

A photograph of a forest landscape. A large, textured tree trunk is the central focus, surrounded by dense green vegetation, including tall grasses and small purple flowers. The background shows more trees and a bright, slightly overcast sky.

Ozark - St. Francis National Forests

**Ozark East Ecosystem
Restoration Proposal
April 2010**

Collaborative Forest

Landscape Restoration Program - 2010

PROPOSED TREATMENT (SECTION 1)

Introduction

The Ozark East project area encompasses 320,000 acres and is a part of the Ozark Highland that contains one of the largest contiguous remnant systems of oak woodlands, forests and savannas in the United States. Over 150 endemic species call the Ozarks home, but in the past decade, this forest ecosystem has been in severe decline. Since 2000, the red oak borer has impacted at least 1.5 million acres in the Ozarks, and 375,341 acres on the Ozark National Forest. Many of these oak stands were completely annihilated and have few if any residual oak trees. Natural resource professionals and researchers point at two major land management practices that set the stage for these catastrophic events: fire suppression that had occurred over the past century and the extensive logging in the late 19th century. These practices made the forest more homogenous in age class, significantly increased the density of trees, and allowed certain tree species to move into sub-marginal habitats. These changes decreased open forest habitats such as woodlands, glades and savannas from an estimated 60% to no more than 6% and significantly reduced canebrakes, a rare community that occurred in bottomlands or stream terraces. As a result, the hydrology of the local streams became flashier as the area lost the herbaceous understory and soils. Also the extensive timber harvest significantly reduced large trees in the area. This loss affected the Large Woody Debris inputs to streams which affected the hydrology and habitat diversity in these systems. Over 40% of the terrestrial species of viability concern on the Ozark National Forest utilize open habitats, and all of the aquatic species are directly impacted by these changes. In addition, recreational use has increased; as a direct result, both legal and illegal roads/trails have also increased on the Forest. Unmaintained or poorly located roads/trails have a significant effect on sedimentation, hydrologic regimes, and migration of aquatic species. These conditions further affect many aquatic species including species of viability concern.

Historically, large ungulates such as elk and bison had a significant effect on these ecosystems, but they were extirpated during the 1800s. The Arkansas Game and Fish Commission reintroduced elk immediately north of the project area on the Buffalo National River. This elk herd has expanded from a few individuals to around 300. They are now a significant tourist attraction for the local businesses in the area. With the increased population, elk have begun to expand their territory, primarily on private land, which has resulted in increased conflicts between elk and local farmers.

A strategy to address these issues was developed through a collaborative effort that included experts from 14 different Federal, State and Local agencies and organizations. There are two primary focuses of this project. The first focus of this strategy is to thin stands in areas that were identified as more open forest habitats and prescribe burn on a rotation of 3 to 5 years at the landscape scale. The second focus is to construct openings in the Wildlife Emphasis Management Area as described in the Revised 2005 Forest Plan.

In 2006, Arkansas/Missouri Pine-Oak Woodlands Partnership (AMPOWP) designed a 320,000 acre project in order to connect smaller restoration projects across administrative boundaries. This consolidation of projects would better coordinate efforts and utilization of funding and

personnel resources. This project boundary is also the Ozark Eastside CFLRP proposal boundary. See the Ownership and Focus Areas Map. To date, the Forest has completed 128,085 acres of restoration thinning and/or prescribed burning and construction of 68 acres of openings in the project area. In addition, the Arkansas Game and Fish Commission have accomplished 1800 acres of thinning, 5700 acres of prescribed burning, and 400 acres of opening maintenance. These activities have shown to be successful in improving conditions for many plant and animal species. Areas that have been thinned and burned on the 3 to 5 year rotation have increased species richness for plants by as much as 5 fold. Also, two research projects have shown an increase in abundances for both small mammals and avian populations.

The restoration thinning and prescribed burning along with the opening construction within the last 10 years has been successful in establishing a herd of approximately 80 elk on Arkansas Game and Fish Commission land, and the work done on Forest Service land has already moved some elk into the project area year around. For other accomplishments, see Table 1.

The Forest is looking to expand both the aquatic and terrestrial restoration activities over the next ten years. For the aquatics, the primary focus will be on improving Best Management Practice structures on existing roads, decommissioning roads/trails in poor locations, constructing new trails to better manage off road motorized and non-motorized forest users, repair culverts affecting fish migration and improving stream crossings. Priority watersheds will be ones that contain Federally Endangered or Species of Viability Concerns. The project area has one watershed that contains an Endangered Mussel.

Proposed Treatments

The Ozark East Collaborative Forest Land Restoration Project (ECFLRP) is approximately 320,000 which encompass 224,178 National Forest Service (NFS), 26,180 National Park Service (NPS), 28,600 Arkansas Game and Fish Commission (AGFC) and 41,042 privately owned lands. See the land ownership map for land patterns. Primary objectives are returning the landscape to historical ecological conditions before significant European settlement; restore large woody debris in local streams to help maintain biodiversity in aquatic ecosystems; reduce invasive species impacts; provide habitat enhancement for wildlife and floral species including Regional Forester's Sensitive, Federally Endangered and Threatened Species; increase carrying capacity for elk on Forest Service Land; to expand the elk herd and management opportunities on private land; establish fuel breaks and promote fuel reduction to protect resource values and comply with urban interface goals; allow for and manage dispersed recreation opportunities; and continue to provide commercial opportunities for forest products to support the local economy. For a summary of activities accomplished on Forest Service and Partner's lands as well as future work ready to implement and in the process of planning, see Table 1 in the Appendix. The Activities currently covered by Nepa are as follows: Commercial Timber Harvest (2,555 acres), Prescribed Burning (128,085 acres), Restoration thinning (8,000 acres), Understory Removal (3805 acres), Opening Construction (354 acres), and Invasive species control, Plants (500 acres).

Below is an overview of proposed CFLRP activities:

Activities	Amount Over Next 10 Year Period (2010-2019)		Total
	Ozark NF	CFLRP	
Prescribed Burning (Acres)	200,000	0	200,000
Timber Sale Prep (Acres)	23,271	0	23,271
Openings Construction (Acres)	1346	0	1346
Opening Management (Acres)	10,000	0	10,000
Road Maintenance (miles)	1337	0	1,337
Restoration thinning (Acres)	571	18,500	19,071
Understory Removal (Acres)	0	12,602	12,602
Invasive Species, hogs (Acres)	20,000	180,000	200,000
Invasive Species, Plants (Acres)	1980	8,000	9980
Cane Restoration (Acres)	0	1503	1503
Large Woody Debris (miles)	0	36	36
Stream Crossing Repair (structures)	0	20	20
Trail Construction (miles)	0	134	134
Trail Closure (miles)	0	285	285
Road Closure (miles)	63	0	63
Road Decommissioning (miles)	11	0	11
Culvert Replacement/installation (structures)	0	2	2
Monitoring (Acres)	70,450	0	70,450

The Forest plans to primarily use a combination of ID/IQ, timber sale and stewardship contracts along with stewardship agreements to accomplish this work. An existing ID/IQ contract and a Stewardship Agreement with The National Wild Turkey Federation will be used to accomplish 2010 and 2011 work. Estimated appropriated, Knudsen Vandenberg, stewardship, and partner funds to accomplish the Forest portion of the work equals \$12,095,100 with a breakdown of 69%, 9%, 16%, and 6%, respectively. Appropriated funds were estimate using a typical year funding amount from our normal program of work for each activity except prescribed burning. We are expecting the target to increase within the project area during the second half of this proposal so 10,000 acres were added to each year during this time frame. A breakdown of CFLRP funds needed to accomplish the above work is described in Table 2 in the appendix. We will hire 3 to 5 temporaries per year to help with layout of these activities out of the personnel cost. These funds will only be used on Forest Service Lands.

These activities will have a significant impact on management for both aquatic and terrestrial species. Restoration thinnings, understory removal, and cane restoration are expected to increase open forest and/or canebrakes on at least 12% of the appropriate land types in the project area. These habitat improvements along with Opening construction are expected to increase carrying capacity for elk by 300 to 500 individuals which is approximately double the current conditions. This will allow more elk to move on public lands and increase management opportunities for the Arkansas Game and Fish Commission to deal with farmer and elk conflicts while maintaining a

strong herd for tourism. Accomplishing the roads and trails activities will decrease sedimentation rates and improve hydrologic regimes on approximately 50% of the area while creating a trail system that should decrease the construction of illegal trails. Also, desired future conditions will be met in at least 40% of the stream miles in two major drainages. Invasive species treatments will help maximize the benefits from the proposed activities and reduce source population in our restoration areas.

Monitoring

The project monitoring will be designed to utilize existing protocols and monitoring programs. The USFS, Nature Conservancy and the Arkansas Natural Heritage Commission developed an ecological monitoring program to determine the effects of restoration activities and the success of restoration projects. The broad goal of the monitoring program is to document and quantify fuels reduction and forest health enhancement actions in achieving the desired future condition. To determine attainment of success and project goals, eight monitoring protocols are :USFS fuels assessment to document fuel loading; cover type assessments through aerial photo interpretation and ground-truthing to quantify the size and distribution of the desired plant communities (forest types); plant community monitoring to quantify the structure, diversity, regeneration of plant communities (forest type groups) and ratio of native/non-native species; avian monitoring to quantify populations of selected area-dependent birds; fire regime condition class (FRCC) monitoring to track attainment of the historic fire regime; post-burn assessments to determine individual unit coverage and post burn severity; photo-monitoring to qualitatively document and communicate restoration progress; program accomplishments in terms of acres burned, thinned, harvested, and project costs.

The Forest along with our partners are planning to increase the number of macro plots to capture a new Land Type Association within the project area from 96 to 109. This number may change after further research. These plots are monitored and will continue to be monitored in partnership with The Nature Conservancy and Arkansas Heritage Commission on a three year rotation.

Fish will be monitored in at least three of the major drainages using the forest sampling protocols to determine any changes in fish assemblages. In addition, The Forest will continue to work with Arkansas Tech University, Arkansas Game and Fish Commission to develop a monitoring program to determine changes in stream dryness and stream flows.

An additional 19 bird plots in bearcat hollow will be established to determine changes in avian communities using R8 bird protocols. Volunteers from the Arkansas Audubon Society and Arkansas Wildlife Federation will be running these points.

Other Forest and Regional monitoring programs such as deer/elk spotlight surveys, R8 bird and Breeding Bird Surveys will be conducted in the project area and can be used to capture potential effects on animal populations.

ECOLOGICAL CONTEXT (SECTION 2)

Vegetation

The landscape is dominated by oak-hickory and oak-pine ecosystems that have been altered in composition and structure as a result of past timber management and fire exclusion activities. These forests are typically closed canopy stands with an understory dominated by shrubs, poison ivy and Virginia creeper. Current densities average 300-1000 stems per acre. More fire intolerant species are beginning to move into land types that are drier and historically influenced by fire such as red oaks along with maples and dogwoods in the understory. These Forest are very susceptible to any stressor such as climatic changes. The red oak borer and oak decline has affected over a million acres in the Ozarks and 48,000 acres in the project area. In these areas, canopies have been severely reduced and in some areas completely eliminated. Without the presences of fire, most of these stands have a substantial woody understory with oaks as a minor component of the regeneration. This greatly impacts the sustainability of our oak-hickory forest.

Our desired future conditions would be more of a mosaic in terms of age composition and structure. Stands that are on the ridge top would have more open canopies with approximately 38-76 trees per acre. The canopy would be dominated by fire tolerant species such as post and white oaks with an understory of grasses and other herbaceous species. You would see some woody species in the understory but they would be dominated by the same fire tolerant species found in the canopy. As you move away from the ridge tops to the riparian areas, the trees per acre would increase and more fire intolerant species would begin to move into the canopy. Also the understory would transition from a herbaceous to woody species. On the lower slopes and riparian areas, it would look very similar to the current conditions but with a slightly thinner canopy and where appropriate an increase in Giant Cane.

See the Desired Condition Maps for location of the various community types. The Dry Oak Forest and Woodland and Shortleaf Pine–Oak woodlands communities would be typically more open with the grassy understory. Dry-Mesic Oak Forest and Shortleaf Pine Forest are in the transitional zones to the riparian areas where mesic hardwood forest and riparian forest can be found.

Wildlife

The Arkansas Wildlife Action Plan is a comprehensive strategy that identifies wildlife issues, species of concern and management recommendations. The project area primarily falls into the Boston Mountain Ecoregion with a small portion of the northern section falling within the Ozark Highlands. Two of the primary management objectives for these Ecoregions are habitat protection and habitat restoration and improvements. The Forest Plan standards are designed to protect rare communities and other sensitive habitats and will meet the objective for habitat protection. As far as habitat restoration and improvements, one of the most significant issues facing our wildlife populations is the declining health of our Oak-hickory forest and loss of open forested habitats. Based upon the modeling developed by the AMPOWP, sixty percent of the project should be in woodlands with more open conditions. Currently there is less than 3% in

woodlands. A list of species of Greatest Conservation Need associated with these habitats from the Arkansas Wildlife Action plan can be found immediately after the Appendix. During the Forest Plan Revision, over 40% of the species of viability concern on the forest was associated with more open communities. These species included the Federally Endangered Indiana and Ozark Big-eared Bats and the Regional Forester's Sensitive species Bachman Sparrow, Eastern Small-footed Myotis, Ozark Chinquapin, and Small-headed Pipewort. These woodlands and open habitats are also important to Arkansas population of elk. Although this species is not considered a species of viability concern, it was extirpated from the state in the 1800s. Elk were reintroduced and appear to be stable, but the population is still small 300 to 500 animals with little available habitat to expand, especially on public land. This project will increase woodland habitats by at least 12% and is designed to maintain these habitats over time. These activities will also make our forest more resilient to climatic changes by diversifying the forest age, composition, and structure. This will stabilize wildlife populations in this area.

Aquatics

The streams in this area typically have high water quality and are relatively nutrient poor. Even though the productivity of these streams is considered low, they support diverse communities. Upper to mid reaches will support 10 or more fish species with lower reaches having species richness in the mid to upper 20s. Several of these species are considered sensitive to changes in hydrologic and sedimentation regimes. The project area has 3 species that score relatively high in priority ranking for species of concern according to the Arkansas Wildlife Action Plan. One of these species, the Yellow Cheek darter (*Etheostoma moorei*), has the highest priority ranking of concern. The primary threat to these species in the project area within Forest Service control is the road and trail systems. Many of the trails and roads are found in the riparian areas and cross drains multiple times. Also, several of the trails were constructed by forest users illegally. These roads and trails cause significant changes in the hydrologic and sedimentation regimes. Road maintenance, stream crossing repair, road/trail closure, and road decommissioning are designed to reduce these potential effects on streams.

Illegal trail construction typically occurs when forest users such as ATV and horses back riders have inadequate trail systems. For this reason, they will go through the forest to connect trails, make various loops, and to get to popular viewing sites. These trails have none of the structures which inhibit erosion and dissipate water flow and sediment. Many times they are found in sensitive areas such as riparian areas, steep slopes, and wilderness areas and can do a lot of damage to the natural resources. The Forest is proposing to construct trails to provide for some of the needs discussed above and obliterate illegal trails to prevent further damage. In the long term this activity should reduce the amount of illegal trail construction.

The extensive cutting during the 19th century removed most of the large trees and decreased large woody debris inputs over the last century. Also several stream characteristics have changed such as stream dryness and flashiness of stream flows. These things would all decrease the amount and duration of large woody debris in the streams. This idea is supported by surveys conducted in the project area that identified low numbers of large woody debris in these streams. The loss

of the large woody debris would negatively affect the hydrology, nutrient inputs and habitat diversity. For this reason, the Forest is looking to put large woody debris back into the streams. Our objective for large woody debris is placing 10 trees per mile over 14 inches in DBH into local streams.

Culverts at stream crossings can create barriers for aquatic species. Due to the design and placement of some culverts, the soil and material around the openings erode and create holes below the opening so at low flows the water level is below the openings. In this situation, aquatic species are not able to pass. Also, smaller culvert openings increase water velocity preventing species movement through these areas. Two culverts have been identified as barriers and will be repaired to allow for aquatic species to move through the crossing.

Infestations & Disease

After a century of fire exclusion and extensive logging, forested ecosystems have become more homogenous in age, dominated by dense, closed-canopy stands, and species such as red oaks are moving into sub-marginal habitats. Historic records indicate that pre-settlement woodlands averaged around 38-76 trees per acre which comprised approximately 60% of the stands in the project. Current densities in much of the region average 300-1000 stems per acre. Due to these changes, the region has recently suffered widespread red oak borer infestation and oak decline. Oak decline has impacted at least 300,000 acres of the Ozark National Forest of which 16% is in project area. Experts believe the catalyst that set this decline in motion was the dry conditions that occurred during the 1990's and indicates the health and resiliency of these forest ecosystems are declining. The Restoration thinning, understory removal and prescribed burning are specifically designed to address this issue and is coordinated with other agencies/organization from multiple states to maximize these efforts across administrative boundaries. As we begin to move toward the future desired conditions, the forest will become more resilient and able to adapt to climatic changes such as extended dry periods.

COLLABORATION (SECTION 3)

Collaborative Effort

The current state of declining forest health throughout the Interior Highlands clearly demonstrates a need for ecosystem restoration projects with a collaborative partnership approach. The ecosystem restoration project outlined in this paper receives support from a team of organizations and state and federal agencies that has formed to address the issue in Arkansas. The Oak Ecosystem Team includes representatives from the Arkansas Wildlife Federation, Arkansas Game and Fish Commission, Arkansas Forestry Commission, Arkansas Natural Heritage Commission, US Fish and Wildlife Service, University of Arkansas Cooperative Extension Service, The Nature Conservancy, US Forest Service, and US Forest Service – Southern Research Station. The Team’s vision is: “To enhance the understanding of restoration and management needed in the upland oak ecosystem to maintain its health, sustainability, and diversity through public awareness, research, demonstration, and education.”

In the fall of 2002, the team hosted a conference in Fayetteville, Arkansas entitled “Upland Oak Ecology: History, Current Conditions, and Sustainability.” The goal of the conference was to examine the scientific understanding of the causes of oak mortality and discuss the need for ecosystem restoration. Over 350 professionals and researchers attended. The proceedings have been published by the USDA Forest Service Southern Experiment Station. From the conference presentations and discussion, there was a clear need for collaborative ecosystem restoration projects.

From the information presented at the conference and later meetings, the Oak Ecosystem Restoration Team developed five core strategies to restore the ecosystem: (1) Develop a suite of large landscape scale multi-ownership demonstration projects across the region, (2) develop a multi-level information and media campaign utilizing the demonstration sites to solidify broad-based public support for ecological restoration (hazardous fuel reduction, forest health enhancement), (3) identify and address state and federal policy barriers to extensive ecological restoration, (4) develop an ecological monitoring program that measures progress in abating the threat of altered fire regimes to the conservation of biodiversity, and (5) secure adequate funding for oak ecosystem restoration on public, private, and state lands throughout the region. Participation on this team is a priority for each of the participating agencies and organizations.

This project embodies the strategies outlined by the Oak Ecosystem Team for ecosystem restoration in the Interior Highlands and will be used to host public, private and legislative tours. In addition to this regional synergy, the ecosystem restoration project outlined in this paper has participated in the Fire Learning Network (FLN), a collaborative project between the U.S. Forest Service, Department of the Interior, and The Nature Conservancy. The FLN promotes the development and testing of creative, adaptive, multi-ownership fire management strategies that are compatible with the National Fire Plan goals and the conservation goals of The Nature

Conservancy. The network strives to achieve tangible, lasting results at landscape and ecoregional scales.

Accomplishments

The Ozark-St. Francis National Forest has been developing a partner base for many years. The Partnerships formed through this collaborative effort have improved relationships with typically adversarial groups, expanded our expertise base, and obtained funding, equipment and personnel to accomplish restoration activities on the ground. Partners have helped the Forest complete ecological models for the landscape, spatially explicit maps of current and desired future conditions, alternative management scenarios for oak and pine woodland restoration, and develop specific management activities and monitoring programs to track progress to desired future conditions for this project. The AMPOWP that developed through the Oak Ecosystem Team and FLN was able to obtain \$100,000 for the project area. The National Wild Turkey Federation has taken on an agreement currently valued at \$293,422.70 of which \$96,072 is non-federal dollars. These non-federal dollars are coming from The National Wild Turkey Federation, Arkansas Game and Fish Commission and Rocky Mountain Elk Foundation. Also, these partners along with Arkansas Wildlife Federation, Arkansas Canoe Club, Local Chapters of NWTF, Arkansas Audubon Society, and The Nature Conservancy are working on obtaining matching funds for the \$500,000 National Forest Foundation Funds obligated to projects on the Ozark National Forest.

Multi-party Monitoring

As discussed in the proposed treatment section, Partners that include The Nature Conservancy, Arkansas Heritage Commission, Arkansas Wildlife Foundation, Arkansas Game and Fish Commission and Arkansas Audubon Society have and will continue to assist with our monitoring programs. The Nature Conservancy, Arkansas Heritage Commission, and Arkansas Game and Fish Commission have also assisted in developing some of the protocols used in these monitoring programs.

WILDFIRE (SECTION 4)

Current Condition

The current condition of the proposed landscape is varied. However, the majority would be classified as Fire Regime Condition Class (FRCC) III, meaning the landscape is substantially altered from its natural range. Currently 85% is closed canopy with 15% being open forest in focus areas (see Ownership and Focus Areas Map) within the project area. Prescribed burning and mechanical treatments have occurred in areas scattered across this proposal, and in those areas where the two treatments have been combined, the landscape is beginning to shift toward FRCC II. Continued treatment of these areas will be required to maintain this level, and to continue moving toward FRCC I. In those areas that are untreated, the use of prescribed fire and mechanical treatments will be required to truly have any effect on FRCC.

Due to the high departure from the historic range of variability, fuel composition is an altered component of the ecosystem. The historic range would have open conditions with a fuelbed dominated by an herbaceous layer, perhaps best represented by Fire Behavior Fuel Model (FM) 2. Currently, the fuels are hardwood leaf litter and pine needles within a closed canopy and well established mid-story as represent by FM 9. Based on historical records the average number of trees per acre was 54 and 76% was open forest (woodland/savannah) leaving 24% closed canopy.

Wildfire Behavior

In approximately the northern 1/3 of the project area, the 2009 ice storm added a significant amount of 10, 100, and 1,000 hour fuels. Although this fuel will not be the primary carrier of fire, it will contribute to fireline intensity as well as increase the amount of time required to suppress wildland fires. Spotting would also be expected to increase due to this additional fuel.

Fires in FM 2 will exhibit a faster Rate of Spread (ROS) than those in FM 9. This faster ROS will also result in less residence time around the boles of trees, and may decrease mortality in the overstory. The moisture of extinction is 10 percent less in FM 2, so relative humidity plays a bigger role in fire behavior. Fireline intensity and ROS will decrease quicker in FM 2 as relative humidity increases. Even with a faster ROS, fires may be easier and quicker to suppress. This would relate to a decrease in suppression costs.

Community Wildfire Protection

This proposal will continue to provide wildfire protection to several local communities. The communities of Lurton, Pelsor, Witts Springs, Tilly, Hector, and Appleton were listed in the Federal Register in 2001 as Communities at Risk from wildfires. The District has worked with the FIREWISE boards of Hector and Appleton as they were seeking national certification as a FIREWISE community. Many of our current burns are implemented in conjunction with the

Arkansas Forestry Commission (AFC). The AFC obtains agreements with local landowners to burn private property adjacent to Forest Service prescribed burns.

Wildfire Cost Reduction/Benefits/Restored Fire Regimes

Over time, with repeated burning, the fuel complex will continue to shift more from timber litter to grass. As tree density decreases, more sunlight will reach the forest floor, and the wind will have a greater effect on fuels. This will result in fuels that dry out quicker. The combination should result in more opportunities to utilize prescribed burning to maintain the desired condition. Burning these types of fuels may require the same number of personnel and equipment, but should take less time to implement, resulting in lower per acre costs. The effects of smoke should also be lessened, since these fuels should dry out quicker, and less moisture will

mean less smoke generation. The only opportunities we have to increase our burning are to add more personnel, or open more burn windows. Changing the fuel complex is our best bet to increase acreage.

The risk of wildfire will not change significantly as we change condition class. Around 90% of our fires are arson caused and that risk will still be in place. However, in these areas, fires will be easier to suppress, with less impact on the ground. This should relate to a decrease in the suppression costs in these areas

UTILIZATION (SECTION 5)

Forest Product Description and Utilization

Utilization of small diameter wood has been and is one of the stumbling blocks for ongoing restoration efforts and will continue to be in the Ozark East CFLRP. Utilization and removal of trees greater than 8 inches occurs when commercial timber sales are used as the mechanism to dispose of timber in restoration areas. In this case there is enough sawtimber being removed to make it economically feasible to remove small diameter trees at the same time. It is only when most of the wood products are of small diameter that removal and utilization has been difficult and resulted in a high cost per acre in reaching the desired future condition.

These restoration areas have little or no commercial value. As a result, the Forest is in the process of using stewardship contracts to pay the chipping and Bio-fuel industries for the harvesting and removal of trees from the project area. By offsetting the cost with the forest product removed, it is speculated that the cost of the restoration thinning would decrease by as much as half. This decrease in cost will save the Forest \$1,579,774, increase volumes by 54,786 CCF with a value of \$547,860, and increase our restoration capacity. Benefits from this activity would be the reduction in residual fuels which would protect reserve trees during prescribed burning activities, facilitate better utilization of forest products, and reach our desired future conditions quicker by treating more acres. To further address this issue, forest has formed a committee and hired a consultant to investigate and develop opportunities to utilize small round wood on the Ozark-St. Francis National Forest.

Current plans within the Ozark East CFLRP will result in the removal of approximately 101,725 CCF of timber using standard commercial timber sales and stewardship agreements and sales with an estimated value of \$3,919,004. About 61,008 CCF will consist of hardwood species with an average diameter at breast height (DBH) of 14.5 inches for sawtimber and 8.0 inches for pulpwood. The remaining 40,717 CCF consist of shortleaf pine with an average DBH of 14.0 inches for sawtimber and 10.0 inches for pulpwood. Of the removed volume, approximately 60% will be sawtimber for both hardwood and pine species with the remaining 40% being pulpwood. Hardwood sawtimber will be manufacture into furniture, flooring, lumber, railroad ties, and pallet material with pulpwood being used for railroad ties, paper, some lumber, railroad ties, and pallet material. Pine sawtimber uses are lumber, low quality paper, and chip board with pulpwood being used for low quality paper, chip board, and lumber.

Cost Off Set

An estimated 25% of the dollars generated from this project will utilize stewardship authorities in order to put as many dollars as possible back into work on the ground and create additional opportunities to secure matching funds. An additional 25% of trust fund (KV) funding will be used throughout the project to assist in meeting the desired future condition.

Figures given above for timber volumes and potential funds do not include restoration thinning areas. The Forest is currently working with local purchasers to develop a strategy to reduce costs and utilize small diameter wood (see investments section).

INVESTMENTS (SECTION 6)

Federal & Non-Federal Investments

There are many different sources of funding used in restoration efforts. Federal funding will come from 7 different sources totaling 10,996,610 over the next ten years. The Forest estimates that our partners will provide \$702,500 of non-federal funds during the same time frame. See Tables 3 and 4 in the Appendix for a breakdown of federal and non-federal funding sources.

Investments Outside of Landscape

Adjacent to the project area to the north and east (see Ownership and Focus Areas Map) are two Arkansas Game and Fish Commission (AGFC) owned wildlife management areas. The AGFC has conducted similar management activities as those inside the project area resulting in the construction of over 400 acres of openings, 1,800 acres of thinning, and 5,700 acres of prescribed burning. In the spring of 2007, the Gulf Mountain co-op burn between the AGFC and Forest Service (FS) was conducted resulting in 1,400 acres of FS and 1,200 acres of AGFC lands being burned. This burn will again be conducted within the next five years when the restoration thinning is completed on FS lands within the burn area. Another co-op burn called Bearcat Hollow is planned in the next 2-3 years which will involve three agencies and include acres on the Buffalo National River (USDI), FS, and AGFC (Gene Rush WMA) lands. In addition to the prescribed burning on a 3-5 year rotation (approx. 1,200 ac/yr), the AGFC will continue to manage the 400 acres of openings on a rotating bases and thin additional acres creating a wide variety of habitats.

Benefits of Restoration

As previously discussed utilization section, restoration efforts on the Ozark East CFLRP are restoring areas with little or no commercial value. By offsetting the cost with the forest product removed, it is speculated that the cost of the restoration thinning would decrease by as much as half. Over the past 5 years, the cost of restoration thinning has increased 4% each year. Projecting out to ten years, the cost will increase from \$113 to \$158 or \$45 per acre. This means the 23,756 acres of restoration thinning in this project area distributed evenly over the next 10 years will cost approximately \$3,159,548. By cutting the cost in half, the forest would save \$1,579,774. Additional benefits from this activity would be the reduction in residual fuels which would protect reserve trees during prescribed burning activities, facilitate better utilization of forest products, and increase our capacity to reach our desired future conditions quicker by treating more acres. When implemented, this strategy will produce approximately 54,786 CCF with a value of \$547,860 that could be used for additional restoration activities not included in the figures described in Tables 3 and 4 (Appendix).

Another benefit which would occur as acres are restored to a grassier understory is that burning would not be needed as often to maintain these areas in a restored state thus reducing overall

cost. This would also increase the opportunity (more burning days) to burn these areas and provide additional funds to burn areas more in need of prescribed burning.

Employment

The Ozark East CFLRP encompasses parts of Newton, Searcy, Pope, and Conway counties in north central Arkansas. Of these counties as much as 40% of Newton and Pope Counties' timbered lands are part of the Ozark National Forest (ONF). The remaining counties, Searcy and Conway, have relatively small portions inside the ONF boundary. The timber industry has always been a part of the history of these counties and will continue to be long into the future. In 1997 timber removed from these counties ranged from 302,843 tons in Pope County to 101,491 tons in Newton County. In 2001, 80% of the jobs in Newton County were in the manufacturing of furniture and wood products resulting in 77% of earnings. Newton county in particular is one of the poorest per capita in Arkansas and has one of the highest numbers of small sawmills. Most, if not all, of the timber harvested from this project will involve small businesses whether it be a local logger, sawmill, or both. Although it is difficult to estimate the number of jobs created by harvested timber within this project, it is with much certainty that the timber industry is a vital part of the economic well being of these counties.

Securing CFLRP funds will allow the hiring of 2-3 Stay in School (SIS) and 1-2 temporary employees to assist in the implementation of this project. These employees will be a vital asset in the future success of the Ozark East CFLRP.

In addition to the employment opportunities mentioned above, there is an estimated \$5,064,483 (see table 2 in appendix) for contracting to complete various tasks over the next ten years. When these funds become available it will create a huge impact on employment for both local and non-local contractors and their employees.

Training Opportunities

During implementation and on into the maintenance phase (10-15 years) of this project there will be many opportunities for training. When prescribed burning is conducted, training opportunities are created for the Southwest Fire Use Training Academy (one of our partners),

Forest Service employees, and other crews helping with burning activities. The main training or task book work is for burning boss certification, but other opportunities exist for both class b and c faller and engine boss just to name a few. The importance of this is having new burning bosses available for burning which means more acres burned and more ecosystem restoration maintained in the future.

The previously mentioned SIS student help will assist with the identification, mapping, and control of non-native invasive species, biological inventories, monitoring, prescribed burning, layout and marking of restoration areas, and trail construction/rehabilitation. The goal for these students is to return to school and move into their future careers with a broad range of work and land management experience.

FUNDING ESTIMATES (SECTION 7)

Funds to be used on NFS lands for ecological restoration treatments and monitoring that would be available by fiscal year to match funding from the Collaborative Forested Landscape Restoration Fund	
Fiscal Year 2010 Funding Type	Dollars/Value Planned
FY 2010 Funding for Implementation	\$711,306
FY 2010 Funding for Monitoring	\$22,500
1. USFS Appropriated Funds	\$494,610
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$112,000
4. Partnership In-Kind Services Value	\$25,196
5. Estimated Forest Product Value	2,000
6. Other (specify)	0
FY 2010 Total (total of 1-6 above for matching CFLRP request)	\$733,806
FY 2010 CFLRP request (must be equal to or less than above total)	\$81,100
Funding off NFS lands associated with proposal in FY 2010 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2010 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0
Fiscal Year 2011 Funding Type	Dollars/Value Planned
FY 2011 Funding for Implementation	\$1,626,196
FY 2011 Funding for Monitoring	\$22,500
1. USFS Appropriated Funds	\$1,215,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$158,500
4. Partnership In-Kind Services Value	\$25,196
5. Estimated Forest Product Value	\$150,000
6. Other (specify)	0
FY 2011 Total (total of 1-6 above for matching CFLRP request)	\$1,648,696
FY 2011 CFLRP request (must be equal to or less than above total)	\$745,377
Funding off NFS lands associated with proposal in FY 2011 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2011 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0

Fiscal Year 2012 Funding Type	Dollars/Value Planned
FY 2012 Funding for Implementation	\$1,501,446
FY 2012 Funding for Monitoring	\$15,000
1. USFS Appropriated Funds	\$960,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$158,750
4. Partnership In-Kind Services Value	\$17,696
5. Estimated Forest Product Value	225,000
6. Other (specify)	0
FY 2012 Total (total of 1-6 above for matching CFLRP request)	\$1,461,446
FY 2012 CFLRP request (must be equal to or less than above total)	\$1,126,386
Funding off NFS lands associated with proposal in FY 2012 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2012 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0
Fiscal Year 2013 Funding Type	Dollars/Value Planned
FY 2013 Funding for Implementation	\$1,509,750
FY 2013 Funding for Monitoring	\$22,500
1. USFS Appropriated Funds	\$960,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$148,750
4. Partnership In-Kind Services Value	\$7,500
5. Estimated Forest Product Value	\$225,000
6. Other (specify)	0
FY 2013 Total (total of 1-6 above for matching CFLRP request)	\$1,477,250
FY 2013 CFLRP request (must be equal to or less than above total)	\$1,149,139
Funding off NFS lands associated with proposal in FY 2013 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2013 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0

Fiscal Year 2014 Funding Type	Dollars/Value Planned
FY 2014 Funding for Implementation	\$1,067,000
FY 2014 Funding for Monitoring	\$22,500
1. USFS Appropriated Funds	\$690,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$12,000
4. Partnership In-Kind Services Value	\$7,500
5. Estimated Forest Product Value	225,000
6. Other (specify)	0
FY 2014 Total (total of 1-6 above for matching CFLRP request)	\$1,034,500
FY 2014 CFLRP request (must be equal to or less than above total)	\$872,069
Funding off NFS lands associated with proposal in FY 2014 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2014 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0
Fiscal Year 2015 Funding Type	Dollars/Value Planned
FY 2015 Funding for Implementation	\$510500
FY 2015 Funding for Monitoring	\$15,000
1. USFS Appropriated Funds	\$745,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$12,000
4. Partnership In-Kind Services Value	\$0
5. Estimated Forest Product Value	\$225,000
6. Other (specify)	0
FY 2015 Total (total of 1-6 above for matching CFLRP request)	\$1,082,000
FY 2015 CFLRP request (must be equal to or less than above total)	\$882,634
Funding off NFS lands associated with proposal in FY 2015 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2015 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0

Fiscal Year 2016 Funding Type	Dollars/Value Planned
FY 2016 Funding for Implementation	\$635,996
FY 2016 Funding for Monitoring	\$22,500
1. USFS Appropriated Funds	\$745,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$12,000
4. Partnership In-Kind Services Value	\$7,500
5. Estimated Forest Product Value	225,000
6. Other (specify)	0
FY 2016 Total (total of 1-6 above for matching CFLRP request)	\$1,089,500
FY 2016 CFLRP request (must be equal to or less than above total)	\$841,841
Funding off NFS lands associated with proposal in FY 2016 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2016 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0
Fiscal Year 2017 Funding Type	Dollars/Value Planned
FY 2017 Funding for Implementation	\$510,500
FY 2017 Funding for Monitoring	\$22,500
1. USFS Appropriated Funds	\$745,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$12,000
4. Partnership In-Kind Services Value	\$7,500
5. Estimated Forest Product Value	\$225,000
6. Other (specify)	0
FY 2017 Total (total of 1-6 above for matching CFLRP request)	\$1,089,500
FY 2017 CFLRP request (must be equal to or less than above total)	\$924,493
Funding off NFS lands associated with proposal in FY 2017 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2017 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0

Fiscal Year 2018 Funding Type	Dollars/Value Planned
FY 2018 Funding for Implementation	\$635,996
FY 2018 Funding for Monitoring	\$15,000
1. USFS Appropriated Funds	\$745,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$12,000
4. Partnership In-Kind Services Value	\$0
5. Estimated Forest Product Value	225,000
6. Other (specify)	0
FY 2018 Total (total of 1-6 above for matching CFLRP request)	\$1,082,000
FY 2018 CFLRP request (must be equal to or less than above total)	\$946,814
Funding off NFS lands associated with proposal in FY 2018 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2018 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0
Fiscal Year 2019 Funding Type	Dollars/Value Planned
FY 2019 Funding for Implementation	\$510,500
FY 2019 Funding for Monitoring	\$22,500
1. USFS Appropriated Funds	\$745,000
2. USFS Permanent & Trust Funds	\$100,000
3. Partnership Funds	\$12,000
4. Partnership In-Kind Services Value	\$7,500
5. Estimated Forest Product Value	\$225,000
6. Other (specify)	0
FY 2019 Total (total of 1-6 above for matching CFLRP request)	\$1,089,500
FY 2019 CFLRP request (must be equal to or less than above total)	\$911,288
Funding off NFS lands associated with proposal in FY 2019 (does not count toward funding match from the Collaborative Forested Landscape Restoration Fund)	
Fiscal Year 2019 Funding Type	Dollars Planned
USDI BLM Funds	0
USDI (other) Funds	0
Other Public Funding	0
Private Funding	0

FUNDING PLAN (SECTION 8)

The National Forest System (NFS) lands in the southeastern United States offer unique opportunities for restoring the native forests and ecological systems that were once commonly found throughout the region. In many developed areas, the NFS lands are some of the few remaining large, forested landscapes in the South. Restoring and sustaining these lands and doing so in close coordination with our partners and neighboring landowners were a key part in the establishment of the Southern Region national forests and continue to be an emphasis in our management goals for today.

The Collaborative Forest Landscape Restoration Program (CFLRP) will supplement the Southern Region's work priorities very well. The Southern Region has developed a Strategic Framework to guide the important work we do. This Strategic Framework has identified restoration as one of the main areas of emphasis for developing programs of work. The goal for this region-wide focus is "ecological systems are returned to their natural resilience and sustained," which also supports intent of the CFLRP.

The Southern Region's program of restoration work includes a broad set of management practices designed to control the establishment, growth, composition, health, and quality of forests to meet the diverse needs and values of society on a sustainable basis. In developing our regional funding plans, the integration of multiple programs is the primary driver for budget development. Annual funding requests are made by each national forest based on their integrated capacity to accomplish needed work to support land management goals and objectives. The goals and objectives are guided by Land Management Plans, the Region's Strategic Framework, and other restoration strategies. Our regional program managers (fire, fuels, wildlife, forest health protection, vegetation, and watershed management) then work together to develop a seamless regional budget package that takes full advantage of the strengths of each individual program.

Vegetation treatment activities for restoration are designed to protect and restore ecosystems, address energy and other social needs, and protect human communities. The funding identified through the process above is used to plan, implement, and monitor the work activities to be accomplished in each fiscal year. The Southern Region will continue to utilize this process to inform allocation decisions in support of CFLRP requirements and to assure that CFLRP funding allocated in FY2010 and FY2011 will be used on this proposal in the year transferred. The Region has also committed to assuring that funding will be available to support the long-term multiparty monitoring requirement for this proposal. The Southern Region has a proven track record for delivering a very efficient program of work with high integrity for producing results.

USDI FUNDING (SECTION 9)

USDI Funding Section does not apply.

OTHER FUNDING (SECTION 10)

Other Funding Section does not apply.

MAPS (SECTION 11)

Maps are in separate files and will need to be attached to the proposal.

LANDSCAPE STRATEGIES (SECTION 12)

Because the Revised Land and Resource Management Plan (RLRMP) for the Ozark St-Francis National Forest is relatively recent, signed in September of 2005, and the strategies developed within the RLRMP were based on the Fire Learning Network, best available science, research, and lessons learned and monitoring of on the ground implementation of similar treatments within this project, the strategies for the Ozark East CFLRP will be simply to implement the RLRMP. The RLRMP developed Management Areas (MA) all across the forest and established what was to be emphasized within each area and a desired future condition for each. The MAs within the Ozark East project boundaries where the majority of the work will occur are 3.A Pine Woodland, 3.B Oak Woodland, 3.C Mixed Forest, 3.D Oak Decline Restoration Area, and 3.K Wildlife Emphasis Area are summarized below. Other MAs with minor amounts of work mainly at stream crossings are 1.C Designated Wild and Scenic Rivers, 1.D Recommended Wild and Scenic Rivers, and 3.I Riparian Corridors. These MAs are not summarized.

Priorities for the Ozark East CFLRP

Priorities displayed in the appendix (table 2), with the exception of prescribed burning, concentrate on two distinct areas: aquatic restoration and restoration of pine and oak woodlands and savannahs. Priorities, in order of importance, for woodlands and savannahs would be control of invasive species (plants), restoration thinning, prescribed burning, cane restoration, understory removal, and invasive species (hogs). Priorities, in order of importance, for aquatics would be trail construction and closure, large woody debris, stream crossing repair, and culvert replacement/installation. Priorities were influenced by the Arkansas State Wildlife Plan (www.wildlifearkansas.com) and restoration treatments completed earlier within the landscape.

3.A Pine Woodland

Emphasis

This MA is allocated to approximately 97,629 acres on the Ozark National Forest of which 37,029 acres are within the Ozark East CFLRP. The primary emphasis in this management area is to restore and maintain a landscape mosaic of open pine woodland that approximates historical conditions. The purpose is to provide habitat for associated plants and animals, some of which are rare and declining, and to create a setting for recreation that is different, uncommon, visually appealing, and rich in wildlife. Restoration and maintenance of pine woodland occur primarily on xeric and dry sites within this management area. This management area differs from MA 3.B. because its primary emphasis is restoring pine woodland rather than oak woodland. Where oak dominates on oak-appropriate sites, however, restoration and maintenance of oak woodland is also emphasized. On more mesic sites, management emphasis varies as needed to provide for other multiple uses and values that are compatible with the primary emphasis of this area.

Lands within this management area are predominately classed as suitable for timber production. Silvicultural prescriptions applied are primarily those for pine woodland restoration with a variety of other prescriptions applied in areas not suited for woodland restoration.

Restoration and maintenance of pine woodland is accomplished through application of a variety of forest management practices. Thinning of trees is often needed to create initial open-canopy conditions, and may be achieved through manual, mechanical, or chemical methods including use of commercial timber sales. Frequent prescribed fire (often applied at landscape scales) may be used to thin trees, and is the predominate method used to maintain open conditions and well-developed understory communities. Regeneration of woodland occurs on a scheduled basis to diversify age class distribution to ensure a sustained supply of this habitat over time.

Desired Condition

This area is characterized by a mosaic of woodland and forest with pine woodland occupying approximately 60 percent of the total community acreage, and typically occurring on ridges and south- to-west facing aspects. Generally, patches of pine woodlands are well connected in networks of ridges and other suitable sites incorporating other fire-dependent communities such as glades and barrens. Forests (> 60% canopy closure) are present on lower slopes and drains, with most being in an open condition (60 to 80% canopy closure).

Pine woodlands have open canopies (10 to 60% canopy closure), sparse midstories, and well-developed understories that are typically dominated by grasses and forbs, but also may have a significant woody component. The density of the overstory and midstory and the woody component of the understory generally increase as one moves down slope and onto north and east aspects, gradually merging with more typical forest conditions.

Where pine woodland restoration efforts have just begun, evidence of management activities used to thin forests is common and may include downed trees, tree branches, and stumps. Within a few years, these elements are much less evident as they are obscured by well-developed understories and are reduced through the effects of fire and decay.

Evidence of fire is common at all stages of the pine woodland restoration process in the form of charred bark and top-killed woody sprouts. Occasionally, freshly burned areas are encountered with large areas of blackened ground and scorched vegetation. These areas typically green-up quickly through the sprouting of fire-adapted vegetation. Fire often occurs over large areas (up to several thousand acres) in blocks surrounded to the extent practicable by existing permanent fire breaks such as roads and streams. Typically, blocks are burned every two to five years with every third burn, on average, occurring within the growing season (April 1 through October 15).

Fire intensity varies with topographic condition resulting in a variety of vegetation conditions across the landscape. Some areas, especially the most mesic sites, do not typically burn, or burn at very low intensities with minimal effects on vegetation and litter layers.

Age classes of pine woodland patches are diverse and generally balanced from regenerating up to mature and old growth with overstory ages up to 120 to 150 years or more. Woodland above the minimum old growth age (100 years) is common. Regenerating and young woodland (0 to 40 years old) may have higher levels of canopy closure (> 60%) than that which defines the woodland condition (< 60% canopy closure).

The abundance of pine woodlands within this area provides optimal habitat conditions for many species including management indicator species brown-headed nuthatch and northern bobwhite, rare species, and species in demand for hunting such as wild turkey and whitetail deer.

Forest communities other than pine woodland are present in a variety of conditions and ages. Evidence of vegetation management may be present in these communities. Where rare communities are present within this area, they support healthy populations of associated species, and are free from threats that would degrade their integrity. Water quality in stream systems is excellent, and aquatic communities reflect native diversity.

Monitoring

Within the Pine Woodland MA (3.A), monitor and evaluate trends in:

- ▶ Abundance of pine woodland.
- ▶ Proportion of the Shortleaf Pine-Oak Forest and Woodland Community burned at desired intervals and seasons.

3.B Oak Woodland

Emphasis

This MA is allocated to approximately 154,704 acres on the Ozark National Forest of which 54,946 acres are within the Ozark East CFLRP. The primary emphasis in this management area is to restore and maintain a landscape mosaic of open oak woodland that mimics historical conditions. The purpose is to provide habitat for associated plants and animals, some of which are rare and declining, and to create a setting for recreation that is visually appealing, rich in wildlife, and not commonly encountered elsewhere. Restoration and maintenance of oak woodland occurs primarily on xeric and dry sites within this management area. This management area differs from MA 3.A because its primary emphasis is restoring oak woodland rather than

pine woodland. Where pine dominates on pine-appropriate sites, however, restoration and maintenance of pine woodland is also emphasized. On more mesic sites, management emphasis varies as needed to provide for other multiple uses and values compatible with the primary emphasis of this area.

Lands within this management area are predominately classed as suitable for timber production. Silvicultural prescriptions applied are primarily those for oak woodland restoration with a variety of other prescriptions applied in areas not suited for woodland restoration.

Restoration and maintenance of oak woodland is accomplished through application of a variety of forest management practices. Thinning of trees is often needed to create initial open-canopy conditions, and may be achieved through manual, mechanical, or chemical methods including use of commercial timber sales. Frequent prescribed fire (often applied at landscape scales) may be used to thin trees, and is the predominate method used to maintain open conditions and well-developed understory communities. Regeneration of woodland occurs on a scheduled basis to diversify age class distribution to ensure a sustained supply of this habitat over time.

Desired Condition

This area is characterized by a mosaic of woodland and forest with oak woodland occupying approximately 60 percent of xeric and dry sites, and typically occurring on ridges and south- to west facing aspects. Patches of oak woodland are generally well connected in networks of ridges and other suitable sites incorporating other fire-dependent communities such as glades and barrens.

Oak woodlands are primarily comprised of the Dry Oak Forest and Woodland community. They have open canopies (10 to 60% canopy closure), sparse midstories, and well-developed understories that are typically dominated by grasses and forbs, but also may have a significant woody component. The density of the overstory and midstory and the woody component of the understory generally increase as one moves down slope and onto north and east aspects, gradually merging with more typical forest conditions.

Where oak woodland restoration efforts have just begun, evidence of management activities used to thin forests is common, and may include downed trees, tree branches, and stumps. Within a few years, these elements are much less evident as they are obscured by well-developed understories, and are reduced through the effects of fire and decay.

Evidence of fire is common at all stages of the oak woodland restoration process in the form of charred bark and top-killed woody sprouts. Occasionally, freshly burned areas are encountered with large areas of blackened ground and scorched vegetation. These areas typically green-up quickly through the sprouting of fire-adapted vegetation. Fire often occurs over large areas (up to several thousand acres) in blocks surrounded to the extent practicable by existing permanent fire breaks such as roads and streams. Typically, blocks are burned every two to seven years with

every third burn, on average, occurring within the growing season (April 1 to October 15). Fire intensity varies with topographic condition resulting in a variety of vegetation conditions across the landscape. Some areas, especially the wettest sites, do not typically burn, or burn at very low intensities with minimal effects on vegetation and litter layers.

Age classes of oak woodland patches are diverse and generally balanced from regenerating up to mature and old growth with overstory ages up to 140 to 200 years or more. Woodland above the minimum old growth age (110 years) is common. Regenerating and young woodland (0 to 40 years old) may have higher levels of canopy closure (> 60%) than that which defines the woodland condition (< 60% canopy closure).

The abundance of oak woodlands within this area provides optimal habitat conditions for many species including management indicator species prairie warbler and northern bobwhite, rare species, and species in demand for hunting such as wild turkey and whitetail deer.

Forest communities other than oak woodland are present in a variety of conditions and ages. Evidence of vegetation management may be present in these communities. Where rare communities are present within this area, they support healthy populations of associated species, and are free from threats that would degrade their integrity. Water quality in stream systems is excellent, and aquatic communities reflect native diversity.

Monitoring

Within the Oak Woodland MA (3.B), monitor and evaluate trends in:

- ▶ Abundance of oak woodland.
- ▶ Proportion of potential Dry Oak Forest and Woodland acreage burned at desired intervals and seasons.

3.C Mixed Forest

Emphasis

This MA is allocated to approximately 360,401 acres on the Ozark National Forest of which 48,468 acres are within the Ozark East CFLRP. These lands are managed to ensure the health and sustainability of the pine, pine/hardwood, hardwood/pine, and hardwood forest types across the landscape. Timber will be a by-product of vegetation management aimed at maintaining sustainable ecosystems. This area is suitable for timber production.

Light levels to the forest floor are managed to develop an assemblage of desirable regeneration and to maintain a moderate herbaceous component. This is accomplished through silvicultural activities including prescribed fire as well as mechanical and chemical vegetation control. The

difference between this management area and woodland MAs is that stocking levels of trees in this MA are denser than the stocking levels in the woodland MAs.

Desired Condition

The character of the land is predominately natural appearing with a diversity of forest successional classes and ecological community types. Thinning, prescribed fire at regular intervals, and regeneration harvests are common silvicultural treatments. Stands are regularly thinned to reduce stress as trees age. Fire is common, typically as a result of prescribed burning. Evidence of fire in the form of charred bark and occasional freshly burned areas may be encountered. Fires occur approximately every 3 to 10 years, during both the dormant and growing seasons. Growing season fires generally occur on lower sites appropriate for woodland conditions. Pine and oak woodlands are found throughout the area on appropriate sites. Late-successional to old growth characteristics are provided on suitable lands within this area. High quality, well-maintained roads through the area are designed to facilitate vegetative management and protect water quality. Although a mixed forest is the overriding emphasis of this MA, a variety of silvicultural prescriptions can be used (depending on site conditions) to meet other secondary desired conditions.

Other communities that occur on low productivity sites (e.g., glades) typically comprise a small proportion of the area. Where they occur; however, they exhibit high levels of ecological integrity and diversity of characteristic species. Rare communities within the management area are maintained at desired composition, structure, and function. They support characteristic associations of species. Occurrences for threatened and endangered species are stable or expanding as are those for sensitive and locally rare species, which are needed to provide for their viability.

Priorities

- ▶ Manage for pine and oak woodlands on lower sites.
- ▶ Managed for medium density or balanced age classes on medium to high sites.

Objectives

Apply appropriate silviculture prescriptions to provide the following forest products on medium to high sites: 14" to 16" sawtimber with grade 2 butt logs and/or yellow pine 18" sawtimber. Performance Indicator: Determine DBH during inventories.

Monitoring

Within the Mixed Forest MA (3.C), monitor and evaluate trends in:

- ▶ Number of acres harvested.

3.D Oak Decline Restoration Areas

Emphasis

This MA is allocated to approximately 67,691 acres on the Ozark National Forest of which 48,514 acres are within the Ozark East CFLRP. These areas range from low to high sites and occur on south as well as north facing aspects. These are areas where red oak and white oak trees suffered severe mortality due to general oak decline, repeated insect outbreaks (red oak borer), and disease. Fuel loadings in these areas are high and wildlife mast producing capabilities are greatly reduced from what was present the last 50 years. While present in some areas, red oak and white oak regeneration is at risk from being overtopped by competitors, which will rapidly respond to the increased light. Other areas are completely devoid of oak regeneration and the oak overstory has died leaving no possible future seed source. This area is suitable for timber production.

The emphasis of this MA is to restore and maintain a healthy white oak group, red oak group, and hickory forest that is resistant to large-scale insect and disease attacks and provides for regeneration of oak into the future. Currently, the red oak ecotype is all but gone from these acres due to recent massive outbreaks of red oak borer, other pathogens, and general oak decline. The replacement forest in the absence of management will likely succeed to shade tolerant species such as dogwood and gum. Most of the area has suffered heavy mortality with red oak mortality ranging from 70 to 100 percent. Red oak regeneration is absent or, if it exists, is in a shaded condition from shade tolerant competitors and may soon die. Fuel loading is extremely high creating a serious fire hazard for the next few years. The primary objective of this MA is to return mast-producing trees to the area for wildlife and to repopulate the forest stands with desirable species of commercial value to assist local economies. Management to achieve the desired future condition of these areas is accomplished through various forest management practices including prescribed fire and manual, mechanical, and chemical vegetation control.

Desired Condition

The desired future condition is to have a well-balanced age class scattered over the landscape. Prescribed fire every 3 to 10 years will effectively release the existing red and white oak seedlings on much of the area. On high sites, oak planting may occur where no existing advanced

regeneration is present. Pine, a pioneer species, will capture some of these sites. Because it is commercially viable and desirable for wildlife, pine is managed where it exists.

A series of regular thinning maintains quality oaks in a stress-free environment. This thinning will help prevent serious outbreaks of pathogens. The species mix of the restored forest is diverse, resisting pathogens that target individual tree species or species groups.

Evidence of forest management activities (e.g., tree stumps, logging roads) is seen as a result of forest management. Rare communities and associated species continue to exist in the area including disturbance dependent communities requiring active management. Although oak restoration is the overriding theme of this management area, other silvicultural prescriptions can be used depending on site conditions. High quality, well-maintained roads through the area are designed to facilitate timber removal and protect water quality.

Habitat associations emphasized include both xeric and mesic oak habitats, and some species (fire dependent species) in the early-successional habitat. The conditions are suitable for wild turkey and whitetail deer. The management and protection of rare communities and species habitats is provided along with the management and protection for population occurrences of threatened, endangered, and sensitive (TES) and locally rare species.

The landscape character is of a forest with closed overstory canopies except where thinned to promote oak regeneration. Herbaceous vegetation is created through repeated prescribed fire, but will not be the primary objective of this prescription. In order to balance age classes and to prevent the recurrence of an over mature landscape regeneration, harvests are prescribed.

Priorities

- ▶ Restore pine and oak woodlands on lower sites.
- ▶ Restore a red oak/white oak/hickory forest type in heavily damaged hardwood areas.

Monitoring

Within the Oak Decline Restoration Areas MA (3.D), monitor and evaluate trends in:

- ▶ Number of acres restored to a red oak/white oak/hickory forest type.

3.K Wildlife Emphasis Area

Emphasis

This MA is allocated to approximately 15,712 acres on the Ozark National Forest adjacent to the Gene Rush Wildlife Management Area with the entire acreage being within the Ozark East CFLRP. This area is suitable for timber production.

This management area is established to provide optimal wildlife habitat to benefit both game and non-game wildlife species (e.g., elk, deer, turkey, quail, Neotropical migrant birds, and small mammals), and to enhance consumptive and non-consumptive recreational opportunities as they relate to these and other wildlife species that benefit from a mix of early- and late-successional habitat management.

In addition to providing for quality habitat for such mammals as deer and black bear, this MA would expand the range of the Arkansas' population of elk from adjoining Arkansas Game and Fish Commission lands (Gene Rush Wildlife Management Area) onto Ozark National Forest lands. This expansion is encouraged by managing for oak and pine woodlands, creating medium-sized openings and pastures, and providing additional water sources where needed.

Oak and pine woodlands are prescribed on appropriate sites through thinning and prescribed fire to maintain widely spaced trees. On north and east slopes with high site indices, appropriate forest prescriptions are used. These prescriptions are aimed at providing optimal habitats to support populations of the plant and animal species associated with these communities, and to provide a very high likelihood that all species within these habitats continue to persist on National Forest System lands.

Improved pastures and wildlife openings composed of native species and other non-invasive species are created and maintained to provide year-round forage and to reduce wildlife impacts on private lands. Travel corridors mostly made up of fire lines and roads are used to connect opening where appropriate.

Desired Condition

The area is dominated by grass and herbaceous understories with widely spaced large oaks or pines. Light reaching the forest floor is ample to support a widely diverse and abundant herbaceous component. Stand densities are reduced through repeated thinning to achieve the desired light levels, and repeated fires including growing season burns to control hardwood understories. Prescribed fire is used in the establishment phase until desired objectives are met. Regeneration will occur in this type by withholding fire for a number of years and allowing oak

advanced regeneration to become established. A final removal of the overstory may or may not occur.

This oak community type is an oak overstory with herbaceous/shrub understory providing high species diversity. It is shaped primarily by the use of frequent fires and thinning with open areas occurring from natural events and constructed and maintained openings and pastures. Evidence of forest management activities (e.g., tree stumps, logging roads) may be seen as a result of thinnings. Pine forest community types may comprise a portion of this area and will receive the same treatments as the hardwood areas. Rare communities and associated species would continue to exist in the area including disturbance dependent communities requiring active management.

Improved pastures are constructed and maintained to provide year-round forage for wildlife. They will consist of cool and/or warm season grasses and a variety of forbs. Lime and fertilizer are used to improve vigor and nutrition in pastures. Ponds are constructed to provide water for wildlife. These treatments will provide improved habitat condition for a variety of wildlife including elk, bear, deer, turkey, rabbits and a variety of non-game species.

Habitat associations being emphasized include xeric oak associates, fire dependent species, and early-successional habitat associates. The conditions provided are suitable for elk, prairie warbler, quail, wild turkey, and whitetail deer. This will provide a high likelihood that species within these habitats will continue to persist on National Forest System lands.

Scattered within the Wildlife Emphasis MA are small vegetative communities more applicably managed with pine, oak, and mixed forest woodland types with high quality forest products prescriptions. Although wildlife management is the overriding theme of this management area, these other management prescriptions may be utilized.

The landscape character is open with a prairie-like ground cover with sparse overstory intermixed with openings, pastures, and ponds with closed canopy forest mainly on north and east slopes.

Priorities

- ▶ Work with Arkansas Game and Fish Commission (AGFC) and other partners to provide elk habitat.

Table 1. Description of activities that are accomplished, ready to implement and planning.

Treatments	Accomplished		Future Work		
	Forest Service lands	Partner's lands	Ready to Implement	Planning	Total
Prescribed burning	209,911	5700	128,085	18,594	146,679
Restoration thinning	11681	1800	8,000	15756	23,756
Understory Removal	533	0	3805	14,107	17,912
Opening Construction	68	400	354	1406	1,760
Invasive species Control (Plants)	75	0	500	8000	8,500
Invasive species Control (Hogs)	12,000	0	224,178	0	224,178
Trail Construction	0	0	0	134	134
Trail Closure	0	0	0	285	285
Road Closure	0	0	0	63	63
Road Reconstruction	0	0	0	58	58
Road Decommission	0	0	0	11	11
Road Maintenance	0	0	0	127	127
Culvert replacement/installation	0	0	0	2	2
Cane Restoration	0	0	0	1503	1,503
Large Woody Debris (Miles)	2	0	4	36	40
Stream Crossing repair	0	0	0	20	20

Table 2. Description of activities proposed for CFLRP Funding by year.

Year	Treatments	acres/mile	Cost			
			contract/agreement	supplies	Personnel	Total
2010	Restoration Thinning	500	\$56,600	\$2,000	\$22,500	\$81,100
2011	Restoration thinning	2000	\$236,640	\$5,916	\$53,244	\$295,800
	understory removal	1402	\$112,581	\$49,126	\$42,985	\$204,692
	Invasive Species (hogs)	20,000	\$5,120	\$2,240	\$24,640	\$32,000
	Invasive Species (Plants)	889	\$69,431	\$30,297	\$26,510	\$126,238
	Cane Restoration	167	\$10,014	\$448	\$4,484	\$14,947
	Large Woody Debris (Miles)	4	\$0	\$1,316	\$3,384	\$4,700
	Stream Crossing repair	2	\$20,350	\$1,850	\$14,800	\$37,000
	Trail Construction	10	\$20,100	\$1,200	\$8,700	\$30,000
2012	Restoration thinning	2000	\$124,727	\$5,585	\$55,848	\$186,160
	understory removal	1600	\$133,619	\$58,307	\$51,018	\$242,944
	Invasive Species (hogs)	20,000	\$5,325	\$2,330	\$25,626	\$33,280
	Invasive Species (Plants)	889	\$72,208	\$31,509	\$27,570	\$131,288
	Cane Restoration	167	\$10,415	\$466	\$4,663	\$15,544
	Large Woody Debris (Miles)	4	\$0	\$1,369	\$3,519	\$4,888
	Stream Crossing repair	3	\$30,647	\$2,786	\$22,289	\$55,722
	Trail Construction	16	\$33,446	\$1,997	\$14,477	\$49,920
	Trail Closure	36	\$57,096	\$3,744	\$32,760	\$93,600
	Culvert replacement/installation (fish passage)	1	\$206,606	\$15,652	\$90,782	\$313,040
2013	Restoration thinning	2000	\$129,524	\$5,800	\$57,996	\$193,320
	understory removal	1600	\$138,758	\$60,549	\$52,980	\$252,288
	Invasive Species (hogs)	20,000	\$5,530	\$2,419	\$26,611	\$34,560
	Invasive Species (Plants)	889	\$74,985	\$32,721	\$28,631	\$136,337
	Cane Restoration	167	\$10,815	\$484	\$4,843	\$16,142

Table 2. Continued.

Year	Treatments	Acres/mile	Cost			Total
			Contract/Agreement	Supplies	Personnel	
2013	Large Woody Debris (Miles)	4	\$0	\$1,421	\$3,655	\$5,076
	Stream Crossing repair	2	\$20,513	\$1,865	\$14,918	\$37,296
	Trail Construction	16	\$34,733	\$2,074	\$15,034	\$51,840
	Trail Closure	36	\$59,292	\$3,888	\$34,020	\$97,200
	Culvert replacement/installation (fish passage)	1	\$214,553	\$16,254	\$94,273	\$325,080
2014	Restoration thinning	2000	\$134,322	\$6,014	\$60,144	\$200,480
	understory removal	1600	\$143,898	\$62,792	\$54,943	\$261,632
	Invasive Species (hogs)	20,000	\$5,734	\$2,509	\$27,597	\$35,840
	Invasive Species (Plants)	889	\$77,763	\$33,933	\$29,691	\$141,387
	Cane Restoration	167	\$11,216	\$502	\$5,022	\$16,740
	Large Woody Debris (Miles)	4	\$0	\$1,474	\$3,790	\$5,264
	Stream Crossing repair	3	\$30,891	\$2,808	\$22,466	\$56,166
	Trail Construction	16	\$36,019	\$2,150	\$15,590	\$53,760
	Trail Closure	36	\$61,488	\$4,032	\$35,280	\$100,800
2015	Restoration thinning	2000	\$139,119	\$6,229	\$62,292	\$207,640
	understory removal	1600	\$149,037	\$65,034	\$56,905	\$270,976
	Invasive Species (hogs)	20,000	\$5,939	\$2,598	\$28,582	\$37,120
	Invasive Species (Plants)	889	\$80,540	\$35,145	\$30,752	\$146,436
	Cane Restoration	167	\$11,616	\$520	\$5,201	\$17,338
	Large Woody Debris (Miles)	4	\$0	\$1,527	\$3,925	\$5,452
	Stream Crossing repair	2	\$20,676	\$1,880	\$15,037	\$37,592
	Trail Construction	16	\$37,306	\$2,227	\$16,147	\$55,680
	Trail Closure	36	\$63,684	\$4,176	\$36,540	\$104,400
2016	Restoration thinning	2000	\$143,916	\$6,444	\$64,440	\$214,800

Table 2. Continued.

Year	Treatments	Acres/mile	Cost			Total
			Contract/Agreement	Supplies	Personnel	
2016	understory removal	1200	\$115,632	\$50,458	\$44,150	\$210,240
	Invasive Species (hogs)	20,000	\$6,144	\$2,688	\$29,568	\$38,400
	Invasive Species (Plants)	889	\$83,317	\$36,357	\$31,812	\$151,486
	Cane Restoration	167	\$12,017	\$538	\$5,381	\$17,936
	Large Woody Debris (Miles)	4	\$0	\$1,579	\$4,061	\$5,640
	Stream Crossing repair	2	\$20,757	\$1,887	\$15,096	\$37,740
	Trail Construction	16	\$38,592	\$2,304	\$16,704	\$57,600
	Trail Closure	36	\$65,880	\$4,320	\$37,800	\$108,000
2017	Restoration thinning	2000	\$148,713	\$6,659	\$66,588	\$221,960
	understory removal	1200	\$119,486	\$52,140	\$45,622	\$217,248
	Invasive Species (hogs)	20,000	\$6,349	\$2,778	\$30,554	\$39,680
	Invasive Species (Plants)	889	\$86,094	\$37,568	\$32,872	\$156,535
	Cane Restoration	167	\$12,418	\$556	\$5,560	\$18,534
	Large Woody Debris (Miles)	4	\$0	\$1,632	\$4,196	\$5,828
	Stream Crossing repair	2	\$20,838	\$1,894	\$15,155	\$37,888
	Trail Construction	16	\$108,854	\$1,183	\$8,282	\$118,320
	Trail Closure	35	\$66,185	\$4,340	\$37,975	\$108,500
2018	Restoration thinning	2000	\$153,510	\$6,874	\$68,736	\$229,120
	understory removal	1200	\$123,341	\$53,821	\$47,094	\$224,256
	Invasive Species (hogs)	20,000	\$6,554	\$2,867	\$31,539	\$40,960
	Invasive Species (Plants)	889	\$88,872	\$38,780	\$33,933	\$161,585
	Cane Restoration	167	\$12,818	\$574	\$5,739	\$19,132
	Large Woody Debris (Miles)	4	\$0	\$1,684	\$4,332	\$6,016
	Stream Crossing repair	2	\$20,920	\$1,902	\$15,214	\$38,036
	Trail Construction	14	\$106,453	\$1,157	\$8,100	\$115,710
	Trail Closure	35	\$68,320	\$4,480	\$39,200	\$112,000

Table 2. Continued.

Year	Treatments	Acres/mile	Cost			Total
			Contract/Agreement	Supplies	Personnel	
2019	Restoration thinning	2000	\$158,308	\$7,088	\$70,884	\$236,280
	understory removal	1200	\$127,195	\$55,503	\$48,565	\$231,264
	Invasive Species (hogs)	20,000	\$6,758	\$2,957	\$32,525	\$42,240
	Invasive Species (Plants)	888	\$91,546	\$39,947	\$34,954	\$166,447
	Cane Restoration	167	\$13,219	\$592	\$5,919	\$19,729
	Large Woody Debris (Miles)	4	\$0	\$1,737	\$4,467	\$6,204
	Stream Crossing repair	2	\$21,001	\$1,909	\$15,274	\$38,184
	Trail Construction	14	\$37,145	\$2,218	\$16,078	\$55,440
	Trail Closure	35	\$70,455	\$4,620	\$40,425	\$115,500
Summary						
	Restoration thinning	18500	\$1,425,379	\$58,609	\$582,672	\$2,066,660
	understory removal	12602	\$1,163,547	\$507,730	\$444,263	\$2,115,540
	Invasive Species (hogs)	180,000	\$53,453	\$23,386	\$257,242	\$334,080
	Invasive Species (Plants)	8000	\$724,756	\$316,257	\$276,725	\$1,317,737
	Cane Restoration	1503	\$104,548	\$4,681	\$46,812	\$156,041
	Large Woody Debris (Miles)	36	\$0	\$13,739	\$35,329	\$49,068
	Stream Crossing repair	20	\$206,593	\$18,781	\$150,250	\$375,624
	Trail Construction	134	\$452,648	\$16,510	\$119,112	\$588,270
	Trail Closure	285	\$512,400	\$33,600	\$294,000	\$840,000
	Culvert replacement/installation (fish passage)	2	\$421,159	\$31,906	\$185,055	\$638,120
					Total	\$8,481,141

Table 3. Description of the Federal Investments (Total 10,996,610).

<u>Year</u>	<u>Timber Sale Prep.</u>	<u>Prescribed Burning</u>	<u>Stewardship Timber Value</u>	<u>Forest Service Approp.</u>	<u>Forest Service Mon.</u>	<u>Trust Fund Knutson- Vandenberg</u>	<u>Road Maintenance</u>
<u>2010</u>	<u>59,610</u>	<u>375,000</u>	<u>2,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2011</u>	<u>780,000</u>	<u>375,000</u>	<u>150,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2012</u>	<u>525,000</u>	<u>375,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2013</u>	<u>525,000</u>	<u>375,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2014</u>	<u>255,000</u>	<u>375,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2015</u>	<u>60,000</u>	<u>625,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2016</u>	<u>60,000</u>	<u>625,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2017</u>	<u>60,000</u>	<u>625,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2018</u>	<u>60,000</u>	<u>625,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>2019</u>	<u>60,000</u>	<u>625,000</u>	<u>225,000</u>	<u>10,000</u>	<u>15,000</u>	<u>100,000</u>	<u>35,000</u>
<u>Total</u>	<u>2,444,610</u>	<u>5,000,000</u>	<u>1,952,000</u>	<u>100,000</u>	<u>150,000</u>	<u>1,000,000</u>	<u>350,000</u>

Table 4. Description of Non-Federal Investments (Total 702,500).

<u>Year</u>	<u>National Forest Foundation</u>	<u>TNC & ANHC Monitoring</u>	<u>Arkansas Game & Fish Comm.</u>	<u>National Wild Turkey Federation</u>	<u>Rocky Mountain Elk Foud.</u>
<u>2010</u>	<u>90,000</u>	<u>7,500</u>	<u>10,000</u>	<u>10,000</u>	<u>2,000</u>
<u>2011</u>	<u>136,500</u>	<u>7,500</u>	<u>10,000</u>	<u>10,000</u>	<u>2,000</u>
<u>2012</u>	<u>136,750</u>	<u>0</u>	<u>10,000</u>	<u>10,000</u>	<u>2,000</u>
<u>2013</u>	<u>136,750</u>	<u>7,500</u>	<u>5,000</u>	<u>5,000</u>	<u>2,000</u>
<u>2014</u>		<u>7,500</u>	<u>5,000</u>	<u>5,000</u>	<u>2,000</u>
<u>2015</u>		<u>0</u>	<u>5,000</u>	<u>5,000</u>	<u>2,000</u>
<u>2016</u>		<u>7,500</u>	<u>5,000</u>	<u>5,000</u>	<u>2,000</u>
<u>2017</u>		<u>7,500</u>	<u>5,000</u>	<u>5,000</u>	<u>2,000</u>
<u>2018</u>		<u>0</u>	<u>5,000</u>	<u>5,000</u>	<u>2,000</u>
<u>2019</u>		<u>7,500</u>	<u>5,000</u>	<u>5,000</u>	<u>2,000</u>
<u>Total</u>	<u>500,000</u>	<u>52,500</u>	<u>65,000</u>	<u>65,000</u>	<u>20,000</u>

Note: TNC- The Nature Conservancy, ANHC- Arkansas Natural Heritage Commission

Ozark-Ouachita Pine/Bluestem Woodland

Seminole Bat (*Lasiurus seminolus*)
Eastern Towhee (*Pipilo erythrophthalmus*)
Western Diamondback Rattlesnake (*Crotalus atrox*)
Red-cockaded Woodpecker (*Picoides borealis*)
Desert Shrew (*Notiosorex crawfordi*)
Red-headed Woodpecker (*Melanerpes erythrocephalus*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Western Slender Glass Lizard (*Ophisaurus attenuatus*)
Bachman's Sparrow (*Aimophila aestivalis*)
Prairie Warbler (*Dendroica discolor*)
Ringed Salamander (*Ambystoma annulatum*)
Northern Bobwhite (*Colinus virginianus*)
Brown-headed Nuthatch (*Sitta pusilla*)

Ozark-Ouachita Pine-Oak Forest

ground beetle (*Scaphinotus parisiensis*)
Wood Thrush (*Hylocichla mustelina*)
ground beetle (*Scaphinotus inflectus*)
beetle (*Rimulincola divalis*)
Prairie Warbler (*Dendroica discolor*)
Seminole Bat (*Lasiurus seminolus*)
Eastern Towhee (*Pipilo erythrophthalmus*)
Chimney Swift (*Chaetura pelagica*)
Northern Bobwhite (*Colinus virginianus*)
Kentucky Warbler (*Oporornis formosus*)
Fourche Mountain Salamander (*Plethodon fourchensis*)
Kiamichi Slimy Salamander (*Plethodon kiamichi*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Western Diamondback Rattlesnake (*Crotalus atrox*)
Hooded Warbler (*Wilsonia citrina*)
Ringed Salamander (*Ambystoma annulatum*)
Caddo Mountain Salamander (*Plethodon caddoensis*)
Bald Eagle (*Haliaeetus leucocephalus*)
Whip-poor-will (*Caprimulgus vociferus*)
Worm-eating Warbler (*Helmitheros vermivorus*)
Mole Salamander (*Ambystoma talpoideum*)

Ozark-Ouachita Pine-Oak Woodland

Eastern Tiger Salamander (*Ambystoma tigrinum tigrinum*)
Bewick's Wren (*Thryomanes bewickii*)
Great Plains Skink (*Eumeces obsoletus*)
Northern Bobwhite (*Colinus virginianus*)
Red-headed Woodpecker (*Melanerpes erythrocephalus*)
Texas Frosted Elfin (*Callophrys irus hadros*)
Ringed Salamander (*Ambystoma annulatum*)
Painted Bunting (*Passerina ciris*)
Chuck-will's-widow (*Caprimulgus carolinensis*)

Central Interior Highlands Calcareous Glade and Barrens

Scrubland Tiger Beetle (*Cicindela obsoleta*)
Whip-poor-will (*Caprimulgus vociferus*)
Ground Snake (*Sonora semiannulata*)
Texas Horned Lizard (*Phrynosoma cornutum*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Collared Lizard (*Crotaphytus collaris*)
Western Slender Glass Lizard (*Ophisaurus attenuatus*)

Central Interior Highlands Dry Acidic Glade and Barrens

Texas Horned Lizard (*Phrynosoma cornutum*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Great Plains Skink (*Eumeces obsoletus*)
Rufous-crowned Sparrow (*Aimophila ruficeps*)
Desert Shrew (*Notiosorex crawfordi*)
Western Slender Glass Lizard (*Ophisaurus attenuatus*)
Northern Bobwhite (*Colinus virginianus*)
Collared Lizard (*Crotaphytus collaris*)
Diana (*Speyeria diana*)
Western Diamondback Rattlesnake (*Crotalus atrox*)
Whip-poor-will (*Caprimulgus vociferus*)

Ozark-Ouachita Dry Oak Woodland

Indiana Bat (*Myotis sodalis*)
Western Diamondback Rattlesnake (*Crotalus atrox*)
Ozark Big-eared Bat (*Corynorhinus townsendii ingens*)
beetle (*Rimulincola divalis*)
Northern Bobwhite (*Colinus virginianus*)
Texas Frosted Elfin (*Callophrys irus hadros*)
Yellow-billed Cuckoo (*Coccyzus americanus*)
noctuid moth (*Schinia indiana*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Prairie Warbler (*Dendroica discolor*)
Great Plains Skink (*Eumeces obsoletus*)
Bewick's Wren (*Thryomanes bewickii*)
Red-headed Woodpecker (*Melanerpes erythrocephalus*)
Blue-winged Warbler (*Vermivora pinus*)
Whip-poor-will (*Caprimulgus vociferus*)
Eastern Towhee (*Pipilo erythrophthalmus*)
Meske's Skipper (*Hesperia meskei*)

Ozark-Ouachita Dry-Mesic Oak Forest

Worm-eating Warbler (*Helmitheros vermivorus*)
Great Plains Skink (*Eumeces obsoletus*)
beetle (*Rimulincola divalis*)
Ouachita Pseudactium (*Pseudactium magazinensis*)
Chuck-will's-widow (*Caprimulgus carolinensis*)
Prairie Warbler (*Dendroica discolor*)
Whip-poor-will (*Caprimulgus vociferus*)
Cow Path Tiger Beetle (*Cicindela purpurea*)
Mole Salamander (*Ambystoma talpoideum*)
Chimney Swift (*Chaetura pelagica*)
Ozark Pseudactium (*Pseudactium ursum*)
pseudoscorpion (*Microcreagris ozarkensis*)
Indiana Bat (*Myotis sodalis*)
Fourche Mountain Salamander (*Plethodon
fourchensis*)
Kiamichi Slimy Salamander (*Plethodon kiamichi*)
Small-eyed Mold Beetle (*Ouachitychus parvovulus*)
Caddo Mountain Salamander (*Plethodon caddoensis*)
Yellow-billed Cuckoo (*Coccyzus americanus*)