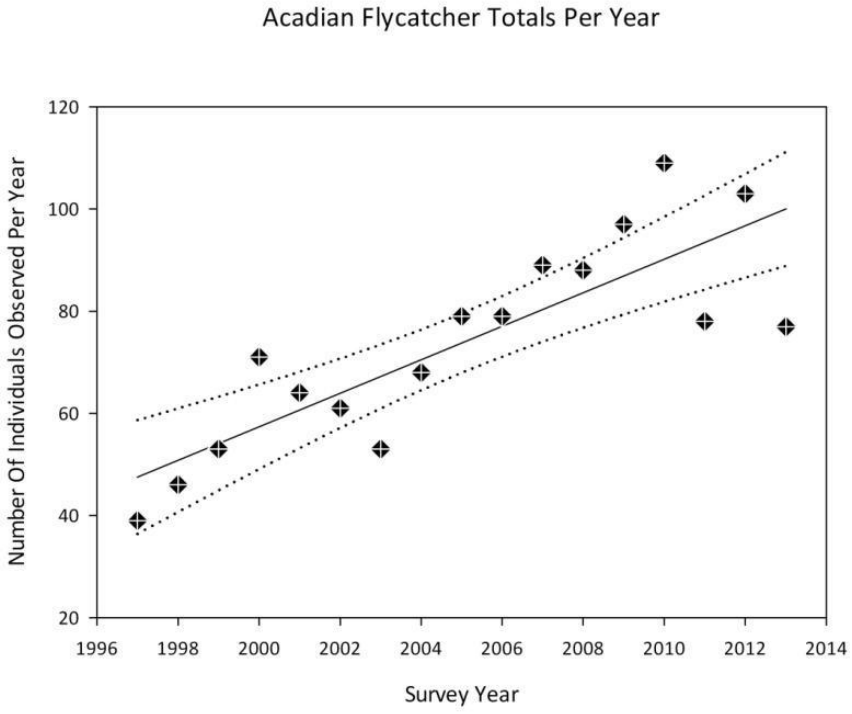

Figure 17: Numbers of Acadian Flycatcher observations (diamonds) recorded during R8BIRD point-count surveys conducted in the OSFNFs 1997 - 2013.

Management Implications and Recommendations
Acadian flycatcher population trends are increasing. Habitat for this avian species will continue to be monitored. No change is warranted at this time.

Species Requiring Glade Habitats

RUFOUS-CROWNED SPARROW

Rufous-crowned sparrow is a common resident in the desert southwest but is very rare in Arkansas. It was chosen as an MIS to track habitat conditions for the species that require maintained glades along bluff lines. Glades containing Rufous-crowned sparrows will be tracked as maintained or not. The species is currently only known to reside on the Ozark NF at Mt. Magazine.

This rarely seen bird has been documented on Mt. Magazine on a regular basis at one time but numbers of this bird fluctuate to such a degree that it is hard to say whether the population is up or down. Habitat for this species has been improved over much of the top of the mountain by the use of prescribed fire and selective thinning of competing red cedar. This work will hopefully continue with the support of the state park.

Management Implications and Recommendations
Habitat for this avian species will continue to be monitored. No change is warranted at this time.

Species Requiring Mature and Over-Mature Forest Habitats

CERULEAN WARBLER

Cerulean warbler was chosen as an MIS to represent species needing mature and over-mature forest with a complex canopy structure on highly productive sites.

The cerulean warbler is a species of concern that merits a special evaluation. Its habitat needs are unique and still being evaluated. Breeding cerulean warblers prefer and are most common in large contiguous forested tracts (Hamel 1992). In general, their habitat is mature or over-mature, high site, hardwood forest with a complex canopy structure. Large trees protruding above the rest of the canopy are favored. A developed understory also appears to be important (*Personal Communication.* C. Kellner.). The OSFNFs are on the edge of this species range and they only use a percentage of the stands meeting the above criteria. It is not known if the population is a source or sink population (*Personal Communication.* C. Kellner).

This Neotropical migrant bird (NTMB) winters in evergreen forests of the eastern slope of the Andean Foothills (Evans and Fischer. 1997). Tropical deforestation

may threaten the cerulean more than any Neotropical migrant because of its dependence on this limited habitat type (Flaspohler. 1993). Habitat loss in this area has been extensive in the past 10 to 15 years, and the area is reported to be one of the most intensively developed (e.g., logged, cultivated) regions in the Neotropics (Robbins et al. 1992).

The cerulean warbler population on the Ozark NF has been documented by several sources. Dr. Chris Kellner of Arkansas Tech University is currently doing extensive research on the species and its breeding habitat on the Forests.

Although mature forest with a canopy is clearly a requirement, several sources indicate that birds tolerate or respond positively to canopy gaps. Noting several sources, Hamel (2000 and references therein) indicated, "gaps in the canopy or openings are important to the distribution of birds." In the Missouri Ozarks, birds similarly use taller trees, group selection cuts, and breaks in the canopy next to rivers. All appear to create structurally similar gaps or microhabitat "edges" that result in use by cerulean warblers (Burhans et al. 2002). Some studies reported use of small openings, canopy gaps, and areas with a history of logging and disturbance (Burhans et. al. 2002).

Data Sources: Forest R8Bird point data (2007 – 2011) and population trend are used to address changes in their condition.

Breeding Bird Survey: Based on the data available, the cerulean warbler in Arkansas' portion of the Central Hardwoods has shown a steady decline in the population trend since 1967 in the BBS (Figure 18).

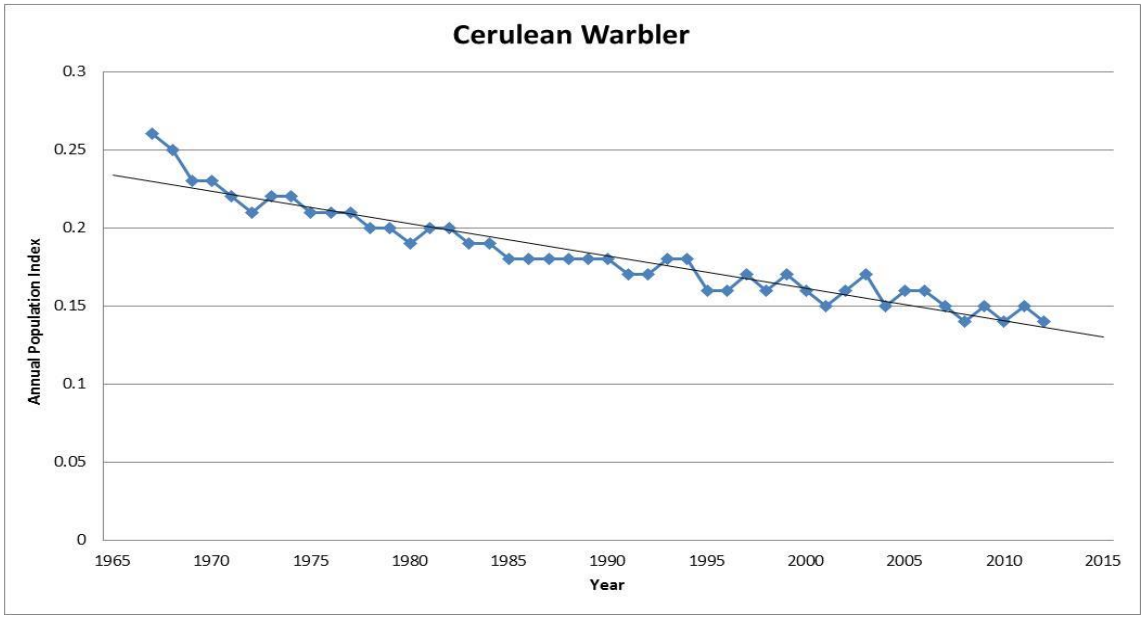

Figure 18: Cerulean Warbler Breeding Bird Survey Population Trend for Arkansas Central Hardwoods for 1967 - 2012.

R8Bird Data: Forest R8Bird point data (1997 – 2012) and population trend are used to address changes in their condition. The 1997 – 2012 R8Bird data shows a stable to increasing population trend, however, there was a dip in 2006 and 2007 (Figure 19).

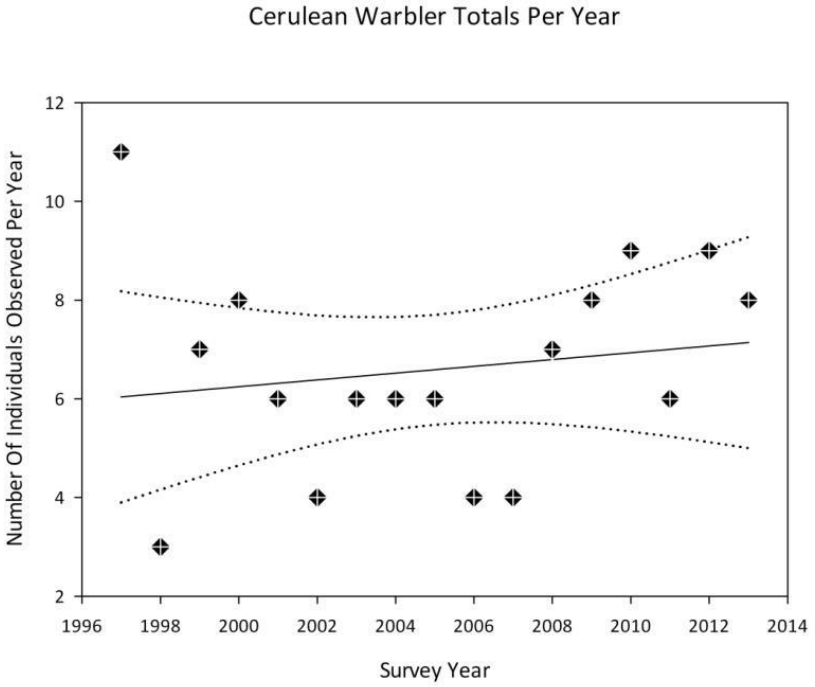

Figure 19: Numbers of Cerulean Warbler (*Dendroica cerulea*) observations (diamonds) recorded during R8BIRD point-count surveys conducted in the OSFNFs 1997 – 2013.

Management Implications and Recommendations

This bird has been documented on the Forests and prefers a specific habitat condition. Limited timber management is probably not going to impact this species but the creation of large gaps in the canopy would likely be detrimental. In addition, the use of prescribed fire in these stands also reduces or eliminates the use by cerulean warbler. Recent studies suggest that burning in these stands alters the complex canopy structure that this bird species prefers. No change is warranted at this time. Management specifically designed to manage for cerulean warblers may be in conflict with other priority species that inhabit the same area of the Forest.

Species Requiring Dry-Oak and Dry-Mesic Oak Habitats

OVENBIRD

Ovenbird was selected to represent ground nesting birds in dry-oak and dry-mesic oak forests.

Breeding Bird Survey: Based on BBS data the ovenbird in Arkansas' portion of the Central Hardwoods showed a downward trend since 1967 (Figure 20).

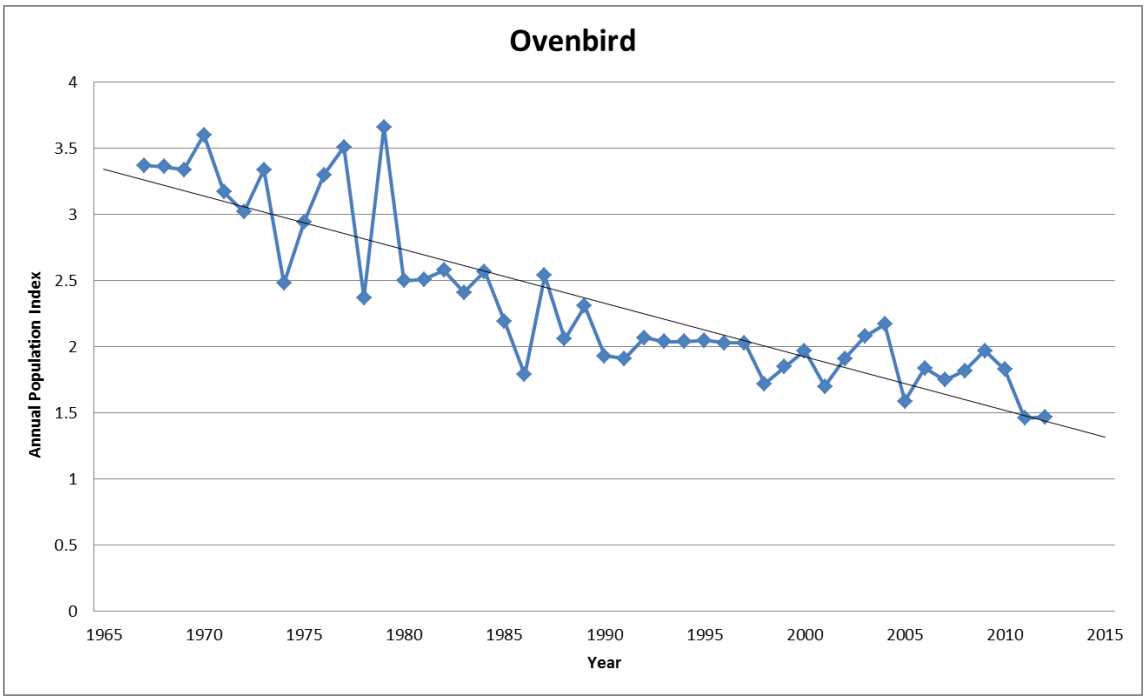

Figure 20: Ovenbird Breeding Bird Survey Population Trend for Arkansas Central Hardwoods for 1967 - 2012.

R8Bird: R8Bird point data (1997-2012) shows that the Ovenbird is common on the Forest with a negative trend (Figure 21).

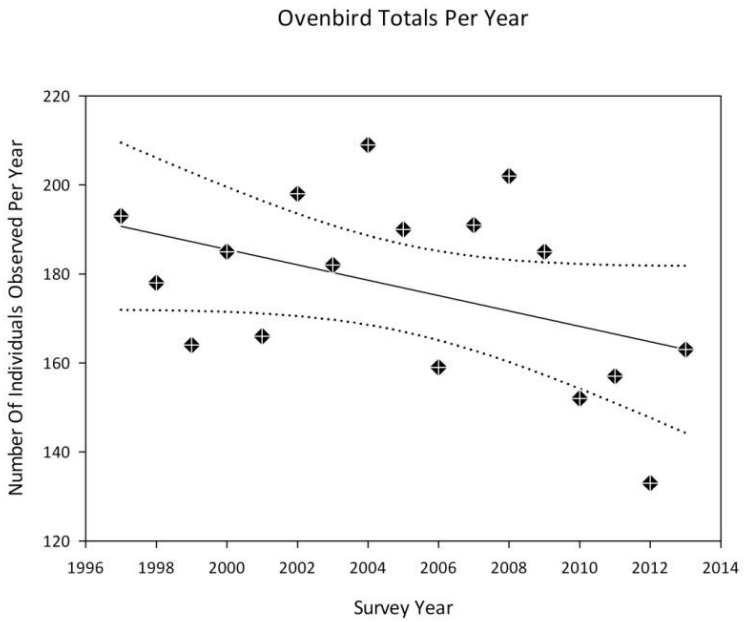

Figure 21: Numbers of Ovenbird observations recorded during R8BIRD point-count surveys conducted in the OSFNFs 1997 – 2013.

Management Implications and Recommendations

The Forests should continue to monitor ovenbird habitat and bird populations. No change in management is warranted at this time.

RED-HEADED WOODPECKER

Red-headed woodpecker was selected to represent species requiring oak woodlands. This species is uncommon on the Forests at present.

Breeding Bird Survey: Based on the data available, the red-headed woodpecker in Arkansas' portion of the Central Hardwoods has shown a decrease in the population trend since 1967 in the BBS (Figure 22).

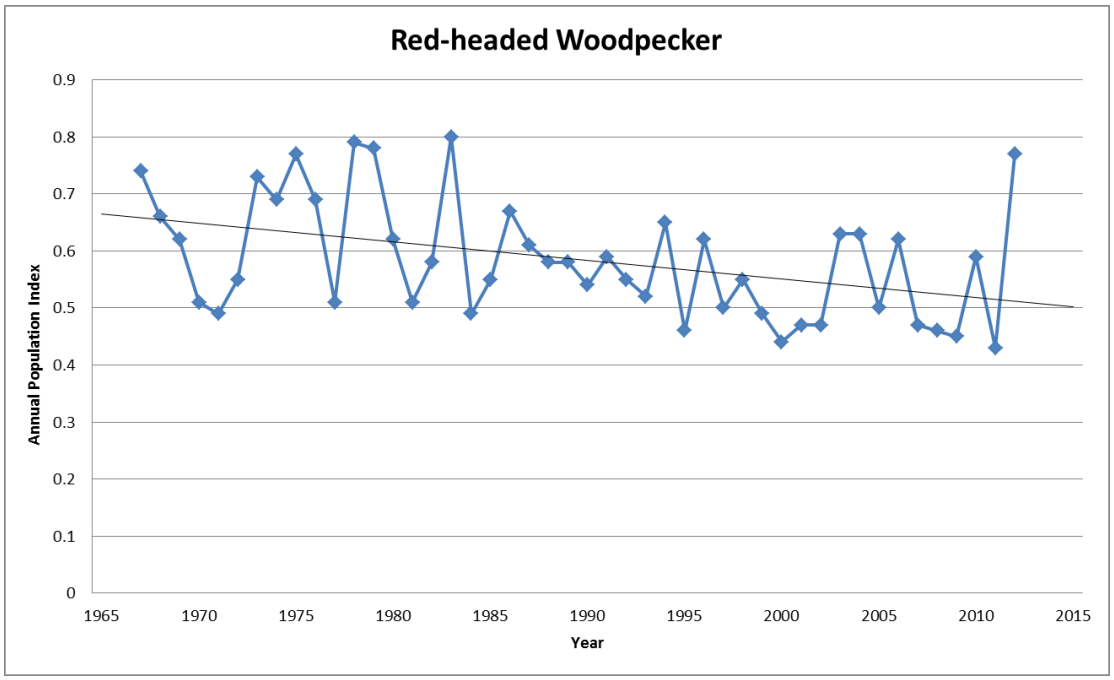

Figure 22: Red-Headed Woodpecker Survey Population Trend for Arkansas- Central Hardwoods from 1966 – 2012.

R8Bird: R8Bird point data (1997 – 2012) shows an upward trend for Red-headed Woodpecker on Ozark-St. Francis National Forests (Figure 23).

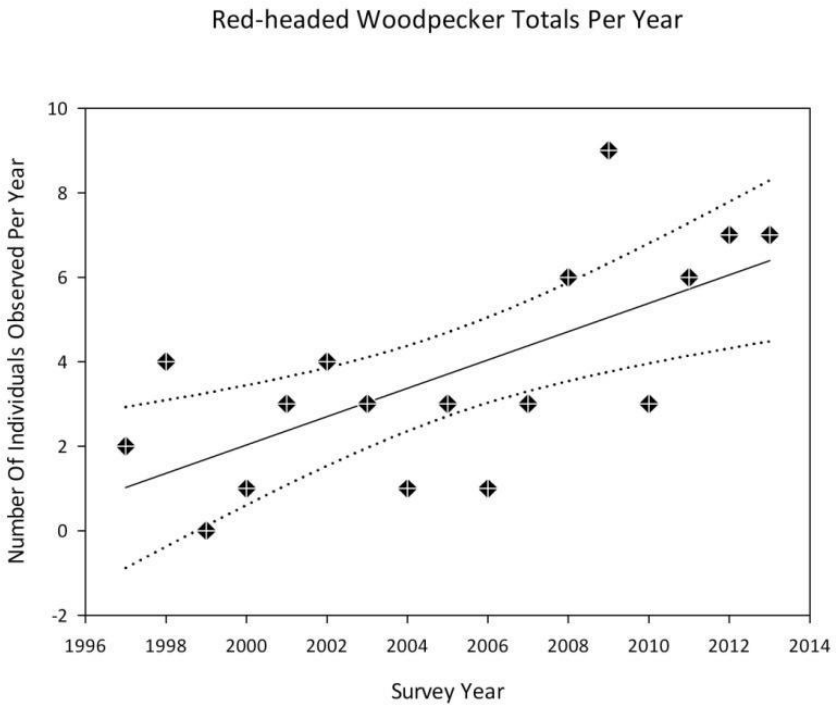

Figure 23: Numbers of Red-headed Woodpecker observations recorded during R8BIRD point-count surveys conducted in the OSFNFs 1997 – 2013.

Management Implications and Recommendations

The Forests should continue to improve habitat for red-headed woodpeckers. This is a priority bird for the Central Hardwoods and the Forests have been improving habitat and populations while most of the province has declining habitat and populations.

SCARLET TANAGER

Breeding Bird Survey: Based on the data available, the scarlet tanager in Arkansas' portion of the Central Hardwoods has shown a steady decrease in the population trend since 1967 (Figure 24).

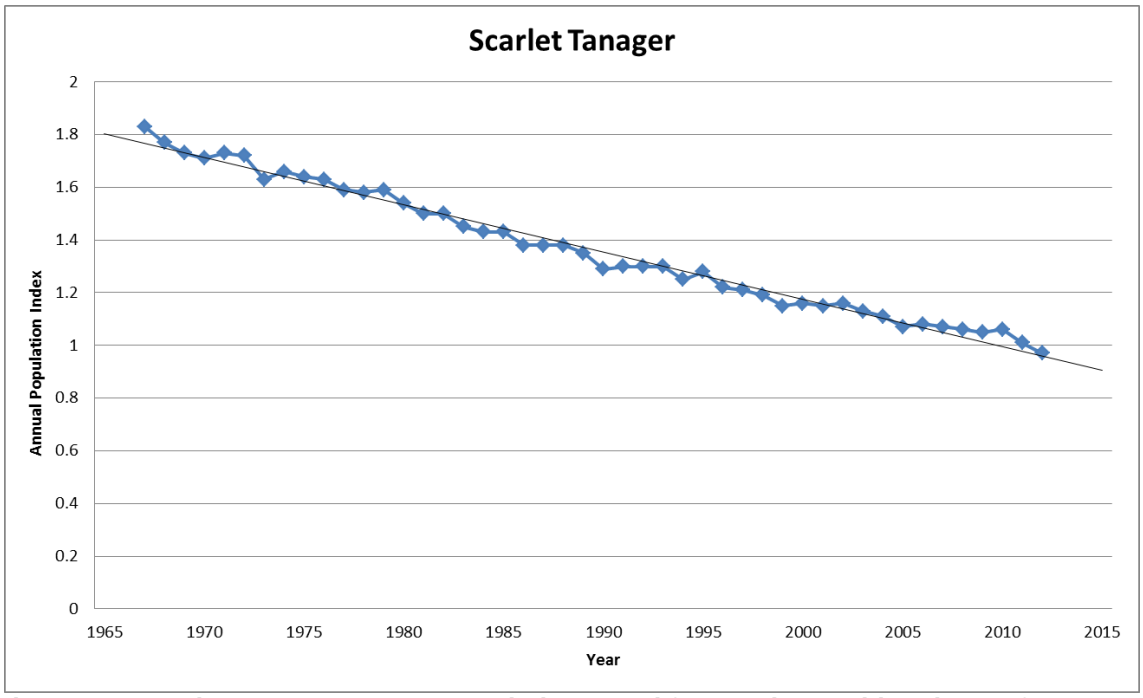

Figure 24: Scarlet Tanager Survey Population Trend for Ozark-Ouachita Plateau for 1967 - 2012.

R8Bird: Forest R8Bird point data (1997-2013) shows an increasing trend for scarlet tanager on Ozark-St. Francis National Forests (Figure 25).

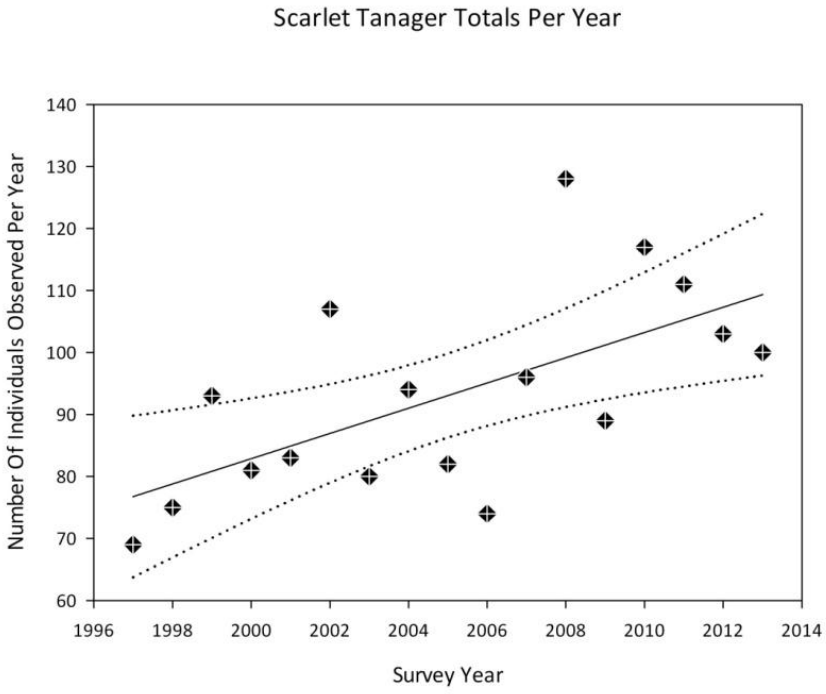

Figure 25: Numbers of Scarlet Tanager observations (diamonds) recorded during (R8BIRD) breeding season point-count surveys conducted in the OSFNFs from 1997 through 2013.

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Management Implications and Recommendations
Monitoring indicates that scarlet tanagers are increasing on the Ozark NF while populations are declining in the overall physiographic province. No change is warranted at this time.

Species Requiring Snag and Older Forest Habitats

PILEATED WOODPECKER

This species was selected as a MIS to represent snag-dependent species and species requiring older forests. BBS in the Arkansas-Central Hardwoods suggest that populations of the pileated woodpecker trended downward. The recent episode of oak decline may provide a temporary spike in habitat for this species.

R8Bird surveys from OSFNFs indicate a decline in pileated woodpeckers occurring on survey plots (Figure 26) in comparison to Breeding Bird survey plots (Figure 27) for Arkansas's Central Hardwoods.

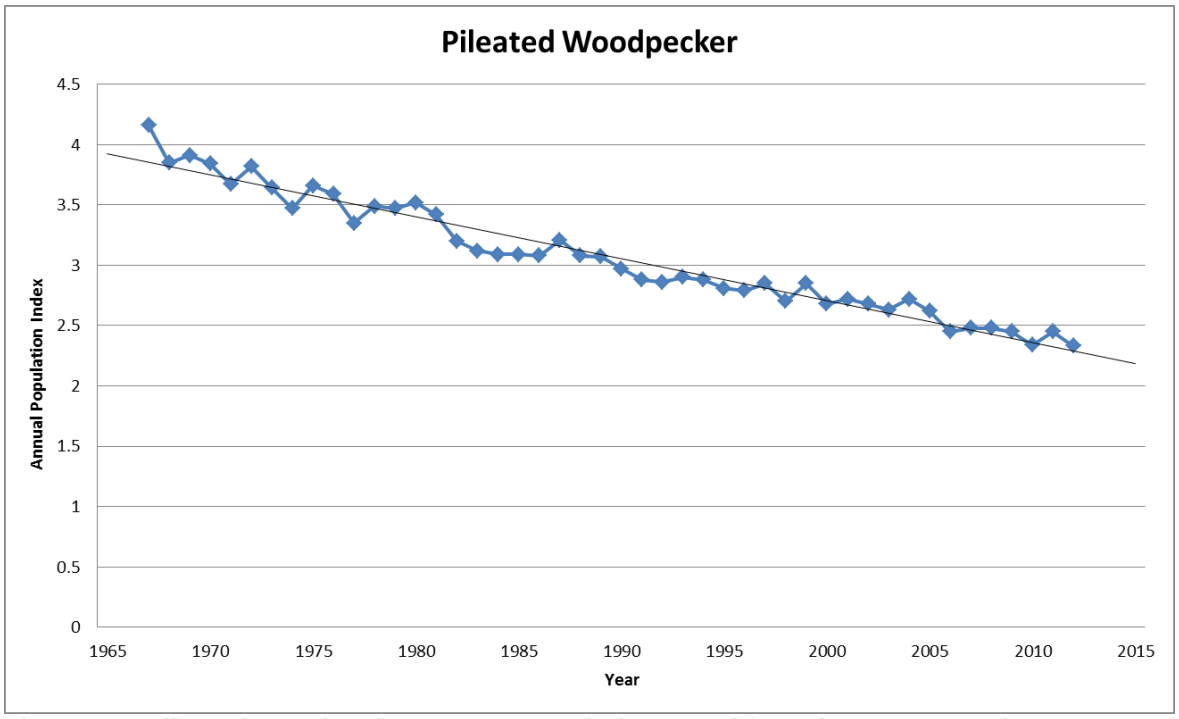

Figure 26: Pileated Woodpecker Survey Population Trend for Arkansas Central Hardwoods for 1967 - 2012.

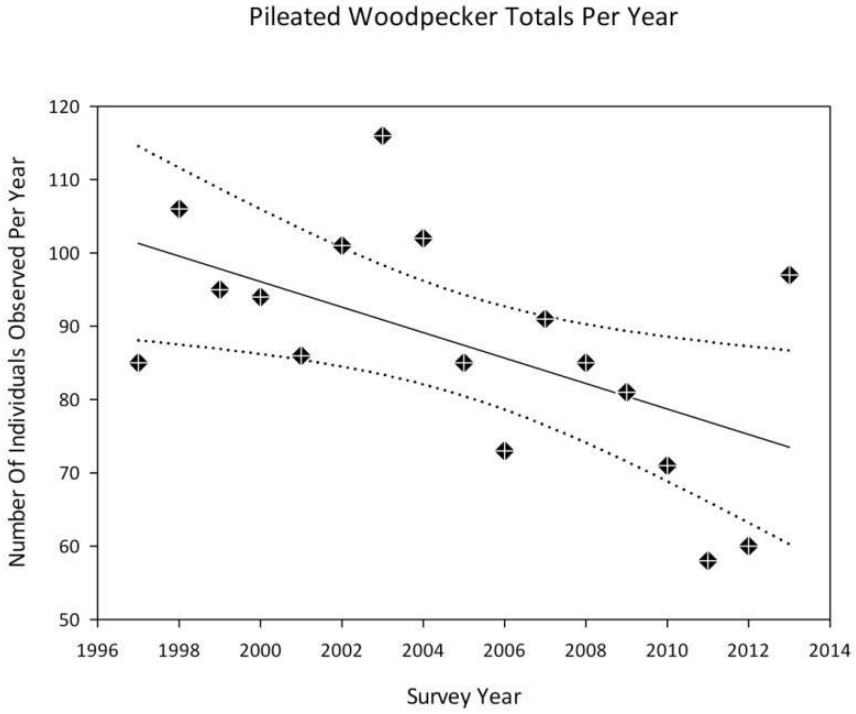

Figure 27: Numbers of Pileated Woodpecker (*Dryocopus pileatus*) observations (diamonds) recorded during (R8BIRD) breeding season point-count surveys conducted in the OSFNFs from 1997 through 2013.

Management Implications and Recommendations

No change in management for pileated woodpecker is warranted at this time.

Game Species

Whitetail Deer

Whitetail deer was chosen as a MIS because of its popularity as a hunted game species. Monitoring of this species has been done by using the annual harvest data for the species along with deer spotlight surveys. These monitoring tools have been conducted for many years and help to track population trends over time. In 2011, the OSFNFs discontinued the use of deer spotlight surveys in conjunction with the Arkansas Game and Fish Commission and started a new monitoring technique of incidental observation for deer.

This report summarizes the OSFNFs Deer Harvest Data for the M&E Reports from FY-2005 to FY-2011. Data for this report have been provided by districts as well as the Arkansas Game and Fish Commission.

Contained within the OSFNFs are seven co-op Wildlife Management Areas (WMA) as displayed in the Table 11.

Table 11: Deer Harvest on Wildlife Management Areas on the Ozark-St. Francis NFs.

Wildlife Management Areas	Acres	Total Harvest							
		2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Bearcat Hollow**	16,000	-	-	-	-	-	-	-	6
Mount Magazine	120,000	95	168	146	175	369	265	388	329
Ozark NF	662,878	206	348	189	143	235	221	400	464
Piney Creeks	180,000	82	133	120	65	226	108	157	200
St. Francis NF	21,201	31	29	33	34	49	37	60	71
Sylamore	150,000	137	230	299	278	245	248	347	525
Wedington	16,000	20	29	34	58	87	58	57	74
White Rock	280,000	270	475	176	167	197	168	283	277
Total	**1,446,079***	**841**	**1,412**	**997**	**920**	**1,408**	**1,105**	**1,692**	**1,946**

***Includes some private lands. ** Part of the Ozark NF WMA till 2012 – 2013 season**

On the OSFNFs, deer harvest levels have remained relatively stable. Some years have been slightly lower than others. This may be attributed to a combination of factors such as a poor hard mast crop and the current oak decline, as well as the ice storm that occurred in January 2009.

The Forest Service along with the Arkansas Game and Fish Commission (AGFC) conducted spotlight surveys across the Forests with coverage from the St. Francis NF across to the Wedington and Lee Creek units along the west side of the Forests. In 2011, the deer spotlight surveys were replaced with an incidental deer count.

The Final Environmental Impact Statement for the 2005 Forest Plan (September 2005) indicates in Table 3-9 (page 3-273), a desired terrestrial habitat capability to support an average of 11.7 deer per square mile after 10 years. Based on deer spotlight survey monitoring and incidental deer observation survey results, this goal is being achieved.

Management Implications

Deer are widespread, abundant, and the habitat capability still remains above the RLRMP projection. There are no indications of a need for adjustments in current management practices.

Black Bear

Black bear was chosen as a MIS due to its popularity as a hunted game species. Monitoring has been done by using the annual harvest data for the species along with bear bait station surveys. These monitoring tools have been conducted for many years and help to track population trends over time.

Arkansas' black bear population, historically distributed statewide, was nearly extirpated by the early 1900's because of over exploitation from unregulated hunting and habitat loss caused by human population expansion. In 1915, the

AGFC was created and in 1927 bear hunting was closed because of declining bear numbers. In 1951, the AGFC reported that only 40-50 bears remained in the state.

Between 1958 and 1968, approximately 254 bears from Minnesota and Manitoba were released into Arkansas' Interior Highlands. In 1980, after a 52-year prohibition, bear hunting resumed in the Interior Highlands of Arkansas. The objectives of the hunt were to provide recreational opportunity to hunters and to collect biological data that would help manage the black bear as a resource. Today, AGFC estimates there to be 3,500 bears in the Interior Highlands and a harvest of 10% of the Ozark population and 15% of the Ouachita population is sustainable.

Statewide, hunters checked 288 bears during the 2012/2013 season. This was a 33% decrease from the harvest of 432 in 2011/2012 statewide, but there was a 19% increase of bear harvest on the Forests. In 2013, the top three Wildlife Management Areas on the Forests accounted for 90% of the harvest (Ozark National Forest (24 bears), White Rock WMA (18 bears), and Piney Creek WMA (14 bears). (See Table 12.)

Table 12: Bear Harvest on Wildlife Management Areas on the Ozark-St. Francis NFs.

Wildlife Management Areas	Acres	Total Harvest							
		2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Bearcat Hollow**	16,000	-	-	-	-	-	-	-	2
Mount Magazine	120,000	2	1	3	5	7	7	3	4
Ozark NF	662,878	45	15	41	22	21	26	23	24
Piney Creeks	180,000	8	6	13	8	7	9	3	14
St. Francis NF	21,201	-	-	1	0	0	0	0	0
Sylamore	150,000	9	5	4	1	3	2	4	0
Wedington	16,000	-	-	-	-	-	-	-	-
White Rock	280,000	17	4	22	19	7	31	19	18
Total	**1,446,079***	**81**	**31**	**84**	**55**	**45**	**75**	**52**	**62**

***Includes some private lands. ** Part of the Ozark NF WMA till 2012 – 2013 season**

Statewide, 533 bears were legally harvested during the 2008/2009 season. This was a 28% increase from 2007/2008. The 2008/2009 bear harvest was the highest harvest record since modern-day bear hunting began in 1980 (Figure 28). In 2009, more than 80% of the bears harvested were taken from private lands. In 2011/2012, more than 88% of the bears harvested were taken from private lands. On the Forests, bear populations continue to remain high and harvest by hunters is the primary means of controlling their numbers.

The AGFC along with the OSFNFs has conducted bear bait station surveys every year since 1985. Bait-station survey trends and reproductive trends suggest healthy and expanding or stable populations in the Ozarks.

Management Implications and Recommendations

Black bear are widespread, abundant, and the habitat capability still remains above the Plan projection. There are no indications of a need for adjustments in current management practices.

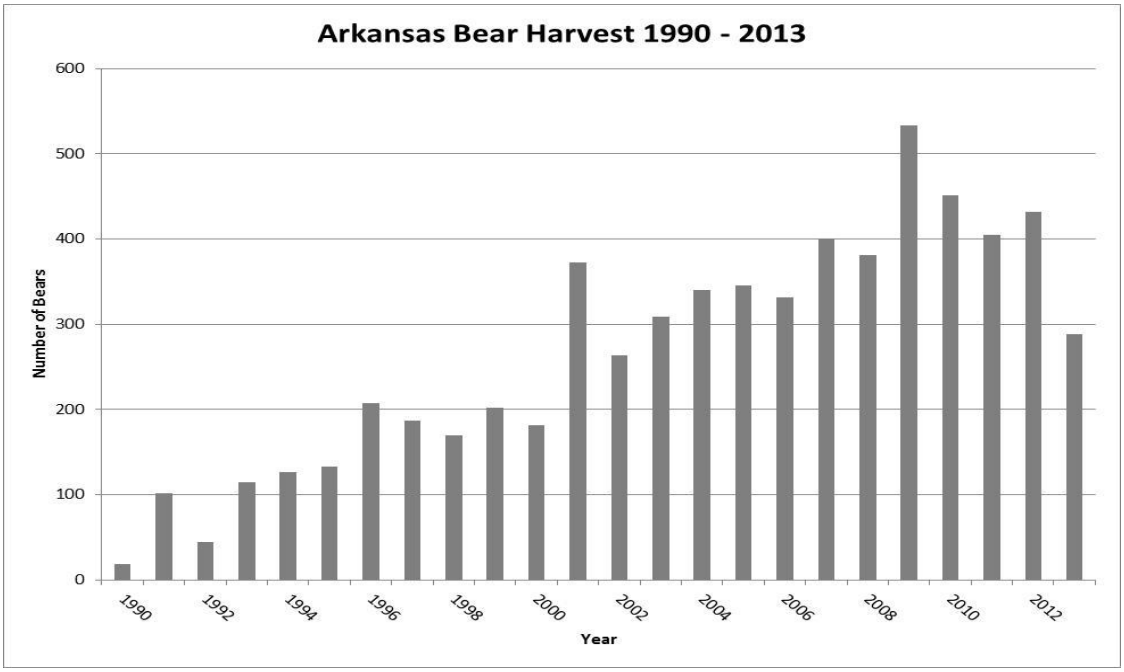

Figure 28: Arkansas Black Bear Harvest, 1990 – 2013.

Wild Turkey

Wild turkey was chosen as a MIS because of its popularity as a hunted game species and its need for a diverse mix of habitat types. Wild turkey was historically abundant on the Forests. Habitat destruction and over hunting decimated populations in the early 1900s. Restocking efforts and habitat improvement had led to increasing populations for the last 30 years. Open areas with high insect populations are critical as brood rearing areas. Historically, this habitat has been provided by glades, pine-bluestem, and oak savanna areas. Monitoring has been done by using the annual harvest data provided by the AGFC.

Both the fall and spring seasons are down significantly from the record harvest of 19,947 turkeys in the spring 2003 hunt. Spring turkey harvest rose dramatically following five above-average brood production years (1997-2001) and liberalization of seasons from 2000 until 2006. However, harvest has dropped with below-average brood production beginning in 2002 (Figure 54). The numbers have gotten so low that fall turkey hunting season has been closed in Arkansas, and spring seasons have been shortened. In 2012 the season was shortened to just 15 days for most of Arkansas (not counting the youth season which was 2 days).

There has been a steady decline in turkey harvest since 2002. The reduced season length is responsible for about one-third (1/3) of the decline in the number of turkeys killed. The decline was expected primarily because turkeys have not reproduced well in most areas of Arkansas since 2001. One or two bad hatches usually do not impact turkey numbers or turkey harvests drastically, but five years in a row can be devastating. Liberal seasons in place from 2001 - 2006 (up to 39 days of hunting) also likely played a part in the rapid decline in spring gobbler harvest. Data collected by the AGFC suggest gobbler survival declined rapidly after 2001, when seasons were lengthened and opened earlier.

Turkeys are relatively short-lived animals. Because of this short lifespan, annual reproduction is very important to the total population. Several years of good reproduction can result in abundant turkey numbers, while several poor years can result in falling turkey numbers. Long-term data collection in Arkansas has shown that turkey harvest is strongly related to annual poult production.

The OSFNFs turkey harvest has varied greatly over the years with a low point in 1976 of 50 birds taken from the Forests to a high point of 1,177 birds in 2003. See Figure 29 for annual turkey harvest records from 1975 to 2012.

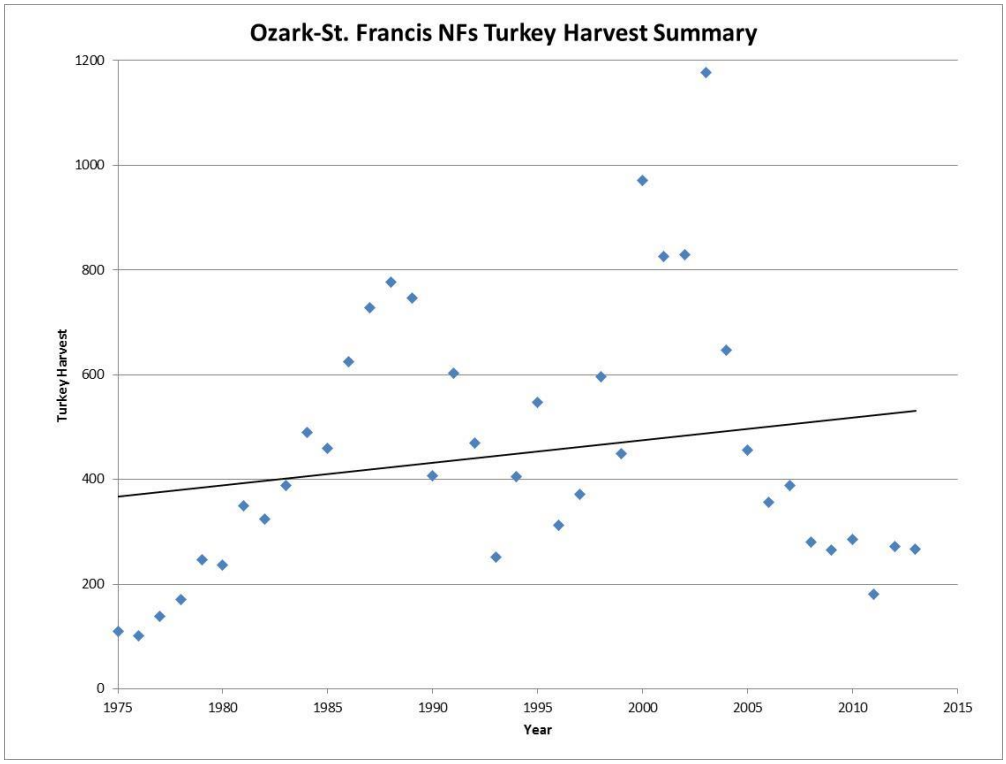

Figure 29: Annual Turkey Harvest over the past 38 years on the Forests. Recent Turkey Harvest Rates suggest a Downward Trend in the Population.

Turkey Brood Summary: The AGFC has conducted the Annual Wild Turkey Brood Survey since 1982. Throughout its history, the survey has helped in evaluating turkey stocking success by examining spread and growth of existing populations and determining trends in turkey numbers. The survey has also

proven to be highly correlated to turkey harvests in subsequent fall and spring seasons. The poult/hen index of 1.03 for 2009 was the poorest since this survey was initiated in 1982, and remains well below the long-term average of 3.02 poults/hen. Brood production has now been below average for nine years in a row. The number of poults reported in 2009 was the lowest since 1990. Weather had a negative effect on overall brood production in several of these years. Figure 30 illustrates the poult/hen ration from 1992 to 2013.

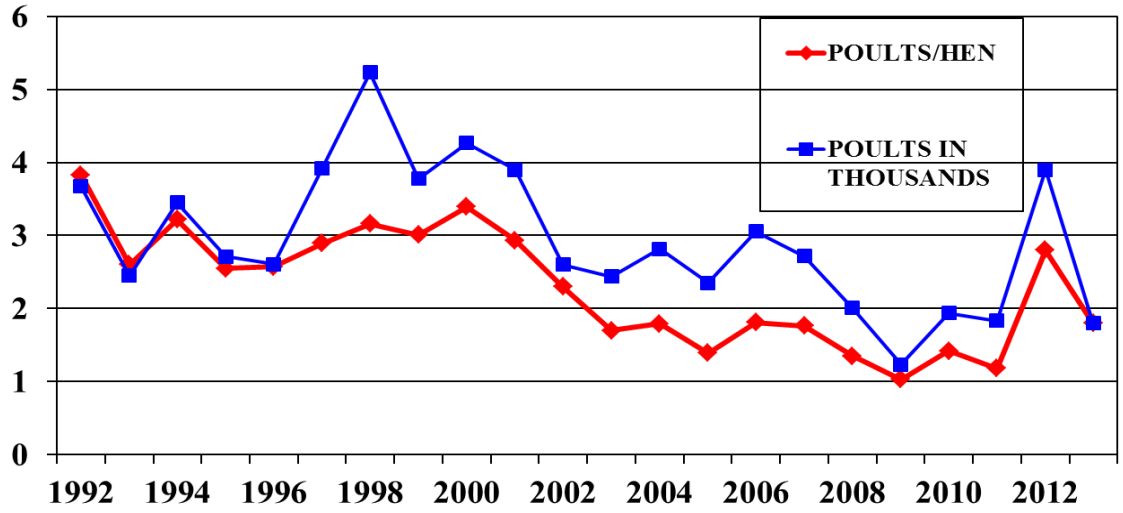

Figure 30: Wild Turkey Poults and Poult/Hen Ratio, 1992-2013.

Management Implications and Recommendations

Turkey is a widespread species and although once abundant, relatively recent declines in the population are troubling. Habitat capability on the Forests still remains fair to good. Increased thinning and prescribed burning should produce more early seral or brood habitat for turkeys.

A turkey management meeting to discuss possible reasons for the decline in turkey population numbers in the state was held in Mayflower in January, 2010. Attendees included AGFC, USFS, NPS, private industry, and various academias. Discussions centered on the possible reasons for the decline in turkey numbers in recent years. Possible reasons for the decline included weather, predators, nest predators, feral hogs, supplemental feeding, growing season landscape scale prescribed burns, nesting and brood habitat, illegal kill, and fall hunting, among others. The Forest, AGFC, and the National Wild Turkey Federation are currently funding research on the Forests to try to determine some of the causes of the decline in turkey populations especially looking at the effect of the prescribe burning program on turkey nesting success.

AQUATIC MANAGEMENT INDICATOR SPECIES (MIS)

Within the RLRMP, largemouth bass were included as a MIS for the sole purpose of monitoring conditions of lakes and ponds on the Forests. Smallmouth bass were chosen as a MIS species to monitor the effect of management activities on a stream-dwelling species. Table 13 is a summary of the MIS monitoring. An accompanying document provides some additional information and contains a much more detailed analysis and monitoring of these species.

Table 13: Monitoring Methods and Trends for Aquatic Management Indicator Species.

Common Name	Ozark	St. Francis	Trend Evaluation Method	Trend
Smallmouth Bass	X		Relative abundance in stream	Stable
Largemouth Bass	X	X	Proportional Stock Density & Relative Stock Density	Stable

LARGEMOUTH BASS

An ideal largemouth bass population within the lakes would be balanced with the available food source.

Relative weights are a measure of the weight of an individual captured versus the weight of an ideal fish at that same length multiplied times 100. Relative weights for all size classes would be at a minimum greater than 85 but no greater than 105 (Kohler and Hubert 1993). Proportional Stock Density (PSD) and Relative Stock Density (RSD) are a measure of the balance of multiple size classes within a population. PSD are the number of quality length fish (>300 mm) versus the number of stock length fish (>200 mm) multiplied times 100 and RSD is the number of preferred length fish (>380 mm) versus the number of stock length fish (>200mm) multiplied times 100. The PSD for largemouth bass should range from 40-70 where as RSD should range from 10-40 (Murphy and Willis 1996).

For lakes on the Forests, the overall relative weights, PSD, and RSD for largemouth bass stayed fairly stable from 2005 to 2010 (Figures 31 and 32). Only Bear Creek Lake on the St. Francis was sampled in 2011 because of high water caused by rain events in the spring. The data also shows that the mean relative weight values for all the lakes on the Forests do not get over the values expected in an ideal largemouth bass fishery. The Forests completed 493 acres of lake-habitat improvement in 2006; 527 acres in 2007; 516 acres in 2008; 810 acres in 2009; 1100 acres in 2010, 1023 acres in 2011,1088 acres in 2012, and 1335 acres in 2013. This consisted of the following types of projects: spawning bed development, fertilization, liming, road closures causing sedimentation in the lake, structural additions (cedar trees, Christmas trees, tree hinging along the shore, etc.), sediment removal, and addition of bait fish to the food biomass for

predators like largemouth bass. Figure 33 shows a largemouth bass that was shocked in Lake Wedington in 2006.

Management Implications or Recommendations

There is no need to change management direction at this time. Continue to follow RLRMP.

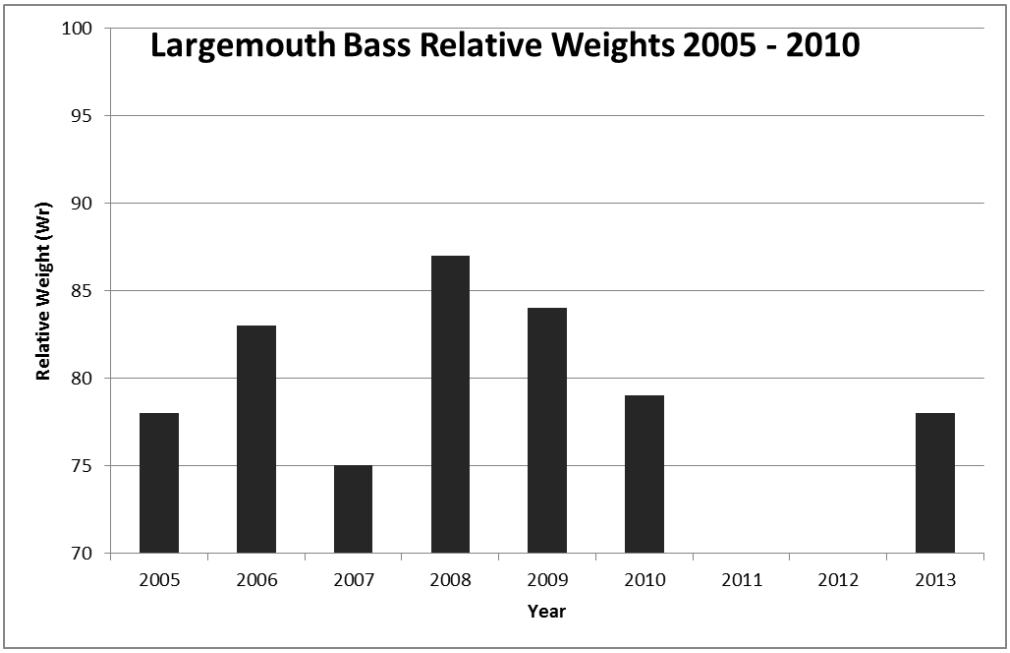

Figure 31: Largemouth Bass Mean Relative Weights for Lakes on the Forest from 2005 – 2010. No Relative Weights were taken for 2011 and 2012, due to late year sampling.

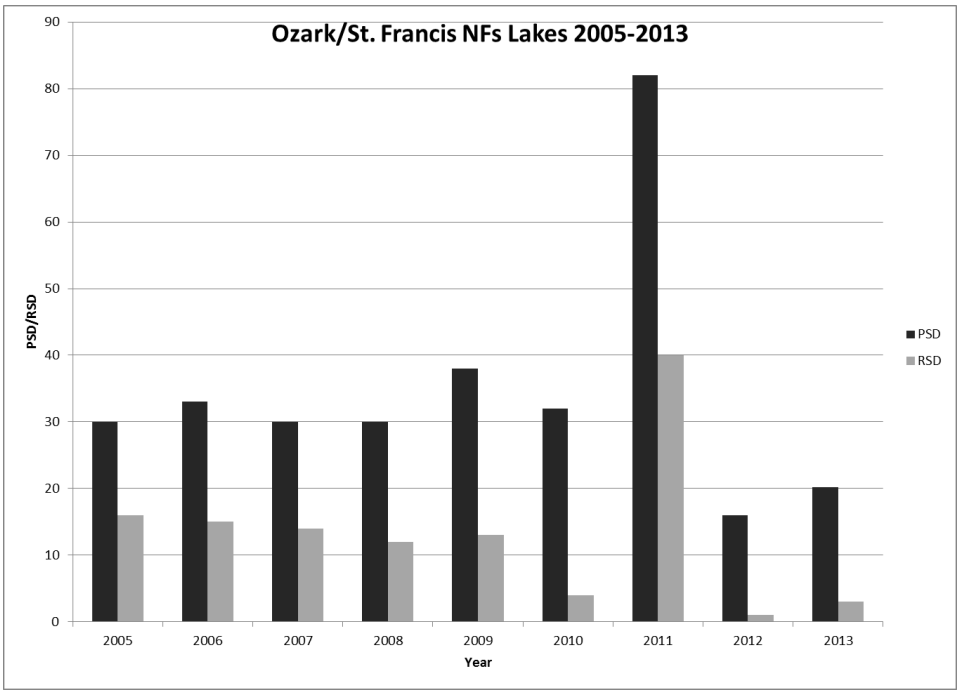

Figure 32: Largemouth Bass Proportional Stock Density (PSD) and Relative Stock Density for Preferred Size Fish (RSD) on the Ozark/St. Francis NFs from 2005 - 2013 sampling. Only Bear Creek Lake on the St. Francis RD was sampled in 2011 because of high water (PSD – 82; RSD – 40). Only Spring Lake on the Magazine RD was sampled in 2012 because of high water (PSD – 16; RSD – 1).

Figure 33: 10 ½ lb. Largemouth Bass Shocked in Lake Wedington in 2006.

SMALLMOUTH BASS

Smallmouth bass were chosen as a MIS species to monitor the effect of management activities on a stream-dwelling game species. In most watersheds sampled between 2006 and 2012, smallmouth bass were found. In streams where the species is found, smallmouth bass made up less than 1% of the overall fish relative abundance. This is normal for a species that is usually the top predator in these systems. In surveys conducted by the USGS in streams in the Ozarks from 2001 to 2002, smallmouth bass relative abundance ranged from 0-4 with a majority of sampling sites having relative abundance less than 1 (Petersen, 2004).

The Forests completed 16 miles of stream habitat improvement in 2006; 33 miles in 2007; 67 miles in 2008; 60 miles in 2009; 71 miles in 2010; 62 miles in 2011; 86 miles in 2012; and 68 miles in 2013. These projects consisted of large woody debris (LWD) placement in streams, stream bank stabilization to decrease sediment inputs, road crossing/fish passage barrier replacement, road closing and/or road obliteration in riparian areas, cane restoration in riparian areas, and trash cleanups in riparian areas. All this work will help to improve habitat and stream quality within the OSFNFs for all stream fish species including smallmouth bass. (Figure 34)

Figure 34: Smallmouth Bass Caught as part of the Study on the Illinois Bayou.

The Forests funded a master's thesis project at Arkansas Tech University in 2006 and 2007, which looked at the effect of summer stream drying on smallmouth bass populations and movement in the Illinois Bayou watersheds. The study found that streams that had high public access as well as stream drying experienced higher than normal rates of smallmouth bass mortality (Hafs 2007). Figure 35 shows the passive integrated transponder (PIT) tag being implanted in a smallmouth bass as part of the study. This information will help guide the Forests in making recommendations to the Arkansas Game and Fish

Commission (AGFC) on fishing regulations for streams on the Forests. The Forests continued to fund smallmouth bass research at Arkansas Tech University in 2008, 2009, 2010, and 2011 to determine if there was historical stream drying in the Illinois Bayou and to continue to look at the current smallmouth bass population.

Figure 35: Smallmouth Bass having Passive Integrated Transponder (PIT) Tag Implanted.

Management Implications or Recommendations

There is no need to change management direction at this time. Continue to follow RLRMP.

THREATENED, ENDANGERED, AND SENSITIVE (TES) SPECIES

VASCULAR PLANTS

OUACHITA FALSE INDIGO (*Amorpha ouachitensis*) (REGIONAL FORESTER'S SENSITIVE)

The usual habitat for the Ouachita false indigo (also called Ouachita leadplant) seems to be on rocky, open, and sunlit areas having reliable soil moisture. It occurs on glades, on roadside banks, in roadside ditches, and along ephemeral drainages. Further south into the Ouachita Mountains, this species appears to prefer the edges of small streams and drainages.

This plant is known from several locations on Mt. Magazine (Tucker, 1989). This endemic is found elsewhere in Arkansas and Oklahoma. It has been noted in Conway, Franklin, Johnson, Logan, Madison, and Van Buren Counties as well as in southern Arkansas in Clark, Garland, Montgomery, Perry, Polk, Saline, Scott, and Yell Counties.

Habitat on the Forests is limited to streamside zones and a few roadside ditches where ground disturbance has occurred.

Populations appear to be stable. Typically, areas where this plant occurs will receive little to no resource management other than roadside mowing.

Management Implications

This plant is known to occur on the Mt. Magazine, Boston Mountain, and Pleasant Hill Ranger Districts. Because this plant prefers and is found along streamside zones or roadside ditches where disturbance regularly occurs, there is little likelihood that the viability of this species will be compromised. The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the Arkansas Natural Heritage (ANH) database.

BUSH'S POPPYMALLOW (*Callirhoe bushi*) (REGIONAL FORESTER'S SENSITIVE)

The usual habitat for this plant is rocky open woods, wooded valleys, ravine bottoms, and borders of glades. This plant ranges from extreme southwestern Missouri to northwest Arkansas and northeastern Oklahoma. In Arkansas, it has been noted in Benton, Boone, Carroll, Conway, Logan, Marion, Searcy, and Washington Counties.

This species has often been noted in Benton and Washington Counties on roadsides and is easily viewed from several county roads. This species is known from several locations on the Wedington Unit of the Boston Mountain RD.

Threats to this species include collection by plant enthusiasts and herbicide application along roadside areas where it occurs.

Management Implications

This plant is still found occasionally on the Forests in fields and along roadside ditches where regular disturbance occurs. Collection by the public along easily accessed roads will likely continue but hasn't been a particular problem yet. The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

OZARK CHINQUAPIN (*Castanea pumila* var. *ozarkensis*) – (REGIONAL FORESTER'S SENSITIVE)

Until the introduction into this country of the chestnut blight (*Endothia parasitica*) and its subsequent spread, the Ozark chinquapin had been considered a locally abundant and widespread tree species in the Interior Highland Region. As a result of the spread of this parasite, few mature trees of this species still exist although sprouting from stumps is quite common (Tucker, 1980). This plant is fairly common and is found on all forest districts except the St. Francis.

Data Sources: Forest monitoring for this species has been done since 2001. Population trends reflect a decreasing population trend on the Forests. This information should be tempered by the fact that we still have lots of chinquapin and the blight is the main cause for decline. The Ozark NF has been working

informally with outside organizations and agencies to develop a seed orchard where this plant could be grown to help produce a blight-resistant strain with the resulting seeds being used for planting around the Forests.

Management Implications

This species is likely to hold its own despite its infection with chestnut blight, which is the biggest threat to this species. Monitoring of the plant has shown that as plants mature, clonal groups die-off but are soon replaced with other clones. This species seems to do best where sites are disturbed and the overstory competition is reduced.

In early 2010, the US Fish and Wildlife Service received a petition to list this species as threatened or endangered. The US Fish and Wildlife Service determined not to list the Ozark Chinquapin.

The Ozark NF will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

SOUTHERN LADY'S SLIPPER (*Cypripedium kentuckiense*) (REGIONAL FORESTER'S SENSITIVE)

Habitat for this plant consists of moist floodplains along creeks and on rich, moist slopes. It is a large plant, can grow to a height of three feet, and has a pale, deep lip that barely extends past its opening. The collection for commercial sale and the digging for replanting in wildflower gardens pose the biggest threat to the plant. The plant appears to be able to tolerate certain timber management activities with some treatments, such as thinning, beneficial.

This species is known to occur in 12 Arkansas counties and possibly others (Smith, 1988). Southern lady's slipper occurs in a relatively narrow range from northeastern Texas and southeastern Oklahoma east to Georgia (although very few sightings) and north to Kentucky. There are very few, if any, protected sites. Threats include highway construction and possible exploitation through plant collecting. On the Forests, one real threat is from feral hogs that root out the plant. One site has already been destroyed by feral hogs.

This species is found in the western 1/3 of the Forests and is confined to riparian areas, moist floodplains, or rich moist slopes.

Management Implications

Because this plant is found scattered over a large geographical area with several new populations found on the Forests each year, some may be adversely impacted by forest management but the large number of known sites makes it almost impossible to impact this species to the point where viability would be a concern. The greatest threat to this species is likely

from collection by flower enthusiasts on both public and private lands and the growing feral hog population.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database. The Forests, in conjunction with the AGFC, are also taking an active role in reducing the feral hog population.

MOORE'S DELPHINIUM (*Delphinium newtonianum*) (REGIONAL FORESTER'S SENSITIVE)

Moore's delphinium is endemic to and locally abundant in two separate regions of the Interior Highlands regions of Arkansas, but it is unknown from either Missouri or Oklahoma. Preliminary biological data indicate it is of widespread occurrence within a relatively small area in the Ozark National Forest, where it occurs in both mature and successional vegetation types.

Field observations have shown that Moore's delphinium can tolerate at least light fire during the cool season. Because it typically occurs in mesic habitats, there is probably little potential for fire to pass through suitable habitat with more than low to moderate intensity. These mesic sites are naturally buffered from fire impacts except in extreme circumstances where the fire removes large amounts of surface organic material or excessively dries out the surface soils.

Management Implications

Because this plant is found scattered over a fairly small geographical area, some may be adversely impacted by forest management but because these sites are found in habitat conditions that don't offer much from a resource management standpoint, the likely hood of adversely affecting the majority of sites is slim to none and the Forests will continue to check these sites to make sure habitat and numbers of plants are not being adversely impacted by resource management. The greatest threat to this species is likely from collection by flower enthusiasts on both public and private lands.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

GLADE LARKSPUR (*Delphinium treleasei*) (REGIONAL FORESTER'S SENSITIVE)

According to Smith (1989), this species is endemic to southwestern Missouri and northwest Arkansas. It occurs on limestone glades and bald knobs in the White River region and on rocky open limestone exposures and glades elsewhere.

This plant is known to occur only in Missouri and in counties in north and northwest Arkansas and is relatively common within its limited range, having approximately 80 occurrences. It is no longer tracked in Missouri.

Populations seem to be stable over the Ozark National Forest as continued work on cedar encroachment and reintroduction of fire has had a positive effect.

Management Implications

Because this plant is found scattered over a fairly large geographical area, some may be adversely impacted by certain forest management activities such as herbicide application, but because this plant is typically found in habitat conditions where little management is likely to occur, the likelihood of adversely affecting this species to the point of losing viability is very remote.

The Ozark NF will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

FRENCH'S SHOOTING STAR (*Dodecatheon frenchii*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

At most locations, French's shooting star grows in microhabitats (i.e., beneath sandstone overhangs) within forest communities that have been managed for timber harvest in the past. Some of the largest populations are located in forested areas that have been high-graded for commercial timber harvest in the past (probably on multiple occasions). Observations made at known sites have demonstrated that the species typically is associated with heavy shade conditions for most of the day. Forest-wide standards limit all disturbance activities above and below bluffs. Talus sites are protected as well.

Field observations that provide solid information on this species' resistance to fire are lacking. Because it typically occurs in isolated and protected habitats such as beneath bluff shelters, overhangs, and natural bridges where there is little available fuel, there is probably limited potential for fire to pass through suitable habitat with more than low-to-moderate intensity. Because these sites are naturally buffered from fire effects, the impacts of fire may be insignificant except in extreme circumstances where the fire removes large amounts of surface organic material or excessively dries out the surface soils. Aerial parts of the French's shooting star plant are somewhat fleshy and probably would be easily damaged by fire; its fleshy thickened roots, however, probably can withstand at least light fire with little or no damage during the cool season.

Management Implications

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

GULF PIPEWORT (*Eriocaulon koernickianum*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

In the western part of its range (Arkansas, Oklahoma, and Texas), it's found in or near permanently moist to wet seepage areas (particularly upland sandstone glade seeps), bogs, and prairie stream banks. Gulf pipewort is intolerant of shade and is probably an early-successional species (Nature Serve 2002).

This species is reported in Benton, Conway, Franklin, Logan, Johnson, Madison, Pope, and Van Buren Counties in Arkansas.

Field studies indicate gulf pipewort is an early successional and often times long persistent species. There is limited habitat on the Forests for this rare plant species.

Habitat for this species would likely benefit from glade restoration and most timber harvest treatments and prescribed burning, which open the forest floor to sunlight.

Management Implications

The forest should increase thinning, burning and glade restoration in areas likely to harbor Gulf Pipewort.

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

LARGE WITCHALDER (*Fothergilla major*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

Large witchalder occurs in mesic-dry to dry habitats of the uplands (rich mountain woods) and its most characteristic habitats are disturbed areas on dry ridges of southeastern highlands. It grows in hill areas, often along streams.

In Arkansas, this species is found only in Searcy County. This plant is rare throughout its range of five southeastern states and is disjunct in Arkansas. This plant has not been found on the Forests.

Management Implications

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

BUTTERNUT (*Juglans cinerea*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

Butternut occurs in rich woods along the base of slopes or bluffs, and along streams. Butternut is found on the Sylamore Ranger District in north central Arkansas, and in most counties along Crowley's Ridge on the St. Francis NF. There have been reports from Benton and Marion Counties in northwestern Arkansas. One report of butternut on the Wedington Unit has remained unconfirmed despite numerous surveys attempting to locate it there.

Butternut has experienced a serious decline over the past 25 years over its entire range due in part to the butternut canker, caused by a fungus. The butternut canker is believed to be an introduced disease, and was first isolated in the 1960s. In the north central states, there has been a 70% reduction in live trees over a 15- to 20-year period, particularly in regeneration since butternut does not sprout.

Management Implications

Timber harvest activities will follow Forest Service guidelines and policy for management. Butternut will be left uncut unless they are dead or pose a risk to public safety. Intermediate timber treatments in stands containing butternut could be beneficial to this species.

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

ALABAMA SNOW-WREATH (*Neviusia alabamensis*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

Most populations are found on steep, rocky, wooded sites; however, this is not always true as one Arkansas population is found on a steep riverbank near the Buffalo River. One new site on the Forests has been documented and the site will be excluded from management.

Population monitoring has been done since 2001 and a slight increase in population numbers has been noted.

Data Sources: Ozark National Forest data (2001 – 2012) and population trend information will be used to address changes in their condition. Population trends continue to reflect a very slight increase since 2001 on the Forests (see Figure 36).

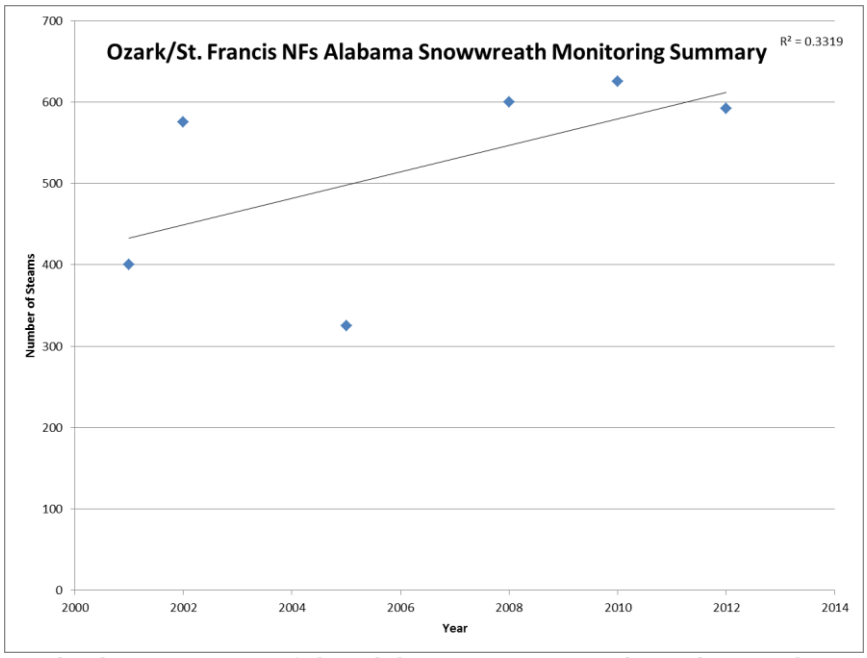

Figure 36: Monitoring Summary of the Alabama Snow-wreath on the Ozark NF 2001 - 2012.

Management Implications

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

MAPLE-LEAF OAK (*Quercus acerifolia*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

This small tree species occurs in open woods, ledges and cliff edges, and the rocky edges of plateaus. It is endemic to Mt. Magazine and the Ouachita Mountains in Arkansas with six total occurrences and a few hundred individuals.

This plant could possibly occur on similar sites on the Mt. Magazine Ranger District but because of the limited available habitat, there is likely less than 30 acres of available habitat on the OSFNFs.

Management Implications
Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

BAY STARVINE (*Schisandra glabra*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment
Bay starvine or climbing magnolia is a vine that occurs in the Atlantic and Gulf Coastal plains from North Carolina south to northern Florida, west to Louisiana and up the Mississippi Embayment into western Tennessee and eastern Arkansas. In Arkansas, it is known only on the St. Francis NF from Crowley's Ridge where it appears to be restricted to four counties (Cross, Lee, Phillips, and St. Francis). Within a year (1990-1991), at least 50 new sites were discovered on the St. Francis NF. Based on continuing survey and inventory, it is expected that this species will be considered very common on the St. Francis NF.

Climbing magnolia has a widespread range but with only a small number of known secure populations. It is highly threatened by competition from non-native invasives, (particularly Japanese honeysuckle and kudzu), land-use conversion, and habitat fragmentation (conversion to pine plantations in Piedmont has eliminated many populations).

Management Implications
Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

BLUE RIDGE CATCHFLY (*Silene ovata*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment
The range for this species is from Virginia south and west to Georgia, Alabama, Mississippi, and northern Arkansas. In Arkansas, this species is found in Baxter, Benton, Cleburne, Newton, Pope, Stone, and Van Buren Counties.

Favorable habitat would include talus slopes beneath a sandstone bluff lines. This type of habitat is limited on the Forests.

Management Implications

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

ROYAL CATCHFLY (*Silene regia*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

This Midwestern endemic of tall grass prairie habitats with relatively few, scattered populations are most abundant in Missouri; extirpated from Kansas and Tennessee, and considered quite rare in all other states in its range. Many remaining population remnants are along roadsides where vulnerable to construction or to changes in management of roadside vegetation.

This species is known from Benton, Boone, Bradley, Hot Springs, Newton, Searcy, Sharp, Stone, and Washington Counties in Arkansas. There are very few known locations for this plant on the Forests.

The major threat to this species is habitat destruction through agricultural practices. Prairies are no longer extensive in the Midwest and this plant species is now found principally along roadsides where prairie vegetation still occurs. Other right-of-way maintenance activities such as herbicide application (used to maintain railroad and power line rights-of-way and roadsides) and untimely mowing are additional threats.

Management Implications

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

OZARK SPIDERWORT (*Tradescantia ozarkana*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

This once considered rare plant is endemic to the Ozark Mountains of Missouri, Oklahoma, and Arkansas and the Ouachita Mountains of western Arkansas and southeastern Oklahoma. There are 15 extant populations in Missouri, more than that in Arkansas, and a few in Oklahoma. The species is considered relatively secure despite some documented declines due to construction of dams/impoundments.

Ozark spiderwort does not appear to be highly habitat- specific (Foti 1994). Throughout its range, it has been recorded from rich, diverse, mainly deciduous woodlands.

There are numerous sites on the western side of the Forests where this species is found.

Management Implications

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

OZARK LEAST TRILLIUM (*Trillium pusillum var. ozarkanum*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

This species occurs in acid cherty-flinty soils of shallow draws of oak-hickory, oak-pine, or oak-chestnut woodland in the Ozark region. This species is not known to occur on the Forests.

Because this plant is found scattered over a fairly large geographical area with many more sites, it is considered to be relatively secure. More serious threats to this species occurs off-forest where human population increases in Northwest Arkansas are leading to increased housing developments and road construction which are removing available habitat.

Management Implications

Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

OZARK CORNSALAD (*Valerianella ozarkana*) (REGIONAL FORESTER'S SENSITIVE)

Affected Environment

This plant is found in Benton, Carroll, Conway, Madison, Searcy, and Stone Counties in Arkansas. The Boston Mountain (Wedington Unit), Pleasant Hill, and the Sylamore Ranger Districts have limited habitat along stream bottoms in mixed hardwood stands.

Management Implications
Activities associated with the implementation of the RLRMP were addressed and may impact individual plants but cumulatively these actions would not cause a trend to federal listing or a loss of viability.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences in the ANH database.

SNAILS

MAGAZINE MOUNTAIN SHAGREEN (*Mesodon magazinensis*) (REGIONAL FORESTER'S SENSITIVE)

This species is known to occur in a very limited area along the north-facing slopes of Mt. Magazine. Habitat is steep talus sites in rich mesic hardwood forest. This snail prefers a cool, moist climate; it moves deeper into rock crevasses during warm, dry weather.

The restricted range of the Magazine Mountain shagreen makes it vulnerable to any land use change or activity that would have an adverse effect on the talus slopes where it is found.

The species is located inside the protected Magazine Mountain Special Interest Area (SIA). Other similar habitat areas are covered by forest-wide standards that prohibit timber harvest, road construction, or recreational development on talus slopes.

Mount Magazine shagreen (MMS) population numbers have been studied since the species discovery in 1989. The population has been monitored since 1996 when 10 permanent survey stations were established. Weather patterns leading up to survey dates have been quite variable in years surveyed and may have affected the numbers of MMS located as much as actual population numbers. It is speculated that in low rainfall years, snails may stay further below the surface level seeking a more desired moisture regime. This would affect numbers encountered per hour of searching. Even though soil conditions on the sampling dates were moist, drought conditions from a 4-year drought were still persistent.

This species had been listed as threatened but was delisted by the U.S. Fish and Wildlife Service in 2012. The Forest Service along with the Arkansas Game and Fish Commission, U.S. Fish and Wildlife Service, and Lincoln Memorial University are monitoring the species post de-listing to continue to track the species population.

Data Sources: Figure 37 shows the number of MMS found during sampling. The numbers declined from 1996 through 1999. Surveys were not conducted in 2000. A rebound occurred in 2001 and 2002; however, the 2003 survey dropped

back to the 1999 level. In 2004, eight live snails were found. The 2004 numbers were equal to the previous record high number found in 1996. In 2005, a record 13 live snails were observed. In 2006, 2007, and 2008, six live snails were found in each of those years. In 2009 and 2010, no live snails were found. In 2011, four live snails were found. In 2012, one live snail was found. In 2013, ten live snails were found.

This species is found in a SIA and monitoring of populations will continue. Implementation of the RLRMP with its forest-wide standards will continue to provide protection and, where necessary, habitat improvement if applicable. An example of this protection is that after studying of the Nationwide Fire Retardant Environmental Impact Statement, the Forests made the north side of Mt. Magazine a “no-drop zone” for fire retardant in the event of a wildfire in this area.

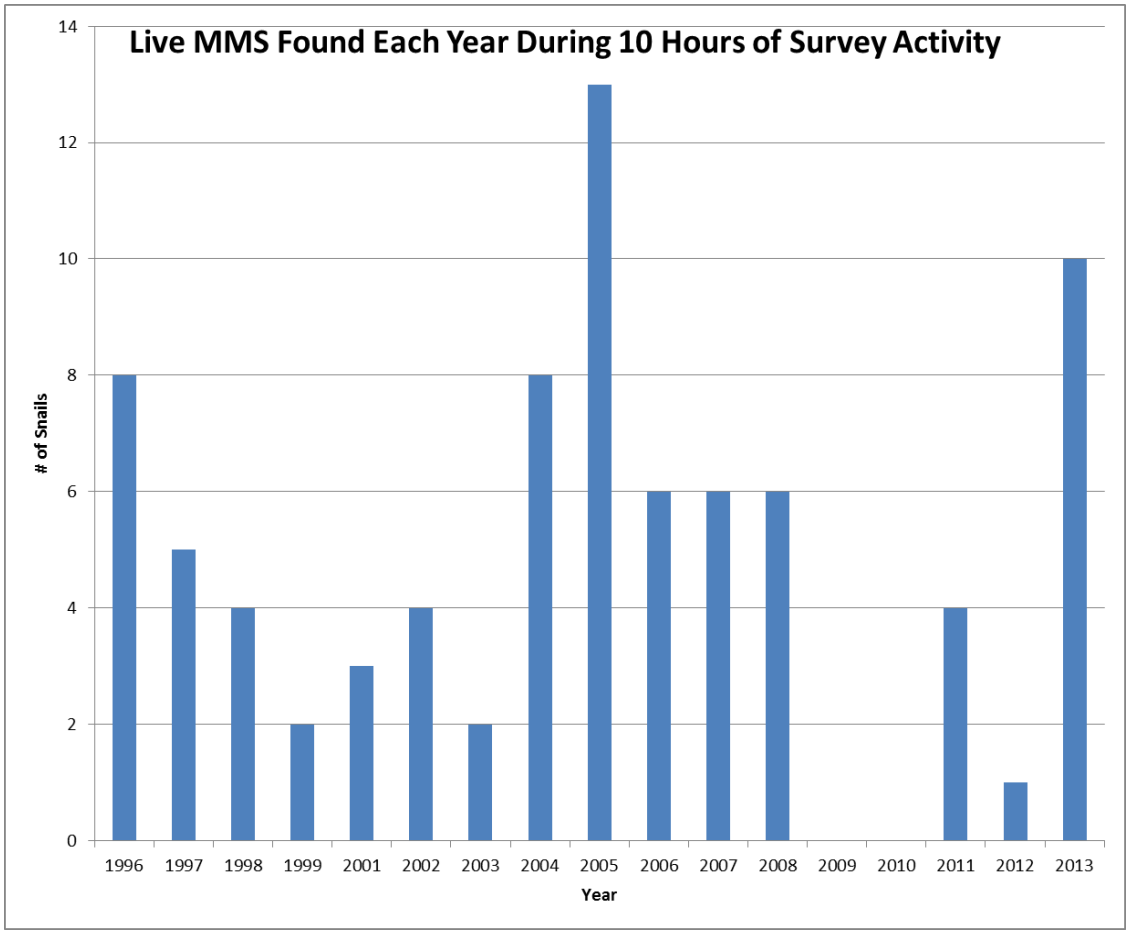

Figure 37: The number of MMS found during sampling, 1996 – 2013.

Management Implications and Recommendations

The Forests should work with U.S. Fish and Wildlife Service and continue to protect and monitor MMS locations.

INSECTS/ISOPODS

AMERICAN BURYING BEETLE (*Nicrophorus americanus*) ENDANGERED

On the Ozark NF, American burying beetle (ABB) primary habitat consists of Savanna, Woodland and Pasture habitat in a forested matrix with suitable soil conditions. Most ABB captures occur in soils that are well drained and include sandy and silt loams with a clay component. Soil conditions must be conducive to ABB excavation for reproduction. Level topography and well-formed detritus layer at the ground surface are common.

Regional Population Data: USFWS (2008) summarizes regional population data for the ABB as follows:

At the time of listing, only two ABB populations were known, one on Block Island, Rhode Island, and one in Latimer County, Oklahoma. When the recovery plan was completed in 1991, the ABB also was known to occur in Sequoyah, Cherokee, and Muskogee Counties in Oklahoma. Between 1992 and 2006, numerous presence/absence surveys for the ABB were conducted in Oklahoma, resulting in the rediscovery of ABB in 19 other counties in the state.

Since 1991, field surveys have discovered additional occurrences in the following states: Arkansas (Figure 38), Kansas, Nebraska and South Dakota. From 2003 to 2005, the ABB was also discovered in two discrete locations in northeastern Texas: Lamar County and a nearby site in Red River County (Godwin and Minich 2005).

The ABB has been found in very small numbers on the western side of the Mt. Magazine RD in Logan County, Arkansas. ABB captures at these locations typically fluctuate on an annual basis, but in general ABB numbers appear low but stable. (H. Dikeman, USFWS, pers. comm.).

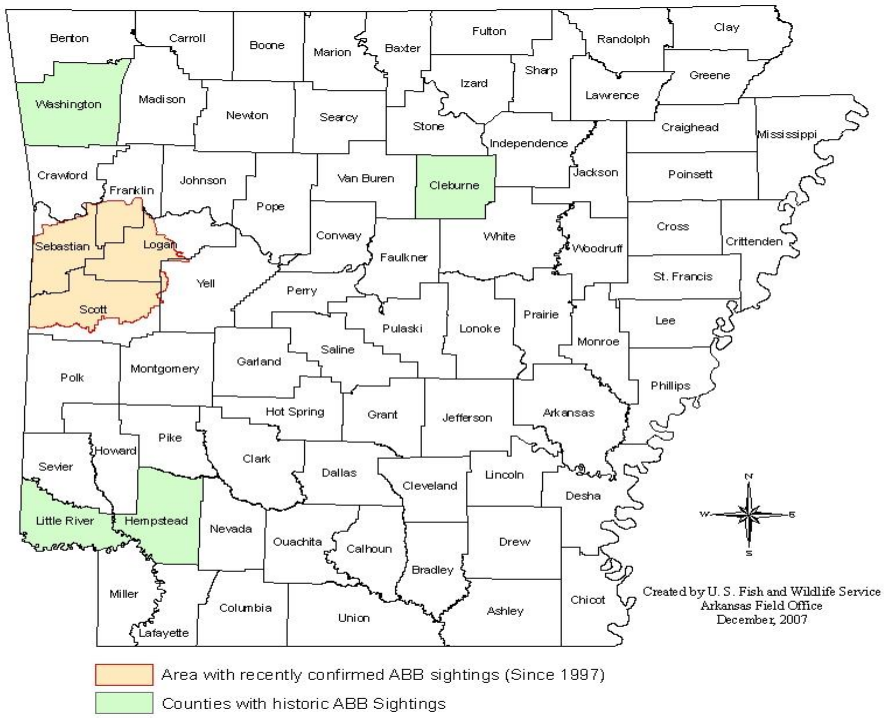

Figure 38: American Burying Beetle Has Been Found in these Arkansas Counties (USFWS 2008).

American Burying Beetle Conservation Plan

The Ozark-St. Francis NFs, Ouachita NF, and U.S. Fish and Wildlife Service completed an American Burying Beetle Conservation Plan in April of 2010. This plan delineates specific areas of opportunity for management, research, inventory and monitoring, and education that should be addressed by natural resource managers and cooperators on the Ouachita NF (Arkansas & Oklahoma) and Ozark-St. Francis National Forests.

The ABB Plan is the first step in a process to develop a multi-faceted conservation strategy for ABB. The plan covers current knowledge about the species, current condition of the ABB Areas (ABBAs), desired condition of the ABBAs, and actions needed to manage for ABBs. The conservation plan's strength is in providing managers with rationale and information on conservation actions necessary to conserve, protect, and expand ABB populations and their habitat.

We envision that the conservation strategy will eventually lead to significant progress toward maintaining and increasing ABB populations and habitat to assure that they remain a healthy functioning component of the National Forest

(NF) lands in Arkansas and Oklahoma and make a significant contribution to recovery of the species through:

1. Developing effective means to protect (no net loss of optimum ABB habitat) and restore (provide a net annual increase of optimum ABB habitat) habitats at important sites designated as ABBAs.
2. Maintaining existing populations within sustainable habitat (ABBAs).
3. Identifying meaningful actions to address limiting factors and threats.
4. Developing a comprehensive monitoring program.
5. Implementing population augmentation in areas identified within this plan when deemed appropriate by the U.S. Forest Service (USFS) and U. S. Fish and Wildlife Service (FWS).
6. Improving the abilities of the FWS to recover ABB populations.
7. Supporting conservation programs based on sound, objective biological information.
8. Encouraging and supporting collaborative management and research programs at local state, regional, and national levels.
9. Enhancing outreach efforts to improve dissemination of information to decisionmakers and the public about issues relevant to conservation of ABB populations.
10. Ensuring that research programs are designed and prioritized to address management needs and have application to conservation programs.

In 2012, two ABBs were captured during annual surveys inside the ABBA. In 2013, no ABBs were captured.

Management Implications and Recommendations

This species has been found on the OSFNFs only on the Mt. Magazine RD. The Forests will continue to follow guidance in the ABB Conservation Plan.

NEOARCTIC PADUNEILLIAN CADDISFLY (*Paduniella nearctic)*
(REGIONAL FORESTER'S SENSITIVE)

No new data have been collected for Neoarctic paduneillian caddisfly (*Paduniella nearctic)* on the Forests since 2005. A study with the University of Arkansas is being proposed to review the current knowledge about this species as well as surveys of potential habitat on the Forests to better understand its distribution. This species is being protected during management activities by following state BMPs and standards in the RLRMP. Populations are assumed to be stable.

Management Implications and Recommendations

Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

ISOPOD (*Lirceus bicuspidatus)* (REGIONAL FORESTER'S SENSITIVE)

No new data have been collected for *Lirceus bicuspidatus* on the Forests since 2005. A study with The Nature Conservancy is currently ongoing to research the current knowledge about this species as well as surveys of potential spring and seep habitat on the Forests to better understand its distribution. This species is being protected during management activities by following of state BMPs and standards in the RLRMP. Populations are assumed to be stable.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

CRAYFISH

WILLIAM'S CRAYFISH-(*Orconectes williams)* (REGIONAL FORESTER'S SENSITIVE)

No new data have been collected for William's crayfish on the Forests since 2005. The species has been found in streams in the headwaters of the White River system. It has been found in the past on the Ozark NF on the Pleasant Hill Ranger District. This species is being protected during management activities by following state BMPs and standards in the RLRMP. Populations are assumed to be stable.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

Mussels

NEOSHO MUCKET (ENDANGERED)

In 2008, the U.S. Fish & Wildlife Service and the Arkansas Game and Fish Commission, with the assistance of the Forest Service, conducted a comprehensive status survey for Neosho mucket in the Arkansas portion of the Illinois River. There was a 53% decline in the number of sites inhabited by Neosho mucket compared to surveys done by Harris in 1998. Sixty-seven percent (67%) of the sites with Neosho mucket present were represented by three or fewer live individuals. Of the 15 survey sites, only 2 appear stable with the rest in decline and extirpation is imminent, one of these sites was the site just downstream of Chambers Hollow along the northern edge of the Wedington Unit. Channel instability emerged in 2008 as the primary threat to not only the Neosho mucket population but also threatens the continued existence of an entire mussel community in the Arkansas portion of the Illinois River. Channel instability in this segment of the Illinois River can be attributed to two sources: 1) urban development in the watershed resulting in altered river hydrology and

geomorphology (i.e., more frequent flood events that alter channel characteristics), and 2) clearing of riparian vegetation for conversion to pasture (i.e., increase in number and length of eroding stream banks). This species is being protected during management activities on the Forests by following of state BMPs and standards in the RLRMP. Agricultural and urban activities on private lands within the watershed are the leading cause of the channel instability. Populations in the Illinois River are declining. The Forests are dedicated to working with the Fish and Wildlife Service and the Arkansas Game and Fish Commission to try to protect this mussel community.

On September 17th of 2013 the Neosho Mucket was listed as threatened by the U.S. Fish and Wildlife Service. The listing of critical habitat for this species is still under consideration by the U.S. Fish and Wildlife Service.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. The Forests will work with the U.S. Fish and Wildlife Service to improve habitat for this species as the recovery plan for this species is developed. There is no need for change in the RLRMP at this time.

FISH

PALLID STURGEON (ENDANGERED)

No new data have been collected for pallid sturgeon on the Forests since 2005. The species is currently known only on the Forests from the St. Francis River. This species is being protected during management activities by following state BMPs and standards in the RLRMP. Population trends in the St. Francis River are unknown.

Management Implications and Recommendations
Continue to follow forest plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

OZARK SHINER (REGIONAL FORESTER'S SENSITIVE)

No new data have been collected for Ozark shiner on the Forests since 2005. The stream surveys reported above did not find any Ozark shiner. This species is being protected during management activities by following state BMPs and standards in the RLRMP. Populations are assumed to be stable.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

LONGNOSE DARTER (REGIONAL FORESTER'S SENSITIVE)

No new data have been collected for longnose darter on the Forests since 2005. The stream surveys reported above did not find any longnose darter. This species is being protected during management activities by following state BMPs and standards in the RLRMP. Populations are assumed to be stable.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

SOUTHERN CAVEFISH (REGIONAL FORESTER'S SENSITIVE)

No new data has been collected for southern cavefish on the Forests since 2005. One cave on the Sylamore RD contains a cavefish species that was first identified as Southern cavefish. Recent genetics studies have identified this as a potentially new species. Further research is being conducted to validate this genetic information. This species is being protected during management activities by following state BMPs and standards in the RLRMP. Populations at this cave are assumed to be stable.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

AMPHIBIANS

OKLAHOMA SALAMANDER (REGIONAL FORESTER'S SENSITIVE)

No new data have been collected for Oklahoma salamander on the Forests since 2005. The known range of the Oklahoma salamander on the Forests is strictly within the Wedington Unit. Recent publications have questioned the validity of this species and some states like Missouri no longer recognize it as a valid taxon. This species is being protected during management activities by following state BMPs and standards in the RLRMP. Populations on the Wedington Unit are assumed to be stable.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

Reptiles

AMERICAN ALLIGATOR (THREATENED)

Arkansas Game and Fish Commission records show an increase in American alligator populations in the state. The population has grown so much that the state had their first open hunting season for alligator in 2007. The population on the St. Francis is stable to growing.

Management Implications and Recommendations

Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

BIRDS

INTERIOR LEAST TERN (*Sterna antillarum athalassos*) (ENDANGERED)

This bird species builds nests mainly on riverine sandbars or salt flats that become exposed during periods of low water. Because of vegetational succession and/or erosion, preferred nesting habitat typically is ephemeral.

Although a widespread species, it is only found in Arkansas along the Mississippi River and Arkansas River systems where it nests on sandbars. This species is distributed over a relatively large area but is found only on the St. Francis NF.

Breeding Bird Survey: Based on the data available, the interior least tern in Arkansas has shown an increase in the population trend since 1966.

Management Implications and Recommendations

Because this bird species is found over a fairly large geographical area and habitat is very limited to the St. Francis NF, there is little likelihood that any adverse impacts will occur from management with the current forest-wide standards that protect riparian habitat as well as streamside zones.

The Forests will continue to survey for this species in suitable habitat and will document those occurrences and provide information to the USFWS as it becomes available.

BALD EAGLE (*Haliaeetus leucocephalus*) **(REGIONAL FORESTER'S SENSITIVE)**

The bald eagle is listed as a Regional Forester's Sensitive Species and is typically transitory in this area of Arkansas. There is one known active nest site on the Forests, but there are three other active nests that are within the boundary of the Forests but are on private tracts that are very close to FS land. The AGFC and USFS check the nests annually. Wintering populations within the state have steadily increased to over 1,000 birds according to the annual eagle survey conducted by the AGFC in cooperation with the USFWS, U. S. Army Corps of Engineers, National Wildlife Federation (NWF), and USFS.

Several roost sites occur scattered over the Forests and are usually associated with lakes or rivers. Being shot by poachers is the most important recognizable threat to the bald eagle in Arkansas at this time, although there is concern of avian diseases with past die-offs occurring on Lake Ouachita and Lake DeGray.

Because the Forests will implement forest-wide standards for the protection of eagle nesting and communal roost sites as well as the protection of riparian areas, there is only a remote possibility that proposed management will adversely affect this species. There is, however, still the possibility that the species could be disturbed by noise or recreational use around lakes and streams on the Forests.

Management Implications and Recommendations
Continue to follow Forest Plan standards and protect habitat for this species. There is no need for change in the RLRMP at this time.

BACHMAN'S SPARROW (*Aimophila aestivalis*) **(REGIONAL FORESTER'S SENSITIVE)**

Historically, this species has been found in mature to old growth southern pine woodland that has been subjected to frequent growing-season fires. It is a fugitive species, breeding wherever fires create suitable conditions. This species requires a well-developed grass and herb layer with limited shrub and hardwood midstory components. Ideal habitat was originally the extensive longleaf pine woodlands of the South. It was able to colonize clearcuts and early seral stages of old field succession but such habitat remained suitable only for a short time.

In Arkansas, this species ranges across the southern half of the state up to the southern one-half of the Forests. This species historically has been found in Baxter, Conway, Franklin, Johnson, Logan, Newton, Pope, and Van Buren counties in Arkansas. Good or ideal habitat is limited on the Forests to areas where timber management has taken place in the recent past.

Breeding Bird Survey: Based on the data available, the Bachman's sparrow in Arkansas has shown a decrease in the population trend since 1966.

Management Implications and Recommendations

The Forests will continue to survey for this species in suitable habitat and will document those occurrences and provide information to the USFWS as it becomes available. Plan implementation should provide additional suitable habitat for this species on the Forests.

BATS

Emerging Issue

White Nose Syndrome

White-Nose Syndrome (WNS) is a new disease that has killed at least one million hibernating bats in caves and abandoned, underground mines in the northeastern USA since 2006. WNS symptoms include loss of body fat during hibernation, wakefulness, early starvation, and mass die-offs. Affected bats fly outside caves or mines in winter, sometimes at mid-day, when they should be hibernating. Many of the bats have a white fungal infection (*Geomyces destructans,* or Gd,) visible on the face, wings, and ears.

To date, WNS has only been confirmed in bat species that hibernate (at least in part) in caves and abandoned, underground mines as no cases have been reported in other species. It is currently thought that any bat species that depends on hibernation as a strategy to survive the winter is potentially at risk for WNS.

The WNS risk to the gray bat and Indiana bat is aggravated by the fact that the majority of the population of both these endangered species hibernate in just a handful of caves. Approximately 85% of Indiana bats, with a present known population of less than one-half (½) million, hibernate at only nine locations in the eastern USA. Approximately 95% of gray bats, with a present population of 2-3 million bats, hibernate in only eight caves. This makes both these populations extremely vulnerable to destruction.

On May 21, 2009, an emergency closure order was issued to close all caves and mines, unless posted open, on Region 8 (Southern Region) National Forest lands for one year. The emergency closure has been extended three times and the current closure will be in effect until May 21, 2013, unless terminated earlier by the Regional Forester. The objectives of the closure order were to protect the diversity of bats and other cave wildlife and to prevent or delay the human-caused spread of WNS. As a result, all caves were closed on National Forests in Arkansas, with the exception of Blanchard Springs Caverns on the OSFNFs. This cave is the only commercially operated show cave that is administered by the US Forest Service in the Southern and Eastern Regions.

The OSFNFs has been proactively implementing procedures to prevent, or at least delay, the spread of the WNS fungus by human transmission and reduce other factors that may contribute to the bat mortality observed with the syndrome. Human disturbance of bats exacerbates the mortality rate caused by WNS. Closing bat caves to human entry reduces human disturbance of bats and reduces the risk of possible human-borne transmission. In April 2010, the OSFNFs developed a *Precautionary Procedure and Outreach Program* for Blanchard Springs Caverns to minimize the threat of human transmission of WNS to bats and the cave. It included both sanitation and public education or outreach components. It is currently being implemented and is changing as needed to accommodate new situations, developments, and new information.

Arkansas Game and Fish Commission, US Fish and Wildlife Service, and Ozark-St. Francis NFs are monitoring caves for signs of White Nose Syndrome. If it is found on the Forests, appropriate measures will be taken to address the situation. At this time, no WNS has been found in Arkansas.

US Fish and Wildlife Service is currently conducting status reviews on several species of bats most likely to be affected by WNS. The occurrence of WNS could eventually lead to more bat species being added to the endangered species list.

For more information on this White-Nose Syndrome visit our website at;
http://www.fs.usda.gov/wps/portal/fsinternet/!ut/p/c4/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gjAwhwtDDw9_AI8zPyhQoY6BdkOyoCAGixyPg!/?ss=110810&navtype=BROWSEBYSUBJECT&cid=STELPRDB5213741&navid=091000000000000&position=Feature*&ttype=detail&pname=Ozark-St. Francis National Forests- Home

or go to:

http://www.aokforests.com/ and
Click the Ozark-St. Francis National Forests button, then under "Features" click on Blanchard Caverns Increasing Efforts to Protect Caves, Bats

GRAY BAT (*Myotis grisescens*) **(ENDANGERED)**

The USFWS prepared a Recovery Plan for the bat (USFWS 1982) and it described the habitat components as:

> "…perhaps the most restricted to cave habitats of any U.S. mammal. With rare exception it roosts in caves year around. Most winter caves are deep and vertical; all provide large volume below the lowest entrance and act as cold air traps. In summer, maternity colonies prefer caves that act as warm air traps. Summer caves, especially those used by maternity colonies, are nearly always located within a kilometer (0.6 mi) of rivers or reservoirs (rarely more than 4 km [3 mi]). Except for brief periods of inclement weather in early spring and possibly late fall, adult gray bats feed almost exclusively over water along river or reservoir edges. Detailed observations over an east Tennessee reservoir indicated that most foraging was restricted to within 5 m (16 ft) of the water surface near

shore, but gray bats in Missouri have been seen foraging in forest canopy along river edges in addition to low over-water. Newly volant young gray bats often feed and take shelter in forest surrounding cave entrances. Also, whenever possible, gray bats of all ages fly in the protection of forest canopy between caves and feeding areas."

Transient groups, consisting of male bats and non-breeding females roost in separate caves from the maternity colonies. Transient bats usually do not show strong ties with the caves that they utilize and may change roost locations.

Clark *et al.* (1993) studied foraging activity of the bats and found that edge habitat (between forest and open areas) was the preferred foraging habitat. They felt this was due to the habitat providing cover from predation (for the bats) and allowing for easier access to the prey species.

There are at least nine caves on the Forests that contain, or have been known to contain, gray bats.

Habitat Trend: Many of the habitat trends for gray bat are similar to those for Indiana bat. Although gray bats are not dependent on roost trees, timber management levels that are imposed to protect Indiana bats are likely to favor gray bats as well. Gray bats forage along or over streams, lakes and ponds. These areas are usually buffered from most forest management activities and, therefore, are protected. Cave protection strategies for Indiana bat serve gray bats as well. As a result, habitat conditions for this species are relatively stable.

Population Trend: Based on the summary of surveys on eight known hibernacula, it appears there has been a stable trend in the number of gray bats on the Forests (Figure 39). Surveys are conducted every other year, however, not all caves are always surveyed each year.

Important Note Regarding Yearly Cave/Bat Surveys:
It is important to the reader looking at the population trend charts below on what to read or not read into them. These surveys are done on a bi-annual basis, with approximately ½ of caves surveyed one year and the other ½ surveyed the next year. Due to this type of survey schedule, a complete population estimate for the various bat species is not completed each year. Hence, a true picture of the real population levels is not necessarily true, if viewed individually. For example, one year Gray bat hibernacula are visited followed by maternity colonies of Indiana bat the next. Also, in some years, all significant caves may not be visited due to such reasons as not locating caves in remote locations, illness of surveyors, or other reasons. This, of course, can influence yearly population levels. With the potential for White-Nose Syndrome to affect bats in Arkansas, in addition to gathering bat population and trend data, WNS surveillance objectives are also incorporated into the surveys.

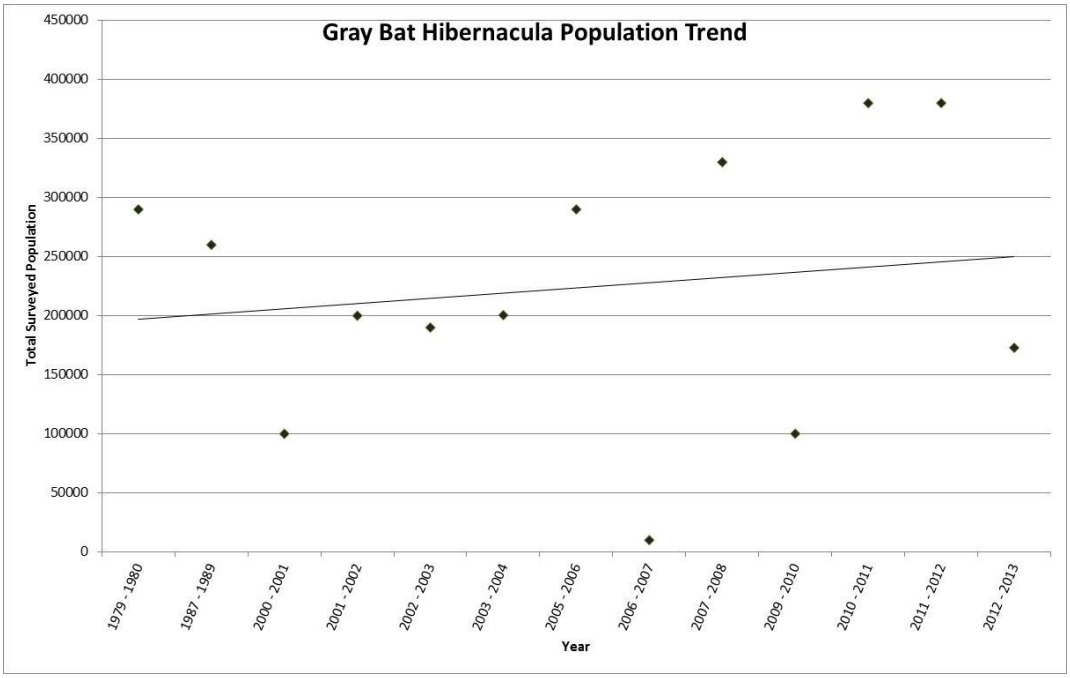

Figure 39: Population Trend for the Gray Bat Hibernacula on the OSFNFs.

The bats are extremely susceptible to vandalism and disturbance during hibernation, either by "waking" the bats causing them to use up there critical fat reserves needed to survive the winter or by direct killing. Another major threat to bats is improper cave gates and structures. If the cave entrance is blocked to bats, it can cause a change in the airflow and temperature of the cave. The bats tend to congregate in large numbers in a few caves. This congregation of such a large proportion of the known population into so few caves constitutes the real threat to this species. Additional threats to this species are pesticides, either by bioaccumulation or by depleting their aquatic insect food source; deforestation of areas near the cave entrances and between caves and foraging areas; impoundments of waterways; natural cave flooding, and of course now the threat of WNS.

Note: Population numbers shown should not be taken as a complete population estimate for Gray bats because several caves housing Gray bats on the OSFNFs were not visited in 2006-2007, 2009-10, or 2010-2011, including one of the more important caves, known as Bonanza Cave. Another cave, Surprise Cave, a deep pit cave, has not been completely surveyed but based on observations of emergence is probably significant in size.

Management Implications and Recommendations

The viability of the gray bat on the Forests appears as secure as can be expected for a federally-listed endangered species. The Forests' adherence to the identified direction in the Recovery Plan helps to avoid and/or minimize potential impacts. The stable or slightly increasing populations in most forest caves and increasing numbers of bats in caves

just off the forest boundary suggest that the bat is likely to persist on and near the Forests for the foreseeable future.

Caves where this species occurs are to be protected on the Forests. Riparian vegetative conditions will be maintained based on standards associated with the Management Area 3.I. Insect populations (especially mayflies and other aquatic insects) will continue to be maintained so foraging will not be affected.

The Forests will continue to survey for and monitor populations of this species in suitable habitat and will document those occurrences and provide information to the USFWS as it becomes available.

INDIANA MYOTIS (*Myotis sodalist*) **(ENDANGERED)**

The Indiana bat was listed as endangered under provisions of the Endangered Species Act (ESA) on March 11, 1967. The USFWS developed a Recovery Plan dated October 14, 1983. This range-wide recovery plan outlines distributional and life history information along with management recommendations and recovery objectives. In April 2007, the Indiana Bat Recovery Team released a Technical Draft Indiana Bat Recovery Plan, with a final revised plan due any time.

The Indiana bat currently ranges from several Midwestern states to the mid-Appalachians. It formerly extended north to the New England states of New York, Vermont, and Massachusetts. Its greatest population concentration occurs in Indiana, Kentucky, and Missouri. In Arkansas, approximately 2,200 Indiana bats are found in 10 caves scattered over the northern and western parts of the state. This species has been recorded in Franklin, Izard, Newton, Stone, and Washington counties in Arkansas. The USFWS identify no critical habitat in Arkansas.

Less than one percent (< 1%) of the caves and mines within the range of the species offer suitable hibernating conditions. Indiana bats hibernate in characteristically dense clusters in particular sections of certain caves and usually return annually to the same places in the same caves. They emerge in late-March to early-April and disperse to summer habitat.

Available information on summer habitats suggest they disperse to roost, forage, and bear young in riparian as well as upland sites. It is likely that female Indiana bats from Arkansas hibernacula migrate northward to maternity roost sites located to the north of the Ozark Mountains.

On the Forests, eight known caves serve, or have served historically, as hibernacula for Indiana bats. The entire Ozark National Forest provides potential suitable habitat.

Habitat Trend: Habitat within the secondary zone around Indiana bat hibernacula is important as this is the core area where they forage and roost during much of the year during warmer months.

Population Trend: Range-wide population trend for the Indiana bat is shown in Figure 40. Most of the increase seen in the species population has come in the core of its home range (Indiana, Illinois, and Missouri).

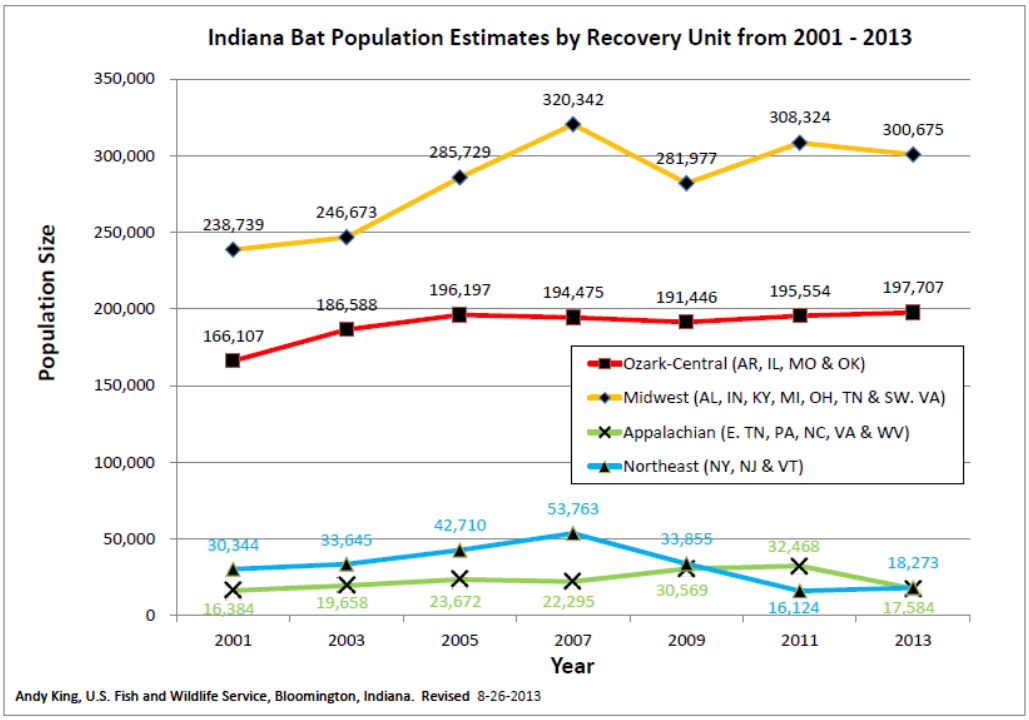

Figure 40: Range-wide population Trend of the Indiana Bat 2001 – 2013.

Based on the summary of surveys on eight known hibernacula, it appears there has been a stable to slightly declining trend in the number of Indiana bats on the Forests (Figure 41). Surveys are conducted every other year, however, not all caves are always surveyed each year.

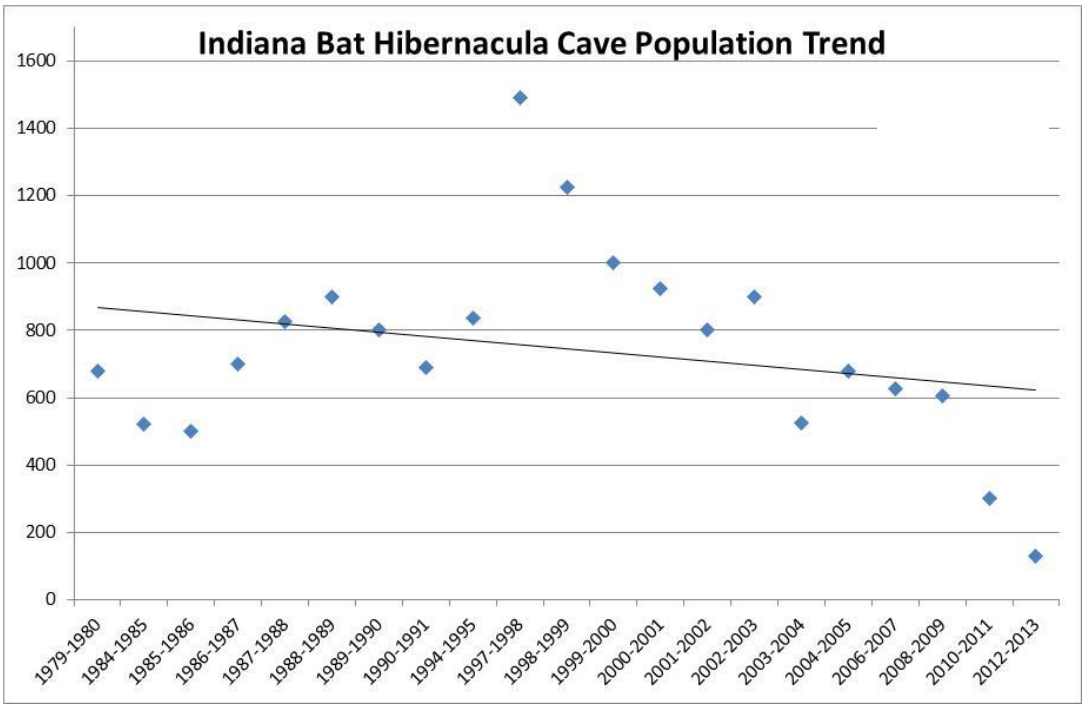

Figure 41: Indiana Bat Hibernacula Cave Population Trend on OSFNFs, 1978-2013.

Management Implications and Recommendations:

Under full implementation of the RLRMP, the Forests will maintain an abundant supply of snags, live potential roost trees, upland water sources, and other habitat features across the landscape to allow for the maintenance and to promote the recovery of Indiana bat populations.

The Forests will continue to survey for and monitor populations of this species in suitable habitat and will document those occurrences and provide information to the USFWS as it becomes available.

OZARK BIG-EARED BAT (*Corynorhinus townsendii ingens*) **(ENDANGERED)**

The Ozark big-eared bat is generally associated with caves, cliffs, and rock ledges in well-drained, oak-hickory forests. Maternity caves and hibernacula occur in a number of different surroundings ranging from large continuous blocks of forest to smaller forest tracts interspersed with open areas. Clark (1993) found that adult female Ozark big-eared bats from maternity colonies preferred to forage along woodland edges. By foraging along woodland edges, the bat benefits from a less cluttered environment with cover nearby and prey densities high.

The Ozark big-eared bat is now found in western and north central Arkansas as well as eastern Oklahoma. The total population of this species is estimated to be from 1,300 to 2,000 individuals with most found in Oklahoma. Only six caves in

Arkansas are presently known to be regularly inhabited by colonies of Ozark big-eared bats: a hibernation cave and two nearby maternity caves in north central Arkansas, and a hibernation cave and two maternity caves and in the northwestern part of the state. Based on summer estimates, the Arkansas population is approximately 550 individuals (AGFC Annual Report 2002-2003). This species has been reported from the Boston Mountain Ranger District in several locations and potentially may be found on other districts as well. It is found in Crawford, Franklin, Marion, and Washington Counties in Arkansas.

Population Trend: Looking at the trend of Ozark big-eared bat population, there is a slight increase at hibernation sites on the Forests (Figure 42). There was an increase in the population at maternity sites until 2012 (Figure 43). The agencies are still looking into why there were such lows numbers at the maternity sites in 2012. Surveys are conducted every third year, however, not all caves are always surveyed each year. Since WNS was found the agencies have cut back on monitoring the bats as often.

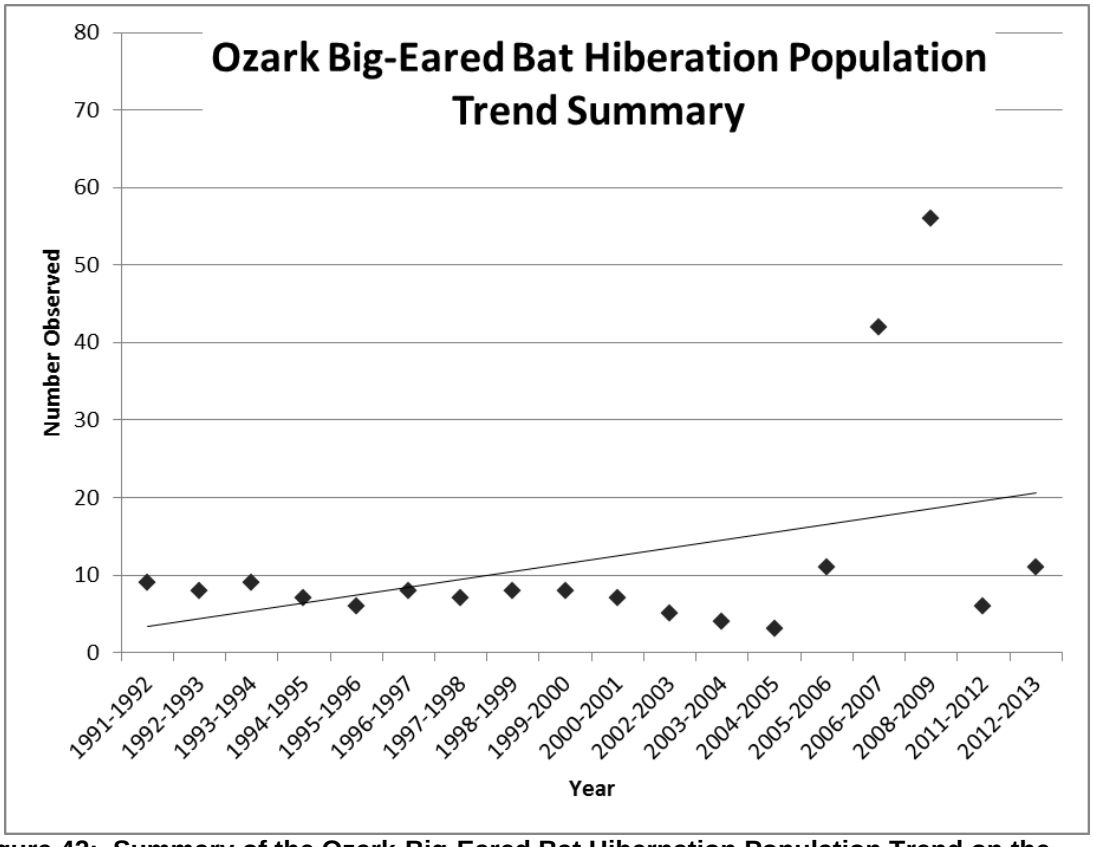

Figure 42: Summary of the Ozark-Big-Eared Bat Hibernation Population Trend on the OSFNFs.

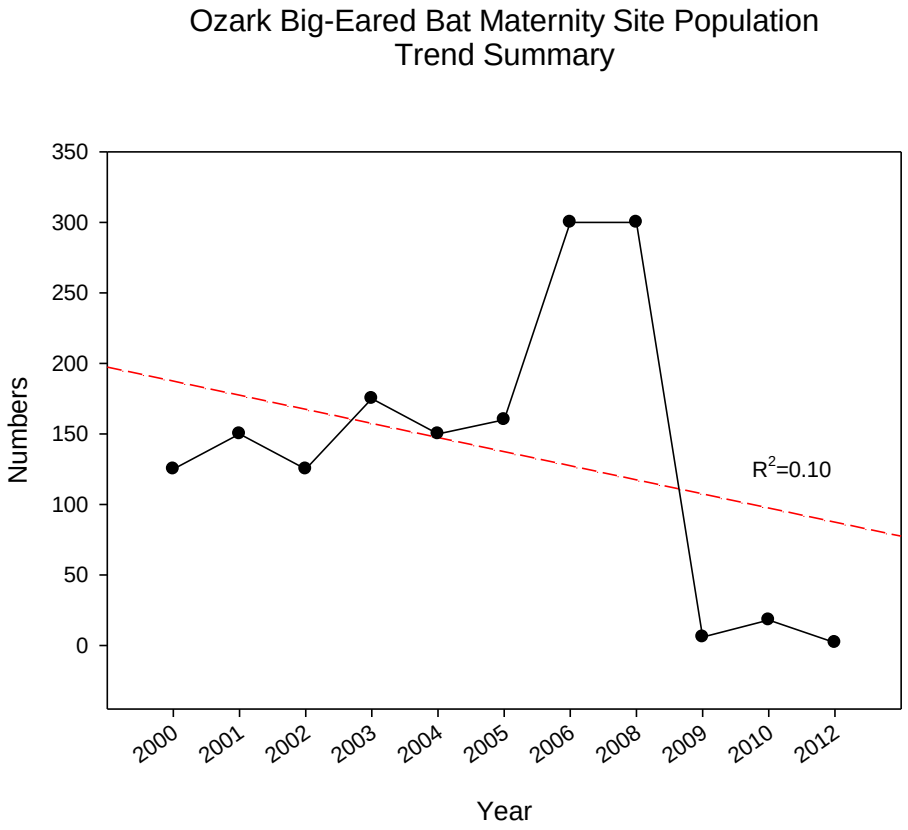

Figure 43: Summary of the Ozark-Big-Eared Bat Maternity Population Trend on the OSFNFs.

Management Implications

Full implementation of the RLRMP will continue to protect unique bat habitats this species uses and, when necessary, gates or other exclusion devices will be used to protect bat habitat.

The Forests will continue to survey for and monitor populations of this species in suitable habitat and will document those occurrences and provide information to the USFWS as it becomes available.

EASTERN SMALL-FOOTED BAT (*Myotis leibii*) **(REGIONAL FORESTER'S SENSITIVE)**

This species ranges from eastern Canada, south to Georgia and west to Oklahoma. Hibernating in caves or mines, they are the "hardiest" of U.S. cave bats. In Arkansas, it is known in small numbers from only a few caves in the Ozarks. It has been in Newton and Stone Counties, and more recently during surveys conducted in Franklin County. They are one of the last to enter caves in autumn and often hibernate near cave or mine entrances where temperatures drop below freezing and where humidity is relatively low.

This bat species is occasionally found on the Forests during mist net surveys and there are records documenting their presence. This species is rarely captured but occasionally, many can be caught in a single spot.

Management Implications
Under full implementation of the RLRMP, the Forests will maintain an abundant supply of snags, live potential roost trees, upland water sources, and other habitat features across the landscape to allow for the maintenance and to promote the recovery of Indiana bat populations.

The Forests will continue to survey for and monitor populations of this species in suitable habitat and will document those occurrences and provide information to the USFWS as it becomes available.

Over time as human populations increase on both public and private lands, negative impacts to this species and its habitat are likely to occur. Implementation of forest-wide standards will help to reduce these negative impacts on this species.

TES SPECIES WITH POTENTIAL/NOT OCCURRING ON FOREST

Table 14 lists TES species that have the potential to occur on the Forests but have not been found. Surveys are currently being done for these species. If they are found on the Forests, they will be added to future monitoring reports.

Table 14: TES Species with Potential to Occur but not Currently on Ozark-St. Francis NFs.

TES Species with Potential to Occur but are not Currently Found on the Ozark-St. Francis National Forests		
Scientific Name	**Common Name**	**Status**
Lesquerella filiformis	Missouri Bladderpod	Threatened
Lindera mellissifolia	Pondberry	Endangered
Geocarpon minimum	Geocarpon	Threatened
Potamilus capax	Fat Pocketbook	Threatened
Lampsilis abrupta	Pink Mucket	Endangered
Leptodea leptodon	Scaleshell Mussel	Endangered
Lampsilis streckeri	Speckled Pocketbook Mussel	Endangered
Cambarus aculabrum	Cave Crayfish	Endangered
Cambarus zophonastes	Hell Creek Cave Crayfish	Endangered
Amblyopsis rosae	Ozark Cavefish	Threatened
Campephilus principalus	Ivory-billed Woodpecker	Endangered
Draba aprica	Open-ground draba	Sensitive
Solidago ouachitensis	Ouachita Mountain goldenrod	Sensitive
Valerianella nuttallii	Nuttall's cornsalad	Sensitive

FISH COMMUNITIES, STREAMS, AND LAKES

The Forests completed 16 miles of stream habitat improvement in 2006; 33 miles in 2007; 67 miles in 2008 (Figure 44); 60 miles in 2009; 71 miles in 2010; 62 miles in 2011; 86 miles in 2012; and 68 miles in 2013. These projects consisted of large woody debris (LWD) placement in streams, stream bank stabilization to decrease sediment inputs, road crossing/fish passage barrier replacement, road closing and/or road obliteration in riparian areas, cane restoration in riparian areas and trash cleanups in riparian areas. The Forests completed 493 acres of lake-habitat improvements in 2006; 527 acres in 2007; 516 acres in 2008; 810 acres in 2009; 1100 acres in 2010; 1024 acres in 2011; 1088 acres in 2012; and 1335 acres in 2013. This consisted of the following types of projects: spawning bed development, fertilization, liming, road closures causing sedimentation in the lake, structural additions (cedar trees, Christmas trees, tree hinging along the shore, etc.), and addition of bait fish to the food biomass for predators like largemouth bass.

Figure 44: Spraying of Yellow Floating Heart in Lake Wedington in 2008.

The RLRMP also stated that looking at fish communities in streams would be a way of monitoring the conditions of streams on the Forests. This includes working with other agencies to develop Index of Biotic Integrity (IBI) for looking at the overall health of each aquatic system in a particular eco-region. An IBI is a numerical measure of the biological completeness of a system. An IBI allows for easy comparison between communities and systems, because it gives each stream a numerical score.

The Arkansas Department of Environmental Quality (ADEQ) had already developed IBIs for all the eco-regions in Arkansas for their analysis of water quality in the state and they have shared their IBIs with the Forests (Jim Wise, personal communication). The IBIs developed by the ADEQ were classified by the eco-region in which the stream exists. Table 15 shows the list of metrics used in the IBIs developed by the ADEQ by eco-region.

Table 15: Individual metrics used in the IBIs developed by the Arkansas Department of Environmental Quality for eco-regions in Arkansas that contain OSFNFs lands. The X shows which metrics were used for each eco-region.

Metric	Arkansas Eco-Regions			
	Arkansas River Valley	Boston Mountain	Ozark Highlands	Delta Least Disturbed Streams
% Sensitive Species	X	X	X	X
% Minnow Species	X	X	X	X
% Catfish Species	X	X	X	X
% Sunfish Species	X	X	X	X
% Darter Species	X	X	X	X
% Primary Feeders (algae eaters)	X	X	X	X
% Key Individuals in each eco-region	X	X	X	X
Diversity (using Shannon-Weiner Diversity Index)	X	X	X	X
# of Species			X	

For each metric in an IBI, the stream is given a score of 0-5 based on the value of the metric. The scores for each of the metrics are then summed to give a total score for each stream. The final score is then compared to a range of scores from streams that were sampled in that particular eco-region in the past to determine the overall quality of that stream. Table 16 gives the fish species composition of streams sampled from 2006 to 2013 as well as the IBI scores and ratings for each stream. The IBI score and rating for each stream are based on the IBIs developed by ADEQ. Streams that rated out in the poor category are either on small streams or ones with large amounts of private and USFS mixed ownership.

Table 16: Fish Species Composition of Streams Sampled from 2006 – 2013 with IBI Scores and Ratings for Each Stream.

Fish Species Composition of Sampled Streams				
District	**Watershed**	**Stream**	**IBI Score**	**IBI Rating**
Sylamore	White River/ Livingston Creek	Tributary of West Livingston Creek	18	Fair
		Tributary of East Livingston Creek	24	Fair
		Tributary of West Livingston Creek (spring)	13	Fair
		Bearhead Branch	16	Fair
		Coldwater Creek	28	Good
		Farris Creek	22	Fair
		Goose Creek	13	Fair
		East Livingston Creek	37	Excellent
		Livingston Creek	33	Good
		Perry Creek	39	Excellent
		Sneeds Creek	23	Fair
		Sugarloaf Creek	11	Poor
		Sycamore Creek	27	Good
		Twin Creek	16	Fair
		Walker Creek	25	Good
Big Piney	Richland Creek	Richland Creek	24	Good
		Falling Water Creek	14	Fair
		Bobtail Creek	8	Poor
	South Fork of the Little Red River	SF Little Red River	28	Excellent
		Brushy Fork	24	Good
		West Prong of Brush Fork	12	Fair
	Upper Illinois Bayou	Middle Fork Illinois Bayou	22	Good
		Snow Creek	8	Poor
		Meyer Branch	14	Fair
		Hurricane Creek	14	Fair
		Crouch Hollow	6	Poor
		East Fork Illinois Bayou	18	Good
		Mill Creek	18	Good
		Unnamed trib to Mill Creek (002247)	10	Fair
	North Fork Illinois Bayou	Right Hand Prong of NF of Illinois Bayou	14	Fair
		Dry Creek	14	Fair
		Treadwell Hollow	10	Fair

Table 16 (Continued): Fish Species Composition of Streams Sampled from 2006 – 2013 with IBI Scores and Ratings for Each Stream.

Fish Species Composition of Sampled Streams				
District	**Watershed**	**Stream**	**IBI Score**	**IBI Rating**
Big Piney	North Fork Illinois Bayou	Unnamed Tributary of NF Illinois Bayou (2276)	4	Poor
		Sulpher Creek	14	Fair
		Payne Creek	12	Fair
		Unnamed Tributary of NF Illinois Bayou (2250)	12	Fair
		Cowan Hollow	10	Fair
		Unnamed Tributary of NF Illinois Bayou (2299)	12	Fair
		Unnamed Tributary of NF Illinois Bayou (2301/2303)	12	Fair
		Campbell Hollow	12	Fair
	West Fork Point Remove Creek	Drivers Creek	16	Fair
		Brock Creek	22	Good
		Unnamed trib to Brock Creek (001119)	8	Poor
		Hill Creek	12	Fair
		Unnamed trib to Brock Creek (001116)	8	Poor
		Unnamed trib to Drivers Creek (001091)	14	Fair
		Mocassin Hollow	8	Poor
		Sweeden Hollow	10	Fair
		Unnamed trib to Brock Creek (001111)	14	Fair
		Rock Creek	14	Fair
		Unnamed trib to Brock Creek (001111)	14	Fair
		Unnamed trib to Brock Creek (002382)	8	Poor
		Unnamed trib to Brock Creek (001108)	10	Fair

Table 16 (Continued): Fish Species Composition of Streams Sampled from 2006 – 2013 with IBI Scores and Ratings for Each Stream.

Fish Species Composition of Sampled Streams				
District	**Watershed**	**Stream**	**IBI Score**	**IBI Rating**
Big Piney	West Fork Point Remove Creek	Unnamed trib to West Fork Point Remove (001130)	8	Poor
		Unnamed trib to Rock Creek (001130)	0	Poor
		Poe Creek	14	Fair
		Unnamed trib to Poe Creek (001201)	12	Fair
		Anderson Creek	12	Fair
		Elm Hollow	12	Fair
	Big Piney Creek	Bear Creek	12	Fair
		Gee Creek	14	Fair
		Indian Creek	26	Excellent
		Gunter Branch	16	Fair
		Lick Creek	16	Fair
		Spring Creek	16	Fair
		Trace Creek	16	Fair
		Moccasin Creek	16	Fair
	Little Piney Creek	Sulpher Creek	18	Good
Pleasant Hill	Upper Mulberry River	Lewis Prong	18	Good
		Panther Creek	16	Fair
		Turner Hollow	12	Fair
		Bear Branch	18	Good
		Washita Creek	8	Poor
	Horsehead Creek	Horsehead Creek	20	Good
		West Fork Horsehead Creek	12	Fair
		East Fork Horsehead Creek	6	Poor
		Cole Creek	4	Poor
		Unnamed trib to Horsehead Creek (001363)	4	Poor
		Unnamed trib to Horsehead Creek (001386)	4	Poor
		Unnamed trib to East Fork Horsehead Creek (001412)	8	Poor
	Little Piney Creek	Murrray Creek	24	Good
Boston Mountain	Lee Creek	Falls Creek	20	Good
		Lee Creek	24	Good
		Mountain Fork	26	Excellent

Table 16 (Continued): Fish Species Composition of Streams Sampled from 2006 – 2013 with IBI Scores and Ratings for Each Stream.

Fish Species Composition of Sampled Streams				
District	**Watershed**	**Stream**	**IBI Score**	**IBI Rating**
Boston Mountain	Lee Creek	West Cedar Creek	8	Poor
		Whitzen Hollow	16	Fair
		Buckhorn Creek	14	Fair
		Range Hollow	8	Poor
	Hurricane Creek/Mulberry River	Hurricane Creek	22	Good
		Salt Fork	14	Fair
Mt. Magazine	Short Mountain Creek/ Reville Creek	Lower Cove Creek	6	Poor
		Upper Cove Creek	14	Fair
		Gum Creek	4	Poor
		Gutter Rock Creek	10	Fair
		Reville Creek	6	Poor
		Short Mountain Creek	16	Fair
		South Wicked Creek	12	Fair
St. Francis	Mississippi River – Tunica Lake	Unnamed trib to Phillips Bayou	6	Poor

Proportional Stock Density (PSD) and Relative Stock Density (RSD) are a measure of the balance of multiple size classes within a population. The Forests are using PSD and RSD to evaluate the quality of lake and pond habitat for largemouth bass. PSD are the number of quality length fish (>300 mm) versus the number of stock length fish (>200 mm) multiplied times 100 and RSD is the number of preferred length fish (>380 mm) versus the number of stock length fish (>200mm) multiplied times 100. The PSD for largemouth bass should range from 40 – 70 whereas RSD should range from 10 – 40 (Murphy and Willis, 1996).

Figures 45-53 show the PSD and RSD values for all lakes on the Forests where sampling was done from 2005 to 2013.

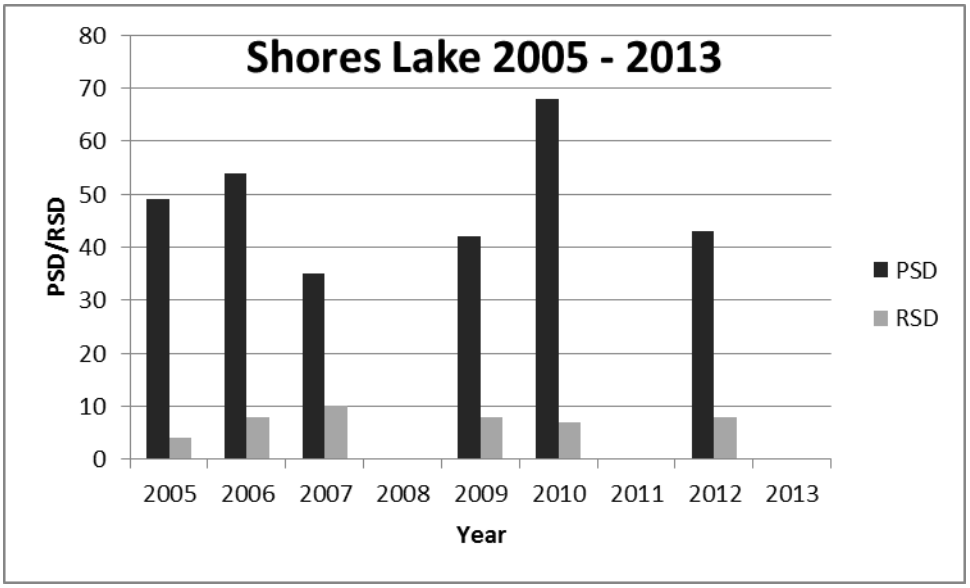

Figure 45: PSD and RSD values for Shores Lake. Surveys were not done in 2013.

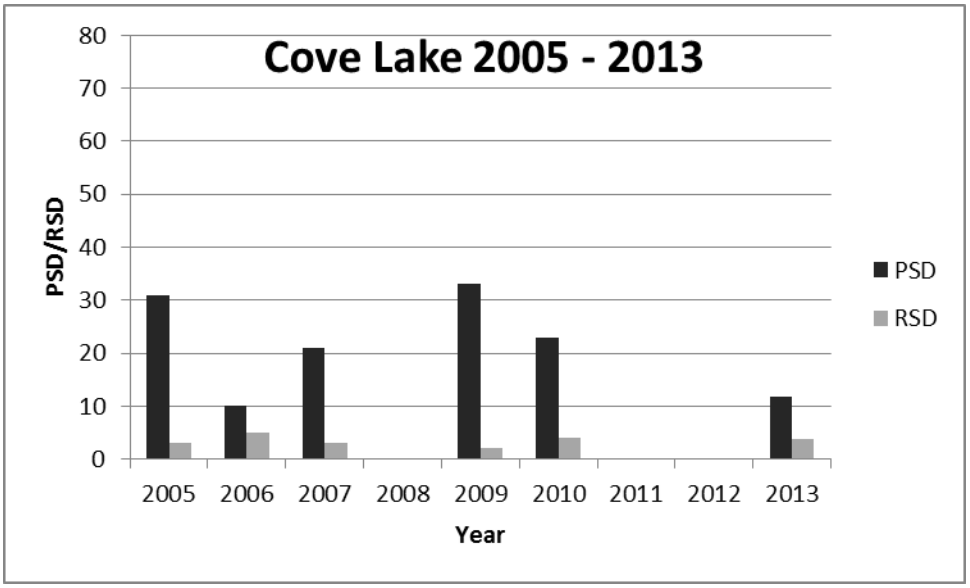

Figure 46: PSD and RSD values for Cove Lake. Surveys were not done in 2008, 2011 or 2012 (No lakes were sampled in 2011 on Ozark NF because of high water).

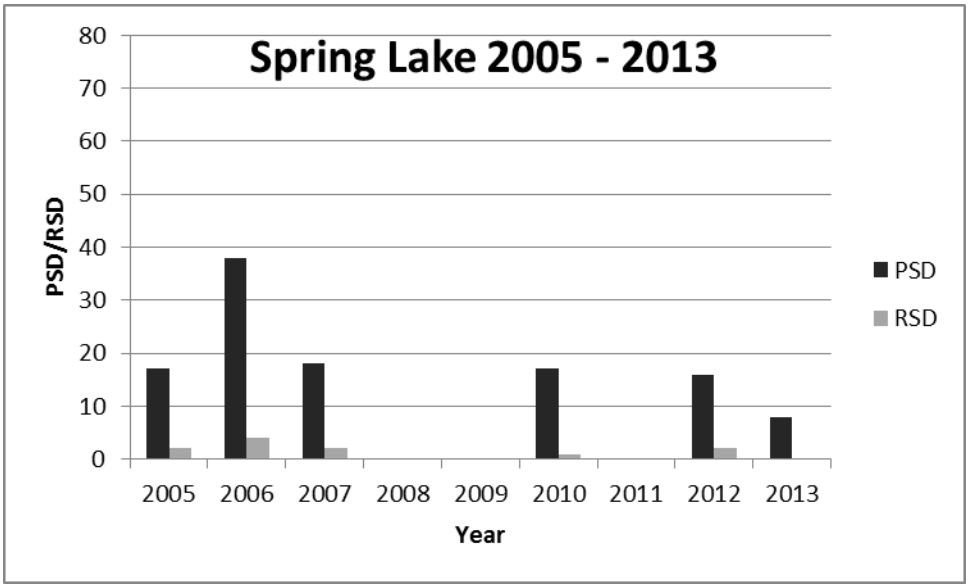

Figure 47: PSD and RSD values for Spring Lake. Surveys not done in 2008, 2009 or 2011 (No lakes were sampled in 2011 on Ozark NF because of high water).

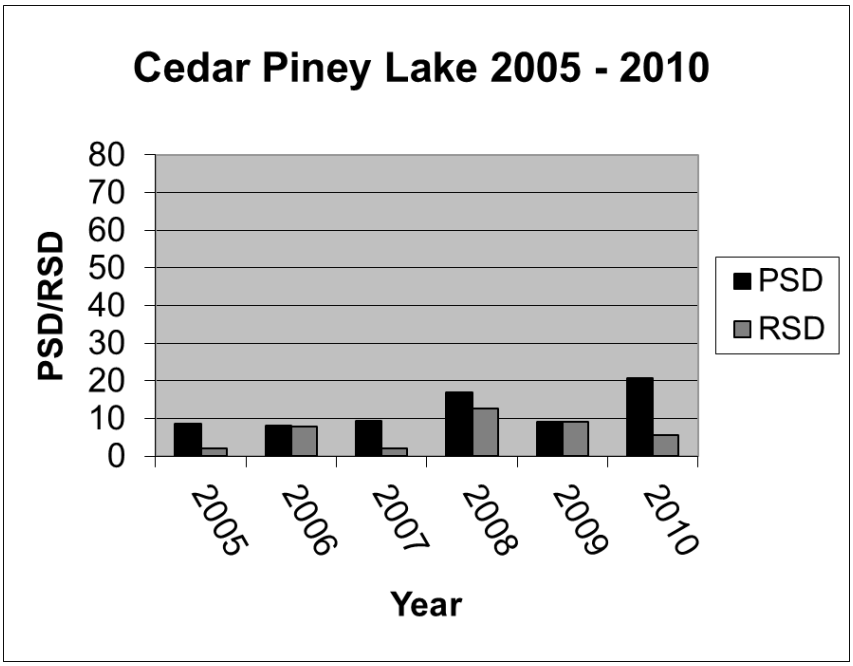

Figure 48: PSD and RSD values for Cedar Piney Lake. No surveys done since 2010.

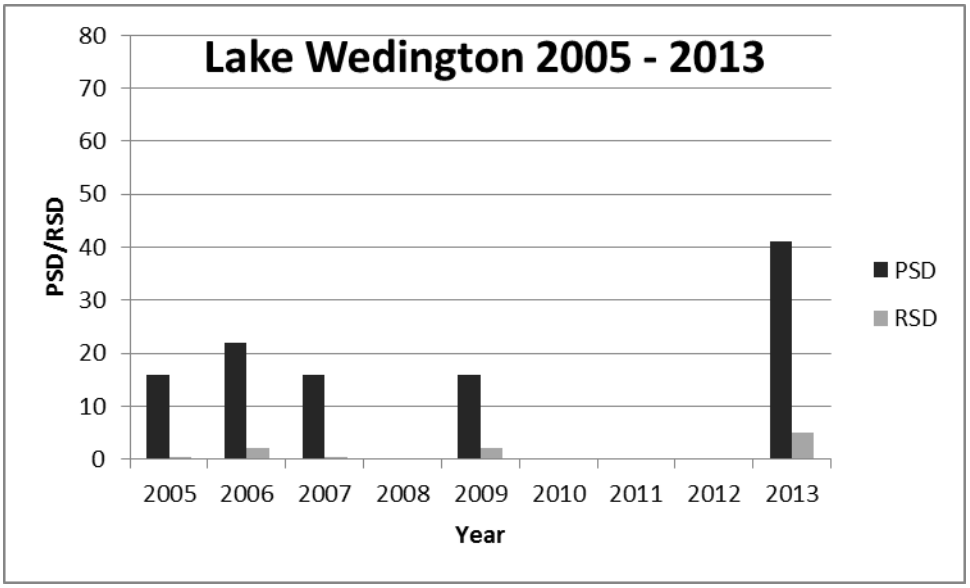

Figure 49: PSD and RSD values for Lake Wedington 2005 - 2013.

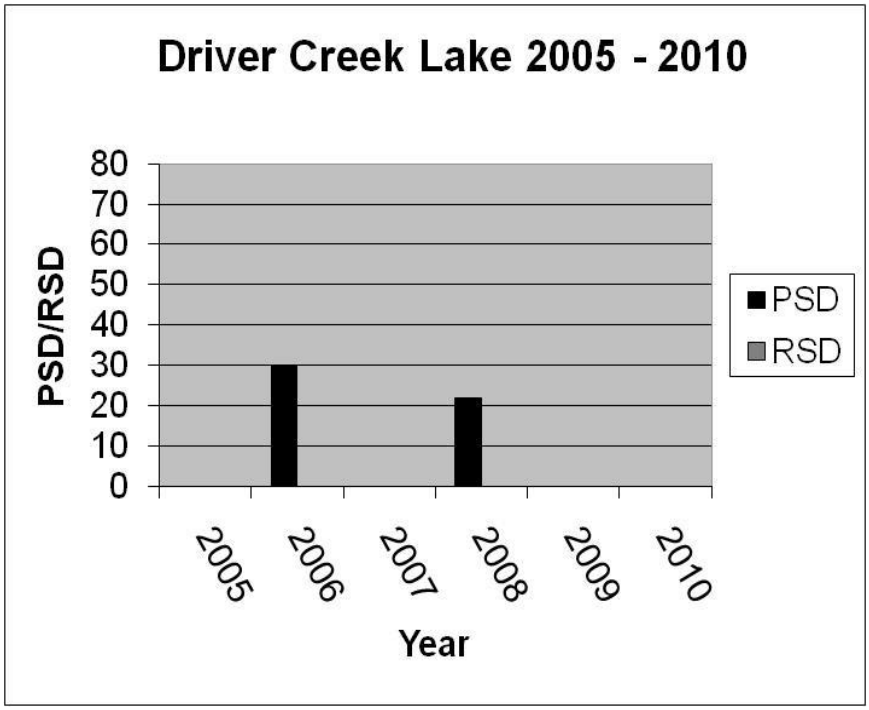

Figure 50: PSD and RSD values for Driver Creek Lake 2005 - 2010.

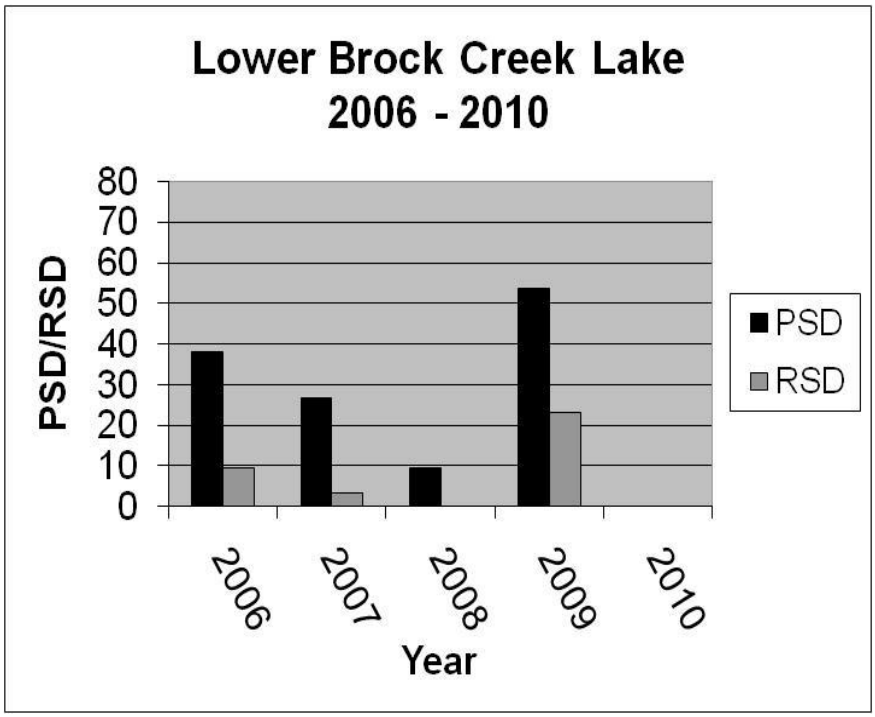

Figure 51: PSD and RSD values for Lower Brock Creek Lake.

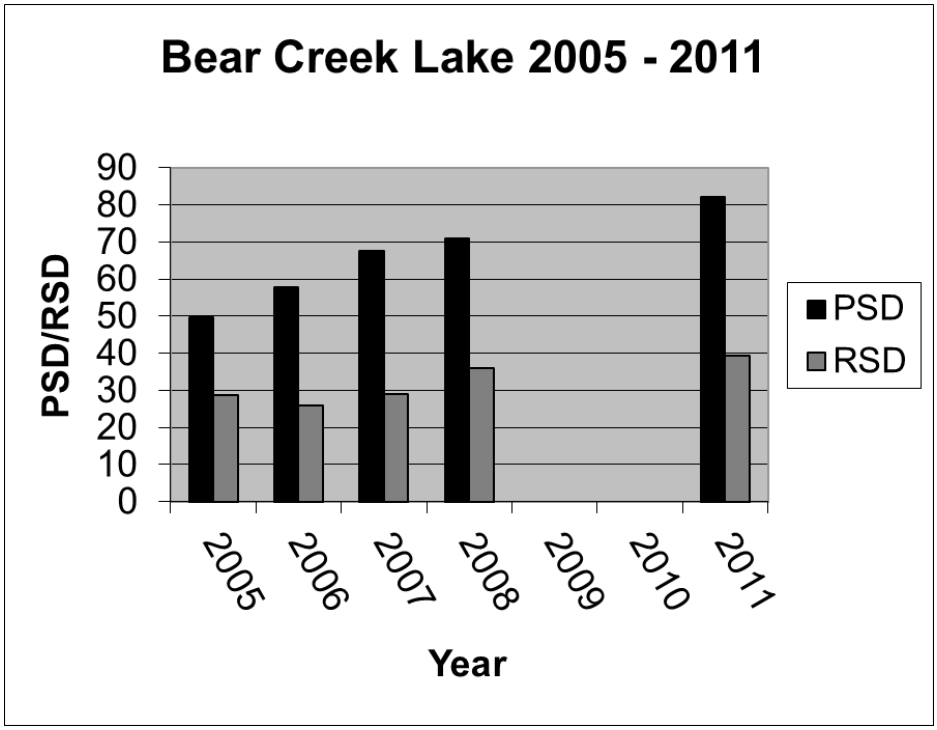

Figure 52: PSD and RSD values for Bear Creek Lake.

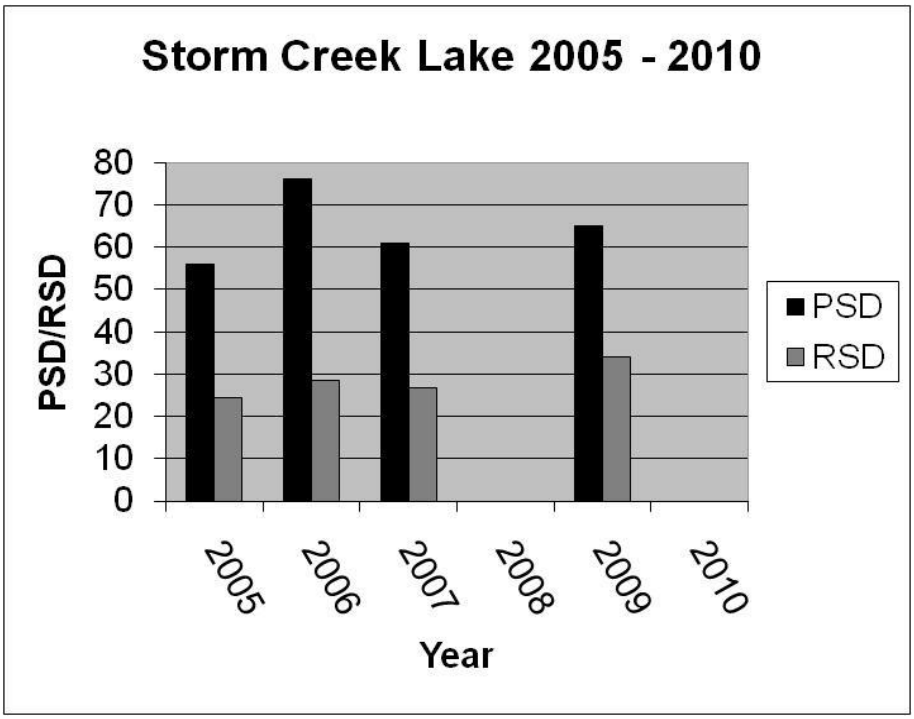

Figure 53: PSD and RSD values for Storm Creek Lake. Surveys were not completed in 2008, 2010, 2011, or 2012.

Management Implications and Recommendations

Continue to follow Forest Plan standards and protect and manage habitat for these species. There is no need for change in the RLRMP at this time.

SOIL, AIR, AND WATER

Emerging Issue

Water Use

Patterns of water use have changed since the Forest Plan was issued. Consumptive water use was not addressed in the RLRMP. There is the possibility that the Forests could receive a proposal to use water from the Forests for a municipal water supply or for gas well activity. Until there is a specific proposal for water use, this issue cannot be analyzed.

Management Implications and Recommendations

When and if a proposal is made, the appropriate National Environmental Protection Act (NEPA) will be conducted to analyze the proposed project. This could lead to a plan amendment.

In fiscal year 2006, the Forests accomplished 34 acres of watershed improvement, which consisted of cane restoration in a riparian area, stream bank stabilization, gully stabilization, and stream cleanup.

In fiscal year 2007, the Forests accomplished 139 acres of watershed improvement, which consisted of improving riparian area condition by closing illegal stream crossings and trails, erosion control and decommissioning of illegal trails, seeding grass and planting trees on eroding areas, gully stabilization, and stream bank restoration.

In fiscal year 2008, the Forests accomplished 385 acres of watershed improvement, which consisted of illegal road/trail closure, gully stabilization, hog eradication (causing sediment issues), trash cleanups in watersheds, large wood additions to streams, and cane restoration.

In fiscal year 2009, the Forests accomplished 48 acres of watershed improvement, which consisted of illegal road/trail closure, road obliteration, bank stabilization, hog eradication (causing sediment issues), trash cleanups in watersheds, large wood additions to streams, wetland restoration, and cane restoration.

In fiscal year 2010, the Forests accomplished 85 acres of watershed improvement, which consisted of illegal road/trail closure, road obliteration, bank stabilization, hog eradication (causing sediment issues), trash cleanups in watersheds, large wood additions to streams, wetland restoration, and cane restoration.

In fiscal year 2011, the Forests accomplished 969 acres of watershed improvement, which consisted of road decommissioning, bank stabilization, installation of erosion control structures, trash cleanups in watersheds, illegal road/trail closure, and large wood additions to streams.

In fiscal year 2012, the Forests accomplished 1917 acres of watershed improvement, which consisted of illegal road/trail closure, road obliteration, bank stabilization, hog eradication (causing sediment issues), trash cleanups in watersheds, large wood additions to streams, and road/stream crossing improvements.

In fiscal year 2013, the Forests accomplished 5,358 acres of watershed improvement, which consisted of road decommissioning, installation of erosion control structures and vegetation, stream bank stabilization, illegal road/trail closure, and trapping of feral hogs.

The RLRMP provided these three objectives for improved stream conditions on the OSFNFs:

- OBJ. 21 - Maintain or restore between 30 to 70 percent of the total perennial stream/river surface area if the National Hydrography Dataset (NHD) reaches as pool habitat in the first decade.
- OBJ. 22 - Maintain or restore large woody debris (LWD) levels in perennial streams/rivers at 75 to 200 pieces/mile for all LWD larger than 3.3 feet long and 3.9 inches in diameter in the first decade.

- OBJ. 23 - Maintain or restore LWD levels in perennial streams/rivers at 8 to 20 pieces/mile for all LWD larger than 16.4 feet long and 19.7 inches in diameter in the first decade.

Table 17 gives results of streams surveys conducted from 2006 to 2013 on the Forests for each of these objectives and the miles of streams where LWD was added to improve pool habitat conditions and LWD levels in the stream. Figure 54 shows a site of LWD additions on the Sylamore Ranger District.

Table 17: Stream miles surveyed during the summers of 2006 to 2013, amounts of pool habitat and LWD levels found during the surveys, and miles of stream were LWD was added from 2006 to 2013.

FY Year	2006	2007	2008	2009	2010	2011	2012	2013
Miles of Stream Habitat Inventoried	76	72	47	90	80	23	0	0
Miles Meeting 30-70% Pool Habitat OBJ 21	35 (46%)	47 (65%)	21 (45%)	34 (38%)	68 (85%)	17 (74%)	-	-
Miles Meeting LWD 75-200 Pieces Larger 3.3 Feet Long & 3.9 Inches in Diameter OBJ 22	0 (0%)	10 (14%)	19 (47%)	59 (84%)	51 (64%)	0 (0%)	-	-
Miles Meeting LWD 3-20 Pieces Larger 16.4 Feet Long & 19.7 Inches in Diameter OBJ 23	0 (0%)	0 (0%)	4 (9%)	1 (1%)	4 (5%)	0 (0%)	-	-
Miles of Stream Where LWD Was Added to Meet OBJ 22 & OBJ 23	0	10	7	12	6	1	22	23

Figure 54: Site of Large Woody Debris Additions in Cole Fork on the Sylamore RD.

One of the other main focus areas of the RLRMP was the improvement of native cane breaks within riparian areas on the Forests. Native cane breaks are a rare community on the Forests where they provide bank stabilization and flood control as well as an important niche habitat for certain wildlife species.

Table 18 shows the cane restoration accomplished on the Forests in fiscal years 2006 through 2013.

Table 18: Cane Restoration Accomplished on the OSFNFs, FY2006 – FY2013.

CANE RESTORATION		
Year	**# of Acres**	**Method Used**
2006	6	Expanded area covered by cane in riparian area that had been converted to pasture
2007	8	Increased stem density in previously planted areas and expanded the size of the area in cane
2008	15	Increased stem density in previously planted areas and expanded the size of the area in cane
2009	14	Increased stem density in previously planted areas and expanded the size of the area in cane
2010	11	Increased the stem density in areas with natural current cane populations through thinning of overstory trees
2011	0	N/A
2012	0	N/A
2013	179	Seeding/planting for erosion control and thinning of overstory trees to increase stem density in areas with natural current cane populations

Another main focus of the RLRMP was on improving road/stream crossings to improve fish/aquatic organism passage. Funding was used in 2005, 2007, 2008, and 2009 to complete inventories on the Forests to determine locations where problems existed. Table 19 supplies information about road crossings that were inventoried and found to be barriers to aquatic organism migration. Funding in 2006 and 2007 was used to do National Environmental Protection Act (NEPA) analysis and design work on several projects on the Forests. The Forests started construction on three fish passage projects in 2008 (Barkshed, Chambers, and Spring Lake). Two of the projects were not completed until early 2009. One crossing replacement contract was awarded at the end of 2011 (Fanes Creek) but was not completed until 2012. Four crossings were started in 2012 but were not finished until 2013 (Lumpkin Creek (2), North Wicked Creek, and Accord Hollow). The third crossing on Lumpkin Creek was awarded in 2013 and scheduled to be completed in 2014. An example of an inventoried bad culvert is shown in Figure 55. The RLRMP Objective 54 called for replacing at least 6 crossings a year. The Forests did not meet that objective in any of the years but they did acquire the data that can make it possible to meet that objective in future years if funding is available.

Table 19: Road crossings inventoried from 2005 to 2013 and found to be barriers to aquatic organism migration, as well as, number of fish barriers replaced each year.

Year	Road/Stream Crossings Inventoried	Road/Stream Crossings Inventoried - Impassible	Fish Passage Projects Completed on the Forest
2005	35	27 (77%)	-
2006	-	-	0
2007	84	53 (62%)	0
2008	10	10 (100%)	3
2009	21	15 (71%)	0
2010	-	-	0
2011	-	-	1
2012	-	-	4
2013	-	-	1

Figure 55: A Road Crossing Surveyed on the Big Piney Ranger District in the Summer of 2008 that was identified as a barrier to aquatic organisms.

Management Implications and Recommendations

Continue to follow Forest Plan standards and protect and manage habitat for these species. There is no need for change in the RLRMP at this time.

AIR RESOURCES

The RLRMP for the OSFNFs sets forth priorities related to air quality. Specifically, the RLRMP requires that the Forests work to:

- prevent exceeding air quality standards from prescribed fire activity and other Forest actions;
- plan for resource management emissions to fall within the current state implementation plan (SIP), which establishes acceptable levels of air pollution;
- minimize air pollution impacts to the Air Quality Related Values (AQRVs) of the Class I Area, Upper Buffalo Wilderness, through a cooperative working relationship with agencies managing air quality. Furthermore, the RLRMP establishes OBJ. 18, to protect and improve the AQRVs of Upper Buffalo Wilderness with performance indicators of the number of Prevention of Significant Deterioration (PSD) permits reviewed and the number of regional air quality planning committees participated in. The Air Quality Specialist working with the OSFNFs reviews all PSD permit applications for air quality impacts to the Upper Buffalo Wilderness, and works with local, state and federal air quality agencies to ensure that increases in acidic deposition or regional haze do not occur.

Air pollution often has a subtle but critical impact on ecosystems and vistas, and can alter ecosystems by harming plants and animals, or changing soil or water chemistry. Ecosystems then become more vulnerable to damage from insects and diseases, drought, or invasive species. Additionally since many visitors to National Forests value pristine areas with magnificent vistas, air pollution can lessen their experience and enjoyment of the National Forests.

The main air pollutants of concern on the OSFNFs are ozone, fine particulate matter, and sulfur and nitrogen deposition. Ozone is a pollutant formed by emissions of nitrogen oxides and volatile organic compounds in the presence of sunlight. At elevated concentrations, it causes human health concerns as well as negative impacts to vegetation. The US Environmental Protection Agency (EPA), as directed by Congress, has set a National Ambient Air Quality Standard (NAAQS) for ozone of 0.075 parts per million (ppm) to protect both human health and the environment. Particulate matter is a mixture of extremely small particles made up of soil, dust, organic chemicals, metals, and sulfate and nitrate acids. The size of the particles is directly linked to health effects, with smaller particles causing the worst impacts to human health. As a result, EPA has set a primary NAAQS for ultra-small (less than 2.5 microns in diameter) particulate matter on both a short-term (24-hour) and annual basis. The 24-hour (short term) fine particulate matter (PM2.5) NAAQS is currently set at 35 µg/m3, while the annual PM2.5 NAAQS is 12 µg/m3.

Air quality is recognized in the land management plan for OSFNFs as an important parameter to measure forest health. The plan lists the following forest-wide standards relating to air quality.

- FW93: Prescribed burning will be conducted in, or adjacent to, counties with forecasted high Air Quality Index (AQI) values (AQI equals orange or higher) only if meteorological conditions indicate that smoke will be carried away from the high AQI area.
- FW94: Conduct all National Forest management activities in a manner that does not result in (1) a significant contribution to a violation of National Ambient Air Quality Standards (NAAQS) or (2) a violation of the applicable provisions in the State Implementation Plan (SIP).

Forest-Wide Standard FW93. The use of prescribed fire emits $PM_{2.5}$, along with other pollutants. With the growing prescribed fire program, it is important for the National Forests to be aware of downwind concentrations of fine particulate matter to ensure that prescribed fire emissions are not contributing to any violations of the NAAQS. There are two $PM_{2.5}$ monitors near the OSFNFs. One is located in Pope County, AR and the other is located in Sebastian County, AR. The measured concentrations of fine particulate matter at each of these locations, both on a daily and an annual basis do not exceed the $PM_{2.5}$ NAAQS which are 35 and 12 µg/m3, respectively. Therefore, while prescribed fire may be

contributing to nearby concentrations of $PM_{2.5}$, the area is still meeting the NAAQS for this pollutant.

Forest-Wide Standard FW94. The National Ambient Air Quality Standards are based on 3-year averages of the measured concentrations. Using 2008 through 2013 data, the measured concentrations near the OSFNFs were compared to the 24-hour and the annual $PM_{2.5}$ NAAQS. As shown in Figure 56, these monitors have not recorded any exceedances of the $PM_{2.5}$ NAAQS over the past six years. Thus, it can be concluded that forest management activities are not resulting in any exceedances of the NAAQS.

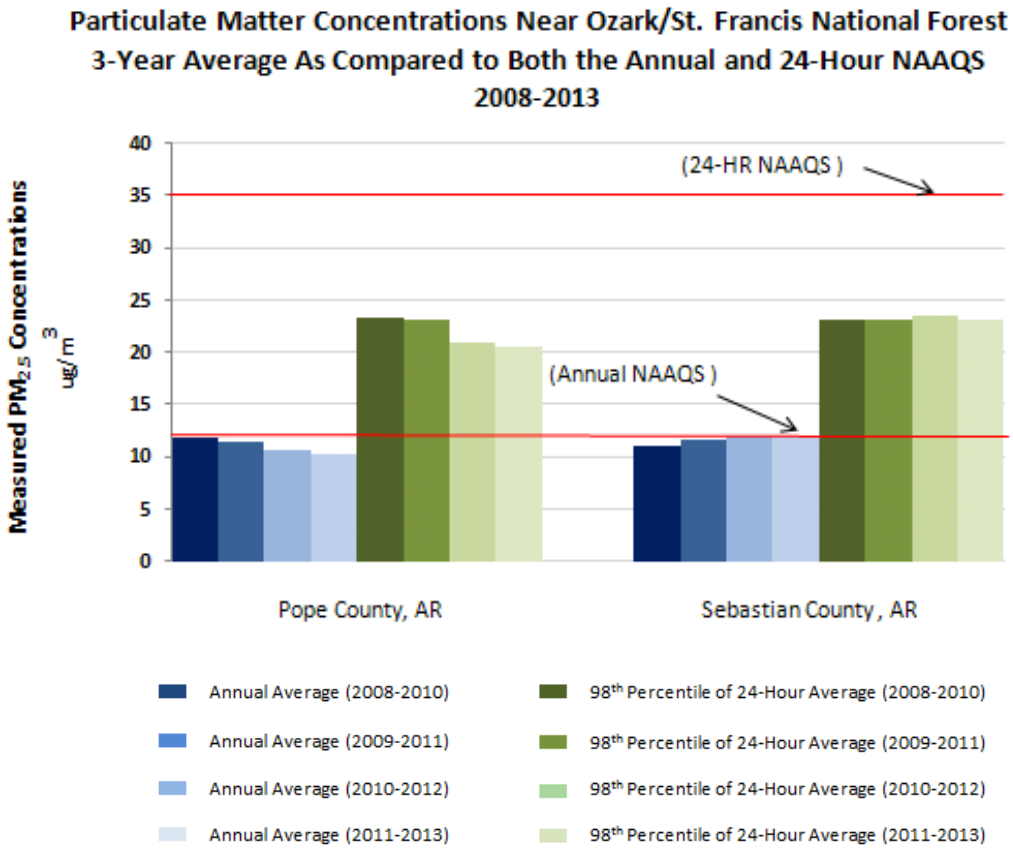

Figure 56: 3-year averages of Particulate Matter Concentrations near the OSFNFs from 2008 – 2013.

Ozone concentrations are also measured at several locations near the OSFNFs. The NAAQS is based on a 3-year average of the 4th highest 8-hour ozone concentration. Figure 57 shows the nearby ozone concentrations as compared to the NAAQS. The 3-year averages of ozone has recently risen in the past but in the 2011-2013 3-year average, data shows all sites recorded a decrease in ozone levels except for Sequoyah County; which shows a slight increase. Though most of the yearly averages are below the ozone National Ambient Air Quality Standards (NAAQS), both the 2010-2012 and the 2011-2013 3-year averages for Adair County, AR, are exceeding the NAAQS.

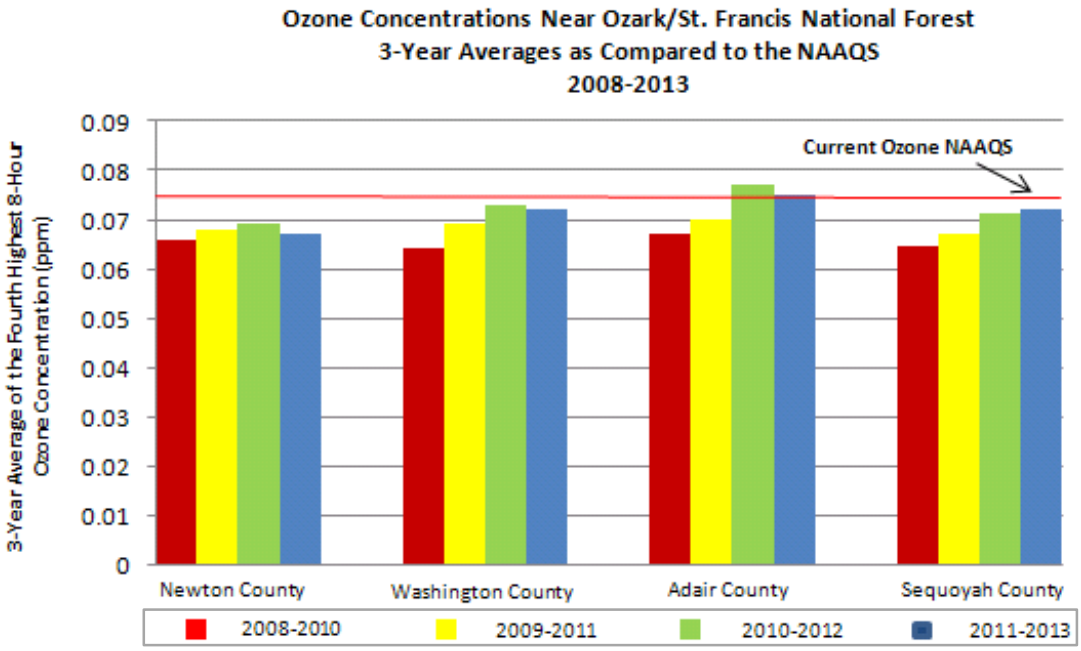

Figure 57: 3-year averages of Ozone Concentrations near the OSFNFs from 2008 – 2013.

The atmosphere is a complex mixture of gases and other compounds and some are considered air pollutants because they can decrease visibility and have an adverse impact to people's health or to forest and aquatic ecosystems. As the atmosphere moves across the landscape the air pollution can be deposited on the forest vegetation and soils. Scientists refer to this as dry deposition. Air pollutants can also travel though the atmosphere in the clouds and are deposited when it rains, or snows; this can be called wet deposition or acid rain. The third method of deposition is when fog or clouds intercept the landscape, especially the tops of mountains. The amount of acid compounds deposited from clouds can be far greater than from dry deposition or rainfall and snow. The primary compounds in the atmosphere that contribute to acidification of forested ecosystems are:

Sulfur compounds – Sulfur dioxide (SO_2) is converted in the atmosphere and forms sulfates and sulfuric acid. Sulfur dioxide is released primarily from coal-fired power plants.

Nitrogen compounds – Nitrogen oxides and ammonia (NH4) can increase nitrogen deposition. Most forests types respond favorably to nitrogen, which is usually limiting, except old growth spruce-fir ecosystems. Automobiles and utilities are the major sources of nitrogen oxides.

The deposition of acid compounds in high concentrations or for long time periods can impact forest nutrient cycling of base cations. Excessive removal of base cations from forest soils can lead to unhealthy vegetation, and poor water quality for aquatic biota.

Wet Sulfate: Deposition has decreased on average about 0.2307 kilograms per hectare (kg/ha) each year. The model is highly significant with less than 1 in 1000 cases where there is actually no relationship between the mean of the annual wet sulfate deposition as predicted by the years since 1983 and the mean of the annual precipitation. Overall, 81% of the variation in the estimated mean of the annual wet sulfate deposition can be accounted for with the two predictors. The multiple regression model and graphic for wet sulfate deposition is shown in Figure 58.

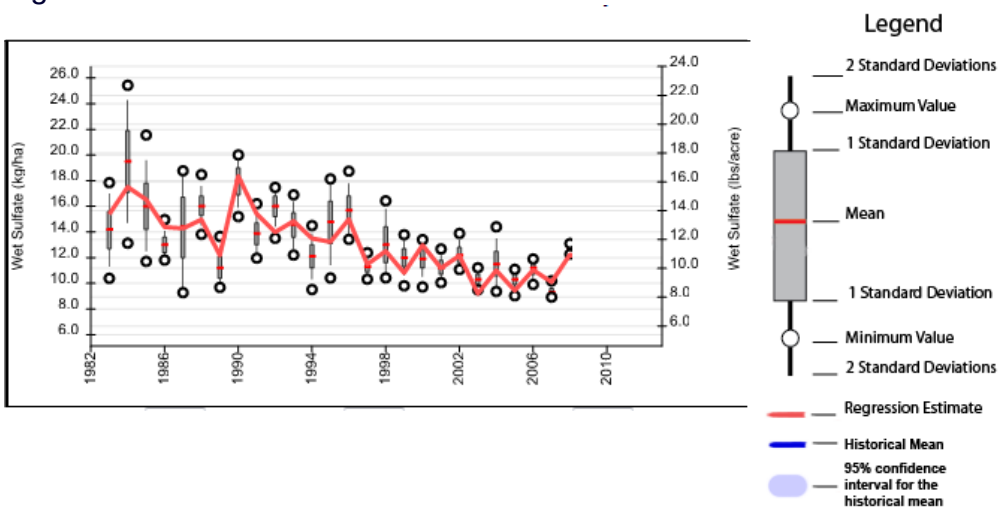

Figure 58: The Multiple Regression Model and Graphic for Wet Sulfate Deposition.

Wet Total Nitrogen: The wet total nitrogen trend could not be determined because one or more multiple regression assumptions were not met, or the coefficient for the year and/or precipitation predictor was not significant. Therefore, Figure 59 illustrates the historical mean of the annual wet total nitrogen deposition of 4.8 kg/ha with the true mean between 4.53 and 5.12 kg/ha for 95% the time.

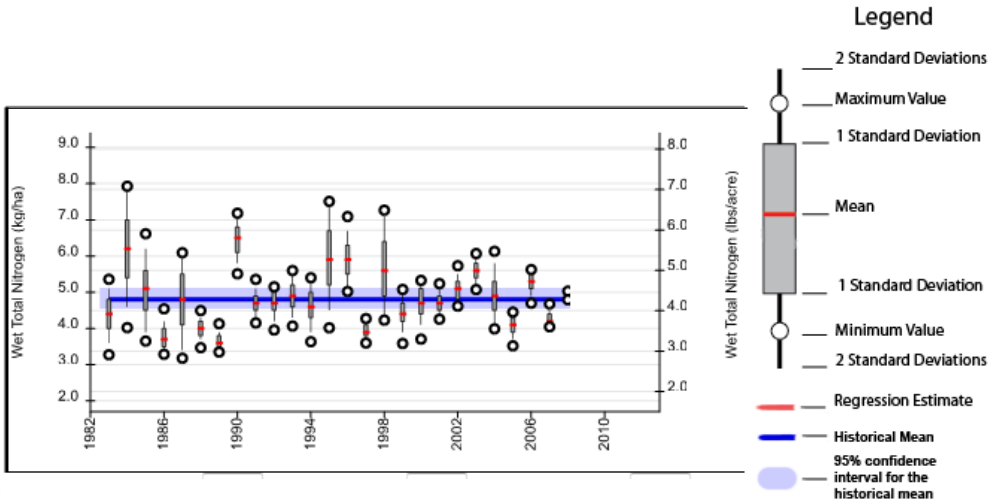

Figure 59: Historical Mean of Annual Wet Total Nitrogen Deposition.

PSD Permit Review. The Clean Air Act and its amendments designate specific wilderness areas and national parks as mandatory Class I areas, and these areas are provided special protection against degradation of air quality related values such as visibility. The OSFNFs manage one Class I area, the Upper Buffalo Wilderness. The Clean Air Act requires federal land managers with the "affirmative responsibility" to protect the air quality related values at these Class I areas, and to consider whether a proposed new or modified source of air pollution may adversely impact these values. The OSFNFs work with state regulatory agencies in Arkansas and Oklahoma to determine if new or existing industry will impact air quality at Upper Buffalo Wilderness through the Prevention of Significant Deterioration (PSD) permitting process. Table 20 shows the number of proposed new or modified sources that were reviewed over the past five years.

Table 20: Number of Proposed New or Modified sources Reviewed 2009-2013.

Prevention of Significant Deterioration (PSD) Permits Reviewed by the Ozark-St. Francis National Forests	
Fiscal Year	**Number of Permits**
2009	6
2010	3
2011	2
2012	5
2013	6

None of these proposed facilities were shown to cause an adverse impact to the Upper Buffalo Wilderness.

VISIBILITY

Visibility has been monitored at the federally mandated Class I Upper Buffalo Wilderness Area since 1993 following the Interagency Monitoring of Protected Visual Environments (IMPROVE) protocols (http://vista.cira.colostate.edu/improve/).

The Regional Haze Program relies on the haze index to track two different trends: visibility on the haziest days annually and on the clearest days annually. Both trends are measured beginning with the 2000-2004 "baseline" period. The haziest days are also compared to the goal of no manmade impairment in 2064. The haze index has a unit of measure called a deciview and a one unit change in a deciview may be noticeable under certain conditions. Higher deciview values correspond to hazier scenes. Figure 60 shows the clearest and haziest annual deciview values for the entire data record for the Upper Buffalo Wilderness Area. The red line represents the haziest day "glide path" connecting the baseline conditions to the 2064 goal, and is intended to be a guide in gauging progress at this Class I area. The 2008 through 2012 haziest 5-year average (of available

data) indicates the haze index is below the glide path; with 4 of 4 years below the red line. On the clearest days, the past 4 of 4 years of the clearest 5-year average (of available data) have been below the 11.71 deciview baseline (green line below).
(http://webcam.srs.fs.fed.us/graphs/vis/index.php)

Between 2008 and 2012, ammonium sulfate was the primary particle in the atmosphere contributing to the light extinction observed on the days classified with the haziest conditions. On the clearest days, ammonium sulfate was also the primary particle contributing to light extinction.
(http://webcam.srs.fs.fed.us/graphs/vis/index.php)

Haze Index Results **Legend**

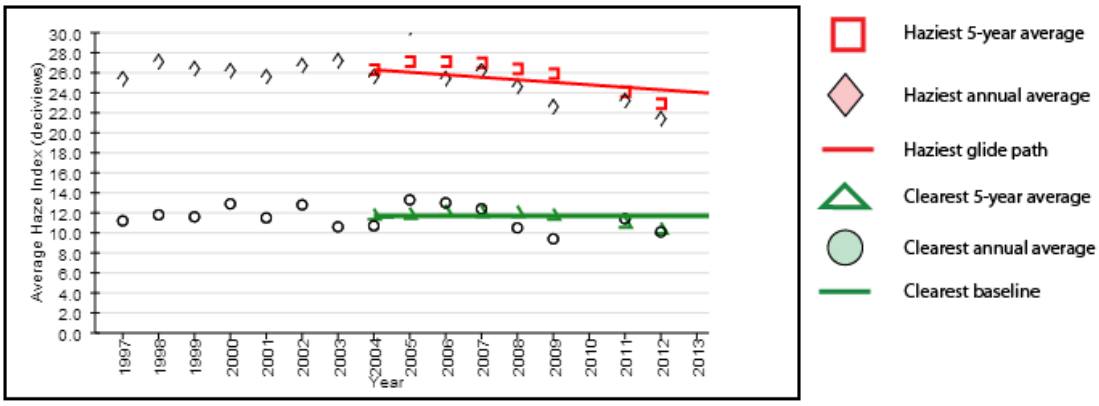

Figure 60: Haze Index Results Measured at the Upper Buffalo Wilderness Area.

FIRE

Prescribed Burning

All prescribed burns require an approved prescribed burn plan and must comply with the Clean Air Act and the Arkansas Voluntary Smoke Management Program (http://www.frames.gov/rcs/13000/13888.html)

Agency requirements for conducting prescribed burns identify specific weather conditions (parameters) that must be met prior to burning. Planning efforts include picking wind directions to avoid negatively impacting smoke sensitive sites and notifying the public of impending burns. Simple smoke screening is done to determine potential downwind impacts. (A model for simple smoke screening can be found at (http://shrmc.ggy.uga.edu/smoke/)

Other, more complex models such as VSMOKE
(http://webcam.srs.fs.fed.us/tools/vsmoke/index.shtml)
and HYSPLIT (http://www.arl.noaa.gov/ready/hysplit4.html) are used to model smoke from planned prescribed burns.

The Arkansas-Oklahoma Interagency Coordination Center (AOICC) provides detailed mapping and tables of information for each planned Forest Service burn. This site includes archives back to calendar year 2005.
(http://www.fs.fed.us/r8/ouachita/fire/index_aoicc.shtml)

Archived tables of prescribed burn locations, sizes, and names can be found at
(http://www.fs.fed.us/r8/ouachita/fire/rx_information_archive.shtml)

A toll free number is provided (**1-888-243-1042)** with daily messages detailing who is burning and location of the burn. Additionally, individual ranger districts maintain a "call-up" list of people wanting to be notified of local prescribed burns. Media (newspapers and radio), sheriff's departments, and volunteer fire departments are also contacted prior to burning.

Smoke is monitored at near real-time through use of websites such as
(http://adds.aviationweather.gov/satellite/)
and (http://www.firedetect.noaa.gov/viewer.htm)

Archived smoke plumes as detected from satellites from prescribed burns and other federal and non-federal sources (including wildfires) can be found via use of NOAA's website above.

Real-time ambient monitoring can be done via the use of
(http://www.airnow.gov/), or when available, real-time reading from EBAM or E-Sampler $PM_{2.5}$ monitors. Archived emissions monitoring information can be extracted from these sites also.

Visibility monitoring is done using aircraft during burns or sometimes via webcams found at sites such as:(http://www.fsvisimages.com/upbu1/upbu1.html)
or (http://www.wunderground.com/webcams/index.html)

There were very few smoke-related incidents attributable to FS prescribed burning between Oct. 1, 2008 and October 1, 2013. Smoke impacts for these incidents were moderate in intensity and short-lived - lasting only a few hours. While not all the smoke that affected communities came from FS burning, it is probable that some did.

During the monitoring period, no prescribed burns conducted by the FS are known to have negatively affected any regulatory-related federal or state smoke monitors contributing to higher-than-average hourly or daily $PM_{2.5}$ emissions.

Fire Management activities across the OSFNFs are relatively stable with a general trend of 15 to 30 wildfires occurring annually burning an average of 862 acres in the past 6 years (Table 21), with the majority of those being human caused. Lightning activity as a source of fire ignition plays an important but relatively small role in fire cause.

Table 21: Acres of Wildland Fires on the OSFNFs from 2008 – 2013.

Objective or Activity	Unit of Measure	2008	2009	2010	2011	2012	2013
Wildland Fire	Acres	285	1,221	273	626	2,459	309

The objective to treat 50,000 to 100,000 acres of the OSFNFs with prescribed fire for hazardous fuels reduction is usually reached as shown in Table 22. However, this does not achieve the level to treat the management areas or communities with the return frequency desired. All opportunities to increase treatments are utilized. By partnering with the state agencies, non-government organizations, and private land owners through agreements, landscapes and benefits are being achieved on a landscape scale crossing agency boundaries. Treatment activities across the Forests to move landscapes toward desired conditions through prescribe burning, mechanical methods, and integrated activities have remained fairly constant the last few years. We would expect this trend to continue.

Table 22: Acres of Prescribed Fire on the OSFNFs from 2008 – 2013.

Objective or Activity	Unit of Measure	2008	2009	2010	2011	2012	2013
Prescribed Fire	Acres	63,376	53,140	65,058	38,351	51,879	47,006

Effects of the fuels treatment program have resulted in gains toward restoration of ecosystems, reduction in risk of unwanted wildfires, and wildlife habitat improvement. Legal mandates, congressional intent expressed in annual budgets, natural disturbance events, and other issues or factors beyond the control of the fire program influence performance. Opportunity to move toward desired conditions through the management of wildfires for multiple objectives has been increased.

At the time the RLRMP was approved, wildland fire was a general term describing any non-structure fire that occurs in the wildland. Wildland fire was categorized into three types:

- **Wildfire** -- Unplanned ignitions or prescribed fires declared a wildfire. All wildfires had to be managed with the single objective of controlling/confining the fire so as to provide protection to public and firefighters, and limit damages to the extent possible.
- **Fire Use Fires** – Unplanned ignitions ignited from natural sources managed to achieve resource benefit objectives.
- **Prescribed Fires** – Planned ignitions to achieve resource goals, objectives, and benefits

On Feb 13, 2009, the Fire Executive Council (FEC) approved guidance for implementation of federal wildland fire management policy. By direction of the Wildland Fire Leadership Council, this guidance provides for consistent implementation of the *Review and Update of the 1995 Federal Wildland Fire Management Policy* (January 2001) The guidance still defines wildland fire as a general term describing any non-structure fire that occurs in the wildland, however, the policy now directs that only two categories of wildland fire exist.

- **Wildfires** – Unplanned ignitions and prescribed fires declared a wildfire.
- **Prescribed Fires** – Planned ignitions.

Furthermore, it clarifies, directs, and recognizes that:

- A wildfire can be managed for more than one objective,
- Objectives can change as the fire spreads,
- Objectives are affected by changes in fuels, weather, topography, and involvement of other government jurisdictions having differing missions and objectives.

All responses to wildland fire are based on objectives and constraints in the RLRMP.

Two design criteria in the RLRMP are:

- Forest-Wide Standard 162 which permits fire use,
- Management Area Standard MA1.A-13 which prohibits the use of prescribed fire in wilderness.

The RLRMP priorities for fire suppression strategy are to:

- Suppress wildfire at a minimum cost providing for firefighter and public safety while considering benefits as well as values at risk,
- Use a full range of suppression tactics consistent with forest and resource management objectives and direction,
- Manage natural ignitions to accomplish resource management objectives, as outlined in the Fire Management Plan except in Wilderness (RLRMP page 2-26)

It is reasonable to assume that since the RLRMP permitted fire use, managing wildfires for multiple objectives would also be permissible. It is recommended to include a short statement to add clarity to these changes in policy and wildfire categories. “Due to changing guidance and national policy, wildfires occurring in Forest Management Areas that allowed Fire Use will be managed following the most up-to- date guidance for implementing wildland fire management policy.”

Emerging Issue

Burn Policy on Natural Ignitions in Wilderness

One priority for wilderness management in the RLRMP is to "Protect and manage wilderness to improve the capability to sustain a desired range of benefits and value so that changes in ecosystems are primarily a consequence of natural processes." The change in fire management policy broadens the ability to use wildfire to improve the capability of the wilderness to sustain the desired range of the ecosystem, while the RLRMP does not manage natural ignition sourced fires in wilderness. The requirement to suppress fires in wilderness greatly limits the probability of a wildfire event functioning to maintain the wilderness qualities. The source of ignition for much of the fire that shaped this ecosystem relied on human caused fires, which by policy must be suppressed.

Management Implications and Recommendations

It is recommended to evaluate a possible plan amendment to allow managing naturally occurring wildfires in wilderness for resource management objectives, as well as allowing the use of prescribed fire to enhance wilderness values inside the Ozark National Forest Wilderness Areas.

SMOKE

Wildland and prescribed fires produce smoke. Smoke from prescribed burning is a problem when it creates an annoyance, nuisance, or negatively affects human health and safety. Managing smoke production from prescribed fires is one of the biggest challenges for fire managers. Through scientific modeling and developed smoke management guidelines, we are able to predict smoke production. Additionally, smoke production is monitored capturing particulate matter $_{2.5}$ ($PM_{2.5}$) measurements using portable real-time beta gauge monitors traceable to EPA requirements. Two portable Environmental Beta Attenuation Mass Monitors (EBAMS) are used across the Forests to gather real time information pre-burn, during burns, and post burns.

To manage impacts of smoke, the Forests have agreed through regional guidelines to follow Arkansas' State Department of Environmental Quality smoke guidelines in the planning and implementation of prescribed burns. The guidelines use reference weather data to determine a daily category rating (allowable smoke production) for each air shed in which a prescribed burn is being conducted. The total number of acres allowed to be burned each day in an air shed is based on fuel loadings and fuel types. Regional Prescribed Fire Manual guidance allowed for variance waivers to the state guidelines, as the state's position was that we were voluntarily following the guidelines, and they had no jurisdiction. In previous years, this amounted to about 10% of prescribed

burns being conducted with regional waiver approval. The Regional Forester plans to delegate the waiver process to the Forest Supervisor level.

Prescribed burning to manage wildlife habitat improvement vegetation for restoration, fuel reduction, and health and safety for employees and the public is a common and accepted practice.

CONDITION CLASS (CC) IMPROVEMENT

Prescribed burns are conducted to meet a variety of resource objectives. These site-specific objectives are documented in either the Prescribed Burn Plan and/or in environmental assessments associated with compliance to NEPA. Burning has the potential to help restore ecological conditions to approximate reference conditions [with vegetation composition and structure similar to those estimated for the pre-settlement (pre-Columbian) landscape]. Typical reference conditions for the Interior Highlands are documented in (http://www.landfire.gov and http://www.frcc.gov).

A Condition Class 1 (CC1) is one closest to the reference condition while a CC3 represents the most "highly departed" of landscape conditions. The vast majority of prescribe burns conducted during the monitoring period improved (lowered) condition class with perhaps 50%-60% of the burns lowering condition class quantitatively from CC3 to CC2.

WILDLAND URBAN INTERFACE (WUI)

The WUI is variously defined as that area of urbanized (or rural) development adjacent to wildlands. For purposes of monitoring, this is designated as the area involving private lands with human improvements (homes, buildings etc.) within one-half (½) mile of the Forest Service administrative boundary.

Table 23 shows estimated acres treated with fire or other means that reduce wildfire risk within one-half (½) mile of the Wildland Urban Interface.

Table 23: Wildland Urban Interface Acres Treated with Fire, 2006 - 2013

WUI Acres Treated with Fire		
Year	**Total # of Burns**	**Estimated Acres W/I .50 mi. WUI**
2006	24	49,057
2007	41	64,519
2008	62	48,647
2009	61	44,757
2010	61	46,191
2011	36	25,720
2012	35	52,748
2013	45	57,217

COMMUNITIES AT RISK AND FIREWISE COMMUNITIES

Communities at risk are federally identified communities in the WUI where the risk of wildfire could pose a significant threat. There are 18 such communities found adjacent to FS land on the OSFNFs.

Firewise communities are recognized through state and federal certification for their efforts to mitigate the risk of wildfires through specific mitigation projects conducted by homeowners. Information on Arkansas Firewise Communities can be found at (http://www.arkansasfirewise.com/)

NATIVE AMERICAN FIREFIGHTER PROGRAM

The Native American Firefighter Program was conceived by the OSFNFs and began in 1988. This program jointly administered by the OSFNFs and Oklahoma Native American Tribes (Apache Tribe, Caddo Nation, Cherokee Nation, Choctaw Nation, Iowa Tribe, and Otoe-Missouria Tribe) involves the recruitment, training, and mobilization of hundreds of Native Americans representing federally-recognized tribes. These trained crews are dispatched to wildland fires and other regional and national disasters where they provide critical manpower.

The salaries earned by this workforce contribute significantly to local economies in rural areas of Oklahoma.

Over the last 5 years this program has trained hundreds of fire fighters and sent out over 20 crews that have impacted many incidents.

In 2006, Participating Agreements were established with the six tribes/nations in Oklahoma and the OSFNFs. These agreements allow the Tribal firefighters/members to participate in Forest projects, which include but are not limited to, Heritage Resource surveys, Prescribe Burning, Recreation construction and maintenance, trail construction and maintenance, etc. Each year, these agreements have provided several weeks of work for the Tribal firefighters/members outside the normal wildland fire season.

The Caddo Nation was the first to become qualified as Heritage Resource surveyors and have since surveyed thousands of acres on the OSFNFs, Ouachita NF, National Forests and Grasslands in Texas, Kisatchie National Forest in Louisiana and on the Bugaboo Fire in Florida.

LANDS AND SPECIAL USE PERMITS

Table 24 shows the Lands and Special Use items that are tracked. The amount of work accomplished depends upon funding for that item each year.

Table 24: The Lands and Special Use Items that are Tracked.

Lands and Special Use Items Tracked on the Ozark-St. Francis NFs									
#	Lands/Special Use Item	2006	2007	2008	2009	2010	2011	2012	2013
1	Land for Land Exchange (total acres)	40	572	0	41.3	517	0	0	80
2	Tripartite Exchange	80	0	255	40	0	0	0	0
3	LWCF Purchase	80	19.7	0	0	87	80	0	35
4	Small Tracts Act,	-1.19	0	0	0	0	0	0	
5	Administrative Site Conveyance	0	1	0	0	0	0	0	0
6	Change in Public/Private Land Interface	-3.3	-5.25	-3.5	-0.5	-6	-1.25	0	-2.75
7	Miles of Landlines Maintained	11.8	26.28	36.1	4	139	166	147	35
8	Miles of Landlines Established	4.8	68.05	132	127.6	11.13	38	18	25
9	Trespass Cured/Title Claims	12	16	9	10	15	9	11	7
10	Special Use Permits Administered to Standard (Recreation)	78	89	89	145	64	93	93	73
11	Special Use Permits Administered to Standards (Lands)	419	524	511	528	533	511	509	378
12	Rights-of-Way Secured (Donation or Purchase)	3	1	1	2	3	1	1	0
13	Rights-of-Way Secured (Land Adjustment)	1	3	1	0	2	0	0	0

Note:

1- 2013 – Tri-County Exchange total acres (private & Federal side).
2- Tripartite Exchange is land purchased with excess timber receipts.
3- 2013 – Enos Purchase – Land & Water Conservation Funds from Prior Year;
6- Boundary reduction accomplished through acquisition/exchange of land; reduces urban interface within the Forests.

Management Implications and Recommendations

Previous monitoring reports recommended that the Forests drop the Corners Maintained and the Corners Set from future Monitoring & Evaluation Reports because the important unit of measure is miles of boundary marked/maintained on the ground and not the number of corner monuments (which can range from two per mile for a public land survey to one per hundred feet for a metes and bounds survey).

MINERALS (NATURAL GAS)

Mineral Leasing and Development Summary

Minerals activity is dependent on market values for gas and estimated potential to drill producing wells. Table 25 summarizes the minerals activities which were approved from 2005–2013 during the first eight years of the RLRMP for the OSFNFs. Activity on the Forests appears to be increasing.

Table 25: Mineral Leasing & Development Summary from 2006 to 2013.

Mineral Leasing & Development Summary										
#	Minerals Activity	2006	2007	2008	2009	2010	2011	2012	2013	Average Per Year
1	Acres on Title Reports submitted to R.O. for submission to BLM (Leasing)	238,000	87,000	90,000	115,000	170,000	145,000	0	0	105,625
2	Notices of Intent (Seismic)	1	3	0	0	0	0	0	1	<1
3	SUPO portion of Applications for Permits to Drill (APD's) or Operating Plan (Reserved/ Outstanding Rights) approved	0	8	16	26	12	9	0	0	10.1
4	Producing wells administered to standard	51	57	63	79	92	90	89	81	74

Note:

1- **Acreage submitted on Title Reports to BLM is for all federal lands within an entire township; in most cases a portion of the land is already under lease.**
2- **Seismic proposals can be for 2-D or 3-D, and sizes can vary from a few miles linear, to thousands of consecutive acres on a single proposal.**
3- **Approved wells are not always drilled in the year they are approved and may not be drilled at all.**
4- **Well locations continue to be inspected beyond the Plugging & Abandonment (P&A) procedure to ensure all surface reclamation is to Forest Service standards prior to releasing the operator from liability; these numbers do not reflect the number of producing wells on the Forest; 100% of operations have been inspected a minimum of one time each fiscal year.**

During the first eight years of RLRMP implementation:

- Forests noted potential increase in activity through actions being taken east of the Forests and through meetings with operators.
- Forests requested new Reasonably Foreseeable Development Scenario (RFDS) from BLM in 2007; RFDS received in 2009 from BLM.
- Changed Conditions Analysis (CCA) was performed by forest specialists based on new information disclosed in RFDS. BLM was a cooperator in analysis process.
- Supplemental Information Review (SIR) was completed based on CCA. SIR found no changes needed to Leasing Decision made in 2005 RLRMP/EIS.
- Forests participated with other federal & state agencies to create Best Management Practices (BMPs) for the Fayetteville Shale.
- The Forest currently employs two full-time Minerals Technicians and has three Certified Oil & Gas Specialists on staff with a fourth person working on certification.
- Mitigation standards were applied to projects and include implementation of standards from *The Gold Book*, Arkansas State Best Management Practices, and the Arkansas Best Management Practices for Fayetteville Shale Natural Gas Activities. These are applied to 100% of the locations proposed as they apply.

Management Implications and Recommendations

The Forests should continue to work with lease holders and others concerned about natural gas development. Proposals for exploration, production and reclamation should employ the most reasonable and responsible methods possible.

The Forests have dropped the Notice of Staking (NOS-onsite completed) as a monitoring item from this and future M&E Reports as it has no bearing on actual proposals (APDs) received and does not show the actual projects being completed.

TIMBER FOREST PRODUCTS

In the process of managing communities and management areas for their desired future condition, there are products produced that benefit the public. One of the main products is wood used by industry for a variety of reasons.

Total timber volume harvested annually the last eight years has ranged from 91,313 ccf in 2008 to 153,059 ccf in 2011. Table 26 gives the approximate breakdown in harvest for the last eight years.

Table 26: Volume of Timber Harvested in ccf from 2008 through 2013.

Volume of Timber Harvested in ccf								
Harvest Type	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Hardwood sawtimber	16,226	15,556	17,838	27,417	21,872	41,326	20,996	9362
Hardwood small round wood	6,490	6,222	13,489	20,962	17,268	27,550	22,307	19023
Pine sawtimber	68,151	65,337	44,350	68,165	55,257	64,285	50,714	62,005
Pine pulpwood	17,308	16,593	15,636	23,800	20,721	19,898	17,718	20,920
Totals	**108,175**	**103,708**	**91,313**	**140,344**	**115,118**	**153,059**	**111,772**	**111,310**

Non-Native Invasive Species

The National Forests in the Southern Region began implementing a noxious and invasive weed strategy in June 1999 following the signing of national Executive Order 13112. The definition of a non-native invasive species (NNIS), based on Executive Order 13112, is an organism that:

- It is not native to the ecosystem under consideration, and
- Its introduction causes or is likely to cause economic or environmental harm or harm to human health.

The goal of the Southern Region NNIS program is to reduce, minimize, or eliminate the potential for introduction, establishment, spread, and impact of NNIS across all landscapes and ownerships. The Ozark-St. Francis RLRMP prioritizes NNIS survey, detection, evaluation, suppression, and prevention of infestation. The Plan's NNIS objective (OBJ.9) is to treat at least 200 acres per year for reduction or elimination of NNIS. During 2013, the OSFNFs have treated a total of 3,971 acres of NNIS plants and 39,000 acres of feral swine. Watershed level and other project level environmental assessments include NNIS control.

Recommendations:

- Develop district-wide programmatic NNIS environmental assessments to implement early detection rapid response. Watershed level environmental assessments limit NNIS management practices to the watershed boundary.
- Partnership with other organizations to establish a cooperative invasive species management area.
- Continue implementing national and regional invasive species strategies.

RANGE

Table 28 lists the active/vacant range grazing allotments on the OSFNFs. Closed allotments are not listed, as these are primarily the old woodland allotments and are not available for grazing. Vacant allotments are currently not grazed but may be in the future.

The following Monitoring Elements are identified in the RLRMP:

- Each year document the number of acres in allotments managed to standard.
- Every fifth year, evaluate rangeland condition and trends to determine progress toward the desired condition.

Allotments Managed to Standard

Table 27 displays the current number of acres that are managed to standard. INFRA is the Database of Record. All active allotments have been fully managed to standard from 2006 to 2013 (there are no vacant or active grazing allotments on the Pleasant Hill Ranger District).

Table 27: Livestock Grazing Allotments on the OSFNFs.

Livestock Grazing Allotments on the Ozark-St. Francis NFs				
Allotment Name	**Ranger District**	**NFS Acres**	**Total Acres**	**Status**
Nature #16	Sylamore	45	45	Vacant
Middleton #17	Sylamore	30	30	Vacant
Landers #18	Sylamore	50	50	Vacant
Dorsey #19	Sylamore	216	216	Inactive
White River #20	Sylamore	32	32	Vacant
Bonanza #21	Sylamore	25	25	Vacant
Gee #21	Big Piney	8265	8818	Active
Hefley #9	Big Piney	9162	12084	Active
Natural Dam No. 26	Boston Mountain	120	4100	Vacant
Wedington No. 1	Boston Mountain	117	4097	Active
Wedington No. 3	Boston Mountain	4033	4033	Active
Wedington No. 4	Boston Mountain	66	4046	Active
Wedington No. 5	Boston Mountain	47	4027	Active
Wedington No. 6	Boston Mountain	9574	12101	Active
Wedington No. 7	Boston Mountain	508	4488	Vacant
Wedington No. 8	Boston Mountain	368	4348	Active

Table 27 (Continued): Livestock Grazing Allotments on the OSFNFs.

Livestock Grazing Allotments on the Ozark-St. Francis NFs				
Allotment Name	**Ranger District**	**NFS Acres**	**Total Acres**	**Status**
Wedington No. 9	Boston Mountain	244	4224	Vacant
Wedington No. 10	Boston Mountain	84	4064	Vacant
Wedington No. 11	Boston Mountain	176	4156	Active
Wedington No. 12	Boston Mountain	247	4227	Active
Wedington No. 13	Boston Mountain	100	4080	Vacant
Wedington No. 16	Boston Mountain	26	4006	Active
Mountain Fork No. 6	Boston Mountain	0	0	Vacant
Range hollow No. 8	Boston Mountain	42	4022	Active
Blackburn No. 10	Boston Mountain	110	3638	Active
Hurricane No. 19	Boston Mountain	90	3618	Vacant
Frog No. 20	Boston Mountain	5467	5467	Active
Sunset No. 21	Boston Mountain	37	4017	Active
Cedar Creek #15	Mt. Magazine	123	123	Active
Briar Creek #13	Mt. Magazine	5	5	Active
Ranger Station #1	St. Francis	117	1699	Vacant
Hattie #2	St. Francis	105	1687	Active
Summer Home # 3	St. Francis	115	1697	Active
Bear Creek #4	St. Francis	44	1626	Vacant
Taylor #5	St. Francis	260	1842	Active
Mulehead #8	St. Francis	40	1622	Active
Total		**38,646**	**118,360**	

Rangeland Condition and Trend

All allotments, with few exceptions, have either stable to improving ecological condition and are either at, or moving toward, desired conditions. Any ecological problems that arise are usually temporary and relatively minor and can usually be solved by adjustments in number of livestock, changes in class of livestock, modifications to the season of use, or adjustments to distribution patterns.

In addition to the periodic monitoring of allotments by ranger district personnel, each year all the allotments on a single ranger district are monitored through Functional Assistance Trips (FATs). These trips/meetings are conducted by the Supervisor's Office Ecosystem Staff and appropriate ranger district staff. These trips consist of two days of monitoring. The first day, range file folders are reviewed for compliance and completeness. Range folders include the 2210 and 2230 folders. These include NEPA documentation records, a review of administration procedures, inspections completed on the ground, and numerous other things involved in the management of grazing allotments. The second day is spent in the field to view actual field conditions of the allotments. Following these monitoring procedures, a report and recommendations are provided by the staff to ensure that allotment administration and the range resources are properly functioning.

FACILITIES

Health and Safety

There is a culture of safety that is nurtured within the Forest Service. Health and safety considerations are built into all projects and jobs performed on National Forest lands. For example, projects that address health and safety concerns are top priority to be funded each year.

Safety training is offered through AgLearn and recorded in each employee's personal training file. The Safety and Health Information Portal System (SHIPS) is used to record personnel/vehicle accidents.

Management Implications and Recommendations

It is recommended that the Forests continue to nurture safe procedures. All projects and jobs should consider safety of the workforce and the public. Having Health and Safety as a separate monitoring item should not be necessary.

Energy Efficient Upgrades and Accessibility

Region 8 awarded an Energy Savings Performance Contract (ESPC) to Honeywell on December 13, 2013. Included in the contract was the Sylamore Ranger District's Visitor Information Center (VIC) at the Blanchard Springs Cavern. Energy conservation measures include replacing lighting fixtures, re-lamping and re-ballasting in the VIC, Exhibit Hall and Bus Stop buildings. Installation was completed the last week in March.

The ESPC allows us to use private capital for projects that improve our energy efficiency, reduce greenhouse gas emissions and save money by lowering electric bills. This will help meet the energy reduction goals for our Agency set forth by Executive Orders and Statues.

Facilities Master Plan

The current 2003 Facility Master Plan will be updated in 2013/2014. It is used as a guide to the continued use, maintenance, improvement, and disposal of Forest Service facilities on the districts in support of their administrative needs and functions.

Management Implications and Recommendations

A statement should be added to the RLRMP recognizing the most recent Facility Master Plan as the guide to follow in carrying out the RLRMP.

TRANSPORTATION AND PUBLIC ACCESS ROAD CHANGES

Road Closures from Storm Events

Unusual and severe storm activity from 2008 through 2011 caused significant damage across the Forests. These storms came in the form of series of heavy rainfall events, followed by ice storms, and followed again by multiple rainfall events. Most heavily hit were the Boston Mountain, Pleasant Hill, and Big Piney Ranger Districts. Repairs continued through 2013.

Road Mileage Totals

The overall total miles of Forest Service roads have decreased since 2006 as well as the miles of road open for public use. The total is increased over the FY 2012 totals. The Forest is in the process of a Forest Wide Travel Analysis Plan which has included some administrative adjustments to the IWeb database as field verification of Operational Maintenance Level (OML) 1 roads and some OML 2 roads have been done. Some OML 1 roads have been re-categorized as OML 2, administrative use only.

Table 28 shows the number of roads on the Forests for the years 2006, 2012 and 2013. This shows the overall number of roads as well as the number of roads available to motorized vehicles has decreased since 2006. This trend correlates with the RLRMP directive to reduce the total number of open Forest Service maintained roads.

Table 28: Roads on OSFNFs in FY2006, FY2012, and FY2013.

Operation Maintenance Level	FY2006 Miles	FY2012 Miles	FY2013 Miles
1 - Basic Custodial Care (Closed)	2,689	3,000	2,985
2 - High Clearance Vehicles	2,941	2,620	2,679
3 - Suitable For Passenger Cars	230	167	158
4 - Moderate Degree Of User Comfort	67	28	28
5 - High Degree Of User Comfort	23	21	20
Total Road Miles	5,950	5,836	5,870
Open Roads (2,3,4,5 above)	3,261	2,836	2,885

Table 29 shows how Forest Service roads compare in numbers with other local road authorities. (Note - Forest Service miles includes closed roads.)

Table 29: Comparison of FS Roads with other Local Authorities in FY 2006, FY2012 & FY2013.

Roads by Jurisdiction	FY2006 Miles	FY2012 Miles	FY2013 Miles
C - County, Parish, Borough	1,350	1,385	1389
FS - Forest Service	5,950	5,836	5,870
L - Local	6	2	2
P - Private	31	53	58
S - State	418	429	431
Total Road Miles	7,755	7,705	7,750

Road Maintenance

A total of 384 miles of open road received maintenance in FY2013. Continuing budget cuts in all funding sources impact the level of road maintenance achieved annually. Twenty-two (22) miles of road received improvements.

Road Decommissioning

Table 30 shows miles of road decommissioned in 2013. The closing of 22 miles of road correlates with the RLRMP directive to remove and landscape unnecessary roads and reduce the number of unauthorized (previously known as unclassified) roads.

Table 30: Roads Decommissioned in 2013.

Roads Decommissioned	FY2012 Miles
System Roads Decommissioned	22
Unauthorized Roads Decommissioned	0.6

Management Implications and Recommendations

The recent Forest-Wide Travel Analysis Plan (TAP) has provided us with a database table of information from every discipline on every road that will help in the ongoing road analysis processes. The analysis provides information and guidance on consideration of the use and purpose of roads for the future based on the data collected. Continue to analyze and adjust the road system in NEPA documents with public input. Use the RLRMP, watershed assessment ratings, and the data collected for the recent Forest-Wide Travel Analysis Plan as guides while making road decisions.

OFF-HIGHWAY VEHICLES (OHV)

In 2008-2013, the Forests worked with the public to designate new OHV routes on the Forests. The result of this collaboration was an updated OHV system map (Traveling the Backcountry) that was completed in 2013.

The latest version of the Traveling the Backcountry includes almost 912 miles of designated routes on roads and an additional 160 miles of designated OHV trails for an approximate total of 1,072 miles. Traveling the Backcountry is posted on line at:
(http://www.fs.usda.gov/detailfull/osfnf/recreation/?cid=stelprdb5213804&width=full)

Management Implications and Recommendations
There is no need to change direction or policy at this time. The Forests should continue to work with trail riders and riding groups to provide safe and environmentally sound travel routes.

RECREATION AND VISUAL MANAGEMENT

SCENIC BYWAY

Plans Completed – No plans were completed in 2013.

Byway Areas Monitored – The Pig Trail Scenic Byway, Ozark Highlands Scenic Byway, Mulberry River Road Scenic Byway (estimated kiosk completion in FY2013-14), Arkansas Scenic 7 Scenic Byway, St. Francis Scenic Byway, Hwy 123 Scenic Byway, Mt. Magazine Scenic Byway, Sylamore Creek Scenic Byway, and the Sylamore Scenic Byway Extension were monitored during 2006 – 2013.

Management Implications and Recommendations
Complete Mulberry River Road Scenic Byway Plan and complete forest scenic byway nomination documentation for Mulberry River Road Scenic Byway (estimated completion in FY 2014).

WILD AND SCENIC RIVERS

Plans Revised – No plans were revised in 2013. The Mulberry River Assessment was completed in April 2010.

Change in Outstandingly Remarkable Values – There were no changes in values from 2006 - 2013.

Use Trend Change – Usage appears to be increasing over time. A counter was installed in FY 2012 to gauge visitation on the Mulberry WSR at Redding Campground canoe access point. Visitation was estimated to be approximately 24,500 from Dec-May 2013.

Visitor Satisfaction – Visitor satisfaction data was not collected in 2006 - 2013, but apparent increase in use may suggest user satisfaction increased. Increased scenic driving and sightseeing along the Mulberry River by motorcycle groups touring Highway 215 has increased visitation to Redding and Wolf Pen Recreation Areas and High Bank Access. Kayaking during storm events appears to have increased some in 2010-2013.

Management Implications and Recommendations
Schedule Wild and Scenic River Plan revisions. Eliminate visitor satisfaction as a meaningful measure due to difficulties in obtaining this type of information.

WILDERNESS AREAS

Non-Native Invasive Species (NNIS) Inventoried – Some field data was collected in 2007, however no entries were entered in data base.

Non-native Invasive Species (NNIS) Treated – No NNIS treatments were done in wilderness areas from 2006 - 2013.

Old Roads Reverting Back to Natural – Richland Creek and Leatherwood Wilderness Areas are experiencing significant impacts from unmanaged horse use, which is causing trammeling and erosion issues along old road corridors. Illegal trails are being built to connect the old roads together and to special points of interest. Upper Buffalo, East Fork and Hurricane Wildernesses are experiencing similar impacts, but to a lesser degree.

Resource Damage Monitored Using Limits of Acceptable Change – Wilderness air quality plan was completed, including monitoring of water quality as a surrogate for air quality. Water quality sampling took place in 2010 – 2013 and is scheduled for 2014. RLRMP limits group size to 12 (including stock and persons). Periodically, surveys of wilderness use will be done to determine if overuse is occurring.

Management Implications and Recommendations
Monitor and map NNIS occurrences and prioritize treatment needs. The Forests should fully fund on-going water quality sampling in wilderness areas as required by the new air quality plan (AQR).

OZARK HIGHLANDS TRAIL (OHT)

Miles of Trail Maintenance – The miles of maintenance to the Ozark Highlands Trail achieved by each district is displayed in Table 31. From 2006 to 2013, the Ozark Highlands Trail Association (OHTA) performed most of the maintenance on the OHT. Additional grant monies were obtained for maintaining the Hurricane Wilderness section of the OHT in FY2013-2014, which impacted overall trail maintenance accomplishment. Other volunteers were also used to maintain

various portions of the OHT. The first 6.1 miles of the OHT are on Lake Ft. Smith State Park and are managed by the Arkansas State Parks.

Table 31: Miles of Maintenance Performed by District on OHT from 2006 – 2013.

Miles of Maintenance to the Ozark Highlands Trail								
District	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Big Piney RD	57.1	57.1	68.4	68.4	66.4	5.5	57.1	23.8
Boston Mountain RD	26.6	26.6	26.6	26.6	26.1	26.6	26.2	6.2
Pleasant Hill RD	68.4	68.4	68.4	68.4	69.1	74.4	69.7	18.7
Sylamore RD	16.7	15.6	32.0	32.0	31.0	31.0	31.0	31.0
Total Miles	168.8	167.7	195.4	195.4	192.6	137.5	184.0	79.7

Note: All OHT mileage distances were verified by INFRA database. These distances include OHT spur trails, which are managed to OHT standards, and the Sylamore section of the OHT.

Management Implications and Recommendations
Continue to monitor trail conditions and facilitate cooperation with various volunteer groups to maintain and improve the OHT trail network.

EXPERIMENTAL FORESTS

Research Projects Developed – No projects were developed in 2006 - 2013.

Data Collected or Analyzed – None.

Management Implications and Recommendations
Indiana bat habitat work is needed in the Sylamore Experimental Forest.

SPECIAL INTEREST AREAS

Management Plans Completed –
No special interest area plans were completed in FY2013.

Trends – In 2010-2013, overall use trends continued to be down due to past weather events that have contributed to vehicular access issues.

RESEARCH NATURAL AREAS

Research Natural Area Plan Priority – Priorities have not yet been established.

STATE PARKS

Visitor Satisfaction Related to the Partnership – Unknown.

Public Health and Safety through Permit – The annual state park inspections for Mt. Magazine State Park were completed in 2006 - 2013. In 2011 - 2013, the Mississippi River State Park annual inspection was done. Health and safety were addressed.

DEVELOPED RECREATION AREAS

Visitor Satisfaction – Visitor satisfaction data was collected in 2005 and 2010 using the National Visitor Use Monitoring (NVUM) program. Additionally, fee envelope comments and recreation area user contacts show visitor satisfaction remains high.

Public Health and Safety – All recreation sites are inspected annually before each major recreation season (March or April).

Rotary Ann Rest Stop on Arkansas Scenic 7 Byway continues to provide the only free FS public restroom facilities along the length of Arkansas Highway 7.

Management Implications and Recommendations
Drop visitor satisfaction as a measure due to difficulties in obtaining this type of information. Continue to improve existing developed recreation area infrastructure. Continue to do health and safety inspections and follow-up treatments.

RLRMP RECREATION PRIORITIES

WILDERNESS

Priority One - Protect and manage wilderness to improve the capability to sustain a desired range of benefits and value so that changes in ecosystems are primarily a consequence of natural processes. Protect and manage the areas recommended for wilderness designation to maintain their wilderness values.

- In 2013, AQM monitoring was completed in both the Leatherwood and Upper Buffalo Wilderness Areas. In FY 2012, grants were obtained to survey all dispersed recreation sites and trails on the Forest. Upper Buffalo, Hurricane, East Fork, and Leatherwood Wilderness Areas on the OSFNFs were inventoried. In FY 2013, Richland Creek Wilderness had all dispersed recreation sites and trail inventoried.
- In 2014, AQM monitoring is planned for the Upper Buffalo Wilderness Area.
- In 2012, two visitor monitors were installed at key access points, on the Hurricane Wilderness and Richland Creek Wilderness Areas. In 2014, a monitor may be installed on the Upper Buffalo Wilderness and Leatherwood Wilderness Areas.

Management Implications and Recommendations
Monitor visitor use and take appropriate management actions to limit degradation of the wilderness following Limits of Acceptable Change (LAC) guidelines. Install monitors to capture visitor use trends at major access points.

Priority Two - Update all wilderness management plans, including monitoring components, wilderness education, and restoration needs. Original plans were signed in 1990.

- Plans were not updated in 2006 - 2013.
- Wilderness education plan was complete in 2011 and is being implemented.

The Forests participates in the 10-year Wilderness Stewardship Challenge. Table 32 shows the Stewardship Challenge Scores for each wilderness area for 2006 - 2013.

Table 32: Wilderness 10-Year Stewardship Challenge Scores for 2006 – 2013.

Wilderness Stewardship Challenge Scores								
Wilderness Area	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
East Fork	45	56	56	56	58	59	61	61
Hurricane Creek	45	56	56	56	58	59	61	61
Leatherwood	47	56	56	56	58	59	61	63
Richland Creek	45	56	56	56	58	59	55*	61
Upper Buffalo	45	56	56	56	58	59	61	61

***In FY 2012 Dispersed camping sites and trails inventories were not completed in the Richland Creek Wilderness. Planned completion is in FY 2013. Baseline AQR samples were completed in the Leatherwood Wilderness.**

Management Implications and Recommendations
Update plans as funds are available. Work toward meeting the 10-year wilderness challenge stewardship guidelines (60 is a passing score). The information page for the Wilderness Challenge is at (http://www.wilderness.net).

Priority Three - Prohibit mining claim locations under the General Mining Law of 1872 in Designated Wildernesses (MA 1.A)

- No wilderness mining claims were processed in 2006 - 2013.

Management Implications and Recommendations
There is no need to monitor this item. It is standard procedure to deny mining claims in Ozark National Forest wilderness areas.

RLRMP Recommended Wilderness

Priority One - Complete landline surveys on newly recommended wilderness boundaries. Boundaries would be ready for use as boundary postings after congressional designation.

- Landlines were not surveyed for recommended wilderness in 2006 - 2013.

Management Implications and Recommendations
Annually prioritize surveying budget and survey proposed wilderness boundaries as budget allows.

DESIGNATED WILD AND SCENIC RIVER

Priority One - Manage designated wild and scenic river sections to perpetuate their free-flowing condition and designated classifications, and to protect and enhance their outstandingly remarkable values and water quality. (http://www.rivers.gov/).

- This requirement was followed in 2006 - 2013.

Management Implications and Recommendations
Drop this monitoring item. This requirement is covered in Priority Two (below) on an individual river basis.

Priority Two - Manage designated wild and scenic rivers in accordance with their Comprehensive River Management Plan.

- Comprehensive management plans were followed in 2006 - 2013.
- A Section 7(a) analysis for the Ft. Douglas Stream Bank Restoration Project on the Big Piney Wild & Scenic River was initiated in FY 2013. Anticipated approval in FY 2014.

Management Implication and Recommendation
Continue to follow Plan direction.

Priority Three - Review public access needs.

- Big Piney Canoe Launch alternative access point evaluation will begin in 2013.
- Big Eddy Canoe Launch access points evaluations were started in 2012.

Management Implications and Recommendations
Follow river management master planning and provide additional access as funding sources are provided.

Priority Four - Prohibit mining claim locations under the General Mining Law of 1872 in designated wild sections of the Designated Wild and Scenic Rivers.

- There were no mining claims in 2006 - 2013.

Management Implications and Recommendations
Drop this as a monitoring requirement. Wild sections are classified as Withdrawn from mining leasing. It is standard procedure to restrict claims for these areas.

It is also standard procedure to follow the protocol listed on Table 2-12 (Page 2-83) of the RLRMP to regulate mining on Scenic and Recreational Sections of Wild and Scenic Rivers.

RECOMMENDED WILD AND SCENIC RIVERS

Priority One - For the newly recommended Wild and Scenic River (North Fork of Illinois Bayou River), a comprehensive river management plan and boundary declaration will be prepared and implemented within three years of congressional designation as required in the designation language.

- There was no activity toward congressional designation of North Fork of Illinois Bayou in 2013.

EXPERIMENTAL FOREST

Priority One - Protect and manage experimental forests to maintain them as a resource to be used to develop and disseminate scientific knowledge and silvicultural techniques needed to provide a full range of benefits to the OSFNFs and other Southern forests.

- There was no activity reported in 2013.

Priority Two - Continue to cooperate and assist the Southern Research Station to provide forest managers research data related to timber harvest, ecosystem management, prescribed burning, soil, water, and other related forestry and wildlife management activities**.**

- No research activities on the Forests were reported in 2013.

Management Implications and Recommendations
The Sylamore Experimental Forest contains important Indiana bat habitat zones. They are in need of habitat improvement. It is recommended that these bat zones be evaluated and treated.

RESEARCH NATURAL AREA

Priority One - Protect and manage research natural areas to maintain natural processes. Identify a sufficient range of opportunities to meet research needs. Compatible uses and management activities are allowed.

- No activities were reported in 2013.

SPECIAL INTEREST AREA

Priority One - Protect and manage each special interest area (SIA) for its unique qualities and features. Allow uses and management activities, including access, that complement or are subordinate to the unique qualities and features.

- No access facilities serving SIAs were constructed in 2013. High Mountain EA identified a need for better access to Buzzard Roost SIA, however, this SIA needs to have a management plan in place to identify and/or address these and other issues before any work can occur.

Priority Two - Within the planning cycle, develop management plans and monitoring protocols for existing SIAs. Management plans for SIAs will be developed before implementing project work.

- Twin Peaks SIA Plan was developed in 2012.

SCENIC BYWAY CORRIDOR

Priority One - Preserve view-shed quality when accomplishing other resource activities.

- All Districts incorporate view shed quality into NEPA for all proposed actions.

Priority Two - Develop public view points and interpretive opportunities.

- Overlooks and public view points are being maintained by the districts (FY2005-2013).
- Byway 215 (Mulberry River) Interpretation Project is progressing with an estimated completion in FY 2014.
- The Baseline Trail Project on the St. Francis Scenic Byway began in FY2011, estimated completion in FY2015.

Priority Three - Promote and manage the scenic byways within the Forests for the traveling public and the benefit of local communities.

- Mt. Magazine RD continues litter clean-up along a one-mile section of Scenic Byway 309 per Adopt-a-Highway agreement with Arkansas Highway Department.
- Scenic Byway is displayed in various brochures available to the public.

Priority Four - Work toward state or national scenic byway designation for all byways.

- There was no activity toward national scenic byway designation in FY2013.

Priority Five - Within one year of the approval of the RLRMP, establish a schedule to complete corridor plans for all scenic byways. Complete all plans in the first planning period.

- All scenic byway plans for all scenic byways on the Forests need to be reviewed and revised as necessary as a result of the adoption of the RLRMP.

OZARK HIGHLANDS TRAIL (OHT) CORRIDOR

Priority One - Maintain a forest trail system across the Ozark NF.

- OHT was maintained by Ozark Highlands Trail Association (OHTA), contractors, forest district employees, and volunteer groups in FY2006-2013.
- Additional work (16+ miles) of trail maintenance within the Hurricane Wilderness and the Richland Creek sections of the OHT was completed, using a National Forest Foundation grant obtained in FY2013.

Priority Two - Manage the Ozark Highland Trail to protect the trail experience, and to provide for the conservation and enjoyment of its nationally important scenic, historic, natural, and cultural qualities.

- The OHT was managed to provide for conservation and protection of visitors' experiences in 2013.

STATE PARKS

Priority One - Work with the state parks to provide interpretive information about forest management activities.

- The Mt. Magazine Ranger District provides the state park with brochures and recreation information. The district participates in state park events such as the Mt. Magazine International Butterfly Festival.

- Boston Mountain RD provides public info/brochures to Devil's Den State Park and Lake Fort Smith State Park.
- The St. Francis NF worked cooperatively with Arkansas Department of Parks to facilitate the transition of FS recreation facilities to the state for the creation of the Mississippi River State Park. In FY2010-2012, most developed recreation facilities on the St. Francis NF were transferred to the Mississippi River State Park. Additional facilities and trails will be transferred to the state park management in the future. Dedication of the Mississippi River State Park occurred May 16, 2013.

DEVELOPED RECREATION AREA

Priority One - Supply a variety of recreational facilities that are responsive to user demands.

- No new areas were added in 2007 – 2013. Shelton Point Shooting Range on the Big Piney RD is planned to be opened in FY 2014.
- Moccasin Gap Horse Camp and Richland Creek Campgrounds. underwent extensive renovations in FY 2013. Estimated completion dates in FY 2014.
- A defined parking area was developed near Falling Water Falls on the Big Piney RD.

Management Implications and Recommendations
Look into zoning recreation uses/areas and capacity assessments.

Priority Two - Operate developed recreation sites including campsites and picnic areas. Activities included in this endeavor are trash collecting, cleaning, maintaining equipment, monitoring water systems, and other activities associated with keeping the facilities clean, safe, and in good repair. These will continue to be managed utilizing meaningful measures standards or the appropriate Agency standards while stressing health and safety.

- All ranger districts on the Forests maintain the minimum standard for developed recreation site operations.

Management Implications and Recommendations
Request that a Regional Alignment Committee (RAC) meets to address proposals involving new fees as well as increases in current recreation fees. Costs are continuing to increase while budgets decrease.

Priority Three - Focus investments and improve the cost effectiveness of operating recreational facilities by using one or more of the following techniques where feasible: decommissioning underused sites, maintaining concessionaire

agreements, entering into management partnerships, and investigating other measures.

- Cove Lake and Spring Lake Rec. Areas on the Mt. Magazine RD are operated by a concessionaire.
- Mt. Magazine State Park is located on the Mt. Magazine RD by a management partnership.
- The Mississippi River State Park on the St. Francis NF is operated under a management partnership.
- Most of the Ozark Highlands Trail is maintained by the Ozark Highlands Trail Association, a volunteer organization, and some contracts.
- Solicitations for interpretive associations FY 2013, estimated organization selection and agreement signing in FY 2014.
- In FY2010, Fairview Campground (Big Piney RD) was submitted for decommission/conversion to a trail head, and approved.
- In FY2011, heavy rain flooded the Buckhorn Trailhead. It was approved for flood damage repair in FY2012. In addition, Natural Dam Day Use Area sustained significant water damage due to flooding. The site's facilities were reduced to minimize impacts from future potential flood events.
- In FY2011, all recreation sites on the Forests were evaluated for potential high water events.
- In FY2012, some recreation areas were evaluated for concessionaire operations.
- In FY 2013, Lake Wedington had a concessionaire operation in the beach bath house with minimal operations.

Priority Four - Focus developed recreation on the niche statement written during the recreation alignment process, which emphasizes water related day-use activities, scenic and wildlife viewing, and trail activities such as hiking, biking, horseback riding, and off-highway vehicle (OHV) riding. Overnight facilities will only be developed in support of the niche activities.

- Mill Creek High Priority Restoration project (trails and access points) will be completed in FY 2014.
- Moccasin Gap trail/campground improvement, reconstruction, and expansion projects were started in FY 2012 and will be completed in FY 2014.
- Baseline Trail construction on the St. Francis Unit was started in FY 2011, with an estimated completion in FY 2015.
- Richland Creek Campground remodel and restoration occurred in FY 2013 with an estimated completion in FY 2014.
- All districts report following the above focus for 2006 – 2013.

UPPER BUFFALO DISPERSED RECREATION AREA

Priority One - Maintain semi-primitive non-motorized management of activities.

- An EA with a signed decision notice, and acknowledgment of a formal trail development/designation process for 35 miles of user defined mountain bike trails within the Upper Buffalo Dispersed Recreation Area with an estimated completion date in FY2015. Some relocation and re-construction may occur.

  Management Implications and Recommendations
  Ensure all Allowed Trail Management (ATM) restrictions and design characteristics, including Forest Service Trail Accessibility Guidelines (FSTAG) are followed and add area to INFRA when complete.

WEDINGTON UNIT URBAN RECREATION AREA

Priority One – Provide urban recreation opportunities.

- District contracted with University of Arkansas to concession the area in 2006.
- FS reassumed management of Lake Wedington in 2008 and continues to manage the area (2008 – 2013).
- Lakeside trail was restored in summer of FY 2013

INDIAN CREEK DISPERSED RECREATION AREA

Priority One - Provide a combination of semi-primitive, non-motorized, and motorized management activities.

- Forest activities within Indian Creek Dispersed Recreation Area were performed to provide various dispersed recreational experiences and activities.

Priority Two - Maintain two major motorized routes through the Indian Creek Dispersed Recreation Area as the primary access with secondary routes supporting dispersed recreation opportunities. This includes access to trailheads for horseback riding, hiking, biking, and rock climbing activities, local historic points of interest, interpretive opportunities, and administrative uses including timber harvest for forest health. Development of motorized recreation opportunities will not be a priority in this area although they will exist due to motorized access to other recreational opportunities.

- Indian Creek Dispersed Recreation Area Draft Management Plan will ensure that dispersed recreation, interpretation, and forest health priorities are met. It is scheduled to be written in FY 2014.

Priority Three - Determine where motorized access will be allowed by considering support of dispersed recreation activities; disturbance of solitude of large blocks of land; public health and safety; forest health; and local economic and administrative considerations.

- Indian Creek Dispersed Recreation Area Draft Management Plan was scheduled to be written in FY2009, but moved start date to FY2014.

Priority Four - The Forests' Trails Strategy Team will consider motorized opportunities in this area utilizing roads and trails developed for access to other dispersed recreation opportunities.

- Indian Creek Dispersed Recreation Area Draft Management Plan was scheduled to be written in FY2009, but moved start date to FY2014.

  Management Implications and Recommendations
  Complete Indian Creek Dispersed Recreation Area Management Plan in FY2014-15. Update MVUM as needed to comply with RLRMP.

VISUAL MANAGEMENT

Scenery management was evaluated for the 1986 Forest Plan using visual quality objectives (VQO). To evaluate scenery management for the 2005 RLRMP, the Forests' visual quality objectives were cross-walked to the newer Scenery Management System (SMS) Scenery Integrity Objectives (SIO). Records do not indicate that any of the parameters used in calculating VQO (scenic attractiveness, distance zone or concern levels) were updated or revised prior to their adaptation into the various SMS components for plan revision purposes.

The OSFNFs were assigned SIOs based upon inventories completed prior to 1986. Since the old system and SMS system do not correlate directly from one component to the other, the overall scenic objectives for the Forests are not ideally described or assigned.

Management Implications and Recommendations
It is recommended that a complete review and re-inventory of the Forests visual management parameters be conducted and new SIO ratings established. This would allow managers to be more responsive to visuals management using updated information.

HERITAGE

Archeological sites are reported as either protected to standard or managed to standard.

"Protection" is defined as avoiding any disturbing impacts to an archaeological site. This includes redesigning projects to avoid sites, or painting boundaries around sites to prevent any penetration by machines or ground disturbing activities.

"Managed" is defined as a treatment that enhances, protects, or preserves an archaeological site. This could include removal of all trees within a tree-length buffer around a cemetery, use of prescribed fire to reduce woody vegetation favoring fine fuels to prevent root damage to intact cultural deposits, or stream bank stabilization to reduce erosion and caving.

The items listed in the RLRMP to be monitored by Heritage are displayed in Table 33 with results being given for the period 2008 - 2013.

Table 33: Heritage Monitoring Results for 2008-2013.

Heritage Items Monitored on the Ozark-St. Francis National Forests						
Heritage Item Monitored	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Sites protected to standard	3,064	3,484	3,521	3557	3720	3795
Sites managed to standard	4,624	5,044	5,081	5117	5280	5280
Number of site management plans made	4	5	5	2	3	3
New sites recorded in heritage resource database	357	420	37	38	163	76
Government to government agreements	1	1	2	2	4	6
Participation in Bridge-A-Gap Conference	Yes	Yes	Yes	Yes	Yes	Yes
Evaluation of Native American feedback	Positive	Positive	Positive	Positive	Positive	Positive

LAW ENFORCEMENT

Trends in Unlawful Criminal Behavior

- There has been a decrease in marijuana production on USFS lands.
- Illegal use of OHVs remains about the same with little or no notable changes.

- The illegal harvest of ginseng continues to increase due to the increase of the price per pound. Most wholesalers are giving $800 per pound.

Cumulative Impacts to Natural/Cultural Resources

Continued illegal OHV use is causing soil erosion on natural resources.

- Law Enforcement continues to enforce laws against illegal activities by patrolling known OHV areas as much as possible.

Accidents

- Accidents including OHV and hunting continue to rank high in the accident category.
- The majority of OHV accidents are caused by the abuse of alcohol and speed.
- Hunting accidents occur sporadically through hunting season and are usually attributed to hunters not identifying their target.

Citations

Citations issued by Law Enforcement for FY2006 through FY2013 are recorded in Table 34.

Table 34: Citations issued by Law Enforcement for FY2006 through FY2012.

Law Enforcement Citations on the Ozark-St. Francis National Forests								
Type of Citation	**FY 2006**	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**
Violation Notices	578	882	592	409	546	508	509	444
Warning Notices	305	770	609	606	452	569	610	503
Incident Reports	328	401	405	322	303	304	404	396

Acres Affected

The majority of the Forests are affected in some form. The majority of the affected acres are in recreation areas both developed and undeveloped.

Types of Impact of Illegal Activity

- Illegal OHV use impacts natural resources.
- Illegal use of alcohol and drugs continues to impact the public and employees by creating a driving hazard.
- Violating State driving laws impacts driving conditions as well as public and employee safety.
- Continued disturbance and thefts of cultural resources continues to be impacted by opportunist and organized theft.

Appendix A

List of Preparers

The following individuals contributed to the 2013 Monitoring and Evaluation Report.

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Appendix B

References

**All web sites are current at the time of the publication of this document (September 2013).

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