FIRE MANAGEMENT PLAN

for

BUFFALO NATIONAL RIVER

United States Department of the Interior
National Park Service
Buffalo National River
Harrison, Arkansas

FIRE MANAGEMENT PLAN

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I. INTRODUCTION

A. REQUIREMENTS

The Fire Management Plan (FMP) is an addendum to Buffalo National River's Resource Management Plan. This plan outlines a detailed program of actions to be taken by Buffalo National River to meet the fire management goals for the area.

The plan is also guided by Director's Order-18 (DO-18) (http://www.nifc.nps.gov/fire/policy/do18/do18.htm) which requires that all park units with vegetation capable of sustaining fire develop a FMP. Until a FMP is approved, the Park will aggressively suppress all wildland fires, taking into account the safety of firefighting personnel, the visiting public and protection of all resources at risk on the unit.

B. GOALS AND OBJECTIVES TO ACHIEVE

Overall resource management objectives for the River guide the FMP. Resource management objectives determine whether fire may be used as a tool to manipulate vegetation and how it will be managed.

1. Unit Objectives

Objectives from the River's Master Plan (1977) that relate to wildland fire management follow:

- Openings – The openings cut by river, man, or fire, in many cases provide the 'edge' habitat of variety and animal activity so appealing to man for wildlife observation.
- Open fields – Open fields will be maintained where scenic and wildlife habitat will be enhanced.
- Game Habitat – Improvement of game habitat for hunting will be undertaken where it can be coordinated with other programs such as improvement of scenic or general wildlife habitat and maintaining open fields.
- Plant Succession – The nature of the plant succession in the area, the role of fire, and the extent and effect on forest types of former logging activities should be known; endemic plant species will be identified so they can be protected.
- Perpetuation of Resources – The area will be managed for perpetuation of the resources, while providing recreation for visitors in such a manner that the impact on the environment will be minimized.

2. National Fire Plan Goals

In addition to existing planning document objectives, there are 4 goals in the National Fire Plan (NFP) (http://www.fireplan.gov/) that are addressed in unit fire management plans.

Goal 1. Improve Prevention and Suppression – Improvements in cooperative efforts with local units of government and other Federal agencies will result from direction in this plan.

Goal 2. Reduce Hazardous Fuels – Projects proposed in this plan, both mechanical and prescribed fire will assist meeting this goal at Buffalo River.

Goal 3. Restore Fire Adapted Communities – Projects proposed for Goal 2 will continue the restoration of fire to the vegetative community at Buffalo River.

Goal 4. Promote Community Assistance – Through the NPS Rural Fire Assistance Program, funding has been provided to several rural VFDs for firefighter PPE, training, and wildland firefighting equipment. A potential exists for additional VFD support as well as technical assistance to nearby communities for risk reduction in the wildland urban interface.

C. NEPA AND OTHER COMPLIANCE

An Environmental Assessment (EA) guides the FMP and complies with National Environmental Policy Act (NEPA) (http://www4.law.cornell.edu/uscode/42/ch55.html#PC55) requirements and National Park Service (NPS) policy. The completed EA analyzes environmental impacts of the operations detailed in this plan.

The FMP will implement activities in accordance with the regulations and directions governing the protection of historic and cultural properties as outlined in the Department of Interior Manual, Part 519 (519 DM), and Code of Federal Regulations (36 CFR 800). The National Historic Preservation Act of 1966 (NHPA), as amended, Section 106, (http://www4.law.cornell.edu/uscode/16/470.html) sets the requirements for the protection of cultural properties found on the unit.

There are several endangered species identified as resident of the unit. An Endangered Species Act, Section 7 consultation will be requested from the U.S. Fish and Wildlife Service.

The EA, State Historic Preservation Officer concurrence and Section 7 consultation results will be found in Appendix D.

D. AUTHORITY FOR IMPLEMENTATION

The legal authority for the operation of the fire management program is found in 16 U.S.C. Chapters 1 and 3. The specific authorities can be found in 620 DM 1.1, (http://elips.doi.gov/elips/release/3203.htm). The Organic Act of the National Park Service (August 25, 1916, Section 102) provides the authority for implementation of this plan.

The authority for FIREPRO funding (Normal Fire Year Programming) and all emergency fire accounts is found in the following authorities:

1. Section 102

   Section 102 of the General Provisions of the Department of the Interior's annual Appropriations Bill provides the authority under which appropriated monies can be expended or transferred to fund expenditures arising from the emergency prevention and suppression of wildland fire.

2. Public Law 101-121

   Public Law 101-121, Department of the Interior and Related Agencies Appropriation Act of 1990 established the funding mechanism for normal year expenditures of funds for fire management purposes.

3. 31 USC 665 (E) (1) (B)

   Title 31, United States Code, Section 665 (E) (1) (B) provides the authority to exceed appropriations due to wildland fire management activities involving the safety of human life and protection of property.

II. COMPLIANCE WITH POLICY AND RELATION TO OTHER PLANS

A. NPS AND 2001 FEDERAL FIRE MANAGEMENT POLICY

This FMP is prepared to meet the policy requirements of Director's Order 18, Wildland Fire Management dated November 17, 1998. The primary NPS policy consideration from DO 18 is: "Wildland fire may contribute to or hinder the achievement of park objectives. Therefore, park fire management programs will be designed to meet resource management objectives prescribed for various areas of the park and ensure that firefighter and public safety are not compromised." In addition, preparation of this plan meets the requirements set forth in Department of Interior Manual 620 (620 DM) and the requirements of the Federal Fire Policy update of 2001.

The goals of the NPS wildland fire management program are to:

- Conduct a vigorous and safe wildland fire management program with the highest professional and technological standards.
- Identify the type of wildland fire that is most appropriate to specific situations and areas.
- Efficiently accomplish resource management objectives through the application and management of prescribed and wildland fires.
- Continually evaluate the wildland fire program operations and accomplishments to better meet program goals by refining treatment and monitoring methods, and by integrating applicable technical and scientific advancements.

The 2001 Federal Fire Management Policy update addresses 17 distinct items, the foremost being safety; all Fire Management Plans and activities must reflect this commitment. The full text of the policy, Secretarial Transmittals, and Appendices may be found at (http://www.nps.gov/fire/fire/policy/rm18/index.htm).

The four goals of the National Fire Plan are also addressed is this plan (see Section I.B.2.)

B. RELATION TO ESTABLISHING LEGISLATION

1. Establishment

Buffalo National River, containing approximately 95,700 acres, was established by Public Law 92-237 (86 Stat. 45) on March 1, 1972.

2. Purpose

16 USC § 460m-8 states the purpose of establishment: ". . . . conserving and interpreting an area containing unique scenic and scientific features, and preserving as a free-flowing stream an important segment of the Buffalo River in Arkansas for the benefit and enjoyment of present and future generations . . . .".

16 USC § 460m-12 further directs: "The Secretary shall administer, protect, and develop the Buffalo National River in accordance with the provisions of sections 1, 2, 3, and 4 of this title, as amended and supplemented; except that any other statutory authority available to the Secretary for the conservation and management of natural resources may be utilized to the extent he finds such authority will further the purposes of this subchapter

3. Administration

Buffalo National River is administered under the Organic Act of August 25, 1916, which established the National Park Service. This act states the purpose of the National Park Service is, "…to conserve the scenery and natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations".

4. Threatened and Endangered (T&E) Species

Buffalo National River species listed as endangered under the Endangered Species Act of 1973 (http://endangered.fws.gov/esa.html) include gray, Indiana, and Ozark big-eared bats, the southern bald eagle is listed as threatened. Several species, such as the alligator snapping turtle, are candidates for future listing.

The implementation of the River's fire management program will not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitat. Fire management operations will consider appropriate actions to identify and protect from adverse effects any rare, threatened or endangered species currently or subsequently located within the unit. A Section 7 Consultation with the U.S. Fish and Wildlife Service will be required.

C. OBJECTIVES OF MASTER PLAN RELATED TO FIRE MANAGEMENT

There is no current General Management Plan. The Final Master Plan for Buffalo National River provides the following general guidance for managing the park's natural resources related to the use of fire.

1. Openings

The openings cut by river, man, or fire, in many cases provide the 'edge' habitat of variety and animal activity so appealing to man for wildlife observation.

2. Open fields

Open fields will be maintained where scenic and wildlife habitat will be enhanced.

3. Game Habitat

Improvement of game habitat for hunting will be undertaken where it can be coordinated with other programs such as improvement of scenic or general wildlife habitat and maintaining open fields.

4. Plant Succession

The nature of the plant succession in the area, the role of fire, and the extent and effect on forest types of former logging activities should be known; endemic plant species will be identified so they can be protected.

5. Perpetuation of Resources

The area will be managed for perpetuation of the resources, while providing recreation for visitors in such a manner that the impact on the environment will be minimized.

D. OBJECTIVES OF RESOURCE MANAGEMENT PLAN RELATED TO FIRE MANAGEMENT

The following objectives from the 1998 Resource Management Plan relate directly to fire management.

1. Fire Effects

Unwanted wildland fires may cause damage to delicate ecosystems, degrade the scenic value of natural areas and destroy property. Conversely fire can also be used as a valuable resource management tool to improve wildlife habitat, maintain open areas and prevent forest fuel build-up. Very few lightning or natural caused fires have been recorded for the Buffalo National River region. However, the Ozarks have a long history of man-caused fires dating back to the Indian habitation. Here fire has been used as a tool for field and forest management and as a weapon against one's enemies.

2. Wildland Fire Suppression

All unwanted wildland fires will be suppressed.

3. Prescribed Fire Use

A minimum program of prescribed fires would be initiated to evaluate fire as a tool to maintain some of the open fields and pine groves. These prescribed fires will be conducted to gather vital research information which will be used to establish the prescription necessary to accomplish the objectives of using fire as a management tool.

E. ACHIEVING MP AND RMP OBJECTIVES THROUGH THE FMP

With proper planning and execution, prescribed fire can manipulate vegetation to produce healthier habitats as a background for the river area. At the same time fuel management, using both mechanical means and prescribed fire, can reduce the risk to the cultural and historic resources and NPS infrastructure on the unit. Implementation of the FMP will achieve both Master Plan and RMP objectives listed under items C and D above.

F. FMP PROGRAM STATEMENT

The FMP is a detailed description of the actions necessary to carry out fire management policies and achieve both Master Plan and RMP objectives. Legal mandates related to the unit's establishment are also supported by the FMP. Further development of the prescribed fire program will assist in reducing levels of hazardous fuels, thereby reducing the risk of large, catastrophic fires; providing an acceptable level of safety to visitors and employees; and providing increased defensibility of NPS infrastructure on the River.

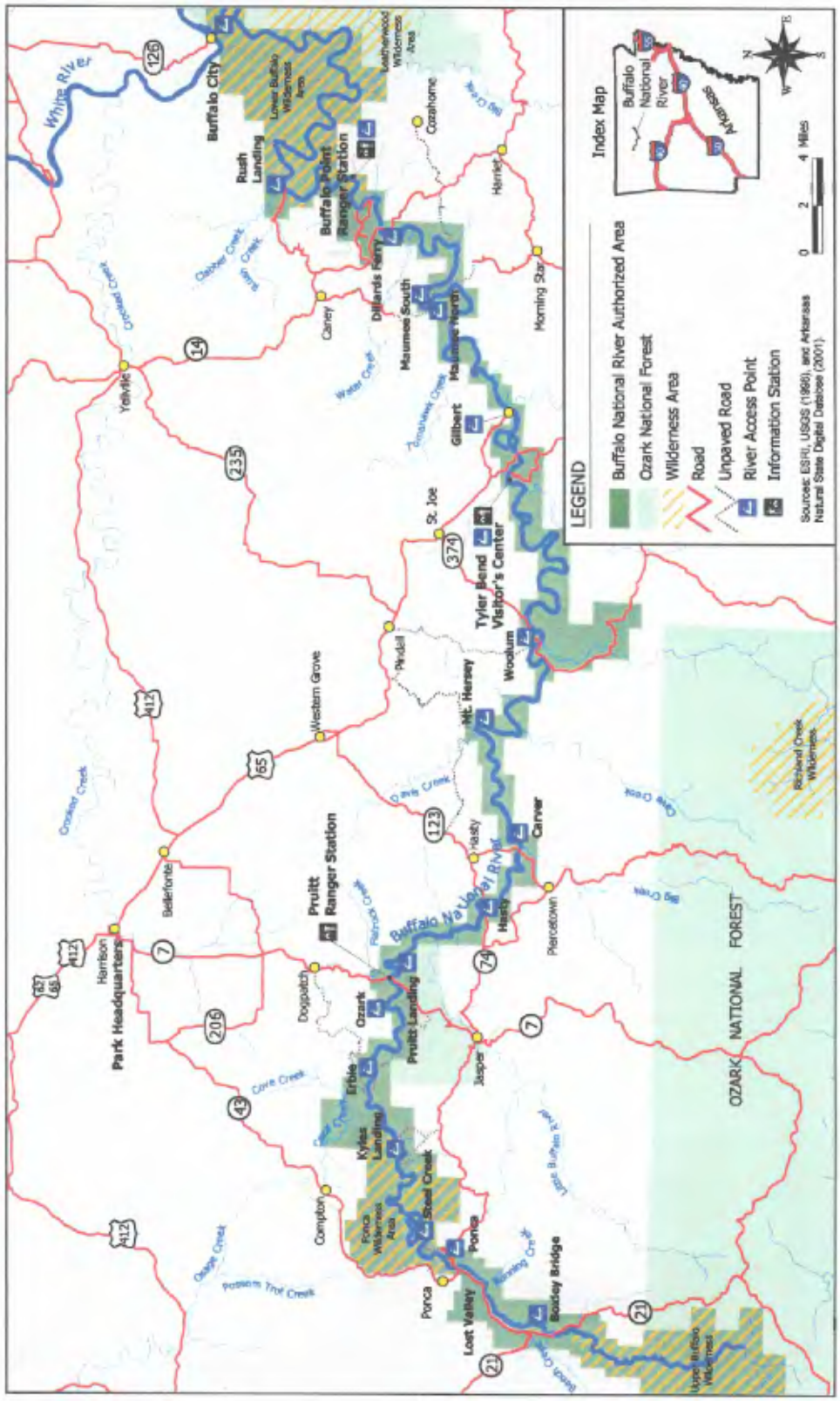


Figure 1 – Vicinity Map of Buffalo National River, Arkansas

III. SCOPE OF WILDLAND FIRE MANAGEMENT PROGRAM

A. BUFFALO RIVER FIRE MANAGEMENT GOALS

The primary goals for the River's fire management program are:

- To promote a program that ensures firefighter and public safety.
- A reduction in human-caused fires.
- Ensure appropriate suppression response capability to meet expected fire complexity.
- Increase use of prescribed fire for restoration of fire dependent ecosystems and to reduce hazardous fuel accumulations, especially in wildland-urban interface areas on the boundary.

B. WILDLAND FIRE MANAGEMENT ELEMENTS

1. Wildland Fire

a. Suppression – All wildland fires, regardless of cause, will receive an appropriate response. If resource needs exceed the park's ability, then local resources from volunteer departments will be requested. Memoranda of Understanding with local fire departments are included in Appendix E. Additional resources from the interagency zone coordination center may also be requested.

Suppression strategies will seek to control the spread of wildland fires through direct or indirect attack. Modes of attack will be determined by the on site Incident Commander with consideration given to various fire parameters and an assessment of values at risk including firefighter safety, protection of the visiting public and the potential for fire movement to private property.

Suppression operations are made difficult by the linear nature of Buffalo River although numerous roads and trails allow fair access to most areas of the unit. With an increase in residential construction and timber harvesting activities close to the park boundary, there is a corresponding increase in potential of fires escaping NPS lands.

b. Wildland Fire Use – There will be no Wildland Fire Use For Resource Benefit (WFU) on Buffalo National River. This decision is due to the linear nature of the unit, relative small size of WFU eligible wilderness areas, juxtaposition of adjacent residential areas and lack of significant lightning ignitions in the park's fire history.

2. Fuels Management

a. Prescribed Fire – Prescribed fire will be used to reduce fuels loads to protect park resources. Fire will also be used to maintain fire dependent habitats and maintain cultural landscapes. Restoration of habitats such as the glades and Post Oak savannas is another use for fire where fire exclusion has caused a degradation in habitat quality.

b. Non-Fire Applications – In addition to prescribed fire, mechanical means may be used to reduce hazard fuels. Mechanical treatment may stand alone or be an interim step prior to application of prescribed fire. Most non-fire work is expected to be near boundaries and near NPS historic structures or infrastructure.

C. DESCRIPTION OF FIRE MANAGEMENT UNITS (FMU)

Four Fire Management Units have been identified at Buffalo National River. They are Wilderness, Natural, Agriculture/Open Fields and Development. Each unit may be further divided into subunits having similar fire management objectives.

1. Unit I – Wilderness

FMU I, totaling 34,570 acres, is made up of three subunits; the Upper Buffalo Wilderness, the Ponca Wilderness, and the Lower Buffalo Wilderness. The boundaries of these subunits are identical to the wilderness boundaries described by Congress and available on maps in the fire management office.

a. Unit Characteristics

Vegetation – The vegetative community at Buffalo National River is rich and diverse. The ridges, bluffs, hillsides and valleys provide a variety of habitats supporting over 1500 floral species. The major forest types are the Floodplain, Mixed-Hardwood, Oak-Hickory, Oak-Pine, Cedar Glade and Beech. Different stages of ecological succession are present throughout the area.

Wildlife – The large number of wildlife species at Buffalo National River reflects the habitat diversity. Wildlife observers have recorded over 54 species of mammals, 250 species of birds and 59 species of fish, along with a multitude of reptiles, amphibians, insects and other invertebrates. Several animal species with restricted habitat requirements are found here and offer clues to past habitat conditions. These species are discussed in detail in the Resource Management Plan.

T&E Species – Resident species listed as threatened or endangered under the Endangered Species Act include gray, Indiana, and Ozark big-eared bats, and southern bald eagle. Several species, such as the alligator snapping turtle, are candidates for future listing.

Geology – Buffalo National River is located in north-central Arkansas within the heart of the Ozark Plateau. Elevations range from a high of 2,385' at Pickert Point to a low of 375' at the river's confluence with the White River. Eons of erosion have sculptured the Buffalo River landscape. Flat-topped ridges are joined by hollows containing rocky slopes and bluffs, which descend to the alluvial flood plains of the Buffalo River. Springs, caves and solution pockets are abundant in this karst topography.

Hydrology – The geology and hydrology of the Buffalo River watershed is unique because of a combination of factors such as karst geomorphology, steep topography, shallow soils and highly interactive ground/surface water. Within the steep terrain of the Ozarks, storm runoff from unpaved roads and cleared land carries both fine and coarse sediments to streams. This can result in unstable stream channels, eroding stream banks, and degraded aquatic habitat. Other non-point source water quality issues are also present in the basin.

The Arkansas Department of Pollution Control and Ecology has designated the Buffalo River and Richland Creek (a tributary) as "Extraordinary National Resource Waters …providing the highest water quality standards and protection through a policy of non-degradation." The water quality of the Buffalo has remained relatively unpolluted due to the large amount of forested land, few point source pollution sources, and a relatively sparse population within the watershed.

Air Quality – The entire river with the exception of the Upper Buffalo Wilderness is a Class II airshed. Upper Buffalo is rated as a Class I airshed requiring closer attention to smoke management issues for prescribed fires.

Cultural Resources – These resources are found throughout the park, including the Wilderness FMU. Due to the scattered nature of sites and sensitivity to disturbance, site locations will be available in the cultural resource office at headquarters.

Buffalo National River has numerous identified archeological sites, mostly subsurface, scattered throughout the park. Many more sites are suspected to be present. Heat generated from a wildland fire could cause fracturing of lithic materials lying at or within an inch or so of the surface. The fire history of the area indicates frequent light fires of a predominantly anthropogenic nature, thus fire has likely burned over most sites frequently in the past several hundred years. Prescribed fire operations will be conducted with minimum impacts and avoidance of known sensitive sites if possible. Wildland fire suppression personnel will watch for signs of archeological resources in the fire area.

Several historic zones have been identified as having over 250 historic structures. A number of Historic Districts are included on the National Register of Historic Places. Other resources are constantly evaluated for inclusion. The List of Classified Structures (LCS) includes 257 resources. All historic structures on the unit will be protected from fire to extent possible with consideration of public and firefighter safety foremost.

b. Fire Management Objectives
   - Provide for the safety of suppression forces, visitors and park neighbors.
   - Contain 95% of all wildland fires at less than 5 acres to protect wilderness values.
   - Restore fire to all fire dependent habitats within the wilderness areas.
   - Restoration of fire dependent native species i.e. warm season grasses and Post Oak (*Quercus stellata*) savanna.
   - Increase public awareness of the role of fire in natural processes and the use of fire in the restoration habitat through interpretative programs during the prescribed fire season.
   - Protect the visiting public from all wildland fire while continuing to provide quality visitor experiences traditionally found on the unit

c. Management Considerations
   - Aircraft resources will be allowed when needed for life protection.
   - The use of bulldozers and tractor-plows in suppression or prescribed fire operations is not authorized.
   - Engines may be restricted from areas identified as possessing a significant hazard to engine and crew members if operated off road. (i.e. in heavy brush and/or boggy areas that engines may be trapped in.)
   - During wildland suppression actions that require ground disturbance a trained archeologist should be consulted and may be on-site.
   - All appropriate cultural and archeological clearances will be obtained as part of the planning process for planned ignited prescribed fires.
   - Management ignited prescribed fires will not occur during county-wide or Arkansas Forestry Commission (AFC) established burn restrictions without written approval from the county judge.
   - Maintain Class I or II air quality standard as appropriate.
   - Maintain aquatic and riparian health and function

d. Historic Role of Fire

Prior to European settlement the Osage Indians were the primary inhabitants of the Ozark Plateau region. The Osage maintained a hunting-gathering-farming economy, with hunting being the primary method of subsistence. Written accounts strongly suggest the use of fire by Indians to burn off prairies. This was done to encourage the emergence of lush new grasses, grazed by free-ranging elk and bison, and to drive wildlife toward hunters. A written account of Indians using fire was documented by Goodspeed in 1889 in the History of Northwest Arkansas :

> "Annually, after this rank growth of vegetation became dead and dry, the Indians set fire to it, and burned it from the entire surface of the country. . . . . This they did to destroy the places of concealment for wild game, the better to enable them to secure their prey. This burning of the decaying vegetation also destroyed the germs of sprouts and thus prevent the growth of young timber."

With the advent of European settlement, fire played an increasing role in the development of the agrarian economy. Fire was used to clear land, renew pastures, encourage wildlife habitat and reduce tick and chigger populations. Its use was so prevalent that, in 1830, Missouri was denied a grant of land from the United States to raise timber on the basis that:

> "…it is only necessary to keep out the fires to cover the prairies with timber by the operations of nature."

Today, the landholders of the Ozark Plateau region still use fire for the same reasons. This traditional use of fire is reflected in the fire history data collected at Buffalo National River.

Lightning is still a factor in the fire regime. The Sylamore Ranger District of the Ozark National Forest adjoins the park on the southeast boundary, and averages 1.5 lightning fires per year

e. Wildland Fire Management Situation

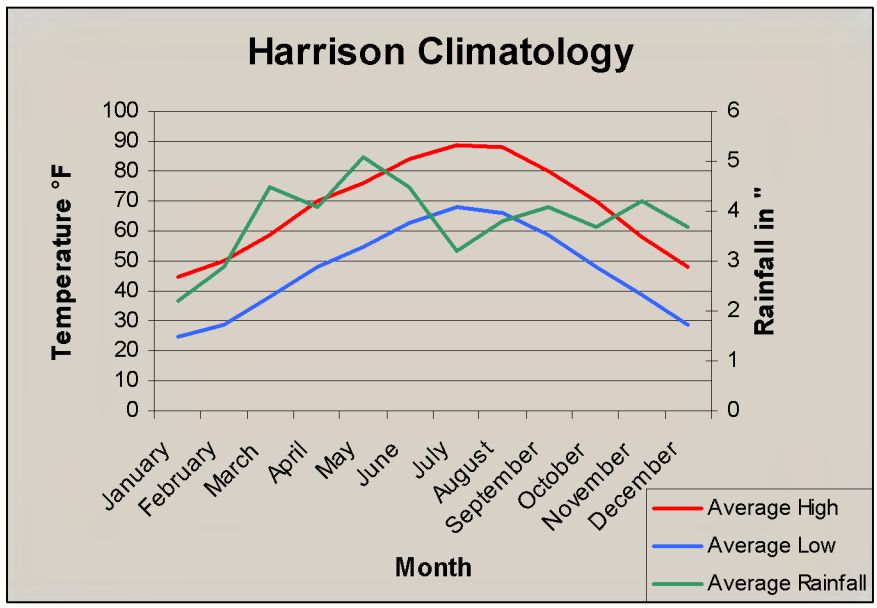
(1). Climate – Buffalo National River has hot summers and mild winters. Precipitation at Harrison averages 46 inches per year. March, May and June are the wettest months, January and February are the driest months. Snowfall averages 12 inches per year. Temperature records at Harrison run from -13 F to 107 F.

At other locations on the River, the maximum recorded precipitation is 82.3 inches in 1927 and the minimum 30.3 inches in 1901. Recorded temperatures have varied from 114 F to 23 F, with an average annual temperature of 58 F

Summers are long, providing an average growing season of 199 days from early April to late October. Thunderstorms, ice, hail, occasional tornadoes and wet winter snowfall and ice storms cause considerable damage to vegetation from limb and bole breakage. Due to elevation differences from the upper to lower end of the river, data from any intermediate site would reflect different extremes in temperature and rainfall.

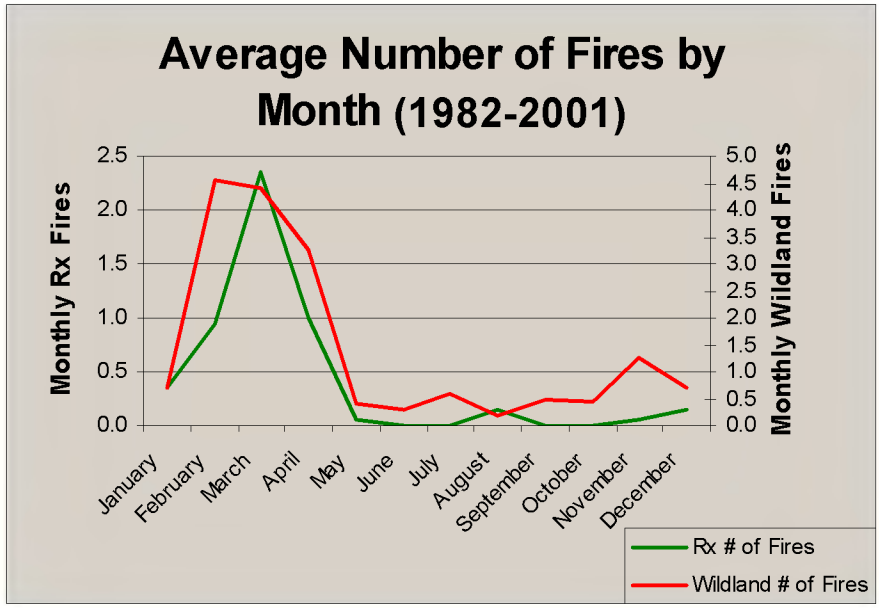
Arkansas experiences periodic droughts, which significantly increases the potential for unwanted wildland fire. A recent example of this extreme occurred in 1980, when the Ozarks experienced high temperatures and low rainfall. Climatological data from Harrison (about mid-way in elevation and river distance) is shown in the chart below.

Figure 1 – Harrison Climatology



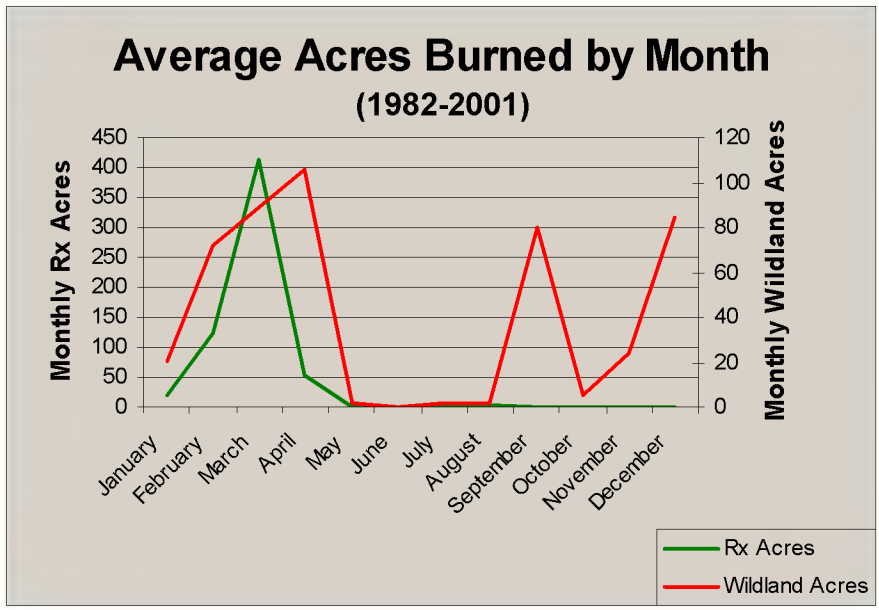
(2). Fire Season – The wildland fire season at Buffalo National River, based on an analysis of fire occurrence during 10-day periods, is from February 11 to April 20 and November 1 to January 20 of each year. Wildland fires have occurred during every month of the year, primarily due to arson. Figure 2 below shows the annual average number of fires, both prescribed and wildland

Figure 2 – Average Monthly Fire Count



Prescribed fire operations can be conducted during any month but the peak season at Buffalo River is during March. As fire effects monitoring information becomes available, seasonality of prescribed fire application may change to better achieve desired results. In addition, a change in season of some prescribed fire would reduce the potential for air quality problems when the park and other land management entities (particularly the US Forest Service) are conducting prescribed fire during the same window of opportunity. This is particularly important for air quality in the Upper Buffalo Wilderness Area. Figure 3 below shows the average acreage burned, both by prescribed fire and wildland fires.

Figure 3 – Average Acres Burned Monthly



(3). Fuel Characteristics – Vegetative fuel loads at Buffalo National River have been determined to be light to moderate. A 1985 University of Oklahoma study calculated the fuel loadings within three vegetation types. The forest floor accumulations were found to be 6.2 tons/hectare (t/ha) for cedar glade and 18.8 to 38.8 t/ha for the deciduous and oak-pine associations.

The primary fuels of concern are those light fuels found on fields and on forest edges. The usual forest fuel is categorized as National Fire Danger Rating System Model E (Hardwoods - winter) while fields and other open areas are considered Model A (Western Annual Grasses) (Deeming, J.E. et al, 1977). Typically, the period from late September through early April produces the greatest number of active fires on or adjacent to the unit. While most fires occur in grassy fuels, leaf fall in the forest lands contribute to an increased potential in the dormant season timeframe. An added fuel problem occasionally occurs as a result of ice storm damage to forest trees. This results in an additional load of 10 and 100 hour fuels, which in turn increases the resistance to control and mop-up problems. Infestations of Gypsy moth (*Lymantria dispar*) and Red Oak borer (*Enaphalodes rufulus*) have changed the complexion of the vegetative community resulting in increased fuel loads in some areas.

Table 1 – NFDRS Fuel Model Distribution

NFDRS Fuel Model	Acres
C-Open Pine w/Grass	4,144
E-Hardwoods Winter	83,535
T-Sagebrush-grass	5,300
Total	**92,979**

Critical fire behavior variables, such as flame length, rate of spread, and fireline intensity are estimated using the BEHAVE computer software and Northern Forest Fire Laboratory (NFFL) fuel model 9 as this is the predominant fuel (Anderson, H.E., 1982, Rothermal, 1983). Predictions are also shown for model 2 (timber – grass and understory), model 1 (shortgrass), and model 8 (closed timber litter) which are found in several areas of this FMU. The following tables (2-9) display this information:

Table 2 – Fuel Model 1 – Average Fire Behavior

Inputs		Outputs	
Fuel Model	1	Rate of Spread (chains/hour)	52
1 hour fuel moisture	8	Heat/Unit Area (BTU/ft²)	84
Mid-Flame Wind Speed (mph)	4	Fireline Intensity (BTU/ft/s)	81
Slope (%)	0	Flame Length (feet)	3.4

Table 3 – Fuel Model 1 – Extreme Fire Behavior

Inputs		Outputs	
Fuel Model	1	Rate of Spread (chains/hour)	446

1 hour fuel moisture	3	Heat/Unit Area (BTU/ft²)	103
Mid-Flame Wind Speed (mph)	16	Fireline Intensity (BTU/ft/s)	844
Slope (%)	0	Flame Length (feet)	10.0

Table 4 – Fuel Model 2 – Average Fire Behavior

Inputs		Outputs	
Fuel Model	2	Rate of Spread (chains/hour)	19
1 hour fuel moisture	8	Heat/Unit Area (BTU/ft²)	444
10 hour fuel moisture	10	Fireline Intensity (BTU/ft/s)	155
100 hour fuel moisture	12	Flame Length (feet)	4.6
Live herbaceous moisture	150		
Mid-Flame Wind Speed (mph)	4		
Slope (%)	0		

Table 5 – Fuel Model 2 – Extreme Fire Behavior

Inputs		Outputs	
Fuel Model	2	Rate of Spread (chains/hour)	376
1 hour fuel moisture	3	Heat/Unit Area (BTU/ft²)	550
10 hour fuel moisture	6	Fireline Intensity (BTU/ft/s)	3795
100 hour fuel moisture	9	Flame Length (feet)	19.9
Live herbaceous moisture	75		
Mid-Flame Wind Speed (mph)	16		
Slope (%)	0		

Table 6 – Fuel Model 9 – Average Fire Behavior

Inputs		Outputs	
Fuel Model	9	Rate of Spread (chains/hour)	8
1 hour fuel moisture	8	Heat/Unit Area (BTU/ft²)	343
10 hour fuel moisture	10	Fireline Intensity (BTU/ft/s)	48
100 hour fuel moisture	12	Flame Length (feet)	4.8
Mid-Flame Wind Speed (mph)	5		
Slope (%)	5		

Table 7 – Fuel Model 9 – Extreme Fire Behavior

Inputs		Outputs	
Fuel Model		Rate of Spread	

Inputs		Outputs	
	9	(chains/hour)	80
1 hour fuel moisture	3	Heat/Unit Area (BTU/ft²)	448
10 hour fuel moisture	6	Fireline Intensity (BTU/ft/s)	661
100 hour fuel moisture	9	Flame Length (feet)	8.9
Mid-Flame Wind Speed (mph)	16		
Slope (%)	5		

Table 8 – Fuel Model 8 – Average Fire Behavior

Inputs		Outputs	
Fuel Model	8	Rate of Spread (chains/hour)	2
1 hour fuel moisture	8	Heat/Unit Area (BTU/ft²)	173
10 hour fuel moisture	10	Fireline Intensity (BTU/ft/s)	6
100 hour fuel moisture	12	Flame Length (feet)	1
Mid-Flame Wind Speed (mph)	5		
Slope (%)	5		

Table 9 – Fuel Model 8 – Extreme Behavior

Inputs		Outputs	
Fuel Model	8	Rate of Spread (chains/hour)	8
1 hour fuel moisture	3	Heat/Unit Area (BTU/ft²)	223
10 hour fuel moisture	6	Fireline Intensity (BTU/ft/s)	33
100 hour fuel moisture	9	Flame Length (feet)	2.3
Mid-Flame Wind Speed (mph)	16		
Slope (%)	5		

NFFL model 9 fires are primary fires on the River. While both model 1 and 2 fires spread more rapidly and have longer flame lengths under both average and extreme conditions, most grass areas are relatively small in area. The shift in fuel models at forest edges tends to improve suppression circumstances.

Fires in hardwood litter (FM 9) generally consume leaf litter and may top-kill small trees up to five inches in diameter (Brown, J.K., 2000, Rowe, J.S., 1983). During extreme weather much of the overstory can also be scorched with a potential to be killed, particularly with the large accumulation of 100 hour fuels that have developed from extensive sprouting after logging and years of fire protection. In the summer hardwoods fire effects are generally less severe, except many top-killed trees do not sprout as well after summer fires. No hardwood crown fires have been observed on the River, but surface fires are frequent.

In the cedar glades, conditions tend to be dry year round and fire behavior would be driven by fuel moisture and to a lesser degree by wind. With fuel loads ⅓ to ½ of the values in hardwood forests and areas involved smaller, less fire damage

is expected.

(4). Fire Regime Alteration – A 1985 University of Oklahoma research study of the fire history for Buffalo National River found data for presettlement times scarce due to unavailability of old hardwoods, pines and cedar trees for fire scar examination. A separate study conducted in south-central Missouri determined the fire return interval for presettlement times as being every two to three years at any given site. Researchers generally believe the forests of the Buffalo River country were more extensive during this period, indicating a fire interval greater than 3 years, but less than 9 years.

Since the establishment of Buffalo National River the length of the fire return interval has increased by 610 percent. From the early 1900's to 1973 the fire return interval was determined to be 9.2 years, while from 1973 to 1983 with greater park land protection, the interval increased to 54.9 years. The overall mean fire return interval from the early 1900's to 1983 was 11.2 years.

The 1985 fire study recommended the following fire return intervals based on slope and aspect. It was suggested that steep slopes should burn every 10-15 years; level and gentle slopes every 20-25 years; and north facing slopes every 30-40 years.

A 2002 fire history study, completed under contract for the NPS by the University of Missouri-Columbia, examined the relationship between fire frequency and population increases between 1680 and 2000 in what is now the Lower Buffalo Wilderness. Mean fire intervals for four anthropogenic fire regime stages were found to range from 1.6 to 7.7 years.

(5). Control Problems –Access for fire suppression personnel through the park is only fair to poor. A number of major roads cross the river and provide some access close to the crossing points. In many areas access is restricted to old county roads and trails. The response time is generally longer than desirable because of these factors. Some wildland fire suppression equipment is available at each district on the River. Requests are in place for equipment updates to provide safe and reliable equipment for wildland fire response. While the Federal Fire Policy is very concerned about the movement of fire from Federal to private lands, the larger concern on Buffalo National River is movement onto the unit from private lands.

The sprawling nature of the unit requires cooperative efforts with local fire departments, the Ozark National Forest and AFC. During some seasons the nearest NPS fire personnel that could provide assistance to district personnel are at Pruitt, as much as 60 miles and 2+ hours driving time away. Copies of Cooperative Agreements are found in Appendix E.

(6). Values to Protect – T&E species are not expected to be affected by most wildland fires (Smith, J.K., 2000). During both suppression and prescribed fire operations, efforts will be made to minimize disturbance of cultural or archeological sites. If possible an archeologist or cultural resource specialist should be available on-site for these operations. Complete descriptions of locations and resources at risk are found on GIS maps and in other plans.

Prescribed fire operations in and near the Upper Buffalo Class I airshed will make every effort to avoid or minimize adverse air quality impacts. Few wildland or

prescribed fires burn for more than one operational period so effects are expected to be temporary and short-term.

Arkansas Voluntary Smoke Management Guidelines (http://www.arkforests.org/interest.htm) will be followed and any new requirements for smoke management implemented when applicable.

Adjacent landowners are most at risk because of the difficulty of access to park boundaries in the Wilderness FMU. Communication during wildland and prescribed fire operations is critical to minimizing adverse effects.

2. Unit II – Agriculture/Open Fields

FMU II includes all agriculture lands under special use permit, use and occupancy and scenic easement reservations, and fields within the park identified by the open fields management plan. The agricultural fields as well as the development zones are identified on a map found in the fire management office. The exact boundaries of the open fields are based upon the Open Fields Management Plan (November, 1987 –currently under revision).

a. Unit Characteristics – See Section III.C.1.

b. Fire Management Objectives
- Provide for the safety of suppression forces, visitors and park neighbors.
- Contain 95% of all wildland fires at less than 5 acres to protect resource values.
- Increase public awareness of the role of fire in natural processes and the use of fire in the restoration habitat through interpretative programs during the prescribed fire season.
- Protect the visiting public from all wildland fire while continuing to provide quality visitor experiences traditionally found on the unit.
- Encourage native species diversity, especially warm season native grasses, while discouraging exotic species.
- Maintain scenic vistas with fire on a 5-10 year cycle.

c. Management Considerations
- Aircraft resources will be allowed when needed for life protection.
- The use of tracked vehicles in suppression or prescribed fire operations is not authorized.
- Engines may be restricted from areas identified as possessing a significant hazard to engine and crew members if operated off road. (i.e. in heavy brush and/or boggy areas that engines may be trapped in.)
- During wildland suppression actions that require ground disturbance a trained archeologist should be consulted and may be on-site.
- All appropriate cultural and archeological clearances will be obtained as part of the planning process for management ignited prescribed fires.
- Prescribed fires will not occur during county-wide or AFC established burn restrictions.
- Maintain Class I or II air quality standard.
- Maintain aquatic and riparian health and function

d. Historic Role of Fire – See Section III.C.1.d.

e. Wildland Fire Management Situation – See Section III.C.1.e except as presented below.

(3). Fuel Characteristics – The primary fuels of concern in this unit are fine, grassy, fuels. NFFL model 3 provides the best estimate of fire behavior.

Critical fire behavior variables, such as flame length, rate of spread, and fireline intensity are estimated using the BEHAVE computer software and Northern Forest Fire Laboratory (NFFL) fuel model 3 as this is the predominant fuel in the FMU. The following tables display predicted behavior variables:

Table 10 – Fuel Model 3 – Average Fire Behavior

Inputs		Outputs	
Fuel Model	3	Rate of Spread (chains/hour)	77
1 hour fuel moisture	8	Heat/Unit Area (BTU/ft²)	689
Mid-Flame Wind Speed (mph)	4	Fireline Intensity (BTU/ft/s)	975
Slope (%)	0	Flame Length (feet)	10.7

Table 11 – Fuel Model 3 – Extreme Fire Behavior

Inputs		Outputs	
Fuel Model	3	Rate of Spread (chains/hour)	712
1 hour fuel moisture	3	Heat/Unit Area (BTU/ft²)	900
Mid-Flame Wind Speed (mph)	16	Fireline Intensity (BTU/ft/s)	11743
Slope (%)	0	Flame Length (feet)	33.5

Based on the BEHAVE runs, only those historic objects on or within 2 cm of the surface are expected to be affected by wildland fire passing over them. Those effects would vary depending on the composition of the article and soil temperature, soil moisture and other factors. It is generally thought that fire has passed over the landscape numerous times with minimal effect. In addition, these sites are disturbed and significant damage is likely to have occurred prior to acquisition. More damage is likely to be done to artifacts during suppression operations than by the fire itself.

Effects on vegetation are not expected to be significant. Some mortality of shrubs and small trees at the edge of open areas is expected and desired. Grasses and forbs will not be affected as resprouting from roots and rhizomes is the normal situation,

Wildlife populations will be affected slightly by both fire and smoke. The effects will be temporary, lasting for perhaps 6-24 hours after the passage of the flame front. Large animals are not expected to show mortality. Some small mammals such as field mice and voles may be caught by the flame front but mortality is not expected to be heavy (Kelleyhouse, 1979). Regeneration of vegetation provides an excellent habitat for these small species and natural reproduction will quickly repopulate the area (Schramm, et al, 1983).

Ground dwelling reptile and insect populations are not expected to be affected. For ground nesting birds, the seasonal timing for fires may be critical for some species although a relatively small percentage of any specific habitat will be treated in a season.

(5). Control Problems – Access to open fields is generally rated as good, although distances from equipment storage locations may be a problem with wildland fires. A number of fields and agriculture areas are close to boundaries and thus the risk of fire moving from the River to private land is higher.

The sprawling nature of the unit requires cooperative efforts with local fire departments, the Ozark National Forest and AFC. During some seasons the nearest NPS fire personnel that could provide assistance to district personnel are as far as 60 miles and 2+ hours driving time away. Copies of Cooperative Agreements are found in Appendix E.

(6). Values to Protect – Protection of lands adjacent to the boundary of this FMU will be high priority for protection. Communication during wildland and prescribed fire operations is critical to minimizing adverse effects.

T&E species are not expected to be affected by most wildland fires. During both suppression and prescribed fire operations, efforts will be made to minimize disturbance of cultural or archeological sites. If possible an archeologist or cultural resource specialist should be available on-site for these operations. Complete descriptions of locations and resources at risk are found on GIS maps and in other plans.

Prescribed fire operations near the Upper Buffalo Class I airshed will make every effort to avoid or minimize adverse air quality impacts. As most open areas are relatively small, fire effects are expected to be temporary and short-term.

3. Unit III – Development

FMU III includes all structures located within the park boundary and on severance lands. These structures include, in part; residential homes, historic buildings, cabins, maintenance facilities, barns, sheds, campgrounds, picnic areas, information stations, radio towers, discovery sites, bulletin boards, signs, and utility poles. In addition, those lands adjacent to agricultural or residential lands outside the park boundary are included.

a. Characteristics – See Section III.C.1.a.

b. Fire Management Objectives
- Provide for the safety of suppression forces, visitors and park neighbors.
- Contain 95% of all wildland fires at less than 5 acres to protect values at risk including adjacent lands and improvements.
- Increase public awareness of the role of fire in natural processes and the use of fire in the restoration habitat through interpretative programs during the prescribed fire season.
- Protect the visiting public from all wildland fire while continuing to provide quality visitor experiences traditionally found on the unit.

c. Management Constraints
- Aircraft resources will be allowed when needed for life protection.
- The use of bulldozers and tractor-plows in suppression or prescribed fire operations is not authorized.
- Engines may be restricted from areas identified as possessing a significant hazard to engine and crew members if operated off road. (i.e. in heavy brush and/or boggy areas that engines may be trapped in.)
- During wildland suppression actions that require ground disturbance a trained archeologist should be consulted and may be on-site.

d. Historic Role of Fire – See Section III.C.1.d.

e. Wildland Fire Management Situation – See Section III.C.1.e except as presented below.

(3). Fuel Characteristics – Fuels in this FMU can generally be classified as NFFL model 1 (short grass). Much of the area is either maintained as lawn or receives maintenance mowing. During the late fall and early spring, fuels may be dry enough to burn, the remainder of the year fuels are green enough to burn poorly. Fuel model 9 may also be present in this FMU.

Tables 2 and 3 for model 1, and tables 4 and 5 for model 9, show expected fire behavior for dry fall or spring conditions prior to active growth (green-up). Critical fire behavior variables, such as flame length, rate of spread, and fireline intensity are estimated using the BEHAVE computer software and Northern Forest Fire Laboratory (NFFL) fuel model 1 as this is the predominant fuel. Model 9 is included as it is the next most abundant fuel in the FMU.

Expected Fire Effects – Based on the BEHAVE runs, only those historic objects on or within 2 cm of the surface are expected to be affected by wildland fire passing over them. Those effects would vary depending on the composition of the article and soil temperature, soil moisture and other factors. As this FMU consists of disturbed sites it is unlikely that significant damage to artifacts would occur.

Effects on vegetation are not expected to be significant. Grasses and forbs will not be affected as resprouting from roots and rhizomes is the normal situation.

(4). Fire Regime Alteration – As this unit consists of the developed areas of the park, fire regime alteration is not a concern. Management activities prevent the restoration of the historic fire regime.

(5). Control Problems – Access to most of the FMU is good. Ranger district initial attack forces are generally located close by and response time is usually short. Local volunteer fire departments are usually available close to most of the FMU and will be backup for NPS suppression personnel.

(6). Values to Protect – Historic buildings, cultural resources, NPS infrastructure, and utilities are among the values to be protected. The nature of the FMU indicates that T&E species, other wildlife species and most plant communities will not be affected. Tables 12 and 13 show general locations and number of cultural resources at risk.

Table 12– Historic Sites and Building Count

Site	# of Units
Boxley Valley Historic District	250
CCC Facilities at Buffalo Point	7
Cold Springs School	1
Eva Barnes Henderson Farm	3
Parker-Hickman Farm at Erbie	8
Rush Historic District	7
Sod Collier Farm	3
Total	**279**

Table 13 – Archeological Areas and Site Counts

Area	Site Count
Big Buffalo Valley Archeological District	47
Calf Creek Archeological Site	1
Identified, Non-inventoried Sites	438
Rush Site	1
Total	**487**

Table 14 lists NPS real property and values as well as value of remaining inholdings protected.

Table 14 – NPS Real Property and Value

Site	# of Units	Value
Boxley/Ponca (Public)	99	1,608,000
Boxley/Ponca (Private)	86	1,452,000
Buffalo Point	36	674,000
Compton	1	50,000
Erbie	6	48,000
Hasty	3	20,500
Hathaway Mountain	1	50,000
Kyles Landing	1	2,500
Point Peter	1	50,000
Pruitt/Ozark	18	188,000
Rush	2	5,000
Silver Hill	7	31,900
Steel Creek	8	36,500
Toney Bend	4	23,000
Tyler Bend	14	1,934,635
Woolum	1	18,000
Total	**288**	**6,192,035**

4. Unit IV – Natural FMU

FMU IV represents all land within Buffalo National River not described under the other three units. (See maps in Fire Management Office). This unit is further broken down into three subunits based upon vegetative associations. They are; Floodplain/Beech, Mixed-Hardwood/Oak-Hickory, and Oak-Pine/Cedar-Glade.

Fire is recognized as a natural force and will be used as a tool to benefit plant and animal populations, especially to fire-dependent species. Prescriptions for each of the vegetative associations will be developed through a specific prescribed fire plan, which must be approved by the Superintendent.

a. Characteristics – See Section III.C.1.a.

b. Fire Management Objectives
- Provide for the safety of suppression forces, visitors and park neighbors.
- Contain 95% of all wildland fires at less than 5 acres to protect resource values.
- Restore fire to all fire dependent habitats within the FMU.
- Use fire to manage fuel loads, especially where visitation exists.

- Increase public awareness of the role of fire in natural processes and the use of fire in the restoration habitat through interpretative programs during the prescribed fire season.
- Protect the visiting public from all wildland fire while continuing to provide quality visitor experiences traditionally found on the unit

c. Management Considerations
- Aircraft resources will be allowed when needed for life protection.
- The use of bulldozers and tractor-plows in suppression or prescribed fire operations is not authorized.
- Engines may be restricted from areas identified as possessing a significant hazard to engine and crew members if operated off road. (i.e. in heavy brush and/or boggy areas that engines may be trapped in.)
- During wildland suppression actions that require ground disturbance a trained archeologist should be consulted and may be on-site.
- All appropriate cultural and archeological clearances will be obtained as part of the planning process for management ignited prescribed fires.
- Prescribed fires will not occur during county-wide or AFC established burn restrictions.
- Maintain Class I or II air quality standards as appropriate.
- Maintain aquatic and riparian health and function

d. Historic Role of Fire – See Section III.C.1.d.

e. Wildland Fire Management Situation – See Section III.C.1.e.

IV. WILDLAND FIRE MANAGEMENT

A. GENERAL MANAGEMENT CONSIDERATIONS

1. GMP Direction

There is no current General Management Plan. The Final Master Plan for Buffalo National River provides general guidance for managing the park's natural resources related to the use of fire.

Maintenance of scenic vistas and wildlife habitat is a primary concern. The role of fire in plant succession and perpetuation of native species is also a primary consideration. Protection of cultural resources is necessary to meet legal and management mandates.

The direction provided by the Master Plan indicates that prompt, aggressive suppression actions will be the normal response to wildland fires at Buffalo National River. Prompt action will help protect the native species, historic resources, cultural resources and NPS infrastructure

Over the last 20 years (1982-2001) the River has averaged 17 wildland fires per year burning about 485 acres. The largest single wildland fire in the period was 1,470 acres in 2000. During the analyzed period, 52 of 346 wildland fires (15%) were over 50 acres in size, some including acreage on adjoining lands.

2. Implementation Procedures

As WFU is not an option under this FMP, full suppression action is expected with due consideration to firefighter and visitor safety. A Wildland Fire Implementation Plan (WFIP) is not needed. In cases of multiple fires however, completion of the WFIP may assist management in setting priorities for suppression.

Should multiple fires occur, priority will be assigned to those fires that threaten park infrastructure, cultural resources, and other values at risk identified in Section III.C. When multiple fires occur, lower priority fires may be managed within natural or man-made barriers until sufficient suppression forces are available to take more aggressive action.

B. WILDLAND FIRE USE

Wildland Fire Use (WFU) will not be considered for implementation under this FMP at Buffalo National River. This decision is based on several criteria:

- Few naturally occurring fires.
- The linear nature of the unit.
- Juxtaposition of adjacent residential areas and potential for escape.

C. WILDLAND FIRE SUPPRESSION

1. Fire Behavior

Fire behavior expected under both average and extreme conditions for the major fuel types on the unit can be found in the tables in Section III.C.1 of this plan.

2. Preparedness Actions

a. Prevention – The objectives of the park's fire prevention program are: to prevent human caused wildland fires and, to incorporate prevention messages into interpretive programs. Community outreach by the Prevention and Education Specialist is key to successful prevention efforts. The Fire Prevention Plan is found in Appendix J.

b. Annual Training – Annual refresher training emphasizing safety will be made available to River staff. Minimum training will include LCES, Standards for Survival, fire shelter training and other updates as appropriate. In addition, each year the Chief of Resource Management and Fire Management Officer will assess the current qualifications of the unit's fire qualified personnel. From this assessment, current and future training needs for both the unit and individuals will be determined. Training will be obtained in the most cost-effective manner through services of the Arkansas Group Fire Management Office or through interagency training courses. Qualified instructors will be utilized for all courses.

c. Readiness – Each year prior to and after the fire season, the Engine Foreman will conduct an inventory of the District fire caches. Any needed supplies or equipment will be requested through the Fire Management Officer. The Engine Foreman will also be responsible for ensuring that unit fire tools and engines are maintained in a state of readiness, especially during the fire season.

d. Fire Weather and Fire Danger

(1). Weather Stations – The weather station is station number 031201, Silver Hill. NFDRS Model E is the selected model for fire danger predictions. This station is automated and can be polled for current conditions as needed.

(2). NFDRS – BUFF uses NFDRS Model E, Burning Index (BI) as the primary trend monitoring index and fire danger prediction scale. The Step-up Plan in Appendix H shows the break points for each individual staffing class along with the actions, both preparedness and prevention, required in each class. Additional breakpoints are included for model L, Western Perennial Grasses and for model R, Hardwoods (summer). Model R is used during the peak of summer weather if conditions appear dry enough to offer a fire threat.

(3). Monthly Risk Analysis – When weather and fuels appear to be outside the expected parameters, a monthly risk analysis will be conducted by the FMO. The items considered will include the items in the following table. Results should be passed on to the regional FMO for compilation and use for requesting additional funds and/or resources for wildland fire suppression. Information developed from this analysis may be used to modify actions planned under various staffing classes in the Step-up Plan.

Table 15 – Monthly Risk Analysis

Factor	Current Level	Historic Average
Temperature Levels (Highs)		
Temperature Levels (Lows)		
Precipitation Levels		
Keetch-Byram Drought Index		
1000 hour Fuel Moistures		
Live Fuel Moistures		

Factor	Current Level	Historic Average
Unusual Weather Events Ice storms, hard freezes		N/A
Unusual fire load		
30-90 day temperature forecast		
30-90 day precipitation forecast		

e. Step up Plan – The Step up Plan provides a guide to follow as fire danger indices increase. Specific actions and trigger points are listed in the table in Appendix H.

Weather observations will be taken at the fire weather station at Buffalo River daily via the automated weather station. NFDRS fuel model E will be used as the primary model for rating fire danger. Weather observations and fuel measurements will be taken each burning period, and the NFDRS BI computed. Specific actions and trigger points are listed in the Step-up Plan in Appendix H.

3. Pre-attack Plan

This is basically a checklist of items to be considered and located prior to wildland fire occurrence. Preparation of items determined necessary for suppression operations will make for a smoother transition if off-park resources are needed. The table is divided into four parts that correspond to four of the functions found in the Incident Command System and is found in Appendix G. When NFDRS indices indicate a Staffing Class of 4 or 5 the pre-attack plan should be reviewed and appropriate actions taken.

4. Initial Attack

a. Setting initial attack priorities involves determining the FMU involved, risk of fire to visiting public and firefighters, resources at risk, existing fires and threat to adjoining property. With multiple ignitions, the FMUs by priority are: Development, Agriculture/Open Fields, Natural and Wilderness. Within each FMU a set of priorities also exists and are listed in the sections below.

(1). FMU I, Wilderness FMU – All fires will be aggressively suppressed with due consideration of firefighter and public safety. Priority will be given to fires threatening adjacent residential property. Second priority will be given to visitor use areas and third to identified cultural resource locations in unoccupied habitats.

(2). FMU II, Agriculture/Open Fields FMU – Fire threatening adjacent residential property or easements will receive the first priority for suppression in this FMU and will be aggressively attacked. Known cultural resources will receive second priority and will be protected from suppression action damage to the greatest extent possible.

(3). FMU III, Development FMU – This FMU contains many NPS buildings and other infrastructure. Because visitors may be present in concentration, fires in this FMU will receive the top priority for initial attack if fires in other FMUs are reported simultaneously

(4). FMU IV, Natural FMU – Priorities in this FMU will mirror the priorities in the Wilderness FMU.

Maps of developed areas, and cultural resources are available in the fire management office.

b. Normally initial attack crews will be comprised of at least two qualified persons fully equipped with personal protective equipment. A radio and tools such as rakes, back-pack pumps, etc., will be carried in all patrol trucks. Additional gear such as fire engines, pumps, hose, fuel, etc. may be provided by back-up crews as needed. Allocation of personnel will be accomplished with a minimum of disruption to district visitor services or operations. In order to effectively meet this objective, other NPS personnel and off-park personnel will be used when necessary to supplement District personnel for initial attack, and project fire operations.

   Small fires will be controlled, if possible by an initial attack handcrew. An initial attack crew on a larger fire will be reinforced by additional firefighters. In most cases an effort should be made not to tie up a number of crews on one fire to the point that the remainder of the park is left under-staffed. If additional personnel or equipment are needed on the fire, the Incident Commander will notify the park Fire Program Assistant or FMO who will arrange for additional suppression forces and/or cover crews to be available for initial dispatch.

   When wildland fires occur in areas where there is a immediate threat to life and property, the I.C. may request a tractor plow from AFC or the U.S. Forest Service without delay. However, tractor plows should not be utilized without the concurrence of the superintendent if possible. Should a tractor plow be requested the superintendent or designee must be notified immediately. If a wildland fire threatens known cultural resources, the Incident Commander will notify cultural resource staff to document impacts.

c. Confinement as an Initial Attack Suppression Strategy – Confinement strategies may be used in all FMUs except the Development FMU if, in the opinion of the Initial Attack Incident Commander, direct suppression would put firefighters at risk due to terrain considerations, lack of adequate IA staffing or other safety issues exist.

   If a confinement strategy is considered, it should be supported by completion of a Wildland Fire Implementation Plan (WFIP).

d. Response Times – For most fires, response time by NPS equipment and personnel will run up to 60 minutes depending on location of fire and responding personnel.

e. Management Constraints – The suppression tactics to be used at Buffalo River include use of water or foam firelines in conjunction with natural barriers to reduce damage potential from suppression actions. Water will normally be supplied by engines operating generally from established roads and/or trails. There are four primary management constraints:
   - Safety of fireline personnel, the visiting public and park neighbors will be the highest priority in all wildland fire operations.
   - The routine use of bulldozers or heavy equipment in suppression operations may only be authorized by the Superintendent or designee.
   - Engines will be restricted from areas identified as potentially affected by vehicle traffic where rutting, soil compaction or other habitat damage could occur.
   - Handlines will be constructed only in areas where damage to cultural resources is not likely to occur.

f. Local Issues – Close communication with local units of government, adjacent landowners, and permittees should reduce wildland fire controversy to a minimum. There are no tribal issues.

5. Extended Attack and Large Fire Suppression

a. Extended attack needs – Based on the fire history from 1982, few fires will remain uncontrolled past the first burning period. The largest fire on the area now included in the park was 1,470 acres in 2000.

AFC personnel will respond under a Memorandum of Understanding (mutual aid) if resources are available and not committed to their own suppression activities. The park provides reciprocal assistance to AFC.

The use of other DOI agency and US Forest Service resources to assist with all aspects of fire management activities is covered under an Interagency Agreement for Fire Management. For fires requiring large numbers of personnel or other resources, contact with the Arkansas-Oklahoma Interagency Coordination Center will bring any necessary resources from sources nationally. The current contact information is found in Appendix E.

b. Implementation Plan Requirements – A Wildland Fire Implementation Plan will not be required on initial attack fires. The development of a Wildland Fire Situation Analysis (WFSA) will be required at the point where the second burning period will not see control of fire spread. At this point a WFSA will be completed each day until the fire is surrounded by firelines or natural or other barriers that will stop fire spread.

c. Complexity Decision – When a WFSA has been completed for use during the operations on a second burning period, the fire will be considered to be an extended attack fire.

d. Delegation of Authority – A sample delegation of authority to an incident commander is included in Appendix E.

6. Exceeding Existing WFIP

If the periodic reassessment of a WFIP indicates that a change in strategy is needed, the following actions will be taken:

a. If the fire is the result of an escaped prescribed fire, a WFSA will be completed and a new strategy selected based on the results.

b. If the initial attack appropriate management response was a confinement strategy and operations continue beyond the second operational period, a WFSA will be completed and new strategy selected if appropriate.

7. Minimum Impact Suppression Tactics (MIST)

Director's Order #18 states that: "Methods used to suppress wildland fires should minimize impacts of the suppression action and the fire, commensurate with effective control and resource values to be protected." Specific restrictions are listed in IV.C.4.e.

8. Fire Rehabilitation

On this unit the only rehabilitation needs anticipated are those associated with fireline construction and mop-up activities. Proper placement of hand constructed firelines should reduce the need for major work. Areas with handlines will be restored to their pre-fire condition as soon as possible. The nature of fires on the unit indicates that long term rehabilitation should not be necessary. Should a Burned Area Emergency Rehabilitation

Team (BAER) be required on the unit a hydrologist and archeologist or cultural resource specialist should be part of the team. Following are park specific guidelines:

- Trash will be removed from lines, camp locations and other staging areas.
- Should waterbars be necessary they will be installed every 70-200 feet for slopes 0 to 15%, 50-70 feet for 15-30%, and 30-50 feet for 30+% slope.
- Stumps will be cut within 3 inches of the ground.
- All snags or trees felled will be lopped and the branches scattered.
- Rehabilitation will occur before resources are released from the fire to the greatest extent possible.

9. Records and Reports

The Superintendent is ultimately responsible for fire reporting and fiscal accounting. Individual report assignments may be made by the Superintendent. The table below is a checklist of possible wildland fire documents and the individual usually responsible for completing them.

Table 16 – Checklist of Wildland Fire Documentation

Checklist of Wildland Fire Documents and Reports		
Document	**Revision or Preparation Frequency**	**Responsible Party**
DI-1202	Each incident	Incident Commander
WFSA	As needed	Unit management/IC
Fire Weather	Daily in season	FMO
Fire Situation Report	Daily in season	FMO
Fire Danger	Daily in season	FMO
Fire Complexity Analysis	Per Incident as Needed	Incident Commander
Monthly Risk Analysis	Monthly	FMO/Chief of Resource Management
Pre-Attack Plan	Annually	FMO/Chief of Resource Management
Wildland Fire Critique	Each Incident	On site suppression staff

Time and filing deadlines are associated with each of these reports and will control scheduling and response times.

V. FUELS MANAGEMENT

A. LONG-TERM FUELS MANAGEMENT

Prescribed fire has been in use at Buffalo National River since the mid-1980's. Continued use of prescribed fire will maintain historic landscape scenes. One of the primary management objectives for Buffalo National River is to maintain its unique scenic diversity. To maintain this scenic diversity through time, some type of disturbance must exist to set back the succession of some plant communities, while stimulating the regeneration of others.

Plant communities associated with the bluffs and ridges reflect the past influences of fire. Prairie grasses and pines occupy the drier sites and have evolved with mechanisms to withstand fire. Fire-dependent (oak-pine, and cedar-glade) and fire-tolerant (oak-hickory) plant associations are found scattered throughout the unit. Detailed descriptions of these habitats are found in the Wildland and Prescribed Fire Monitoring Plan in Appendix F. Without the disturbance of fire, the pine, cedar and grasses would eventually be replaced by more dominant oaks.

To maintain the scenic diversity, so unique to the River, fire is needed to perpetuate these communities. Prescribed fire provides the most natural and economic means to accomplish these park objectives.

The use of prescribed fire along the unit's boundary can reduce the likelihood of wildland fire coming from adjacent lands and threatening River resources as well as protecting adjoining private lands from fires starting on River lands.

As needed, mechanical fuel reduction will take place in the vicinity of historic structures, NPS infrastructure and other locations where prescribed fire is not the appropriate tool.

Fuels management will meet the Master Plan goals of perpetuating resources, maintaining scenic openings, providing habitat for wildlife and maintaining plant succession.

B. PRESCRIBED FIRE PLANNING

1. Annual Preparation

A schedule of proposed burns will be developed and reviewed annually. The annual review will determine if fuels conditions are such that burn implementation can take place. As part of the review, past burn areas will be examined to determine if the burn objectives over the long term are being achieved. Adjustments to return intervals, prescription parameters and climate conditions will also be reviewed.

2. Long-term Prescribed Fire Relation to FMU's

Four FMU's exist on the River. All of the items discussed in Section A. above support the prescribed fire program. Many burn units within the FMU's have been fully identified; others have not as significant areas under NPS jurisdiction require additional evaluation to determine the appropriate fuel management or vegetative manipulation level of effort.

3. Personnel Requirements

As part of the Arkansas Group, the Buffalo River Fire Use Module is expected to be the primary fire personnel source. Other fire qualified personnel from Buffalo River and other Arkansas Park Group units will be asked to assist as needed. Development of

specific prescribed fire plans will be coordinated by the FMO with input from the burn boss and Buffalo National River staff.

4. Fire Behavior and Fire Effects Monitoring

A Monitoring Plan (draft) is included as Appendix F. Fire weather data used in development of prescriptions is routinely entered into the Weather Information Management System (WIMS). This information provides some inputs for the BEHAVE modeling tool. An on-site monitor will take and record weather and fire behavior observations hourly during the execution of the burn. When combined with the information gathered on fire effects, a reasonably complete view of the success or failure of the operation should emerge.

5. Critique of Prescribed Fire Operation

The following items, as a minimum, will be reviewed following each prescribed fire operation.

- Were any unsafe acts noted?
- Were burn objectives met within an acceptable range of results? :
- What should be done differently to obtain desired results or get better results?
- Was there any deviation from plan? If so, why?
- Was prescription appropriate?
- Were weather changes a factor in accomplishing burn?
- Problems and general comments:

6. Documentation and Reporting

The following table lists the reports and other documents required for prescribed fire operations.

Table 17 – Checklist of Prescribed Fire Documentation

Checklist of Prescribed Fire Documents and Reports		
Document	**Revision or Preparation Frequency**	**Responsible Party**
FIREPRO Project Submission	Annual	FMO
Original Signed Prescribed Fire Plan	Each Project	Regional Director
Checklist of Pre-Burn Prescribed Fire Activities (no specific form)	Each Project	Prescribed Fire Burn Boss
All Reviewer Comments	Each Project	Reviewers
All Maps	Each Project	FMO\Prescribed Fire Burn Boss
Notification Checklist	Each Project	Prescribed Fire Burn Boss
Permits such as burn, smoke, etc.	Each Project	FMO\Prescribed Fire Burn Boss
Monitoring data	Each Project	Prescribed Fire Monitor
Weather forecasts	Each Project	FMO\Prescribed Fire burn Boss
Agency Administrator Go/No-Go Pre-Ignition Approval	Each Project	Superintendent
Operational Go/No-Go Checklist	Each Project	Prescribed Fire Burn Boss
Incident Action Plan(s)	Each Project	FMO\Prescribed Fire Burn Boss
Unit logs, Daily Validation or other unit leader documentation	Each Project	FMO\Prescribed Fire Burn Boss
Press Releases, Public Comments, and Complaints	Each Project	Local Park Staff
Smoke dispersal information	Each Project	FMO\Prescribed Fire Burn Boss
Post fire analysis (Critique)	Each Project	All Participants in Operation
Fire Occurrence (DI-1202) report (Must also be reported in SACS)	Each Project	Prescribed Fire Burn Boss

Time and filing deadlines are associated with each of these reports and will control scheduling and response times.

7. Historic Fuel Treatments

The map depicting historic treatments will be a part of the GIS as information on fuel treatments is added to the system.

C. PRESCRIBED FIRE BURN PLAN

Prescribed fire plan requirements at Buffalo National River are similar to the requirements at other NPS units. A detailed outline and discussion is found in RM-18, Chapter 9, Exhibit 15 (http://www.nps.gov/fire/fire/policy/rm18/index.htm). BUFF plans have the following specific requirements:

- Signature Page
- Executive Summary
- Description of Prescribed Fire Area
- Goals and Objectives
- Project Complexity
- Organization
- Cost
- Scheduling
- Pre-burn Considerations
- Ignition and Holding Actions
- Wildland Fire Transition Plan
- Protection of Sensitive Features
- Public and Firefighter Safety
- Smoke Management and Air Quality
- Interagency Coordination and Public Notification
- Monitoring
- Post Fire Rehabilitation
- Post Fire Reports
- Appendices
  - Technical Reviewer Checklist and Comments
  - Reviewer Comments
  - Maps
  - Risk Mitigation and Complexity Worksheets
  - Fire Modeling Outputs
  - Agency Administrator GO/NO-GO Pre-ignition Approval
  - Prescribed Fire Operations GO/NO-GO Checklist
  - IAP/Briefing Guide
  - Adequate Holding Resources Worksheet
  - Post-project Analysis
  - Prescribed Fire Monitoring Form
  - Job Hazard Analysis
  - Project Clearance Form
  - Notification Checklist

D. EXCEEDING PRESCRIBED FIRE PLAN

In instances where the Wildland Fire Transition Plan is implemented, a WFSA will be completed and suppression action will be initiated based on the WFSA.

E. AIR QUALITY AND SMOKE MANAGEMENT

1. Air Quality Issues

Under the provisions of the Clean Air Act (PL 88-206, as amended), (http://www.epa.gov/oar/oaq_caa.html) Buffalo National River is classified as a Class II Area. Short term adverse conditions may exist during periods of prescribed burning or wildland fire.

As Buffalo National River is crossed by several major highways, smoke is a primary concern, both with wildland and prescribed fires. The River is also bounded primarily by private lands and with a 230 mile perimeter, effects of smoke on private lands can be a major concern. Both air quality and smoke management must be considered in developing prescribed fire plans. Under both wildland fire and prescribed fire conditions there will be times when visibility of the park's scenic vistas will be temporarily impacted.

As the state of Arkansas does not have specific regulations concerning air quality/smoke management relative to prescribed fire, although voluntary smoke management guidelines are in place. No permits are presently required prior to igniting a prescribed fire. Despite the lack of regulations, all prescribed fire plans will be developed to lessen potential adverse impacts on local highways and unit neighbors.

2. Smoke Management

Every effort will be made to conduct burning operations with a goal of avoiding impacts on sensitive targets downwind from the operation. Spot weather forecasts and on site weather observations can help the prescribed burn boss determine if a burn should be ignited. Careful observation of fuel moisture and other fire behavior factors can also assist in mitigating smoke problems. Other management actions including mop-up of heavy fuels can also reduce smoke production. Arkansas Voluntary Smoke Management Guidelines (http://www.arkforests.org/interest.htm) will be followed and any new requirements for smoke management implemented when applicable.

Due to the canyon-like topography along portions of the river, close attention will be given to weather conditions that could transport smoke downstream. Areas normally beyond the expected smoke dispersal area could be adversely affected.

a. Class I Airsheds – The Upper Buffalo Wilderness Area is located adjacent to the west end of the River. Prescribed fire planned for the area within 5 miles of the wilderness may temporarily affect visibility. The short duration of most prescribed fries in the area will mitigate impacts as will a prescription with adequate parameters to promote rapid smoke dispersion.

b. Smoke Sensitive Areas – There are more than 10 communities adjacent to the river, each of which is a potentially smoke sensitive area. Maps showing the potential targets; hospitals, nursing homes, airports etc. are available in the Fire Management Office. Roads, campgrounds and other visitor facilities are also targets.

c. Local/Regional Smoke Restrictions – There are no current restrictions, however, the amount of prescribed fire applied by the agencies in the river basin does have potential to create problems which might be solved by restriction or regulation. A cooperative effort to manage smoke from prescribed fires is ongoing.

d. Mitigation Strategies

(1). Planned prescribed fires – Fires to improve resource values will have a smoke dispersion component in the prescription. If smoke creates a prolonged hazard or significant nuisance, appropriate actions will be taken to mitigate the condition causing the problem or the fire will be suppressed.

(2). Suppression – Suppress or mop up smoldering fuels when they are likely to generate smoke management "problems."

(3). Ignition – Ignite smoldering fuels to get them to burn with an active flame, which generates less than half the emissions than smoldering combustion. Flaming combustion also generates convection columns, which raise smoke above ground level.

(4). Types of Fires – Use backing fires when possible.

(5). Dispersion – Recognize poor dispersion conditions that will last several days, such as the predicted passage of a slow-moving warm front; a lingering high pressure system with stable atmosphere; or high humidity conditions, and adjust burning strategies as necessary.

(6). Residual Smoke – When a fire has burned for an extended period of time and generated a lot of residual smoke, the NPS will consider appropriate actions to minimize additional smoke production.

(7). Firefighter Safety – During high smoke production phases of a prescribed fire operation, crews will be rotated out of high smoke areas.

(8). Sensitive Areas – Planned prescribed fire ignitions in sensitive areas will be done either when visitation is low, or the Superintendent will restrict entry to areas potentially impacted by smoke.

e. Guidelines – The following are the management guidelines for all phases of the fire management program.
- No prescribed fires will be ignited during air pollution alerts, temperatures inversions or when a burn ban has been established by any local government.
- Fire weather forecasts will be used to predict smoke dispersal.
- Burning will be done only when conditions result in rapid smoke dispersal.
- Proper firing techniques to lower smoke production will be utilized.
- Timing of prescribed fires will occur after 9:00 am with ignition ending one hour before sunset.
- Smoke projection maps will be prepared to assist in projecting smoke dispersal patterns.
- Local police and fire agencies will be notified of any planned prescribed fire so they may provide any needed assistance with traffic flow should problems with smoke dispersal occur.
- Prescribed fires will be planned and conducted when proper wind flow will disperse smoke over unpopulated or low density populated areas.

F. NON-FIRE APPLICATIONS

During the current planning horizon (2002-2007), several mechanical fuel hazard treatments are proposed on the unit. There are no chemical treatments proposed for hazard fuel reduction purposes.

1. Annual Activities

Each project will require approximately 1 ½ weeks to prepare project proposals and complete the review process. A request will be made during the prior year for funding to support the project. Most of the actual work will be accomplished by the fire use module when prescribed fires are not possible due to weather or other restrictions. A prioritized schedule will be prepared for each field season.

2. Seasonal Restrictions

To protect remnant native vegetation mechanical treatments are best completed prior to the active growth period or after dormancy.

3. Monitoring

Short and long-term monitoring will concentrate on measurements of acres treated and stems removed. If fire is to be applied as a second phase of treatment, monitoring will be as defined in the Wildland and Prescribed Fire Monitoring Plan (Appendix F).

4. Critique of Project

The following items, as a minimum, will be reviewed following each mechanical treatment.

- Were any unsafe acts noted?
- Were treatment objectives met within an acceptable range of results? :
- What should be done differently to obtain desired results or get better results?
- Was there any deviation from plan? If so, why?
- Were weather changes a factor in completing treatment?
- Problems and general comments:

5. Cost Accounting

Records of costs associated with the project will be kept by the fire program assistant.

6. Documentation and Reporting

The following table lists the reports and other documents required for prescribed fire operations.

Table 18 – Checklist of Non-Fire Fuel Treatment Documentation

Checklist of Mechanical Fuel Treatment Documents and Reports		
Document	**Revision or Preparation Frequency**	**Responsible Party**
FIREPRO Project Submission	Annual	FMO
Signed Project Plan	Each Project	Superintendent
Project Maps	Each Project	FMO\Project Manager
Notification Checklist	Each Project	Local Staff\Project Manager
Permits	Each Project	Local Staff
On-Site Effects Reporting	Each Project	Monitor
Unit Logs or Other Documentation	Each Project	Local\Project Staff
Contracts	Each Project	Local\Project Staff
Project Critique	Each Project	Project Staff

Time and filing deadlines are associated with each of these reports and will control scheduling and response times.

7. Annual Project List

The list is found in Appendix I

VI. FIRE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

A. FIRE ORGANIZATION STRUCTURE

1. Fire Management Officer

The Fire Management Officer will oversee all suppression operations and planned prescribed fires and is responsible for day to day fire management operations at the park level. Also has responsibility for planning training, arranging fitness testing, updating plans, preparing prescribed fire plans, WFSA for escaped wildland or prescribed fires.

2. Prevention-Education-WUI Specialist

This individual is involved in public outreach to explain the fire program from both a suppression/prevention viewpoint and a prescribed fire viewpoint. During wildland fire suppression operations, or planned prescribed fires, will act as liaison between NPS personnel, other agencies and general public. Also coordinates the Rural Fire Assistance Program with local fire departments.

3. Fire Program Assistant

Maintains all records for the fire program as well as keeping accounts, FIREPRO submissions, qualification records and fire reports (DI-1202) up to date. Serves as primary dispatcher supporting wildland and prescribed fire operations.

4. Engine Foreman

Maintains engines, other fire equipment and fire caches. Supervises park fire suppression crew. Is frequently the initial attack incident commander and provides support for prescribed fire operations.

5. Fire Use Module Foreman

Supervises Buffalo River Fire Use Module (FUM). Leads FUM support for park and interagency prescribed fire implementation.

B. FIREPRO FUNDING

FIREPRO funding is available for approved equipment needs and staffing. Project proposals, for prescribed fire, are submitted through normal channels for approval. BUFF supports a Fire Use Module that is available to assist other NPS units in the Midwest and southeastern U.S.

A total of 23 individuals (13.2 FTEs) are involved in the fire program and funded by FIREPRO. The permanent staff consists of 6 positions. Seven additional positions are subject to furlough with the remainder seasonal. Staff from the park also support fire management needs of other Arkansas Group Parks.

C. FIRE ORGANIZATION STRUCTURE RELATED TO PARK ORGANIZATION

1. Superintendent or Designee

Responsible for the overall program direction. Has final decision making authority for management operations. Approves and signs Interagency Agreements pertaining to the unit. Approves WFSA for wildland fires or escaped prescribed fires.

2. Fire Management Officer

The Fire Management Officer will oversee all suppression operations and planned prescribed fires and is responsible for day to day fire management operations at the park level. Position is located under the Chief of Resource Management.

3. Chief Ranger

During any fire operations, wildland fire or prescribed fires, acts as, or assigns, liaison between NPS personnel, other agencies and general public. Provides for investigation of human caused wildland fires and security of fire scenes and equipment

4. Chief of Resource Management

Supervises aspects of the fire management program including program direction, goals and objectives, prescribed fire planning and rehabilitation.

D. INTERAGENCY COORDINATION AND AGREEMENTS

The River maintains a good working relationship with local Volunteer Fire Departments, the Arkansas Forestry Commission and the Ozark National Forest.

The Arkansas-Oklahoma Interagency Coordination Center (AOICC) is managed by the Ouachita National Forest and can be contacted for assistance at any time circumstances dictate. This contact will initiate the response of any resources necessary for assistance to the River. AOICC is located at Hot Springs, AR.

Prescribed fire use in the Gene Rush Wildlife Management Area is done cooperatively with Arkansas Fish and Game Commission. An agreement is being developed and will be included in Appendix E when approved.

E. KEY INTERAGENCY CONTACTS

HA-RO-CO VFD	Carole Brooks	(870) 448-5841
Jasper VFD	Terry Brasel	(870) 446-2633
Krooked Creek VFD	Gerry Carlton	(870) 743-1800
Morningstar VFD	Richard Groves	(870) 448-5809
PG & S Fire Department	Jerry Willis	(870) 439-2571
Ralph-Caney VFD	Chuck Reimer	(870) 449-5549
Rea Valley VFD	Rick Beel	(870) 449-4741
Ozark NF Fire Staff Officer	Roger Fryar	(501) 964-7293
Ozark NF Sylamore RD FMO	Ronnie Anderson	(870) 269-3228
Ozark NF Bayou RD FMO	Mark Morales	(501) 284-3150
Ozark NF Buffalo RD FMO	Larry Faught	(870) 446-5122
AFC State Fire Chief	Don McBride	(501) 296-1870
AFC District 7 FMO	Eric Curl	(870) 269-3441
Arkansas Oklahoma Interagency	Dewey Watson	(501) 321-5231
Coordination Center (AOICC)		(501) 321-5232

F. FIRE-RELATED AGREEMENTS

Not all local fire departments are signed up with the Rural Fire Assistance Program. The following table lists participating fire departments with the areas protected that have agreements. These agreements may cover other non-law enforcement emergency responses (search and rescue, spills, structural fire, etc.) and are located in Appendix E.

Table 19 – Agreements with Local Fire Departments

Fire Department	Township Protected	Agreement Date
HA-RO-CO Volunteer Fire Department	HA-RO-CO Fire District	6/5/01
Jasper Volunteer Fire Department	Jasper Fire District	6/4/01
Krooked Kreek Volunteer Fire Department	Krooked Kreek Fire District	7/17/02
Morningstar Volunteer Fire Department	Morningstar Fire District	5/29/01
PG & S Fire Department	PG & S Fire District	7/17/01
Ralph-Caney Rural Volunteer Fire Department	Ralph-Caney Rural Fire District	3/19/02
Rea Valley Volunteer Fire Department	Rea Valley Fire District	6/22/01

VII. FIRE RESEARCH

A. PREVIOUS AND ONGOING FIRE RELATED RESEARCH

The only significant fire related research project on the unit in the past was a 1985 University of Oklahoma research study of the fire history for Buffalo National River. This study found data for presettlement times scarce due to unavailability of old hardwoods, pines and cedar trees for fire scar examination. Information from an off-site study in south-central Missouri was used to help develop information on fire return intervals.

B. FIRE RESEARCH NEEDS

A large number (15) of research needs were identified by River staff. The top five needs are listed below with a brief explanation of the project/need.

1. Updated Vegetation Maps

   These maps will provide information about vegetation changes since the last set of maps. This provides an opportunity to document gains or losses in habitat types important to the River's mission.

2. Update 1985 Fire History

   An update would document the efficacy of the current prescribed fire program in terms of proper fire return interval. Information produced would improve prescribed fire planning over the expected life span of the FMP.

3. Relationship of Fire to Canebrakes and Neotropical Migrants

   This proposal would document the effects of fire on both canebrakes and neotropical migrant birds. Both the habitat and users of the habitat appear to be declining in extent.

4. Pre-burn Cultural Resource Surveys

   Surveys would provide information to prescribed fire personnel about protection needs during preparation and execution during burns.

5. Effects of Smoke on Cave Habitats

   Because bats are frequently found in the caves along the river and there is potential for endangered bats to use those areas, this project would provide information useful in planning prescribed fire near caves.

Other projects proposed generally requested fire effects studies on sensitive species, exotic vegetative species, cultural objects and various miscellaneous studies.

VIII. MONITORING

A program to monitor fire effects is currently in development and a Fire Monitoring Plan has been drafted. The existing monitoring program consists of monitoring fire weather and behavior during prescribed fire operations. Evaluation of vegetative and fuel conditions will occur prior to any prescribed fire and at designated intervals thereafter. Data gathered from such monitoring will be used to develop future fire prescription parameters to determine the success of prescribed fire meeting the long-term objectives of the Open Fields Management Plan, Wilderness Plan and other documents that define a desired future condition.

A. SHORT-TERM MONITORING

The definition of short-term monitoring as used on this unit is monitoring done to measure vegetative response, fuel reduction and other measurable changes occurring immediately following fire application.

B. LONG-TERM MONITORING

Long-term monitoring is defined as that level of effort required to track changes in vegetative composition, wildlife use, vista maintenance or other changes occurring over a multi-year period.

C. MONITORING PLAN

The Monitoring Plan discusses in detail the level of effort for each habitat to be monitored. Included are specific results desired to measure goal achievement in the various habitats. All monitoring will be conducted in accordance with the NPS National Fire Monitoring Handbook. The plan is found in Appendix F.

IX. PUBLIC SAFETY

A. ISSUES AND CONCERNS

As hazards exist in both wildland and prescribed fires, safety will always be the highest priority. Smoke on roads on and adjacent to the unit is of concern. A significant amount of residential development is located near or adjacent to the River as well. Smoke from sources on and off the unit can be a safety issue to the visiting public. The flaming front of a fire can, potentially, put unsuspecting members of the visiting public at risk. For this reason, areas affected by fire of any cause will be closed to the public. Adjacent landowners will be notified when fire, particularly wildland fire, is a threat to off-unit residential areas.

B. MITIGATION

In order to make Service employees and the general public aware of such hazards, the following mitigation measures will be considered:

- General public will be made aware of wildland fires and prescribed fires through press releases and general interpretive presentations.
- The general public will not be allowed access to any areas affected by fire.
- Safety briefings will be conducted for NPS personnel prior to any participation in wildland suppression or prescribed fires.
- Appropriate regulatory and/or enforcement agencies will be notified prior to any prescribed fires to assist in safely managing pedestrian, equestrian or vehicular traffic. Warning signs will be posted along roads and trails as necessary.
- All fire personnel will be reminded of the "18 situations that Shout Watch Out" and will be expected to comply with the "10 Standard Fire Orders".

X. PUBLIC INFORMATION AND EDUCATION

A. CAPABILITY AND NEEDS

An excellent opportunity is available for fire information dissemination at each visitor contact area. To further public information and education, the following guidelines will be followed:

- Timely and accurate information will be provided to the media and River visitors regarding the status of fire actions and suppression efforts.
- Informational handouts explaining the fire management program will be prepared and updated as necessary. During periods when management fires are burning, these handouts will be distributed to River visitors and general public.
- The prescribed fire program will be discussed in informal contacts with all unit personnel, neighbors and visitors.
- Adjacent landowners will be notified when fire, particularly wildland fire, is a threat to off-River residential areas.

B. RESPONSE TO INCREASING FIRE ACTIVITIES

When the staffing class is at SC-4 or SC-5, Information will be prominently displayed at visitor contact points. Patrol activity on the River will be increased to detect potential fires and to monitor visitor activity. At SC-5 it may become necessary to close portions of the River to protect the public.

XI. PROTECTION OF SENSITIVE RESOURCES

A. ARCHEOLOGICAL/CULTURAL/HISTORIC RESOURCES

Archeological and historic resources found within BNR are irreplaceable. Therefore these sites and structures must receive special attention. Guidelines from NPS-28 and other legal mandates will be followed to protect these resources from fire.

1. Archeological Sites

Buffalo National River has numerous identified archeological sites scattered throughout the unit. The heat generated from a fire can cause the fracturing of lithic materials lying on or close to the surface. To protect these sites, the following actions will be taken:

- The Prescribed Burn Boss (RxBB) or Incident Commander (IC) will identify all sites that may be, or have been affected by active fire.
- For wildland fires – The degree of heat penetration into the soil is the primary concern. A fire moving with a high rate of spread and not burning down to the soil will have little effect on lithics. However, if the fire is slow moving and is consuming all fuel to the mineral soil, aggressive suppression will take place if firefighter safety will not be compromised.
- For prescribed fire – If the prescription calls for removal of more than 50% of the ground litter, the site will be excluded from the burn or wetline, foam or other techniques will be used to exclude fire from the site.
- The RxBB will not use handtools to construct fireline within any known site boundaries.
- If fire has already burned over a suspected site, the RxBB or IC will contact the archeologist to evaluate the site.
- The protection of sites will be done in such a manner as to not permit public disclosure.

If Native American human remains and/or objects are found during fire operations, the site will be evaluated by staff or regional archaeologists in accordance with Sec. 3, Native American Grave Protection Resource Act (NAGPRA).

2. Historical

Buffalo National River has several historic zones and many historic structures. Several Historic Districts are on the National Register of Historic Places and potentially historic structures are being evaluated for inclusion. All registered structures will be protected from fire externally unless a threat to firefighters exists that cannot be adequately mitigated.

3. Mitigation

Personnel taking part in suppression as well as prescribed fires will be briefed on the potential for disturbance of such resources. Any and all control actions undertaken will minimize the impact on such resources; wet line, foam and leaf blowers are the preferred minimum impact suppression techniques. Prescribed fire planning will consider all known resources within a burn unit. No construction of handlines will occur in connection with prescribed fire.

B. NATURAL RESOURCES

1. Resources

The vegetative resources are basically fire adapted given the correct prescription and require no specific protection. Most animal species are not likely to be adversely affected. Bats in caves may be affected by smoke and avoiding smoke impacts will be part of the prescribed fire planning process.

2. Mitigation

Until addition information is available, prescribed fire in riparian habitats and canebrakes will be applied as a research tool in limited areas. Until further information on effects of smoke on bats is available, caves containing endangered bats will be protected from smoke intrusion by burning under weather conditions that facilitate rapid smoke dispersal, and by keeping fire at least 200" from cave entrances.

C. INFRASTRUCTURE

1. Resources

NPS buildings on the unit include several maintenance, office and visitor facilities. The estimated value of these improvements in the 2002 FIREPRO run was $6,192,000. Several use and occupancy leases exist within the unit, most are scheduled for closure by 2005. A Boy Scout camp does exist within the unit and is expected to remain indefinitely. Protection of this facility is the responsibility of the Mount Sherman VFD. There are a number of locations with residential development at or near the unit boundary.

2. Mitigation

Because many park facilities are in areas of mowed lawns and not in the woodlands, there are no specific mitigation measures required for those facilities. Other facilities will require some hazard fuel reduction for protection. Following is a partial list of facilities requiring some hazard fuel management for protection: Lost Valley, Steel Creek Ozark House, Pruitt Maintenance and Ranger House, old Pruitt fire cache, Erbie Church. As other needs are identified, hazard fuel reduction projects will be scheduled.

XII. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

A. INTRODUCTION

1. Scope

All wildland fires and fire-related incidents will be reviewed. All prescribed fires will be reviewed as appropriate.

2. Reviews

Reviews are conducted for one or more of the following purposes:

a. To examine the progress of an on-going fire incident and to confirm effective decisions or correct deficiencies.

b. To identify new or improved procedures, techniques or tactics.

c. To compile consistent and complete information to improve or refine park, regional or national fire management programs.

d. To examine anomalous fire-related incidents in order to determine cause(s), contributing factors, and where applicable, recommends corrective actions. If negligence is indicated, the circumstances will be reported and investigated in accordance with applicable regulations, policies or guidelines.

e. To determine the cost effectiveness of a fire operation.

3. Authority

The authority to convene a fire review rests with the park superintendent, regional director, or the Associate Director, Park Operations and Education. It is the clear responsibility of the superintendent to call for a review, to insure timely completion, and to implement recommended actions. The regional director has responsibility to follow-up with the superintendent: that reviews are established and completed in a timely manner, and that recommended actions are completed. The superintendent may request technical support from Fire Management Program Center, regional, park or interagency personnel with the appropriate expertise.

4. Incident Types

All wildland fire incidents which result in human entrapment, fatalities, or serious injuries, or result in incidents with potential, will be investigated and reviewed.

5. Associate Director

The Associate Director, Park Operations and Education, will convene an ad-hoc team to review Service-wide fire management programs subsequent to the occurrence of any significant, controversial or unusual wildland fire management activities.

6. Purpose

All reviews will be conducted as constructive critiques aimed at determining the facts related to the specific fire or fire management program. They will identify commendable

actions, techniques and decisions as well as areas which need improvement. Reviews are intended to resolve operational issues, not impose punitive actions.

B. FIRE REVIEWS

1. "Hotline" Review

The purpose of the hotline review is to examine the progress of an on-going fire incident, regardless of size. The review will provide a confirmation of the decisions being made daily in the Wildland Fire Situation Analysis or determine where the decision process has been faulty and corrective actions are needed.

The "hotline" review is normally conducted by the park's fire management officer (or an official who has designated fire program management responsibilities) in conjunction with the incident commander on the fire.

These reviews require no special reporting. Documentation of "hotline" reviews should be included in the normal fire report narrative.

2. Incident Management Team (IMT) Closeout and Review

The park superintendent will conduct a closeout review with the IMT prior to their release from the fire incident. The purpose of this review is to ensure complete transition of the incident management back to the unit and to evaluate the status of any incomplete fire business. RM 18, Chapter 13, Exhibit 1 (http://www.nps.gov/fire/fire/policy/rm18/index.htm) contains a sample Close-Out Review with an Incident Management Team.

3. Unit Level Review

The superintendent or his/her designated representative should conduct the unit level review. The superintendent will appoint other qualified persons, including the unit fire management officer (or an official who has designated fire program management responsibilities) to be a part of the review. The purpose of this review is to provide the superintendent with information to recognize commendable actions and to take needed corrective action(s). Costs associated with the review will be charged to the account assigned to the fire with the approval of the regional fire management officer. A copy of the complete report will be sent to the regional fire management officer, who will review it and, if appropriate, forward a copy to the Fire Management Program Center.

4. Regional Level Review

A regional level review may be conducted for any fire that:

a. Crosses a park's boundary into another jurisdiction without the approval of an interagency agreement.

b. Results in adverse media attention.

c. Involves serious injury to less than 3 personnel, significant property damage, or an incident with potential.

d. Results in controversy involving another agency.

The regional level review normally will be conducted at the unit where the fire occurred. The regional fire management officer or his/her designated representative will convene

the review. Attendees will include the superintendent of the unit, unit fire management officer (or the official who has designated fire program management responsibilities), the incident commander(s) for the fire, and other individuals agreed upon by the regional director and superintendent. If possible, the review team should visit the actual fire site as part of the review. A copy of the review report will be sent to the Fire Management Program Center. Costs associated with the review will be charged to the account assigned to the fire.

5. National Level Review

A national level review may be conducted for any fire that involves Service wide or national issues, including:

a. Significant adverse media or political interest.

b. Multi-regional resource response.

c. A substantial loss of equipment or property.

d. A fatality, or multiple, serious fire-related injuries (three or more personnel).

e. Any other fires that the Associate Director, Park Operations and Education, wants reviewed.

The national level review normally will be conducted at the unit where the fire occurred. The National Fire Management Officer or his/her designated representative will convene it. It will be attended by the superintendent of the unit, the unit's fire management officer (or an official who has designated fire program management responsibilities), the regional fire management officer, the incident commander(s) for the fire, and other individuals agreed upon by the National Fire Management Officer, the regional director and the superintendent. If possible, the review team should visit the actual site of the fire as part of the review. All costs associated with the review will be charged to the account assigned to the fire.

RM 18, Chapter 13, Exhibit 2 (http://www.nps.gov/fire/fire/policy/rm18/index.htm) provides an outline for final reports of fire reviews. RM 18, Chapter 13, Exhibit 3 (http://www.nps.gov/fire/fire/policy/rm18/index.htm) provides a checklist of sample questions, which might be asked during a fire review. These two documents should be used for unit, regional and national level reviews.

6. Entrapment and Fire Shelter Deployment Review

Fire shelter deployment is defined as the use of a fire shelter for its intended purpose in any situation other than training. Use of the terms "precautionary deployment", "practice deployment" and "entrapment deployment" are not acceptable or recognized. Entrapments and fire shelter deployments will be reviewed in order to gather complete and accurate information to determine the reasons for the deployment. Corrective recommendations will be developed to minimize future situations which might lead to other shelter deployments. All entrapments and fire shelter deployments will be reported to the regional fire management officer, who will be responsible for developing the review team in cooperation with the Fire Management Program Center. The team leader will contact the superintendent for reporting information. See Safety & Health RM 18, Chapter 3 (http://www.nps.gov/fire/fire/policy/rm18/index.htm) for investigation and reporting requirements.

All entrapments and fire shelter deployments will be investigated as soon as possible after the deployment incident. RM 18, Chapter 13, Exhibit 4 (http://www.nps.gov/fire/fire/policy/rm18/index.htm) provides specific directions for conducting an entrapment or shelter deployment review. RM 18, Chapter 13, Exhibit 5 (http://www.nps.gov/fire/fire/policy/rm18/index.htm) provides an outline format for final reports on entrapment and fire shelter deployment reviews.

C. PROGRAM REVIEWS

1. Operations Evaluations

Operations evaluations of NPS units and regions may include review of fire management programs to assure compliance with established Service standards.

2. Annual Fire Program Review

The superintendent will convene an ad-hoc team to review park fire activity during any year in which significant, unusual or controversial fire activity occurs. This review team should analyze the reports from any reviews to determine what, if any, operational changes should be initiated. The review team will develop findings and recommendations and establish priorities for action.

3. FIREPRO Review

Annually, the FMO will conduct a FIREPRO audit and review of the park values at risk, research, equipment and project needs. This review will be completed on the schedule set by the Fire Management Program Center.

4. Fire Readiness Review

Fire readiness or preparedness reviews, utilizing the Interagency Fire Readiness Review Guide as adapted for park-specific needs, should be conducted annually prior to the established fire season by park fire management staff.

XIII. CONSULTATION AND COORDINATION

The following individuals and groups were consulted during the preparation of this plan.

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XIV. APPENDICES

APPENDIX A

A. REFERENCES CITED

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Arkansas Voluntary Smoke Management Guidelines (http://www.arkforests.org/interest.htm)

Clean Air Act (PL 88-206, as amended), (http://www.epa.gov/oar/oaq_caa.html)

Common names of plants found at (http://plantsdatabase.com/)

Cultural Resource Management references
(http://archnet.asu.edu/archnet/topical/crm/crmusdoc.html)

Endangered Species Act of 1973 (http://endangered.fws.gov/esa.html)

Fire Effects Information System for common names of plants found at
(http://www.fs.fed.us/database/feis/)

National Fire Plan (http://www.fireplan.gov/)

National Historic Preservation Act (http://www4.law.cornell.edu/uscode/16/470.html)

National Park Service DO-18, Wildland Fire Management
(http://www.nps.gov/fire/fire/policy/do18/do18.htm)

National Park Service RM-18, Wildland Fire Management
(http://www.nps.gov/fire/fire/policy/rm18/index.htm)

University of Wisconsin Herbarium for common names of plants at
(http://wiscinfo.doit.wisc.edu/herbarium/)

U.S. Department of Agriculture Plants Database for plant information and common names at
(http://plants.usda.gov/ http://plants.usda.gov/)

U.S. Geological Survey, Northern Prairie Research Center herbarium listing for common names of plants at (http://www.pwrc.usgs.gov/history/herbarium/category.htm)

APPENDIX B

B. DEFINITIONS

A consistent list of terms and their definitions has been developed and approved by the NWCG. This list of defined terms includes terms obsolete under the new policy. Additional terms used in this reference guide but not defined by NWCG are from the Fire Effects Information System and other sources. The sources may be found in the References Cited (Appendix A).

Appropriate Management Response – Specific actions taken in response to a wildland fire to implement protection and fire use objectives. This term is a new term that does not replace any previously used term.

Backfire – A fire set along the inner edge of a fireline to consume the fuel in the path of a fire or to change the fire's convection column.

BI – Burning Index. A number related to the contribution that fire behavior makes to the amount or effort needed to contain a fire in a particular fuel type within a rating area. An Index for describing Fire Danger.

Climax – A biotic community that is in equilibrium with existing environmental conditions and represents the terminal stage of an ecological succession (Smith 2000).

Confinement – A wildland fire management strategy which allows the fire to burn within determined natural or existing boundaries such as rocky ridges, streams, trails, and possibly roads.

Cover – The proportion of ground covered by the aerial parts of individuals of a species, usually expressed as a percentage (Grieg-Smith 1983). Total cover for all species on a site can exceed 100%. However, TOP-COVER, the proportion of ground for which a species provides the uppermost cover, cannot exceed 100% (Grieg-Smith 1983). Mueller-Dombois and Ellenberg (1974) consider basal area a special kind of "cover," but FEIS does not usually use COVER in this way.

Crown Fire – Fire that burns in the crowns of trees and shrubs. Usually ignited by a surface fire. Crown fires are common in coniferous forests and chaparral-type shrublands (Brown 2000).

Direct Effects of Fire – Described in FEIS plant species summaries under FIRE EFFECTS; IMMEDIATE FIRE EFFECT ON PLANT and DISCUSSION AND QUALIFICATION OF PLANT RESPONSE.

Duff – Partially decomposed organic matter lying beneath the litter layer and above the mineral soil. Includes the fermentation and humus layers of the forest floor (02 soil horizon) (Brown 2000).

Ecosystem – An interacting system of interdependent organisms.

Expected Weather Conditions – Those weather conditions indicated as common, likely, or highly probable based on current and expected trends and their comparison to historical weather records. They are the most probable weather conditions for this location and time. These conditions are used in making fire behavior forecasts for different scenarios (one necessary scenario involves fire behavior prediction under "expected weather conditions).

Experienced Severe Weather Conditions – Those weather conditions that occur infrequently, but have been experienced on the fire site area during the period of weather records. For example, rare event weather conditions that significantly influence fires may have occurred only once, but their record can be used to establish a baseline for a worst-case scenario. These are the most severe conditions that can be expected. These conditions are used in making fire behavior forecasts for different scenarios (one necessary scenario involves fire behavior prediction under "experienced severe weather conditions).

Fire Cycle – Length of time for an area equal to the entire area of interest to burn; size of the area of interest must be clearly specified (McPherson and others 1990).

Fire Duration – The length of time that combustion occurs at a given point. Fire duration relates closely to downward heating and fire effects below the fuel surface as well as heating of tree boles above the surface.

Fire Exclusion – The policy of suppressing all wildland fires in an area (Smith 2000).

Fire Frequency = Fire Occurrence – Number of fires per unit time in a specified area (McPherson and others 1990).

Fire Intensity – A general term relating to the heat energy released in a fire. FEIS usually uses more specific terms to describe rate of heat release. See FIRELINE INTENSITY below.

Fire Interval – Time (in years) between two successive fires in a designated area (i.e., the interval between two successive fire occurrences); the size of the area must be clearly specified (McPherson and others 1990).

Fire Management Plan (FMP) – A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans and prevention plans.

Fire Management Unit (FMU) – Any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that sets it apart from management characteristics of an adjacent unit. FMU's are delineated in Fire Management Plans (FMP). These units may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

Fire Regime – Describes the patterns of fire occurrence, size, and severity - and sometimes, vegetation and fire effects as well - in a given area or ecosystem (Agee 1994, Mutch 1992, Johnson and Van Wagner 1985). A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured. The fire regime on a particular kind of site or in a particular ecosystem is not cyclic in a deterministic sense; it is, rather, a story about climate, human use, other disturbance, and species dispersion as they have all changed and interacted to affect an ecosystem, both suddenly and subtly, over millennia. The concept of fire regime as story lets us think about the future in that type or ecosystem as a question, perhaps a choice, rather than a destiny. According to Agee (1994), "A fire regime is a generalized way of integrating various fire characteristics. The organization may be according to the characteristics of the disturbance..., dominant or potential (climax) vegetation on the site..., or fire severity, the magnitude of effects on dominant vegetation...." According to

Mutch (1992), "A natural fire regime is the total pattern of fires over time that is characteristic of a natural region or ecosystem. The classification of fire regimes includes variations in ignition, fire intensity and behavior, typical fire size, fire return intervals, and ecological effects." According to Johnson and Van Wagner (1985), "... fire regime is a multivariate system characterized by (i) the fire history measured in fire frequency or fire return period, (ii) fire intensity measured in kW/m, and (iii) depth of burn (duff removed) measured in kg/m, or percent...."

Fire-Resistant Species – Species with morphological characteristics that give it a lower probability of being injured or killed by fire than a FIRE-SENSITIVE species, which has a "relatively high" probability of being injured or killed by fire (McPherson and others 1990). Implies that the organism does not get injured by things that would seem able to injure it (Johnson and Van Wagner 1985). (Rowe (1983) uses a more restrictive definition of resistance - relating it only to plants with aboveground parts that survive fire.)

Fire Severity – Degree to which a site has been altered or disrupted by fire; also used to describe the product of fire intensity and residence time (McPherson and others 1990, Agee 1994, Rowe 1983).

Fire Suppression Specialist – Staff specialist with primary duties of managing the preparedness and suppression programs.

Fire Use – The combination of wildland fire use and prescribed fire application to meet resource objectives

Fireline Intensity – The rate of heat release per unit time per unit length of fire front. Numerically, the product of the heat of combustion, quantity of fuel consumed per unit area in the fire front, and the rate of spread of a fire, expressed in kW/m (McPherson and others 1990).

Flame Length – The length of flames in a fire front measured along the slant of the flame, from the midpoint of its base to its tip. Flame length is mathematically related to fireline intensity and tree crown scorch height (Brown 2000).

FMO – Fire Management Officer.

FMP – Fire Management Plan.

Fuel – Fuel is comprised of living and dead vegetation that can be ignited. It is often classified as dead or alive and as natural fuels or activity fuels (resulting from human actions, usually from logging operations). Fuel components refer to such items as downed dead woody material by various size classes, litter, duff, herbaceous vegetation, live foliage etc. (Brown 2000).

Fuel Continuity – A qualitative description of the distribution of fuel both horizontally and vertically. Continuous fuels readily support fire spread. The larger the fuel discontinuity, the greater the fire intensity required for fire spread (Brown 2000).

Fuel Loading – The weight per unit area of fuel, often expressed in tons per acre or tonnes per hectare. Dead woody fuel loadings are commonly described for small material in diameter classes of 0 to 1/4-, 1/4 to 1-, and 1 to 3-inches and for large material in one class greater than 3 inches (Brown 2000).

Fuel Moisture – percent or fraction of oven dry weight of fuel. It is the most important fuel property controlling flammability. In living plants it is physiologically bound. Its daily fluctuations vary considerably by species but are usually above 80 to 100%. As plants

mature, moisture content decreases. When herbaceous plants cure, their moisture content responds as dead fuel moisture content, which fluctuates according to changes in temperature, humidity, and precipitation (Brown 2000).

FWS – U.S. Fish and Wildlife Service, Department of the Interior.

GIS – Geographic Information System

GMP – General Management Plan. A park document that describes broad management goals and objectives for NPS units.

GPS – Geographic Positioning System

Ground Fire – Fire that burns in the organic material below the litter layer, mostly by smoldering combustion. Fires in duff, peat, dead moss and lichens, and punky wood are typically ground fires (Brown 2000).

Hazard Fuel – A fuel complex that, by nature, presents a hazard to socio-politico-economic interests when ignited. The hazard fuel condition can be mitigated through hazard fuel reduction.

Hazardous fuels – Those vegetative fuels which, when ignited, threaten: public safety, structures and facilities, cultural resources, natural resources, and/or natural processes. Also: fuels that permit the spread of wildland fires across administrative boundaries except as authorized by agreement, and fuel accumulations and arrangement may be within the natural range of variability and still be hazardous because of the proximity to values at risk.

Headfire – A fire spreading or set to spread with the wind (National Wildfire Coordinating Group 1995).

ICMR – Incident Commander Multiple Resources

ICSR – Incident Commander Single Resource.

Initial Attack – The first aggressive suppression action taken on a fire, consistent with firefighter and public safety, and values to be protected.

Initial Attack Incident Commander – Leader of first response fire suppression forces.

Ladder Fuels – Shrubs and young trees that provide continuous fine material from the forest floor into the crowns of dominant trees (Smith 2000).

Litter – The top layer of the forest floor (01 soil horizon); includes freshly fallen leaves, needles, fine twigs, bark flakes, fruits, matted dead grass and other vegetative parts that are little altered by decomposition. Litter also accumulates beneath rangeland shrubs. Some surface feather moss and lichens are considered to be litter because their moisture response is similar to that of dead fine fuel.

Long-Term Effects – Effects lasting more than 10 years. (Personal communication (Oct. 21, 1998) with Wendell Hann, Fire Ecologist and assistant to National Fuels Specialist, U.S. Department of Agriculture, Forest Service).

Mast – Fruits of all flowering plants used by wildlife, including fruits with fleshy exteriors (such as berries) and fruits with dry or hard exteriors (such as nuts and cones).

Mean Fire Interval – Arithmetic average of all FIRE INTERVALs determined, in years, for a designated area during a specified time period; the size of the area and the time period must be specified.

Mitigation Actions – Mitigation actions are considered to be those on-the-ground activities that serve to check, direct, or delay the spread of fire; and minimize threats to life, property, and resources. Actions may include mechanical and physical non-fire tasks, specific fire applications, and limited suppression actions. These actions will be used to construct firelines, reduce excesssive fuel concentrations, reduce vertical fuel continuity, create fuel breaks or barriers around critical or sensitive sites or resources, create "blacklines" through controlled burnouts, and to limit fire spread and behavior.

Mixed-Severity Fire Regime – Fire regime in which fires either cause selective mortality in dominant vegetation, depending on different species' susceptibility to fire, or vary between understory and stand replacement (Smith 2000).

MOA – Memorandum of Agreement

MOU – Memorandum of Understanding.

National Fire Danger Rating System (NFDRS) – A widely used system to predict several measures of fire probability and resistance to control.

National Fire Plan (NFP) – A plan prepared by agencies of the U.S. Departments of Agriculture and Interior to reduce adverse effect from unwanted wildland fires.

Natural Fire – Fires ignited by natural means (usually lighting).

NFFL Model – One of the thirteen fuel models used to predict fire behavior using the fire spread formulas developed by Rothermel (1972).

NPS – National Park Service, Department of the Interior.

Organic Soils – Deep layers of organic matter that develop in poorly drained areas such as bogs, swamps, and marshes (Brown 2000).

Preparedness – Activities that lead to a safe, efficient and cost effective fire management program in support of land and resource management objectives through appropriate planning and coordination. This term replaces presuppression.

Prescribed Fire – Any fire ignited by management actions to meet specific objectives. Prior to ignition, a written, approved prescribed fire plan must exist, and National Environmental Protection Act requirements must be met. This term replaces management ignited prescribed fire.

Presettlement Fire Regime – The time from about 1500 to the mid- to late-1800s, a period when Native American populations had already been heavily impacted by European presence and before extensive settlement by European Americans in most parts of North America, before extensive conversion of wildlands for agricultural and other purposes, and before fires were effectively suppressed in many areas (Smith 2000).

Prescribed Fire Plan – A plan required for each fire application ignited by managers. It must be prepared by qualified personnel and approved by the appropriate Agency Administrator prior to implementation. Each plan will follow specific agency direction and must include critical elements described in agency manuals. Formats for plan development vary among agencies, although the content is identical.

Prescribed Fire Specialist – The staff specialist with primary duties of managing both the prescribed fire and Wildland Fire Used for Resource Benefit (where applicable) programs.

Prescription – Measurable criteria which define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social or legal considerations.

Relict – A biotic community or fragment of a community that has survived some important change, often to become in appearance an integral part of existing vegetation

Resource Management Plan (RMP) – Park planning document that describes resource management goals and objectives for NPS units.

Sere – A succession of plant communities leading to a particular plant association (Smith 2000).

Short-Term Effects – Effects lasting less than 10 years (Personal communication (Oct. 21, 1998) with Wendell Hann, Fire Ecologist and assistant to National Fuels Specialist, U.S. Department of Agriculture, Forest Service).

Snag – A standing dead tree from which the leaves and some of the branches have fallen (Smith 2000).

Stand-Replacement Fire Regime – Fire regime in which fires kill or top-kill aboveground parts of the dominant vegetation, changing the aboveground structure substantially. Approximately 80 percent or more of the aboveground, dominant vegetation is either consumed or dies as a result of fires. Applies to forests, shrublands, and grasslands (Smith 2000).

Succession – The gradual, somewhat predictable process of community change and replacement leading toward a climax community; the process of continuous colonization and extinction of populations at a particular site (Smith 2000).

Suppression – see Wildland Fire Suppression

Surface Fire – Fire that burns in litter and other live and dead fuels at or near the surface of the ground, mostly by flaming combustion (Brown 2000).

T&E – Threatened and Endangered plants and animals. Also referred to as listed species.

Top-Kill – Kills aboveground tissues of plant without killing underground parts from which the plant can produce new stems and leaves (Smith 2000).

Total Heat Release – The heat released by combustion during burnout of all fuels, expressed in BTU per square foot or kilocalories per square meter (Brown 2000).

Underburn – Understory fire.

Understory Fire Regime – Fire regime in which fires are generally not lethal to the dominant vegetation and do not substantially change the structure of the dominant vegetation. Approximately 80 percent or more of the aboveground dominant vegetation survives fires. Applies to forest and woodland vegetation types (Smith 2000).

Urban Interface – Locating structures (homes, offices, and other developments) in wildland fuel complexes. Also known as wildland-urban interface.

Urban Intermix – Locating structures (homes, offices, and other developments) in wildland fuel complexes. Also known as wildland-urban interface.

USFS – United States Forest Service

Wildfire – An unwanted wildland fire. *This term was only included to give continuing credence to the historic fire prevention products. This is NOT a separate type of fire.*

Wildland Fire – Any non-structure fire, other than prescribed fire, that occurs in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Wildland Fire Management Program – The full range of activities and functions necessary for planning, preparedness, emergency suppression operations, and emergency rehabilitation of wildland fires, and prescribed fire operations, including non-activity fuels management to reduce risks to public safety and to restore and sustain ecosystem health.

Wildland Fire Situation Analysis (WFSA) – The decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives.

Wildland Fire Suppression – An appropriate management response to wildland fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire. All wildland fire suppression activities provide for firefighter and public safety as the highest consideration, but minimize loss of resource values, economic expenditures, and/or the use of critical firefighting resources.

Wildland Fire Use – The management of naturally-ignited wildland fires to accomplish specific, pre-stated, resource management objectives in pre-defined geographic areas outlined in Fire Management Plans. Operational management is described in the Wildland Fire Implementation Plan (WFIP). Wildland fire use is not to be confused with "fire use," a broader term encompassing more than just wildland fires.

APPENDIX C

C. SPECIES LISTS

The following table lists the Federally listed Threatened and Endangered species found on (K), or with potential to be found on (P), Buffalo National River.

Table 20 – Federally Listed Threatened and Endangered Species

Common Name	Scientific Name	Listing Status
	Plants	
Eastern Prairie Fringed Orchid (P)	*Platanthera leucophaea*	T
	Mammals	
Gray Bat (K)	*Myotis grisescens*	E
Indiana Bat (K)	*Myotis sodalis*	E
Ozark Big-Eared Bat(K)	*Corynorhinus (=Plecotus) townsendii ingens*	E
	Birds	
Bald Eagle (K)	*Haliaeetus leucocephalus*	T

Species lists of plants, mammals and birds commonly found on Buffalo National River may be found in the Interactive Species Database at the University of California, Davis.

APPENDIX D

D. NEPA, NHPA AND ENDANGERED SPECIES COMPLIANCE

Copy of the EA and documentation of NHPA compliance in form of letter or other document from State Historic Preservation Officer and section 7 consultation to be added here.

APPENDIX E

E. ANNUAL REVISION DOCUMENTS

1. Fire Call-up List

Interagency Coordination and Public Information

Notifications:

Arkansas Forestry Commission Dispatch	501-332-2000/4445
Arkansas Oklahoma Interagency Coordination Center (AOICC)	501-321-5231
Harrison Police Department	870-365-0799
Newton County Sheriff's Office	870-446-5124
Searcy County Sheriff's Office	870-448-2340
Marion County Sheriff's Office	870-449-4236
Pruitt Ranger Station	870-446-5373
Tyler Bend Ranger Station	870-439-2502
Buffalo Point Ranger Station	870-449-4311/4310

Ambulance Services:

North Arkansas Medical Center	870-365-2000
Flippen, Yellville & Summit	870-449-6211
Marshall	870-448-5855

Emergency Medevac Helicopter

Air-Evac-Lifeteam (Yellville)	1-800-247-3822

CLOSEST MEDICAL BURN UNIT

Childrens Hospital (Little Rock, AR)	501-364-1230

Individual firefighter and fire support personnel lists are maintained at the Fire Management Office.

2. Preparedness Inventory

The tables following contain the inventory of each of the three caches on the River.

Table 21 – Pruitt Cache Inventory

Pruitt Fire Cache Inventory		
10/18/02		
Item	**On Hand**	**Stocking Level**
PPE		
Fire Shelter (complete unit)	5	5
Nomex pants (misc. sizes, jeans)	4	5
Nomex pants, 32 x 34	8	5
Nomex pants, 34 x 34	3	5
Nomex shirt, large	5	5
Ear Plugs, 1 box	1	1
Glasses, safety, clear	0	5
Gloves, large	0	5
Goggles, clear	5	5
Hard Hat	5	5
Water Handling		
Backpack Pump, nylon	5	5
Backpack Pump, rigid can	3	3
Foam, *Fire-Trol*, 5 gal.	3	1
Foam, *Silvex*, 5 gal.	1	1
Hose, 1" 100 ft. synthetic lined	2	5
Hose, 1.5" 100 ft. CJRL	12	10
Hose, 1.5" 100 ft. synthetic lined	24	30
Hose, 1.5" 50 ft. CJRL	8	10
Hose, 1.5" 50 ft. cotton	8	
Hose, 3/4" 50 ft. synthetic lined	2	5
Miscellaneous Supplies		
Batteries, AA, 1 box (24 ea.)	0	3
Batteries, D, 1 box (8 ea.)	0	3
Canteen case, cloth	8	10
Canteen, 1 qt.	17	10
Equipment Belt (web gear)	8	5
Fireline Pack, *GSA*, yellow	5	5
First Aid Kit, personal	5	5
Head Lantern *(D cell)*	5	
Headlamp Bulb, spare	5	5
Headlamp, firefighter's *(AA cell)*	2	5
Sleeping Bag, summer	10	5
Handtools		
Council Rake	10	10
Flapper	2	2
Leaf Rake	10	10
Pulaski	10	10
Shovel, forest fire	5	10

Table 22 – Tyler Bend Cache Inventory

Tyler Bend Fire Cache Inventory		
10/18/02		
Item	**On Hand**	**Stocking Level**
PPE		
Shirt, large	12	10
Shirt, large, long	2	4
Shirt, medium	32	10
Shirt, medium, long	4	4
Shirt, small	1	4
Shirt, small, long	2	2
Shirt, XL	1	10
Shirt, XL, long	4	4
Shirt, XXL	2	4
Shirt, XXL. Long	2	4
Pants, BDU, 26-30 x 30	0	4
Pants, BDU, 30-34 x 30	0	4
Pants, BDU, 32-36 x 30	0	4
Pants, BDU, 34-38 x 30	0	4
Pants, BDU, 36-40 x 30	0	4
Pants, BDU, 40-44 x 30	0	4
Pants, BDU, 26-30 x 34	0	4
Pants, BDU, 28-32 x 34	0	4
Pants, BDU, 30-34 x 34	7	6
Pants, BDU, 32-36 x 34	6	6
Pants, BDU, 34-38 x 34	0	4
Pants, BDU, 36-40 x 34	0	6
Pants, BDU, 40-44 x 34	4	4
Pants, Jeans, 30 x 30	1	NR
Pants, Jeans, 32 x 30	7	NR
Pants, Jeans, 34 x 30	1	NR
Pants, Jeans, 36 x 30	2	NR
Pants, Jeans, 38 x 30	1	NR
Pants, Jeans, 40 x 30	3	NR
Pants, Jeans, 30 x 34	5	NR
Pants, Jeans, 32 x 34	21	NR
Pants, Jeans, 34 x 34	6	NR
Pants, Jeans, 36 x 34	2	NR
Pants, Jeans, 38 x 34	1	NR
Pants, Jeans, 40 x 34	0	NR
Pants, Jeans, 35 x 37	0	NR
Pants, Jeans, 32 x 32	2	NR
Pants, Jeans, 28 x 34	2	NR
Pants, Jeans, 26 x 30	1	NR
Brush Jacket Liner, small	5	NR
Brush Jacket, small	5	NR
Brush Jacket Liner, medium	2	NR
Brush Jacket, medium	3	NR
Brush Jacket Liner, large	1	NR
Brush Jacket, large	3	NR

Tyler Bend Fire Cache Inventory		
10/18/02		
Item	**On Hand**	**Stocking Level**
Brush Jacket Liner, extra large	1	NR
Brush Jacket, extra large	4	NR
Water Handling		
Adapter, 1.5" NH – 1.5" NPSH	3	2
Adapter, 1.5" NPSH – 1.5" NH	0	2
Cap, 1.5"	6	2
Clamp, Fire Hose	4	4
Double-female, 1" NPSH	0	2
Double-female, 1.5" NH	3	2
Double-male, 1" NPSH	3	2
Double-male, 1.5" NH	3	2
Foam, *Fire-Trol*, 5 gal.	2	2
Foam, *Silvex*, 5 gal.	3	2
Foot Valve w/ strainer, 1.5" NH	3	2
Gasket, hose, assorted	1	1
Hose, synthetic 1", 100 ft.	1	4
Hose, synthetic 1.5", 100 ft.	0	4
Hose, synthetic 3/4", 50 ft.	8	6
Mop-up wand	3	4
Nozzle Tip, 3 gpm fog	1	4
Nozzle Tip, 3/16" straight stream	3	4
Nozzle Tip, 3/8" straight stream	1	2
Nozzle, 1" aluminum barrel-type	5	2
Nozzle, 1" brass barrel	2	2
Nozzle, 1" plastic barrel-type	3	2
Nozzle, 1.5" aluminum barrel	0	2
Nozzle, 1.5" *Bubble Cup*	3	2
Nozzle, 1" *QuadraFog*	3	2
Nozzle, 1.5" plastic barrel-type	4	2
Nozzle, 1.5" foam	0	2
Nozzle, 3/4" foam	0	2
Nozzle, 3/4" garden hose, brass	2	2
Nozzle, Forester Fog	2	4
Pressure Relief Valve, 1.5"	2	2
Pail, collapsible, 3 gal.	1	2
Pump, Backpack	1	4
Reducer, 1" NPSH - ¾ NH"	16	5
Reducer, 1.5" NH - 1" NPSH	12	5
Reducer, 1.5" NPSH – 1" NPSH"	1	5
Reducer, 2.5" NPSH – 1.5" NH	0	5
Tee, capped, 1" NPSH - 1" NPSH	4	5
Tee, capped, 1.5" NH - 1" NPSH	20	5
Tee, valved, 1.5" NH – 1" NPSH	4	5
Valve, 1" gated wye	2	2
Valve, 1.5" gated wye	6	2
Valve, 3/4" gated wye	1	4
Valve, Ball Shut-off, 1" NPSH	3	2
Valve, Ball Shut-off, 1.5" NH	1	2
Valve, Shut-off, 3/4" garden hose	4	4

Tyler Bend Fire Cache Inventory		
10/18/02		
Item	**On Hand**	**Stocking Level**
Wrench, hydrant	3	2
Wrench, spanner, 1" – 1.5"	10	4
Wrench, spanner, 1" – 2.5"	1	2
Wrench, spanner, universal	3	2
Wye, 1.5" to 1" ungated	4	2
Saw Supplies		
Air Filter	0	3
Air Filter	0	3
Axe, single bit	1	2
Bar Oil, 1 gal.	2	6
Chaps, chainsaw, 32"	0	2
Chaps, chainsaw, 36"	4	2
Fuel Bottle, aluminum,1 liter	7	5
Fuel Bottle, aluminum, 33 oz.	6	5
File, chain saw, 7/32"	36	12
Nut, bar cover	5	6
Saw chain, *Carlton*, 100 ft.	1	1
Saw Kit (field pouch)	1	5
Scrench	10	5
Spark plug	2	5
Spark plug	3	5
Wedge, large	9	5
Wedge, medium	5	5
Wedge, small	2	5
Handtools		
Brush Hook	6	2
Council Rake	13	10
Flapper	7	5
Leaf Rake	17	10
McCleod	10	5
Pulaski	10	10
Fire Broom	2	2
Shovel, standard blade	6	2
Shovel, flat blade	3	2
Shovel, forest fire	13	5
Ax, single-bit	3	1
Ax, double-bit	6	2
Adze	2	2
Pick-Ax	2	2
Miscellaneous Supplies		
Antifreeze, gal.	1	1
Batteries, AA, 1 box (24 ea.)	8	6
Batteries, C, 1 box (4 ea.)	1	1
Batteries, D, 1 box (8 ea.)	1	5
Caution Flasher	4	4
Dolmar, 1.5 gal	2	3
Drip Torch	5	4
File, flat, 10"	6	5
File, flat, 12"	6	5

Tyler Bend Fire Cache Inventory		
10/18/02		
Item	**On Hand**	**Stocking Level**
Fire Shelter, training system	11	10
Fluid, brake	0	2
Fluid, power steering	1	2
Fluid, purging, pint, 1 dozen	1	1
Fluid, transmission, quart.	0	2
Fluid, windshield washer, gal.	1	1
Fusee, 1 box (72 ea.)	1	1
Gas treatment, *Stabil*, 32 oz.	2	2
Helmet, large	2	2
Helmet, medium	2	2
Helmet, X-large	1	2
Oil, *Rotella*, 15W40, gal.	1	1
Oil, Two-cycle, *Stihl*, 8 oz.	10	6
Oil, Vehicle, 10W30, quart.	0	6
Radio Charger (mobile), *King*	4	4
Rations, box (12 ea.)	1	3
Sign, "Prescribed Fire"	2	2
Sign, "Smoke Ahead"	1	2
Sleeping Bag, cold weather	5	5
Sleeping Bag, summer	11	10

Table 23 – Buffalo Point Cache Inventory

Buffalo Point Fire Cache Inventory		
10/18/02		
Item	**On Hand**	**Stocking Level**
Tools		
Leaf Rake	3	
Flapper	8	
McLeod	8	
Council Tool	6	
Pulaski	6	
Shovel	5	
Axe-single bit	6	
Axe-double	3	
Brush Hook	2	
Bow Saw	1	
Trimmer	1	
Chain Saw	1	
Chain Saw with kit	2	
Back-Pack Pump	3	
Drip Torch	1	
Fusees	16	
Belt Wx Kit	1	
Foam	15 gal	
Flagging	6 roll	

Buffalo Point Fire Cache Inventory		
10/18/02		
Item	**On Hand**	**Stocking Level**
PPE		
Shirt, Small	4	
Shirt, Med	6	
Shirt, Lrg	5	
Shirt, Xlrg	0	
Pant, 30	5	
Pant, 32	3	
Pant, 34	8	
Pant, 36	5	
Pant, 38	3	
Helmet	10	
Helmet Suspension	8	
Safety Goggle	2	
Ear Plug	1 bx	
Glove, sm	0	
Glove, med	1	
Glove, lg	1	
Glove, xlg	1	
Miscellaneous Equipment		
Red Pack	4	
Yellow Pack	7	
Fire Shelter w/case and Cover	6	
Fire Shelter - Practice	3	
Head lamp	2	
Vest	2	

3. Cooperative Agreements

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

Memorandum of Understanding between the National Park Service and the Rea Valley Volunteer Fire Department

Agreement#G7150010004

ARTICLE I - BACKGROUND AND OBJECTIVES

This agreement is entered into by and between the National Park Service (hereinafter "NPS"), United States Department of the Interior, acting through the Superintendent of Buffalo National River (hereinafter "Park"), and the Rea Valley Fire Department acting through its Assistant Chief. The purpose of this agreement is to establish the terms and conditions under which the parties will provide mutual assistance in preventing, detecting, and suppressing structural fires and wildfire and in conducting search and rescue operations on lands within the Park's boundaries, within the Rea Valley Fire District, and in the immediate surrounding area.

Currently the NPS is primarily responsible for providing, through an interagency acquisition agreement with the Forest Service, United States Department of Agriculture, fire prevention, detection, and suppression and for conducting search and rescue operations on federally owned land within the Park. The Rea Valley Fire Department is primarily responsible for providing fire prevention, detection, and suppression and for conducting search and rescue operations within the Rea Valley Fire District and in the immediate surrounding area (including non-federally owned land within the Park's boundaries).

ARTICLE II - AUTHORITY

This agreement is entered into under the authority of 42 U.S.C. § 1856a (1994).

ARTICLE III - STATEMENT WORK

A. The NPS agrees to,

1. Furnish, when requested by the Rea Valley Fire Department, qualified, on-duty NPS employees to assist in the suppression of structural fires and wildfires and in search and rescue operations within the Rea Valley Fire District or in the immediate surrounding area whenever the furnishing of such assistance does not seriously impact the conduct of Park business. For purposes of interpreting this agreement, NPS employees are deemed to be "on duty" from 8:00 a.m. to 5:00 p.m., Monday through Friday. Authorized, on-duty NPS employees shall be deemed to be acting within the scope of their federal employment when responding to calls from the fire department.

2. Provide federal worker's compensation coverage for authorized, on-duty NPS employees who respond to calls from the Rea Valley Fire Department.

3. Provide to the Rea Valley Fire Department an annual familiarization tour of the Park's facilities, equipment, and access points.

B. The Rea Valley Fire Department agrees to:

1. Furnish when requested by the NPS, available qualified personnel, fire equipment, and rescue equipment to assist in the suppression of structural fires and wildfires and in search and rescue operations on federally owned land within the Park.

2. Provide worker's compensation coverage for qualified, off -duty NPS employees who are members of the Rea Valley Fire Department and who respond to calls from the fire department for assistance within the Rea Valley Fire District or in the surrounding area.

3. Provide to the NPS an annual familiarization tour of the Rea Valley Fire Department's facilities and equipment.

C. The parties further agree as follows:

1. Each party shall provide to the other party a list of responsible persons, with telephone numbers, to be contacted in an emergency. At least once a year, or more often if necessary, each party shall provide the other party with an updated list of such persons and telephone numbers.

2. Each party shall provide to the other party copies of current fire management plans for their areas of primary responsibility, including maps of areas involved and descriptions of special or extraordinary actions to be taken.

3. Only Minimum Impact Suppression Tactics shall be used when fighting fires within the Park. No chainsaws or ground-disturbing equipment such as graders or bulldozers shall be used without the permission of the NPS Superintendent or his/her designee.

4. After notifying the other party of a fire's discovery, either party may take immediate action to suppress a fire in the other party's area of primary responsibility in order to save life or property.

5. Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

6. Neither party to this agreement shall reimburse the other party for all or any part of the cost incurred by such party in providing fire protection pursuant to this agreement.

7. Nothing in this agreement shall be construed as obligating the NPS to expend in anyone fiscal year any sum in excess of the monies appropriated by Congress and allocated by the NPS for the performance of this agreement.

ARTICLE IV - TERM OF AGREEMENT

This agreement shall be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VIII that follows.

ARTICLE V - KEY OFFICIALS

All communications and notices regarding this agreement shall be directed to the following key official(s) for each party:

A. For the NPS:

Superintendent, Buffalo National River
402 North Walnut St. Suite 136
Harrison, Arkansas 72601
(870) 741-5443

B. For the Rea Valley Fire Department:

Head of Fire Operations/Assistant Chief
Richard E. Beel
P.O. Box 913
Flippen, Arkansas 72634
(870) 453-8155 (Home)
(870) 449-4741 (Work)

ARTICLE VI - PRIOR APPROV AL

Not applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

Upon request and to the full extent permitted by applicable law, the parties shall share with the other final reports of incidents involving both parties.

ARTICLE VIII - PROPERTY UTILIZATION

Unless otherwise agreed to in writing by the parties, any property furnished by one party to t other shall remain the property of the furnishing party. Any property furnished by the NPS to Rea Valley Fire Department during the performance of this agreement shall be used and disposed of as set forth in the NPS Property Management Regulations.

ARTICLE IX - MODIFICATION AND TERMINATION

A. This agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with sixty (60) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to try to avoid terminating this agreement.

ARTICLE X - STANDARD CLAUSES

A. Civil Rights

During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination, and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, sexual orientation, national origin, disabilities, religion, age or sex.

B. Promotions

The Rea Valley Fire Department shall not publicize or otherwise circulate promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts, or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of a product, service, or position which the Rea Valley Fire Department represents. No release of information relating to this agreement may state or imply that the Government approves of the Rea Valley Fire Department's work product or considers the Rea Valley Fire Department work product to be superior to other products or services.

C. Public Information Release

The Rea Valley Fire Department must obtain prior Government approval from the Superintendent of Buffalo National River for any public information release which refers to the Department of the Interior, any bureau, park unit, or employee (by name or title), or to this agreement. The specific text, layout, photographs, etc. of the proposed release must be submitted with the request for approval.

D. Liability Provision

Each party to this agreement will indemnify, save and hold harmless, and defend each other against all fines, claims, damages, losses, judgments, and expenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

ARTICLE XI - SIGNATURES

IN WITNESS HEREOF, the parties hereto have executed this agreement on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE

Signature: /s/
Name:Ivan D. Miller
Title: Superintendent, Buffalo National-River
Date: 6/22/01

FOR THE REA VALLEY FIRE DEPARTMENT

Signature: /s/
Name: Richard E. Beel
Title: Head of Fire Operations/Assistant Chief
Date: 6/12/01

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

Memorandum of Understanding between the National Park Service and the JASPER Volunteer Fire Department

Agreement#G7150010001

ARTICLE I - BACKGROUND AND OBJECTIVES

This agreement is entered into by and between the National Park Service (hereinafter "NPS"), United States Department of the Interior, acting through the Superintendent of Buffalo National River (hereinafter "Park"), and the Jasper VFD acting through its Chief. The purpose of this agreement is to establish the terms and conditions under which the parties will provide mutual assistance in preventing, detecting, and suppressing structural fires and wildfire and in conducting search and rescue operations on lands within the Park's boundaries, within the Jasper Fire District, and in the immediate surrounding area.

Currently the NPS is primarily responsible for providing, through an interagency acquisition agreement with the Forest Service, United States Department of Agriculture, fire prevention, detection, and suppression and for conducting search and rescue operations on federally owned land within the Park. The Jasper Fire Department is primarily responsible for providing fire prevention, detection, and suppression and for conducting search and rescue operations within the Town of Jasper and in the immediate surrounding area (including non-federally owned land within the Park's boundaries).

ARTICLE II - AUTHORITY

This agreement is entered into under the authority of 42 U.S.C. § 1856a (1994).

ARTICLE III - STATEMENT WORK

A. The NPS agrees to,

1. Furnish, when requested by the Jasper Fire Department, qualified, on-duty NPS employees to assist in the suppression of structural fires and wildfires and in search and rescue operations within the Town of Jasper or in the immediate surrounding area whenever the furnishing of such assistance does not seriously impact the conduct of Park business. For purposes of interpreting this agreement, NPS employees are deemed to be "on duty" from 8:00 a.m. to 5:00 p.m., Monday through Friday. Authorized, on-duty NPS employees shall be deemed to be acting within the scope of their federal employment when responding to calls from the fire department.

2. Provide federal worker's compensation coverage for authorized, on-duty NPS employees who respond to calls from the Jasper Fire Department.

3. Provide to the Jasper Fire Department an annual familiarization tour of the Park's facilities, equipment, and access points.

B. The Jasper Fire Department agrees to:

1. Furnish when requested by the NPS, available qualified personnel, fire equipment, and rescue equipment to assist in the suppression of structural fires and wildfires and in search and rescue operations on federally owned land within the Park.

2. Provide worker's compensation coverage for qualified, off -duty NPS employees who are members of the Jasper Fire Department and who respond to calls from the fire department for assistance within the Town of Jasper or in the surrounding area.

3. Provide to the NPS an annual familiarization tour of the Jasper Fire Department's facilities and equipment.

C. The parties further agree as follows:

1. Each party shall provide to the other party a list of responsible persons, with telephone numbers, to be contacted in an emergency. At least once a year, or more often if necessary, each party shall provide the other party with an updated list of such persons and telephone numbers.

2. Each party shall provide to the other party copies of current fire management plans for their areas of primary responsibility, including maps of areas involved and descriptions of special or extraordinary actions to be taken.

3. Only Minimum Impact Suppression Tactics shall be used when fighting fires within the Park. No chainsaws or ground-disturbing equipment such as graders or bulldozers shall be used without the permission of the NPS Superintendent or his/her designee.

4. After notifying the other party of a fire's discovery, either party may take immediate action to suppress a fire in the other party's area of primary responsibility in order to save life or property.

5. Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

6. Neither party to this agreement shall reimburse the other party for all or any part of the cost incurred by such party in providing fire protection pursuant to this agreement.

7. Nothing in this agreement shall be construed as obligating the NPS to expend in anyone fiscal year any sum in excess of the monies appropriated by Congress and allocated by the NPS for the performance of this agreement.

ARTICLE IV - TERM OF AGREEMENT

This agreement shall be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VIII that follows.

ARTICLE V - KEY OFFICIALS

All communications and notices regarding this agreement shall be directed to the following key official(s) for each party:

A. For the NPS:

Superintendent, Buffalo National River
402 North Walnut St. Suite 136
Harrison, Arkansas 72601

B. For the Jasper Fire Department:

Chief
Terry Brasel
HC 31 Box 215
Jasper, AR 72641

ARTICLE VI - PRIOR APPROV AL

Not applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

Upon request and to the full extent permitted by applicable law, the parties shall share with the other final reports of incidents involving both parties.

ARTICLE VIII - PROPERTY UTILIZATION

Unless otherwise agreed to in writing by the parties, any property furnished by one party to t other shall remain the property of the furnishing party. Any property furnished by the NPS to Jasper Fire Department during the performance of this agreement shall be used and disposed of as set forth in the NPS Property Management Regulations.

ARTICLE IX - MODIFICATION AND TERMINATION

A. This agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with sixty (60) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to try to avoid terminating this agreement.

ARTICLE X - STANDARD CLAUSES

A. Civil Rights

During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination, and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take

affirmative action to ensure that applicants are employed without regard to their race, color, sexual orientation, national origin, disabilities, religion, age or sex.

B. Promotions

The Jasper Fire Department shall not publicize or otherwise circulate promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts, or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of a product, service, or position which the Jasper Fire Department represents. No release of information relating to this agreement may state or imply that the Government approves of the Jasper Fire Department's work product or considers the Jasper Fire Department work product to be superior to other products or services.

C. Public Information Release

The Jasper Fire Department must obtain prior Government approval from the Superintendent of Buffalo National River for any public information release which refers to the Department of the Interior, any bureau, park unit, or employee (by name or title), or to this agreement. The specific text, layout, photographs, etc. of the proposed release must be submitted with the request for approval.

D. Liability Provision

Each party to this agreement will indemnify, save and hold harmless, and defend each other against all fines, claims, damages, losses, judgments, and expenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

ARTICLE XI - SIGNATURES

IN WITNESS HEREOF, the parties hereto have executed this agreement on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE

Signature: /s/
Name:Ivan D. Miller
Title: Superintendent, Buffalo National-River
Date: 6/22/01

FOR THE TOWN OF JASPER

Signature: /s/
Name: Shannon Willis
Title: Mayor
Date: 6/4/01

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

Memorandum of Understanding between the National Park Service and the Morning Star Volunteer Fire Department

Agreement#G7150010003

ARTICLE I - Background and Objectives

This agreement is entered into by and between the National Park Service (hereinafter "NPS"), United States Department of the Interior, acting through the Superintendent of Buffalo National River (hereinafter "Park"), and the Morning Star Volunteer Fire Department acting through its Fire Chief.

The purpose is for mutual assistance in preventing, detecting, and suppressing fires and in conducting search and rescue operations in the immediate areas of our joint boundaries.

ARTICLE II – Legislative Authority

This agreement is entered into under the authority of 42 U.S.C. § 1856a (1994).

ARTICLE III - Statement of Work

A. The National Park Service will:

1. Furnish, when requested by the Morning Star Volunteer Fire Department, qualified, on-duty NPS employees to assist in the suppression of fires and search and rescue operations in the Morning Star area whenever the assistance does not seriously impact the conduct of Park business. Authorized, on-duty NPS employees shall be deemed to be acting within the scope of their federal employment when responding to calls from the fire department.

2. Provide federal worker's compensation coverage for authorized, on-duty NPS employees who respond to calls from the Morning Star Volunteer Fire Department.

3. Provide to the Morning Star Volunteer Fire Department an annual familiarization tour of the Park's facilities, equipment, and access points.

B. The Morning Star Volunteer Fire Department will:

1. Furnish when requested by the NPS, available qualified personnel, fire equipment, and rescue equipment to assist in the joint suppression of fires and in search and rescue operations on federally owned land near the Morning Star response area.

2. Provide worker's compensation coverage for qualified, off -duty NPS employees who are members of the Morning Star Volunteer Fire Department and who respond to calls from the fire department.

3. Provide to the NPS an annual familiarization tour of the Morning Star Volunteer Fire Department's facilities and equipment.

C. The parties further agree as follows:

1. Each party shall provide to the other party a list of responsible persons, with telephone numbers, to be contacted in an emergency. At least once a year, or more often if necessary, each party shall provide the other party with an updated list of such persons and telephone numbers.

2. Each party shall provide to the other party copies of current fire management plans for their areas of primary responsibility, including maps of areas involved and descriptions of special or extraordinary actions to be taken.

3. Only Minimum Impact Suppression Tactics shall be used when fighting fires within the Park. No chainsaws or ground-disturbing equipment such as graders or bulldozers shall be used without the permission of the NPS Superintendent or his/her designee.

4. After notifying the other party of a fire's discovery, either party may take immediate action to suppress a fire in the other party's area of primary responsibility in order to save life or property.

5. Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

6. Neither party to this agreement shall reimburse the other party for all or any part of the cost incurred by such party in providing fire protection pursuant to this agreement.

7. Nothing in this agreement shall be construed as obligating the NPS to expend in anyone fiscal year any sum in excess of the monies appropriated by Congress and allocated by the NPS for the performance of this agreement.

ARTICLE IV - Term of Agreement

This agreement shall be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VIII that follows.

ARTICLE V - Key Officials

All communications and notices regarding this agreement shall be directed to the following key official(s) for each party:

A. For the NPS:

Superintendent, Buffalo National River
402 North Walnut St. Suite 136

Harrison, Arkansas 72601

B. For the Morning Star Fire Department:

Fire Chief, Morning Star Fire Department
HC 89, Box 193A
Marshall, AR 72650

ARTICLE VI - Prior Approval

Not applicable.

ARTICLE VII - Reports and/or Other Deliverables

Upon request and to the full extent permitted by applicable law, the parties shall share with the other final reports of incidents involving both parties.

ARTICLE VII - Property Utilization

Unless otherwise agreed to in writing by the parties, any property furnished by one party to t other shall remain the property of the furnishing party. Any property furnished by the NPS to Rea Valley Fire Department during the performance of this agreement shall be used and disposed of as set forth in the NPS Property Management Regulations.

ARTICLE VIII - Modification and Termination Clause

A. This agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with sixty (60) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably.

ARTICLE IX - Signatures

IN WITNESS HEREOF, the parties hereto have executed this understanding on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE

Signature: /s/
Name:Ivan D. Miller
Title: Superintendent, Buffalo National-River
Date: 6/22/01

FOR THE MORNING STAR VOLUNTEER FIRE DEPARTMENT

Signature: /s/
Name: Zeb Horton, Title: Fire Chief
Date: 5/29/01

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

Agreement Number **G7150010006**

Memorandum of Understanding
between the
National Park Service
and the
PG&S Fire Department

ARTICLE I - BACKGROUND AND OBJECTIVES

This agreement is entered into by and between the National Park Service (hereinafter "NPS"), United States Department of the Interior, acting through the Superintendent of Buffalo National River (hereinafter "Park"), and the PG&S Fire Department, acting through its Chief. The purpose of this agreement is to establish the terms and conditions under which the parties will provide mutual assistance in preventing, detecting, and suppressing structural fires and wildfires and in conducting search and rescue operations on lands within the Park's boundaries, within the PG&S Fire District, and in the immediate surrounding area.

Currently the NPS is primarily responsible for providing, through an interagency acquisition agreement with the Forest Service, United States Department of Agriculture, fire prevention, detection, and suppression and for conducting search and rescue operations on federally owned land within the Park. The PG&S Fire Department is primarily responsible for providing fire prevention, detection, and suppression and for conducting search and rescue operations within the District of PG&S and in the immediate surrounding area (including non-federally owned land within the Park's boundaries).

ARTICLE II - AUTHORITY

This agreement is entered into under the authority of 42 U.S.C. § 1856a (1994).

ARTICLE III - STATEMENT WORK

A. The NPS agrees to,

1. Furnish, when requested by the PG&S Fire Department, qualified, on-duty NPS employees to assist in the suppression of structural fires and wildfires and in search and rescue operations within the District of PG&S or in the immediate surrounding area whenever the furnishing of such assistance does not seriously impact the conduct of Park business. For purposes of interpreting this agreement, NPS employees are deemed to be "on duty" from 8:00 a.m. to 5:00 p.m. Monday through Friday. Authorized, on-duty NPS employees shall be deemed acting within the scope of their federal employment when responding to calls from the fire department.

2. Provide federal worker's compensation coverage for authorized, on-duty employees who respond to calls from the PG&S Fire Department.

3. Provide to the PG&S Fire Department an annual familiarization tour o Park's facilities, equipment, and access points.

B. The PG&S Fire Department agrees to:

1. Furnish when requested by the NPS, available qualified personnel, fire equipment and rescue equipment to assist in the suppression of structural fires and wildfires and in search and rescue operations on federally owned land within the Park

2. Provide worker's compensation coverage for qualified, off-duty NPS employees who are members of the PG&S Fire Department and who respond to calls from the fire department for assistance within the Town of Cheyenne or in the surrounding area.

3. Provide to the NPS an annual familiarization tour of the PG&S Fire Department's facilities and equipment.

C. The parties further agree as follows:

1. Each party shall provide to the other party a list of responsible persons, with telephone numbers, to be contacted in an emergency. At least once a year or more often if necessary, each party shall provide the other party with an updated list of such persons and telephone numbers.

2. Each party shall provide to the other party copies of current fire management plans for their areas of primary responsibility, including maps of areas involved and descriptions of special or extraordinary actions to be taken.

3. Only Minimum Impact Suppression Tactics shall be used when fighting fires within the Park. No chainsaws or ground-disturbing equipment such as graders or bulldozers shall be used without the permission of the NPS Superintendent or his/her designee.

4. After notifying the other party of a fire's discovery, either party may take immediate action to suppress a fire in the other party's area of primary responsibility in order to save life or property.

5. Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

6. Neither party to this agreement shall reimburse the other party for all or any part of the cost incurred by such party in providing fire protection pursuant to this agreement.

7. Nothing in this agreement shall be construed as obligating the NPS to expend in any one fiscal year any sum in excess of the monies appropriated by Congress and allocated by the NPS for the performance of this agreement.

ARTICLE IV - TERM OF AGREEMENT

This agreement shall be effective for a period of five years from the date of final signature unless it is terminated earlier by one of the parties pursuant to Article VIII that follows

ARTICLE V - KEY OFFICIALS

Communications and notices regarding this agreement shall be directed to the following key contacts for each party:

For the NPS:

Superintendent, Buffalo National River
402 North Walnut Street, Suite 136
Harrison, Arkansas 72601

For the PG&S Fire Department:

Chief Jerry D. Willis
P..0. Box 85
St. Joe, Arkansas 72675

ARTICLE VI - PRIOR APPROVAL

Not Applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

On request and to the full extent permitted by applicable law, the parties shall share with each other final reports of incidents involving both parties.

ARTICLE VIII - PROPERTY UTILIZATION

Unless otherwise agreed to in writing by the parties, any property furnished by one party to the other shall remain the property of the furnishing party. Any property furnished by the NPS to the Fire Department during the performance of this agreement shall be used and disposed of in accordance with the NPS Property Management Regulations.

ARTICLE IX - MODIFICATION AND TERMINATION

A. This agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with sixty (60) days advance written notice. In the event that one party provides the other party notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to try to avoid terminating this agreement.

ARTICLE X - STANDARD CLAUSES

A. **Civil Rights**

During the performance of this agreement, the participants agree to abide by the USDI-Civil Rights Assurance Certification, non-discrimination, and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, sexual orientation, national origin, disabilities, religion, age or sex.

B. **Promotions**

The PG&S Fire Department shall not publicize or otherwise circulate promotion material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts, or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of product, service, or position which the PG&S Fire Department represents. No release of information relating to this agreement may state or imply that the Government approves of the PG&S Fire Department's work product or considers the PG&S Fire Department's work product to be superior to other products or services.

C. **Public Information Release**

The PG&S Fire Department must obtain prior Government approval from the Superintendent of Buffalo National River for any public information release which to the Department of the Interior, any bureau, park unit, or employee (by name or tile) or to this agreement. The specific text, layout, photographs, etc. of the proposed release must be submitted with the request for approval.

D. **Liability Provision**

Each party to this agreement will indemnify, save and hold haIm1ess, and defend each other against all fines, claims, damages, losses, judgments, and expenses arising out of; or from, any omission or activity of such person organization, its representatives, or employees.

ARTICLE XI – SIGNATURES

IN WITNESS HEREOF, the parties hereto have executed this agreement on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE

/s/ Ivan D. Miller
Superintendent, Buffalo National River
7/20/01

FOR THE DISTRICT OF PG&S

/s/ Jerry D. Willis
Secretary-Treasurer, PG&S Fire Department
7/17/01

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

Memorandum of Understanding between the National Park Service and the Ralph-Caney Rural Volunteer Fire Department

Agreement#MU7150050001

ARTICLE I - BACKGROUND AND OBJECTIVES

This agreement is entered into by and between the National Park Service (hereinafter "NPS"), United States Department of the Interior, acting through the Superintendent of Buffalo National River (hereinafter "Park"), and the Ralph-Caney Rural VFD acting through its Chief. The purpose of this agreement is to establish the terms and conditions under which the parties will provide mutual assistance in preventing, detecting, and suppressing structural fires and wildfire and in conducting search and rescue operations on lands within the Park's boundaries, within the Ralph-Caney Rural Volunteer Fire District, and in the immediate surrounding area.

Currently the NPS is primarily responsible for providing, through an interagency acquisition agreement with the Forest Service, United States Department of Agriculture, fire prevention, detection, and suppression and for conducting search and rescue operations on federally owned land within the Park. The Ralph-Caney Rural Volunteer Fire Department is primarily responsible for providing fire prevention, detection, and suppression and for conducting search and rescue operations within the communities of Ralph and Caney and in the immediate surrounding area (including non-federally owned land within the Park's boundaries).

ARTICLE II - AUTHORITY

This agreement is entered into under the authority of 42 U.S.C. § 1856a (1994).

ARTICLE III - STATEMENT WORK

A. The NPS agrees to,

1. Furnish, when requested by the Ralph-Caney Rural Volunteer Fire Department, qualified, on-duty NPS employees to assist in the suppression of structural fires and wildfires and in search and rescue operations within the communities of Ralph-Caney or in the immediate surrounding area whenever the furnishing of such assistance does not seriously impact the conduct of Park business. For purposes of interpreting this agreement, NPS employees are deemed to be "on duty" from 8:00 a.m. to 5:00 p.m., Monday through Friday. Authorized, on-duty NPS employees shall be deemed to be acting within the scope of their federal employment when responding to calls from the fire department.

2. Provide federal worker's compensation coverage for authorized, on-duty NPS employees who respond to calls from the Ralph-Caney Rural Volunteer Fire Department.

3. Provide to the Ralph-Caney Rural Volunteer Fire Department an annual familiarization tour of the Park's facilities, equipment, and access points.

B. The Ralph-Caney Rural Volunteer Fire Department agrees to:

1. Furnish when requested by the NPS, available qualified personnel, fire equipment, and rescue equipment to assist in the suppression of structural fires and wildfires and in search and rescue operations on federally owned land within the Park.

2. Provide worker's compensation coverage for qualified, off -duty NPS employees who are members of the Ralph-Caney Rural Volunteer Fire Department and who respond to calls from the fire department for assistance within the communities of Ralph and Caney or in the surrounding area.

3. Provide to the NPS an annual familiarization tour of the Ralph-Caney Rural Volunteer Fire Department's facilities and equipment.

C. The parties further agree as follows:

1. Each party shall provide to the other party a list of responsible persons, with telephone numbers, to be contacted in an emergency. At least once a year, or more often if necessary, each party shall provide the other party with an updated list of such persons and telephone numbers.

2. Each party shall provide to the other party copies of current fire management plans for their areas of primary responsibility, including maps of areas involved and descriptions of special or extraordinary actions to be taken.

3. Only Minimum Impact Suppression Tactics shall be used when fighting fires within the Park. No chainsaws or ground-disturbing equipment such as graders or bulldozers shall be used without the permission of the NPS Superintendent or his/her designee.

4. After notifying the other party of a fire's discovery, either party may take immediate action to suppress a fire in the other party's area of primary responsibility in order to save life or property.

5. Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

6. Neither party to this agreement shall reimburse the other party for all or any part of the cost incurred by such party in providing fire protection pursuant to this agreement.

7. Nothing in this agreement shall be construed as obligating the NPS to expend in anyone fiscal year any sum in excess of the monies appropriated by Congress and allocated by the NPS for the performance of this agreement.

ARTICLE IV - <u>TERM OF AGREEMENT</u>

This agreement shall be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VIII that follows.

ARTICLE V - KEY OFFICIALS

All communications and notices regarding this agreement shall be directed to the following key official(s) for each party:

A. For the NPS:

Superintendent, Buffalo National River
402 North Walnut St. Suite 136
Harrison, Arkansas 72601

B. For the Ralph-Caney Rural Volunteer Fire Department:

Chief Wesley Shipman
P.O. Box 405
Summit, Arkansas 72677

ARTICLE VI - PRIOR APPROV AL

Not applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

Upon request and to the full extent permitted by applicable law, the parties shall share with the other final reports of incidents involving both parties.

ARTICLE VIII - PROPERTY UTILIZATION

Unless otherwise agreed to in writing by the parties, any property furnished by one party to t other shall remain the property of the furnishing party. Any property furnished by the NPS to Ralph-Caney Rural Volunteer Fire Department during the performance of this agreement shall be used and disposed of as set forth in the NPS Property Management Regulations.

ARTICLE IX - MODIFICATION AND TERMINATION

A. This agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with sixty (60) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to try to avoid terminating this agreement.

ARTICLE X - STANDARD CLAUSES

A. Civil Rights

During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination, and will not discriminate against any person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, sexual orientation, national origin, disabilities, religion, age or sex.

B. Promotions

The Ralph-Caney Rural Volunteer Fire Department shall not publicize or otherwise circulate promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts, or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of a product, service, or position which the Ralph-Caney Rural Volunteer Fire Department represents. No release of information relating to this agreement may state or imply that the Government approves of the Ralph-Caney Rural Volunteer Fire Department work product or considers the Ralph-Caney Rural Volunteer Fire Department work product to be superior to other products or services.

C. Public Information Release

The Ralph-Caney Rural Volunteer Fire Department must obtain prior Government approval from the Superintendent of Buffalo National River for any public information release which refers to the Department of the Interior, any bureau, park unit, or employee (by name or title), or to this agreement. The specific text, layout, photographs, etc. of the proposed release must be submitted with the request for approval.

D. Liability Provision

Each party to this agreement will indemnify, save and hold harmless, and defend each other against all fines, claims, damages, losses, judgments, and expenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

ARTICLE XI - SIGNATURES

IN WITNESS HEREOF, the parties hereto have executed this agreement on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE

Signature: /s/
Name:Ivan D. Miller
Title: Superintendent, Buffalo National-River
Date:

FOR THE COMMUNITIES OF RALPH AND CANEY:

Signature: /s/
Name: Viola Irene Wang
Title: Board Member
Date: 3/19/02

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

Memorandum of Understanding between the National Park Service and the HA-RO-CO Volunteer Fire Department

Agreement#G7150010002

ARTICLE I - BACKGROUND AND OBJECTIVES

This agreement is entered into by and between the National Park Service (hereinafter "NPS"), United States Department of the Interior, acting through the Superintendent of Buffalo National River (hereinafter "Park"), and the HA-RO-CO Fire Department acting through its Chief. The purpose of this agreement is to establish the terms and conditions under which the parties will provide mutual assistance in preventing, detecting, and suppressing structural fires and wildfire and in conducting search and rescue operations on lands within the Park's boundaries, within the HA-RO-CO Fire District, and in the immediate surrounding area.

Currently the NPS is primarily responsible for providing, through an interagency acquisition agreement with the Forest Service, United States Department of Agriculture, fire prevention, detection, and suppression and for conducting search and rescue operations on federally owned land within the Park. The HA-RO-CO Fire Department is primarily responsible for providing fire prevention, detection, and suppression and for conducting search and rescue operations within the Town of HAROCO and in the immediate surrounding area (including non-federally owned land within the Park's boundaries).

ARTICLE II - AUTHORITY

This agreement is entered into under the authority of 42 U.S.C. § 1856a (1994).

ARTICLE III - STATEMENT WORK

A. The NPS agrees to,

1. Furnish, when requested by the HAROCO Fire Department, qualified, on-duty NPS employees to assist in the suppression of structural fires and wildfires and in search and rescue operations within the Town of HAROCO or in the immediate surrounding area whenever the furnishing of such assistance does not seriously impact the conduct of Park business. For purposes of interpreting this agreement, NPS employees are deemed to be "on duty" from 8:00 a.m. to 5:00 p.m., Monday through Friday. Authorized, on-duty NPS employees shall be deemed to be acting within the scope of their federal employment when responding to calls from the fire department.

2. Provide federal worker's compensation coverage for authorized, on-duty NPS employees who respond to calls from the HAROCO Fire Department.

3. Provide to the HAROCO Fire Department an annual familiarization tour of the Park's facilities, equipment, and access points.

B. The HAROCO Fire Department agrees to:

1. Furnish when requested by the NPS, available qualified personnel, fire equipment, and rescue equipment to assist in the suppression of structural fires and wildfires and in search and rescue operations on federally owned land within the Park.

2. Provide worker's compensation coverage for qualified, off -duty NPS employees who are members of the HAROCO Fire Department and who respond to calls from the fire department for assistance within the Town of HAROCO or in the surrounding area.

3. Provide to the NPS an annual familiarization tour of the HAROCO Fire Department's facilities and equipment.

C. The parties further agree as follows:

1. Each party shall provide to the other party a list of responsible persons, with telephone numbers, to be contacted in an emergency. At least once a year, or more often if necessary, each party shall provide the other party with an updated list of such persons and telephone numbers.

2. Each party shall provide to the other party copies of current fire management plans for their areas of primary responsibility, including maps of areas involved and descriptions of special or extraordinary actions to be taken.

3. Only Minimum Impact Suppression Tactics shall be used when fighting fires within the Park. No chainsaws or ground-disturbing equipment such as graders or bulldozers shall be used without the permission of the NPS Superintendent or his/her designee.

4. After notifying the other party of a fire's discovery, either party may take immediate action to suppress a fire in the other party's area of primary responsibility in order to save life or property.

5. Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

6. Neither party to this agreement shall reimburse the other party for all or any part of the cost incurred by such party in providing fire protection pursuant to this agreement.

7. Nothing in this agreement shall be construed as obligating the NPS to expend in anyone fiscal year any sum in excess of the monies appropriated by Congress and allocated by the NPS for the performance of this agreement.

ARTICLE IV - TERM OF AGREEMENT

This agreement shall be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VIII that follows.

ARTICLE V - KEY OFFICIALS

All communications and notices regarding this agreement shall be directed to the following key official(s) for each party:

A. For the NPS:

Superintendent, Buffalo National River
402 North Walnut St. Suite 136
Harrison, Arkansas 72601

B. For the HAROCO Fire Department:

Chief
Jeff Still
HC 80 Box 272A
Harriet, AR 72639

ARTICLE VI - PRIOR APPROV AL

Not applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

Upon request and to the full extent permitted by applicable law, the parties shall share with the other final reports of incidents involving both parties.

ARTICLE VIII - PROPERTY UTILIZATION

Unless otherwise agreed to in writing by the parties, any property furnished by one party to t other shall remain the property of the furnishing party. Any property furnished by the NPS to HAROCO Fire Department during the performance of this agreement shall be used and disposed of as set forth in the NPS Property Management Regulations.

ARTICLE IX - MODIFICATION AND TERMINATION

A. This agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with sixty (60) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice and to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to try to avoid terminating this agreement.

ARTICLE X - STANDARD CLAUSES

A. Civil Rights

During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination, and will not discriminate against any

person because of race, color, religion, sex, or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, sexual orientation, national origin, disabilities, religion, age or sex.

B. Promotions

The HAROCO Fire Department shall not publicize or otherwise circulate promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts, or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of a product, service, or position which the HAROCO Fire Department represents. No release of information relating to this agreement may state or imply that the Government approves of the HAROCO Fire Department's work product or considers the HAROCO Fire Department work product to be superior to other products or services.

C. Public Information Release

The HAROCO Fire Department must obtain prior Government approval from the Superintendent of Buffalo National River for any public information release which refers to the Department of the Interior, any bureau, park unit, or employee (by name or title), or to this agreement. The specific text, layout, photographs, etc. of the proposed release must be submitted with the request for approval.

D. Liability Provision

Each party to this agreement will indemnify, save and hold harmless, and defend each other against all fines, claims, damages, losses, judgments, and expenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

ARTICLE XI - SIGNATURES

IN WITNESS HEREOF, the parties hereto have executed this agreement on the date(s) set forth below.

FOR THE NATIONAL PARK SERVICE

Signature: /s/
Name:Ivan D. Miller
Title: Superintendent, Buffalo National-River
Date: 6/22/01

FOR THE TOWN OF HA RO CO (Harriet, Rock Creek and Cozahome)

Signature: /s/
Name: Jeff Still
Title: Fire Chief
Date: 6/5/01

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

Agreement Number MU7150020002
Page 1 of 6

Memorandum of Understanding between the National Park Service and Krooked Kreek Volunteer Fire Protection Association, Inc.

ARTICLE I - BACKGROUND AND OBJECTIVES

This agreement is entered into by and between the National Park Service (hereinafter "NPS"), United States Department of the Interior, acting through the Superintendent of Buffalo National River (hereinafter "Park"), and Krooked Kreek Volunteer Fire Protection Association, Inc. acting through the President of the Board of Directors. The purpose of this agreement is to establish the terms and conditions under which the parties will provide mutual assistance in preventing, detecting, and suppressing structural fires and wildfires and in conducting search and rescue operations on lands within the Park's boundaries, within the Krooked Kreek Volunteer Fire Protection Association, Inc. district, and in the immediate surrounding area.

Currently the NPS is primarily responsible for providing, through an interagency acquisition agreement with the Forest Service, United States Department of Agriculture, fire prevention, detection, and suppression and for conducting search and rescue operations on federally owned land within the Park. The Krooked Kreek Volunteer Fire Department is primarily responsible for providing fire prevention, detection, and suppression and for conducting search and rescue operations within the Krooked Kreek Volunteer Fire Department's district and in the immediate surrounding area (including non-federally owned land within the Park's boundaries).

ARTICLE 11 - AUTHORITY

This agreement is entered into under the authority of 42 U.S.C. § 1856a (1994).

MEMORANDUM OF UNDERSTANDING FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

ARTICLE III - STATEMENT WORK

A. The NPS agrees to,

1. Furnish, when requested by the Krooked Kreek Volunteer Fire Department, qualified, on-dutyNPS employees to assist in the suppression of structural fires and wildfires and in search and rescue operations within the DISTRICT OF Krooked Kreek Volunteer Fire Department or in the immediate surrounding area whenever the furnishing of such assistance does not seriously impact the conduct of Park business. For purposes of interpreting this agreement,NPS employees are deemed to be "on duty" from 8:00 a.m. to 5:00 p.m., Monday through Friday. Authorized, on-duty NPS employees shall be deemed to be acting within the scope of their federal employment when responding to calls from the fire department.

2. Provide federal worker's compensation coverage for authorized, on-duty NPS employees who respond to calls from the Krooked Kreek Volunteer Fire Department.

3. Provide to the Krooked Kreek Volunteer Fire Department an annual familiarization tour of the Park's facilities, equipment, and access points.

B. The Krooked Kreek Volunteer Fire Department agrees to:

1. Furnish when requested by the NPS, available qualified personnel, fire equipment, and rescue equipment to assist in the suppression of structural fires and wildfires and in search and rescue operations on federally owned land within the Park.

2. Provide worker's compensation coverage for qualified, off-duty NPS employees who are members of the Krooked Kreek Volunteer Fire Department and who respond to calls from the fire department for assistance within the district of Krooked Kreek Volunteer Fire Deptarment or in the surrounding area.

3. Provide to the NPS an annual familiarization tour of the Krooked Kreek Volunteer Fire Department's facilities and equipment.

MEMORANDUM OF UNDERSTANDING
FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

C. The parties further agree as follows:

1. Each party shall provide to the other party a list of responsible persons, with telephone numbers, to be contacted in an emergency. At least once a year, or more often if necessary, each party shall provide the other party with an updated list of such persons and telephone numbers.

2. Each party shall provide to the other party copies of current fire management plans for their areas of primary responsibility, including maps of areas involved and descriptions of special or extraordinary actions to be taken.

3. Only Minimum Impact Suppression Tactics shall be used when fighting fires within the Park. No chainsaws or ground-disturbing equipment such as graders or bulldozers shall be used without the permission of the NPS Superintendent or his/her designee.

4. After notifying the other party of a fire's discovery, either party may take immediate action to suppress a fire in the other party's area of primary responsibility in order to save life or property.

5. Each party to this agreement waives all claims against the other party for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement.

6. Neither party to this agreement shall reimburse the other party for all or any part of the cost incurred by such party in providing fire protection pursuant to this agreement.

7. Nothing in this agreement shall be construed as obligating the NPS to expend in any one fiscal year any sum in excess of the monies appropriated by Congress and allocated by the NPS for the performance of this agreement.

MEMORANDUM OF UNDERSTANDING
FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

ARTICLE IV - TERM OF AGREEMENT

This agreement shall be effective for a period of five years from the date of final signature, unless it is terminated earlier by one of the parties pursuant to Article VIII that follows.

ARTICLE V - KEY OFFICIALS

All communications and notices regarding this agreement shall be directed to the following key official(s) for each party:

A. **For the NPS:**

Superintendent
Buffalo National River
402 North Walnut Suite 136
Harrison, AR 72601

B. **For Krooked Kreek Volunteer Fire Protection Association, Inc.:**

Fire Chief
Krooked Kreek Volunteer Fire Protection Association, Inc.
P.O. Box 2341
Harrison, AR 72602

ARTICLE VI - PRIOR APPROVAL

Not applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

Upon request and to the full extent permitted by applicable law, the parties shall share with each other final reports of incidents involving both parties.

ARTICLE V111 - PROPERTY UTILIZATION

Unless otherwise agreed to in writing by the parties, any property furnished by one party to the other shall remain the property of the furnishing party. Any property furnished by the NPS to the during the performance of this agreement shall be used and disposed of as set forth in the NPS Property Management Regulations.

MEMORANDUM OF UNDERSTANDING
FIREFIGHTING/SEARCH AND RESCUE ASSISTANCE

ARTICLE IX - MODIFICATION AND TERMINATION

A. This agreement may be modified only by a written instrument executed by the parties.

B. Either party may terminate this agreement by providing the other party with sixty (60) days advance written notice. In the event that one party provides the other party with notice of its intention to terminate, the parties shall meet promptly to discuss the reasons for the notice -.nd to try to resolve their differences amicably. The parties commit to using every reasonable means available, including the use of a neutral mediator if necessary, to try to avoid terminating this agreement.

ARTICLE X - STANDARD CLAUSES

A. **Civil Rights**

During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination, and will not discriminate against any person because of race, color, religion, sex, or national

origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, sexual orientation, national origin, disabilities, religion, age or sex.

B. **Promotions**

The Krooked Kreek Volunteer Fire Protection Association, Inc. shall not publicize or otherwise circulate promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures, articles, manuscripts, or other publications) which states or implies Governmental, Departmental, bureau, or Government employee endorsement of a product, service, or position which Krooked Kreek Volunteer Fire Protection Association, Inc. represents. No release of information relating to this agreement may state or imply that the Government approves of the Krooked Kreek Volunteer Fire Protection Association, Inc. work product or considers the Krooked Kreek Volunteer Fire Protection Association, Inc. work product to be superior to other products or services.

C. **Public Information Release**

The Krooked Kreek Volunteer Fire Protection Association, Inc. must obtain prior Government approval from the Superintendent of Buffalo National River for any public information release which refers to the Department of the Interior, any bureau, park unit, or employee (by name or title), or to this agreement. The specific text, layout, photographs, etc. of the proposed release must be submitted with the request for approval.

MEMORANDUM OF UNDERSTANDING
FIREFIGHTINIG/SEARCH AND RESCUE ASSISTANCE

D. **Liability Provision**

Each party to this agreement will indemnify, save and hold harmless, and defend each other against all fines, claims, damages, losses, judgments, and' -.xpenses arising out of, or from, any omission or activity of such person organization, its representatives, or employees.

ARTICLE XI -SIGNATURES

IN WITNESS HEREOF, the parties hereto have executed this agreement on the' date(s) set forth below.

FOR THE NATIONAL PARK SERVICE:

Signature: Ivan D. Miller

Name: _____

Title: Supt.

Date: 07/22/02

FOR KROOKED KREEK VOLUNTEER FIRE PROTECTION ASSOCIATION, INC.:

Signature: Garry Carlton

Name: _____

Title: Fire Chief

Date: 07/17/02

1443MU715090001

**MEMORADUM OF UNDERST A1'\TDING
BETWEEN THE NATIONAL PARK SERVICE
AND ARKANSAS FORESTRY COMMISSION**

This **Memorandum of Understanding**, made and entered into by and between the State Forester of Arkansas for and in behalf of the Arkansas Forestry Commission, hereinafter called the State, and Superintendent of Buffalo National River, for and in behalf of the United States Department of the Interior, National Park Service, hereinafter called the Service, under the authority granted the Superintendent in 16 U.S.C. § 1b, 16 U.S.C. § 460m-8 and 42 U.S.C. § 1856 et seq.
WITNESSETH,

ARTICLE I.

WHEREAS, the State is responsible for suppression of wildfires on privately owned land in and surrounding the boundaries of the National River; and

WHEREAS, the Service is responsible for suppression of wildfires on federally owned lands within the boundaries of the Buffalo National River; and

WHEREAS, the parties hereto are desirous of cooperating for the purpose of suppressing all wildfires on intermingled State and Service lands within the National River boundaries; and

WHEREAS, wildfires occurring on lands administered by either agency constitute a threat to adjacent lands of the other agency; and

WHEREAS, it is to the mutual advantage of the State and the Service to cooperate closely in the suppression of wildfires and fire prevention; and

WHEREAS, the State is the major wildfire fighting agency having coverage of lands adjacent to the National River.

ARTICLE II.

NOW, THEREFORE, IT IS MUTUALLY AGREED THAT:

1. The Service will make initial attack and attempt to suppress all fires on Service owned lands and private lands within ½-mile of the Service's boundary which pose a threat to Service land. The State may provide, if requested, crew, equipment and reinforcements needed to control wildfires occurring on Service lands. Each agency will forward reports they receive of fires involving lands under the other's jurisdiction.

2. The Service will assist the State with fire suppression activities outside the Park and 1/2-mile protection zone during periods of extreme fire emergencies. Request for use of Service personnel and equipment must be made through the Superintendent.

3. The State and the Service consider fire prevention as a beneficial endeavor. Wildfire prevention programs shall be coordinated to complement and reinforce individual agency and joint programs of fire prevention in North Central Arkansas.

4. Each and every provision of this Memorandum of Agreement is subject to the laws of the United States, the laws of the State of Arkansas, and all lawful rules and regulations promulgated thereunder, and shall be interpreted accordingly.

5. Nothing in this Memorandum of Agreement shall be construed as obligating either party hereto to the expenditure of funds or the future payment of money in excess of appropriations authorized by law.

6. Nothing contained herein shall be construed as limiting in any way the responsibility and authority as defined by law, of the Superintendent, Buffalo National River, and the State Forester, Arkansas Forestry Commission, in connection with the administration and protection of lands and resources under their respective administrations.

7. The Service and the State shall not be liable, one to the other, for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement. It is agreed by the parties hereto that each agency will be solely responsible for the acts and omissions of its officers and employees resulting in damage to property or injury to their parties to the same extent as each agency is presently responsible under applicable laws and regulations.

8. It is understood that for purposes of Federal employees' compensation coverage, employees of the Federal government assisting in suppressing fires on State or private lands within or adjacent to the Park are to be considered employees of the Federal Government and not the State Government.

9. It is understood that for purposes of State employees' compensation coverage, employees of the State Government assisting in suppressing fires on Park lands are to be considered as employees of the State Government and not the Federal Government.

ARTICLE III.

This Memorandum of Agreement will run for a period of five years. Parties to this agreement will reassess the benefits that have accrued and determine if they should reaffirm this Memorandum prior to the expiration date.

ARTICLE IV.

The agency officials instrumental to the administration of this cooperative agreement including approving, reaffirming or termination of this agreement will be the Superintendent of Buffalo National River for the National Park Service and the State Forester for the Arkansas Forestry Commission.

ARTICLE V.

1. The State and Service shall meet once annually, prior to the fall fire season to prepare and/or revise a written "Annual Action Plan" which will be attached to and made part of this agreement, and to discuss the previous fire season's activities, determine future needs, and to discuss fire prevention programs, and to arrange for necessary joint meetings of field personnel. Specific plans, and reporting procedures, communications and other related details shall be spelled out in the plan.

2. For statistical reporting of fires:

   a. The State will report all fires that burn on private lands, within the authorized boundary of the National River.

   b. The Service will report all fires that burn on federally owned lands within the National River.

   c. The State will forward all fire report data on federally owned lands to the Service on State Form 2410.1 to Buffalo National River, P .O .Box 1173, Harrison, Arkansas, 72602-1173, so they can report the statistical fire. If the Service puts out any fires on State lands, they will forward a Form DI-1202 to the appropriate area District Forester for the same purpose.

   d. Courtesy copies of other fires within the authorized boundary of the National River, that are the other agency's statistical fires, should be sent to the appropriate State District Forester or the Fire Management Officer, at Harrison for information purposes.

3. The Service will provide updated data to the State on federal ownership within the authorized boundary as land acquisition continues, so that m the State can be kept current.

ARTICLE VI.

Either party may terminate the understanding by providing 45 days advance notice to the other party.

ARTICLE VII

1. During the performance of this agreement, the participants agree to abide by the terms of USDI-Civil Rights Assurance Certification, non-discrimination and will not discriminate person because of race, color, religion, sex or national origin. The participants will take action to ensure that applicants are employed without regard to their race, color, religion, sex or national origin.

2. No member or delegate to Congress, ore resident Commissioner, shall be admitted or part of this agreement, or to any benefit that may arise therefrom, but this provision construed to extend to this agreement if made with a corporation for its general benefit.

3. Arkansas Forestry Commission shall not publicize, or otherwise circulate, promotional material (such as advertisements, sales brochures, press releases, speeches, still and motion pictures manuscripts or other publications) which states or implies Governmental, Department, bureau or Government employee endorsement of a product, service, or position which the Arkansas Forestry Commission represents. No release of information relating to this agreement may state or imply that the Government approves of the Arkansas Forestry Commission's work product, or the Arkansas Forestry Commission's work product to be superior to other products or services.

4. Arkansas Forestry Commission must obtain prior Government approval from Buffalo River for any public information releases which refer to the Department of the Interior, park unit, or employee (by name or title), or this agreement. The specific text, layout, photographs etc., of the proposed release must be submitted with the request for approval.

ARTICLE VIII

IN WITNESSETH WHEREOF, the parties hereto have executed this Memorandum of Agreement as of the date last signed below.

National Park Service

Dated: 11/8/99 By: John Linehan
Superintendent
Buffalo National River

State of Arkansas
Arkansas Forestry Commission

Dated: 10/4/99 By John Shannon

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REAFFIRMATION MEMORANDUM

AGREEMENT NUMBER MU 7150-7-8002

AGREEMENT TITLE: Memorandum of Understanding between the National Park Service, Buffalo National River, and Arkansas Game and Fish Commission.

We, the undersigned, have the authority and do hereby reaffiffi1 this agreement between the National Park Service, Buffalo National River, and the Arkansas Game and Fish Commission.

The original agreement was signed by Alec Gould, Superintendent of Buffalo National River, and Steve Wilson, Director of Arkansas Game and Fish Commission, and dated 1/05/87. A reaffirmation of this agreement was signed 1/16/92 and 4/23/97.

This agreement and all its tenus and conditions is to continue in effect for an additional five years from 1/06/2002 until 1/06/2007.

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s/n/s Ivan D. Miller Date:05/07/02
Name and Title
Superintendent, Buffalo National River, National Park Service

S/n/s Hugh C. Durham Date:04/30/02
Name and Title
Director, Arkansas Game and Fish

Agreement No. MU 7150-7-8002

MEMORANDUM OF UNDERSTANDING
BETWEEN
'NATIONAL PARK SERVICE
AND
ARKANSAS GAME AND FISH COMMISSION

ARTICLE I. Ba~kground and Objective~

This MEMORANDUM OF UNDERSTANDING between the National Park Service. Buffalo National River. hereinafter referred to as the "Service" and the State of Arkansas Game and Fish Commission. hereinafter referred to as the "Commission." is as follows:

WHEREAS. the Commission has been created under the laws of the State of Arkansas to provide an adequate and flexible system of control. propagation. protection. and regulation of all fish and wildlife in Arkansas. and is responsible for regulating the public use of these resources for the benefit of the people of the State of Arkansas; and

HEREAS. the Service is responsible under Public Law 92-237 and 16 USC to administer and manage the lands. waters. natural and historic resources contained within the boundaries of Buffalo National River for the benefit and enjoyment of the people of the United States; and

WHEREAS. the Commission and the Service recognize the necessity for ecologically sound regional planning to perpetuate and to restore. where opportunity presents. the diversity and abundance of fish and wildlife resources within the State of Arkansas; and

WHEREAS. the Commission and the Service desire to conduct joint and cooperative endeavors which will focus the skills and abilities of the Commission and the Service on resolving their mutual fish and wildlife problems. achieving maximum public benefits from fish and wildlife resources. and ensuring that the respective objectives and responsibilities of the Commission and the Service are fulfilled.

ARTICLE II. Statement of Work

A.. The Service agrees that:

1. Consistent with the official Service policies and objectives. the Service will practice those forms of management which recognize and benefit fish and wildlife resources.

2. As provided by Congress in Section 3 of the Act establishing the Buffalo National River, the Service shall permit hunting and fishing on lands and waters under its jurisdiction within the boundaries of the Buffalo National River in accordance with applicable Federal and State laws, except there may be established designated zones where and when no hunting or fishing shall be permitted for reasons of public safety, administration, fish or wildlife management, or public use and enjoyment. Except in emergencies, any rules or regulations of this nature shall be put into effect after consultation with the Arkansas Game and Fish Commission.

3. It will cooperate with the Commission in the joint enforcement of applicable game and fish laws on lands and waters administered by the Service to the fullest extent permitted by law.

4. Will authorize the use by Commission personnel of the Service's radio frequency in up to 7 Commission radio units in order to enhance official communication capabilities necessary for joint law enforcement and management operations.

5. It will develop fishery and wildlife management plans to guide the management of these two park resources.

6. It will cooperate with the Commission in monitoring fish and wildlife populations on lands and waters administered by the Service.

B. The Commission agrees that:

1. It will consult with the Service before establishing any special hunting or fishing seasons and regulations. or implementing any management programs that might affect the fish or wildlife resources within the Buffalo National River area. Except in emergencies. any rules or regulations of this nature shall be put into effect only after consultation with the Service.

2. It will only release, trap or stock wildlife and/or fish species or introduce any plant species within the park with the approval of the National Park Service in accordance with approved management plans.

3. It will assist the Service in the maintenance or restoration of the natural or historical distribution and abundance of fish and wildlife populations in the Buffalo National River by means concurred with or approved by the National Park Service.

C. The Commission and the Service mutually agree that:

1. They will meet at least once annually before April 30. And to provide for other meetings as deemed necessary. For discussion of matters relating to the management of the fish and wildlife on the lands and waters within the boundaries of Buffalo National River.

2. They will encourage the joint publication of press releases and the interchange between parties of all-pertinent agency policies and objectives. statutes. rules and regulations, and other information required for the wise use and perpetuation of the fish and wildlife resources of Buffalo National River.

3. They will enter into working arrangement for special projects. as occasion demands. For the use of lands, buildings and other facilities owned and operated by either party hereto.

4. They will enter into such supplemental agreements to this Memorandum of Understanding as may be necessary to carry out joint evaluations of fish and wildlife resources and to carry out joint approved management programs.

5. They will obtain the other agency's collection permits and abide by any special regulations concerning collecting and/or research prior to conducting any research or monitoring of game and fish populations within the boundaries of Buffalo National River and will ensure that any research they contract is conducted under similar permits.

ARTICLE III. Term of Agreement

This Memorandum of Understanding shall become effective when signed by the parties hereto and shall continue in force for a period of five years. Parties to this agreement will reassess the benefits that have accrued and determine if they should reaffirm this agreement prior to expiration date.

Amendments to this Memorandum of Understanding may be proposed by either party and shall become effective upon approval by both parties.

Each and every provision of this Memorandum of Understanding is subject to the laws of the United States. the laws of the State of Arkansas. and all lawful rules and regulations promulgated thereunder. and shall be interpreted accordingly.

Nothing in this Memorandum of Understanding shall be construed as obligating either party hereto to the expenditure of funds or the future payment of money in excess of appropriations authorized by law.

Nothing contained herein shall be construed as limiting in any way the responsibility and authority. as defined by law. of the Director. National Park Service. and the Director. Arkansas Game and Fish Commission, in connection with the administration and protection of lands and resources under their respective administrations.

ARTICLE IV. Key Officials

The key officials in executing this Memorandum and any amendments. Re-affirmations or supplemental agreements which may be necessary to carry out this Memorandum will be the Superintendent. Buffalo National River. and the Director. of Arkansas Game and Fish Commission.

ARTICLE V. Termination

This Memorandum of Understanding may be terminated by mutual agreement or by either party upon sixty (60) days' notice in writing to the other of their intention to do so.

ARTICLE VI. Required Clauses

During the performance of this agreement. the participants agree to abide by the terms of Executive Order 11246 on nondiscrimination and will not discriminate against any person because of race. color. religion. sex or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race. color. religion. sex or national origin.

No member or delegate to Congress or resident Commissioner. shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom. but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum of Understanding as of the date last signed below:

NATIONAL PARK SERVICE

Dated: 01/05/87 By:s/n/s Alex Gould
Superintentdent, Buffalo National River

State of Arkansas -Game and Fish Commission

DATED: 12/08/86 **BY: S/N/S STEVE WILSON**

Director

42.3

BLM AGREEMENT#: 1422-R220A7-6000
FS AGREEMENT#: 97-SIA-004
FWS AGREEMENT#: 1448-93510-97-H-504
BIA AGREEMENT#: POOC14IA9871
NPS AGREEMENT#: 1443-IA9560-97-002

INTERGENCY AGREEMENT FOR FIRE MANAGEMENT
Between the
BUREAU OF LAND MANAGEMENT

BUREAU OF INDIAN AFFAIRS

NATIONAL PARK SERVICE
U.S. FISH AND WILDLIFE SERVICE
of the
UNITED STATES DEPARTMENT OF THE INTERIOR
and the
FOREST SERVICE
of the
UNITED STATES DEPARTMENT OF AGRICULTURE

I. Introduction.

Fire management in the nation's wildlands continues to be a matter of concern to the American public and to the land management Bureaus of the Department of the Interior and the Department of Agriculture, Forest Service, hereafter called the "agencies." Considerable progress has been made in fire management planning, fire use, and fire suppression by all agencies. More progress can be made by closer cooperation and coordination among the agencies. Cooperation in all aspects of fire management has benefited all agencies. Because fire recognizes no boundaries, programs must lead to more productive cooperation and efficient operations between these agencies.

II. Authority.

A. Protection Act of 1922 (16 U.S.C. 594).
B. Memorandum of Understanding between United States Depart of the Interior and the Department of Agriculture, dated January 28, 1943.
C. Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 42 U.S.C.1856a).
D. Economy Act of June 30, 1932 (47 Stat. 417; 31 U.S.C. 1535), as amended.
E. Federal Land Policy and Management Act of 1976 (43 U.S.C. 1702).

F. National Park Service Organic Act of August 1916 (16 U.S.C. 1).
G. National Wildlife Refuge System Administrations Act of 1966 (16 U.S.C.668dd-668ee; 80 Stat. 927), as amended.
H. Disaster Relief Act of 1974 (42 U.S.C. 1521).
I. National Indian Forest Resources Management Act of 1990 (25 U.S.C. 3101).
J. Cooperative Forestry Assistance Act of 1978 (P.L. 95-313, 92 Stat, 365 as amended; 16 U.S.C. 2101 (note), 2101-2103, 2103a, 2103b, 2104-2105).

III. Objective.

A. To provide a basis for cooperation between the agencies on all aspects of wildland fire management and as authorized in non-fire emergencies.
B. To facilitate the exchange of personnel, equipment, supplies, services, and funds between the agencies.

This agreement supersedes "The Interagency Agreement between the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service, of the United States Department of the Interior, and the United States Forest Service of the Department of Agriculture" that was effective October 1, 1982, and all amendments and modifications thereto.

IV. Program Coverage.

The agencies agree to cooperate in the full spectrum of wildland fire management activities and as authorized in non-fire emergencies to achieve land management goals. Cooperative efforts shall be provided for at the national, geographical, and local levels to facilitate efficient use of personnel, supplies, equipment, aviation services and other resources. Activities may include, but are not limited to:

A. Prevention of human-caused wildfires;
B. Training of personnel to common standards;
C. Presuppression activities;
D. Suppression of wildfires;
E. Rehabilitation of areas burned by wildfires;
F. Development and exchange of technology and database.
G. Development and distribution of cost information.
H. Fuels management, including prescribed fire;
I. Establishment of interagency fire management resources;
J. Development of annual local, geographical, and national operating plans;
K. Fire research;
L. Interagency fire management projects.

V. Statement of Work

A. Agencies will develop mutually beneficial fire management plans which include those activities previously identified in Section IV.

B. Agencies will develop cooperative arrangements to cover administrative and jurisdictional responsibilities which will provide for:

1. Use of closest-forces and total mobility concepts for wildfire suppression, including personnel, equipment, and supplies;
2. Development and use of fire equipment and supply caches compatible with total interagency requirements by local, geographical, and national needs;
3. Training to mutually agreeable standards and curriculumn;
4. Mutually acceptable performance qualifications and standards for all fire management positions.

C. Agency representative shall coordinate and exchange fire management plans to include information on available personnel, equipment, and supplies as necessary.

D. Agencies will mutually monitor fire suppression equipment and supplies stocking levels to assure proper distribution and quantities are on hand to meet the potential needs.

E. An agency is expected to take prompt initial action, with or without request, unless otherwise provided for, on fires within zones of mutual interest. Where one agency takes initial action in the protective unit of the other, the initial attack agency shall continue to fight the fire until relieved by an officer of the other agency.

F. When fires burn on or threaten lands of more than one agency, joint planning will be conducted by local officials to suppress the fire.

G. Billing procedures for fire management activities are as follows:

1. Emergency Fire Suppression - Agencies shall not bill for services rendered by the signatory agencies of this agreement.
2. Fire Management Projects - Agencies may choose to bill by mutual agreement. (See activities listed in Section IV, Program Coverage.)
3. Fire Presuppression (including severity) -Agencies may choose to bill by mutual agreement. (This includes severity funded activities which use suppression operations funds to enhance preparedness to meet abnormal conditions.)
4. Mobilization of State Fire Suppression Resources- Forest Service will pay cost for interstate assistance. Intrastate assistance is paid by the receiving Federal agency as provided by local Interior agency/State agreements.

H. Each agency shall, upon request, forward specific cost information for

billings.

I. Indirect administrative surcharges will not be assessed by any signatory agency for preparedness activities performed for another.

VI. General Provisions.

I. Each agency shall make direct settlement from its own funds for all liabilities it incurs under this agreement.

B. Parties to this agreement are not obligated to make expenditures of funds under terms of this agreement unless such funds are appropriated for the purpose by the Congress of the United States, or are otherwise legitimately available under Section 101 and 102 of the annual Appropriations Acts. If some extraordinary emergency or unusual circumstance arises which could not be anticipated involving an expenditure in excess of available funds for the protection of life or property, all agencies shall seek supplemental appropriations to meet their respective shares of such emergency obligations.

C. This agreement will take effect on the date of the last signature. The Agreement shall remain in effect until September 30, 2002. Any signatory agency may terminate their participation in this agreement by written notice to all other signatories provided that such notice shall be given between the dates of October 1 of any year and February 1 of the following year. The remaining signatories may continue the provisions of this agreement.

D. Amendments and modifications to this agreement may be initialed by any signatory agency. The amendments shall not take effect until documented and signed by all signatory agencies.

E. Financial obligations under this agreement, to accomplish activities under Section IV, must be approved by the responsible officers at the appropriate level operating within their authority.

F. Billing and collection procedures will follow the On-Line Payment and Accounting System (OPAC) process.

G. Economy Act Determinations to support reimbursement are not required because the Reciprocal Fire Protection Act specifically authorized the execution of agreements between agencies of the United States and other agencies and instrumentalities for mutual aid in fire protection and other fire management purposes. It is stated in the Federal Aquisition Regulations (FAR) 17.500(b) that the Economy Act only applies when more specific authority does .

VII. Task Orders.

A. Specific projects to be funded and performed under this agreement shall be identified in separate task orders developed among the agencies involved in each project. Task orders will contain the following minimum information:

1. Detailed description of services to be done or supplies to be delivered;
2. Description of the deliverables;
3. Time period for completion;
4. Target cost/price;
5. Identify responsible project officials for each Task

Order agency;

6. Payment procedures including applicable billing procedures (identification of codes, advance payments or reimbursement).
7. Signature(s) by authorized personnel for each Task Order agency.

B. Task Orders may be prepared in any format acceptable to the agencies involved in each project.

VIII. Waiver.

Each party to this agreement does hereby expressly waive all claims against the other party for compensation for any loss, damage, personal injury or death occurring in consequence of the performance of this agreement.

/s/ Mat Millenbach
Bureau of Land Management Date 1/2/97

/s/ Joan M. Comanor
Forest Service Date 2/20/97

/s/ Hilda A. Manuel
Indian Affairs Date 1/28/97

/s/ Jay P. Gerst
Fish and Wildlife Service Date 2/11/97

/s/ Roger Kennedy
National Park Service Date 1/15/97

APPENDIX E

4. Sample Delegation of Authority

Buffalo National River
Harrison, AR

Delegation of Authority

As of 1800, May 20, 2001, I have delegated authority to manage the Pruitt 1 fire, number 0102, Buffalo National River, to Incident Commander, John Doe and his Incident Management Team.

The fire which originated as an arson fire on May 18, 2001, is burning in habitat adjacent to the River boundary. My considerations for management of this fire are:

1. Provide for firefighter safety.

2. I would like the fire managed in such a manner that suppression actions will cause little environmental damage as possible.

3. Key features requiring priority protection are: adjacent private lands, campground, and NPS infrastructure.

4. Key resource considerations are: protecting bluffs adjacent to the river.

5. Restrictions for suppression actions are no tracked vehicles in the area of the bluffs or river bottom will be utilized.

6. Minimum tools for use are Type II/III helicopters, and chainsaws.

7. My agency advisor will be park Fire Management Officer, James Mattingly.

8. Managing the fire cost-effectively for the values at risk is a significant concern.

9. Providing training opportunities for River personnel is requested to strengthen our organizational capabilities.

Superintendent, Buffalo National River
May 20, 2001

APPENDIX F

F. Wildland and Prescribed Fire Monitoring Plan (Draft)

BUFFALO NATIONAL RIVER

FIRE MONITORING PLAN

MAY 2002

Prepared by: George Oviatt Date: 2/15/2002
Chief, BUFF Resource Management

James P. Mattingly Date: 5/15/2002
Fire Management Officer

Reviewed by: _____ Date: _____
MWR Ozark Ecoregion Fire Ecologist

Reviewed by: _____ Date: _____
MWR Fire Ecologist

Reviewed by: _____ Date: _____

BUFFALO NATIONAL RIVER FIRE MONITORING PLAN

I. INTRODUCTION:

Buffalo National River has an active prescribed and wildland fire use program within the Division of Resource Management. The program has fire responsibility for the Arkansas "Group" parks (PERI, ARPO, HOSP, FOSM) as well as the national river's own fire program. Since 1993 park staff has pursued the use of prescribed fire within historic zones, open fields, native grass ecosystems including glades and savannas. Hazard fuel reduction and wildland fire suppression have been an active program since the park's establishment in 1972.

A. Relationship to planning documents:

The Master Plan for Buffalo National River speaks to the need for "openings cut by the river, man, or fire" as providing the edge habitat for animal activity and wildlife observation. It also addresses the need to know the "..nature of plant succession in the area, role of fire…" which points to the need to monitor fire effects to assure these needs are met. (NPS 1977)

The Fire Management Plan for Buffalo National River, completed in 1988, echoes the monitoring concerns stated in the Master Plan to "…fully understand the interrelationship of fire with Buffalo River flora….". (NPS 1988) and the approved Resource Management Plan (RMP) goals and objectives to "Manage for the perpetuation of natural and cultural resources…", "Inventory and monitor park resources", and maintain open fields. The RMP also directs the park to identify specific areas to be maintained …(by prescribed fire) and to attempt to restore a pre-settlement landscape diversity and associated native plant communities.

This same Fire management Plan identifies six major vegetative forest associations and addresses their response to fire. A larger grouping of these associations into fire intolerant, fire tolerant and fire dependant marks the first division.

1. Fire intolerant grouping include floodplain or bottomland where fire is excluded by virtue of the high moisture environment. Major tree species include American elm, green ash, silver maple, box elder, sycamore, river birch, black willow, cottonwood, and sweetgum. Beech forest with American beech, red maple, and American basswood form another less common association.

2. Fire tolerant grouping contains the mixed hardwood as a transition zone between the floodplain and the more fire tolerant oak-hickory forest. Major species include white ash, butternut hickory, hackberry, blackgum, black walnut and various oaks. The oak-hickory is more tolerant and is the most extensive within the park. Found on the dry north to south facing slopes the more common species are the post oak, blackjack oak, black oak, and mockernut hickory. The Fire Management Plan also discusses a range of specific tolerance for the various species.

3. Fire dependent associations are the oak-pine dominated by the short-leaf pine. These are found in scattered patches throughout the park. The role of fire in pine regeneration is well documented in the plan and elsewhere in the literature. Within the fire dependant communities is also the cedar-glade association found on bluffs and steep slopes of limestone and some dolomite. While the red cedar may predominate as the tree species understory grass species include big bluestem, little bluestem, Indian grass and switch grass. These areas are scattered throughout the park and the role of fire in the preservation of these communities is also well documented within the literature. The existing open field associations and their perpetuation by fire is also a point of discussion within the plan.

During a recent meeting (2000) to initiate the frame work for a Fire Monitoring Plan with park staff, the Midwest region fire ecologist, and Ozark National Scenic Riverways fire monitoring leader the following associations were agreed upon as being the focal point of prescribed fire efforts within Buffalo National River. The species description of these following associations would mirror and expand on the Fire Management Plan discussion with the exception of the additions of cane communities and open fields. The ecotypes selected for monitoring contain additional discussions of fire's role in these ecosystems and combinations of the Fire Management Plan's groupings.

II. *PARK ECOLOGY*:

A. Glades, Glade/forest transition/post oak barrens

General descriptions of the vegetation allow for comparisons within the Ozark Highlands between the Missouri Ozarks and the Buffalo National River. Historically, evidence points to the "Ozark forest included both open, park-like stands and dense forest cover. The open park-like stands had little understory and a dense herbaceous ground flora of prairie grasses and wild flowers. Both openness and the abundance of prairie herbs suggest that periodic fire, and to a lesser extent grazing by bison and elk, were important processes in the pre-settlement landscape." Additionally many unusual communities, both terrestrial and aquatic, are endemic to the Ozarks. The most extensive glades in the Midwest are found in the Ozarks as well as the largest savanna and forested landscapes. (Missouri Biodiversity task Force 1992)

The glades of Buffalo are small and predominantly on sedimentary (limestone) substrates. (Hinterthuer 1977)(Logan 1992). Generally, the glades are dominated by grasses, including little bluestem (Andropogon scoparius), and indian grass (Sorghastrum nutans) with a rich mixture of forbs. The glades are surrounded by woodlands dominated by white oak (Quercus alba), northern red oak (Q. rubra) and shortleaf pine (Pinus echinata) interspersed with remnant post-oak (Q. stellata) savannas. (Willson 1997) Such savannas are grasslands interspersed with trees and maintained by fire. They are usually distinguished by a tree canopy cover of 10 to 50 percent, the almost complete absence of a shrub layer, and the dominance of prairie grasses and herbs. (Iffrig and Nelson 1983, R.C. Anderson 1982) Other differentiating characteristics are identified by Logan describing ozark glades as an opening with shallow soils or bare rock in an otherwise forested landscape while differentiating savanna by substrate, topography, extensiveness and structural vegetative differences. (Logan 1992)

Among this vegetation the most dynamic points in the terrestrial ecosystems are the transition zones between forest and glades. In many cases these transitions were formerly species-rich savanna/woodlands. Soil depth, climate, and fire (reviewed by Ladd 1991) probably shaped the gradual ecotone between glade and forest, but with fire suppression of the last 50-100 years, the character of the transition zone appears to have radically changed (Reiter 1991).

A 1991 site report by the Arkansas Natural Heritage identified an approximately 1000 acre post oak savanna or barrens within the Turkey Mountain area of the Lower Buffalo Wilderness as unique to the state and "presumably degraded through protection from fire". (Foti 1991) The term "barrens" as it appears in historical surveyor's notes was used to describe thin, poor, or rocky soil unable to grow trees in the Ozarks. (Schroeder 1981)
According to Logan 1992 this area is "unlike any of the glade sites of the Buffalo River". Foti (unpublished) states the area appears to fit the Nelson (1985) classification of limestone/dolomite savanna and is the first example of this community type found in Arkansas.

B. Forest oak/dry woodland

The vegetation of the river is mostly upland forest with the predominant type being the oak-hickory. Typically the predominant species would be white oak (Quercus alba), black oak (Q. velutina), white hickory (Carya tomentosa) and sweet gum (Liquidambar styraciflua). Some differences may be on cool moist site dominated by beech (Fragus grandifolia) or dryer sites with post oak (Q. stellata) and blackjack (Q. marilandica). South facing slopes may be dominated by shortleaf pine (Pinus echinata) and species such as red cedar (Juniperus virginiana) and honey locust (Gleditsia triacanthos) may be present in areas recently cleared or having experienced an absence of fire. (Johnson and Schnell 1988)

C. Open fields

Old field sites are heavily dominated by fescue (Festuca arundinacea), sericea lespedeza (Lespedeza cuneata) and bluegrass (Poa pratensis). (Johnson and Schnell 1988) Beginning in 1995 the park undertook a program to identify and manage field openings through a combination of prescribed fire, native grass restoration, and mechanical treatment. During 1999 fifty-eight of the 125 identified openings along the river corridor were qualitatively surveyed for vegetation. Twenty-nine of the units contained little bluestem and it was found to be the dominant or subdominant species within 5 of the units. Additionally, seven of the units were found to have "glade-like" qualities and the final recommendation of the survey was for "controlled burns for all of those fields surveyed. (Logan 1999)

D. Cane communities

The Ecological Society of America's recent report on endangered ecosystems listed southeastern canebrakes as one of America's most critically endangered natural communities, suffering a decline of 98% of its' ecological structure since European settlement. (Fulcher pers communication) The role of canebrakes in the southeast and other areas such as Missouri for habitat of species in decline such as the Swainson's Warbler is well documented in the literature. (Thomas 1996) Decline of this ecosystem is related to altered burning regimes and historic accounts of canebrakes in Arkansas can be traced from 1749 though the 1850s. Studies have found that frequent burning of southern canebrakes results in decline whereas burning every 7-10 years favors the community. (Platt 1997)

III. *MANAGEMENT OBJECTIVES*:

General: Provide a better understanding of the effect of prescribed fire in accomplishing management goals designed to protect and preserve field openings, glades, and post oak barrens (savanna) remnants.

A. Constraints:

The role of fire along with climate and humans interacting to produce landscape scale changes in vegetation (Guyette and Dey 1997), soils, and watersheds is well documented.
Fire history studies within Buffalo National River by Johnson and Schnell in 1985 found fire return intervals averaging 9.2 year for the period of 1880 to 1973. Since 1973 it has increased greatly to more than 60 years. A 60 year fire return interval would probably result in a change in tree species composition over a long period of time. The same study concluded with the recommendation for "a program of prescribed burning…including long-term monitoring of vegetation changes…" (Johnson 1985)

Previous work by Jenkins et al.(1997) has led the way in providing a better understanding of both the presettlement fire regime and the effects of fire suppression within the post oak barrens remnant in Buffalo National River. Data from 18 plots identified 254 species and showed that limestone glades with shallow soil had the highest diversity while sites with deeper acid soils and a high woody basal area (due to post fire regeneration of black hickory and black jack oak) had the lowest diversity. A fire history from that same study indicated a fire return interval of 5.7 years for the past 225 years.

B. Level 1 monitoring: BUFF will use monitoring design outlined in the USDI National Park Service Fire Monitoring Handbook (2001).

C. Level 2 monitoring: BUFF will use monitoring design outlined in the USDI National Park Service Fire Monitoring Handbook (2001).

D. Specific objectives: level 3 and level 4 monitoring:

1. Glades, Glade/forest transition/post oak barrens – Scheduled for FY 2001. The park will focus on reconnaissance for areas with least cedar or mechanical thinning, windrow & burn to establish monitoring plots. We will target the transition zones adjacent to cedar glades and establish permanent plots within additional post oak barrens areas.

- herbaceous layer – increase cover of native species by 40% after 10 years of burning level 3
- reduce stem density by 60% after 10 years of burning (level 3 short term)
- reduce new growth eastern red cedar by 95% (level 4 long term) after three consecutive burns

2. Forest oak/dry woodland – Scheduled for FY2002 establish permanent plots

- reduce tree density to open vista with a target density of 30-50 trees/acre after 20 years – level 4 long term
- reduce stem density by 60% after 10 years of burning level 3
- reduction reduce live stems/ac by 60 % over 10 years of burning level 3

3. Open fields

a. wildlife – Maintain/restore/intro native grass species
- Increase percent cover of native species by 25% after three prescribed burn applications level 3

b. cultural/historic - Maintain historical farmstead openings Scheduled FY 2003
- establish monitoring photopoints
- maintain woody species density at 90% of preburn level within open fields over 10 years of burning level 3

4. Cane communities – Maintain or increase cane community size Scheduled FY 2003

– maintain edge effect of cane community within 100% or more of preburn cover level 3
– encourage nesting for neotropical migrants (Swainsons)

IV *MONITORING DESIGN and OBJECTIVES*:

A. Monitoring objectives - Glade Transition/Post oak Barrens:

We want to be 90% sure of detecting an increase in 40% of the cover values for native species after 10 years. Based on this long term data set we are willing to accept a 10% chance of saying that such changes took place when it did not. We want to be 80% sure of detecting a decrease in density of 60% of pole size trees over the next ten years and are willing to accept a 20% chance of saying such changes took place when it did not. We also we to be 90% sure of a 95% reduction of new growth eastern red cedar after three consecutive burning events. We will accept a 10% chance of saying such changes took place when they did not.

FMH-4 MONITORING TYPE DESCRIPTION SHEET PARK: BUFF

MONITORING TYPE CODE: F S C S C 1 D 0 2 Date Described:

Monitoring Type Name: *Schizachyrium scoparium* **Glade Transition/Post oak barrens**
Preparers: G. Oviatt, S. Lail, J Mattingly, R. Klein,

Burn Prescription: These units will initially be burned in the spring, between approximately February 15 and April 15 (into green-up). Most units will be burned 2-3 times within the first ten years. Future bums (following the initial bum) may be conducted in the spring or fall. The units should be burned under moderate conditions that produce fire severity low enough to retain overstory trees, but high enough to meet stated objectives and minimizes smoke impacts. Temperatures typically range from 30-80°F; Relative humidities 25-50%: Midflame wind speed 2-15 mph; 1-hour fuel moisture 5-20%; 10-hour fuel moisture 10-20%.

Burn Goals: Decrease the density of seedling and pole trees greater than 1.4m in height and less than 10 cm DBH. Increase the cover and frequency of native herbaceous species while maintaining or increasing the number of native species. Reduce coverage and loading of fine fuels (hardwood litter) in overgrown glade units and all transitions.

Monitoring Type Variable(s): Density of seedling and pole trees. Total cover and frequency of native grasses and forbs. Number and percent of native herbaceous species.

Physical Description: Gentle to steep summits, backslopes, benches, and variable soil depth units. Aspects may be any or all but are predominantly south and west (135-315°). This type is typically found on exposed, variable-depth units over sedimentary limestone. This type will often have patches of exposed bedrock or variously sized boulders.

Biological Description: Glades are mid-grass/herbaceous dominated openings surrounded by, and often forming a mosaic with, various forms of woodlands and forests. Limestone/dolomite savanna (post oak barrens) are also mid-grass openings with *Quercus stellata (post* oak*),* as the dominant tree species. Transition is comprised of patches with some degree of wooded overstory

immediately adjacent to glade openings. Transition woodlands are characterized by a short, sparse canopy of overstory or understory woody species over sparse to dense grass/herbaceous ground cover. Unburned open- glades and transition woodlands are often overgrown and have high densities of pole and seedling trees. Dominant species of open glades include *Schizachyrium scoparium* (little bluestem), *Andropogon gerardii* (big bluestem), *Sorghastrum nutans (Indian grass), Panicurn virgatum* (switch grass), *Rudbeckia spp.*, *Liatris spp. (blazing* star), and many others. Associated trees of transition include *Quercus stellata (post* oak), *Juniperus virginiana (eastern red cedar), Ulmus alata g* (winged elm), *Rhus copallina* (winged sumac), *Quercus muhlenbergii* (chinquapin oak), *Quercus marilandica* (blackjack oak), and others. Mosses and lichens are often conspicuous over exposed rock. **Rejection Criteria:** Exclude anomalous vegetation patches, monitoring type boundaries, and barren areas (>35% cover by rock). Also reject areas within 30 meters of any physical barriers such as roads, trails, or streams. Reject plots that are less than 80% within either open glade or transition woodland. For example, plots 100% open glade or 100% transition are fine. Plots 50% open glade & 50% transition would be rejected.

B. Monitoring objectives - Forest oak/dry woodland:

We want to be 80% sure of reducing tree density to 30 tree/acre after 20 years. Based on this long term data set we are willing to accept a 20% chance of saying that such changes took place when it did not. We want to be 80% sure of detecting a decrease in 60% of pole size trees over the next ten years and are willing to accept a 20% chance of saying such changes took place when it did not. We also we to be 90% sure of a 60% reduction of live stems per acre over 10 years of burning. We will accept a 10% chance of saying such changes took place when they did not.

FMH-4 MONITORING TYPE DESCRIPTION SHEET **PARK: BUFF**

MONITORING TYPE CODE: F Q U V E I D 0 9 **Date Described:**

Monitoring Type Name: Quercus alba **Forest Oak/ Dry Woodland**

Preparers: G. Oviatt, S. Lail, J Mattingly, R. Klein

Burn Prescription: These units will initially be burned in the spring, between approximately February 15 and April 15 (into green-up). Most units will be burned 2-3 times within the first ten years. Future bums (following the initial bum) may be conducted in the spring or fall. The units should be burned under moderate conditions
that produce fire severity low enough to retain overstory trees, but high enough to meet stated objectives and minimizes smoke impacts. Temperatures typically range from 30-80° F; Relative humidities 25-50%: Midflame windspeed 2-15 mph; 1-hour fuel moisture 5-20%; 10-hour fuel moisture 10-20%.

Burn Goals: Reduce coverage and loading of fine fuels (hardwood litter). Increase the cover and frequency of native herbaceous species while maintaining or increasing the number of native species. Decrease the density of seedling and pole trees greater than 1.4m in height and less than 10cm DBH

Monitoring Type Variable(s): Density of seedling and pole trees. Total cover and frequency of native grasses and forbs. Number and percent of native herbaceous species.

Physical Description: Gentle to moderately steep summits, shoulder ridges, shoulders, and backslopes. Aspects may be any but are predominantly south and west (135-315°). This type is typically on exposed upper slopes and summits overlaying Everton and Boone formations. Soils are rapidly draining with frequent occurrence of chert gravel or boulders at or near the surface.

Biological Description: Open to closed (60-90% cover) canopy oak, oak-hickory, oak-pine, oak-cedar, or pine woodlands. The canopy is typically short in stature (50-75') and dominants include predominant species would be white oak (Quercus alba), black oak (Q. velutina), white hickory (Carya tomentosa) and sweet gum (Liquidambar styraciflua) *Quercus stellata (post* oak), *Pinus echinata* (shortleaf pine), and *Carya* spp. (hickory). The subcanopy is short (5-15'), poorly developed (<50% cover), and often *consists of Amelanchier arborea* (serviceberry) and *Cornus florida* (dogwood). Brush is often conspicuous and includes species such as *Vaccinium* spp. (blueberry) and *Rhus aromatica* (fragrant sumac). Herbaceous cover is sparse (<20%) and includes *Pteridium aquilinum* (bracken fern), *Desmodium* and *Lespedeza* spp. (bush clover). Mosses and lichens are often conspicuous on rock or bare soil. Ground surface is typically dominated by hardwood and/or pine litter.

Rejection Criteria: Exclude anomalous vegetation patches, monitoring type boundaries, and barren areas (>20% cover by rock). Also reject areas within 30 meters of any physical barriers such as roads, trails, or streams.

C. Monitoring objectives - Open fields/cane communities:

We want to be 80% sure of increasing the percent cover of native species by 25% after three fire applications. Based on this long term data set we are willing to accept a 20% chance of saying that such changes took place when it did not. We want to be 80% sure of maintaining a woody species density at 90% of the preburn level after 10 years of burning and are willing to accept a 20% chance of saying such changes took place when it did not. We also want to be 90% sure of maintaining or increasing the size of the cane community after ten years of burning. We will accept a 10% chance of saying such changes took place when they did not.

FMH-4 MONITORING TYPE DESCRIPTION SHEET PARK: BUFF

MONITORING TYPE CODE: GFEAR D 01 Date Described:
Monitoring Type Name: fescue (Festuca arundinacea), **Open fields**
Preparers: G. Oviatt, S. Lail, J Mattingly, R. Klein

Burn Prescription: These units will initially be burned in the spring, between approximately February 15 and April 15 (into green-up). Most units

will be burned 2-3 times within the first ten years. Future bums (following the initial bum) may be conducted in the spring or fall. The units should be burned under moderate conditions.
Temperatures typically range from 30-80° F; Relative humidities 25-50%: Midflame windspeed 2-15 mph; 1-hour fuel moisture 5-20%; 10-hour fuel moisture 10-20%.

Burn Goals: Reduce coverage and loading of fine fuels (hardwood litter). Increase the cover and frequency of native herbaceous species while maintaining or increasing the number of native species. Decrease the density of seedling and pole trees greater than 1.4m in height and less than 10cm DBH

Monitoring Type Variable(s): Total cover and frequency of native grasses and forbs. Number and percent of native herbaceous species.

Physical Description: Gentle to gradual slopes adjacent to river or close to river bottoms. Upland sites are generally thin soils with soil texture ranging from sandy to a clay or gravel texture. Lowland sites have deep, well drained sandy soils, dense vegetation and noticeable moisture gradients.

Biological Description: Open (90% cover) with fescue (Festuca arundinacea), sericea lespedeza (Lespedeza capitata), bluegrass (Poa pratensis), or wingstem (Verbesina virginica) as the dominant or codominate species. Twenty-five percent of the fields examined had a strong little bluestem (Schizachyrium scoparium) component. Several wooded community types were also present including a riparian community dominated by box elder (Acer negrundo) and a dry woods community containing winged elm (Ulmus alata) and other species. Dense thickets of rivercane were found adjacent to the riparian area and in association with many open fields.

Rejection Criteria: Exclude anomalous vegetation patches, monitoring type boundaries, and barren areas (>20% cover by rock). Also reject areas within 30 meters of any physical barriers such as roads, trails, or streams.

V. *MONITORING IMPLEMENTATION SCHEDULE*:

See attached xls file – this will be inserted as part of final plan

VI. *DATA SHEET EXAMPLES*

VII. *RESPONSIBLE PARTY*

This Monitoring Plan was developed by the Division of Resource Management for Buffalo National River and the Fire effects Monitoring Specialist for Ozark National Scenic Riverways

VIII. *FUNDING NEEDS ASSESSMENT*

FIREPRO funding will be used for all monitoring activities. Additional funding will be sought from the Biological Resources Division, Northern Prairie Research center, National Park Service.

IX. *MANAGEMENT IMPLICATIONS OF POTENTIAL RESULTS*:

The fire dependent nature of the ecosystems and sites identified for fire monitoring is well documented within the literature as well as park specific references. The effects of the absence of fire within these ecosystems is equally well documented. (Foti 1991, Jenkins 1997, Johnson 1988,Logan 1992,1999) Confirming the role of prescribed fire applications through monitoring within these areas can allow management to approximate the effects of historic fire regimes and restore the balance to these dependant ecosystems. The loss or reduction of many critical natural areas, such as the post oak barrens, will be prevented by preventing or reducing the intrusion of species such as the eastern red cedar which invade in the absence of fire. Monitoring will provide information to park staff on the reduction in the density of forest cover and the subsequent increase of habitats such as cedar thicket through fire application. Scenic vistas and bird foraging will be protected or increased.

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XI. *CONSULTATION AND COORDINATION*

Douglas Ladd, The Nature Conservancy, St. Louis, Missouri
Jim DeCoster, Regional Fire Ecologist, National Park Service
Mark Baron, Wildlife Biologist, Arkansas Game and Fish Commission

XII. *REVIEWERS*

XII. *APPENDIX*

A. Plant specimen voucher collection/plant list
B. Vegetation map (To be initiated FY2001)
C. Fire Management unit map (To be developed as part of the FMP FY2001)
D. Fuel Model Map (To be developed as part of the FMP FY2001)
E. Plot Location Map

APPENDIX G

G. PRE-ATTACK PLAN

Table 24 – Pre-Attack Plan

Function/Item	Available	Needed	Not Needed
Command			
Pre-attack WFSA	X		
Pre-positioning Needs	X		
Draft Delegation of Authority	X		
Management Constraints	X		
Interagency Agreements	X		
Evacuation Procedures		X	
Structural Protection Needs	X		
Closure Procedures		X	
Operations			
Water Sources	X		
Control Line Locations	X		
Natural Barriers	X		
Safety Zones	X		
Flight Routes/Restrictions		X	
Staging Area Locations	X		
Helispot/Helibase Locations	X		
Logistics			
ICP Location	X		
Roads/Trails with Limitations	X		
Utilities	X		
Medical Facilities	X		
Stores/Restaurants/Services	X		
Rental Equipment Sources	X		
Construction Contractors	X		
Sanitary Facilities	X		
Law Enforcement/Fire Departments	X		
Communications (availability)	X		
Maintenance Facilities	X		
Sanitary Landfills	X		

Planning			
Park Base Map	X		
Area Topographic Maps	X		
Infrared Imagery		X	
Vegetation/Fuel Maps	X		
Hazard Maps (ground and aerial)	X		
Special Visitor Use Areas	X		
Land Ownership Status	X		
Archeological/Cultural Resource Maps	X		
Sensitive Plant Area Maps	X		

APPENDIX H

H. STEP-UP PLAN

Table 25 – Step-up Plan

Staffing Class	Fuel Model	Burning Index	Step up Actions
SC-1	L E R	0-7 0-7 0-3	Park will continue with normal operations
SC-2	L E R	8-16 8-16 4-7	Park will continue with normal operations
SC-3	L E R	17-34 17-33 8-16	Actions in SC-2 plus District supervisors will know the location and availability of their fire qualified personnel. Equip all vehicles with fire suppression tools. Current fire weather forecasts will be broadcast park-wide daily.
SC-4	L E R	35-47 34-41 17-20	Actions in SC-3 plus FMO may request emergency preparedness account from region. FMO may meet with the Superintendent, Chief of Resource Management and concerned agency representatives to coordinate resource needs. Implement the fire prevention program as defined in Fire Prevention Plan. Coordinate aerial detection with the Ozark National Forest or rent an Office of Aircraft Services (OAS) approved aircraft with

Staffing Class	Fuel Model	Burning Index	Step up Actions
			approved pilot for a daily flight of River area. Selected personnel may be put on standby status at selected staging areas. Single Resource Patrols will be initiated to increase wildland fire detection and to deter arson ignitions. Will assign a dispatcher on any wildland fire. May supplement park personnel with outside overhead, crews and equipment as wildland fire occurrence increases. Current fire weather forecasts will be broadcast park-wide daily.
SC-5	L E R	48+ 42+ 21+	Actions in SC-4 plus Conduct aerial wildland fire surveillance twice daily using OAS approved aircraft and pilot. Bring in outside overhead, crews and equipment and place on standby at staging areas within park if indices are predicted to maintain trigger levels for extended period. Meeting may be held with the Superintendent, Chief of Resource Management, FMO and concerned agency representatives to coordinate resource use and pre-positioning, especially if a wildland fire has been reported on or within 1 mile of the river boundary. Visitor restrictions and/or park closures may be considered. Assign special law enforcement/fire qualified

Staffing Class	Fuel Model	Burning Index	Step up Actions
			personnel to high wildland fire risk areas. Maintain close communications with local fire agencies to provide mutual assistance as defined in Memoranda of Understanding or Cooperative Agreements. Assign a fulltime dispatcher on any wildland fire for fire time accounting and to maintain an accurate record of fire radio traffic.

APPENDIX I

LONG-TERM PRESCRIBED FIRE AND HAZARD REDUCTION PLAN

1. Multi-year prescribed fire schedule

Arkansas Park Group (ARPG) Five Year Prescribed Fire Plan
(Note: Unaccomplished projects will be rescheduled based on anticipated workload and other factors. Additional ARGP projects may be identified and prioritized as the NPS Fuels Program continues to develop).

Calendar Year (priority #)	Project Name	Park	Primary Purpose Hazard Fuel Redcution	Resource Management	Acerage	Prior Burn ? (Y,N,Partial)	Notes
2002	North River Rd	BUFF		X	699	P	Open Fields Program; fuels reduction near boundary
2002	South River Rd	BUFF		X	647	P	Open Fields Program; fuels reduction near boundary
2002	Erbie Campground	BUFF		X	28	N	Open Fields Program
2002	North Erbie	BUFF		X	400	N	Open Fields Program
2002	Gene Rush 4	BUFF		X	900	N	wildlife goals; cooperative burn with AR G&F
2002 (Fall #3)	Love/Hensley	BUFF		X	50	Y	Open Fields Program. Fall 02 project.
2002 (Fall #1)	LBD Cabins	BUFF	X		175	P	Possible WUII Project. Fall 02 project. Moderate to heavy fuels downslope from historic structures. Partially burned in 1996.
2002 (Fall #2)	BP Campground	BUFF	X		71	N	Possible WUII Project. Fall 02 project.
2002	BP Maintenance	BUFF	X		712	P	Possible WUII Project; park structures, moderate to heavy fuels downslope, partial burn in 1997
2002	Toney Bend	BUFF	X		50	N	park houses; moderate fuel loads
2002	Tyler Bend Maintenance	BUFF	X		145	Y	private, park structures; moderate to heavy fuel loads; burned 1n 1996
2002	Rndtop/Cox	PERI		X	650	Y	Revegatation Management Plan unit
2002	Horse Trail South	PERI		X	450	Y	burned in wildfire in 1996
2002	Ford Road	PERI		X	400	Y	burned in 1997
2002	North Boundary	PERI	X		325	Y	private structures; light to heavy fuel loads; burned in 1996

2002	12 Corners	PERI		X	300	P	Revegatation Management Plan unit
2002 (Fall #1)	Piles	PERI	X		25	N	Reduction of cedar slash piles
2003 (Spr#9)	Sod Collier 2	BUFF		X	91	P	Sod Collier prairie and west side of Tyler Bend Road
2003 (Spr #6)	Arnold Bend	BUFF		X	431	Y	Open Fields Program
2003 (Spr#1)	LB Wilderness	BUFF		X	10,887	P	Post Oak/Cedar Glade preservation
2003 (Spr#5)	Gene Rush 1	BUFF		X	1147	N	wildlife goals; cooperative burn with AR G&F
2003 (Spr#3)	Pruitt Complex	BUFF	X		885	P	private, park structures; moderate to heavy fuel loads; partial burn in 1997
2003 (Spr#7)	Hasty	BUFF		X	226	Y	Open Fields Program
2003 (Spr#8)	Ozark House	BUFF	X		164	P	Fuel reduction near park house; cedar glade preservation
2003 (Spr#4)	Pt Peter Mtn	BUFF	X		622	P	reduce d&d fuel accumulations resulting from ice storm, wildfire; private propetry
2003 (Spr#2)	Gilbert East	BUFF	X		640	N	WUII Project. 640 acre project selected from several options after talking with adjoining property owners. Project presents numerous opportunities for the NPS to make good on NFP goals.
2003 (Spr#10	Loafer's Glory	BUFF		X	944	N	Low priority cooperative burn with AR G&F
2003 (Spr#11)	Loafer's Morning	BUFF		X	753	N	Low priority cooperative burn with AR G&F
2003	TB Sprayfield	BUFF	X		3	N	Not in FASTRACS. Dan Jackson's water treatment plant sprayfield
2003 (Spr#1)	NE County Rd	PERI	X		150	Y	park boundary; private land, structures
2003 (Spr#3)	Williams Hollow	PERI	X		450	Y	moderate to heavy fuel loads
2003 (Spr#2)	N.Central Bdry	PERI	X		114	Y	park boundry; private property; structures
2004	North Tyler Bend Road	BUFF	X		551	N	Hazard fuels reduction near Tyler Bend developed area.
2004	LBD Cabins	BUFF	X		175	P	Possible WUII Project; historic structures, moderate to heavy fuels downslope, partial burn in 1996
2004	BP Campground	BUFF	X		71	N	Possible WUII Project; moderate to heavy fuels
2004	Hasty House	BUFF	X		165	P	park structures; light to heavy fuel loads; partial burn in 2000
2004	Beaver Jim	BUFF	X		6	Y	historic structure; burned in 1997
2004	Gilbert West	BUFF	X			N	WUII Project Rx Burn
2004	TB Sprayfield	BUFF	X		3	Y	
2004	Pruitt Glade	BUFF		X	252	P	fairly easy access; partial burn in 2000
2004	Cash Bend	BUFF		X	142	Y	Open Fields Program
2004	Stewart/Hickman	BUFF		X	60	Y	Open Fields Program
2004	Woolum House	BUFF	X		11	N	park house; moderate fuel loads' arson area
2004	Gilbert West	BUFF	X		713	N	WUII Project Rx Burn
2004	Maumee	BUFF		X	501	N	Open Fields Program
2004	Gene Rush 5	BUFF		X	1222	Y	wildlife goals; cooperative burn with AR G&F
2004	Rough Edge A	BUFF	X		1069	N	park boundary; private land, structures

2004	Rough Edge B	BUFF	X		146	N	park boundary; private land, structures
2004	Adams	BUFF		X	212	N	Open Fields Program
2004	Artillary Woods	PERI	X		13	Y	near VC
2004	Hntsvle Rd Wl	PERI		X	220	Y	Revegatation Management Plan unit
2004	Hntsvlle Rd E	PERI		X	103	Y	Revegatation Management Plan unit
2005	North River Road	BUFF		X	699	Y	Open Fields Program
2005	South River Road	BUFF		X	653	Y	Open Fields Program
2005	North Erbie Complex	BUFF		X	601	Y	Open Fields Program
2005	Tyler Bend Maintenance	BUFF	X		152	Y	private, park structures; moderate to heavy fuel loads; burned 1n 1996
2005	Toney Bend	BUFF	X		46	Y	park houses; moderate fuel loads
2005	Rush	BUFF	X		21	P	historic structures; light to moderate fuel loads ; partial burn in 1997
2005	TB Sprayfield	BUFF	X		3	Y	
2005	Gene Rush 2	BUFF		X	2416	Y	wildlife goals; cooperative burn with AR G&F
2005	Riddell	BUFF		X	339	N	Open Fields Program
2005	Leetown N.	PERI		X	40	Y	Revegatation Management Plan unit
2005	Leetown S.	PERI		X	95	Y	Revegatation Management Plan unit
2005	Federal Trenches	PERI	X		54	Y	park boundry; private property; structures
2005	Hwy 72N	PERI		X	40	Y	Revegatation Management Plan unit
2005	Hwy 72 S	PERI		X	113	Y	Revegatation Management Plan unit
2005	SW Corner	PERI	X		75	P	private structures, park boundary, partially burned in 2001
2005	Picnic Area	PERI	X		25	Y	park structures, rx burned in 2001
2006	Sod Collier	BUFF		X	111	P	historic structure; HF reduction
2006	Gene Rush 3	BUFF		X	937	N	Wildlife Goals; cooperative with AR G&F
2006	BP Maintenance	BUFF	X		704	P	Possible WUII Project; park structures, moderate to heavy fuels downslope, partial burn in 1997
2006	TB Sprayfield	BUFF	X		3	Y	
2006	Arnold Bend	BUFF		X	573	Y	Open Fields Program
2006	Love/Hensley	BUFF		X	46	Y	Open Fields Program
2006	Pruitt Complex	BUFF		X	884	P	Open Fields Program, private structures, boundary fuels reduction
2006	Gilbert East	BUFF	X		640	Y	
2006	Rndtop/Cox	PERI		X	650	Y	Revegatation Management Plan unit
2006	Horse Trail South	PERI		X	450	Y	burned in 2002
2006	Ford Road	PERI		X	400	Y	burned in 2002
2006	North Boundary	PERI	X		325	Y	private structures, rx burned in 2002

2006	12 Corners	PERI		X	300	Y	Revegatation Management Plan unit
2007	TB Sprayfield	BUFF	X		3	Y	
2007	Cecil Cove	BUFF	X		995	N	Erbie historic structures protection; also RM goals
2007	Gene Rush 4	BUFF		X	974	Y	wildlife goals; cooperative burn with AR G&F
2007	North Tyler Bend Road	BUFF	X		551	Y	HF Reduction near park developed area
2007	LB Wilderness	BUFF	X		10887	?	Poast oak/Cedar Glade preservation
2007	Gilbert West	BUFF	X			?	WUII Project
2007	Point Peter Mtn	BUFF	X		622	?	hazard fuels reduction; ice storm, wildfire damage; near park boundary
2007	NE County Rd	PERI	X		150	Y	Park boundary HF Reduction
2007	Williams Hollow	PERI	X		450	Y	Hazarf Fuel Reduction
2007	North Central Boundary	PERI	X		114	Y	Park boundary HF Reduction

2. Hazard fuel reduction areas and schedule

Hazardous fuels reduction projects will be scheduled on an as needed basis and be prioritized based on real or potential threats to the safety and welfare of park visitors and employees, the general public, park developed sites and infrastructure, and private property. Ongoing analysis of hazardous fuel conditions will continue to identify areas to be considered for treatment throughout the park. Emphasis is currently placed on park-administered lands near federally listed “communities at risk”. Severe weather events such as ice and wind storms regularly alter the normal fuel regimes found in the Ozark Mountains and necessitate special hazard fuels mitigation activities. As a general rule, prescribed burning rather than mechanical manipulation is the preferred method of hazardous fuel treatment in the Ozarks due to greatly reduced cost per acre, more acceptable results over larger areas, and the well documented benefits of fire to the natural ecosystem. The long term prescribed fire schedule prioritizes hazard fuel reduction projects for the current and following year.

APPENDIX J

J. FIRE PREVENTION PLAN

FIRE PREVENTION ACTION PLAN

for

Buffalo National River

April, 1992

Submitted by: _____
Fire Management Officer
Buffalo National River

Approved by: _____
Superintendent
Buffalo National River

Date: 4/9/92

APPENDIX J

A. Objectives:

To reduce the threat of human-caused fires through visitor and employee education.

To integrate the prevention message into interpretive programs.

B. General Actions:

Responsible members of park staff will be familiar with the plan and be able to explain it to other interested parties and the general public.

Fire prevention will be discussed at park safety meetings during the fire season.

Interpretive programs will include fire prevention messages to alert visitors during fire season.

Community outreach programs will be developed in cooperation with FIREPRO and interpretive staff.

C. Fire Prevention Plan:

The fire prevention analysis is attached to this plan as an appendix. This appendix contains the detailed prevention actions identified for specific areas or fire problems in the unit. It will be reviewed annually by June 15 of each year and updated if changes occur which alter the identified Risks, Hazards, or Values. An informal review of the plan will also occur after the fall fire season, no later than December 31 of each year.

APPENDIX J

FIRE PREVENTION

A major objective of the park's overall fire management program is to reduce human-caused wildland fires.

An analysis of the park's human-caused wildland fires was undertaken to identify appropriate and achievable action items for reducing these fires.

The analysis was completed using guidelines established in NPS-18, Chapter 11 and the NPS Fire Prevention Handbook. A formal record of the full planning process for the park, including the base maps, overlays and complete Fire Prevention Compartment description are on file in the Fire Management Officer's Office.

The Fire Prevention Action Plan, which will be reviewed formally by June 15 of each year and again informally by December 31 of each year, appears as an appendix of the Fire Management Plan.

APPENDIX J

FIRE PREVENTION ACTION PLAN

GENERAL ACTIONS

The following General Action Items have been identified as elements in the park's overall Fire Prevention Program. They are designed specifically to address the one major cause of human-caused fires at Buffalo National River; arson fires.

Arson Fires
Some certain segments of the local population have historically disagreed with park policies and/or regulations and have used arson fires to reflect their opinions.
Park managers should recognize this and strive to increase interaction with public groups to alleviate public resentment.

1. A human-caused fire prevention message will be developed and included on park bulletin boards.

Responsible person: District Rangers Oct. 15 & Jan. 1
Fire Management Officer.

2. During periods of high fire danger, an increased fire detection program will be implemented.

Responsible person: District Rangers
Fire Management Officer Periods identified by manning classes

3. A fire awareness program will be developed through local groups and schools.

Responsible person: Fire Management Officer January, 1994
Chief of Interpretation

APPENDIX J

SPECIFIC FIRE PREVENTION ZONE RATINGS/ACTION ITEMS

FP ZONE #1 -UPPER END OF PARK TO LEATHERWOOD CREEK

Hazard	High	Upper Wilderness Area, not easily accessible.
Value	High	Boxley Historical District and Upper Wilderness Area.
Risk	Medium	Limited access in Upper wilderness Area, good access in Boxley area. with moderate number of fires

SPECIFIC PREVENTION ACTIONS REOUIRED

Increase patrols during high fire danger, determined by manning class days (as described in fire management plan).

Responsible person(s):

Interpretive staff
Fire Management Officer — On-going, during fire season

FP ZONE #2 -STEEL CREEK RESIDENCE, CAMPGROUND, LAUNCH RAMP

Hazard	Low	Mowed fields, high bluffs some old fields.
Value	High	Ranger residence, research center, outbuildings, and campground.
Risk	High	Campfires, high visitor use, easy access, and moderate number of fires.

SPECIFIC PREVENTION ACTIONS REQUIRED

Post fire danger awareness signs at campground and launch ramp during periods of high fire danger (as described in fire management plan).

Increase patrols during periods of high fire danger determined by manning class days (as described in fire management plan).

Responsible person(s):

Upper District Ranger
Fire Management Officer on-going during fire season dependent on manning class rating,

APPENDIX J

FP ZONE #3, 6, 9

3 -Ponca Wilderness Area, land area to Erbie
6 -Land area from Mill Creek to Hasty area
9 -Land area downstream from Hasty to Mt. Hersey

Hazard	Medium	Wilderness area, hardwood fuels with steep slopes predominate, limited access.
Value	Low	Primarily woodlands with no developments.
Risk	Low	No incidence of wildland fires, limited access.

SPECIFIC PREVENTION ACTIONS REOUIRED

Increase patrols during high manning class days (as described in fire management plan).

Responsible person(s):

Upper District Ranger Fire Management Officer	On-going during fire season dependent on manning class rating

FP ZONE #4 -KYLES LANDING AREA

Hazard	Medium	Hardwood fuels.
Value	High	Campground, Camp Orr (Boy Scouts of America), launch ramp.
Risk	Medium	Good access, low incidence of fires.

SPECIFIC PREVENTION ACTIONS REQUIRED

Same as FP Zone #2.

Responsible person (s):

Same as FP Zone #2.

APPENDIX J

FP ZONE #7 -HASTY AREA

Hazard	Low	Fuels are predominately old fields.
Value	High	Ranger residence, launch area, picnic area.
Risk	Medium	Fuel types, easy access, moderate fire occurrence.

SPECIFIC PREVENTION ACTIONS REOUIRED

Same as FP Zone #2.

Responsible person(s):

Same as FP Zone #2.

FP ZONE #8 -CARVER AREA, HWY. 123 CROSSING, DOWNSTREAM TO BIG CREEK

Hazard.	Low	Fuels are predominantly old fields with some hardwood.
Value	Medium	Launch ramp with picnic area.
Risk	Low	Easy access, moderate number of fires

SPECIFIC PREVENTION ACTIONS REQUIRED

Same as FP Zone #2

Responsible person(s):

Same as FP Zone #2.

FP ZONE #10 -MT. HERSEY AREA

Hazard	Medium	Fuels are predominantly hardwood with moderate slopes.

Value	Medium	Launch ramp with picnic area.
Risk	Medium	Easy access, moderate fire occurrence

SPECIFIC PREVENTION ACTIONS REQUIRED

Same as FP Zone #2.

Responsible person(s):

Same as FP Zone #2.

APPENDIX J

FP ZONE #11 -MT. HERSEY. DOWNSTREAM TO THE NARROWS

Hazard	Medium	Fuels predominantly hardwood forest with moderate slopes.
Value	Low	No developments.
Risk	Low	Limited access with low fire occurrence.

SPECIFIC PREVENTION ACTIONS REOUIRED

Increase patrols during high manning class days (as described in fire management plan).

Responsible person(s):

Middle District Ranger Fire Management Officer	On-going during fire season dependent on manning class rating

FP ZONE #12 -NARROWS TO BEAR CREEK

Hazard	Medium	Fuels predominantly hardwood forest with several old fields.
Value	High	Area contains three Ranger residences, two seasonal residences, visitor center, new development with maintenance area and wastewater treatment plant, two campgrounds.
Risk	High	Easy access, highest incidence of fires in park.

SPECIFIC PREVENTION ACTIONS REQUIRED

Post fire danger awareness signs at campground; launch ramps, visitor center.

Make general public aware of high fire danger at visitor center during extended dry periods.

Develop public awareness campaign through local schools

Increased patrols during high manning class days (as described in fire management plan).

Re-station engine during fire season at Tyler Bend.

Responsible person(s):

Middle District Ranger	On-going during fire season dependent on manning class rating
Fire Management Officer	Develop program by 1/94.
Chief of Interpretation	

APPENDIX J

FP ZONE #13 -BEAR CREEK TO MAUMEE AREA

Hazard	Medium	Fuels are predominantly hardwood with some old fields.
Value	Low	No developed areas noted.
Risk	Low	Limited access, low incidence of fires.

SPECIFIC PREVENTION ACTIONS REOUIRED

Same as FP Zone #3.

Responsible person(s):

Middle District Ranger Fire Management Officer	on-going during fire season dependent on manning class rating

FP ZONE #14 -MAUMEE AREA

Hazard	Low	Fuels are predominantly old fields with some hardwoods.
Value	Medium	Launch areas with primitive campground.
Risk	High	Easy access, high incidence of fires.

SPECIFIC PREVENTION ACTIONS REOUIRED

Same as FP Zone #2.

Responsible person(s}:

Middle District Ranger/ Lower District Ranger Fire Management Officer	On-going during fire season dependent on manning class rating

FP ZONE #15 -MAUMEE AREA DOWNSTREAM TO HAT CHUTE

Hazard	Medium	Fuels are predominantly hardwood forests with some old fields.
Value	Low	One primitive campground with mowed field around it.
Risk	Low	Limited access, low incidence of fires

SPECIFIC PREVENTION ACTIONS REOUIRED

Same as FP Zone #3.

Responsible person(s):

Lower District Ranger Fire Management Officer	On-going during fire season dependent on manning class rating

FP ZONE #.16 -HAT CHUTE DOWNSTREAM TO TONEY BEND

Hazard	High	Fuels are predominantly hardwood forests with some old fields.
Value	Medium	Three ranger residences, concession operation, developed campground, historic cabins, maintenance complex, horse barns
Risk	High	Easy access, heavy visitor use, high incidence of fires.

SPECIFIC PREVENTION ACTIONS REQUIRED

Make general public aware of high fire danger through visitor center contacts and interpretive talks.

Responsible person(s):

Lower District Ranger Fire Management Officer	on-going during fire season dependent on manning class rating
Interpretive staff	Develop program by 1/94.

FP ZONE #17 -TONEY BEND TO MOUTH OF RIVER TO INCLUDE LOWER WILDERNESS AREA

Hazard	High	Predominantly hardwood fuels in wilderness area, limited access.
Value	Medium	One launch area with primitive campground, historic buildings at Rush.
Risk	Medium	Limited access except to Rush, moderate incidence of fires.

SPECIFIC PREVENTION ACTIONS REQUIRED

Same as FP Zone #1.

Responsible person(s):

Lower District Ranger Fire Management Officer	On-going during fire season dependent on manning class rating