Environmental Assessment

For

Parks Ecological Management Unit

Compartments *328 and 329*
Scott County, Arkansas

Responsible Agency:
USDA Forest Service
Ouachita National Forest
Poteau-Cold Springs Ranger District

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List of Appendices

Chapter 1
Purpose of and Need for the Proposed Action

Proposed Action

The District Ranger on the Poteau-Cold Springs Ranger District, Ouachita National Forest, proposes to implement management activities in Parks Ecological Management Unit comprised of Compartments 328 and 329, henceforth referred to as Parks. Activities proposed include designation of Red-cockaded woodpecker (RCW) recruitment stands and other RCW habitat work such as timber harvesting, midstory reduction, prescribed burning, and silvicultural treatments. Wildlife treatments, road system improvements, special use permits (ex. firewood and rock collection) and heritage resource protection are also included. These activities should move this project area toward prevention of insect infestations, continued mast development for wildlife, and towards the design criteria for Management Areas 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and Red-cockaded Woodpecker Habitat). These activities should begin in 2011, if an action alternative is selected.

Parks **project area** contains 3,875 acres of national forest lands. These forested acres include 2,763 of "suitable" land.

(TABLE 1. 1) Summary of existing National Forest lands, private ownership and total watershed acreage in the Parks analysis area. These are ***approximate*** acres only based on field examinations, Geographical Information Systems (GIS), and Global Positioning Systems (GPS).

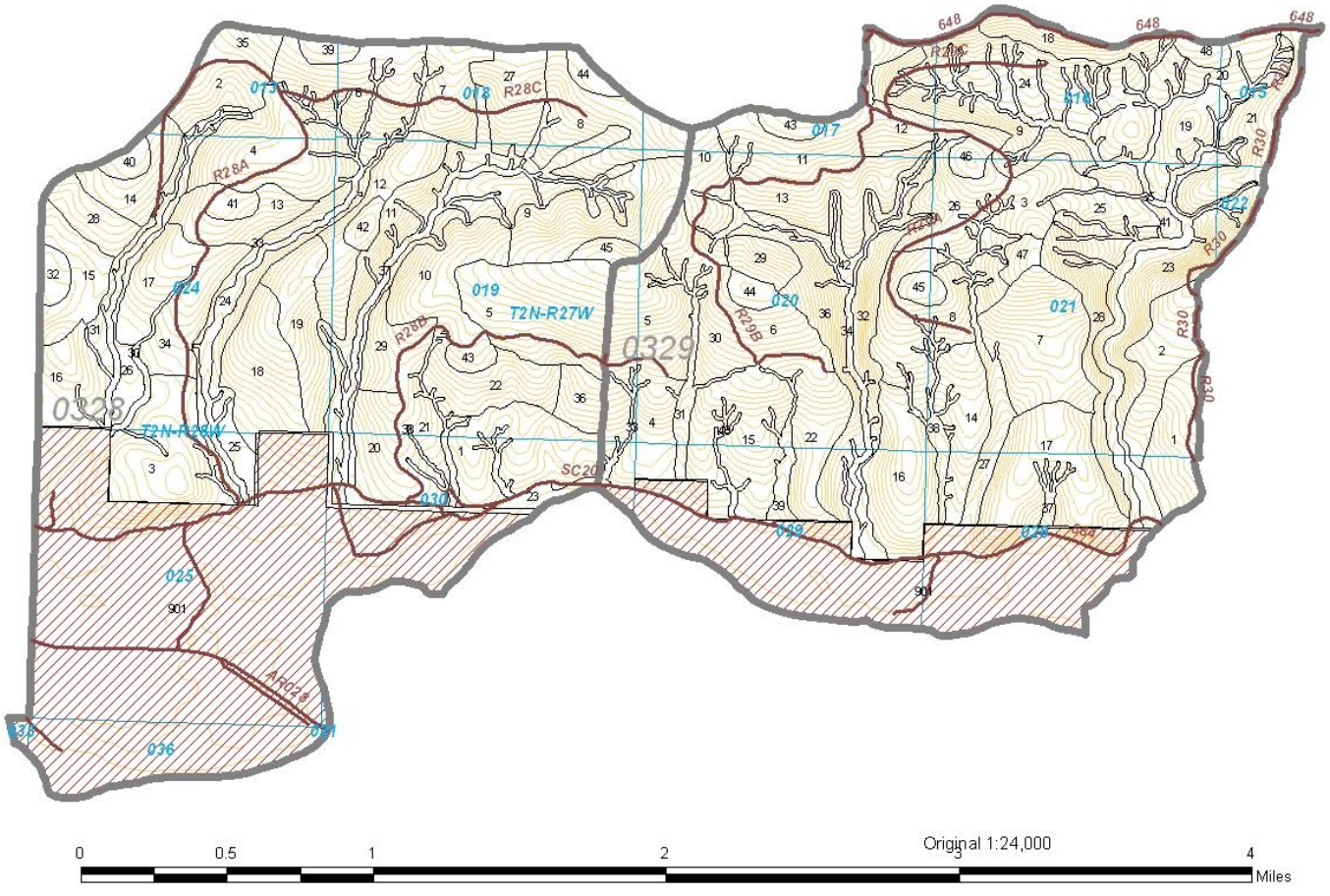
Land Designation	328	329	Total
National Forest Management Areas			
MA 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and RCW Habitat- ***unsuitable* hardwood which includes riparian acres)**	142	259	**401**
MA 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and RCW Habitat- ***unsuitable pine***)	317	394	**711**
MA 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and RCW Habitat- ***suitable***)	1371	1392	**2763**
Total Acres of National Forest	**1830**	**2045**	**3875**
Private acres within boundary	782	314	**1096**
Total Acres within project area (private and NF lands)	**2612**	**2359**	**4971**

(TABLE 1. 2) Summary of watershed acres used for Aquatic Cumulative Effects Analysis. These are ***approximate*** acres only based on field examinations, Geographical Information Systems (GIS),and Global Positioning Systems (GPS). See Watershed Map in appendix.

Watershed	Entire Watershed (Including Project Area)		Total Watershed Acres
111102060108	3,323 ac. (private)	11,480 ac (NF lands)	14,803
111102060111	3,710 ac. (private)	15,645 ac (NF lands)	19,355
TOTAL	7,933 ac. (private)	27,125 ac (NF lands)	34,158

This project area falls within two 6th level watershed (34,158 acres). These watersheds are considered "low risk".

PARKS STAND MAP
Compartments 328 and 329
Poteau-Cold Springs Ranger District



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dm, 7/23/2010

Location

Parks, comprised of Compartments 328 and 329 on the Poteau-Cold Springs Ranger District on the Ouachita National Forest, is located in Scott County, Arkansas. It lies northeast of the Parks Community and north of Highway 28. Forest Service Road 884 provides access to the southern boundary which is the Fourche La Favre River; Forest Service Road R29 forms the eastern boundary; and Forest Service Road 648 forms a portion of the northern boundary. Brushy Mountain is on the northern boundary of the project area. The project area is in T2N, R28W, and all or portions of S13, 24 and 25; and T2N, R27W, and all or portions of S15-22 and 28-30.

A summary of the Proposed Action is listed below:

Designation of RCW Recruitment Stands: Creation of 13 Recruitment stands for the future expansion of the RCW population into this EMU. These designations change the suitable pine from 2,763 to 2,714 acres. These stands will be thinned, have a midstory treatment, and when habitat is ready, have inserts and other RCW structures installed.

(Table 1.3) Summary of changes in National Forest lands created by the Proposed Action.

Land Designation	328	329	Total
National Forest Management Areas			
MA 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and RCW Habitat- ***unsuitable* hardwood which includes riparian acres)**	106	293	**399**
MA 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and RCW Habitat- ***unsuitable pine***)	355	407	**762**
MA 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and RCW Habitat- ***suitable***)	1369	1345	**2714**
Total Acres of National Forest	**1830**	**2045**	**3875**
Private acres within boundary	782	314	**1096**
Total Acres within project area (private and NF lands)	**2612**	**2359**	**4971**

Stand management consists of managing the pine stands in the project area by even-age management on approximately 2,527 acres.

Timber harvesting consists of harvesting shortleaf pine and/or hardwood products on approximately 1,926 acres by commercial thinning to a target average basal area (BA) of 60 for pine; approximately 521 acres by commercial thinning on 20 ft. spacing; and approximately 80 acres of modified shelterwood harvest. All stands would retain 10-20% of quality hardwood, where available. In recruitment clusters, retain no more than 10 square feet of basal area per acre in overstory hardwoods.

Prescribed burning is proposed for multiple purposes (T&E, site preparation, wildlife habitat improvement, and the Healthy Forest Initiative consisting of fuel reduction) on approximately 3,875 acres on an approximate 3-5 year rotation.

Silvicultural Treatments consist of reforestation treatments and timber stand improvements.

Shortleaf pine shelterwood stands (80 acres) would be mechanically scarified, have site prep by hand tools, and prescribed burning. There would be an option to herbicide, rip, and plant, if necessary. Shelterwood stands

would be planted with Shortleaf pine if the sites are not stocked with a minimum of 150 seedlings per acre within 5 years after harvest.

Timber stand improvements consist of 289 acres of hand tool release and 110 acres of pre-commercial thinning.

T&E activities consist of designating 13 recruitment stands for Red-cockaded woodpecker (RCW). These stands will have inserts installed when the habitat is in optimal condition for the RCW. Other treatments, including the use of cavity restrictors, snake and squirrel excluder devices, single-bird augmentations, multiple-bird group-initiations, removal of southern flying squirrels, population/nest monitoring, brush hogging around cavity trees, cavity maintenance, and southern pine beetle (SPB) control efforts could occur.

Midstory reduction and rotational prescribed burning are specifically for the RCW but other wildlife species also benefit.

Wildlife activities proposed consist of 1,926 acres of wildlife stand improvements (midstory or MSR) which will be maintained with prescribed burning. MSR will be accomplished by hand tool treatments, mechanical means, and/or herbicides if necessary. The method chosen would be site-specific and should result in little, if any, impact on non-target plant species.

There would be 13 woodland ponds reconstructed and 3 constructed. A total of 8 nest structures (wood duck/squirrel boxes and bluebird boxes) would be installed in regeneration cuts and 32 nest structures (2 per pond) at the pond sites.

Transportation system consists of proposing road closures, approximately 2.0 miles of road construction, 5.6 miles of road reconstruction, 11.0 miles of temporary road construction, 7.6 miles of prehaul maintenance and a total of 1.20 miles of road obliteration.

Other permits for firewood and rock collection could be issued to the forest user, where appropriate.

Non-native invasive species treatment by herbicides would stop or slow the infestation of non-native invasive species such as mimosa, lespedeza, or any other species of these types encountered within this analysis area.

Landline Maintenance of approximately 6.75 miles would refurbish marked trees by "blazing and repainting line trees on boundary lines. Periodic maintenance is required and scheduled when watersheds are entered for management needs.

Purpose and Need for the Action

Field examinations and inventories of Parks determined that the existing conditions do not meet the desired conditions and objectives of the Revised Forest Plan (USDA Forest Service, 2005a). The Proposed Actions in this environmental document would move Parks towards the desired conditions established by the Interdisciplinary Team and the design criteria in the Revised Forest Plan.

Below is a table that summarizes the National Forest Management Act (NFMA) analysis that the ID Team prepared prior to developing any proposed actions.

(TABLE 1.4) Results of National Forest Management Act (NFMA) analysis describing desired conditions, existing conditions, site specific needs, and possible management activities.

Desired Conditions	Existing Conditions	Site Specific Needs	Possible Management Activities
Maintain or restore community diversity-and a significant component of species diversity-by utilizing prescribed burning in appropriate portions in Mgt Area 22 Revised Forest Plan, pp 58). Maintain the full range of natural systems found within the ONF…pp 59.	Trees in many pine stands are crowded or densely stocked; many Forest stands are older than 70 years of age. These conditions result in stress and reduced vigor and health, increasing susceptibility to insects and disease.	Need to restore healthy conditions by limiting over story, and open the over story to create suitable wildlife habitats by removing unhealthy trees, and reducing stocking.	Commercial Thinning Wildlife Stand Improvements Prescribed burning Treatment of Non-native invasive species
To have at least 4% and not more than 8.3% of the suitable land in the 0-10 year age class in Management Area 22 (Revised Forest Plan, pp. 78).	There is little 0-10 year age class in Management Area 22. This condition does not provide for long term sustainability of balanced age classes for the future.	Need to increase early seral stage habitat within Parks to meet requirements of the Revised Forest Plan for both Management Area 22.	Modified Shelter wood
To have suitable seedbeds in regeneration stands.	Conditions do not exist for successful natural regeneration.	Need to create a bed for seed fall after the regeneration harvests. Need to create a suitable seedbed in regeneration sites after initial prescribed burning in even-age regeneration stands. Need to create a suitable seedbed in the even-age regeneration stands after initial prescribed burning and handtools.	Reforestation Treatments Prescribed Burning Site Prep by Hand tools Site Prep Mechanical Scarification Hand planting of shortleaf pine, if needed herbicide
To provide a quality visual opportunity.	Heavily traveled roads and mostly mature forest conditions are present on Hwy 28 located to the south. Main roads are level II roads.	Maintain roads to standard and manage the project area to meet habitat requirements. All mgt. activities would meet Scenic Integrity Objectives (SIO) in Mgt. Area 22.	Road maintenance contract and monitor forest management practices.
To ensure quality pine and hardwoods.	There are many stands that are dense and need treatment, mostly in the 10-20 year age class and in mature stands.	Need to reduce the stocking rate in stands, where needed.	Pre-commercial Thin Commercial Thin
To provide at least one permanent water source per 160 acres for wildlife objectives (Revised Forest Plan, WF010, pp. 79).	Existing ponds need to be rehabilitated.	Rehabilitate ponds. Build new ponds	Pond Rehabilitation New pond construction
To Increase growth rate and quality of desired trees.	Competition among species is reducing growth rate affecting tree quality.	Need to decrease competition for limited nutrients and water among species.	Hand Tool Release Pre-commercial Thinning Commercial Thinning

Desired Conditions	Existing Conditions	Site Specific Needs	Possible Management Activities
To have adequate nest structures.	There are not adequate nest structures.	Need to increase possible nest structures.	Install nest boxes where ponds are constructed or reconstructed Install nest boxes in regeneration areas
To reduce midstory and allow development of grasses and forbs on the forest floor.	Midstory is too thick to allow development of grasses and forbs.	Need to reduce the midstory.	Wildlife Stand Improvements Prescribed Burning
To have a reliable hard mast crop.	Hardwood crowns are not developed to produce a reliable hard mast crop.	Need to develop hardwood crowns with WSI stands so that residual hardwood will produce a more reliable hard mast crop.	Wildlife Stand Improvements
To achieve open road density (open road per square mile) objective (0.75) in MA 22 (Revised Forest Plan, pp. 59, 67, 90-92)	There are 3,875 acres of NF and 1096 acres of private land resulting in approx. 4971 acres. There are 19.62 miles of total existing roads (both open and closed). Of these roads, 15.88 miles are currently open. Open road density is 2.53 mi./per sq. mile in MA 22.	Need to reduce the open road density, where feasible. In Management Area 22.	Road closure or obliteration
To provide a safe transportation system that meets the minimum needs of the various resources and their users, minimizes wildlife habitat disturbance, and satisfies some public demand for motorized recreation (Revised Forest Plan, pp. 67).	Current road system is in constant use by hunters, sightseers, Forest Service personnel, and other forest visitors.	Need to access harvest units and provide safe road system. Need to repair rusted-out drains and road surface and ditch erosion. Ensure safe road conditions through periodic maintenance	Road Construction Road Reconstruction Prehaul Maintenance Temporary Roads Seasonal Closing
To have healthy, productive stands in these areas.	Portions of this project area were designated as uneven-age management during the last entry. Past management activities have not resulted in a new age class.	Need to increase growth rate in these stands and create new age classes.	Commercial Thinning Seed Tree Shelterwood Prescribed Burning WSI
To reduce wildfire hazards.	Natural fuel buildup and heavy visitor use, increase wildfire hazards in Parks.	Need to create conditions where a wildfire would not become too hot to kill the overstory and a threat to adjacent private properties.	Prescribed Burning, commercial thinning, pre-commercial thinning, and Wildlife Stand Improvement treatments.
To supply rock permits to the local community.	There are no rock permits in the project area.	Need to allow rock permits to be issued, when necessary.	Allow rock permits within road right-of-ways

Desired Conditions	Existing Conditions	Site Specific Needs	Possible Management Activities
To supply firewood areas to the local community.	There are no firewood permit areas in Parks.	Need to provide sites for firewood areas to allow permitting.	Allow firewood permits where possible
Manage the project area for native species while limiting non-native species.	There are various non-native species including mimosa, lespedeza, etc.	Need to remove and/or reduce the non-native species within the project area and replace with native species	Prescribed burning Herbicide Hand Tools
To provide adequate protection of heritage resource sites.	Forty Seven sites have been previously documented, thirty two of which are either eligible or potentially eligible for the National Register of Historic Places and will be protected.	Need to use adequate protective measure to ensure that these sites are protected.	Identify other sites on the ground for protection.
There is a need to follow the Revised Forest Plan for Oil and Gas Exploration.	The Poteau/Cold Springs Ranger District has received approximately 6 applications for permits to drill in the past year for oil and gas exploration.	Need to meet the requests for oil and gas exploration.	Coordinate with Bureau of Land Management on exploration activities.
There is a need to provide recreation and visual opportunities in the project area.	Heavy public use of interior roads for various recreational activities.	Need to ensure that driving/sightseeing is enhanced and the roads are safe to drive.	Road maintenance and vegetation management.
Improve or maintain soil quality (Revised Forest Plan pp.74).	There are pockets of high compaction and erosion concerns on soils throughout the project area.	Need to ensure Best Management Practices are followed and use mitigation where necessary.	Mitigation
Improve or maintain water resources (Revised Forest Plan pp. 74).	This project area falls within two 6th level watershed. Both are considered “low risk” It also lies adjacent to the Fourche LaFave River..	Need to ensure that management activities exceed Revised Forest Plan standards for water quality and follow Arkansas Best Management Practices (BMP’s)	Mitigation
Reduce or eliminate landline problems in project area.	There are approximately 6.75 miles of landlines associated with this project area.	Need to define landlines and maintain landlines	Landline surveys and maintenance
Maintain safety of the public and firefighters on wildfires in project area.	Project area contains some rocky and steep terrain.	Need to ensure management of wildfires throughout Parks adheres to safety measures for firefighters and public.	Wildfires in project area can be managed for resource benefit.
To have the understory and midstory more open.	The understory and midstory are heavily stocked as a result of lack of prescribed burning within Parks.	Need to reduce heavily stocked hardwood in the understories and midstories.	Prescribed Burning WSI

The following pages describe the purpose and need in more detail.

MANAGEMENT AND TIMBER HARVESTING OF SUITABLE STANDS

Even-age Method

Even-age management is needed in Parks to create suitable RCW habitat that is currently lacking in the project area. This would be accomplished through commercial thinning in overstocked stands to create open conditions required by RCW and reducing the overstocked conditions of timber creating a healthier forest (Objective OBJ10 – Reduce susceptibility to southern pine or Ips beetle outbreaks on at least 25,000 acres per year). In addition shelterwood harvests would be utilized to increase early seral stage habitat in this area. Even-age management is another method that will contribute to a sustainable timber supply.

Commercial thinning of shortleaf pine (2,447 acres) the overstocked condition of the midstory and overstory is preventing sunlight from reaching the forest floor. Commercial thinning would reduce the competition for limited soil nutrients, water, and sunlight (USDA Forest Service. 2005a, Priorities pg. 58 and Objective pg. 59). The current conditions exceed the recommended stocking rates for pine identified on page 84 Table 3.6 of Revised Forest Plan. The mature trees at these high stocking rates with heavily stocked midstories are increasingly susceptible to southern pine beetle (primarily) and other insect and disease infestation. Thinning and releasing stands would improve and restore individual tree vigor, health, and resiliency of the Parks analysis area. Commercial thinning would reduce approximately 1,926 acres to a target BA of 60. Research has shown that Southern pine beetle (SPB) infestations in stands that have been thinned with 20-25 feet between trees will not spread to adjacent stands but will disburse (Managing Southern Forest To Reduce Southern Pine Beetle Impacts, May 1986, p19). A target BA of 60 would average at least 25 feet between trees in mature saw timber stands (with 12.5 – 13" ave.dbh). Approximately 521 acres of commercial thinning on 20 ft. spacing would improve and restore individual tree vigor and growth in the older pine plantations.

Modified shelterwood (80 acres) is needed to create early seral stage habitat (USDA Forest Service. 2005a, Pg. 7, 35, and Objective OBJ06, Pg.59). Most of the 0-10 year age class has moved to the next age class leaving Parks with the minimum amount of early seral stage habitats in the suitable land class. There is some early seral stage habitat in Compartment 328 stands 12 and Compartment 329 stand 16 and on private land within the Parks analysis area; there are pastures and grazed woodlands that are fenced. The objective is to have at least 4% and not more than 8.3% of the suitable stands of Parks in this age class. Currently 110 acres 3.98% or 4% of the suitable land class is in the 0–10 yr. age class. This method would increase the 0-10 year age class by 80 acres to 190 acres 6.87 % or 6.9% of the suitable land class in order to meet Management Area 22 goals. Stands selected for even-age modified shelterwood harvest are mature pine stands located at least 10 chains away from existing young stands still considered regeneration openings on National Forest system lands or on private lands. Regeneration openings are young stands that have not grown to 20% of the height of the adjacent stand.

PRESCRIBED BURNING

Prescribed burning is proposed on approximately 3,875 acres on an *approximate* 3-5 year rotation in the Parks project area. Multiple purposes would be met by prescribed burning such as for site preparation, wildlife habitat improvement, control understory, and fuel reduction, which would address the President's Healthy Forest Initiative.

Site preparation prescribed burns are needed in the regeneration stands to prepare a bed for seed fall after the regeneration harvests. Approximately 80 acres are being harvested for regeneration in this proposal.

T&E burning: Prescribed burning on a 3 -5 year rotation is a proven way to maintain open park-like stands of mature pine trees that the endangered RCW require for roosting cavities and foraging.

Wildlife prescribed burning is needed to provide new growth for wildlife to eat. After a prescribed burning, the understory would "green up" providing a healthy food source for wildlife.

Fuel reduction prescribed burning is needed to reduce the wildfire hazards as a result of natural fuel buildup, lack of prescribed burning, and from natural storm events. Fuels can increase from 4-6 tons per acre to 8-10 tons per acre and higher in places without prescribed burning. Prescribed burning conducted on the Ouachita National Forest typically reduces fuel loading on a unit by 1-3 tons per acre. With repeated burns, fuel loading in a burn unit can be maintained at 3-4 tons per acre. Fuels start accumulating immediately after the last prescribed burn and are heavy in half of the Parks area where fire has been excluded for at least 10 years (the east half of Parks was prescribed burned in 2009). Prescribed burning is needed to reduce fuel loads, cycle nutrients stored in leaf litter layers, and reduce offsite species of hardwoods that have encroached through all stands because of lack of fire. These species; ash, cedar, black gum, and maples would eventually replace the oaks species as the dominant hardwood type in the absence of fire. The Healthy Forests Restoration Act (H.R. 1904) was signed on December 3, 2003. This bill was signed into law to improve the overall forest health, including wildlife habitat, by allowing active management of the nation's forests. The management activities proposed for Parks would meet the objectives of the Healthy Forests Restoration Act (H.R. 1904) by reducing the risk of catastrophic fire to communities, helping save the lives of firefighters and citizens, and protecting threatened and endangered species.

SILVICULTURAL TREATMENTS

Reforestation site preparation of Shortleaf pine shelterwood stands (80 acres) would be by mechanical scarification, hand tool site prep, and/or burning. There would be an option to herbicide and/or rip, and plant, if necessary. Shelterwood stands would be planted with Shortleaf pine if the sites are not stocked with a minimum of 150 seedlings per acre within 5 years after harvest.

Timber stand improvements by hand tool release (289 acres) – This treatment is usually necessary to enable the young naturally established or hand planted seedlings to compete for growing space. Without the use of handtools to control existing hardwood vegetation that is competing to occupy the site, the older hardwoods have well established root systems and quickly "overtop" small pine seedlings. When this occurs, the shading effect quickly kills young pine regeneration.

Timber stand improvements by pre-commercial thinning utilizing hand tools or mechanical methods (110 acres) – This treatment is needed to increase growth and improve the quality, vigor, and health of the remaining trees to create suitable and sustainable RCW habitat into the future.

T&E ACTIVITIES

Designate and Development of RCW Recruitment stands including the use of artificial cavities, cavity restrictors, snake and squirrel excluder devices, single-bird augmentations, multiple-bird group-initiations, southern pine beetle (SPB) control efforts, removal of southern flying squirrels, population/nest monitoring, and cavity maintenance are needed to encourage habitat expansion.

As noted early in this document, all WSI and prescribed burning is designed for the improvement of the habitat for the endangered RCW.

WILDLIFE ACTIVITIES

Woodland pond reconstruction on 13 sites and 3 woodland pond construction is needed to ensure that wildlife has sufficient water available on a year-round basis. The Forest Plan suggests one water source for every 160 acres. Two (2) nest structures will also be installed at each pond site. (Revised Forest Plan. Design Criteria WF010, Pg. 79).

Wildlife stand improvements (1,926) midstory reduction treatments are needed to improve the habitat that currently exists. WSI will help produce a grass/forb understory and enhance hard mast production by residual hardwood crowns within the treated stands. WSI may be completed by the use of hand tools or mechanical equipment depending on terrain, species composition, and cost. Herbicides will be retained as a backup treatment where prescribed burning cannot be used or scheduled to retain the open pine/blue stem conditions.

Nest structures (8) are needed in the regeneration stands within the Parks project area. Many snags and cavity trees were created in this area by the December 2000 ice storm. This was a positive condition for many cavity dependent species. However, time is now causing a loss of these snags and cavity trees.

Wildlife openings – There is a lack of early seral stage habitat in Parks. These openings are needed because several species need the early seral stage habitat that these openings would provide until the conditions in newly harvested areas provide the needed conditions (Revised Forest Plan. Design Criteria Pg. 78). These openings would be created from log landings, firelines and temporary roads.

TRANSPORTATION SYSTEM

The current road system within Parks needs improvements (Revised Forest Plan. Design Criteria TR001, Pg. 90).

Road closures of new roads would move toward the Forest standard for open road density.

Road construction is needed on approximately 2.0 miles to access harvest units and provide a safe transportation system for logging activities.

Road reconstruction is needed on approximately 5.6 miles because the roads have surface and ditch erosion, rusted-out drains, and fish passage concerns.

Temporary roads, approximately 11.0 miles, are needed because they provide access to harvest units, but are not needed for long-term management of the natural resources.

Prehaul maintenance is needed on approximately 7.6 miles because roads have some surface and ditch erosion, rusted-out drains, and need some spot rocking.

OTHER

Firewood permits are needed to supply firewood areas to the local community (Revised Forest Plan. Design Criteria FW001, Pg. 97) and would allow the forest user access to resources from this project area. **Firewood permits are normally allowed where TSI and WSI activities have occurred.** Currently, there are no firewood areas in Parks.

Rock Permits are needed to supply rocks to the local community. Currently there are no rock permits for Parks. Permits would be offered to the public for collection of rocks by private individuals within road construction and reconstruction corridors. That is, rocks can be collected within areas of disturbance associated with road construction and reconstruction.

Herbicide treatments of non-native invasive species – This treatment is necessary to stop or slow the infestation of non-native invasive species such as mimosa, lespedeza, or any other species of these types encountered within this analysis area.

Landline Maintenance – (6.75 miles) This action is needed to refurbish marked trees by "blazing and repainting line trees on boundary lines. Periodic maintenance is required and scheduled when watersheds are entered for management needs.

Scope of This Environmental Analysis

The team's ecosystem analysis is incorporated by reference and included in the project file. The scope of this decision does not include other actions that would be planned in the compartments in the unforeseeable future. All of the actions associated with this analysis are foreseeable, and would be included in the analysis of effects since they may contribute to direct, indirect or cumulative effects on the environment.

Public Involvement

Public involvement began March 8, 2011. We sent a letter by postal service to the district mailing list with a detailed description of the Proposed Action and a stand map for Parks. A copy was also sent electronically to Mr. Richard Atley. Mr. Artley responded electronically on March 27, 2011. A response was returned to Mr. Artley on April 1, 2011, addressing his concerns.

In addition to this mailing mentioned above, a 30-day comment period is provided to the public prior to signing a decision.

Relevant Planning Documents

The following documents directly helped develop the Proposed Action by setting the "side boards" to reach desired future conditions:

- → Revised Land and Resource Management Plan, Ouachita National Forest, Arkansas and Oklahoma, 2005 (USDA Forest Service, 2005a).
- → Final Environmental Impact Statement (FEIS), Revised Land and Resource Management Plan, Ouachita National Forest, Arkansas and Oklahoma, 2005 (USDA Forest Service, 2005b).
- → Programmatic Biological Opinion of the Revised Land and Resource Management Plan on the American Burying beetle (USDI FWS September 2005).
- → Biological Assessment for the Revised Land and Resource Management Plan.
- → Biological Evaluation of Environmental Assessment in Parks EMU (June 2011).
- → Roads Analysis (March 2011).
- → Human Health and Ecological Risk Assessment Final Reports for glyphosate and triclopyr herbicides, March 1 and 15, 2003. Syracuse Environmental Research Associates, Inc.
- → Cultural Resource Report, 2011.

Resources that will have Further Study

Air Quality
Currently, this project area meets the National Ambient Air Quality Standards (NAAQS) under the Clean Air Act, but this resource will be analyzed for effects because of the prescribed burning proposed.

Soils
There are no proposed actions concerning sensitive soils, but there are mitigations that would occur because some soils in this watershed have pockets of soil scattered throughout the project area with a moderate-high to high compaction hazard rating. Therefore, this resource will be analyzed for effects.

Water Resources and Quality
The water quality in this project area currently meets the provisions of the Clean Water Act and state water quality standards. Parks has some floodplains and riparian areas, but no jurisdictional wetlands or municipal watersheds. Because of the multiple activities proposed, this resource will be analyzed for effects.

Wildfire Hazards &/or Fuels
This resource will be analyzed for effects because there are wildfire hazards and a fuels buildup on the forest floor in Parks.

Transportation and Infrastructure
The transportation system in Parks is not adequate. The current open road density for Parks (including private land) is 2.53 miles per square mile, exceeding the Revised Forest Plan design criteria of 0.75 mile per square mile (Revised Forest Plan. Design Criteria TR006, Pg. 91). This resource will be analyzed for effects.

Vegetation
Because of the types of activities proposed, such as timber harvesting, stand improvements, and prescribed burning, this resource will be analyzed for effects.

Wildlife, Habitat and Fisheries
Parks contains diverse forest types and streams and other sources of water. These are important for use by both humans and wildlife. These resources will be analyzed for effects in an effort to improve the value of these resources for all users including the native species of plants and animals.

Proposed, Threatened, Endangered, and Sensitive species
The Ouachita National Forest hosts numerous species of plants and animals that are rare or unusual for a variety of reasons. These resources will be identified and analyzed in order to protect and potentially improve habitat conditions for these species, and provide any necessary mitigation of management practices to protect PETS species.

Insects/Disease
Two important changes are constantly occurring on the Ouachita and within the Parks analysis area. Stands are becoming more densely stocked and they are getting older. These constant changes in forest resource characteristics mean more food, habitat, and favorable conditions for insect and disease infestations. These conditions put the forest under stress because a larger number of less vigorously growing trees are competing for the same nutrients and water. Many of the overstory trees are mature (80 years and older) but not near the end of their lives. Pines, white oaks, and red oaks are capable of living hundreds of years but because of the intense competitions many trees are vulnerable and die before their time. Therefore, this will be analyzed for effects.

Local or County Economy (Project Financial or Economic Efficiency)
The economic base of Scott County is timber with 82% of the land area in timber, 62% of which is National Forest land (Department of Workforce Services, 2007). The local timber industry depends on National Forest land for a source of raw material. Private earnings in Scott County from forestry, logging, fishing, hunting, and trapping totaled $3,579,000 in 2005 (U.S. Department of Commerce, 2007). Many local residents depend on firewood from timber and wildlife activities on the district such as regeneration harvest, site preparation, timber stand improvement work, and wildlife midstory reduction. Therefore, this will be analyzed for effects.

Public Health and Safety
This will be analyzed for effects because of the hazardous fuels, the prescribed burning proposed, and the proposed optional use of herbicide for reforestation and wildlife treatments.

Recreation Resources
Recreation use consists of dispersed camping, hunting, all-terrain vehicle use, berry picking, and bird watching. Therefore, recreation will be analyzed for effects.

Visual Resources
Parks is visible from numerous heavily traveled state, county and Forest Service roads; therefore, visual resources will be analyzed for effects.

Resources Eliminated From Further Study

Floodplains, Riparian Areas, Jurisdictional Wetlands and Municipal Watersheds
There are no ground disturbing actions proposed specifically for floodplains and riparian areas. The project area (Parks) has some floodplains and riparian areas, but no jurisdictional wetlands or municipal watersheds. Current Forest Plan monitoring notes these areas are protected by Forest Plan Standards and Guides in Parks, where they occur. The Revised Forest Plan already decided this; therefore this topic is eliminated from further study (Forest Wide Design Criteria SW001-SW009, Pg. 74-76 and Standards for MA 9, 9.01-9.27, Pg. 103-108).

Minerals and Energy Resources
There is no management activity proposed other than to issue rock collection permits. Other minerals or energy resources present or adjacent to the project area would not be impacted. This topic is outside the scope of the proposed actions; therefore, it is eliminated from further study.

Historic and Cultural Resources
Approximately 1,388 acres have been previously surveyed in this EMU. Forty-seven (47) sites have been previously documented, 32 of which are either eligible or potentially eligible for the National Register of Historic Places and will be protected. Heritage resource surveys will be conducted during winter of 2010. A cultural resource report will be prepared and submitted to the Arkansas State Historic Preservation Office (SHPO) and consulting tribal contacts. No activities will occur until consultation has been completed. Based on the results of the heritage resource surveys and SHPO/tribal concurrence, protective measures and mitigations (which may include adequate protective buffers) would be implemented in order to prevent management activities from occurring within sites that are either eligible or potentially eligible for the National Register of Historic Places.

Parklands, Prime Farmlands, and Rangeland
No parklands, prime farmlands, roadless areas, wild and scenic rivers, ecologically critical areas, or scenic or other unique areas are within, or adjacent to, the project area. There are various soil types in Parks EMU, only one is of concern for management activities. It is Sallisaw #85 associated with prime farmlands. This soil type is present in this project area but in three small pockets within unsuitable riparian zones and floodplains that are not Prime Farmlands. Therefore, this topic is eliminated from further study.

Civil Rights, Consumers, Minority Groups, and Women
Impacts from the proposed actions are not anticipated on civil rights. Actions would impact consumers, minority groups, and women in the same manner as all other groups. Therefore, this topic is eliminated from further study.

Federal, State or Local Laws
There is no known Federal, State, or Local Laws that are being violated in the project area from the actions of the Forest Service. Therefore, this topic is eliminated from further study.

Payments to Counties
The local or county economy has benefited from previous activities on the Poteau-Cold Springs Ranger District, which have supplied raw material to the local timber industry. Scott County has elected the "full payment option". The funds from timber sales contribute to the National revenue per the secure Rural Schools and Community Self-determination Act of 2000 (Public Law 106-393). This topic is outside the scope of this proposal; therefore, it is eliminated from further study.

Issues to be Analyzed in Depth

Issues drive the formulation of alternatives. Issues may develop because of the extent of their geographic distribution, the duration of their effects, or the intensity of interest or resource conflict. The Proposed Action was designed to meet the design criteria for Parks EMU *documented* in "The Purpose and Need for Actions" section of Chapter 1.

Issue #1: *Herbicide use is considered an "issue to be analyzed in depth" because of the intensity of interest that will require the formulation of a "non-herbicide" alternative. Herbicides are proposed to achieve the desired conditions to establish native forest cover where needed. This would be to ensure a stand is reforested within five years after harvest and to remove nonnative species such as mimosa or lespedeza.*

Decisions to Be Made

The deciding officer, District Ranger for the Poteau/Cold Springs Ranger District, Ouachita National Forest, must make two decisions: decide which alternative or the Proposed Action to implement, and decide if those actions would constitute a major federal action and result in significant impacts on the human environment (FONSI or Finding of No Significant Impact.).

Chapter 2
Alternatives Including the Proposed Action

Introduction

The alternatives including the Proposed Action are the heart of this environmental assessment. This chapter describes in detail the activities of the Proposed Action, Alternative II (same as the Proposed Action but without herbicides), and the No Action alternative. Two action alternatives were considered but eliminated from detailed study. Then, based on the descriptions of the relevant resources, the predicted effects on the quality of the human environment disclosed in Chapter 3, and the predicted attainment of project objectives, the alternatives are compared in tabular form, providing a clear basis for choice for the decision maker. Finally, this chapter identifies the Responsible Official's preferred alternative.

Alternative Design and Evaluation Criteria

The District Ranger, working with the interdisciplinary team, identified the alternative design and evaluation criteria. The criteria consist of objectives for Management Area 22.

Technical Requirements

The FEIS was prepared to analyze and select the preferred mix and projected levels of vegetation management methods and tools needed to achieve the goals and objectives identified in the Revised Forest Plan. The FEIS identifies management requirements and mitigation measures (USDA FS, 2005b, Chapter 3 – pg. 23 – 283) to be applied to all methods of vegetation management. The proposed actions would adhere to all applicable management requirements and mitigation measures in the FEIS, which are incorporated in this document by reference. The alternative proposing herbicide use has been analyzed additionally by utilizing the Human Health and Ecological Risk Assessment process developed by the Syracuse Environmental Research Associates.

Forest Plan Mitigations

The Forest-wide Design Criteria for Management Area 22 is incorporated by reference as mitigating measures into the Proposed Action by smart design and are located on the website (as of 09/21/09) at http://www.fs.fed.us/r8/ouachita/planning/plan.shtml.

Project Specific Protective Measures

Soils

Compaction: Soils in both Compartments have areas with compaction hazard ratings that range from slight to severe. Most, however, are in the slight to moderate range. Some of these are on landscapes rated as suitable for timber harvest. Soils with a *moderate-high rating will be treated as having a high rating.* This hazard rating would have a limited equipment-operating season from April to November. Operations during December through March are allowed with the use of methods or equipment that does not cause excessive soil compaction.

There is one suitable stand (Comp. 329 std. 15) with a narrow strip along the road with a severe compaction hazard rating. The rest of stand 15 has a moderate compaction rating. This narrow strip would have a limited equipment-operating season from July to November. Operations during December through June are allowed with the use of methods or equipment that does not cause excessive soil compaction. During these drier periods, extra care would be taken to monitor soil conditions and suspend operations when soils become wet. A map of these soil locations is available in the project file and will be made available to specialists involved in implementing any management activities.

The stands listed below have small portions affected by the seasonal harvest requirements:

→ Compartment 328 Stands 1,2,4,5,6,8,9,10,14,16,18,19,21,22,29, and 35
→ Compartment 329 Stands 4,5, 11, and 15

Erosion: There were no areas of active erosion identified in this project area during field examinations. All of the soils in Parks are rated as slight to moderate for erosion hazard. There are no areas of soil with erosion hazards of ***high or severe*** located in the project area on suitable stands where ground disturbing treatments could occur. All ground disturbing activities will be treated while complying with Best Management Practices (BMPs) as established by agency policy and guidelines. A soil map is available in the project file and will be made available to specialists involved in implementing any management activities.

PETS:
Red-cockaded woodpecker: RCW is not known to currently occupy this EMU but it could move in at any time. Seasonal restrictions on activities around active sites will be limited during nesting season.

Herbicide Use

→ HU001 – Herbicides will be used only where necessary to achieve the desired condition in the treatment area, and then only when site specific analysis shows no unacceptable negative effects to human or wildlife health or the ecosystem as defined in HU002.
→ HU002 – Herbicides will be applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human and wildlife health. Site-specific risk assessments are required prior to herbicide application and must be calculated using the procedure developed by Syracuse Environmental Research Associates (SERA).
→ HU003 – To minimize potential effects of herbicide use, whenever possible, use **individual stem treatments**, directed spraying, and crop tree release.
→ HU004 – Herbicides that are not soil-active will be used in preference to soil-active ones when the vegetation management objectives can be met.
→ HU006 – Clearly marked buffers will protect streamside zones, private land and public water supplies.
→ HU010 – The use of herbicides is **prohibited** in the immediate vicinity of **Proposed**, **Endangered,** or **Threatened plants**.
→ HU011 – Within a 300-foot buffer from any source waters (public water supply), do not apply herbicide treatments unless a site-specific analysis supports use within the designated buffer to prevent more serious environmental damage than is predicted if pesticides are used.
→ HU012 – No herbicide mixing, loading, or cleaning areas will occur within a 300-foot buffer of private land, open water, source waters (public water supply), wells, or other sensitive areas.
→ HU018 – A certified pesticide applicator will administer all pesticide application contracts and will supervise any Forest Service personnel involved with the application of pesticides on the Forest.

Monitoring

The Revised Forest Plan lists monitoring activities for the Ouachita National Forest. The Forest's monitoring program is designed to evaluate the environmental effects of actions similar to those proposed in this project, and also serves to assess the effectiveness of treatments. In order to ensure that the appropriate design criteria protecting soil stability, water quality, and other resources are followed, trained contract administrators and inspectors would be on-site during the implementation phase of the project. For those activities that include the use of herbicides, surveillance monitoring to ensure that herbicide label instructions are being followed would be conducted as part of the contract administration. Form R8-FS-2100-1, Herbicide Treatment and Evaluation Record, would be used to monitor work involving herbicides. Stream samples would also be taken to monitor for offsite movement.

Project Objective Requirements

Activities proposed would follow the objective requirements for Management Area 22 (Renewal of the Shortleaf Pine-Bluestem Grass Ecosystem and Red-cockaded Woodpecker Habitat). The complete description of this management area is located in the Revised Forest Plan (*USDA Forest Service. 2005a*).

Project objectives are listed below and summarized by alternative later in this chapter.

- Need to restore healthy conditions by limiting over story, and open the over story to create suitable wildlife habitats by removing unhealthy trees, and reducing stocking.
- Need to increase early seral stage habitat within Parks to meet requirements of the Revised Forest Plan for Management Area 22.
- Need to create a suitable seedbed in the even-age regeneration stands after initial prescribed burning and/or handtools.
- Maintain roads to standard and manage the project area to meet habitat requirements. All management activities would meet Scenic Integrity Objectives (SIO) in Mgt. Area 22.
- Need to reduce the stocking rate in stands, where needed.
- Need to rehabilitate ponds.
- Need to decrease competition for limited nutrients and water among species.
- Need to increase possible nest structures.
- Need to reduce the midstory.
- Need to develop hardwood crowns with WSI stands so that residual hardwood will produce a more reliable hard mast crop.
- Need to reduce the open road density, where feasible in Management Area 22.
- Need to access harvest units and provide a safe road system.
- Need to increase growth rate in these stands and create new age classes.
- Need to create conditions where a wildfire would not become too hot to kill the overstory and a threat to adjacent private properties.
- Need to allow rock permits to be issued, where possible.
- Need to provide sites for firewood areas to allow permitting where possible.
- Need to remove and/or reduce the non native species within the project area and replace with native species
- Need to use adequate protective measure to ensure that these heritage resource sites are protected.
- Need to meet oil and gas exploration as need arises.
- Need to ensure that driving/sightseeing is enhanced and the roads are safe to drive.
- Need to ensure that management activities exceed Revised Forest Plan standards for water quality and follow Arkansas Best Management Practices (BMP's)

- Need to define landlines and maintain landlines
- Need to ensure management of wildfires throughout Parks adheres to safety measures for firefighters and public.

Alternatives Considered But Eliminated from Detailed Study

There were no unresolved conflicts to drive additional alternatives, but the interdisciplinary team considered the following:

No Burning Alternative
A no burning alternative was considered, but eliminated from detailed study. The Interdisciplinary Team considered the use of prescribed fire necessary to meet objectives set forth in this environmental analysis that would address wildfire hazards and fuels accumulation as well as restoration efforts and public health and safety.

No Harvest Alternative
This alternative was considered by the Interdisciplinary Team but eliminated from detailed analysis because the Team felt the No Action Alternative adequately addressed the overall effects of a no harvest alternative.

Alternatives Documented in Detail

PROPOSED ACTION

(TABLE 2.1) Summary of Proposed Action in Parks project area. These are approximate acres only based on field examinations, GIS, and GPS.

TIMBER HARVEST	**C328**	**C329**	**TOTAL**
Commercial Thin pine -- 20 ft. spacing	347	174	**521**
Commercial Thin – target 60 BA	883	1043	**1926**
Modified Shelterwood	40	40	**80**
Total Harvest	**1270**	**1257**	**2527**
PRESCRIBED BURNING			
Multi-purpose(approx. 3-5 year rotation)	1830	2045	**3875**
SILVICULTURAL TREATMENTS			
Reforestation Site Preparation			
Shortleaf pine shelterwood stands (mechanical scarification, hand tool site prep, burn with option to use herbicides, rip and plant if necessary)	40	40	**80**
Timber Stand Improvements			
Hand Tool Release	131	158	**289**
Pre-commercial Thinning	80	30	**110**
Red-cockaded woodpecker			
Designate recruitment stands and develop them for RCWs	**7 stands 70 acres**	**6 60 ac.**	**13 130 ac.**
WILDLIFE			
Woodland Pond Reconstruction	8	5	**13**
Woodland Pond Construction	0	3	**3**
Wildlife Stand Improvements	883	1043	**1926**
Nest Boxes – in regeneration stands	4	4	**8**
TRANSPORTATION			
Road construction			**2.0**
Road reconstruction			**5.6**
Temporary road construction			**11.0**
Prehaul maintenance			**7.6**
OTHER			
Issue firewood and rock permits			**Yes**
Treatment of non-invasive species			**Yes**
Landline Maintenance (miles)	3.5	3.25	**6.75**

This proposed action includes the establishment of 13 recruitment stands and RCW treatments and activities, including use of cavity restrictors, snake and squirrel excluder devices, artificial cavities, single-bird augmentations, multiple-bird group-initiations, brush hogging in cavity tree clusters, removal of southern flying squirrels, population/nest monitoring, and southern pine beetle (SPB) and Ips control efforts.

Nest boxes for other species will also be installed at wildlife ponds.

Permits would be offered to the public for collection of rocks by private individuals within road construction and reconstruction corridors. That is, rocks can be collected within areas of disturbance associated with road construction and reconstruction during the season these roads are open.

This proposal would be conducted in accordance with applicable design criteria found in the Revised Forest Plan and would follow all reasonable and prudent measures and conservation measures as established in biological opinions, biological assessments and species recovery plans for species documented in the biological evaluation for this proposal.

(TABLE 2.2) Description of Road System for the Proposed Action in Parks EMU. These are *approximate* miles based on field examinations, GIS, and GPS. See appendices for Transportation map.

Road Name	Segment	Type of Work	Description
R28A	4	Reconstruction	Reconstruct approx. 0.60 miles from the Scott County Road 20 intersection to a level D standard. Road will be seasonally open after harvest.
R28B	6	Reconstruction	Reconstruct approx. 0.85 mile from the WR3 intersection to the end to a level D standard. This road would be seasonally open after harvest.
R29	9 and 10	Reconstruction	Reconstruct approx. 0.25 mile from the Forest Service Road 884 intersection to a level D standard. This road would be open after harvest.
R29A	11	Reconstruction	Reconstruct approx. 0.80 mile from the Forest Service Road 948 intersection to a level D standard. This road would be seasonally open after harvest.
R29B	12	Reconstruction	Reconstruct approx. 1.10 miles from the Forest Service Road R29A intersection to a level D standard. This road would be seasonally open after harvest.
SC 20	2	Reconstruction	Use a County Road Agreement to have county prepare road bed and Forest Service will rock all or parts of the first 2 miles.
			Total Reconstruction – 5.60 miles.
R28A	4	Prehaul Maintenance	2.32 miles of dozer blading to smooth road bed; clean ditches and maintain drainage structures behind the reconstruction portion. Road would be open after harvest.
R28B	6	Prehaul Maintenance	1.05 miles of dozer blading to smooth road bed; clean ditches and maintain drainage structures on the front portion of this road. Road would be seasonally open after harvest.
R29	8 and 9	Prehaul Maintenance	1.0 mile of dozer blading to smooth road bed; clean ditches and maintain drainage structures. Road would be open after harvest.
R29A	11	Prehaul Maintenance	1.09 mile of dozer blading to smooth road bed; clean ditches and maintain drainage structures. Road would be seasonally open after harvest.
R29B	12	Prehaul Maintenance	0.64 mile of dozer blading to smooth road bed; clean ditches and maintain drainage structures. Road would be seasonally open after harvest.
R29C	13	Prehaul Maintenance	0.84 mile of dozer blading to smooth road bed; clean ditches and maintain drainage structures. Road would be seasonally open after harvest.
R28C	5	Prehaul Maintenance	0.66 mile of dozer blading to smooth road bed; clean ditches and maintain drainage structures. Road would be Closed after harvest.
			Total Prehaul Maintenance – 7.60 miles
R28D	NA	Construction	Construct approx. 1.0 mile to a level D standard. Road will be closed after harvest.
R29D	NA	Construction	Construct approx. 1.0 mile to a level D standard. Road will be closed after harvest.
			Total Construction – 2.0 miles
Temp Roads			11.0 miles – Many of these are old roads that would be opened. A few would be new. All temporary roads would be closed after harvest.
Various		Decks	Approximately 120 decks to be seeded as temporary wildlife openings.

(TABLE 2.3) 328 Proposed Actions for Parks. All acres are approximations based on field examinations, GIS, and Global Positioning Systems data (GPS); basal areas are projected (target) average residual basal areas.

STD	ACRES	MANAGEMENT		TIMBER HARVESTING			BURNING	SILVICULTURAL TREATMENTS			WILDLIFE			
				Even-age			Prescribed	Reforestation (site prep)	Timber Stand Improvements■■		Woodland Ponds		WSI	Nest Boxes
				Commercial Thinning		Regeneration Harvests	Multi-purpose	SL pine SW Stands mechanical scarify, hand tool site prep, burn (option to use herbicide, rip and plant if necessary)	Release hand tools or mech.	Pre Com-mercial Thinning hand tools or mech.	Rehab	New	Midstory-option to use herbicides or mechanical	
		Mgt. Area	Description	20 ft. spacing	Target 60 BA	Shelterwood Shortleaf Pine	Approx. 3-5 year rotation							
1	79	22B		79			79							
2	32	22B			32		32						32	
3	78	22B		78			78				1			
4	87	22B		87			87							
5	103	22B		103			103							
6	75	22B			75		75				1		75	
7	40	22B					40			40				
8	69	22B			69		69						69	
9	76	22B			76		76						76	
10	61	22B			61		61				1		61	
11	135	22B	Unsuitable				135							
12	50	22B					50		50					
13	37	22B			37		37				1		37	
14	35	22B			35		35				1		35	
15	40	22B					40			40				
16	41	22B			41		41						41	
17	63	22B			63		63						63	
18	65	22B			65		65						65	
19	53	22B			53		53						53	
20	41	22B					41		41					
21	39	22B			39		39						39	
22	48	22B			48		48						48	

(TABLE 2.3) 328 continued - Proposed Actions for Parks. All acres are approximations based on field examinations, GIS, and Global Positioning Systems data (GPS); basal areas are projected (target) average residual basal areas.

STD	ACRES	MANAGEMENT		TIMBER HARVESTING			BURNING	SILVICULTURAL TREATMENTS			WILDLIFE			
				Even-age			Prescribed	Reforestation (site prep)	Timber Stand Improvements■■		Woodland Ponds		WSI	Nest Boxes
				Commercial Thinning		Regeneration Harvests	Multi-purpose	SL pine SW Stands mechanical scarify, hand tool site prep, burn (option to use herbicide, rip and plant if necessary)	Release hand tools or mech.	Pre Com-mercial Thinning hand tools or mech.	Rehab	New	Midstory-option to use herbicides or mechanical	
		Mgt. Area	Description	20 ft. spacing	Target 60 BA	Shelter wood Shortleaf Pine	Approx. 3-5 year rotation							
23	16	22	Drains				16							
24	47	22	Drains				47							
25	37	22B	Unsuitable				37							
26	23	22B	Unsuitable				23							
27	45	22B			45		45						45	
28	27	22B			27		27						27	
29	27	22B			27		27				1		27	
30	29	22	Drains				29							
31	17	22B	Unsuitable				17							
32	12	22B	Unsuitable				12							
33	23	22B	Unsuitable				23							
34	20	22B				20	20	20	20					2
35	20	22B			20		20					1	20	
36	20	22B				20	20	20	20					2
37	37	22	Drains				37							
38	13	22	Drains				13							
39	10	22B	RCW Recruitment*		10		10						10	
40	10	22B	RCW Recruitment*		10		10						10	
41	10	22B	RCW Recruitment*		10		10						10	
42	10	22B	RCW Recruitment*		10		10						10	

(TABLE 2.3) 328 continued - Proposed Actions for Parks. All acres are approximations based on field examinations, GIS, and Global Positioning Systems data (GPS); basal areas are projected (target) average residual basal areas.

STD	ACRES	MANAGEMENT		TIMBER HARVESTING			BURNING	SILVICULTURAL TREATMENTS			WILDLIFE			
				Even-age			Prescribed	Reforestation (site prep)	Timber Stand Improvements■■		Woodland Ponds		WSI	Nest Boxes
				Commercial Thinning		Regeneration Harvests	Multi-purpose	SL pine SW Stands mechanical scarify, hand tool site prep, burn (option to use herbicide, rip and plant if necessary)	Release hand tools or mech.	Pre Com-mercial Thinning hand tools or mech.	Rehab	New	Midstory-option to use herbicides or mechanical	
		Mgt. Area	Description	20 ft. spacing	Target 60 BA	Shelter wood Shortleaf Pine	Approx. 3-5 year rotation							
43	10	22B	RCW Recruitment*		10		10						10	
44	10	22B	RCW Recruitment*		10		10						10	
45	10	22B	RCW Recruitment*		10		10						10	
Total	**1830**			**347**	**883**	**40**	**1830**	**40**	**131**	**80**	**6**	**1**	**883**	**4**

*** Recruitment stands will have structures installed after habitat is suitable for RCWs**

(TABLE 2.4) 329 Proposed Actions for Parks. All acres are approximations based on field examinations, GIS, and Global Positioning Systems data (GPS); basal areas are projected (target) average residual basal areas.

STD	ACRES	MANAGEMENT		TIMBER HARVESTING			BURNING	SILVICULTURAL TREATMENTS			WILDLIFE			
				Even-age			Prescribed	Reforestation (site prep)	Timber Stand Improvements■■		Woodland Ponds		WSI	Nest Boxes
				Commercial Thinning		Regeneration Harvests	Multi-purpose	SL pine SW Stands mechanical scarify, hand tool site prep, burn (option to use herbicide, rip and plant if necessary)	Release hand tools or mech.	Pre Com-mercial Thinning hand tools or mech.	Rehab	New	Midstory-option to use herbicides or mechanical	
		Mgt. Area	Description	20 ft. spacing	Target 60 BA	Shelter wood Shortleaf Pine	Approx. 3-5 year rotation							
1	49	22B			49		49						49	
2	49	22B					49		49					
3	47	22B			47		47						47	
4	58	22B			58		58				1		58	
5	61	22B			61		61						61	
6	35	22B			35		35						35	
7	88	22B			88		88						88	
8	68	22B			68		68					1	68	
9	63	22B	Unsuitable				63							
10	30	22B					30			30		1		
11	56	22B			56		56						56	
12	31	22B			31		31						31	
13	61	22B			61		61						61	
14	47	22B			47		47					1	47	
15	84	22B		84			84					1		
16	69	22B					69		69		1			
17	90	22B		90			90				1			
18	33	22B	Unsuitable				33							
19	33	22B			33		33						33	
20	34	22B			34		34						34	
21	51	22B			51		51						51	
22	54	22B			54		54						54	

(TABLE 2.4) 329 continued - Proposed Actions for Parks. All acres are approximations based on field examinations, GIS, and Global Positioning Systems data (GPS); basal areas are projected (target) average residual basal areas.

STD	ACRES	MANAGEMENT		TIMBER HARVESTING			BURNING	SILVICULTURAL TREATMENTS			WILDLIFE			
				Even-age			Prescribed	Reforestation (site prep)	Timber Stand Improvements■■		Woodland Ponds		WSI	Nest Boxes
				Commercial Thinning		Regeneration Harvests	Multi-purpose	SL pine SW Stands mechanical scarify, hand tool site prep, burn (option to use herbicide, rip and plant if necessary)	Release hand tools or mech.	Pre Com-mercial Thinning hand tools or mech.	Rehab	New	Midstory-option to use herbicides or mechanical	
		Mgt. Area	Description	20 ft. spacing	Target 60 BA	Shelter wood Shortleaf Pine	Approx. 3-5 year rotation							
23	91	22B	Unsuitable				91							
24	114	22B			114		114					1	114	
25	20	22B				20	20	20	20					2
26	47	22B			47		47						47	
27	38	22	Drains				38							
28	56	22B	Unsuitable				56							
29	20	22B				20	20	20	20					2
30	48	22B			48		48						48	
31	21	22	Drains				21							
32	48	22	Drains				48							
33	7	22	Drains				7							
34	42	22	Drains				42							
35	108	22	Drains				108							
36	61	22B	Unsuitable				61							
37	6	22	Drains				6							
38	19	22	Drains				19							
39	14	22	Drains				14							
40	7	22	Drains				7							
41	7	22B	Unsuitable				7							
42	22	22B	Unsuitable				22							

(TABLE 2.4) 329 continued - Proposed Actions for Parks. All acres are approximations based on field examinations, GIS, and Global Positioning Systems data (GPS); basal areas are projected (target) average residual basal areas.

STD	ACRES	MANAGEMENT		TIMBER HARVESTING			BURNING	SILVICULTURAL TREATMENTS			WILDLIFE			
				Even-age			Prescribed	Reforestation (site prep)	Timber Stand Improvements■■		Woodland Ponds		WSI	Nest Boxes
				Commercial Thinning		Regeneration Harvests	Multi-purpose	SL pine SW Stands mechanical scarify, hand tool site prep, burn (option to use herbicide, rip and plant if necessary)	Release hand tools or mech.	Pre Com-mercial Thinning hand tools or mech.	Rehab	New	Midstory-option to use herbicides or mechanical	
		Mgt. Area	Description	20 ft. spacing	Target 60 BA	Shelter wood Shortleaf Pine	Approx. 3-5 year rotation							
43	10	22B	RCW Recruitment*		10		10						10	
44	11	22B	RCW Recruitment*		11		11						11	
45	10	22B	RCW Recruitment*		10		10						10	
46	10	22B	RCW Recruitment*		10		10						10	
47	10	22B	RCW Recruitment*		10		10						10	
48	10	22B	RCW Recruitment*		10		10				1		10	
Total	**2048**			**174**	**1043**	**40**	**2048**	**40**	**158**	**30**	**4**	**5**	**1043**	**4**

*** Recruitment stands will have structures installed after habitat is suitable for RCWs**

NO ACTION ALTERNATIVE I (*Deferred Management Activities****)***

Under the No Action Alternative neither the Proposed Action nor any action alternative would be implemented. Management activities would be deferred until a later entry. However, ongoing Forest Service approved activities would continue in the project area. The National Environmental Policy Act of 1969 (NEPA) requires this alternative. The following is a list of activities that would continue under this alternative. This list is not all-inclusive. Actions would continue associated with other Management Areas within this project area that would not normally need a decision.

- **Fire suppression:** Human and natural caused fires would be suppressed.
- **Hunting:** Game hunting would continue under Arkansas Game and Fish Commission regulation.
- **Public vehicle access:** All existing roads that are currently open would remain open. All currently closed roads would remain closed.
- **Road maintenance:** Normal and emergency road maintenance would continue.
- **Dispersed camping:** Dispersed camping would continue under the rules of the Ouachita National Forest.
- **Salvage Actions:** There would continue to be salvage operations, when necessary.

NO HERBICIDE ALTERNATIVE II

This alternative is ***exactly*** the same as the Proposed Action **EXCEPT** the use of herbicide as an option for site preparation and non-native invasive species eradication is **not** proposed.

Other Past, Present, and Reasonably Foreseeable Future Occurrences

This area has a history of prescribed burning to create and retain RCW habitat in the Pine/bluestem management area. A significant portion of Compartment 329 was burned in 2008. A small portion of C-328 was burned in 2010 adjacent to R28B in Sections 19 and 30 of Township 2 North and Range 28 West.

The project area was part of an area hit by the southern pine beetle epidemic of 1995. There is a reasonable expectation that an epidemic could occur again. Recent trapping results for southern pine beetles are down in Arkansas according to the Forest Health Protection researchers (2009). However Ips beetle activity is increasing in the southern part of the state according Southern Research Station entomologists' in e-mail to forest silviculturists (2-16-2011).

Oak decline is always present in scattered pockets throughout the project area. There are still falling dead and dying trees in the project area as a result of past weather events.
Private land is mostly pastureland or grazed woodlands. There is very little commercial timber. There are no other known past, present, and reasonably foreseeable future activities other than what is identified here and in the water quality section and what is proposed in this environmental assessment.

Summary Comparison All Alternatives

(TABLE 2.5) Summary Comparison of Primary Objectives by Alternative (approximates only)

Primary Objectives	Proposed Activity	Units of Measure	Proposed Action (with herbicide)	No Herbicide Alt. II	No Action
To create a healthy forest condition.	Timber Harvest	Acres	2527	2527	0
To create early seral stage habitat (even-age only).	Modified Shelterwood	Acres	80	80	0
To reduce competing vegetation for nutrients, water, and sun.	Commercial Thinning	Acres	2447	2447	0
To site prep a bed for seed fall after the regeneration harvests. To provide new growth for wildlife to eat. To reduce heavily stocked understories and midstories primarily due to lack of fire as part of the ecosystem. To reduce fuel loading.	Prescribed Burning	Acres	3875	3875	0
To create a suitable seedbed in regeneration sites after initial prescribed burning	Site Prep	Acres	80	80—but without herbicide option	0
To increase growth rate and quality of desired trees by reducing competition for nutrients and water among species	Pre-commercial thinning	Acres	110	110	0
To insure survival of desired trees by releasing suppressed trees from competing tree species.	Hand Tool Release	Acres	289	289	0
To create water sources for wildlife.	Pond Rehabilitation Pond Construction	# Ponds	13 3	13 3	0
To reduce midstory and allow development of grasses and forbs on the forest floor.	Wildlife Stand Improvements	Acres	1926	1926—but without herbicide option	0
To move toward the open road density objective.	Road Closures	1 mi/sq/mi	1.27	1.27	2.53
To access harvest units and provide safe road system.	Road Construction	Miles	2.0	2.0	0
To repair rusted-out drains and road surface and ditch erosion.	Road Reconstruction and Prehaul Maintenance	Miles	5.6 7.6	5.6 7.6	0
To provide short-term access to harvest units.	Temporary Roads	Miles	11	11	0
To supply firewood areas to the local community.	Firewood Permits	Yes/No	Yes	Yes	No
To supply rock permits to the local community.	Rock Permits	Yes/No	Yes	Yes	No
To control non-native invasive species	Herbicides	Yes/No	Yes	Yes	No
To maintain landlines	Paint/Blaze	Miles	6.75	6.75	0
Expand the Forest RCW population	Establish RCW recruitment stands	Each	13	13	0

(TABLE 2.6) Summary Comparison of Environmental Effects by Alternative

Environmental Effect (measure)	Measure	Proposed Action with Herbicide Use	No Herbicide Alt. II	No Action
Watershed Condition Rank (**111102060108**) **(111102060107)**	Net increase	Low	Low	Low
Early Seral Habitat Created (modified shelterwood	4%- 8.3%	80 ac. (shelterwood) + 110 ac. (existing regen) = 190 acres / 2713 acres suitable pine (7.0%)	80 ac. (shelterwood) + 110 ac. (existing regen) = xxx acres (7.0%)	110ac (existing regen) 4.1%
Volume Harvested	(ccf)	18,000	18,000	0
Air Quality meets National Ambient Air Quality Standards	Below concentration limits for atmospheric pollutants	Yes	Yes	Yes
Impacts to Wildlife	(Habitat Capability Meets Minimum Viable Populations for all MIS Species - Baseline (Yes/No)	Yes	Yes	Yes
Resulting Road Density	(miles per square mile—goal is 1.0 mile per square mile)	1.27	1.27	2.53
RCW Improvements	(Yes/No)	Yes	Yes	No
Impacts on Society and Economy	(Special Use permits provided - Yes/No)	Yes	Yes	No
Hardwood/Pine and Hardwood in watershed	(acres/%)	Pine 3474 acres 90 % Hardwood 401 ac. 10%	same	same
Revenue Cost Ratio	<1.0 below cost - >1.0 is above cost	1.33	1.33	NA

(TABLE 2.7) Issues Comparison

Issue	Measure	Proposed Action with Herbicide Use	No Herbicide Alt. II	No Action
Herbicide Use option for site preparation and wildlife stand improvements (if needed only)	Acres	80 1926	0	0

The Preferred Alternative

The Proposed Action is the District Ranger's preferred selection for Parks. A final selection will be made after consideration of the final public review.

Chapter 3
Environmental Disclosures

Introduction

The actions described by the Proposed Action are typical of those projected for implementation in the Revised Land and Resource Management Plan and for which the environmental effects are disclosed in the Final Environmental Impact Statement (FEIS). This environmental assessment tiers to the FEIS.

The following inventories and sources of information were used in the analysis:

- → Silvicultural field examinations for Parks were conducted in 2009. Information collected in this inventory is maintained in Forest Service Vegetation database (FSVEG). A summary of this information is located in the project file at the district office and is incorporated by reference.
- → District compartment records of previous management activities.
- → Soil Resource Inventory for the Ouachita National Forest updated.
- → SMS –Scenery Management System by Ouachita National Forest Recreation Staff.
- → Cultural resource surveys by Certified Heritage Resource Technicians and District Archeologist
- → Sensitive, threatened or endangered species database from the Arkansas Natural Heritage Commission.
- → Sensitive plant survey by Vernon Bates, Botanist under contract to the ONF and Arkansas Nature Conservancy.
- → Regional Forester's Sensitive Species List.
- → U.S. Fish and Wildlife Service list of Endangered Species.
- → Field examination for the Biological Evaluation by the District Wildlife Biologist.
- → Geographic Information System (GIS) data files.
- → Roads Analysis (March 2011).

Air Quality

Present Conditions

Currently, air quality in Parks project area is within all National Ambient Air Quality Standards (NAAQS) standards for all six criteria pollutants. Existing emission sources occurring within the project area consists mainly of mobile sources. These would include, but are not limited to, combustion engines (such as those found in motor vehicles); dust from unpaved surfaces; smoke from local, county, agricultural, and forest burning; restaurants and other activities.

The EPA has established NAAQS as the legal concentration limits of atmospheric pollution necessary to protect against adverse effects on public health and welfare (Environmental Protection Agency, 2001). The criteria pollutants of concern for this analysis include: carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter of 10 and 2.5 microns in size (PM_{10}, $PM_{2.5}$), and nitrogen dioxide (NO_2). As of March 2006, no county in Arkansas was listed as "non-attainment". This means that Scott County is in compliance with the National Ambient Air Quality Standard (NAAQS) for all six criteria pollutants. The nearest non-attainment areas concerning CO and SO_2 are located, respectively, near El Paso, Texas and Sierra Vista, AZ, almost 1,034 and 1256 miles from the project area (EPA, March 2006). Sulfur is also a major pollutant of concern with regard to visibility for Class I Areas in Arkansas. However, based upon two years of Interagency Monitoring of Protected Visual Environments (IMPROVE) monitors, emissions of sulfur dioxide have not exceeded NAAQS. The nearest non-attainment area for PM_{10} is located almost 1,034 miles to the west in El Paso, TX. As of March 2006, the Environmental Protection Agency (EPA) had not identified any area within the continental United States as non-attainment for $PM_{2.5}$ or NO_2.

The climate of the project area consists of hot, humid summers and cold winters. The wind is generally from the direction of west-southwest and averages between 2 and 14 miles per hour. During the fall and winter months, there are periods of climatic inversions, which can trap air pollutants close to the surface causing visibility concerns. Overall, however, the air quality for the project area is in good condition and is not exceeding any state or national air quality regulations.

Environmental Effects

The geographic boundary for the effects on air quality would be approximately 30 miles from the edge of the proposed burns, which is the point that the VSmoke model quit making downwind estimates. Timelines for measuring the effects of burns would be 1-2 days after each burn. This particular project is proposing to burn the areas on a 3-5 year rotation. The VSmoke Model is the method of analysis used. The VSmoke Model is used to predict effects of burning (smoke dispersion). The VSmoke model produces three types of outputs that estimate:

1. The ability of the atmosphere to disperse smoke and the likelihood the smoke will contribute to fog formation,
2. Downwind concentrations of particulate matter and carbon monoxide, and
3. Visibility conditions downwind of the fire.

The Dispersion Index (DI) is an estimate of the ability of the atmosphere to disperse smoke to acceptably low average concentrations downwind of one or more fires. This value could represent an area of approximately 1000 square miles under uniform weather conditions. Typically, the Dispersion Index value should be greater than 21 according to the state smoke management plan when igniting a large number of acres within an area. Combining the Dispersion Index and relative humidity values provide an estimate (like is used in insurance actuary tables) of the likelihood of the smoke contributing to fog formation. The Low Visibility Occurrence

Risk Index (LVORI) ranges from 1 (lowest risk) to 10 (greatest risk) and usually you want the value to be less than 4. The base line risk of having low visibility as a result of smoke contributing to fog formation is about 1 in 1000 accidents. The calculated Dispersion Index value was 114, which predicts the atmosphere has a very good capacity to disperse smoke. The Low Visibility Occurrence Risk Index value for this VSmoke analysis was 1 and this is equal to the base line.

PROPOSED ACTION

The smoke dispersion modeling analysis (using VSMOKE and/or VSMOKE-GIS) for this project was performed for 650.0 acres to be burned on 03/08/2010 at the time period of 1500 hours. This time period has daytime dispersion characteristics to disperse the pollutants from the fire. The location of the fire is at approximately 34.819 degrees latitude and -93.92 degrees longitude (-511926.726 meters east and 1236138.842 meters north using US Albers projection). The emission rate of PM2.5 (fine particles) this hour was 1702.681 grams/second, and carbon monoxide was 21251.547 grams/second. The heat release rate was 453.6 megawatts. Both emission rates and the heat release rates were calculated using the Fire Emission Production Simulator (FEPS) model. The estimated background concentration of fine particles and carbon monoxide of the air carried with the winds into the fire are 20 micrograms/cubic meter and 2 parts per million, respectively. The proportion of the smoke subject to plume rise was -0.75 percent, which means 75 percent of the smoke is being dispersed gradually as it rises to the mixing height, and 25 percent is dispersed at ground level.

The meteorological conditions used in this model run were:

1.) Mixing height was 3500 feet above ground level (AGL).
2.) Transport wind speed, and surface wind speed were 15 and 8.8 miles per hour, respectively.
3.) The sky had 20 percent cloud cover, and the clouds were located 3000 feet above the ground.
4.) Surface temperature was 75 degrees Fahrenheit, and the relative humidity was 37 percent.
5.) The calculated stability class from VSMOKE was slightly unstable.

The VSMOKE model produces three types of outputs that estimate: a.) The ability of the atmosphere to disperse smoke and the likelihood the smoke will contribute to fog formation, b.) Downwind concentrations of particulate matter and carbon monoxide, and c.) Visibility conditions downwind of the fire.

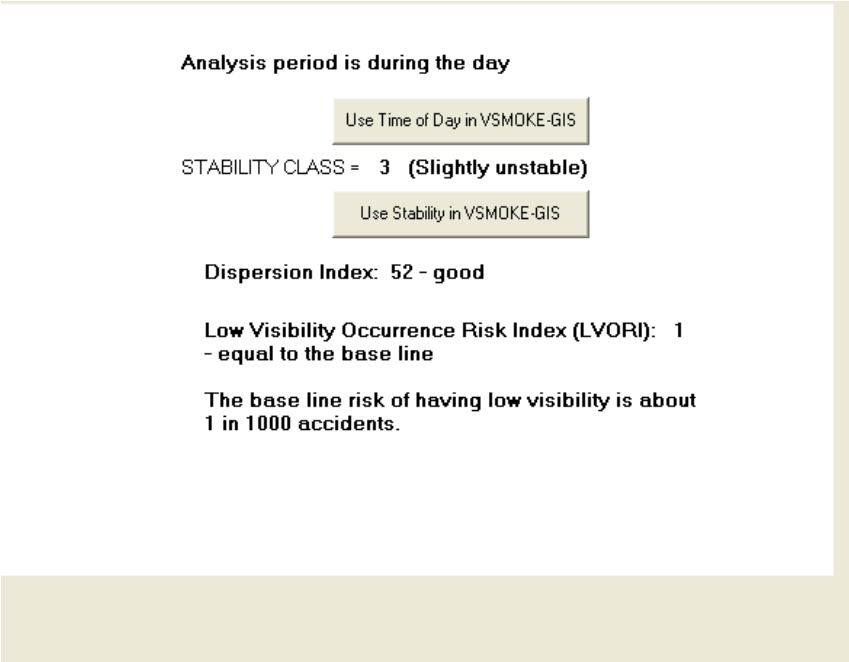
The Dispersion Index (DI) is an estimate of the ability of the atmosphere to disperse smoke to acceptably low average concentrations downwind of one or more fires. This value could represent an area of approximately 1000 square miles under uniform weather conditions. Typically, the Dispersion Index value should be greater than 30 when igniting a large number of acres within an area. The calculated Dispersion Index value was 52, which predicts the atmosphere has a good capacity to disperse smoke.

Combining the Dispersion Index and relative humidity values provide an estimate (like is used in insurance actuary tables) of the likelihood of the smoke contributing to fog formation. The Low Visibility Occurrence Risk Index (LVORI) ranges from 1 (lowest risk) to 10 (greatest risk) and usually you want the value to be less than 4. The base line risk of having low visibility as a result of smoke contributing to fog formation is about 1 in 1000 accidents. The Low Visibility Occurrence Risk Index value for this VSMOKE analysis was 1 and this is equal to the base line.

High concentrations of particulate matter, especially fine particles (PM2.5), and carbon monoxide can have a negative impact on people's health. The Environmental Protection Agency has developed a color coding system called the Air Quality Index (AQI) to help people understand what concentrations of air pollution may impact their health. When the AQI value is color code orange then people who are sensitive to air pollutants, or have other health problems, may experience health effects. This means they are likely to be affected at lower levels than the general public. Sensitive groups of people include the elderly, children, and people with either lung disease or heart disease. The general public is not likely to be affected when the AQI is code orange. Everyone may begin to experience health effects when AQI values are color coded as red. People who are sensitive to air pollutants may experience more serious health effects when concentrations reach code red levels. This analysis shows the air quality at downwind distances less than 6.21 miles from the edge of the fire may have a 1-hour particulate matter concentrations predicted to be code red or worse, while distances less than 12.40 miles are predicted to be code orange or worse. At distances less than 0.49 miles from the edge of the fire the one-hour carbon monoxide concentrations are predicted to be code red or worse, and distances less than 0.78 miles from the fire are predicted to be code orange or worse.

Smoke can also have an impact on how far and how clearly we can see on a highway or in viewing scenery. The fine particles in the smoke are known to be able to scatter and absorb light, which can reduce visibility conditions. The visibility estimates from VSMOKE are valid only when the relative humidity is less than 70 percent. Also, the visibility estimates assume the smoke is passing in front of a person who is looking through the plume of smoke. The visibility thresholds used for this modeling analysis were to maintain a contrast ratio of greater than 0.05 and a visibility distance of 0.25 miles. Visibility conditions may exceed the threshold less than 1037 feet from the edge of the fire.

The VSMOKE-GIS model estimates where for the pre-selected fine particulate matter concentrations (39, 89, 139, 352, and 527 micrograms per cubic meter) to be predicted downwind of the fire. If an analysis was conducted then the results (map) will be attached to the last page of this report. The VSMOKE-GIS analysis had daytime dispersion characteristics to disperse the pollutants from the fire and this is the same as the VSMOKE analysis. The downwind spacing interval was set at 0.025 kilometers, and the model ceased making downwind estimates at 30 miles from the edge of the fire. The stability class used for the VSMOKE-GIS analysis was near neutral and this is different than the calculated stability class in VSMOKE.



The map above shows the *projected* smoke plume.

The largest potential **direct impact** on air quality from this proposed project is the smoke from prescribed burning. The Proposed Action proposes a maximum of 3,875 acres of prescribed burning on a 3-5 year rotation. The Proposed Action includes prescribed burning operations to be conducted during either the dormant or growing season. **Direct**, short-term effects would occur in the form of reduced visibility, increased human activity (flaggers), and roadway smoke warning signs. **Indirect**, effects could potentially include traffic accidents associated with the lingering smoke and its affect on persons with potential health problems. The proposed project would not be implemented in an attainment area and under current regulations and guidelines are in compliance with the State Implementation Plan and the general conformity regulation for Scott County. C**umulative effects** should not cause this area to become a non-attainment area.

Federal Class I Area (40 CFR 81)**.** The closest Federal Class I areas of concern with respect to Regional Haze compliance are the 14,460-acre Caney Creek Wilderness area in the Ouachita National Forest (approx. 71 miles east southeast) and the 12,018-acre Upper Buffalo Wilderness area in the Ozark National Forest (approx. 148 miles northeast). Because the wind direction would be away from the Class I areas, potential prescribed fire smoke impacts to visibility at Caney Creek Wilderness will not be considered in the analysis. The project area would comply with Revised Forest Plan design criteria for air quality, particularly AQ001 and AQ002 (USDA Forest Service. 2005, p. 73). These criteria ensure that resource values in Class II areas (wilderness and general forest area) are protected from the effects of air pollution. Based upon this, it is unlikely that the prescribed treatments would negatively affect air quality to the extent that the counties within which the project area exists (Scott County) would not continue to meet NAAQS. Occasional brief exposure of the general public to low concentrations of drift smoke is more a temporary inconvenience than a health problem. High smoke concentrations can, however, be a very serious matter, particularly near homes of people with respiratory illnesses or near health-care facilities, or on roadways. Human health effects related to particulate matter in smoke include: increased premature deaths; aggravation of respiratory or cardiovascular illnesses; and changes in lung function, structure, and natural defense. Smoke becomes a safety issue when it affects visibility on roadways. Smoke can have negative short-and long-term health effects. Fire management personnel who are exposed to high smoke concentrations often suffer eye and respiratory system irritation. Under some circumstances, continued exposure to high concentrations of carbon monoxide at the combustion zone can result in impaired alertness and judgment. The probability of this happening on a prescribed fire is, however, low

because of limited exposure time. Smoke is composed of hundreds of chemicals in gaseous, liquid and solid forms, some of which are toxins including carbon monoxide, particulate matter, acrolein and formaldehyde. Over 90 percent of the particulate emissions from prescribed fire are small enough to enter the human respiratory system. The repeated, lengthy exposure to relatively low smoke concentrations over many years can contribute to respiratory and cardiovascular problems.

Mitigation measures in the form of 'priorities and objectives' and 'design criteria' (Revised Forest Plan, pgs. 62-69 and 73-97) are included under all action alternatives to minimize potential for these effects. Key is the development of a burning plan prior to implementation that considers wind direction and other smoke dispersal factors. A burning plan would be prepared for each burn to ensure that the combustion products (smoke) do not intrude into smoke-sensitive areas. Burning would only occur when conditions are right for adequate smoke dispersal away from smoke sensitive areas (burn plan would address prescription parameters). Proposed burn areas under the Proposed Action are large enough for efficient burning and small enough to allow burning to be completed by mid-afternoon (1500–1630 hrs), so that most smoke is dispersed by nightfall when smoke tends to sink down slope into valleys. Prescribed burning would be spread over time and space to minimize local cumulative smoke effects. With these measures, effects from smoke under the Proposed Action are expected to be small and within federal and state acceptable levels. Based upon this most recent of EPA-air quality data for Scott County; potential emissions being below the lower limit acceptable by EPA; our compliance with NAAQS; and our meeting general conformity and meeting the intent of the Regional Haze regulation, the prescribed treatments should not detrimentally impact the quality of air in the proposed project area. The prescribed burning in the Proposed Action is expected to have negligible effects on air quality.

CUMULATIVE EFFECTS

The **cumulative effects** of prescribed burning on air quality consist of the downwind impact of multiple, simultaneously burning prescribed burns, in addition to the other emissions in the area. These cumulative effects are rather short-lived, because once the burn is over and the smoke has dissipated, the effect is over. Impacts to air quality will generally be confined to no more than a few hours or at most 1-2 days. VSmoke provides analysis of cumulative effects to air quality by incorporating not only emissions from the analyzed prescribed burn, but also background particulate levels and carbon dioxide levels. It is acknowledged that multiple simultaneous prescribed burns could cumulatively increase particulate levels. While it is difficult or nearly impossible to quantify such emissions in a planning analysis, voluntary compliance with the State of Arkansas Smoke Management Program insures compliance with applicable Federal and State regulations governing open burning.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

There would be no **direct effects** to air quality with this alternative. **Indirectly**, large wildfires could occur with the natural accumulation of fuels. This alternative does not include prescribed burning and therefore would have negligible potential for affecting air quality other than that which may occur under a wildfire situation. Smoke hazards from a reduced visibility and nuisance perspective have the potential to be increased due to the accumulation build-up of unburned fuels.

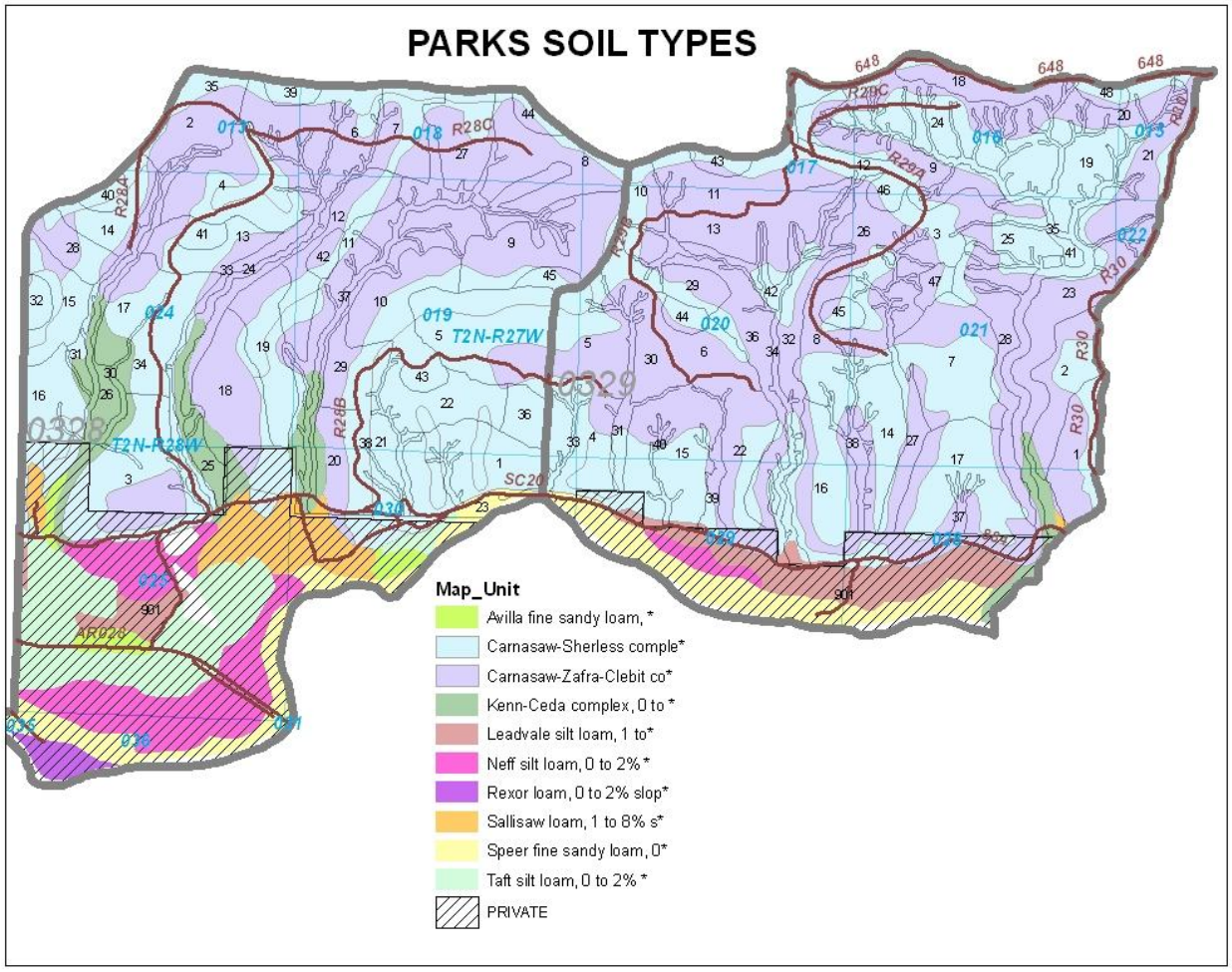
NO HERBICIDE ALTERNATIVE II

The effects on air quality would be the same as the Proposed Action. The only difference between the Proposed Action and this alternative is that herbicide use is not proposed in this alternative.

Soils

Present Conditions

Topographic features of the project area consist of rolling hills with moderately steep side slopes, sloping ridgetops, gently sloping stream terraces and nearly level floodplains. Geology is tilted and fractured shale and sandstone of the Jackfork Sandstone and Johns Valley Shale formations of the Pennsylvanian Period in the Fourche Mountains subdivision of the Ouachita Mountains Physiographic Region. Colluvial material on the lower slopes and alluvial material on streams terraces and in floodplains is derived from these sources and is of the Quaternary Period.



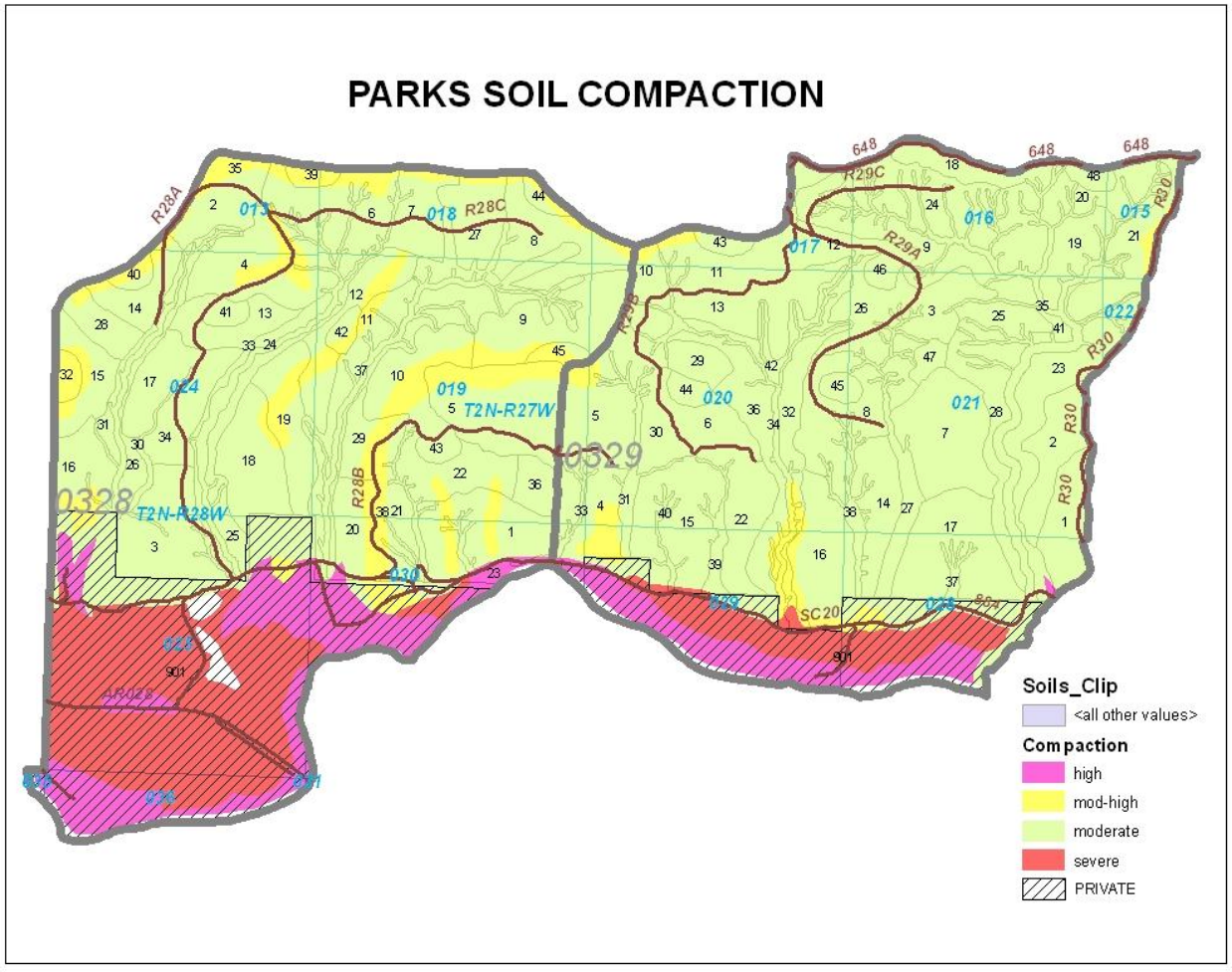
Compaction: Several stands have small pockets of high to severe range for soil compaction (085 Sallisaw loam 1 – 85 slope and 057 Leadvale silt loam 1 – 8% slope) High compaction soils are located in Compartment 328 Stands 11and 20. Severe compaction soils are in Compartment 329 Stands 23, 32, and 34.

There are several stands with a rating of moderate –high compaction rating:

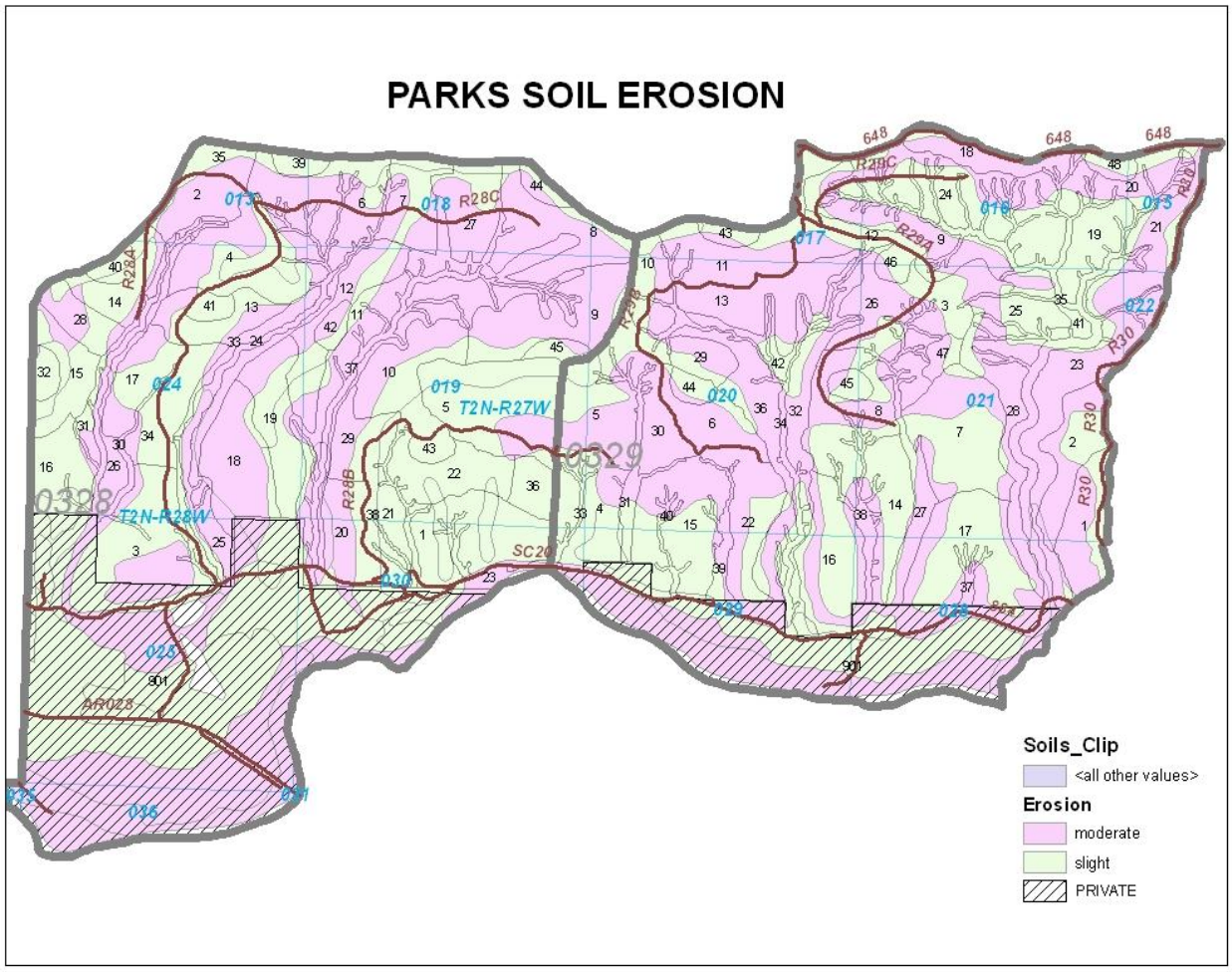
Compartment	Stands
328	1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 21, 22, 29, 32, and 35
329	4, 5, 10, 11, 15, 16, 32, and 33

*underlined stands have some type of harvesting proposed.

A limited operating season for stands with soils in the moderate-high to high range would be from April through November. Even during these drier periods, extra care would be taken to monitor soil conditions and suspend operations when soils become wet. Operations during December through April are allowed with the use of methods or equipment that does not cause excessive soil compaction.



Erosion: There are no soil types with high or severe hazard rating for erosion. All are rated either moderate or slight. An approved prescribed burn plan would be followed during the prescribed burn to ensure a duff layer remains to protect the soil from developing erosion problems. The timber harvest plan would also insure erosion problems do not develop during harvest activities in other soil types rated as slight or moderate.



Environmental Effects

The geographic boundary for the effects on soil quality would be the boundary of both compartments within Parks (Compartments 328 and 329). Timelines for measuring the effects on soils would be 15 years between re-entry periods. The Universal Soil Loss Equation, soil descriptions from Scott County, Revised Forest Plan, Final EIS Revised Land Management Plan, and forest soil scientist documents were used as a basis for analysis.

PROPOSED ACTION

Erosion. The Revised Forest Plan Design Criteria identify maximum allowable soil loss thresholds (USDA Forest Service. 2005a, pg. 74, Criteria SW003). In order to determine whether the proposed practices and connected actions meet these guidelines, the Universal Soil Loss Equation (USLE) was used to calculate soil loss resulting from proposed actions. For this soil loss analysis, a worst-case scenario was employed. There are no severe potential erosion hazard areas in any of the proposed shelterwood harvest areas. Only a moderate erosion potential exists where intensive ground disturbance could be done. The soil type in stand 1 and stand

29 Compartment 329 is soil unit (134), Carnasaw-Zafra-Clebit complex 15-35% slopes. This soil unit was used in the USLE because it shows the worst-case erosion of the soils units contained in this EMU where intensive ground disturbance could exist.

These stands would be the most susceptible to erosion based on the combination of soils, slope, and intensity of ground disturbing management actions planned. The USLE model shows the maximum allowable soil loss for stand 1 the commercial thinning to be 7.2 tons/acre. USLE predicted 3.09 tons per acre for the proposed activities. The USLE results found that the soil disturbing actions being planned for stand 29 a shelterwood harvest would result in soil loss of 5.04 tons/acre with the maximum allowable soil loss to be 12.00 tons per acre. The USLE models predicted soil loss per acre is when standard erosion control measures (i.e. water bars, seedbed scarification and seeding) are implemented. The USLE results include prescribed burning first year then chainsaw scarification the second year if burning does not result in adequate stocking rates on the shelterwood harvest areas. Therefore, stands 1 and 29 and all other soil disturbing actions being proposed in all other stands and compartments in this analysis area should not exceed the Forest soil loss standards.

The woodland ponds to be rehabilitated in the watershed would be less than 2 acres in size. The resultant soil exposure would be temporary. The ponds would be reconstructed on gently sloping sites and, after reconstruction, would act as a barrier to downstream movement of sediment. Planting grasses, clover, and other herbaceous vegetation would reduce the time required for pond site stabilization to less than four months. These measures would limit potential soil erosion and sedimentation to within acceptable levels.

Compaction. The soil resource inventory for Parks analysis area has identified the following areas, where project activities are being proposed, as having a moderate-high compaction hazard rating. This moderate-high rating will be treated as having a high hazard rating. The hazard rating in this analysis area is primarily due to low proportions of rock content in the top 6-inches of soil. This situation when combined with heavy equipment operation on wet soils can result in unacceptable levels of compaction. To ensure that compaction effects are kept within acceptable levels, additional mitigation would be implemented. On these soils with a high compaction hazard rating, logging would be limited to the drier periods of the year, namely April through November. Even during these drier periods, extra care would be taken to monitor soil conditions and suspend operations when soils become wet. All other stands that have timber harvesting proposed will have normal operating seasons. Given this mitigation, soil compaction would be limited and is not expected to impair soil productivity.

Nutrient Loss. Some short-term loss in nutrient capital is expected due to tree harvest and prescribed burning which results in some biomass removal, accelerated erosion, volatilization and deep leaching. This is expected to continue for the next 2-years following project implementation. On the positive side, harvesting and prescribed burning will temporarily increase availability of nutrients resulting in improved vegetative growth during this same period. All timber harvesting will result in the removal of tree boles only. The prescribed burns primarily would be of light to moderate severity. This means that, in addition to the targeted fraction of 10-hour and larger fuels planned for consumption, only the upper forest floor litter layer consisting of non-decomposed or semi-decomposed pine needles, leaves and small twigs would also be consumed. Most of the nutrient capital will remain on-site by leaving the underlying forest floor layer, which consists of more decomposed needles, leaves and twigs, intact and unburned. This remaining organic layer, along with the remaining trees, unconsumed slash and other large woody debris and other living vegetation, will serve to minimize the temporary loss of the nutrient capital. Implementing the action alternative, therefore, would result in no long-term effect on the soils nutrient capital.

Fire Effects and Soil Nutrients. Any long-term negative effects to the soil would be related to high severity burns or very short (less than 3-year) frequency of the burns. Typical burn severity will be limited by established burning parameters and mitigation measures designed to protect soils and overstory trees and to minimize risk of escape. These parameters result in retention of enough leaf litter to protect soil from the negative effects listed above in most cases. Under burn frequencies will be 3-years or greater which will allow

recovery of forest floors and soil biota and will not deplete soil nutrients. With standard prescribed burning planning and mitigation, negative effects to soil productivity from prescribed fire under the Proposed Action Alternative are not expected. This is because the burns would be light to moderate in severity and cool enough to protect overstory trees, and the lower portion of the litter layer would remain in place. The effect to long-term soil productivity as a consequence of those actions being proposed in the Proposed Action Alternative relates to the cumulative effects from erosion, compaction, displacement and the soils nutrient capital as noted above. By practicing a "light-hand-on-the-land" policy during all soil disturbance activities by adhering to mitigation measures common to all actions and following all applicable Forest Plan direction, long-term soil productivity would be maintained. Compaction hazard from scarification would be minimal and erosion negligible (USDA Forest Service 2005b FEIS pg. 44 and 49). In addition, fuel loadings throughout most of the watershed will be reduced from timber harvesting and prescribed fire and the construction of temporary roads will allow increased access for fire suppression needs. These actions will reduce the probability of a future high severity wildfire, which could impair long-term productivity. When considering both the direct and indirect effects, the Proposed Action Alternative would result in the most favorable alternative for maintaining long-term soil productivity.

Effects of Herbicides on Soil. Herbicides do not physically disturb the soil; therefore, treated areas have intact litter and duff. Herbicides could affect soil productivity through biotic impacts, soil erosion, and nutrient leaching. Depending on the application rate soil environment, herbicides can stimulate or inhibit soil organisms. Adverse effects can occur when herbicides are applied at higher rates than the label rate. Use of herbicides at the lowest effective rate required by mitigation measures does not reduce activity of soil biota (Fletcher and Friedman 1986). Litter and duff serve to minimize erosion and nutrient loss from leaching. Forest standards have been developed to ensure that herbicides are applied correctly and pose no greater risk to soils and soils biota and do not accidentally contaminate surface waters. No herbicide will be mixed or used within 100 feet of perennial streams, lakes, or ponds, or within 30 feet of other streams with defined channels. Herbicides, carefully directed and foliar sprayed during late spring to summer at the minimum recommended application rate, should result in no detrimental effects to long-term soil productivity or impact water quality. With plan standards in effect, the proposed action shows acceptably low risk with respect to potential herbicide use (FEIS Revised Land and Resource Management Plan, 2005, pp.47).

CUMULATIVE EFFECTS

The effect to long-term soil productivity as a consequence of those being proposed in the Proposed Action Alternative relates to the cumulative effects from erosion, compaction, displacement and the soils nutrient capital as noted above. By practicing a "light-hand-on-the-land" policy during all soil disturbance activities and herbicide application and by adhering to mitigation measures common to all actions and following all applicable Revised Forest Plan direction, long-term soil productivity would be maintained. Compaction hazard from scarification would be minimal and erosion negligible. In addition, fuel loadings throughout most of the watershed will be reduced from timber harvesting and prescribed burning, and the construction of temporary roads will allow increased access for fire suppression needs. These actions will reduce the probability of a future high severity wildfire, which could impair long-term productivity. When considering both the direct and indirect effects, the Proposed Action Alternative (including timber harvest and associated manual or herbicide application treatments) would result in the most favorable alternative for maintaining long-term soil productivity.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

Erosion. This alternative would result in the least amount of direct erosion. Only the undisturbed natural erosion would be expected to continue. This, however, does not consider the potential indirect effects of accelerated erosion rates that could occur in the event of a wildfire. Under this scenario the No Action Alternative would represent the worst situation, as existing high fuel loadings along with more limited fire suppression equipment access into this area would equate to the most acres that would be expected to burn at the

high severity level. Existing roads, with maintenance issues, would not get repaired through a timber sale, therefore erosion problems would continue.

Compaction and Displacement. This alternative would result in no additional compaction or displacement as no heavy equipment use is planned.

Nutrient Loss. This alternative would result in no direct nutrient loss. However, in the event of a wildfire the nutrient loss could well be the more excessive of the two alternatives. Under this alternative a wildfire would be expected to impact the most acres at a high severity level. The excessive amount of nutrient loss under this scenario would then show this alternative to be the worst of the two alternatives analyzed. Considering only the direct effects, there would be no change to the existing condition and long-term soil productivity would continue to be maintained. However, when also considering the indirect effects, this No Action Alternative would result in the highest probability for a devastating high severity wildfire that could impair long-term soil productivity. As a result, the No Action Alternative should be considered the worst of the two alternatives in terms of maintaining long-term soil productivity.

CUMULATIVE EFFECTS

Considering only the direct effects, there would be no change to the existing conditions and long-term soil productivity would continue to be maintained. However, when also considering the indirect effects, this No Action Alternative would result in the highest probability for a devastating high severity wildfire that could impair long-term soil productivity. As a result, the No Action Alternative should be considered the worst alternative in terms of maintaining long-term soil productivity.

NO HERBICIDE ALTERNATIVE II

Cumulative effects would be the same as the Proposed Action and would result in a favorable alternative for maintaining long-term soil productivity.

Water Resources & Quality

Present Conditions

This project area falls within two 6th level watershed (34,158 acres). These watersheds are considered "low risk".

(TABLE 3.1) Summary of watershed acres used for Aquatic Cumulative Effects Analysis. These are ***approximate*** acres only based on field examinations, Geographical Information Systems (GIS),and Global Positioning Systems (GPS). See Watershed Map in appendix.

Watershed	Entire Watershed (Including Project Area)		Total Watershed Acres
111102060108	3,323 ac. (private)	11,480 ac (NF lands)	14,803
111102060111	3,710 ac. (private)	15,645 ac (NF lands)	19,355
TOTAL	7,933 ac. (private)	27,125 ac (NF lands)	34,158

These watersheds are located completely within the Ouachita Mountain sub region. (Map located in project file). These two watersheds have several small creeks, branches, and hollows within their boundaries; Boston Creek, Robertson Creek, Dailey Creek, Rocky Creek, Stillhouse Hollow, White Oak Hollow, Bates Hollow, Snow Branch, Williams Branch, and John Allen Hollow. Stream flow within these stream beds is mostly intermittent. These small creeks and branches eventually empty into the Fourche LaFave River.

According to the Environmental Protection Agency EnviroMapper map obtained on 09/29/09 (located in project file), no impaired water bodies with reported problems are associated with this watershed. There are no "source" waters within this watershed. The Beneficial Uses in this watershed include primary contact recreation (fishing, boating, or wading); fisheries; and agriculture water supply (consumption by livestock).

Environmental Effects

A valid cumulative effects analysis must be bounded in space and time. For the purposes of project level planning, 6th level watersheds (10,000 to 40,000 acres) are the appropriate spatial bounds for cumulative effects analysis. Local research has shown that the effects of increased sediment as a result of timber harvests are identifiable for up to 3 years (Beasley, R.S., E. L. Miller and E. R. Lawson. 1987). Three years prior and one year following the implementation year bind the timeframe of this model. This captures the effects of other management activities that may still affect the project area. Proposed actions are constrained to a single year. This will express the maximum possible effect that could occur. This is consistent with most project level environmental analyses that have an operability of 5 years. Past activities that have a lasting effect (such as roads and changes in land use) are captured by modeling the sediment increase from an undisturbed condition.

METHODS OF ANALYSIS - In 1989, the Forest began a long-term monitoring effort to determine cumulative effects from silvicultural activities using paired watersheds and Basin Area Stream Survey methods. In 1992, the forest developed a model to estimate sediment yields and analyze the cumulative effects of proposed management actions on water quality. This early process and several updates provided a process to systematically evaluate water quality conditions for watersheds covered in whole or part by forest activities. The October 2005 version of the Aquatic Cumulative Effects (ACE) Model is considerably different. GIS databases have been analyzed and land use, slope, and road data have been summarized by 6th level watersheds.

BACKGROUND INFORMATION

A cumulative effects analysis needs to address pollutants resulting from management activities. Typical activities on the forest include timber harvest, site preparation, road construction and maintenance, and recreation. Monitoring efforts have demonstrated that with proper implementation of forest standards and state best management practices, direct and indirect impacts are individually insignificant on water quality and associated beneficial uses (Clingenpeel 1989, 1990, USDA Forest Service, Ouachita National Forest 1993, Neihardt 1994, Vestal 2000, and Whitsett 2004). A cumulative assessment determines if these individually insignificant actions collectively have an adverse affect.

Pollutants associated with forest management activities (timber harvest, site preparation, road construction and maintenance, and recreation) may include increased sediment, nutrient enrichment, changes in water yield, and pesticides within the water column. A change in water yield is an affect that does not serve as a pollutant until a large change occurs. In addition, water yield models do not characterize the impacts of all management activities such as road construction and the increase in water yield is less than the natural variability. E.L. Miller, R.S. Beasley, and J.C. Covert (1985) could not identify increases in peak flow as a result of timber harvest and site preparation, and could only determine significant increases in summer base flow. Changes in water nutrients or nutrient fluxes within streams as a result of management activities are minor and not appropriate consideration of cumulative effects at the project level (Beasley, R.S., E. L. Miller and E. R. Lawson, 1987).

Sediment is an appropriate measure to determine the effects of management activities on water quality and its associated beneficial uses on forested lands (Coats and Miller, 1981). Sediment increases can adversely affect aquatic biota and habitat including fish productivity and diversity (Alexander and Hansen, 1986), degrade drinking water and affect the recreational values of streams and rivers.

Changes in land use and other disturbances can be modeled with respect to estimated increases in sediment. This model estimates current condition and the effects of various management alternatives. These predictions are then compared to risk levels established by the effects of sediment increase on fish communities. Management activities have the potential to affect water quality. These effects can be categorized as a direct, indirect, or cumulative effect. Any activity that disturbs the land surface, decreases cover or alters vegetation can affect water quality. The primary Forest Service management activities that could affect water quality are; road construction and reconstruction, timber and wildlife management, prescribed burns, fire line construction and reconstruction, pond construction, and herbicide application.

A **direct effect** of management activities on water quality would be when an activity places a pollutant directly into a watercourse. Road maintenance and/or construction, fire line construction and reconstruction, pond construction, prescribed burning, and timber management activities, such as construction of skid trails, temporary roads, and log landings, can result in increases of erosion and sedimentation. Some amount of soil would eventually find its way to the stream course. While it is impracticable to eliminate all soil from entering a stream, it is possible to limit the amount of soil from entering streams through the design and implementation of BMPs.

Best Management Practices (BMP) is defined as "methods, measures, or practices selected by an agency to meet its nonpoint source control needs. BMP include but are not limited to, structural and nonstructural controls, operations, and maintenance procedures. BMP can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters. (Arkansas Forestry Commission BMPs for Water Quality pg. 5)." Usually BMP are applied as a system of practices rather than as a single practice. BMP are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility. BMP are basically a preventative rather than an enforcement system. BMP are a whole management and planning system in relation to sound water quality goals, including both broad policy and site-specific prescriptions.

Indirect effects are from management activities that do not have a direct connection to the stream course. The effect of nutrients released to streams as a result of management activities is an indirect effect. Beasley, Miller, and Lawson (1987) showed an increase in nutrient concentrations of orthophosphorus, potassium, and calcium for only the first year after clear cutting. There was no effect from selection harvesting (commercial thinning would be similar to selection harvesting). Because of the short period of increases (one year) and the dilution of untreated areas, there is no significant impact to water quality.

Monitoring is used to determine the implementation and effectiveness of management activities. Reviewing individual BMP and combinations of BMP across the forest has shown that management activities (temporary road crossings, streamside management buffers in combination with timber harvest, and herbicide applications) do not have a significant adverse effect on beneficial uses (Clingenpeel 1989, 1990, Neihardt 1994, USDA Forest Service, Ouachita National Forest 1993, 1994).

PROPOSED ACTION

The proposed activities (commercial thinning, shelterwood harvest, road construction and reconstruction, prescribed burning, pond construction, site preparation activities, and herbicide application) where ground disturbance would occur have potential to adversely affect water quality. This could occur by increasing sediment levels, pesticides movement into the water, and changing the chemical and biological characteristics of the water quality within a watershed that could have detrimental effects to fish. All of the above mentioned activities would be conducted following Forest Service standards and state Best Management Practices. Monitoring efforts have demonstrated that, with proper implementation of these standards and BMPs, direct and indirect impacts are individually insignificant on water quality and associated beneficial uses (Clingenpeel 1989, 1990, USDA Forest Service, Ouachita National Forest 1993, Neihardt 1994, Vestal 2000, and Whitsett 2004).

An adverse **direct or indirect effect** resulting from the Proposed Action is unlikely based on the results of research and monitoring efforts and the mandatory implementation of BMP. As stated in the forest-wide design criteria, the Poteau Ranger District follows BMP approved by the Department of Pollution, Control, and Ecology (PC&E) when implementing timber harvest, road construction, or reforestation activities such as prescribed burning. Fisheries in project areas where similar timber harvest activities have taken place and BMP have been followed have shown water quality to remain stable (Arkansas Forestry Commission. 1991. Best Management Practices).

The analysis of **cumulative effects** is a requirement of the National Environmental Policy Act (NEPA). A cumulative effect analysis should consider incremental impact of actions when added to past, present and reasonably foreseeable future actions. The analysis includes all actions regardless of who undertakes the actions. Cumulative effects can result from individually minor but collectively significant actions taking place over time.

Sediment is the best measure to determine the effect of management activities on water quality and its associated beneficial uses on forested lands (Coats and Miller, 1981). Sediment increases can adversely affect aquatic biota and habitat including fish productivity and diversity (Alexander and Hansen, 1986). Increases in water yields as a result of harvesting methods could also indicate cumulative effects. However, water yield models do not characterize the effects of all management activities such as road construction. Often the increase in water yield is less than the natural variability. Changes in water nutrients could model cumulative effects. However, nutrient fluxes within streams as a result of management activities are minor. For the purposes of this report a model (USDA Forest Service, 2005c) was used that predicted sediment yields as the surrogate for determining cumulative effects for water quality and associated beneficial uses.

Local research has shown that the effects of increased sediment as a result of timber harvests are identifiable for up to 3 years (Miller, Beasley, and Lawson 1985). Three years prior and one year following the implementation

year bind the timeframe of this model. This captures the effect of other management activities that may still affect the project area. Proposed actions are constrained to a single year. This will express the maximum possible effects that could occur. This is consistent with most project level environmental analyses that have an operability of 5 years. Past activities that have a lasting effect such as roads and changes in land use are captured by modeling the sediment increase from an undisturbed condition. (Results of monitoring on the Ouachita National forest indicate there are no adverse cumulative effects when forest standards and guidelines are followed.) Background information on the process and data used to predict sedimentation is on file at the District Office.

Wildlife treatments such as midstory reductions would most likely be carried out by crews using chainsaws and would not result in any soil disturbance. Temporary wildlife openings would also be located throughout the area and in log landings after the timber sale. Fire lines would use recently reconstructed roads or maintained roads where possible. By the time prescribed burning, scarification, or wildlife treatments are conducted any sediments contributed from road construction or harvest actions would have been stabilized or returned to or near normal conditions (Aquatic Cumulative Effects Model 2005c, Clingenpeel, Crump Pg.5).

The objective of this analysis is to determine the possible cumulative effects of management activities on water quality and its associated beneficial uses. There are two methods to address cumulative effects for this forest. The first is to model changes in land use and disturbance with respect to increases in sediment. The second is to conduct stream surveys and compare these results to reference watershed within their respective sub ecoregion.

(TABLE 3.2) Aquatic Cumulative Effects Analysis. These are *approximate* acres only based on field examinations, Geographical Information Systems (GIS), and Global Positioning Systems (GPS). Watershed Map is located in project file.

Watershed	Beginning Watershed Risk Level	Potential to Adversely Effect	Ending Watershed Risk Level
111102060108	Low	Low	Remains the same --Low
111102060111	Low	Low	Low

*This is the bounded area for the effects analysis for water resources.

Both 6th level watersheds have a current watershed risk level of Low. Where a watershed risk level is low, the potential to adversely affect beneficial uses is low.

The Aquatic Cumulative Effects model showed the proposed actions also resulted in a low risk rating over both watersheds. A low risk indicates minimal adverse effects from sediment increases to aquatic beneficial uses and only requires the application of forest standards and state BMP.

Herbicide Application *(Significant Issue)*

The Proposed Action proposes herbicide application with glyphosate (Round-up®, Accord® or equivalent products), or triclopyr (Garlon 4®, 3A or equivalent products)as backup treatments for release and midstory reduction. If hand tool release does not result in a free-to-grow condition for at least 300 trees per acre of selected pine and hardwood trees in the regeneration areas. Application will be by cut surface application, tree injection, and foliar or basal spray application method. Possible herbicide use could be on approximately 280 acres for release and as a backup treatment for WSI work. Experience on this district has shown that with adequate site preparation burning and adequate regeneration, hand tool release is normally the only necessary treatment for young saplings to overtop competing vegetation. Therefore, it is not anticipated that all 280 acres if any, would require the use of herbicides. Also where adequate use of prescribed fire is implemented, as maintenance, a portion or all of the WSI midstory reduction acres might not need herbicide treatment, either.

The area of potential **direct affect** of herbicide application is immediately downstream of the treated areas. Herbicides may enter streams during treatment by surface or subsurface runoff. To significantly affect the water

resource, they must occur at concentrations high enough to impair water quality for human use or injure or kill aquatic plants or animals.

As part of the monitoring program, stream water samples were collected below two areas treated with Round-up in 1989 on the Poteau Ranger District (now the Cold Springs District). Samples were collected after the first rainstorm large enough to affect stream flow that occurred following treatment. The detectability limit of the test was .0005 ppm. Glyphosate was not detected in one of the samples. The other sample had a concentration of .0015 ppm in the first sample, and no detectable level was found in the second sample. From 1990 thru 2005, stream water samples were collected below two to three treated areas each year, after the first and second large rainstorms. The detectability limit of the 1990 thru 2005 samples was .0005 ppm. No detectable levels were found in any of these samples. With the implementation of design criteria to protect water quality, herbicide movement is expected to be within the above described range.
Based on water monitoring of selected streams on the Cold Springs Ranger District by Forest Hydrologist Alan Clingenpeel, it is very unlikely that glyphosate concentrations in stream flow directly below the treated areas would ever exceed 0.2 ppm. Clingenpeel monitored the use of glyphosate on the forest and the Cold Springs Ranger District. He found detectable amounts (less than 1 part per billion) of glyphosate in storm runoff. However, no concentrations were detected that would pose a threat to beneficial uses. Based on this evaluation, the BMPs used in herbicide transportation, mixing, application, and disposal are effective at protecting beneficial uses such as fisheries (Clingenpeel, 1993).

CUMULATIVE EFFECTS

The risk level for these 6th level watersheds is ***low***. The results of the Aquatics Cumulative Effects model, which included all activities from the Proposed Action such as timber harvesting, road building, reforestation, and wildlife treatments remain in the ***low*** range. A low risk indicates minimal adverse effects from sediment increases to aquatic beneficial uses. The application of herbicides w/in this watershed has no effect to cumulative effect with respect to sediment increases.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

The risk of sediment increase is rated low in both 6th level watersheds. The **direct effect** of this alternative is that no roadwork would be done on many interior roads. Normal and emergency road maintenance would be done on existing open roads. The **indirect effects** would include the continued deterioration of roads, washed out stream crossings, rusted out culverts, and long distances between cross drains. Sediment from the road would eventually increase.

NO HERBICIDE ALTERNATIVE II

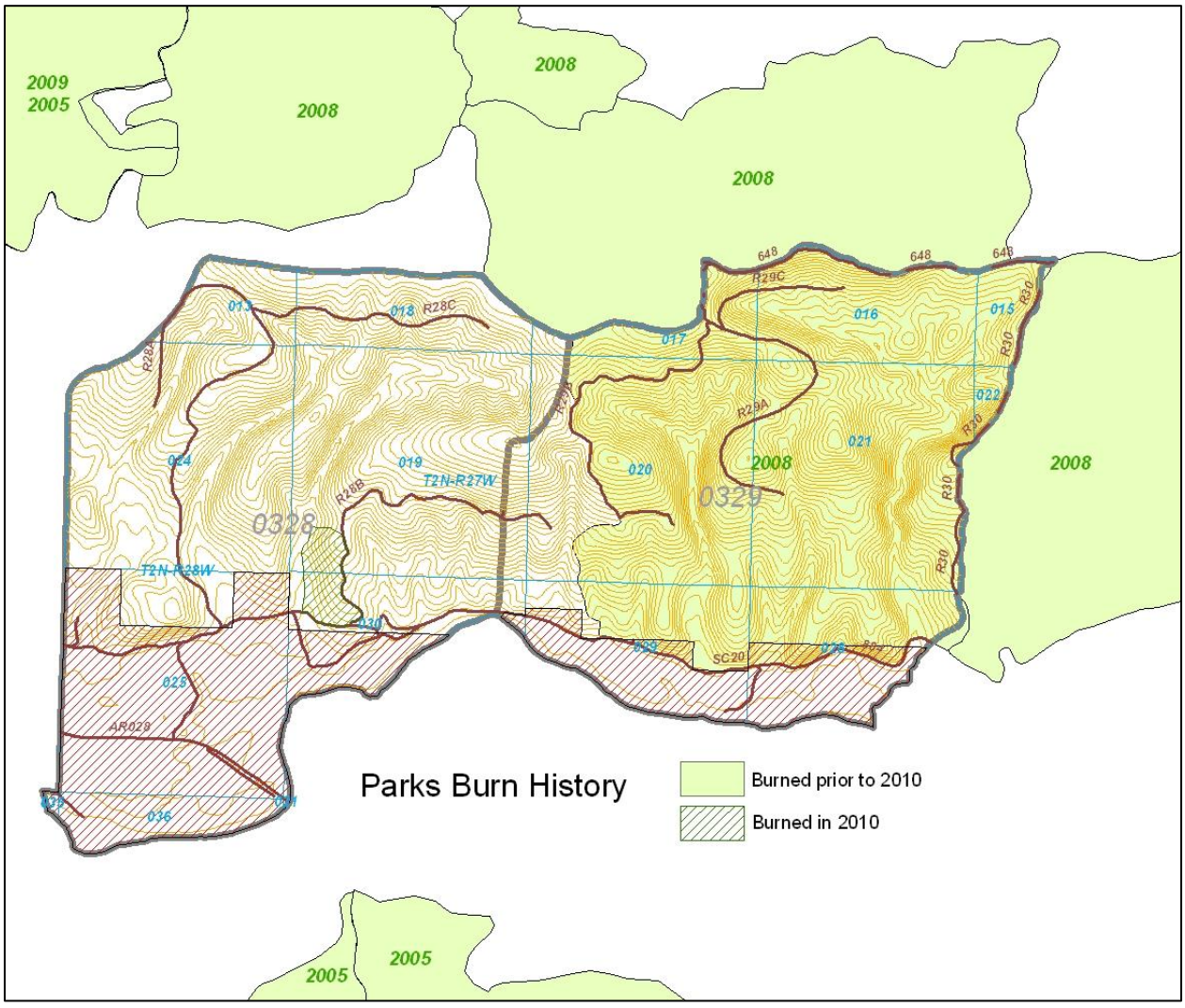
The direct, indirect and cumulative effects would be the same as the effects from the Proposed Action without the effects of herbicide use, and result in a ***low*** risk to water quality.

Wildfire Hazards &/or Fuels

Present Conditions

Heavy fuel loads in Parks have accumulated due to past and recent storm events, several years of extended summer drought, hypoxylon canker a disease that is always present, beetle caused mortality and normal fuel buildup. Fuels increased from approximately 4-6 tons per acre to approximately 8-10 tons per acre where prescribed burning has not taken place. There are steep north slopes, south slopes, and west slopes. Many of these slopes are too steep and rocky to walk or dig fireline with hand tools and too steep for dozers. The project area is accessed by Forest Service Roads 64, 648, R28A, R28B, R29B, R30, and 648. Prescribed burning conducted on the Ouachita National Forest typically reduces fuel loading on a unit by one to three tons per acre. With repeated burns, fuel loading in a burn unit can be maintained at three to four tons per acre.

See the map below for the burn history of this project area.



Environmental Effects

The geographic boundary for the effects on wildfire hazards and fuels would be the entire Parks EMU and the immediate forested areas surrounding Parks. Timelines for measuring the effects are current fuel and future fuel buildup for the next 10 to 15 year period. The analysis method would be by field observations and monitoring of fuels after burns.

PROPOSED ACTION

Fuel management is implemented through normal program planning. Other resource areas such as timber and wildlife may initiate projects that also benefit fire management through fuel modification by use of prescribed fire. Burn plans would be developed to provide protection for soil and water while achieving the resource management objectives. Prescription elements would include such factors as fire weather, expected fire behavior, slope, aspect, soil moisture, fuel moisture, relative humidity, mixing heights, wind speed and direction, fuel loads, and any other indicator that may influence fire intensity.

If the Proposed Action were selected, a direct effect would be logging slash added to an already increased load from normal fuel accumulations. Even though this would add to the normal fuel loads in Parks, a direct effect of a prescribed burn executed under controlled conditions would reduce this load down to near normal amounts reducing the chance of a hot wildfire that could kill live standing timber and remove the soil protecting litter layers that a prescribed burn would leave intact (indirect effect).

CUMULATIVE EFFECTS

Cumulatively, with each successive prescribed burn, less intense fires would resemble natural fire events that were common before fire suppression activities were begun. With each prescribed burn, less fuel would be available to burn and native species would increase that benefit from periodic fire. Eventually stand replacing wildfire would become less likely, easier to control or manage, and burn under moderate conditions.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

If the No Action Alternative were selected, an in**direct effect** would be an increased potential for unmanaged fuels to create a wildfire hot enough to kill overstory trees and remove the understory, midstory, and duff layers.

CUMULATIVE EFFECTS

Without a fuel reducing prescribed burning in the next entry, the chances of a wildfire hot enough to cause adverse **cumulative effects** to soil productivity, water quality, vegetation, and wildlife populations are increased. The reason for this is an unnatural accumulation of fine and heavy fuels buildup, that can create enough heat, could reach the growing tissues in the crowns of mature trees or be hot enough to cause cells inside the bark layer to expand causing mortality to the plant.

Soil productivity could also be altered causing poor growing conditions and slow growth of ground cover plants to protect the soil from erosion. Loss of soil productivity would decrease food sources for various species of soil organisms, insects, and wildlife.

NO HERBICIDE ALTERNATIVE II

The effects would be the same as Proposed Action. The only difference between the Proposed Action and Alternative II is herbicide use is not proposed in this alternative.

Transportation & Infrastructure

Present Conditions

There are 3,875 acres of NF and 1,096 acres of private land. There are 19.62 miles of total existing roads (both open and closed) on FS system land and private. Management Area 22 has 3,474 acres and Management Area 22 (drains) has 401 acres for a total of 3,875 acres. There are 19.62 miles of open roads within the EMU on Forest Service and private land. Open road density is at **2.53** mi./sq. mile for Management Area 22, exceeding the 2005 Revised Land and Resource Management Plan criteria of 0.75 mile per square mile for Management Area 22.

Roads that provide direct access to the project area.

State Highway 28 – This road provides the main access to the Parks EMU project area. This highway is a double lane asphalt surfaced roads under state jurisdiction. State Highway 28 runs east and west direction between Rover, Arkansas and Hwy 71 south of Waldron, Arkansas. This highway is south of this project area and is all on private land.

Roads within the project area. (Segment map on file at the district office.)

Scott County Road 20 (Segments 1, and 2) –This is a single lane, ditched and graveled road under County jurisdiction, and maintenance. The variety of users include: residents, hunters, recreation and forest administration. This road is in poor condition. It has inadequate surfacing and poor drainage.

Forest Service Road 884 (Segment 3) - This is a single lane, ditched and graveled road under Forest Service jurisdiction, and maintenance. The variety of users include: residents, hunters, recreation and forest administration. This road is in poor condition. It has inadequate surfacing and poor drainage.

Forest Service Road R28A (Segment 4) – This is a single lane, ditched, and surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This section of road is in poor condition with some surface erosion and lots of brush encroaching in the road ditches.

Forest Service Road R28C (Segment 5) – This is a single lane, ditched, and surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This section of road is in poor condition with some surface erosion and lots of brush encroaching in the road ditches.

Forest Service Road R28B (Segment 6) – This is a single lane, ditched, and surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This section of road is in poor condition with some surface erosion and lots of brush encroaching in the road ditches.

Forest Service Road 648 (Segment 7) – This is a single lane, ditched, surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This road segment is in good condition.

Forest Service Road R29 (Segment 9) -This is a single lane, ditched, surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This road is in poor condition and is very grown up.

Forest Service Road R29A (Segment 11) – This is a single lane, ditched, and native surfaced road under Forest Service jurisdiction., The variety of users include hunters, recreation, and forest administration. This road is in poor condition with grown in ditches.

Forest Service Road R29B (Segment 12) – This is a single lane, ditched, and native surfaced road under Forest Service jurisdiction., The variety of users include hunters, recreation, and forest administration. This road is in poor condition with grown in ditches.

Forest Service Road R29C (Segment 13) – This is a single lane, ditched, and native surfaced road under Forest Service jurisdiction., The variety of users include hunters, recreation, and forest administration. This road is in poor condition with grown in ditches.

Old Woods Roads (Segments 14, 15, 16, 17, and 18) – These are old temporary roads that are currently being used by hunters and 4-wheeler riders. These roads will not be on the MVUM system and will be closed.

Roads Outside the Project Area

Forest Service Road R29 (Segments 8 and 10) -This is a single lane, ditched, surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This road is in poor condition and is very grown up.

Forest Service Road 648 (Segment 19) – This is a single lane, ditched, surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This road segment is in good condition.

Forest Service Road 64 (Segment 21) NOT SHOWN ON MAP – This is a single lane, ditched, surfaced road under Forest Service jurisdiction and maintenance. The variety of users includes hunters, recreation, and forest administration. This road segment is in good condition.

Forest Service Road 884 (Segment 22) - This is a single lane, ditched and graveled road under Forest Service jurisdiction, and maintenance. The variety of users include: residents, hunters, recreation and forest administration. This road is in poor condition. It has inadequate surfacing and poor drainage.

(TABLE 3.3) Matrix for Existing Roads Outside Analysis Area

Road Number	Road Name	Segment	Jurisdiction	Maintenance	Reconst. miles
R29	Blackjack	8	FS	1	0
R29	Blackjack	10	FS	1	0.22
648	Daily Creek	19	FS	3	0
648	Daily Creek	21	FS	3	0
884	Fourche	22	FS	3	0
64	Bates Hollow	20	FS	3	0

Roads to be closed either year round or seasonally.

The following roads are currently open but will be closed after harvest and connected activities.

- Old Woods Roads (Segments 14, 15, 16, 17 and 1 8) Closed.
- Forest Service Road R28C (Segment 5) Closed
- Forest Service Road R28B (Segment 6) Seasonally Closed
- Forest Service Road R29A (Segment 11) Seasonally Closed
- Forest Service Road R29B (Segment 12) Seasonally Closed
- Forest Service Road R29C (Segment 13) Seasonally Closed

Fish Passage Crossings

The road analysis inventory showed 2 fish passage culverts crossings, of the 10 in the EMU, to have fish passage problems. All fish passage culverts to be replaced will be designed to meet fish passage guidelines.

(TABLE 3.4): Matrix for Existing Roads

Road Number	Road Name	Segment	Jurisdiction	Length Miles	Current Management Status	Future Management Status	Maintenance	Reconst. miles
SC20	SC20	1	County	0.38 (0.19)	O	O	3	0
SC20	SC20	2	County	3.37	O	O	3	2.0
884	Fourche	3	FS	0.83	O	O	3	0
R28A	Snow Branch	4	FS	2.92	O	O	1	0.60
R28C	William Branch	5	FS	0.66	O	SO	1	0
R28B	High Peak	6	FS	1.90	O	C	1	0.85
648	Daily Creek	7	FS	1.71 (0.86)	O	O	3	0
R29	Blackjack	9	FS	1.66	O	O	1	0.03
R29A	Rock Creek	11	FS	1.89	O	SO	1	0.80
R29B	Brushy Mountain	12	FS	1.74	O	SO	1	1.10
R29C	Rock Creek Spur	13	FS	0.84	O	C	1	0
WR1	Woods road	14	FS	0.32	O	C	NA	--
WR2	Woods road	15	FS	0.21	O	C	NA	--
WR3	Woods road	16	FS	0.47	O	C	NA	--
WR4	Woods road	17	FS	1.02	O	C	NA	--
WR5	Woods road	18	FS	0.74	O	C	NA	--
				19.62	19.62	9.83		

( ) = boundary road, ½ length. *** = Roads not on Forest Service Land**

Current Open Road Density	Total Ac = 4791 acres / 640 ac = 7.77 sections	Open Roads = 19.62 mi	Open Road Density = **2.53** mi/ per section
Future Open Road Density		Open Roads = 9.83 mi	Open Road Density = 1.27 mi/ per section

Environmental Effects

The geographic bounds for this project include the transportation system within Parks and portions of roads outside of the project area. Timelines for measuring the effects would be until all activities proposed are completed. The method of analysis for the transportation system in this project area is the Roads Analysis that was completed in March 2011, utilizing GPS data.

PROPOSED ACTION

The Proposed Action would include approximately 5.6 miles of road reconstruction, 2.0 miles of TSL-D new construction, 7.6 miles of prehaul maintenance, and 11.0 miles of temporary road construction. Normal and emergency road maintenance would be done on existing open roads. All stream crossings with culverts being replaced would be engineered with adequate fish passage structures. The open road mileage would be reduced to approximately 9.83 from 19.62 miles resulting in the open road density at 1.27 miles per square mile moving it towards the guideline of 0.75 miles per square mile in the Revised Forest Plan This alternative would reduce the distance between culverts and replace nonfunctioning culverts, which would have an **indirect effect** by reducing sediment from roads in the watershed. The proposed transportation work would allow for timber harvesting, prescribed burning, silvicultural treatments, wildlife work as well as safe public access.

CUMULATIVE EFFECTS

These activities would have a **cumulative effect** of improving forest health, wildlife habitat, forest recreational opportunities and safety.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

The **direct effect** of this alternative is that no roadwork would be done on many interior roads. Normal and emergency road maintenance would be done on existing open roads. The **indirect effects** would include the continued deterioration of roads, washed out stream crossings, rusted out culverts, and long distances between cross drains. Sediment from the road would eventually increase.

CUMULATIVE EFFECTS

Cumulative effects would be a road system that does not meet Forest Service standards, which provides safe access and reduces erosion and sediment problems.

NO HERBICIDE ALTERNATIVE II

Direct, indirect, and **cumulative effects** from herbicide use will be non-existent for this alternative. All other effects are estimated to be the same as those in the Proposed Action since proposed treatments are the same, minus the effects of herbicide application.

Vegetation

Present Conditions

Parks contains a distribution of pine and hardwood forest types that cover rolling hills, steep and moderately steep side slopes. There are 3,474 acres of pine or 90 % of the forested area and 401 acres of hardwood or 10 % of the forested area. There are 1,096 of private lands within the Parks project area. There are 3,875 acres of National Forest system land in Parks.

There is a wide distribution of age classes from under 10 years of age to over 100 years of age in pine and hardwood species. There is 110 acres in the 0-10 year age class in the land suitable for timber production. Total mature pine and pine/hardwood acres (at least 70 years old and older) are 2,733 acres (71 %) of the forested area. Approximately 2,469 acres (64 % of the forested area) of these are *mature growth* pine 80 years old and older. There are approximately 38 acres (1 %) of *mature growth* hardwood and hardwood/pine at least 100 years old. Approximately 363 more acres of hardwood forest types are at least 91 to 100 years old and will move into the mature growth age class within the next 10-year period. These conditions would meet and exceed design criteria WF005 of the Revised Forest Plan.

Tree species common in these stands include various white oaks and red oaks, hickories, blackgum, sweetgum, and shortleaf pine, with some encroachment of invader type species such as cedar and red maple. The Parks area lies south of the areas that were hit hardest when the red oak decline was at its peak several years ago. The recent prescribed burns have allowed the oak regeneration including the red oaks to become established throughout.

The factors that contribute to oak mortality are still present here. These are hardwoods exceeding 70 years, high stem densities, and marginal site indexes (50 to 60). Drought has also played a role in the amount of mortality and decline district wide. Dry years in 1998, 2000, 2001, 2002; August, September, and October of 2004; October through December of 2005; January through March of 2006; and the ice storm of 2000 are still affecting the tree species on the district and forest. The older hardwood stands also become less resistant to insect and disease infestations with age. Hypoxylon canker and red oak borers killed numerous red oaks in the northern part of the district several years ago.

Because of the advanced age and stocking rates of the mature pine stands these pine stands are susceptible to insect infestations. Southern Pine beetle and Ips beetle infestations have become established in mature pine stands in locations throughout the district.

There are off-site and invader type species such as cedar, ash, and maple within this project area. Mimosa and privet are the most numerous non-native invasive tree species. They are prolific seeders that can quickly become established in openings, and are increasing throughout the district.

(TABLE 3.5) Age class distribution for all forested land by forest type for 2010 based on stand inventories, the projected acreage for the year 2011 of the various age classes and the percentage of the project area on national forest system land they comprise are listed by forest type in the following table. *Rounded numbers are used for analysis and may vary slightly.*

(Acres)						
Age Class	**Pine**	**Pine/Hwd**	**Hwd/Pine**	**Hardwood**	**Acres**	**Percent**
0 – 10	110	0	0	0	110	3%
11 – 20	81	0	0	0	81	2%
21 – 30	550	0	0	0	550	14%
31 – 40	0	0	0	0	0	0
41 – 50	0	0	0	0	0	0
51 – 60	0	0	0	0	0	0
61 – 70	0	0	0	0	0	0
71 – 80	242	22	0	0	264	7%
81 – 90	1,869	117	0	0	1986	51%
91 – 100	146	196	156+13	194	705	18%
101 – 110	134	7	0	38	179	5%
111 – 120	0	0	0	0	0	0
121+	0	0	0	0	0	0
Acres	3,132	342	169	228	3,875	
Percent	81%	9%	4%	6%		

Environmental Effects

The geographic boundary for the effects on vegetation would be the boundary of all of the compartments within the Parks Ecosystem Management Unit boundary (Compartments 328 and 329). Timelines for measuring the effects on vegetation would be a 10-15 year timeline from 20010 to 2020-2025, or from this entry to the next. Methods of analysis include interpreting the field data collected throughout the project area to establish existing and desired conditions. The proposed actions developed to meet the desired conditions are analyzed to determine what the direct effect of these actions would be and what the cumulative effects would be to the vegetation in the overstory, midstory, and understories.

PROPOSED ACTION

The proposed harvests are consistent with the Revised Forest Plan's direction to emphasize forest vigor and timber growing potential and sustainability in Management Area 22. It would also provide wildlife habitat diversity for various other wildlife species. The older stands in the unsuitable areas would also represent old growth conditions, a major ecological community of the Ouachita Mountains and the Arkansas Valley of Arkansas and Oklahoma.

The Proposed Action consists of manipulation of 3,875 acres designated as needed RCW habitat in order to achieve a recovered population. Timber harvesting proposed in the Proposed Action consists of 1,926 acres of commercial thinning in shortleaf pine stands to a target average BA of 60; 521 acres of commercial thinning on a 20' spacing; and 80 acres of modified shelterwood to a target average 30 BA. Wildlife stand improvement on 1,926 and prescribed burning all of this EMU to create an open understory to allow unrestricted flight for RCWs.

BAs of stands proposed for commercial thinning vary from Table 3.6 (Revised Forest Plan, pg. 84) that lists thinning guidelines to be used for timber management. The stands to be thinned would be carried beyond the 70 year rotation period making them more susceptible to southern pine beetle infestations. These BAs would reduce the chance that southern pine beetle infestations would spread to adjacent stands. Research has shown

that trees spaced at least 20 to 25 feet apart would still get southern pine beetle infestations but the beetles would soon disperse and the spot would not spread. Average diameter of the pine sawtimber to be thinned is 12 to 13 inches. Reducing them down to a target 60 BA would leave at least approximately 25' between trees. These reduced BAs would eventually reduce the fuel loadings and temporarily create additional early stage habitat needed by various wildlife species.

Where various harvests are proposed there are portions that would not be thinned or harvested because of some type of topographic feature making them unsuitable such as rock outcrops or short steep slopes, or varying widths in riparian zones. The exact acres deducted from these stands would be determined in the field when the timber is marked if the Proposed Action is selected.

A **direct effect** of the Proposed Action shelterwood harvests would create 80 acres of additional early seral stage habitat added to the existing 110 acres (7.0% of the suitable and 4.9% of the overall forested area). A direct effect of the commercial thinning would be a reduced number of trees in the overstory taking the low quality trees and trees that are more susceptible to insect infestations first with the remaining being the best shaped and healthiest trees in the stands **where they exist but keying on taking out small trees, leaving relicts and those with signs of red-heart**

Mature growth pine and pine hardwood 80 years old or older would be reduced by 80 acres to 2,389 acres but increase to 2,653acres by the next entry. Mature growth hardwood and hardwood/pine would eventually increase to 401 acres in 10 years (10.3%) of the forested area.

There would be reduced understory and midstory numbers (hardwood stems) throughout Parks where prescribed burning, harvesting activities, timber stand improvement work, and wildlife stand improvement work would be conducted. The prescribed burning would reduce competing woody vegetation and make some nutrients tied up in the duff layers available for root uptake of remaining overstory, midstory, and understory plants. There would also be an increase of grass and forbs numbers and species composition. Scorch would be visible throughout the area burned. Some needle loss from scorch would occur but as long as the buds are not injured the pine can survive even severe needle loss. Hardwood species most resistant to fire in the project area and most likely to survive are white oaks, post oaks, red oaks, and black oaks. Hickories, red maple, and cedar are less resistant. Hardwood resistance increases with tree diameter due to bark thickness and fire intensity. However some hardwood have the ability to resprout, in fact fire increases basal sprouting of hardwood species like the oaks, cherry, red maple, dogwood, blackgum, and basswood. This ability decreases with age and size. Season also can determine the amount of mortality from fire. Growing season burns injure or kill pine and hardwood species, depending on the type of fire and intensity.

The modified shelterwood harvests, commercial thinning, wildlife stand improvements, prescribed burning, and scarification if needed, would create growing conditions favorable to shade intolerant and fire tolerant plant species. The mature *growth* pine component would initially decrease from the proposed modified shelterwood harvests then increase throughout, as the *mature saw timber* component ages into a *mature growth* condition. The mature growth hardwood component would also increase and respond with more hard and soft mast production providing improved habitat for plant and animal species that require it. The 81 acres of pine in the 11-20 year age class would eventually move into pole size timber while still providing some early seral stage habitat structure when timber stand improvements and prescribed burning is conducted. The 401 acres of hardwood would be allowed to grow and improve the hardwood component. The understory throughout the project area would show an increased growth response after removing part of the overstory and midstory with the commercial thinning. The overstory would also respond with more vigor making them more resistant to insect and disease infestations.

As an **indirect effect** of removing part of the overstory and midstory, the understory would be a rapid response due to increased sunlight that would improve growing conditions for shortleaf pine, some hardwoods, and many species of non-woody plants. A combination of the proposed actions and continued prescribed burning

program would eventually result in the restoration of an old growth conditions in the unsuitable stands and healthy, sustainable timber stands where timber activities are suitable.

Implementing the Proposed Action in the long-term would result in crown closure occurring first in the stands where the pines would be thinned to 60 BA. Crown closure would not affect the established pine saplings in a shelterwood condition. The growth response of the mature pine and hardwood would not be as vigorous as in younger stands since many of the trees retained are mature sawtimber trees that have slowed in growth. However, even though the growth response would be less when compared to younger pine and hardwood stands the reduction of the number of trees per acre by harvesting creating more access to sunlight, water, and nutrients would still result in some improved stand vigor and would reduce the chance of disease or insect infestation in the remaining trees. The 401 acres of hardwood and hardwood/pine stands would be managed to maintain and enhance mast-producing hardwoods.

CUMULATIVE EFFECTS

Cumulatively, the overall stand vigor and health of Parks would be improved with the implementation of the Proposed Action. Reduced competition for water, sunlight, and nutrients would create an improved growing environment for the residual pine, and hardwood species including the red oaks and make them more resistant to various disease and insect infestations.

Other cumulative effects of the Proposed Action would be enhanced growth of remaining shade intolerant trees including cone production in shortleaf pine and hard and soft mast production in various shade intolerant hardwood species. The prescribed burning would resemble the natural fire events that helped develop the overstory, midstory, and understory types that probably existed before European settlement. An overall cumulative effect would be an increase in diversity of fire tolerant plant species.

Other than the **direct, indirect, and cumulative** impacts mentioned above from the proposed harvest activities, and from past, present committed, or reasonably foreseeable future activities there should not be any adverse effects expected to the various forms of vegetation in this analysis area from these actions nor as an accumulation of impacts from other harvest conducted in adjacent compartments or on private land within this watershed.

Effects of Herbicide Application

Removing most of the overstory with the shelterwood harvest will promote a vigorous woody understory of species response. To ensure at least 300 free-to-grow pine seedlings are established after seed fall or planting a herbicide application could be necessary. If herbicides are used it will be selectively applied to individual stems. Application by back-pack foliar spray, by injection, or by application to cut stems makes it possible to leave desirable species in groups or individual stems. **Direct effects**, as with a manual release treatment, vegetative diversity will not be compromised. By reducing species in general, only actual numbers of species on an area will be affected. **Cumulatively**, the pine and hardwood species left after treatment would increase in diameter and height growth. Based on past experience with herbicide treatments, it is anticipated that a substantial component of hardwood species, grasses and forbs will be present in regenerated stands after treatment. Fryar and Clerke (1988) found pine regeneration areas on the Ouachita National Forest had large numbers of hardwood in the stands after a variety of herbicide treatments.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

If this alternative is implemented, early seral stage habitat, an ecologically important part of the overall forest health would be scarce as a **direct effect**. There would be few open stands or developed wildlife openings, or burning program to provide some type of early seral stage structure needed by various wildlife species. There would be no improvement in stand health because all the conditions that make the pine and red oaks vulnerable

now would continue to exist. The understory and midstory would remain dense with fire intolerant species and invader type of species like cedar and red maple that normally do not occupy sites where fire plays a natural role in stand development. Heavy fuel loadings from natural accumulation of fuel buildup would make Parks susceptible to a hot crown killing wildfire.

An **indirect effect** could lead to the condition similar to western states where there would be old, dense, and insect killed trees, causing unnaturally high fuel loading. This would consist of old, dense, and insect or disease killed trees that would cause unnatural fuel loading. If a wild fire should occur it would become more difficult and dangerous to control. Dense stands of timbers that have been susceptible to southern pine beetle infestations and red oak decline would become increasingly vulnerable due to the continued deteriorating conditions that make them vulnerable now. In 1995 and 1996, several large Southern pine beetle (SPB) spots were detected and treated in Parks. With the No Action alternative, SPB and Ips infestations would potentially be more frequent and more difficult to control. Critical RCW habitat would not be created or existing habitat would decline.

CUMULATIVE EFFECTS

A **cumulative effect** would be that shade intolerant species such as shortleaf pine, northern and southern red oaks, and black cherry would decline in numbers and eventually be replaced by shade tolerant species like maple, hickory, black gum, and cedar that are already in the understory and midstory. This is currently happening where red oak decline is present on some of the ridge tops. Some red oaks on these ridges are dying from a combination of drought, hypoxylon canker, overstocking, low site indexes, and various borers although not as bad here as in other parts of the district at this time.

There would be some mature growth pine and hardwood scattered in pockets throughout the area growing under stressed conditions. Lack of water and nutrients caused by overcrowding in the overstory, midstory, and understory would contribute to individual trees inability to withstand any insect or disease infestations that develop. Native grasses and other shade intolerant species would decline and be replaced by invader type species such as cedar and red maple. Growth in existing young pine stands would slow, eventually reducing tree vigor, quality, and stocking in favor of more shade intolerant species.

Fuel load accumulations from natural events have increased from 4 to 6 tons per acre to as much as 8-10 tons and more, with many larger branches and tree boles on the ground. This is creating a situation where any wildfire could potentially become a hard to control, crown killing fire. A wildfire occurring in this fuel type can cause erratic fire behavior with spotting potential. Fires of this intensity have the potential to damage forest resources and endanger the life and property of firefighters and the public.

NO HERBICIDE ALTERNATIVE II

The effects would be the same as the Proposed Action. The only difference between the Proposed Action and Alternative II is herbicide use is not proposed in this alternative.

CUMULATIVE EFFECTS

Without the use of herbicides, several manual methods would be required to control the non-native, off-site species. These species would continue to send up sprouts until the reserves stored in the root system could no longer sustain the plant.

Wildlife, Habitat, and Fisheries

Present Conditions

Parks Ecological Management Unit totals 3,875 acres of National Forest land.

- This EMU is all National Forest land except for private land on its southern boundary.
- There are currently 110 acres in the 0-10 year-old age class.
- About ½ this EMU was prescribed burned in 2008 so some browse is available for wildlife in Compartment 329 but Compartment 328 needs to be incorporated into the prescribed burning calendar of rotational burning.
- Many mature forest stands have a dense midstory that limits grasses and non-woody understory to occur.
- Open road density is over 2 mi./sq. mile for this EMU, far exceeding the 2005 Revised Land and Resource Management Plan criteria of 0.75 mile per square mile for Management Area 22.
- This EMU runs the north side of the Fourche La Favre River which is a fishable stream.
- Deer are heavily hunted in this area.

Revised Forest Plan (RFP) Design Criteria WF001: *On a project-by-project basis, provide grass-forb or shrub-seedling habitats (include regeneration areas 0-10 years in age, areas of recent heavy storm or insect damage, and woodland conditions) at a rate of:*

- *A minimum of 4 percent of the* **suitable acres** *in MA22, Shortleaf Pine/Bluestem Grass/RCW (Ouachita Mountains Habitat Diversity Emphasis, West Gulf Coastal Plain, Habitat Diversity Emphasis, Lands around Lakes, Semi-primitive Areas, and Winding Stair Mountain National Recreation Area and Associated Non-Wilderness Designations, respectively),*

- Minimum regeneration needed to achieve this criteria cannot be determined until suitable acres are re-figured after RCW recruitment/replacement stands are removed from the current suitable acres listed above.

4% X 2,714 (Suitable acres total – 108.5) – 110 of existing 0-10 yr. age class = - 1.5 acres
No regeneration required this entry

RFP Design Criteria WF002: *Limit even-age regeneration cutting in each project area to no more than 8.3 percent of the suitable acres managed under even-aged prescription for Management Area 22:*

- *4-8.3 percent in Shortleaf Pine/Bluestem Grass/RCW*

8.3% X 2,714 (Suitable acres total) – 110 of existing 0-10 yr. age = maximum regeneration
Up to 115 acres possible to regenerate this entry

RFP Design Criteria WF003: *Provide for and designate areas for mast production at the approximate rate of 20 percent of each project area. Hardwood and hardwood-pine forest types, age 50 and older, comprise this component.*

- The hardwood component, which is over 90 years old, is currently about **10% (397** acres of total) of forested land. This project area **DOES NOT MEET** this Revised Forest Plan Design Criteria and cannot due to it all being south slope stands with the large riparian area on the south being in private ownership.

RFP Design Criteria WF006: *Retain or develop mature growth pine habitats (80 years old or greater) and mature growth hardwood habitats (100 years old or greater) at a rate of five percent of each broad cover type within each project analysis area.*

- For Parks EMU, this would be at least 174 acres (5 % of 3,478 acres) of mature growth pine 80 yrs.-old and older and 20 acres (5 % of 397 acres) of mature growth hardwood 100 yrs. old and older.
- There are currently 2,478 acres (71%) of pine considered mature growth pine 80 years old or older.
- There are currently 38 acres (1 %) of mature growth hardwood stands 100 years old or older within Parks. Another 359 acres will reach this age within the next 10 years.

RFP Design Criteria WF012: *Where possible, seasonally close roads during critical periods for wildlife (March–August).*

- Currently the open road density for Parks is 2.53 miles per square mile in Management Area 22. These figures include both FS roads and private roads. This project area **DOES NOT MEET** this Revised Forest Plan Design Criteria.

RFP Design Criteria WF010: *Where there is no existing water source, provide at least one wildlife pond per160 acres where needed to accomplish wildlife objectives.*

- Currently, Parks EMU contains 14 existing waterholes. Reconstruction of 13 of these is necessary to make the existing waterholes reliable as year-round water sources.
- Additional water sources (3) are needed to meet RFP design criteria WF010.

Effects of Management Activities on Wildlife

PROPOSED ACTION and Alternative II

The **RFP Design Criteria and the Guidelines for RCW habitat improvement** were used to develop the Proposed Action and Alternative II for Parks. These criteria are in place to protect and expand populations of endangered species and maintain viable populations of all native wildlife species on the forest.

Actions proposed in this environmental assessment would begin with a timber sale (and associated road work) that could not be sold until early 2012 or later. This sale(s) would probably take 3-5 years to log all stands treated by timber harvest. Most other activities would occur after the timber sale is completed.

Road work would include pre-haul maintenance of 7.6 miles, reconstruction of 5.6 miles of existing roads, new construction of 2.0 miles, and creating temporary roads (11.0 miles) and log decks within stands to be thinned or regenerated. Reconstruction/maintenance includes brushing back right-of-ways, replacing rusted out culverts, and adding surface gravel where necessary along the timber sale haul routes. Road reconstruction would decrease the possibility of increased erosion and sedimentation in the local streams. New construction of 2.0 miles of road in this project area would improve access to a part of this area that currently does not have vehicle access. This new construction will enable needed vegetation management treatments that will enhance wildlife habitat but could disturb wildlife species particularly during nesting/breeding/young rearing seasons. Closing the new construction at least seasonally should reduce human disturbance in the future.

RFP Design Criteria WF012: The Proposed Action and Alternative II will lower the open road density from 2.53 to 1.27 miles per square mile. While this does not meet the MA 22 Criterion, it is an improvement. More roads cannot be closed because they provide thru-access or access to private land.

Temporary roads and log decks are seeded after they are no longer utilized. These temporary roads and log decks along with firelines would then become temporary wildlife openings. The objective of an opening is to provide a supplemental food source to sustain wildlife populations in areas of poor habitat, or to supplement food shortages on a seasonal or temporary basis. These openings also provide nesting and brood habitat for game and non-game birds.

Timber Harvest, particularly even-age regeneration cuts, is often referred to by the public as deforestation. This is **not** the case. The forested area stays forested but becomes a different age with differing vertical structure. These harvest cuts mimic natural occurrences such as wind storms or wild fire. Deforestation occurs when forested land is cleared and then used for other uses such as housing developments.

Regeneration cutting (modified shelterwood of 80 acres would produce enough early seral stage habitats to have appropriate habitat capability for viable populations of many early seral stage species and not exceed standards that protects sustainability of the forest. **RFP Design Criteria WF001 and WF002** are met by the Proposed Action and Alternative II.

Reforestation treatments (even-age/modified shelterwood) would occur on 80 acres of new regeneration units. This would consist of utilizing hand tools and prescribed burning as a first treatment option. If prescribed burning and hand tools does not achieve the desired results, or if prescribed burning cannot be conducted, mechanical scarification would be used. The intent of mechanical scarification is to disturb the duff layer and expose as minimum amount of soil as possible with 8 ft. spacing on contour throughout the shelterwood stands. These treatments would create early seral stage habitat such as grasses, forbs, and woody re-sprouts for wildlife use.

In the **Proposed Action ONLY**, herbicide application would be used if needed to site prepare for natural regeneration. The herbicide of choice would have glyphosate as the active ingredient. Seed tree stands would be planted with Shortleaf pine if the sites do not seed within 5 years after harvest. The objective of reforestation treatments is to prepare the seed bed for regeneration. Early seral stage habitat would be created. The herbicide would have no detrimental effect to wildlife (Syracuse Environmental Research Associates (SERA).

Commercial thinning would occur on 1,926 acres of pine forest to achieve basal areas of 60 square feet of pine per acre and commercial thinning on 20 foot spacing would occur on 521 acres. This would develop the crowns of existing hardwoods and remaining pines in these pine stands. Thinning would increase sunlight to the forest floor, increase the understory species, and further develop hard and soft mast capabilities for this project area.

RFP Design Criteria WF003 (*Provide for and designate areas for mast production at the approximate rate of 20 percent of each project area).* Parks EMU does not currently meet this RFP Design Criteria. Only about 12.8% (935 acres) of Parks can be considered suitable for mast production. There are 42 acres of younger hardwood stands that will mature in time and move acres toward meeting this criterion. However, even with these stand maturing Parks EMU will fall short of meeting 20 percent. The converting of pine forest type stands to hardwood forest type stands for the purpose of meeting this criterion is not an option in this EMU because it would be detrimental to the endangered Red Cockaded Woodpecker which is one of the primary focuses of this management area. This EMU is comprised of primarily south facing slopes more suitable to pine forest types. When looking at mast production at a forest wide scale the shortfall of this EMU will be offset by other EMUs that are primarily hardwood forest types. The Proposed Action or Alternative II does not negatively alter this design criterion for this EMU.

RFP Design Criteria WF006 (*Retain or develop mature growth…)* Parks currently far exceeds this criteria for pine with over 60% of the pine stands currently in a mature growth condition. However, Parks currently has 0 acres in a mature growth condition for hardwoods. The Proposed Action or Alternative II does not negatively

alter this design criterion for this EMU. In 5 years 169 acres of hardwood forest types will mature to an age that will exceed this criteria for this EMU.

Prescribed burning totaling 3,875 acres would first occur after timber harvest is completed in Parks. Multiple objectives would be met by prescribed burning such as wildlife habitat improvement, control understory, and fuel reduction. These burns (every 3 - 5 years) could top-kill some hardwoods if they are less than 2" at collar height but re-sprouting of these hardwood stems would occur. While some cover would be lost in a prescribed burn, there would be an increase in grasses and forbs and this type of cover would replace what may be is lost in a short time. This activity would increase the amount and palatability of browse utilized by various wildlife species such as white-tailed deer.

Timber stand improvements (release of 289 ac. and pre-commercial thinning of 110 ac.) *[some of these are repeated acres]* in the Proposed Action and Alternative II would open these stands for more use by early seral stage wildlife species. The dense conditions now present that do not allow for much understory vegetation in these stands would be reduced. The re-sprouting of hardwoods after the hand tool treatments would also produce new browse utilized by various wildlife species such as white-tailed deer.

Wildlife stand improvement of 1,926 acres of pine stands would further open these stands to allow sunlight to the forest floor and encourage grasses and forbs in the understory. Remaining hardwoods would have more room and less competition and be able to develop healthier crowns and thus increase in mast production. The WSI would also encourage re-sprouting of many oaks and other hardwoods. These re-sprouts would be used as browse by various wildlife species such as white-tailed deer.

Wildlife waterhole reconstruction (13) and construction (3) would provide year-round permanent water sources, which would be utilized by many wildlife species. These waterholes would not be stocked and would provide locations for increased amphibian reproduction. **RFP Design Criteria WF010** *(water developments)* will be met by the Proposed Action and Alternative II.

Nest Box placement (8 in regen, 32 at waterholes) would provide cavities for species such as wood ducks and many bat species at waterhole locations and bluebirds in regeneration areas. Many snags and cavities were naturally created by the ice storm in 2000 but these trees are now falling to the ground. Placing these nest structures in regeneration areas and at waterhole locations will replace many of the snags that are now fall.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

The effects of selecting the No Action alternative for Parks are many. **Directly**, the forest stands would continue to age and mature. Leaf litter would continue to build on the forest floor in mature and maturing stands of pine and hardwoods. Understory plant species would begin to decline in species variety and overall numbers. Early seral stage type habitat and browse would continue to disappear. Open-road density would remain at its current level. Some waterholes would continue to dry up during seasons of drought. Thick existing plantations would continue to be dense and inaccessible to many wildlife species. **Indirectly**, species of wildlife requiring open areas such as Northern bobwhite, Bachman's sparrow, and Eastern bluebird and species requiring a mosaic of forest age classes such as deer, wild turkey, and black bear would move out of the area. Timber stands currently suitable for RCW nesting and foraging would deteriorate due to increases in overstory and midstory density. No other activities are known for this project area. There would be no cumulative effects.

Effects on Management Indicator Species (MIS)

The Forest Service Manual (FSM) defines MIS as "*any species, or group of species, or species habitat element selected to focus management attention for the purpose of resource production, population recovery, maintenance of population viability, or ecosystem diversity*"

Land managers are directed to select management indicators for a Forest Plan or project that best represent the issues, concerns, and opportunities to support recovery of Federally-listed species, provide continued viability of sensitive species, and enhance management of wildlife and fish for commercial, recreational, scientific, subsistence, or aesthetic values or uses. "*Management indicators representing overall objectives for wildlife, fish, and plants may include species, groups of species with similar habitat relationships, or habitats that are of high concern.*"

This current list of MIS (with associated purpose or habitat categories) is shown in Table 3.5.

(TABLE 3.5) Management Indicator Species (MIS) and Associated Purposes

Life form	Scientific name	Common name	Selected for this project? (YES/NO)
DEMAND SPECIES			
Bird	*Colinus virginianus*	Northern Bobwhite	**YES**
Bird	*Meleagris gallopavo*	Eastern wild turkey	**YES**
Fish	*Micropterus dolomieui*	Smallmouth bass – Species not in *Parks EMU*	**NO**
Mammal	*Odocoileus virginianus*	White-tailed deer	**YES**
VIABILITY CONCERN SPECIES – also addressed in T&E section of this EA			
Bird	*Picoides borealis*	Red-cockaded woodpecker	**YES**
ADEQUATE EARLY FOREST STAGE COVER			
Bird	*Colinus virginianus*	Northern Bobwhite	**YES**
Bird	*Dendroica discolor*	Prairie warbler	**YES**
ADEQUATE MATURE PINE FOREST COVER			
Bird	*Dryocopus pileatus*	Pileated woodpecker	**YES**
Bird	*Picoides borealis*	Red-cockaded woodpecker (MA 22)	**YES**
Bird	*Piranga olivacea*	Scarlet tanager	**YES**
ADEQUATE MATURE HARDWOOD FOREST COVER			
Bird	*Dryocopus pileatus*	Pileated woodpecker	**YES**
Bird	*Piranga olivacea*	Scarlet tanager	**YES**
RECREATIONAL FISHING QUALITY (Lakes and Ponds)			
Fish	*Lepomis macrochirus*	Bluegill	**NO**
Fish	*Lepomis microlophus*	Redear sunfish	**NO**
Fish	*Micropterus salmoides*	Largemouth bass	**NO**
HABITAT QUALITY OF STREAMS: Arkansas River Valley Habitat Category			
Fish	*Ameiurus natalis*	Yellow bullhead	**YES**
Fish	*Campostoma anomalum*	Central stoneroller	**YES**
Fish	*Etheostoma whipplei*	Redfin darter	**YES**
Fish	*Lepomis cyanellus*	Green sunfish	**YES**
Fish	*Lepomis megalotis*	Longear sunfish	**YES**
HABITAT QUALITY OF STREAMS: Gulf Coastal Plain -- Habitat Category not in *Parks*			
Fish	*Aphredoderus sayanus*	Pirate perch	**NO**
Fish	*Campostoma anomalum*	Central stoneroller	**NO**
Fish	*Erimyzon oblongus*	Creek chubsucker	**NO**
Fish	*Lepomis cyanellus*	Green sunfish	**NO**
Fish	*Lepomis megalotis*	Longear sunfish	**NO**
HABITAT QUALITY OF STREAMS: Ouachita Mountains -- Habitat Category not in *Parks*			
Fish	*Campostoma anomalum*	Central stoneroller	**NO**
Fish	*Etheostoma nigrum*	Johnny darter (w/in leopard darter range only)	**NO**
Fish	*Etheostoma radiosum*	Orangebelly darter	**NO**
Fish	*Etheostoma whipplei*	Redfin darter	**NO**
Fish	*Fundulus catenatus*	Northern studfish	**NO**
Fish	*Hypentilium nigricans*	Northern hog sucker	**NO**
Fish	*Lepomis cyanellus*	Green sunfish	**NO**
Fish	*Lepomis megalotis*	Longear sunfish	**NO**
Fish	*Luxilus chrysocephalus*	Striped shiner	**NO**
Fish	*Micropterus dolomieui*	Smallmouth bass	**NO**
Fish	*Percina copelandi*	Channel darter (w/in leopard darter range only)	**NO**

Note that several MIS appear under more than one habitat or purpose category.

MIS selected for this project - The Ouachita National Forest MIS list was reviewed and a subset of categories and associated MIS was selected for this project. The right column in Table 3.8 indicates which MIS were selected for this project. The following MIS categories and their associated MIS were eliminated from further consideration because they do not occur on National Forest land in this project area: Habitat Quality of Streams (Gulf Coastal Plain and Ouachita Mountains). In the Demand Species category, smallmouth bass was not selected because there is no suitable habitat for this species within Parks EMU. The remaining categories are represented in the project area and summarized in Table 3.6.

(TABLE 3.6) Management Indicator Species (MIS) for *Parks*

	COMMON NAME	PURPOSE OF SELECTION
1.	Bobwhite quail	Demand Species and Adequate Early Forest Stage Cover
2.	Eastern wild turkey	Demand Species
3.	White-tailed deer	Demand Species
4.	Prairie warbler	Adequate Early Forest Stage Cover
5.	Pileated woodpecker	Adequate Mature Pine Forest Cover /Adequate Mature Hardwood Forest Cover
6.	Scarlet tanager	Adequate Mature Pine Forest Cover /Adequate Mature Hardwood Forest Cover
7.	Red-cockaded woodpecker	Adequate Mature Pine Forest Cover /Viability Concern Species– also addressed in T&E section of this EA
8.	**Habitat Quality of Streams: Arkansas River Valley**	
8a.	Yellow bullhead	Habitat Quality of Streams: Arkansas River Valley
8b.	Central stoneroller	Habitat Quality of Streams: Arkansas River Valley
8c.	Redfin darter	Habitat Quality of Streams: Arkansas River Valley
8d.	Green sunfish	Habitat Quality of Streams: Arkansas River Valley
8e.	Longear sunfish	Habitat Quality of Streams: Arkansas River Valley

Effects on project MIS **-** Six terrestrial animal MIS (1-6 above) were modeled to compare habitat capabilities within the project area for the No Action alternative and the Proposed Action/Alternative II (Table 3.6).

It should be noted that this model assumes that all treatments occur within the same year (when, in fact, treatments may occur over the course of the 10 year planning period; therefore, actual habitat capability would differ from the projections presented here).

(TABLE 3.7) Response of Selected MIS to Alternative by Decade of Implementation (Habitat Capability Model)

	MANAGEMENT INDICATOR SPECIES (MIS)					
	Quail (1)	Turkey (2)	Deer (3)	Prairie Warbler (4)	Pileated Woodpecker (5)	Scarlet Tanager (6)
	INDIVIDUALS PER SQUARE MILE					
NO ACTION						
Baseline	20.99	5.39	14.99	10.46	31.88	28.80
After 10 Years	12.32	5.24	12.78	3.82	32.60	29.43
PROPOSED ACTION & ALTERNATIVE II						
After Initial treatments	162.01	11.27	39.00	164.70	15.40	27.25
After 10 Years	18.66	5.17	14.37	9.40	31.97	29.26

Model coefficients are not available for the other MIS (7 & 8), which were selected for this project, but direct, indirect, and cumulative effects on their populations are discussed below.

PROPOSED ACTION & ALTERNATIVE II

The Proposed Action would produce 80 acres of early seral stage habitat through tree harvesting and site preparation activities. Under the Proposed Action and Alternative II, habitat availability for each terrestrial vertebrate MIS would be sufficient to achieve all of the minimum population objectives and, in several cases, meet or exceed the optimum levels.

Quail: Habitat availability and population trend for quail, a Demand Species that also represents Adequate Early Forest Stage Cover, would increase 8-fold after initial treatments of timber harvest, TSI, WSI, and prescribed burning. Directly, some nest could be disturbed by logging equipment and by prescribed burning if done during nesting season. Indirectly, the Proposed Action and Alternative II would produce more preferred habitat of the quail by producing enhanced nesting cover, an abundance of food, and reliable water sources. These activities should support a positive population trend.

Deer and Turkey: Two MIS species representing Demand Species, deer and turkey, would generally both fair better under the Proposed Action or Alternative II than under No Action. There would be no direct affect to deer but some turkey nest could be disturbed if activities occur during nesting season. Indirectly, the habitat that both species prefer would be improved by action. Indirectly, both species would benefit from the overall affects of the Proposed Action or Alternative II by the enhancement of food, cover and water availability.

Prairie Warbler: Prairie Warbler is an MIS for Adequate Early Forest Stage Cover. Its requirements can be met by forest stands under the age of 20 and by prescribed burning in open pine stands. Treatments in the Proposed Action and Alternative II lead to impressive population levels following treatments. There would be no appreciable direct affect to the prairie warbler though some nest disturbance could occur. Indirectly, with the implementation of an action alternative, more of the preferred habitat of the prairie warbler would be produced enhancing nesting cover and the abundance of food and water available, supporting a positive population trend.

Pileated Woodpecker and Scarlet Tanager: For these MIS representing mature forest types, habitat capabilities are projected to be slightly lowered by the proposed treatments. The amount of Adequate Mature Forest Cover exceeds the optimum needs for Pileated Woodpecker and Scarlet Tanager for pine but currently falls short in meeting hardwood needs. However, in 5 years 169 acres of hardwood forest types will mature to a suitable age that will meet the needs of these two species and this EMU will then exceed this criteria for mature growth hardwood. Habitats for both species are more than adequate outside the project area and especially in hardwood-dominated habitats not subject to treatments within Parks. There would be no direct, indirect or cumulative affects by the proposed activities.

This Proposed Action or Alternative II would perpetuate habitat capabilities for each of the selected terrestrial vertebrate MIS. The Proposed Action and Alternative II meet most of the wildlife associated Revised Forest Plan (2005) Design Criteria mentioned above in this wildlife section with the exception of WF003, WF006 and WF012. The Proposed Action or Alternative II does not negatively alter RFP Design criteria WF003. This EMU is comprised of primarily south facing slopes more suitable to pine forest types. When looking at mast production at a forest wide scale the shortfall of this EMU will be offset by other EMUs that are primarily hardwood forest types. In time (5 years) RFP Design criteria WF 006 will be exceeded by both the Proposed Action and Alternative II. The Proposed Action and Alternative II come closer to meeting WF012 criteria then the No Action Alternative does.

Red-cockaded woodpecker: The RCW does not currently occupy this EMU but does occur in the neighboring Hazel EMU to the north. The entire Proposed Action for the Parks EMU was designed to make as much of this area suitable for the RCW as possible with hopes of population expansion into this Emu within the next 10-yr. period. There would be not direct effect to the RCW as it currently is in this EMU but the indirect and cumulative effects would both be positive.

Habitat Quality of Streams: Arkansas River Valley MIS (MIS species 8a.–8e.): The Proposed Action or Alternative II would have no appreciable direct, indirect, and little cumulative effects on stream habitats (Habitat Quality of Streams: Arkansas River Valley) and the associated aquatic MIS. All streams would be protected from the direct effects of logging, wildlife habitat improvement activities, and prescribed burning. Construction of new roads and reconstruction of existing roads and replacing of several rusted out culverts that are part of the road reconstruction would have a temporary negative effect on the small streams they are installed on. Replacing these culverts is necessary to allow proper stream flow, fish passage, and area access. Road reconstruction would decrease existing erosion and sedimentation. Indirectly, an insignificant increase in sedimentation may occur in some streams. When Cumulative Impacts Analysis (CIA) was run on this project, each watershed was either no net increase or indicates a low risk for sedimentation in upland Ouachita watersheds. The Proposed Action or Alternative II would have little effect on stream habitats in Parks or the stream-associated MIS.

There are no other known activities planned at this time in and around this project area on Forest Service lands that would produce a cumulative Impact to any of the MIS species listed in Table 3.7.

NO ACTION ALTERNATIVE

Quail and Prairie Warbler: The No Action Alternative would have no direct effect on these species and produce no new early seral stage habitat (MIS category: Adequate Early Forest Stage Cover). It would result in not adding any early seral stage conditions in this project area. Habitat availability for prairie warblers would become insufficient to meet the projected minimum available habitat in this area through time. Cumulatively, this alternative would perpetuate conditions that keep quail and Prairie Warbler numbers low in the Forest.

Pileated Woodpecker, Turkey, Scarlet Tanager and White-tailed Deer: There would be no direct effect on these species. Habitat availability for the other terrestrial vertebrate MIS would change little over the first 10 years (indirect and cumulative effect). The No Action Alternative meets Forest Plan objectives for Adequate Mature Forest Cover for Pine and will for Hardwood forest types in 5 years (same as the Proposed Action and Alternative II). Forest plan objectives will also be met for two of the three MIS representing Demand Species (deer and turkey but not quail.

Red-cockaded woodpecker: The No Action alternative will have no direct effect on the RCW but will do nothing to make this area more suitable for this endangered species.

Stream Habitats and Associated MIS: The No Action Alternative would have no appreciable direct or indirect effects on stream habitats or the associated MIS (Habitat Quality of Streams: Arkansas River Valley) due to the lack of active management. These are species 8a.-8e., as listed in Table 3.7.

Effects on MIS in the context of Forest-wide trends *(USDA Forest Service, November 2008)*

The Bobwhite quail has experienced population declines across Arkansas due to decreases in early seral stage habitat; loss of agricultural lands, and changes in agricultural practices. Bobwhite quail call counts, Breeding Bird Census data, both indicate a slightly increasing quail population while Habitat Capability for the Forest is

declining. Habitat capability for the Forest should improve with the implementation of the Revised Forest Plan which will increase the number of acres of early seral stage habitat. In the period between 1990 and 2007, spring call counts have varied from a high of 1.2 birds per stop in 1992 to a low of 0.5 birds per stop in 1999, 2000 and 2001. There is a weakly correlated upward trend. Breeding Bird Survey data collected over the past 40 years (1966 through 2006) indicate a –3.5% decline for the Ozark-Ouachita Plateau, a –3.0% decline for Arkansas, and a -3.0% decline range-wide. Data for the period of 1980-2006 shows a more significant decline of –4.5% for the Ozark-Ouachita Plateau. Habitat capability for bobwhite, as estimated by ComPATS, has declined steadily since 1994. Although the creation of early successional habitat is showing a slight upward trend this habitat creation has not yet reached the Plan objective of 5,500 acres per year. These regional and range-wide declines are primarily attributed to the loss of agricultural land and changes in agricultural practices. The weak increasing trend for the Forest could be due to the aggressive prescribed burning and thinning programs which are providing habitat improvements. The Proposed Action and Alternative II would result in improved habitat condition and increase habitat availability for this species. The No Action alternative would not result in any additional habitat improvements.

The turkey population has fluctuated over the years. Over the past several years (1990 – 2007), the number of turkey poults per hen has varied from a low of 1.45 poults per hen in 1993 to a high of 3.7 poults per hen in 1997. Long term turkey harvest, habitat capability and Breeding Bird Survey data indicate overall positive trends for the turkey population. However, there has been a decreasing trend in harvest levels, poults per hen, and birds detected on the Landbird points, since 2003. This does not negate the long term positive trend, but does identify potential problems that need watching. The habitat capability remains above the level set in the RLRMP and this sustained high level would indicate that the problem with turkey could be factors other than habitat related. The treatments of the Proposed Action and Alternative II would result in improved habitat condition and increase in habitat availability for this species; the No Action Alternative would not result in any additional habitat benefits.

Based on the annual spotlight survey data collected between 1990 to present, average deer density has varied from a low of 29 deer per square mile in 2001, to 65 deer per square mile in 2007. The average density for the Forest for all years is 46 deer per square mile. This level exceeds Forest Plan objectives for deer per square mile. The Proposed Action and Alternative II would contribute positively to deer by improving habitat condition and increasing habitat availability. The No Action alternative would not.

The BBS data for Prairie warbler indicate a significant declining trend of – 4.08% for the time period of 1966-2006 for the Ozark-Ouachita Plateau as well as a decline throughout its range survey wide. This decline is considered directly related to the decline in the acres of early seral habitat. The Proposed Action and Alternative II would result in improved habitat condition and an increase in habitat availability for this species; the No Action Alternative would not result in any additional habitat benefits.

The Pileated woodpecker has a stable population trend across its overall range, and its long-term persistence on the Forest is not in question. Habitat capability data suggest that this species' primary habitat, mature hardwood forest, is increasing. Population trends and habitat capability data are mixed. The BBS data indicated a slight downward trend of –0.6% in the period of 1966-2006, for the Ozark-Ouachita Plateau. CompPATS estimating the habitat capability using all forest types indicate an increasing trend. These data are for pine, pine-hardwood, hardwood, and hardwood-pine stands with the greatest value being for stands greater than or equal to 41 years old. As these stands age, the habitat capability to support the pileated woodpecker should continue to improve. The Proposed Action and Alternative II would probably result in a temporary reduction of habitat for this species due to continued disturbance. However, over 1/2 of Parks is suitable habitat for pileated woodpecker. The No Action Alternative would probably result in no reduction in habitat for this species.

Breeding Bird Survey (BBS) data for Scarlet tanager indicate a nonsignificant increasing trend of +0.89 percent for 1966 – 2006, for the Ozark-Ouachita Plateau. Forest Landbird point data, Breeding Bird Survey data and Habitat capability data all support an increasing trend for the Scarlet tanager.
On the Forest, there are 479,958 acres of hardwood and hardwood/pine forest types greater than 41 years old that will continue to mature. In the pine and pine-hardwood forest types, many more acres are being managed under various treatments under uneven aged management which also serve as habitat. The continued long-term viability of this species is not in question. With the maturing of over 479,000 acres of hardwood, hardwood/pine and designated pine old growth habitats, the continued availability of adequate habitat is secure. The Proposed Action and Alternative II would result in a temporary reduction of habitat for this species due to disturbance. The No Action Alternative would result in no reduction in habitat for this species.

The endangered RCW has had a population growth of 10% per year for the last several years. This population growth and expansion further proves that the prescription set in this Proposed Action will improve Parks EMU for this species and help keep the Forest RCW population growth contining.

The Proposed Action, Alternative II and the No Action alternative would have no appreciable direct, indirect, or cumulative effects on stream habitats and the associated aquatic MIS. All streams would be protected from the direct effects of logging, wildlife habitat improvement activities, and prescribed burning. Cumulatively, the proposed action would have no effect on stream habitats in *Parks* or the stream-associated MIS. This project would have no effect on Forest-wide trends of these MIS.

Proposed, Endangered and Threatened and Sensitive (PETS) Species

Introduction

Parks EMU is in Management 22. MA 22 was designed to develop habitat to recover the endangered Red-cockaded woodpecker (RCW). There currently are no known RCW sites in this EMU but recruitment stands were designated as the first-step of the Proposed Action. These recruitment stands will have inserts and other structures installed as soon as vegetative work creates suitable nesting habitats in these stands.

Parks EMU has the potential to be habitat for 16 species listed on the Ouachita PETS List.

(TABLE 3.8) PETS Species Proposed to be Evaluated

Number of Species from BE	Scientific Name	Common Name
PROPOSED, ENDANGERED, And THREATENED Species		
1	*Picoides borealis*	Red-cockaded Woodpecker
2	*Nicrophorus americanus*	American burying beetle
3	*Ptilimnium nodosum*	Harperella
SENSITIVE Species		
4	*Aimophila aestivalis*	Bachman's Sparrow
5	*Speyeria Diana*	Diana fritillary
6	*Myotis leibii*	Eastern Small-footed myotis
AQUATIC ANIMAL SPECIES (7. – 11.)		
7	*Notropis ortenburgeri*	Kiamichi shiner
8	*Lampsilis hydiana*	Louisiana fatmucket
9	*Obovaria jacksoniana*	Southern hickorynut
10	*Pleurobema rubrum*	Pyramid pigtoe
11	*Villosa arkansasensis*	Ouachita creekshell
RIPARIAN PLANT SPECIES (12. – 14.)		
12	*Amorpha ouachitensis*	Ouachita false indigo
13	*Vernonia lettermannii*	Narrowleaf ironweed
14	*Vitis rupestris*	Sand grape
GENERAL HABITAT PLANT SPECIES (15. – 16.)		
15	*Carex latebracteata*	Waterfall's sedge
16	*Castanea pumila var. ozarkensis*	Ozark chinquapin

The U.S. Fish and Wildlife Service will be consulted for concurrence of determinations on any Proposed, Endangered, or Threatened (PET) species if required.

The following pages describe a brief present condition of each of the species listed above and their habitats. Detailed effects analyses are in the Biological Evaluation (F. Rothwein, June 2011).

1. RED-COCKADED WOODPECKER

Present Conditions: The entire Parks EMU is designated as MA 22. Currently, there are no active RCW clusters within this project area. The present habitat condition within this project area ranges from poor (too thick) to unsuitable. Most mature pine stands in Parks are currently poor habitat due to dense overstory and midstory conditions.

Environmental Effects:

PROPOSED ACTION

Regeneration harvest of pine timber: **Direct** effects are expected to be discountable due to the unlikelihood that an RCW or its cavity tree would be harmed during regeneration harvest of pine timber. RCW cavity trees on the Poteau/Cold Springs RD are well marked. **Indirect** and **cumulative** effects of pine regeneration cutting would delay the suitability of these areas for RCW foraging and nesting habitat; however, the effects of pine regeneration cutting within limits as with this Proposed Action would be positive in the long run by guaranteeing a sustainable supply of old age pine stands in the future.

Reforestation site preparation: No **direct** effect is anticipated for RCW during reforestation site preparation activities. If any RCWs are in the area during these activities they will most likely seek cover and return after workers have left the area. **Indirect** and **cumulative** effects will be positive due to the reestablishment of native shortleaf pine stand that will guaranteeing old age pine stands for RCW nesting and foraging in the future.

Commercial thinning of pine timber: **Direct** effects are expected to be discountable due to the unlikelihood that an RCW or its cavity tree would be harmed during timber thinning. RCW cavity trees on the Poteau/Cold Springs RD are well marked. **Indirect** and **cumulative** effects of pine harvest would be positive, due to the pine-bluestem grass restoration, which is ideal habitat for RCW.

Control of non-native invasive species (NNIS): No **direct** effect is anticipated for RCW during the control of NNIS. If any RCWs are in the area during the treatment of NNIS they will most likely seek cover and return after workers have left the area. **Indirect** and **cumulative** effects of controlling or eliminating NNIS plants would be positive, due to the restoration of native plants species and the associated influx of native insect species that serve as the forage base for RCW.

Wildlife and timber stand improvement: WSI and TSI treatments would have no **direct** effect on RCWs because only small pine trees and hardwoods would be cut. **Indirect** and **cumulative** effect would be positive, due to improved flight paths and the increased production of seeds, fruits and other plant foods on the ground and the production of insects associated with this herbaceous vegetation. These treatments are vital to the restoration of the pine-bluestem grass ecosystem, which is ideal habitat for the RCW.

Prescribed burning: Prescribed burning would have no **direct** effect on RCWs unless an active cavity tree with a nest is burned, which is a highly unlikely since all known RCW trees are prepped before burns by raking fuel away from the base of the trees. It is possible that an unknown cavity tree may exist in the burn area but is unlikely due to a very large amount of field work being conducted in this area and the amount of annual RCW surveying and monitoring that is preformed. **Indirectly** and **cumulatively**, these burns would help restore and maintain open forest conditions vital to RCWs.

Wildlife improvements: Ponds and temporary openings would have habitat effects similar to other disturbances. These disturbances would not affect RCW habitat quality or quantity.

The installation of nests boxes for other species of wildlife would have no **direct** effect on the RCW. **Indirectly** and **cumulatively**, the installation of these nest boxes may lower competition between other species of wildlife and RCWs for RCW inserts or natural cavities.

The first step of the Proposed Action was the designation of 13 RCW recruitment stands. These stands will have inserts installed when the vegetative management is completed.

No **direct** effects are expected for the implementation of (RCW) treatments/activities. **Indirectly** and **cumulatively**, RCW habitat will be improved by maintaining and increasing cavity availability, reducing threats from competition, predation, and insects. The implementation of single-bird augmentations and multiple-bird group-initiations would encourage RCW population growth and expansion.

Road construction, reconstruction, and maintenance: No **direct** effect is anticipated for RCW during road construction, reconstruction and maintenance. If any RCWs are in the area during these activities they will most likely seek cover and return after workers have left the area. **Indirectly** and **cumulatively**, proposed roadwork would enable needed vegetation manipulation to occur that would improve habitat for RCWs.

Firewood/Rock Permits: No **direct** effects on RCWs are expected with these activities. **Indirect** effects for firewood permits are expected to be positive due to the removal of excess wildfire fuels that pose a threat to RCW foraging habitat. No **cumulative** effects are anticipated for these activities.

Determination of Effects: Considering all activities for PARKS, effects would be discountable, insignificant or completely beneficial; therefore the proposed project is ***not likely to adversely affect*** red-cockaded woodpeckers or its habitat.

ALTERNATIVE II (same as Proposed Action without the use of herbicides):

The environmental effects of this alternative are the same as the Proposed Action.

NO ACTION (Deferred management activities):

Habitat within Parks would continue to slowly deteriorate due to mature pine stands becoming denser, lose of ideal insect habitat, and increased midstory densities. The likelihood of large stand replacing wildfires and/or large Southern pine beetle outbreaks would increase.

2. AMERICAN BURYING BEETLE

Present Conditions

ABBs appear to have a preference for grasslands (grasses and forbs) and forested areas with little or no midstory. Considering the broad geographic range formerly occupied by the beetle, it is unlikely that vegetation or soil type were historically limiting. Carrion availability, and not habitat, may be the greatest factor determining where the species can survive. The preference of this insect for areas of grasses and forbs (as would be found in early seral habitats, open pine or hardwood woodlands) is not unexpected, since the largest populations of small rodents and birds occur in these areas and their carcasses afford the beetle egg laying/brood rearing habitat.

Management actions proposed for *Parks* occur over a very small portion of the district. The extent and area(s) of ABB occurrence are unpredictable. Thousands of acres of similar habitat containing forbs and grasses are available for use by this species, both on this district and over the entire ONF. Since surveying began on the district in 1992, no ABBs have been found in the Parks EMU or within several miles of it. This EMU is not in the designated OUF-AR-ABBA.

Environmental Effects

PROPOSED ACTION

By what is currently known about the ABB habitat needs, it would appear that restored shortleaf pine/bluestem grass habitat would be optimum ABB habitat but surveys have found very few ABB in MA 22 and none in PARKS EMU.

In May 2010, the USFWS issued a Revised Programmatic Biological Opinion for the ABB. This document adjusted the ABBA on the Cold Springs Ranger District. **Parks EMU is not in the OUF-AR-ABBA.** Parks EMU is in Scott County south of AR State Highway 80. No ABBs have been found on the Cold Springs RD south of AR State Highway 80 since surveying began in the 1990s.

The American burying beetle Conservation Plan set up a monitoring schedule for the Ouachita National Forest which called three survey lines for monitoring in MA 22 every three years. ***For this reason, this species will be carried through the evaluation process.***

Effects (Direct, Indirect, and Cumulative):

Timber Harvest including WSI treatments: Commercial thinning and creating four modified shelterwoods, and the connected actions such as log decks and temporary roads generally disturb 1/7 of the ground covered by the timber removal. There would be no **direct** effect to this species as the current condition of these stands (thick with dense midstories) makes them unsuitable for the ABB to be present. **Indirect** effects from timber removal would be positive as this habitat would temporarily become more open habitat for ABB prey species such as small mammals and turkey poults.

Control of non-native invasive species (NNIS): The use of herbicides to control NNIS plants will have no direct effect on the ABB as the ABB is a nocturnal species and should not be above ground during this limited herbicide use. **Indirect** and **cumulative** effects of controlling or eliminating NNIS plants

would be positive, due to the restoration of native plants species and the associated influx of native animal species which is the ABB's food base.

Wildlife Treatments: Wildlife treatments include nest structures, and pond construction and reconstruction.

- *Pond Reconstruction:* No **direct, indirect or cumulative** effects are expected by pond work due to the small acreage associated with each site and existing ponds are not suitable ABB habitat.

- *Pond Construction:* No **direct, indirect or cumulative** effects are expected by pond work due to the small acreage associated with each site.

- *Nest structures:* No **direct, indirect or cumulative** effects from this activity due to the ABB not being present and the lack of ground disturbance even if thet were in the vicinity.

Timber Stand improvement: Site prep would only be considered ground disturbance if done by mechanical scarification. If ABB were present, even then, only one stand (20 acres) would be done at a time. One seventh of 20 acres is less than 3 acres and is considered discountable.

Release and pre-commercial thin would have no **direct** or **indirect** effect on the ABB because only tree species of a small size would be cut down using chainsaws. Release would occur in areas that are not proper habitat for this species, at this time. In time, the **cumulative** effect would be to bring these acres into a condition that would be more suitable habitat for the ABB.

Transportation System changes including road construction, reconstruction, and maintenance: No **direct,** indirect, or cumulative effects are expected by roadwork due to the fact that the acreage very small (less than 3 acres total for new road construction) and existing roads are already compacted and not suitable ABB habitat.

Special Use Permits: There would be no **direct, indirect**, or **cumulative** effect on the ABB by issuing special use permits in *Parks EMU*.

In an effort to improve the ABB population on Ouachita National Forest, a Conservation Plan (CP) has been developed for this endangered species. This CP is part of the Reasonable and Prudent Measures (R&PM) of the 2010 RPBO. The RPBO will be followed including surveys within MA 22 in "best habitat" every third year.

Determination of Effects: Considering all activities, effects would be discountable, insignificant or completely beneficial; therefore the proposed project is ***not likely to adversely affect*** the ABB.

ALTERNATIVE II (same as Proposed Action without the use of herbicides)

Herbicides do not appear to affect ABBs so the environmental effects of this alternative are the same as the Proposed Action.

NO ACTION (Deferred management activities)

The No Action alternative would have no **direct effect** on this species. The No Action Alternative would allow this project area to age and lose current open habitats that the ABB prefers. The long-term indirect effects would be to lose habitat and the prey base.

3. HARPERELLA

Present Conditions

Populations of Harperella on the forest are limited to stream/river channels. This federally listed endangered vascular plant was first discovered on the forest in September 1990. It currently known from several locations on National Forest lands on the Mena/Oden, Poteau/Cold Springs, and Jessieville/Winona/Fourche Ranger Districts in Garland, Montgomery, Scott, and Yell Counties, as well as three privately owned sites (Susan Hooks, personal communication, May 14, 2009).

It typically grows on rocky shoals, in crevices in exposed bedrock, and sometimes along sheltered muddy banks. It seems to exhibit a preference for the downstream margins of small pools or other spots of deposition of fine alluvium. In most harperella sites, there seems to be significant deposition of fine silts. Harperella may occur in mostly sunny to mostly shaded sites. On the Ouachita NF, harperella occurs in perennial to near-perennial streams either on or among boulders or large cobbles or on coarse sediment bars. Other plants harperella is most often associated with are water willow (*Justicia Americana*), hyssop (*Gratiola brevifolia*), sedge (*Dulchium arundinaceum*) and rush (*Eleocharis quadrangulata*).

The Fourche La Favre River is the southern boundary of this EMU but National Forest land does not actually reach the river's edge. There is a strip and privately owned land between NF land and the river.

Environmental Effects

PROPOSED ACTION

There is little chance of **direct, indirect,** or **cumulative** effects on Harperella. This is because Actions will take place on upland sites far away from perennial streams and rivers that provide habitat for this species. Forest Plan standards and Best Management Practices, along with the private land that "filters" erosion from this upland site, should cause no increase in sedimentation to reach the river.

ALTERNATIVE II (same as Proposed Action without the use of herbicides)

The environmental effects of this alternative are the same as the Proposed Action.

NO ACTION (Deferred management activities)

The No Action alternative would have **"no direct impacts"** upon this species as road maintenance.

4. BACHMAN'S SPARROW

Present Conditions

In past years, this species was found in very young pine regeneration areas, but with the end of clearcutting in the early 1990s, most records (involving the distinctive song) come from older pine stands maintained in an open condition with prescribed burning.

There are 110 acres of early seral stage habitat (0-10 years old stands) in *PARKS* that could be considered suitable habitat for this species. Older pine stands maintained in an open condition with prescribed burning do exist within Parks adding some additional habitat for this species.

Environmental Effects

PROPOSED ACTION

Additional habitat is expected to result from timber harvest and WSI followed by burning. Bachman's Sparrow is most likely to occur in recent seed tree cuts and pine stands that have brushy or grassy understories and limited midstories beneath a sparse canopy (< 70 BA). There are no identifiable threats or limiting factors expected as a result of implementation of the Proposed Action. *Parks* should provide additional habitat for this species when desired conditions are obtained.

The Proposed Action (logging, control of NNIS, silvicultural treatments, RCW treatments/activities, WSI and then maintaining with fire) would create much more suitable habitat for this species. **Direct** effects could be destroying a nest but that is unlikely because the habitat where logging will occur is too thick for this species to consider optimal habitat. **Indirectly and cumulatively**, this PA would increase the amount of suitable habitat for this sensitive species.

ALTERNATIVE II (same as Proposed Action without the use of herbicides)

The environmental effects of this alternative are the same as the Proposed Action.

NO ACTION (Deferred management activities)

The No Action alternative would have **"no direct impacts"** upon this bird. **Indirectly**, this entire project area will not be suitable habitat for this species. Suitable habitat could result from unplanned natural events like wildfires and insect outbreaks.

5. DIANA FRITILLARY

Present Conditions

This species has been observed in various areas throughout the district. Most of the older scattered records involved sunny openings associated with roadsides. Surveys on the Poteau RD indicate this species to be common in Management Area 22 where timber thinning, WSI, and repeated prescribed burning has produced approximately 40,000 acres of open, park-like forest.

Environmental Effects

PROPOSED ACTION & ALTERNATIVE II (same as PA without the use of herbicides)

The Proposed Action and Alternative II are not likely to have a direct effect on this species as there is little suitable habitat currently present in this project area. These two "action" alternatives would indirectly create suitable habitat for this butterfly in the future.

It is extremely unlikely that the Proposed Action or Alternative II would have any **direct** impacts on adult butterflies since they are highly mobile. However, there is the possibility of harming eggs and larvae if the Proposed Action or Alternative II occurs during the reproductive season. **Indirect** impacts would be positive. Logging, WSI, control of NNIS, and prescribed burning would improve habitat for Diana fritillary by stimulating new herbaceous plant growth that would most likely contain desired nectar producing species and violets for egg deposition. No significant cumulative impacts are anticipated on the Diana fritillary with the proposed Project. The Proposed Project "**may impact individuals but is not likely to cause a trend to Federal listing or a loss of viability**" in the short term and in the long term would have "beneficial impacts" upon this species.

NO ACTION (Deferred management activities)

The No Action alternative would have "**no direct impacts**" upon this butterfly but also would not **indirectly** create habitat for the species.

6. Eastern Small-footed Bat

Present Conditions

In Arkansas the Eastern small-footed bat is known in small numbers from only a few caves in the Ozarks and has been documented on Mt. Magazine in Logan County. Preliminary results from acoustic surveys preformed on the Ouachita National Forest in August and September of 2009 indicated that this species is present in low numbers in Scott and Montgomery Counties. Prior to this survey this species was not known from the caveless region of western Arkansas.

Environmental Effects

PROPOSED ACTION & ALTERNATIVE II (same as PA without the use of herbicides)

Eastern small-footed bats are highly mobile during the active season and it is unlikely that one would be **directly** harmed during The Proposed Action or Alternative II (logging, control of NNIS, pond construction/reconstruction, silvicultural treatments, RCW treatments/activities, WSI and then maintaining with fire). Habitat suitable for hibernation for this species is extremely poor in the *Parks* project area. If any habitat does exist in *Parks* it is most likely located within a SMZ and protected from any direct impacts from the Proposed Action. **Indirectly** and **cumulatively**, this Proposed Action and Alternative II would increase the prey base and improve the foraging habitat for this species.

The Proposed Action and Alternative II will have **"no impacts"** for this species.

NO ACTION (Deferred management activities)

The No Action alternative would have no "**direct impacts**" upon this bat but also would not **indirectly** create habitat for the species.

7. – 11. SENSITIVE AQUATIC ANIMAL SPECIES

7	*Notropis ortenburgeri*	Kiamichi shiner	Fish
8	*Lampsilis hydiana*	Louisiana fatmucket	Mollusk
9	*Obovaria jacksoniana*	Southern hickorynut	Mollusk
10	*Pleurobema rubrum*	Pyramid pigtoe	Mollusk
11	*Villosa arkansasensis*	Ouachita creekshell	Mollusk

Present Conditions

None of the five sensitive aquatic species listed above have been documented from stream sites in the EMU (*per. conversation with A. Clingenpeel*). The small streams within this EMU flow into the Fourche La Favre River after crossing privately own lands. As the River does have occurrences of several of these species and the potential to have all 5 of these species, they will be further evaluated.

Environmental Effects

PROPOSED ACTION & ALTERNATIVE II (same as PA without the use of herbicides)

Vegetation management: All activities connected with timber management and WSI occur in upland pine stands, which have been designated as lands suitable for timber production. There are specific restrictions on use of heavy equipment within SMZs that protect stream quality. Restrictions on herbicide use within the Forest Plan would protect stream quality and therefore limit impacts on aquatic species. Vegetation management would not directly, indirectly, or cumulatively affect these sensitive aquatic species.

Control of non-native invasive species (NNIS): The use of herbicides to control NNIS will have no **direct** effect on the five sensitive aquatic species because herbicides will only be used as per Revised Forest Plan directions and will not be used within streamside zones. **Indirect** and **cumulative** impacts of controlling or eliminating NNIS would be positive, due to the restoration of native plants species.

Wildlife Activities: Pond construction and reconstruction, temporary wildlife openings, RCW treatments/activities, and nest structures all occur in upland pine stands and would not **directly, indirectly,** or **cumulatively** impact these sensitive aquatic species.

Prescribed burning: Low intensity burning should have little or no impact on water quality (Bidwell, et al., no date: 2877-10). Therefore, limitations of forest management activities within SMZs included in the Forest Plan would protect these aquatic sensitive species from undesirable impacts.

Road construction, reconstruction and maintenance: Properly constructed and maintained roads reduce problems of runoff detrimental to streams. Road work in Parks would have no **direct** impacts on these species due to protective measures for streams within the Forest Plan.

Special Use Permits: There would be no **direct, indirect**, or **cumulative** impact on these sensitive species by issuing special use permits in Parks EMU.

Determination of Effects: The proposed project will have **"no impacts"** on these five sensitive aquatic species because of the general protective measures for SMZs within the Forest Plan.

NO ACTION (Deferred management activities)

The No Action alternative would have "**no impacts**" upon these aquatic species.

12. - 14. SENSITIVE RIPARIAN AREA PLANT

12	*Amorpha ouachitensis*	Ouachita false indigo
13	*Vernonia lettermannii*	Narrowleaf ironweed
14	*Vitis rupestris*	Sand grape

Present Conditions

These three sensitive riparian plant species are endemic species to the Ouachita Mountains and is locally abundant. Threats to these species would be similar to those for fish and mollusks. These species are protected through the implementation of Revised Forest Plan Standards for protection of streamside zones.

Environmental Effects

PROPOSED ACTION & ALTERNATIVE II (same as PA without the use of herbicides)

Vegetation management: All activities connected with timber management and WSI occur in upland pine stands, which have been designated as lands suitable for timber production. There are specific restrictions on use of heavy equipment within SMZs that protect stream quality. Restrictions on herbicide use within the Forest Plan would protect SMZs and therefore limit impacts on these plant species. These treatments will occur on a very limited number of acres and will have no significant effect on the viability of these species. Vegetation management would not **indirectly** or **cumulatively** impact these sensitive riparian area plant species.

Control of non-native invasive species (NNIS): The use of herbicides to control NNIS will have no **direct** effect on the three sensitive riparian plant species because herbicides will only be used as per Revised Forest Plan directions and will not be used within streamside zones. **Indirect** and **cumulative** effects of controlling or eliminating NNIS would be positive, due to the restoration of native plants species.

Wildlife Activities: Pond construction and reconstruction, temporary wildlife openings, RCW treatments/activities, and nest structures all occur in upland pine stands and would not **directly, indirectly,** or **cumulatively** affect on these three sensitive riparian plant species.

Prescribed burning: Low intensity prescribed burns often go out in SMZs and should have little or no impact on these three sensitive riparian plant species.

Road construction, reconstruction and maintenance: Road construction will not occur across SMZs at sensitive plant locations. Properly constructed and maintained roads reduce problems of runoff detrimental to streams

and streamside zones. Road work in this EMU would have no **direct, indirect, or cumulative** impacts on these species due to protective measures for streams within the Forest Plan.

Special Use Permits: There would be no **direct, indirect**, or **cumulative** impact on these sensitive species by issuing special use permits in Parks EMU.

Determination of Effects: Therefore, limitations of forest management activities within SMZs included in the Forest Plan would protect these three sensitive riparian area plant species from undesirable impacts. The Proposed Project "**may impact individuals but is not likely to cause a trend to Federal listing or a loss of viability.**"

NO ACTION (Deferred management activities)

The No Action alternative would have **"no impacts"** on these plant species.

15. SENSITIVE PLANT: WATERFALL'S SEDGE

Present Conditions

Waterfall's sedge is an endemic species to the Ouachita Mountains and is locally abundant. It is found in a variety of habitats such as shaley roadsides, dry shale woodlands, riparian areas, mesic oak hickory forest, pine and pine hardwood forest, and mazarn shale, and novaculite glades. This species receives some natural protection from human disturbance by the diversity of its preferred habitats, as described above. Many of the known locations for this species on the Ouachita National Forest are on sites located within areas that have undergone timber management activities and in areas that have been burned.

Environmental Effects

PROPOSED ACTION & ALTERNATIVE II (same as PA without the use of herbicides)

The ground disturbance, herbicide use, and prescribed fire of the proposed project **"may impact individuals but not likely to cause a trend to Federal listing or a loss of viability."**

NO ACTION (Deferred management activities)

The No Action alternative would have **"no impacts"** on this plant species.

16. OZARK CHINQUAPIN

Present Conditions

Ozark Chinquapin is listed as sensitive because throughout its natural range it is threatened with destruction by chestnut blight. Despite its status, it is of widespread occurrence throughout the Interior Highlands. It is found in both early successional and old growth vegetation types. It occurs in dry deciduous and mixed hardwood pine communities on rocky dry slopes and ridge tops. It occurs largely as stump sprouts and it reaches its fastest growth rate where abundant sunlight reaches the forest floor.

Environmental Effects

PROPOSED ACTION & ALTERNATIVE II (same as PA without the use of herbicides)

Vegetation management: Individual sprout clumps may be directly impact through uprooting, or by burying plants under displaced soils in areas mechanically disturbed. Sprouts could also be cut down with chainsaws during WSI, TSI, and pre-commercial thinnings but these treatments should have no significant effect on the viability of the species. No indirect or cumulative impacts are anticipated on the Ozark chinquapin with the proposed Project.

Control of non-native invasive species (NNIS): The use of herbicides to control NNIS will have no **direct** effect on this sensitive plant because herbicides will only be used as per Revised Forest Plan directions. Site-specific surveys for PETS plant species will be conducted prior to the treatment of NNIS to identify, delineate, and protect any PETS plant species present at treatment sites. **Indirect** impacts of controlling or eliminating NNIS would be positive, due to the restoration of native plant species. No **cumulative** impacts are anticipated for Ozark chinquapin.

The Proposed project **"may impact individuals but not likely to cause a trend to Federal listing or a loss of viability."**

NO ACTION (Deferred management activities)

The No Action alternative would have **"no impacts"** on this plant species.

(TABLE 3.9) PETS Species Determinations

Species evaluated in this BE	Scientific Name	Common name	Determination
1	*Picoides borealis* **Endangered**	Red-cockaded woodpecker	**Not Likely to Adversely Affect**
2	*Nicrophorus americanus* **Endangered**	American burying beetle	**May Adversely Affect but not cause jeopardy to the species**
3	*Ptilimnium nodosum* ***Endangered***	Harperella	*Not likely to adversely affect*
4	*Aimophila aestivalis*	Bachman's Sparrow	May impact individuals but is not likely to cause a trend to Federal listing or a loss of viability
5	*Speyeria diana*	Diana fritillary	May impact individuals but is not likely to cause a trend to Federal listing or a loss of viability
6	*Myotisleibii*	Eastern Small-footed Bat	No Impacts
AQUATIC ANIMAL SPECIES 7. - 11.	*Notropis ortenburgeri, Lampsilis hydiana, Obovaria jacksoniana, Pleurobema rubrum, & Villosa arkansasensis*	Kiamichi shiner, Louisiana fatmucket, Southern hickorynut, Pyramid pigtoe, & Ouachita creekshell	No Impacts
RIPARIAN PLANTS 12. – 14.	*Amorpha ouachitensis, Vernonia lettermannii, & Vitis rupestris*	Ouachita false indigo, Narrowleaf ironweed, & Sand grape	May impact individuals but is not likely to cause a trend to Federal listing or a loss of viability
15	*Carex latebracteata*	Waterfall's sedge	May impact individuals but is not likely to cause a trend to Federal listing or a loss of viability
16	*Castanea pumila ozarkensis*	Ozark chinquapin	May impact individuals but is not likely to cause a trend to Federal listing or a loss of viability

Insects and Disease

Present Conditions

Hypoxylon canker is a disease (fungus) that has become established in the red oaks throughout the Ouachita National Forest. It is in the Parks ecosystem management unit as a result of stressed conditions brought on by several years of summer drought (2001-2005 and 2010) and overstocked conditions. The ice storms of 2000 and 2007 (in the higher elevations) added to this stress by causing physical damage to the majority of trees of all species district-wide. The fungus infects stressed trees through wounds and either produces a canker or quickly kills the tree by colonizing the sapwood.

Fruiting structures develop on the cankers and spores are discharged at a rapid rate into the air and spread to new hosts through wounds. Hypoxylon cankers are generally secondary to other stressing conditions, in this case drought, ice storm damage, and age. This disease is always present in the forest but in normal conditions the individual trees, if healthy, are able to resist and overcome any infection. After the hypoxylon canker became established, secondary pests come in including red oak borers and two-lined chestnut borers. Under normal conditions most healthy red oaks would be able to withstand or overcome an infestation of these insects, but the same stress factors that caused the red oaks to become infested with hypoxylon canker also becomes susceptible to these insects. At this time most of the red oaks that have died or are infected with hypoxylon canker are scattered along the ridge tops in small pockets throughout Parks. These affected areas are also stocked with various mature white oaks, hickories, and shortleaf pines, which are surviving and still occupying the sites.

Southern pine beetles are also present in small numbers in some individual shortleaf pine trees that are stressed or injured. In normal years most shortleaf pine would be able to withstand or overcome an infestation of this insect if healthy and growing conditions are favorable. In 1995, due to several years of warmer than normal winters, the populations grew to epidemic proportions and infested not only weaker trees (due to overstocked conditions and drought) but also healthy trees.

Aerial detection flights located several infestations in nearby North Waldron Ridge watershed which has similar timber type, stocking rates, and age conditions. These were active spots that quickly grew until management and salvage operations were able to catch up and keep them in check. One spot was approximately 2 acres when found or when controlled. Other SPB spots were 0.25 acre or less and inactive when found and were monitored. In 2004 Ips beetle populations increased due to several years with mild winters. Throughout the Parks project area, several shortleaf pine trees were infested and killed.

Ips beetles are increasing in numbers and killing large numbers of shortleaf pine trees in southern Arkansas and advancing toward the Ouachita at this time according to Southern Region Research Station entomologist latest reports. Ips are also capable of killing large numbers of shortleaf pine timber on the Ouachita once their numbers become established within an area where the trees have been stressed and have not been thinned.

Environmental Effects

The geographic boundary for the effects on vegetation would be both compartments within the Parks Ecosystem Management Unit boundary (compartments 328 and 329). Timelines for measuring the effects on vegetation would be from 2010 to 2020-2025 or from entry period to entry period. Methods of analysis include reviewing the past history of the project area, interpreting the field data collected throughout the project area to establish existing and desired conditions. The proposed actions developed to meet the desired conditions are analyzed to determine what the direct effect of these actions would be and what the cumulative effects would be to the vegetation in the overstory, midstory, and understories.

PROPOSED ACTION

Similar to the Proposed Action section in Vegetation of this chapter, the large amount of acres of mature pine and hardwood timber types make Parks susceptible to insect and disease infestations. The proposed actions would immediately create conditions allowing all forest types to remain healthy and more resistant to insect or disease infestations by reducing competition for limited water and nutrients.

CUMULATIVE EFFECTS

The proposed commercial thinning, timber stand improvements, and to some extent wildlife stand improvements would improve the health of the affected stands by enabling the stands to withstand and overcome insect or disease infestations and respond to the silvicultural treatments with increased vigor until the next entry period 10 to 15 years down the road.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

A **direct** result of letting these infestations run their course could be large areas of dead or dying overstory and midstory and infesting adjacent watersheds over a several year period until natural events or predators stopped them or they ran out of a suitable host or food source in Parks. **Indirect** results would be vigorous response of growth from the understory and possible change in forest types. Large fuel loads would increase the chance of a hot, crown killing wildfire that could threaten the remaining surviving mature trees in Parks and in adjacent watersheds. If the hypoxylon canker becomes established here the way it has in other parts of the district, there would be an absence or reduction of red oak acorn production for a 20 to 25 year period in the most severely affected areas. The 20 to 25 years is the average age for red oaks to begin producing acorns. In this absence other invader species or non-native species could eventually occupy the site. Cedar and red maple would most likely be the first ones to become established.

CUMULATIVE EFFECTS

If disease or insect infestations are allowed to run their course a **cumulative effect** could be large openings created where native pine or hardwoods once occupied the site. The openings would be established with vegetative species such as forbs, grasses, and other shade intolerant species responding with rapid growth eventually changing the native forest type. Another **cumulative effect** could be loss of site productivity due to soil loss from erosion or impact on water quality due to sediment deposits in the Poteau River if a hot wildfire removes the duff layer and is followed by a heavy rain.

NO HERBICIDE ALTERNATIVE II

These effects mimic those of the Proposed Action without the effects of herbicide use.

Local or County Economy

Present Conditions

The economic base of Scott County is timber with 82% of the land area in timber, 62% of which is National Forest land (Department of Workforce Services, 2007). The local timber industry depends on National Forest land for a source of raw material. Private earnings in Scott County from forestry, logging, fishing, hunting, and trapping totaled $3,579,000 in 2005 (U.S. Department of Commerce, 2007). Many local residents depend on firewood from timber and wildlife activities on the district such as regeneration harvest, site preparation, and wildlife midstory reduction. Approximately 369,618 acres of Scott County is National Forest System lands. The local or county economy has benefited from timber harvesting and gas activities on the Cold Springs Ranger District, which have supplied raw material to the local timber industry.

On October 3, 2008 the Secure Rural Schools and Community Self-Determination Act of 2000 (SRS Act) was amended and reauthorized in P.L. 110-343. This law ensures that for four years (2008 –2011), counties across the country can continue to count on stable and transition payments that provide funding for schools and roads, make additional investments in projects that enhance forest ecosystems, and improve cooperative relationships. With notable exceptions, the SRS Act, as amended, is similar to the original program. The structure and significant elements of Title I were amended but Titles II and III remained intact with few changes (see http://www.fs.fed.us/srs/).

The SRS Act gives counties the option between two payment methods: (1) a newly modified 25 percent seven year rolling average payment of receipts from national forest lands or (2) a share of the State payment as calculated under the new SRS Act. The new formula uses multiple factors, including acres of federal land within an eligible county, average of the three highest 25-percent payment, and an income adjustment based on the per capita personal income for each county. Counties electing to receive a share of the SRS State payment are bound to this decision through 2011. Those choosing the 25 percent payment are bound to it for two years. The full funding amount for each of the fiscal year payments is $500 million for FY 2008 and then 90% of the preceding year's full funding amount for FY 2009 through FY 2011.

Environmental Effects

The geographic boundary for the effects on the local or county economy is Scott County. The timeframe used for measuring these effects is the duration of implementation of the activities included in the project financial efficiency analysis. Quick-Silver (version 5.004.45 (2/15/2000)) was used to determine the financial efficiency of each Alternative. This program is a project analysis tool that utilizes a MS Access database for use by forest managers to determine the economic performance of long-term investments.

PROPOSED ACTION

Directly, harvesting sawtimber and roundwood would support the local timber industry's need for raw material and the local residents need for firewood. The treatments proposed would also provide employment for forest industry workers. The Proposed Action has a revenue cost ratio of 1.10, which means that it does pay for itself from timber receipts. **Indirectly**, timber harvesting would improve wildlife habitat. Also, the money that local forest industry workers earned would be circulated within the local business communities.

CUMULATIVE EFFECTS

Cumulatively, Parks would move toward its desired future condition while providing raw material to the timber industry, firewood to local residents, and improved hunting. The unemployment rate would be stabilized in the

forest industry; local businesses would provide demanded services; and the national forest would remain healthy.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

Directly, this alternative would not provide raw material to the timber industry, no firewood to the local community, or improve hunting in Parks. **Indirectly**, Forest industry workers would have to travel further distances for employment. Businesses would suffer the loss of local forest industry workers not having money to circulate.

CUMULATIVE EFFECTS

Cumulatively, Parks would not move toward its desired future condition to improve and maintain the health of the forest stands of timber or provide suitable habitats for wildlife. Also by products of these activities such as timber would not be available. Unemployment rate could increase due to local forest workers not being able to find local jobs. Local businesses could close due to less money in local economy.

NO HERBICIDE ALTERNATIVE II (same as Proposed Action without the use of herbicides)

Direct, indirect, and **cumulative effects** from herbicide use will be non-existent for this alternative. All other effects are estimated to be the same as those in the Proposed Action since proposed treatments are the same, minus the effects of herbicide application.

Project Financial Efficiency Analysis

The Proposed Action and No Herbicide Alternative would both have costs and revenues associated with the sale of timber. Costs include activities that are directly associated with timber management (site preparation, timber sale administration, road maintenance, etc.). Revenues are generated from the sale of timber. The Quick-Silver evaluation of the financial efficiency of each alternative is displayed in Table 3.11 below. The detailed costs, revenues, and the complete Quick-Silver analysis report are in the Project file.

(TABLE 3.10) Comparison by Financial Efficiency

Cost/Income Activities	No Action Alternative $	Proposed Action $	No Herbicide Action $
Present Value of Revenues[1]	NA	1,075,900.94	1,075,900.94
Present Value of Costs[2]	NA	-808,120.21	-808,120.21
Present Net Value[3]	NA	267,780.73	267,780.73
Revenue/Cost Ratio[4]	NA	1.33	1.33

1- Present Value of Revenues – The sum of all revenues discounted at some interest rate.
2- Present Value of Costs – The sum of all costs discounted at some interest rate.
3- Net Present Value – The sum of the present value of the revenues minus the sum of the present value of the costs.
4- Revenue/Cost Ratio – Present value of revenues divided by the present value of costs.

The Present Net Value and Revenue/Cost Ratio are the same for both action alternatives. The first priority even with the Proposed Action is to use prescribed fire and hand tool treatments. Past history shows this to be successful and explains why there is no difference in cost calculations when compared to the No Herbicide Action alternative.

Public Health and Safety

Present Conditions

Refer to the present conditions described in the Air Quality section and the Water Resources & Quality section of this Chapter.

METHODS OF ANALYSIS

Site-specific risk assessments developed by Syracuse Environmental Research Associates (SERA) have been conducted for this analysis area as required by the Revised Forest Plan and are located in the project file (Revised Forest Plan, Part 3, pg 87, HU002). The SERA Human Health and Ecological Risk Assessments worksheets are a series of excel spreadsheets designed to analyze the risks associated with use of specific herbicides. These worksheets allow for the generation of project specific analysis of potential herbicide use.

Refer to the Air Quality methods of analysis in this Chapter.

Environmental Effects

Only one or the other of the two herbicides will be used, if any herbicide is used. The herbicides under consideration, glyphosate and triclopyr, are available commercially in products called Round-up, Accord, and Garlon. Herbicides proposed for use would be mixed and applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human and wildlife health. Application rate and work time must not exceed levels that pose an unacceptable level of risk to human or wildlife health. Herbicides are proposed as a last resort for release in the Proposed Action.

Glyphosate is a biodegradable herbicide classed as practically non-toxic, with an oral LD50 of >5000 mg/kg (a single lethal dose that kills 50 percent of a test population). Using toxicological data, the EPA has established the human acceptable daily intake (ADI) value for glyphosate at 0.10 mg/kg body weight/day. This ADI value translates into a maximum permissible intake (MPI) value of 6 mg glyphosate/day for the entire human life span.

Triclopyr is a broad-spectrum herbicide that is also biodegradable and practically non-toxic. In forestry, it is labeled for site preparation and release. Methods of application include cut-surface treatments, foliar spray, and basal bark spray. Triclopyr is primarily absorbed by plant leaves and is readily moved throughout the plant. It affects plants by interfering with normal growth processes. In soil, triclopyr is not highly mobile. It is rapidly broken down by soil microorganisms and ultraviolet light. It is present an average of 30-56 days depending on soils and weather. Its half-life in water is about 10 hours at 72°F.

The Revised Forest Plan allows for herbicide use at the lowest effective rate. The watershed analysis calls for the potential use of 1.3 pounds/acre of Glyphosate to be used for cut-surface treatments and 1 pound/acre for foliar spray treatments. In the SERA Final Report for the Risk Assessment on Glyphosate they used a typical application rate of 2 pounds/acre and found the following:

*"Based on the typical application rate of 2 lbs a.e./acre, none of the hazard quotients for acute or chronic scenarios reach a level of concern even at the upper ranges of exposure. This is consistent with the risk characterization given by U.S. EPA/OPP (1993c. p.53): B****ased on the current data, it has been determined that effects to birds, mammals, fish and invertebrates are minimal".***

Given this, no further analysis of Glyphosate was done using the SERA worksheets.

Triclopyr-acid would be applied at a rate of up to 4 lbs/acre for cut-surface treatments and triclopyr-bee at a rate of up to 2 lbs/acre for foliar spray.

The project-specific SERA worksheets completed for this herbicide indicated an increased hazard under certain scenarios in the use of glyphosate. The risk characterization of a worker applying herbicides using a "directed ground spray (backpack)" shows an increased risk for both the typical and upper level applications. This risk can be mitigated however, by requiring the worker to wear the proper attire and safety equipment; have properly functioning equipment; apply the herbicide at the proper rate; work in an organized fashion so as to not re-enter treated areas; by not exceeding the "typical" length of workday (7 hours) and other measures.

The risk characterization for the general public on the SERA worksheets shows several scenarios with an increased risk of acute/accidental and chronic exposures. Public safety in and around areas of herbicide use is a high priority concern. Measures are taken to help ensure that the general public does not come in contact with herbicides. These include posting warning signs on areas that have been treated; selectively targeting for application only that vegetation that needs to be controlled rather than using a broadcast application; establishing buffer zones of non-treatment around private property, streams, roads and hiking trails; carefully transporting only enough herbicide for one days use; mixing it on site away from private land, open water or other sensitive areas; properly maintaining and operating equipment (e.g. no leaks); and having good accident preplanning and emergency spill plans in place. These measures along with others are incorporated into contracts and through good enforcement and administration will be effective in reducing the risk of accidental contamination of humans or the environment.

Herbicides and application methods were chosen to minimize risk to human and wildlife health and the environment (Revised Forest Plan, Part 3, pg 87, HU004). The Revised Forest Plan includes standards for applying herbicides to reduce the possibility of adverse effects. These standards are required at all phases of the project including being incorporated as clauses in contracts (Revised Forest Plan, Part 3, pp 77, 80, 87-89, and 106). In conclusion, application of herbicide at the stated rates would pose only an acceptably low risk to the workers and public in the environment.

Indirect risks to the public from the use of hand tools would include the risk of falling on a remaining stump-stub. This risk would be minimized by maintaining attention to one's path of foot traffic. Although hand tools pose a risk to forest workers for injury and accidents, the required proper personal protective equipment would lessen the likelihood of injuries.

Refer to the Air Quality section of this Chapter for disclosure of effects on public health and safety from prescribed burning.

Refer to the Water Quality section of this Chapter for additional disclosure of effects on public health and safety from herbicide application.

CUMULATIVE EFFECTS

Refer to the Air Quality section and Water Quality section of this Chapter for cumulative effects on public health and safety from prescribed burning. There are no other known or expected activities within the geographic bounds and timelines that would contribute to a cumulative effect on public health and safety.

ALTERNATIVE II (same as Proposed Action without the use of herbicides)

The direct, indirect, and cumulative effects of Alternative II would be the same as those disclosed above for the Proposed Action with the exception of herbicide use. Since no herbicides would be utilized under this

alternative, there would be no direct, indirect, or cumulative effects on public health and safety resulting from herbicide use.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

No **direct effects** on public health and safety would occur. No Action could have a negative **indirect** effect to public health and safety in the event that wildfires occur and create excessive smoke, or smoke that fails to disperse.

CUMULATIVE EFFECTS

There are no other known or expected activities within the geographic bounds and timelines that would contribute to a cumulative effect on public health and safety.

Recreation Resources

Present Conditions

Parks Ecological Management Unit (EMU) is designated as being in Management Areas 9 and 22. The majority of the land base is in MA 22, renewal of the Shortleaf Pine-bluestem Grass Ecosystem and RCW Habitat. Management is dictated by recreational and wildlife objectives that provide for a roaded natural experience and a range of wildlife habitats. Parks EMU offers abundant dispersed recreation opportunities. Hunting is the predominant use. Associated with hunting are dispersed camping, hiking, auto driving, and wildlife viewing. Management emphasis is to promote timber-growing potential by applying a full range of practices to Southern yellow pine while providing a range of wildlife habitat diversity, and a spectrum of dispersed recreational opportunities.

Environmental Effects

The geographic boundary for the effects on recreation resources encompass both analysis area and the entire view shed as viewed from the transportation system. Timelines for measuring the effects on the recreation values are the immediate user experience and the values and memories created for a lifetime. The user experiences created or affected by the proposed management activities would be from short term to possibly indefinitely.

PROPOSED ACTION

A **direct effect** of the Proposed Action would be during harvest operations. The evidence of human activity in the area would increase due to the activity associated with logging. This activity may temporarily displace hunters and other dispersed users. Following harvest, logging activity and equipment would leave the area and disruption would cease.

In the future, prescribed burning could temporarily limit the activities that would occur on these areas. Initially, prescribed burning may produce ash, which sometimes disturbs hunting dogs. However, this ash would settle after 2 or 3 rains. The slash produced in logging areas could impede foot travel in the areas for 2 or 3 years until the slash decomposed. The habitat work proposed in this alternative would promote diversity for both game and non-game species, increasing recreational opportunities for hunting and bird watching. **Direct effects** from this alternative would include an increase in hunting and other dispersed recreational use over time as a result of management activities. The Proposed Action proposes both wildlife stand improvements and pond rehabilitation. The direct effect of these actions would be minimal on recreation activities. Herbicide work would temporarily display evidence of increased human activity within Parks EMU due to traffic associated with the herbicide workers. Recreational users would notice negligible impacts on wildlife and vegetation due to the timing of the herbicide application. **Indirectly**, wild game for hunting would be more abundant due to new growth and increased browse as a result of timber management and prescribed burning activities. Hunting and dispersed camping would continue to occur and most likely increase.

CUMULATIVE EFFECTS

Cumulatively, an increase in dispersed recreational use would be expected to occur. Proposed management activities would result in improved access to the general forest, enhanced wildlife habitat, and a more open forest appearance.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

Under this alternative, there would be no additional management activity occurring within the project area. Only routine maintenance would continue. **Indirect effects** include a reduction in the number of dispersed recreation users due to vegetative growth having a negative impact on access and wildlife encounters. **Indirectly**, wild game would not be as abundant due to no timber harvesting or prescribed burning. The result would be a reduction in hunting activity within the project area.

CUMULATIVE EFFECTS

Cumulatively, no timber harvesting or prescribed burning would result in an unhealthy forest becoming susceptible to insects and disease while allowing the understory and midstory to become dense where openings or gaps occur. Dispersed recreational use would eventually decrease because of an overgrown condition and eventually become stagnant.

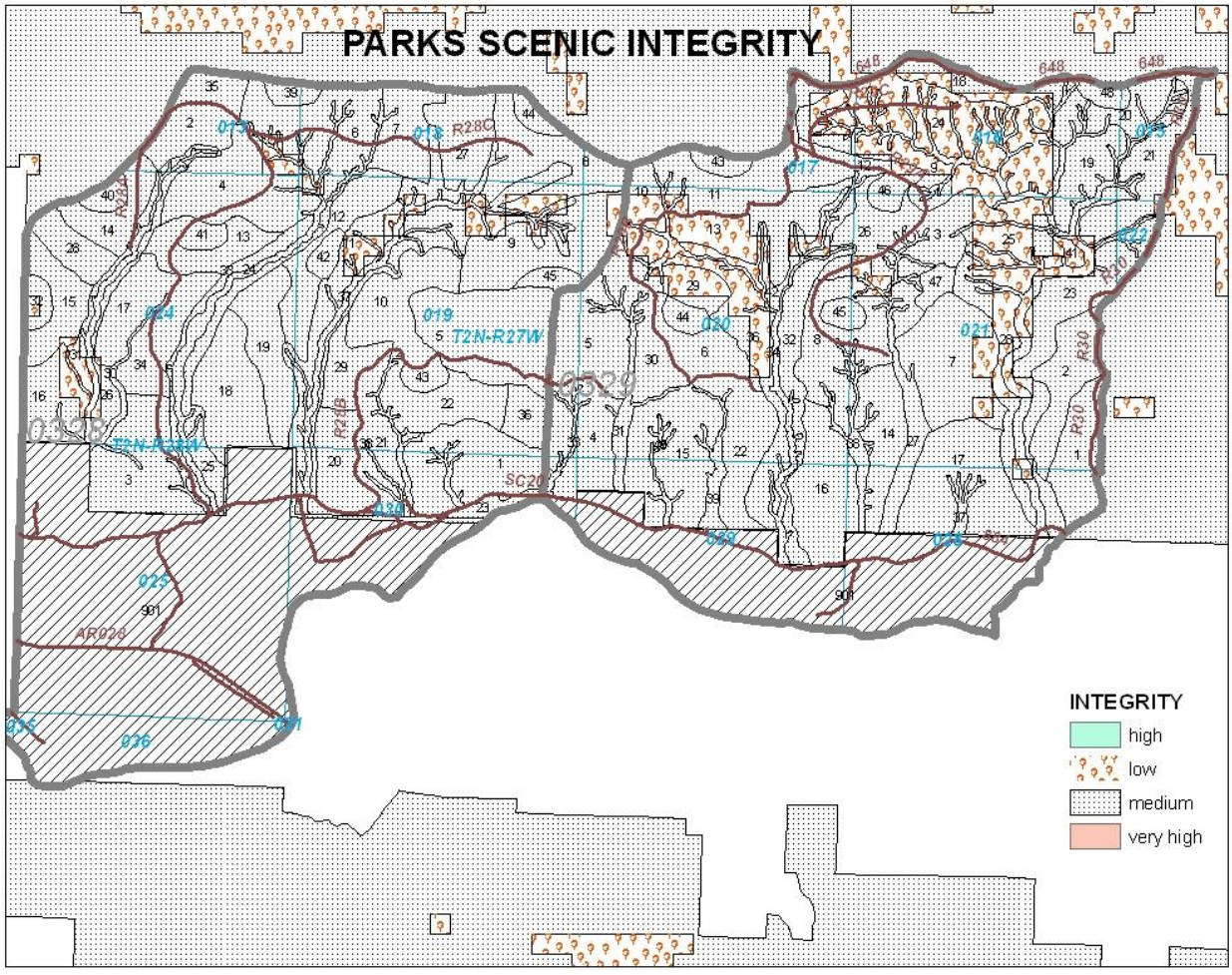
NO HERBICIDE ALTERNATIVE II

Direct, indirect, and **cumulative effects** are estimated to be similar to the effects of the Proposed Action, without the increased human activity associated with a herbicide application.

Visual Resources

Present Conditions

Much of the vegetation in this watershed is blanketed with mature to very mature yellow pine sawtimber with very few natural openings present. The majority of this analysis area consists of Scenic Integrity Objective (SIO) of low to medium. This is due to the remote nature of the area and no unique uses of qualities. Scenic opportunity and seen areas are somewhat limited within the project area. Most of the forest is of a closed-in view shed, meaning that vistas are limited, and trees and understory are normally of such density that the seen area is normally limited to the foreground from interior roads.



The Western Arkansas Valley Mountains Subsection: The project area lies within the Western Arkansas Valley Mountains (Subsection 231Gb; USDA Forest Service 2005b, pp. 24-25, 262). The characteristic features of this subsection consist of low to moderate mountains and ridges interspersed with narrow to wide valleys. Forested slopes covered in shortleaf pine-oak are visible from the valley bottoms. Elevations range from 590 feet to 2,450 feet. Once within the forest, vegetation density prevents most views beyond the immediate foreground with occasional views beyond the foreground along forest roads. Existing forest types are mainly shortleaf pine and oaks. The resulting vegetation form is evergreen needle-leaved forest with pockets of broad-leaved forest. These mixed pine-hardwood forests draw numerous tourists to the region during two

seasons of the year: the spring, when white dogwood blossoms seem to cover the hills, and the fall, when the mountains blaze with color. The existing landscape character for the project area consists of moderate to strongly rolling hills and lower elevation mountains with long ridges interspersed by narrow to wide valleys positioned in an east-west trending direction. Access to the project area is primarily by Forest Service roads. Visibility from nearly all roads is restricted to the foreground. The visitor/viewer within the project area perceives a natural landscape having some evidence of human disturbance. Natural disturbances such as fire, wind, pests, or disease have not contributed significantly to vegetative patterns. Understory species include bushes, vines, briars, grasses, and various hardwoods (oak, hickory, dogwood, gum, maple, etc.). Generally forest roads in the project area follow the natural terrain. Users in this portion of the Forest include sightseers engaging in pleasure driving, dispersed camping, hunting and off highway vehicles (OHV) riding. Existing recreation use in this area is low to moderate and fits most of the experiences described as the Forest's niche: sightseeing, equestrian use, hunting and nature-viewing.

The Forest Service utilizes the Scenery Management System (SMS) to evaluate land management activities in the context of the integration of benefits, values, desires, and preferences regarding aesthetics and scenery. The SMS provides an overall framework for the orderly inventory, analysis, and management of scenery. The system applies to every acre of national forest administered by the Forest Service and to all Forest Service activities. Scenic integrity generally refers to the degree of intactness or wholeness of the landscape character. Human alteration can increase, lower, or maintain the scenic integrity of a landscape. Scenic integrity levels for the Ouachita National Forest include Very High, High, Medium, and Low. During the recent revision process for the Revised Forest Plan, a broad overview of Forest scenery resource was developed by establishing Forest-wide Scenic Integrity Levels using Geographic Information System (GIS) technology (USDA Forest Service 2005B, pp. 260-267). Scenic Integrity Levels establish the objective for management of the scenery resource and is called the Scenic Integrity Objective.

Environmental Effects

The geographic boundary for the effects on the visual resources encompasses both the foreground viewshed and areas outside the analysis area that would be viewed from forest development roads.
Timelines for measuring the effects on the visual resources are immediate, during planned management activities. Any vegetation manipulation techniques would be evident, to varying degrees, for decades. Analysis strategies include, but are not limited to, special techniques, modeling and evaluating all planned vegetation management and soil disturbing proposals.

PROPOSED ACTION

The scenic resource is affected by management activities that alter the appearance of what is visible in the landscape. Short-term scenic effects are usually considered in terms of degree of visual contrast with existing or adjacent conditions that result from management activity. The scenic landscape can be changed over the long-term or cumulatively by the alteration of the visual character. Management activities that result in visual alterations inconsistent with the assigned SIO, even with mitigation, affect scenery. Management activities that have the greatest potential of affecting scenery are road construction, large-scale and long-term vegetation management, insect and disease control, utility rights-of way, and mineral extraction. Other management activities that also can impact the scenic resource at a lesser degree are threatened and endangered (T&E) species habitat management, prescribed burning, fire suppression, land exchange, old growth forest management, recreation, administrative site facility construction, and wildlife management (USDA Forest Service 2005b, pp. 264, 265).

Direct effects to the scenic character of the forest would occur largely in the form of changes in forest vegetation resulting from proposed timber harvest, prescribed burning, site preparation, reforestation treatments (including possible herbicide release), pond rehabilitation, temporary wildlife openings, and wildlife stand

improvement activities (also with possible herbicide application). A **direct effect** would be a loss in vegetative screening. An **indirect effect** of timber harvest activity will be enhanced viewing depth and contrasting tree density. Harvest treatment will also result in a **direct effect** of logging or thinning residue (slash) such as treetops and branches accumulating on the ground. Slash will eventually decay resulting in reduced long-term effect to scenery. Travel-ways within the project area are dominated by a mostly closed view of the forest. Closely spaced trees and dense midstory and/or understory vegetation greatly limit depth of view. Providing some diversity of visibility, with the development of more open forest conditions, was considered by the ID Team to be consistent with Scenic Integrity Objectives.

Prescribed burning will temporarily reduce the amount of understory vegetation, allowing for greater viewing depth into the forest. Burning would create the **direct effect** of a charred appearance on tree trunks and the forest floor. These effects would diminish in three to six months due to re-growth of vegetation on the forest floor, as well as natural leaf and needle shedding. This "green up" would restore a more natural appearance in the landscape.

Proposed stand improvements through release methods (including herbicide release) would result in a short-term direct effect on visual quality as the vegetation becomes brown and dies off. Over time the visual quality would increase as the leaves drop to the forest floor and decompose or are removed during prescribed burning as mentioned above. By implementing the proposed management activities it is expected that there will be an increase in the vigor or health of the forest that will reduce the **direct and indirect** negative effects to visual quality that could result in an alteration of the landscape due to tree damage or mortality caused by insects and disease. Because some of the management treatments target hardwoods, an **indirect effect** could be a loss of spring and fall colors. Changes in color and texture could possibly result from exposed soil in roads and skid trails; however this indirect effect should be expected to be short-term considering expected revegetation from natural conditions and/or restoration measures. With the implementation of controlled (prescribed) burning the potential **direct and indirect** detrimental effects to visual quality resulting from catastrophic fire are diminished. Prescribed burning substantially diminishes the potential for crown fires that could result in dead overstory trees and large burn scars on remaining live trees. Low intensity prescribed fires tends to create short-term color change.

CUMULATIVE EFFECTS

No cumulative effects are expected from implementation of this alternative because there are no other known or expected activities within the geographic bounds and timelines that would affect visual quality. The changes in the landscape would continue to appear natural to the observer.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

By not implementing the proposed activities, this Alternative would not alter scenic quality. Mature and over-mature trees would decay and die creating contrasts in form, line and texture. All changes in this landscape would appear natural to the observer. Scenic integrity may be compromised by not implementing harvest activities in this area. Densely stocked stands result in reduced vigor or health, which cause susceptibility to insects and disease. Infestations could result in tree death, negatively impacting visual quality. In the event of a catastrophic wildfire, crown fires, or those that sweep through the canopy, would create a visible change to the landscape. Snags would appear as black, brown, and gray "skeletons". Other trees would show burn scars. Burn scars on tree trunks or "torched trees" remain visible for a long time. Understory vegetation would quickly green up, however the standing burned vegetation would remain.

CUMULATIVE EFFECTS

No cumulative effects are expected from implementation of this alternative because there are no other known or expected activities within the geographic bounds and timelines that would affect visual quality. The changes in the landscape would continue to appear natural to the observer.

NO HERBICIDE ALTERNATIVE II

Direct, indirect, and cumulative impacts are expected to be similar to those of the Proposed Action without the effects of an herbicide application.

Climate Change

Present Conditions

Forests play a major role in the global carbon cycle by storing carbon in live plant biomass (approximately 50% of dry plant biomass is carbon), in dead plant material, and in soils. Forests contain three-fourths of all plant biomass on earth, and nearly half of all soil carbon. The amount stored represents the balance between absorbing CO2 from the atmosphere in the process of photosynthesis and releasing carbon into the atmosphere through live plant respiration, decomposition of dead organic matter, and burning of biomass (Krankina and Harmon, 2006).

Through the process of photosynthesis, carbon is removed from the atmospheric pool. About half the carbon absorbed through photosynthesis is later released by plants through respiration as they use their own energy to grow. The rest is either stored in the plant, transferred to the soil where it may persist for a very long time in the form of organic matter, or transported through the food chain to support other forms of terrestrial life. When plants die and decompose, or when biomass or its ancient remains in the form of fossil fuels are burned, the original captured and stored carbon is released back to the atmosphere as CO2 and other carbon-based gases. In addition, when forests or other terrestrial ecosystems are disturbed through harvesting, conversion, or natural events such as fires, some of the carbon stored in the soils and organic matter, such as stumps, snags, and slash, is oxidized and released back to the atmospheric pool as CO2. The amount released varies, depending on subsequent land use and probably rarely is more than 50% of the original soil store (Salwasser, 2006). As forests become older, the amount of carbon released through respiration and decay can exceed that taken up in photosynthesis, and the total accumulated carbon levels off. This situation becomes more likely as stands grow overly dense and lose vigor. Wildfires are the greatest cause of carbon release from forests. At the global scale, if more carbon is released than is captured and stored through photosynthesis or oceanic processes, the concentration of carbon dioxide (CO2) builds in the atmospheric pool. However, the greatest changes in forest sequestration and storage over time have been due to changes in land use and land use cover, particularly from forest to agriculture and more recently changes are due to conversions from forest to urban development, dams, highways, and other infrastructure (Malmsheimer et al., 2008).

Environmental Effects

PROPOSED ACTION

The proposed harvest operations would result in a release of carbon and reduce carbon storage in the forest both by removing organic matter (trees) and by increasing heterotrophic soil respiration. However, much of the carbon that is removed is offset by storage in forest products. Forest management that includes harvesting provides increased climate change mitigation benefits over time because wood-decay CO2 emissions from wood products are delayed (Malmsheimer et al., 2008). Prescribed burning activities, although a carbon neutral process, would release CO2, other green house gasses, and particulates into the atmosphere. However, implementing the proposed prescribed burns on a 3 to 5 year cycle would reduce fuel loading and could be expected to reduce fire intensity and severity as well.
Indirectly, implementation of the proposed actions would increase the overall health, vitality, and growth within the project area, reduce the susceptibility to insects and disease, as well as reduce fuel accumulations and lower the risk for a catastrophic wildfire from occurring in the project area. This would serve as a way to increase carbon storage within the project area and mitigate carbon accumulation in the atmosphere.

CUMULATIVE EFFECTS

As GHG emissions and carbon cycling are integrated across the global atmosphere, it is not possible to determine the cumulative impact on global climate from emissions associated with this project or any number of projects. It is not expected that the effects of this project or multiple projects can be specifically attributed the cumulative effects on global climate change.

ALTERNATIVE II (same as Proposed Action without the use of herbicides)

The direct, indirect, and cumulative effects of Alternative II are the same as those disclosed above for the Proposed Action.

NO ACTION ALTERNATIVE I (Deferred Management Activities)

No management activities would occur under this alternative, therefore no direct effects on GHG emissions and carbon cycling would occur.

Because no management activities would take place under this alternative, carbon would continue to be sequestered and stored in forest plants, trees, (biomass) and soil. Unmanaged, older forests can become net carbon sources, especially if probable loss due to wildfires is included (Malmsheimer et al., 2008). In the absence of prescribed fire, fuel loadings would continue to increase and accumulate on the forest floor. In the event of a wildfire, fuel loading would be higher, increasing the risks of catastrophic damage to natural resources. This would result in a large release of GHG and carbon into the atmosphere. By deferring timber harvest activities, the forests would continue to increase in density. Over time this could pose a risk to density dependent mortality, insects, and disease. This could result both in a release of carbon from tree mortality and decomposition as well as hinder the forests ability to sequester carbon from the environment because live, vigorous stands of trees retain a higher capacity to retain carbon.

CUMULATIVE EFFECTS

As GHG emissions and carbon cycling are integrated across the global atmosphere, it is not possible to determine the cumulative impact on global climate from emissions associated with this project or any number of projects. It is not expected that the effects of this project or multiple projects can be specifically attributed the cumulative effects on global climate change.

Chapter 4
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Heritage Resource Technician Raymond McGrath
Fire RL Self
Wildlife Biologist Warren Montague
Wildlife Biologist Jason Garrett*
Silviculturist Keith Hotubbee*
Recreation Assistant John Strom*
Fire Specialist Tim Nutley*
Cartographic Technician Linda Myers
Soil Scientist Jeff Olsen
Soil Scientist Stanley Mason

Chapter 5
Persons and Agencies Contacted &/or Consulted

List of Agencies Consulted

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Osage Nation
Caddo Tribe of Oklahoma
Quapaw Tribe
Chickasaw Nation
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Ricky Chastain, AGFC
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Chickasaw Nation, Cultural Resources Director
Quapaw Tribe, NAGPRA Program Director
Quapaw Tribe, Chairman
Choctaw Nation, Chief
Choctaw Nation, Tribal Historic Preservation Officer
Caddo Tribe, Chairwoman
Caddo Tribe, Historic Preservation Officer
Osage Nation, Principal Chief
Osage Nation, Tribal Historic Preservation Officer
Arkansas Natural Heritage Commission
US Fish and Wildlife Service
The Nature Conservancy
Richard Artley
Clarence Rodrigues, AGFC
Crystal Heaven Mining Co.

Chapter 6
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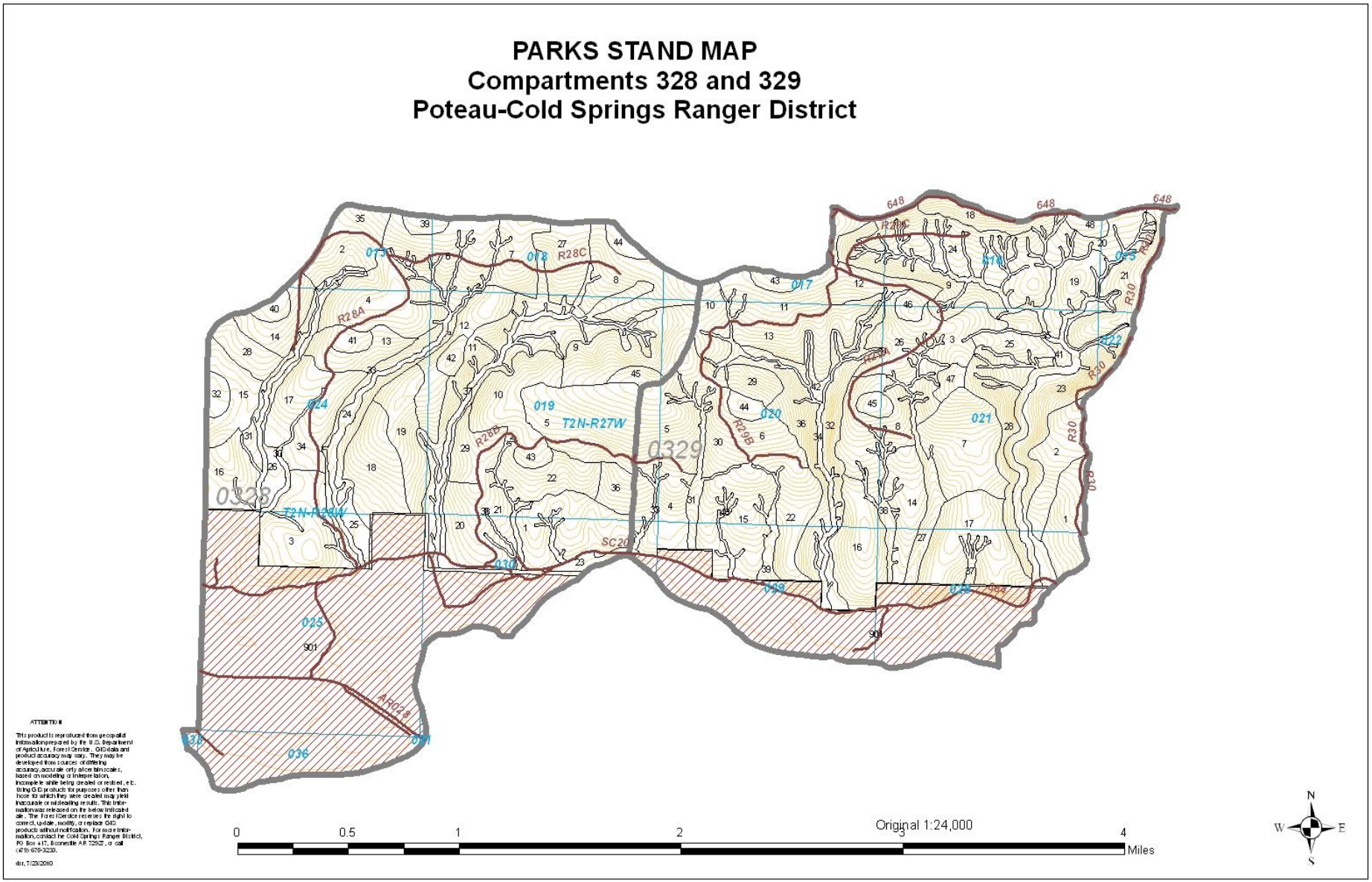
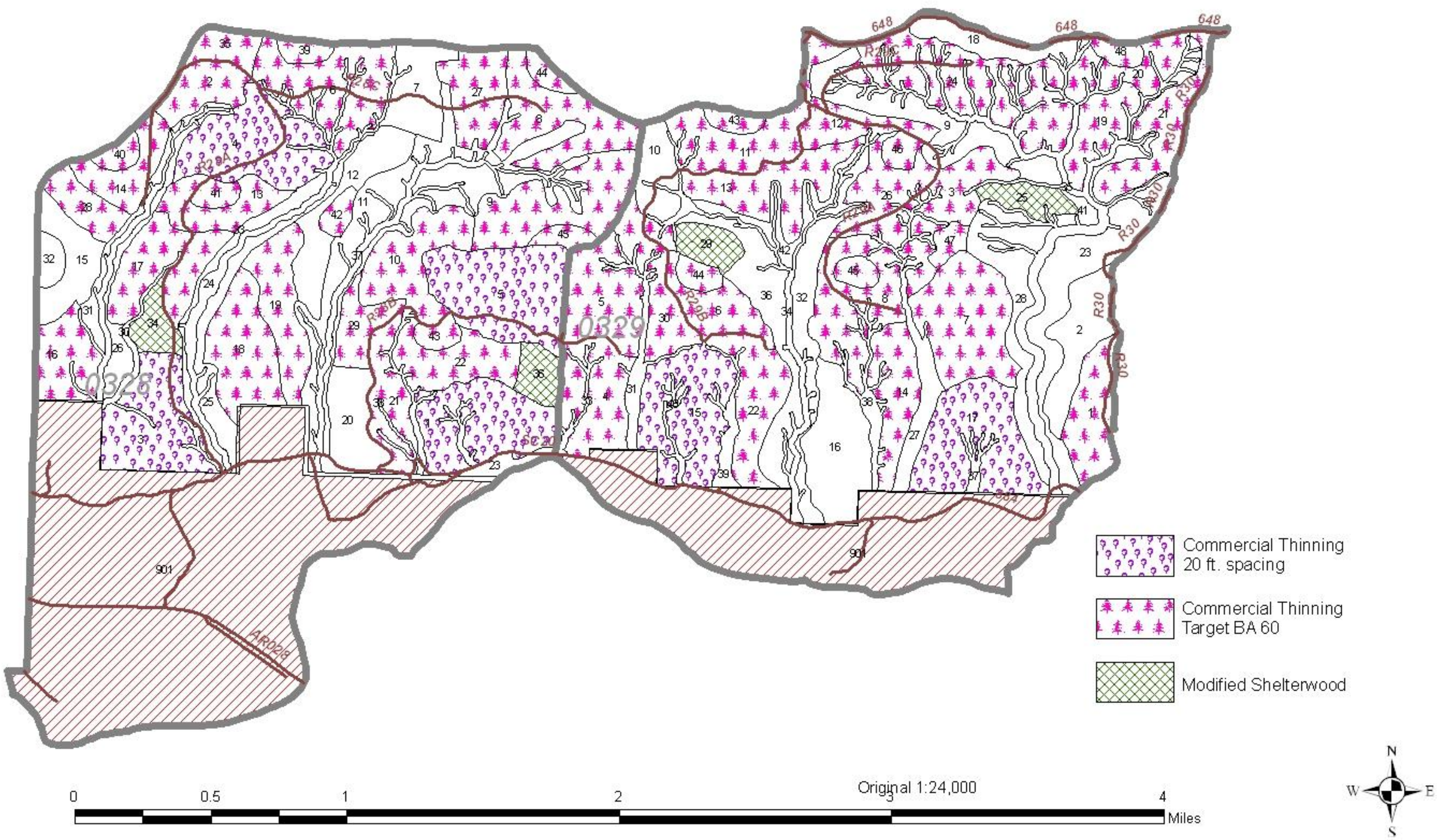

PARKS STAND MAP
Compartments 328 and 329
Poteau-Cold Springs Ranger District
T2N-R28W
T2N-R27W
0328
0329
Original 1:24,000
0
0.5
1
2
3
4
Miles
N
W
E
S

PARKS TIMBER HARVEST MAP
Compartments 328 and 329
Poteau-Cold Springs Ranger District



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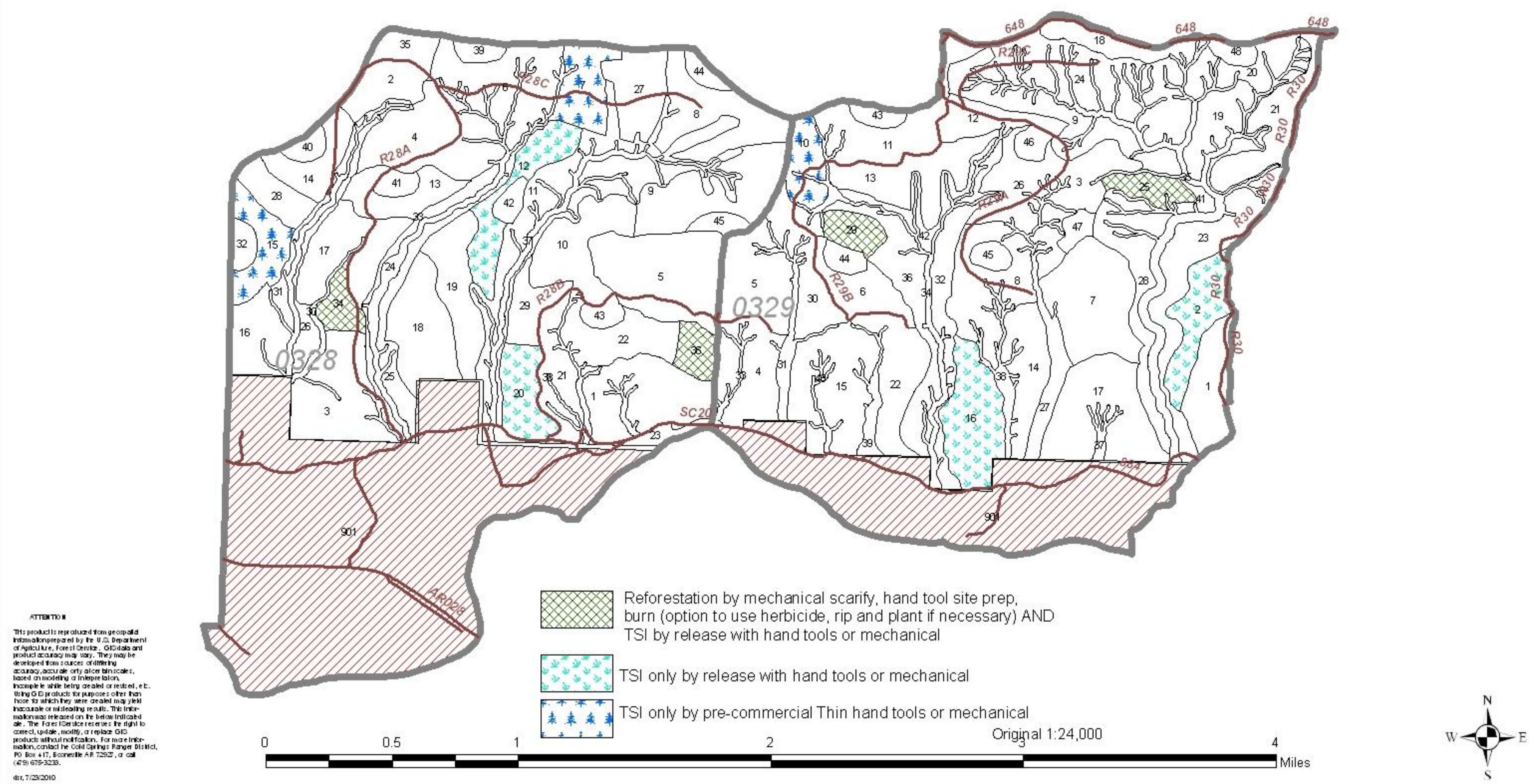
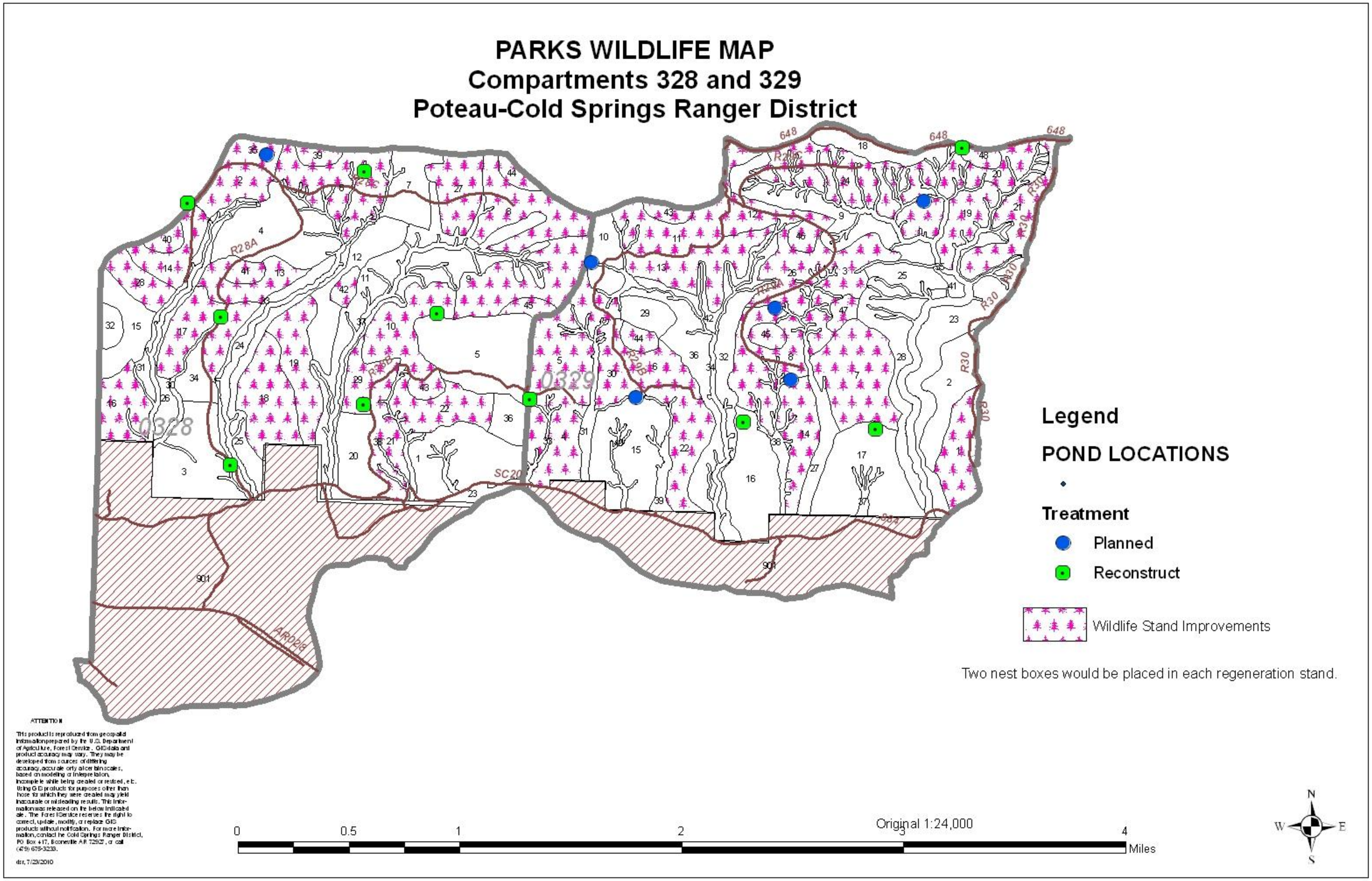
dsr, 7/23/2010

PARKS SILVICULTURE MAP
Compartments 328 and 329
Poteau-Cold Springs Ranger District




PARKS WILDLIFE MAP
Compartments 328 and 329
Poteau-Cold Springs Ranger District
0328
0329
648
R28A
SC20
AR028
R30
901
Legend
POND LOCATIONS
Treatment
Planned
Reconstruct
Wildlife Stand Improvements
Two nest boxes would be placed in each regeneration stand.
ATTENTION
Original 1:24,000
0
0.5
1
2
3
4
Miles
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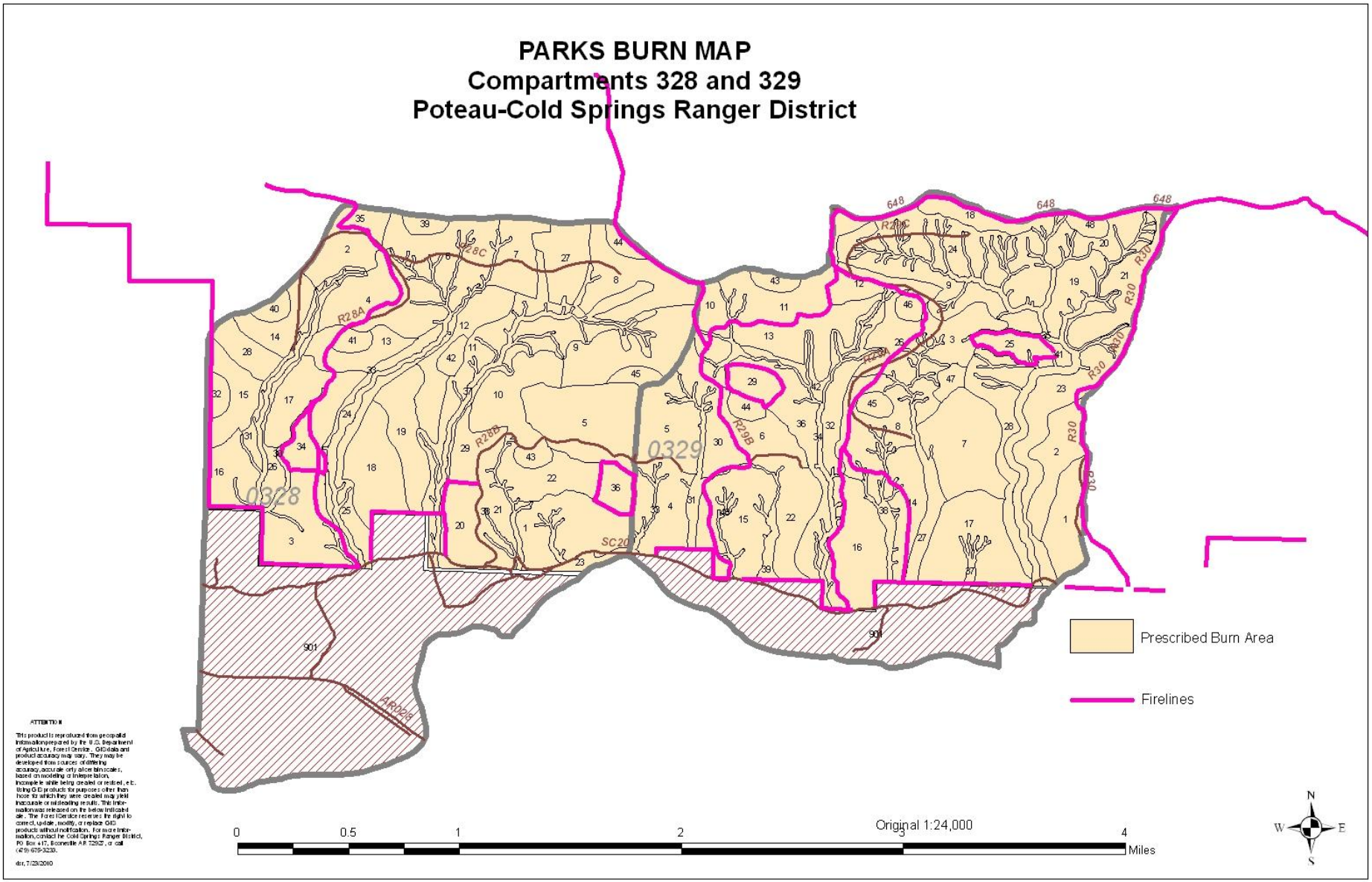
PARKS BURN MAP
Compartments 328 and 329
Poteau-Cold Springs Ranger District
0328
0329
R28A
R28B
R28C
R29B
R30
SC20
AR024
648
901
Prescribed Burn Area
Firelines
Original 1:24,000
0
0.5
1
2
3
4
Miles
N
W
E
S