Hot Springs National Park

Hot Springs, Arkansas

Fire Management Plan

Environmental Assessment

May 2005

U.S. Department of the Interior
National Park Service

FIRE MANAGEMENT PLAN

for

HOT SPRINGS NATIONAL PARK

United States Department of the Interior
National Park Service
Hot Springs National Park
Hot Springs, Arkansas

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TABLE of CONTENTS

LIST OF TABLES

List of Figures

I. INTRODUCTION

A. Requirements

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

The plan is also guided by Director's Order-18 (DO-18) which requires that all park units with vegetation capable of sustaining fire develop a FMP. Until an FMP is approved, the Park will aggressively suppress all wildfires, taking into account the safety of firefighting personnel, the visiting public and protection of all resources at risk on the unit.

B. Collaboration

This plan was written in a collaborative fashion, National Park Service (NPS) staff from the park, the Midwest Regional Office, the Heartland Inventory and Monitoring Network, Ozark National Scenic Riverways and Buffalo National River. In addition, the US Fish and Wildlife Service and the Arkansas State Historic Preservation Office provided input.

C. National Fire Plan Goals

Director's Order #18 states that,

> *"The overall resource management objectives for an NPS unit must guide Fire Management Plans. The resource management objectives will determine whether and how fire will be managed."*

In addition to achieving resource management goals as stated in the Park's resource management plan, this FMP will implement fire management policies and help achieve fire management goals as defined in: (1) *Federal Wildland Fire Management Policy and Program Review, 2001 (USDOI/USDA 2001)*; (2) *Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDOI/USDA 2001)*; and (3) *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan 2001(USDOI/USDA 2001)*.
In addition to existing planning document objectives, there are 4 goals in the National Fire Plan (NFP) 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 Hazard Fuels – Projects proposed in this plan, primarily mechanical, will assist meeting this goal at Hot Springs.

Goal 3. Restore Fire Adapted Communities – Projects proposed for Goal 2 will be a starting point for the restoration of fire to the vegetative community at the Park.

Goal 4. Promote Community Assistance – A potential exists for local fire department support as well as technical assistance to the community for risk reduction in the wildland urban interface.

D. NEPA and Other Compliance

An Environmental Assessment (EA) guides the FMP and complies with National Environmental Policy Act (NEPA) requirements and National Park Service (NPS) policy. The EA analyzes environmental impacts of the operations detailed in this plan, and compares the proposed action of this plan with a range of alternatives.

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, particularly Section 106, sets the requirements for the protection of the historic properties found on the unit.

There are no threatened or endangered species identified as resident of the unit. Consultation with the US Fish and Wildlife Service regarding Section 7 of the Endangered Species Act will be requested to ensure that no proposed listing actions will be affected by this plan.

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

E. 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. 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 wildfire.

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 December 31, 2003. 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 in this plan (see Section I.B.2.)

B. Relation to Establishing Legislation

The land on which Hot Springs National Park is situated was part of the 1803 Louisiana Purchase. By an 1832 Act of the Twenty-Second Congress of the United States, the government reserved from settlement the thermal and salt springs, along with four sections of surrounding land, but settlers nonetheless continued to build bathhouses and residences around the springs. In 1875 the government was forced to reconfirm its jurisdiction over the area in the Court of Claims. In 1877, the Hot Springs Commission was authorized to survey the area, reestablish the boundaries of the reservation, and sell unwanted lots to claimants and other private citizens, thus establishing the permanent Hot Springs Reservation. From this date on, the government closely monitored and supervised the springs and their use by private citizens, guiding their development and protecting their qualities. The reservation became a national park in 1921.

1. Establishment

The establishing citation from 16 USC § 361 follows:

> 16 USC § 361, Establishment; supply of water; free baths for indigent; dedication to United States

> The Secretary of the Interior is authorized to grant to hotels having bathhouses attached, and to bathhouses situated in the Hot Springs National Park, as well as in the city of Hot Springs, Arkansas, the right to install, maintain, and use, either in said bathhouses or in connection with the rooms of said hotels or the bathhouses attached to said hotels, as many bathtubs as in his discretion he may deem proper and necessary for the public service and the amount of hot water will justify. The superintendent shall provide and maintain a sufficient number of free baths for the use of the indigent. All titles given or to be given by the United States shall explicitly exclude the right to the purchaser of the land, his heirs or assigns, from ever boring thereon for hot water; and the Hot Springs, with the National Park and mountain are dedicated to the United States, and shall remain forever free from sale or alienation.

Hot Springs National Park 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".

2. Significant Resources and Values

Hot Springs National Park contains significant natural and cultural resources.

Two vegetation communities are listed as "Inventory Elements" by the Arkansas Natural Heritage Commission: Novaculite glade-outcrop and Xeric Shortleaf Pine-Oak Forest. The park does not contain any known resident threatened or endangered species as listed under the Endangered Species Act of 1973, although it does contain several rare species (see X.B.).

Cultural resources include historic structures, archeological sites and cultural landscapes. Historic structures include the eight historic bathhouses that comprise the Bathhouse Row Historic Landmark District. There are approximately state-registered archeological sites located within park boundaries.

C. Objectives of General Management Plan Related to Fire Management

There are three basic goals of the 1986 General Management Plan (GMP) related to the FMP.

1. Recharge Area

Investigate and protect the recharge area of the thermal springs.

2. Vegetation Management

Improve vegetation management and restore disturbed areas.

3. Natural Resource Research

Research and document the park's natural resources.

D. Objectives of Resource Management Plan Related to Fire Management

1. Preserve Springs

To ensure the preservation of the thermal springs, and protect the entire hydrologic system and the purity of the thermal water.

2. Ecosystem Health

To maintain healthy ecological systems.

3. Natural Diversity

To protect and maintain the natural diversity of plants and animals outside of areas managed primarily for cultural resources or developed areas.

4. Public Understanding

To promote public understanding and appreciation of the Park's thermal features, geological and hydrological resources, and ecological communities.

E. Achieving GMP and RMP Objectives through the FMP

Fire can be used to provide a natural appearing landscape vista for the Park. With proper planning and execution, prescribed fire can manipulate vegetation to produce healthier habitats as a background for the developed zone of the park. At the same time fuel management, using both mechanical means and prescribed fire, can reduce the risk to cultural and historic structures on the unit. Implementation of the FMP will achieve both GMP and RMP objectives listed under items C and D above.

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

III. SCOPE OF WILDLAND FIRE MANAGEMENT PROGRAM

General Management Considerations

Hot Springs National Park is comprised of an historic district adjacent to the city of Hot Springs, surrounded by a forested ecosystem, which in turn is surrounded by development. The fire management program will focus on minimizing the impacts of wildland fire through suppression of wildfires, reducing hazard fuels, while maintaining and restoring the forested ecosystems.

Park Fire Management Goals

The goals of the fire management program are to:

1. Suppress all wildfires, and preventing human-caused fires, while providing for firefighter safety.
2. Reduce hazard fuels to reduce the potential for wildfires.
3. Restore forest vegetation.
4. Provide for public safety.

C. Wildland Fire Management Options

1. Wildfire Suppression

Suppression – All wildfires, regardless of cause, will receive an appropriate response. The park maintains no fulltime firefighters so other park personnel will be encouraged to qualify for and maintain fire qualifications. If resource needs exceed the park's ability, then resources from local fire departments will be requested. Memoranda of Understanding with the local fire departments are included in **Appendix E**. Additional resources from the Arkansas Area Park Group (AAPG) and the interagency zone coordination center may also be requested.

Suppression strategies will seek to control the spread of wildfires 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. Minimal Impact Suppression Tactics will be used.

The NPS infrastructure within the city limits, as well as most of the in-holdings in the park, is protected by the Hot Springs City Fire Department.

2. Wildland Fire Use

There will be no Wildland Fire Use at Hot Springs due to the size of the park and the amount of wildland urban interface...

3. Prescribed Fire

Prescribed fire will be used to reduce hazard fuels and restore vegetation composition and structure. Hazard fuel reduction will reduce the impact of subsequent wildfires and will reduce the likelihood of wildfire moving across Park boundary.

Reasonable available control measures will be used to mitigate the effects of smoke from prescribed fires. Smoke reduction will be addressed in all prescriptions and smoke modeling

software (SASEM, CONSUME) applied where practical.

4. Non-fire Hazard Fuel Reduction

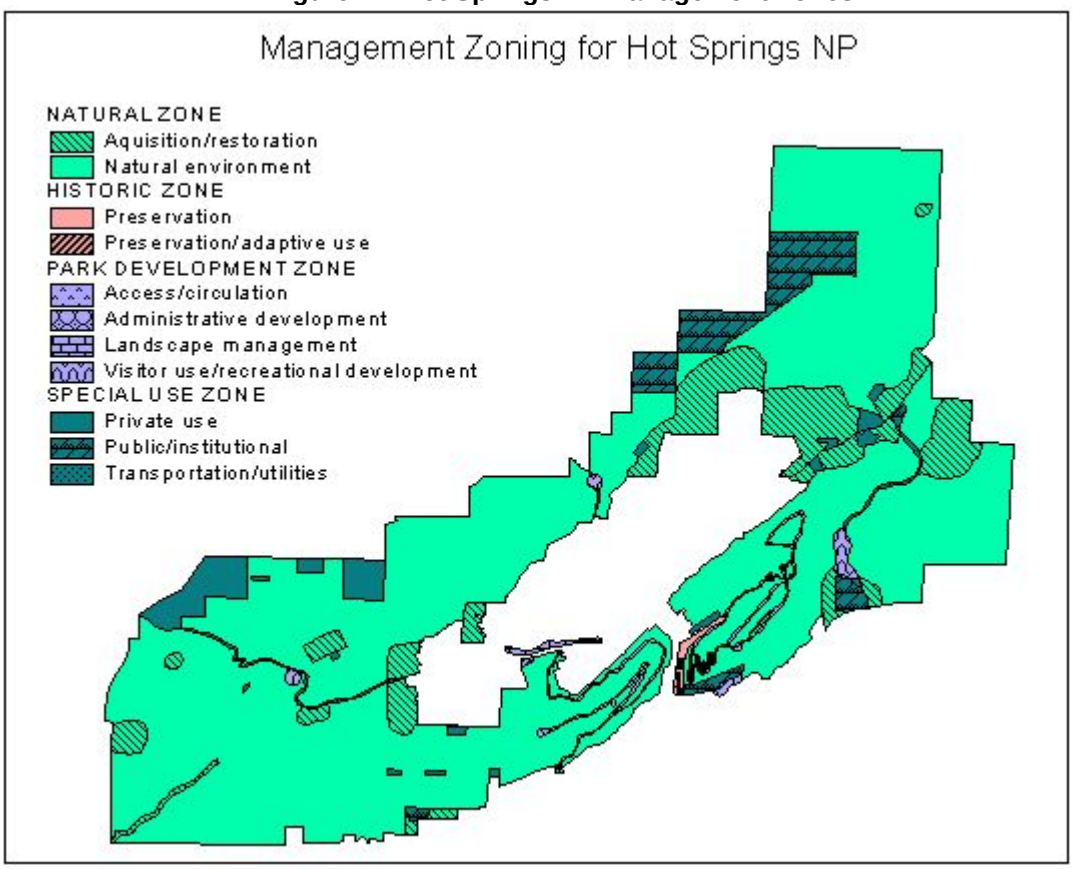
Hot Spring National Park is a true urban park set within and adjacent to the city of Hot Springs. Mechanical fuels reduction projects are ongoing and planned to continue as funding is available to reduce hazard fuels in the wildland urban interface.

C. Description of Fire Management Unit (FMU)

Hot Springs National Park contains only one FMU. The entire park is included in that FMU. The park is located on the north side of the city of Hot Springs, AR, approximately 55 miles southwest of Little Rock. Access to the area is provided by U.S. 270, U.S. 70 and Arkansas 7. The park is in the Zig Zag Mountains on the eastern edge of the Ouachita Range.

The park's vegetation, thermal waters, cold water springs, bathhouses and associated cultural features, foot trails, prehistoric and historic Novaculite quarries, and general physiography combine to form a 5500 acre area of resource preservation and interpretation that is under the exclusive legislative jurisdiction of the federal government. The city of Hot Springs, Arkansas, with an approximate population of 40,000, mostly surrounds the Park and exerts a significant influence on it.

Figure 1 – Hot Springs NP Management Zones

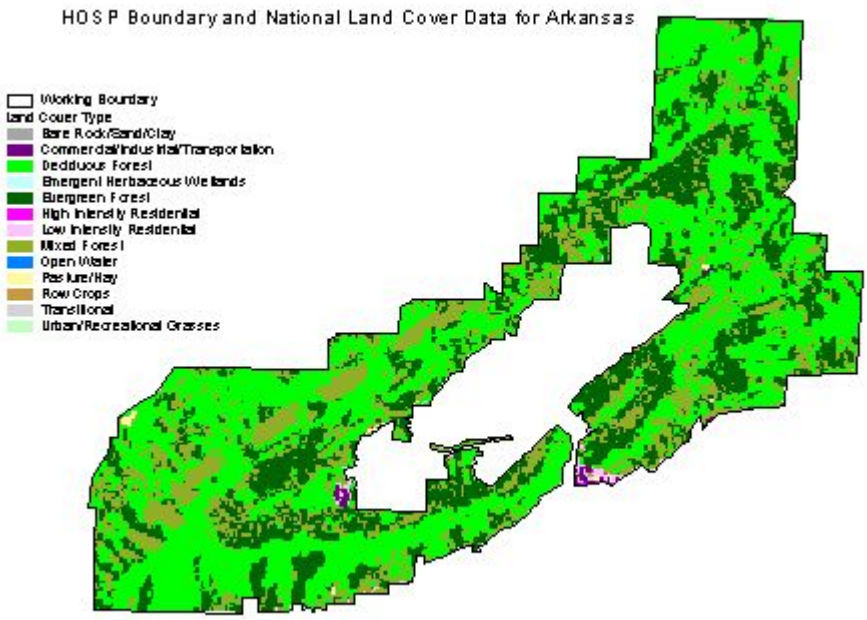


1. Characteristics

a. Vegetation – The area supports mixed stands of oak and hickory interspersed with shortleaf pine on the more exposed slopes and ridge tops. The forest understory contains flowering shrubs, a wide variety of wildflowers, a rare local chinquapin species (*Castanea pumila* var. *ozarkensis*), and occasionally the rare Graves spleenwort (*Asplenium gravesei*).

The park supports dense forest cover, most of which is at least second growth, as timber cutting for a variety of purposes was pervasive in the 1800s and early 1900s. However, it is probable that a virgin stand of trees still exist in the park. There is a stand of old growth shortleaf pine (*Pinus echinata*) located on the north slope of Sugarloaf Mountain. Core samples have indicated ages of several hundred years, (Cook, Meko, Stahle, and Cleaveland, 1999) and the stand is registered under the Arkansas Natural Heritage Program. Even though considerable acreage in the park has been under federal control since 1832, most of the lands acquired since 1972 have either been farmed, mined for gravel, logged for pulpwood, or cleared for home sites; many areas are in need of restoration of vegetation.

Figure 2 – Hot Springs NP Vegetation and Land Cover Data



b. Wildlife – Wildlife within the park is typical of the region, consisting mostly of deer, rodents, bats, other small mammals, reptiles and amphibians. Because of the region's mild climate, bird species are varied and plentiful. Aquatic resources are limited to portions of several small creeks and contain few game fish.

c. Threatened and Endangered Species – There are no known endangered or threatened animals or plants resident in the park.

d. Hydrology – The natural thermal springs are the primary resource of Hot Springs National Park. The presence of the hot springs is a result of the unique geology of the area in combination with the present topography. The water is geothermally heated at an unusually shallow depth of several thousand feet. The water then rises through faults in the Hot Springs sandstone formation to emerge from the thermal springs. Through radiocarbon dating, this process has been determined to take over 4,000 years. In relation to the springs' function, park lands are viewed as two interrelated units: the discharge zone and the recharge zone.

   The discharge zone is a narrow strip about a quarter mile long at the foot of Hot Springs Mountain where the thermal water emerges from fractures in the underlying sandstone formation. This area has been the focus of human use and intensive development over the years and is now the site of Bathhouse Row and downtown Hot Springs. The springs themselves are largely concealed from modern visitors except for three display areas along the row. The rest of the springs were capped before 1901 to prevent contamination; today, the spring water is diverted into the park's extensive thermal spring water distribution system.

   The recharge zone includes the highly permeable Bigfork cherts and the Arkansas Novaculite formation. The largest outcrops of these formations generally occur on the mountain slopes and narrow ridges above 700 feet in elevation. When plotted on a map, they form long ellipses around the valleys drained by Hot Springs and Gulpha Creeks in the Park, and they extend well beyond the Park boundary to the north and east into the upper basin of the South Fork Saline River. Scientific studies (Petersen and Mott, Technical Report, NPS/NRWRD/NRTR 2002/301) indicate that perhaps 50 to 75 percent of the recharge zone is outside the present park boundary and encompasses much of the mountain lands area of the Park. However, it appears possible that the hydrologic system could be disrupted by the wells within any portion of the system.

e. Cultural Resources – To date, fewer than 100 hectares (approximately 250 acres) have been officially surveyed for archeological sites in Hot Springs National Park. This represents, at most, a little over 5% of the federally owned land within park boundaries. Park files indicate that 20 archeological surveys and/or excavations have been performed in the park. Not all these surveys resulted in discovery of sites. Within the park 30 sites are officially recorded with state offices. There are, according to the State Archeologist, likely to be hundreds of old residential locations (structures acquired and removed by the park) that may qualify for registration as sites.

   Past archeological work has included a 1975 park-wide reconnaissance by Charles Baker of the Arkansas Archeological Survey and numerous *ad hoc* surveys preliminary to development in various sections of the park. These surveys were primarily surface/visual-based, with shovel tests at intervals specified in the *Arkansas State Plan for Historic Preservation*. A formal Cultural Sites Inventory (CSI) (mandatory under NPS-28) was completed for the park in May 2004, and the data has been entered, as is required, into the CSI's successor vehicle, the Archeological Sites Management Information System (ASMIS) database. Bathhouse Row, a historic district, is a National Historic Landmark. The Fordyce-Rick Estate (with 17 associated structures) is listed as a National Historic Site. The Indian Mountain Novaculite quarry complex is the only archeological site that has been evaluated.

A Cultural Landscape study is currently underway and expected to be completed in 2006. A number of cultural landscapes have been tentatively identified: Arlington Lawn, Bathhouse Row/ Magnolia Promenade, Gulpha Gorge Campground, Whittington Park and the recreational drives/ overlooks on the surrounding mountains.

f. NPS Infrastructure – Historic buildings to be protected are within the protection zone of the Hot Springs Fire Department and would receive primary protection from that department. Buildings that are part of the NPS administrative site at Hot Springs are also protected by the city fire department.

2. Fire Management Objectives

a. Contain 95% of all wildfires at less than 5 acres to protect park resources.

b. Reduce the potential for large wildfires which could adversely affect unit resources through prescribed fire and mechanical treatments.

c. Use appropriate methods of fuel management to reduce risk of fires in wildland-urban interface areas on the boundary, treating 10% of the boundary annually.

d. Use prescribed fire to maintain healthy ecosystem to protect recharge area.

e. Use prescribed fire to maintain control exotic species and to control or mitigate insect and disease attacks.

f. Increase public awareness of the role of fire in natural processes through interpretation.

3. Management Considerations

The wildland urban interface is a primary concern in all fire management activities. Immediate suppression of wildfires is critical to ensure that wildfire does not leave the park and destroy neighboring developments is of primary importance. Hazard fuel reduction along the boundary is an important strategy to protect this wildland urban interface. The use of prescribe fire must ensure that smoke mitigation strategies are used to ensure that smoke impacts to urban areas are minimized.

4. Historic Role of Fire

Prior to European settlement of Arkansas, natural (lightning) and human-caused (Indian) fires would burn in a mosaic pattern guided only by climatic conditions, natural barriers (streams, bluffs) and available fuels. Native Americans had set fires for a variety of purposes over many thousands of years (Stanturf et al., 2001). Written accounts strongly suggest the use of fire by Indians to burn off prairies and to prevent woodlands from becoming cluttered by underbrush (Ladd, 1991). This was done to encourage the emergence of lush new grasses, grazed by free-ranging elk and bison, and to drive wildlife toward hunters.

The fire return interval, or average period of time for successive fires to pass over a given point, has been estimated at approximately 32 years for the period 1780-1938 (Johnson and Schnell, 1985). From 1938 to 1983, during the era of fire suppression that predominated in Federal land

management during much of the last century, the estimated fire return interval at a given point in the park lengthened to 1,229 years. The longer interval between fires, the greater the likelihood that fires, when they do occur, will be more severe and kill larger trees rather than just small trees and undergrowth (Stanturf et al., 2001).

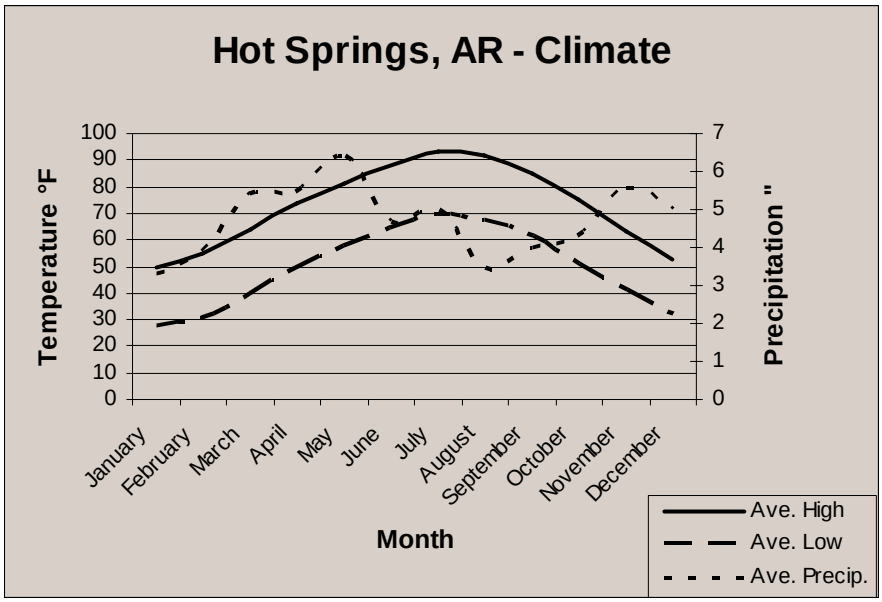
The fire history of the park is taken from the Shared Applications Computer System (SACS) in Boise, ID. Since 1982, 61 wildfires have been reported covering 103 acres. It is possible that additional wildfires on the Park and adjacent to the boundary have been extinguished by the City of Hot Springs Fire Department or other local fire departments with no report provided to the Park for entry into SACS. Park prescribed fire activity has been very limited, with 7 fires for 69 acres reported in the mid 1980's.

5. Wildland Fire Management Situation

a. Historical Weather Analysis - The climate in the area is typical of the southeastern U.S. Spring and fall temperatures are moderate with periods of high humidity. Summer is very hot and humid. Winter temperatures can range from the 20's to the 60's with variable humidity. Average highs range from 50 F in January to 93 F in July. Average lows range from 28 F in January to 78 F in July. Record temperatures range from -5 F to 115 F. Frequent and sometimes violent thunderstorms occur during the summer months. "Dry" lightning is relatively uncommon. General circulation is from the southwest bringing moist air from the Gulf of Mexico.

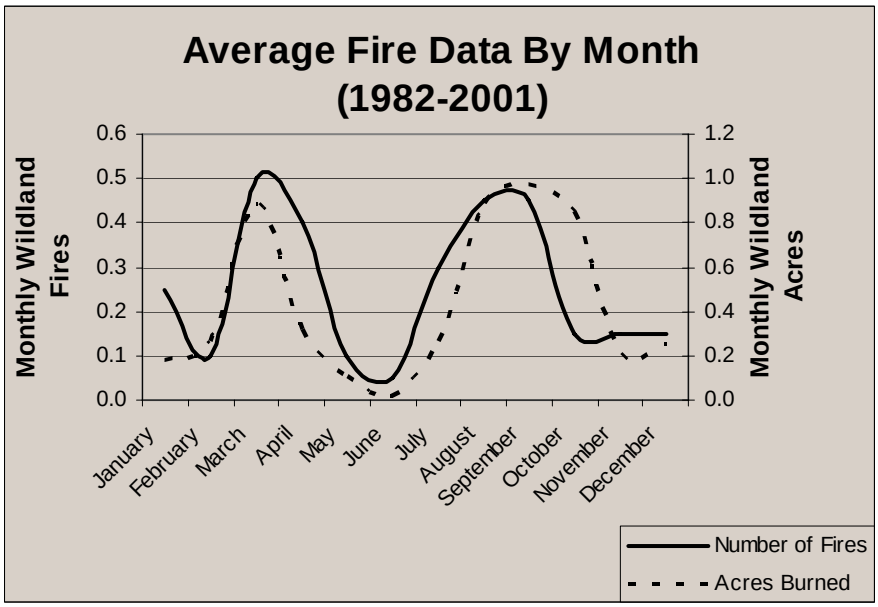
   Rainfall averages 56.6" annually with March, April, November and December being the wettest months and January and August the driest. Snowfall has been recorded during the period from November through April. The record snowfall is 11". Ice storms have been recorded several times in the last 10 years. These storms affect fuel quantity and arrangement. A chart showing the climatology at Hot Springs is found below.

Figure 3 – Hot Springs, AR Climatology



b. Fire Season – Based on SACS fire reports, the fire season is in two parts: March and April, then August and September. Figure 2 shows the 20 year average occurrence. The greatest number of reported fires (10) has occurred in March; August and September have 9 each and April has 8. The higher fire load in March is expected with cleanup after winter storms following two of the driest months of the year.

Figure 4 – Wildland Fire Occurrence



Locally, the active fire season is defined by the Forest Service and Arkansas Forestry Commission (AFC) as the period from October through March. There is insufficient occurrence data to establish a FIREPRO fire season on the park.

c. Fuel Characteristics – 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). A fuel problem that occurs occasionally results from ice storm damage. This causes an additional load of 10 and 100 hour fuels which in turn increases the resistance to control and mop-up problems.

Fall normally lasts from early October until late November and is characterized by cool nights and warm days. Killing frosts occur in October with hard freezes common in November. Freezing and subsequent dehydration of perennials and grasses combined with the dropping of deciduous foliage creates an abundance of light flashy fuels. Because the average rainfall in November and December is 5" or greater, dry fuels do not become an issue until January and February.

The area was logged in the past although the logging has not affected the current fuels. Some areas of in-holdings with grass cover may present a suppression problem due to the nearness of occupied homes.

d. Fire Regime Alteration – The fire regime since European settlement has undoubtedly changes. While records of fires in the area of the park are scanty, natural and human-ignited wildfires are much less frequent. Timber harvesting in the area has also had a significant impact on the forest vegetation. Tree density is probably greater, the forest structure is probably more even-aged, and the ground cover is probably less diverse than at the time of settlement. Prescribed fire would be necessary to help restore the forests back to the presettlement state, In particular, maintenance of the remnant shortleaf pine stands will require. Continued lack of fire in that habitat will result in loss of the stand over the long-term.

Because the park basically surrounds the city of Hot Springs, it is not feasible to restore the original fire regime to the entire area. Some portions of the park may be treated with light ground fires on small areas to maintain relic stands of pine, provide for species diversity and reduce fuels to manageable levels.

e. Control Problems – There are a number of factors that would make the control of a wildfire difficult, including access, the wildland urban interface, topography, and hazard fuel conditions, and personnel.

Access through the park is fair. There are roads in many areas and old trails are well distributed, unfortunately most will accept nothing larger than Type 6 engines. This reduces the help available from local fire departments

The wildland urban interface is extensive, not only with the City of Hot Springs, but also along the entire park boundary. Ensuring that wildfires do not escape the park is critical.

The steep topography of the park also presents challenges for control. Not only does it impede access to the fire, but fires generally exhibit greater fire behavior (higher rates of spread and larger flame lengths on steep slopes.

The limited number of personnel assigned to the Park is a concern during suppression operations. Two cooperative agreements have recently been instituted with local volunteer

fire departments. The nearest Federal agency assistance would be from the Ouachita National Forest just west of the park. Arkansas Forestry Commission assistance would also be available depending on local fire activity.

f. Values at Risk – The Bathhouse Row District and the Fordyce-Rick Estate are both listed as National Historic Places. The Indian Mountain Novaculite quarry complex is the only archeological site that has been evaluated,

Much of the Park infrastructure is within the City of Hot Springs and structural fire protection is provided by the Hot Springs Fire Department. There are about 30 in-holdings in the park. There are numerous locations with residential or business development along the boundary.

The vegetative resources are, for the most part, fire adapted and require no extraordinary protective measures. A specific plant species of concern is chinquapin (*Castanea pumila v. ozarkensis*). This species is listed by the Arkansas Natural Heritage Commission as rare to uncommon/common. Several stands of chinquapin are found in the Park. Most resident animal species are not likely to be adversely affected by either wildland or prescribed fire.

IV. WILDLAND FIRE MANAGEMENT

A. General implementation procedures

A Wildland Fire Implementation Plan (WFIP) will be initiated for all wildfires. This plan will provide the framework for determining the appropriate management response. The WFIP Stage I: Initial Fire Assessment will be the responsibility of the Incident Commander, the Area FMO, or the Park Fire Coordinator. As the park's Fire Management Unit only allows for suppression of unplanned ignitions, the requirement for a decision checklist as a part of the Stage I analysis can be considered met. Subsequently, Stage I analysis may be satisfied at the programmatic level in the FMP through determinations made by combinations of values to be protected and/or fire behavior thresholds. A copy of the WFIP Stage I form can be found in **Appendix M**.

B. Wildfire Suppression

1. Fire Behavior

Under average weather conditions, NFFL model 9 fires generally consume leaf litter and branchwood. They may top-kill small trees up to five inches in diameter. During extreme weather many of the overstory trees can also be killed, particularly with a large accumulation of 100 hour fuels that have developed from extensive sprouting after logging, ice storm damage and years of aggressive fire suppression. In the summer, fire effects in hardwoods are generally less severe, except many top-killed trees do not sprout as well after summer fires. No crown fires have been observed in the Park; surface fires are the normal occurrence.

2. Preparedness Actions

a. Prevention - The objectives of the park's fire prevention program are: to prevent human caused wildfires and, to incorporate prevention messages into interpretive programs. A Fire Prevention Plan is attached as **Appendix J**.

b. Annual Training – Annual refresher training emphasizing safety will be made available to park staff. Minimum training will include LCES, Standards for Survival, fire shelter training and other updates as appropriate. In addition, each year the Park Fire Coordinator and Arkansas Area Park Group Fire Management Officer (FMO) will assess the current qualifications of the Park's fire qualified personnel. From this assessment, current and future training needs for both the Park 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 Park Fire Coordinator will conduct an inventory of the park fire cache. Any needed supplies or equipment will be requested through the FMO. The Park Fire Coordinator will also be responsible for ensuring that the park's fire tools and engine are maintained in a state of readiness, especially during the fire season.

d. Fire Weather and Fire Danger

(1). Weather Stations – The weather station providing National Fire Danger Rating System (NFDRS) fire weather information is station number 034702, Oden, AR.

(2). NFDRS – Hot Springs uses NFDRS Model E, Burning Index (BI) as the trend monitoring index and fire danger prediction scale (Deeming, J.E. et al, 1977). 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.

(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 will be passed on to the regional FMO for compilation and use for requesting additional funds and/or resources for wildfire suppression. Information developed from this analysis may be used to modify actions planned under various staffing classes in the Step-up Plan

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

e. Step up Plan – The Step-up Plan contains the actions to be taken as fire danger increases.

Weather observations recorded at the Jessieville FTS weather station (#34802) will be automatically input into the Weather Information Management System (WIMS) to calculate fire danger and associated staffing levels. NFDRS fuel model E will be used as the primary model for rating fire danger. Weather observations and fuel measurements will be recorded 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

The Pre-Attack Plan is a checklist of items to be considered prior to wildfire occurrence. 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**.

4. Initial Attack

a. Setting initial attack priorities involves determining the risk of fire to the visiting public, firefighters and adjacent property or occupied in-holdings. With multiple ignitions, priorities
b. are: public safety, in-holdings and adjacent properties, and natural habitats. All fires will be aggressively suppressed with due consideration of firefighter and public safety.

Maps of historic, cultural and archeological resources may be available in the natural resource office. Primary responsibility for protection of property adjacent to the Park lies with the Hot Springs Fire Department, or the Piney or Morning Star Volunteer Fire Departments.

There are General Agreements with the City of Hot Springs Fire Department, the Morning Star Volunteer Fire Department and the Piney Volunteer Fire Department. See **Appendix E**. The city department is relied upon to initial attack fires in the interface which usually start on private land and threaten park resources.

b. Normally initial attack crews will be comprised of at least two persons fully equipped with personal protective equipment. A radio and tools such as rakes, back-pack pumps, etc., will be carried in all patrol vehicles. Additional gear may be provided by back-up personnel as needed.

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. If additional personnel or equipment are needed on the fire, the Incident Commander will notify the Park Fire Coordinator who will arrange for additional suppression forces and/or personnel to be available for initial dispatch.

c. Confinement as an Initial Attack Suppression Strategy – Confinement strategies may be used at Hot Springs National Park, 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. Meeting resource management objectives cannot be a criterion in selecting a confinement strategy. A confinement strategy can also be a strategic selection through the Wildland Fire Situation Analysis (WFSA) when the fire is expected to exceed initial attack capability.

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 Park equipment and personnel will run from 20 -60 minutes depending on location of fire and responding personnel.

e. Management Constraints – Limitations to suppression tactics used at Hot Springs include:

- The use of bulldozers in suppression operations may be authorized by the superintendent.
- Bulldozers will not be used on prescribed fires.
- 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.
- Class II air quality standards must be maintained.

- Masonry works scattered over the park must be protected to the greatest extent possible.

- Radio communication is marginal beyond the central core of the park. Such communication is essential for all fire fighting personnel to ensure their safety.
- Stream crossings would be limited to set and existing locations.
- Log jams/debris would be left in streams to protect fish and aquatic insect habitat.

The following special restrictions apply to aerially-applied retardant and different types of foam suppressant use:

Retardant – No retardant drops within 400 feet of open water.

Foam (aerial delivery) – Aerial delivery of foam requires Park Superintendent approval on a case-by-case basis. When approved, the following guidelines apply:
- Foam concentrate will only be injected into the holding tank after the water pick-up operation has been completed.
- Drops from T2 & T3 helicopters – no drops within 200 feet of open water.
- Drops from Scoopers, heavy air tanker or heavy helicopter – no drops within 400 feet of open water.

Foam (ground delivery with motorized pumps):
- No application within 25 feet of open water when using small pumps.
- No application within 50 feet of open water when using Mk III or equivalent pumps.
- All foam concentrate used for injection will be located in impermeable containment basins, i.e. visqueen (plastic sheet) spread over rocks or logs to form a catch basin.

Foam (ground delivery with backpack pumps):
- No application within 10 feet of open water.
- All backpack pumps will be filled a minimum of 10 feet from open water. A separate, uncontaminated container must be used to transport water from source to backpack pump. This container must be kept uncontaminated by concentrate.

f. Local Issues – Close communication with local units of government and adjacent landowners should reduce wildland fire controversy to a minimum.

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 since 1982 was 15 acres and only active a total of 4 days, most of that mop-up and monitoring lines.

The park also has available the services of the Arkansas Forestry Commission on a limited basis. The Arkansas Oklahoma Interagency Coordination Center (AOICC) in Hot Springs is informed of any fire activity at the park. The Coordination Center also processes requests for additional resources.

b. Implementation Plan Requirements – When a fire escapes initial attack, a new strategy must be developed to suppress the fire. This selection process is accomplished through the development of a Wildland Fire Situation Analysis (WFSA).

The WFSA is a decision process that employs a systematic and reasonable approach to determine the most appropriate management strategy for a particular situation. Reasonable management alternatives are identified, analyzed, and evaluated, and are consistent with

the expected probability of success /consequences of failure. The Superintendent shall approve the WFSA and any revisions. Evaluation criteria include firefighter safety, anticipated costs, resource impacts, and social, political, and environmental considerations. The evaluation of alternatives becomes the triggering mechanism for re-evaluation of the WFSA.

A written copy of a WFSA can be found in **Appendix N**.

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

d. Delegation of Authority – A sample limited 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 Wildland Fire Situation Analysis will be completed and a new strategy selected based on the results of that analysis.

b. If the initial attack appropriate management response was a confinement strategy and operations continue into a 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."

There are two primary management constraints that support MIST operations:

- 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 archeological and/or historic resources is not likely to occur.

The following tactics will be followed for all suppression actions:

- Cold trail the fire-edge when practical.
- Wetlines, or environmental lines, will be used wherever possible in lieu of handline construction if water and pumps are available. Waterbars will be constructed on handlines on steep slopes.
- Utilize soaker hose or foggers in mop-up. Avoid "boring" and hydraulic action on shallow soils.
- Firelines will be kept to the minimum width necessary to allow backfiring or safe blackline to be created. Utilize natural barriers wherever possible to avoid "tunnel effect."

- If a mineral soil line is needed, utilize fireline explosives whenever possible instead of a bulldozer.
- Except for spot maintenance to remove obstructions, no improvements would be made to intermittent/perennial waterways, trails, or clearings in forested areas.
- Fire lines would be located outside of highly erosive areas, steep slopes, and other sensitive areas. Following fire suppression activities, fire lines would be re-contoured, water barred, and possibly seeded (with native plant species).

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 park indicates that long term rehabilitation should not be necessary. Should a Burned Area Emergency Rehabilitation Team (BAER) be required on the Park an archeologist or cultural resource specialist should be part of the team. Specific requirements will be coordinated with the Park's Resource Management staff or a designated resource advisor. All emergency stabilization and rehabilitation will follow the guidelines found in the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook.

a. Trash will be removed from lines, camp locations and other staging areas.

b. 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.

c. Stumps will be cut within 3 inches of the ground.

d. All snags or trees felled will be lopped and the branches scattered.

e. 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.

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

Table 1 – 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 Ranger
Pre-Attack Plan	Annually	FMO/Chief Ranger
Wildland Fire Critique	Each Incident	On site suppression staff

C. Wildland Fire Use

Wildland fire use will not be considered for implementation under this FMP at Hot Springs National Park, due to the relatively small size of the park and the extensive wildland urban interface.

D. Prescribed fire

1. Planning and Documentation

a. Annual Preparation

Prescribed fire planning will be completed in accordance with Departmental and National Park Service policies and procedures. Proper planning, use of fully qualified prescribed fire staffing, and strict adherence to an approved plan will lead to successful prescribed fire operations. The Fire Management Officer will coordinate the implementation of prescribed fire at the Park with assistance from the Arkansas Area Park Group Prescribed Fire Specialist.

A schedule of proposed prescribed fires 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, monitoring data and past burn areas will be examined to determine if the prescribed fire objectives over the long term are being achieved. Potential adjustments to return intervals, prescription parameters and climate conditions will also be reviewed.

b. Long-Term Prescribed Fire Strategy

Prescribed fire units are not yet identified as some areas of the unit require an evaluation to

determine an appropriate level of effort for fuel management and whether fire is the correct tool for specific areas. A long-term prescribed fire plan has not been developed. Park staff will meet with the FMO, the Fire Ecologist and regional staff to develop a prescribed fire program.

In the implementation of a prescribed fire program, the strategy will be to start small and slowly build the program. The first units to be burned will be small, easy to implement, and have minimum risk for creating smoke management issues. The program will burn larger and more prominent areas depending on the success of these initial prescribed fires. The park will use the adaptive management model. Monitoring and evaluation will be used to identify prescribed fire units and refine prescribed fire prescriptions.

To date there is only one prescribed fire unit identified. The prescribed fire unit is named North Mountain, covers 16 acres, and is scheduled for spring of 2006.

When a long-term prescribed fire plan is created it will cover a time period of at least five years. The plan will be updated annually. This long-range forecast is necessary to ensure compliance with the National Environmental Policy Act (NEPA), Section 7 of the Endangered Species Act, and Section 106 of the National Historic Preservation Act. The long range prescribed fire plan will be located in **Appendix I**.

c Personnel Requirements

Because the regular Park staff is small, with no fire staff, prescribed fires will be conducted by fire staff at Buffalo River and other qualified NPS and interagency staff. Other fire qualified NPS staff and interagency cooperators may be asked to assist on an ad hoc basis. Specific prescribed fire plans will be developed by the burn boss, fire management office and Hot Springs staff.

d. Prescribed Fire Monitoring– Weather and fire behavior monitoring will be conducted on all prescribed fires, according to RM 18, Chapter 10, and will be the responsibility of the burn boss. This monitoring ensures that the fire remains in prescription. When coupled with fire effects monitoring data, this data can be used to refine prescribed fire prescriptions (Anderson, H.E., 1982, Rothermel, R.C., 1983). . Weather and fire behavior monitoring will follow procedures outlined in the Fire Monitoring Handbook (NPS 2003).

e. 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 fire 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 prescribed fire?
- Problems and general comments~~:~~

f. Documentation and Reporting

The following table lists the reports and other documents to be completed when planning and implementing prescribed fire projects.

Table 2 – 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	Superintendent
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.

g. Historic Fuel Treatment

Only two instances of prescribed fire being used as an ecological tool are documented in the park's history. The first was a small scale attempt to utilize fire in order to control the spread of exotics including Kudzu in and around the park's maintenance compound. Total affected area estimates vary from one half to two acres and the effort was unremarkable. That event took place in 1980. The second instance occurred in 1984 and involved several other agencies. Here the National Park Service, the Arkansas State Forestry Commission, (who manages the City of Hot Springs land parcels around the Waterworks) and the City of Hot Springs Fire Department collaborated on a controlled burn designed to enhance the City's northern domestic water processing facility. Fifty five to sixty total acres were affected. Less than half of that real estate actually belonged to the federal government. Photo study plots were established, but monitoring apparently never occurred.

h. Prescribed Fire Plan

Prescribed fire plan requirements at Hot Springs National Park are similar to the requirements at other National Park Service units. A detailed outline and discussion is found in RM-18, Chapter 10, Hot Springs plans have the following specific requirements:

- Signature Page
- Executive Summary
- Description of Area

- Goals and Objectives
- Risk Management
- 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
- Interagency Coordination and Public Information
- Monitoring
- Post Fire Rehabilitation
- Reporting Needs
- Appendices
- Reviewer Comments
- Technical Reviewer Checklist and Comments
- Project Map
- Prescribed Fire Complexity Rating Worksheet
- Fire Modeling Outputs
- Holding Resources Worksheet
- Agency Administrator GO/NO-GO Pre-ignition Approval
- Prescribed Fire Operations GO/NO-GO Checklist

2. Exceeding Existing 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 results of the WFSA.

3. Air Quality and Smoke Management

a. Air Quality Issues

A key management consideration in the prescribed fire program, with applicability to wildfires as well, is the effect of smoke on both air quality and visibility.

As Hot Springs National Park is located in a valley along 3 major highways (U.S. 70, U.S. 270 and Arkansas 7), smoke is a primary concern, both with wildland and prescribed fires. The Park's interior boundary surrounds much of the City of Hot Springs; much of its exterior boundary is surrounded by the City of Hot Springs and heavy development in Garland County. Due to these concerns, both air quality and smoke management must be a primary consideration in developing prescribed fire plans. Under both wildfire and prescribed fire conditions there will be times when visibility of the park's landscape vistas will be temporarily impacted and the city and surrounding developments may be affected by smoke.

As the state of Arkansas does not have specific regulations concerning air quality/smoke management, although voluntary smoke management guidelines are in place. Permits are not required prior to igniting a prescribed fire. Despite the lack of regulations, any prescribed fire plan will be developed to lessen adverse impacts on the local highways, the city and park

neighbors.

b. Smoke Management

No Class I airsheds exist within the potential area of influence from Hot Springs prescribed fires.

The entire city of Hot Springs is a smoke sensitive area. Of highest priority are health care facilities. Due to the topography of the area, careful planning will be required to mitigate impacts when overnight temperature inversions trap smoke and other particulates near ground level, especially in spring and fall.

The State of Arkansas has issued voluntary smoke management guidelines for use with all prescribed fire. These will be followed with every effort being made to conduct prescribed fire operations with a goal of avoiding impacts on sensitive downwind targets. Spot weather forecasts and on site weather observations will be closely evaluated by the prescribed burn boss prior to determining if a prescribed fire should be ignited. Careful observation of fuel moisture and other fire behavior factors will also assist in mitigating smoke problems. Other management actions including mop-up of heavy fuels, burning small units, and restricting the timeframe in which prescribed fires are ignited will also help reduce smoke production.

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 lessen 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 to generate less emissions. 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 prescribed fire strategies as necessary.

(6). Residual Smoke – When a fire has burned for an extended period of time and generated significant residual smoke, the Park 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 – Prescribed fire ignitions in sensitive areas on the park will be done either when visitation is low or the Superintendent may restrict entry to areas potentially

impacted by smoke.

Guidelines

The following are the guidelines for all phases of the fire management program.

- No prescribed fires will be ignited during air pollution alerts, temperature~~s~~ inversions or when a burn ban has been established by any unit of government
- Fire weather forecasts will be used to predict smoke dispersal.
- Prescribed fires will be conducted only when conditions result in rapid smoke dispersal.
- Firing techniques to lower smoke production will be utilized.
- Timing of prescribed fires will occur after 9:00 am with ignition ending before 4:00 pm.
- Smoke projection maps will be prepared to assist in projecting smoke dispersal patterns.
- Local police and fire agencies will be notified of any prescribed fires so they may provide necessary assistance with traffic flow if any 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.
- Federal Clean Air Act standards will not be violated by any prescribed fires.

E. Non-Fire Fuel Treatment Applications

1. Annual Activities

Mechanical treatment of fuels along the boundary has been underway since 2002 and is proposed during the current planning horizon (2004-2009). These projects are designed to remove fuels in selected interface areas. Project purpose is to keep fires from moving across the Park boundary.

Each project will require personnel to cut and remove fuels from treated areas. A request will be made during the prior year for funding to support the cost of operations.

2. Seasonal Restrictions

There are no expected seasonal restrictions on fuel removal. Because of the noise associated with chainsaw work, off-season timing would be preferable to limit impacts on visitor use and enjoyment.

3. Monitoring

Short and long-term monitoring will concentrate on measurements of acres treated and stems removed. Should fire be applied to treated areas, monitoring will be as defined in the Fire Effects Monitoring Plan **(Appendix F)**.

4. Critique of Project

The following items, as a minimum, will be reviewed following each mechanical treatment. The Arkansas Area Park Group Fire Management Officer (NPS) will provide oversight and direction

through a local National Park Service liaison. This individual will be Hot Springs National Park's Natural Resource Program Manager and/or some other qualified Superintendent's designee.

- 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 contracted non-fire projects will be kept by the unit budget specialist and coordinated with the Fire Management Office. Costs associated with non-contracted fuels reduction work will be tracked by the Fire Management Office.

6. Documentation and Reporting

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

Table 3 – 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\FMO

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

7. Annual Project List

An annual project list is found in **Appendix I**

F. Emergency Rehabilitation and Restoration

All rehabilitation actions will be in accordance with National Park Service Policy found in RM-18, Chapter 12, Departmental Manual (620 DM 3, Burned Area Emergency Stabilization and Rehabilitation) and the guidelines found in the Interagency BAER (Burned Area Emergency

Rehabilitation) Handbook. After the fire is declared out, all flagging, litter and trash associated with the suppression operations will be removed. Firelines will be rehabbed and erosion control devices installed as necessary. Brush will be scattered and stumps will be flush cut and covered with soil. Plow furrows will be rehabilitated by rolling the materials back into the furrow. Public use trails will be patrolled and measures taken to ensure public safety.

The severity of the burn and the resulting impacts will dictate the need to re-seed or reestablish native plant species. Although the likelihood of the need is considered to be quite low, before any action is taken a rehabilitation plan will be prepared and approved in accordance with Park Service policy.

Interagency BAER handbook states that damage to improvements caused by suppression efforts and repairs required to protect national lakeshore resources from imminent damage can be charged to the individual fire suppression account. Emergency Stabilization and Rehabilitation (ESR) funds can be used to repair damage caused by the fire itself as follows:

- Health and safety (imminent danger or immediate threat to life and property)
- Municipal water source loss of capacity (not water quality)
- Threatened and endangered species habitat treatments (not enhancements)
- Cultural site treatments to prevent further erosion (not inventory or mitigation of site)
- Treatments to prevent invasive plant establishment
- Resource protection treatments (site stabilization of soil)

ESR funds generally cannot be used to repair fire damage to park infrastructure. Funds to repair or replace fire damaged infrastructure will come from non fire sources. ESR funds, if approved, are available for the first two years after the fire is declared out. Rehabilitation extending beyond two years is not considered an emergency. Long term rehabilitation will be funded from non fire funding sources.

Requests for ESR funds will be made through the regional fire ecologist.

V. FIRE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

A. Fire Organization Structure

1. Superintendent or Designee

Responsible for overall program direction. Has final decision making authority for management operations. Approves and signs Interagency Agreements pertaining to the park. Signs Fire Management plans and prescribed fire plans. Approves the use of bulldozers and heavy equipment.

2. Arkansas Area Park Group Fire Management Officer (FMO)

Functions as technical advisor for the park fire management program, assigned to Buffalo National River. Coordinate prescribed fire planning. Coordinates training. Prepares FIREPRO funding requests.

3. Chief Ranger

During any fire operations, wildfires or prescribed fires, acts as liaison between NPS personnel, other agencies and general public. May also function as Initial Attack Incident Commander depending on qualification and is responsible for day to day fire management operations at the park level.

4. Park Fire Coordinator

Maintains fire cache. May function as Initial Attack Incident Commander and/or as firefighter, depending on qualifications.

5. Arkansas Area Park Group Prescribed Fire Specialist

Assists the FMO in planning a comprehensive fuel treatment program, assigned to Buffalo National River. Coordinates compliance associated with the prescribed fire and mechanical treatment programs. Coordinates pre- and post burn cultural resource surveys. Drafts prescribed fire and mechanical fuel reduction plans.

6. Administrative Technician

Provide administrative support in procuring any needed supplies and equipment, responsible for proper documentation of personal services.

7. Maintenance Staff

Provide technical assistance in area of suppression equipment available to include light tools and knowledge in locating known utilities and services.

8. Ozarks Highlands Fire Ecologist

Responsible for providing fire ecology support to the park, assigned to Ozark Scenic Riverways. Responsible for the fire effects monitoring program. Supervises fire effects crew. Conducts data analysis and prepares monitoring reports. Prepares and updates Park's monitoring plan. Coordinates fire research.

B. FIREPRO Funding

FIREPRO funding is available for approved equipment needs and prescribed fire operations. Project proposals, for prescribed fire and mechanical projects, are submitted through normal channels for approval. No staffing is funded by FIREPRO.

C. Fire Organization Structure Related to Park Organization

1. Superintendent or Designee

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

2. Fire Management Officer

Oversees all suppression operations and planned prescribed fires at the park level. Coordinates operations with Chief Ranger.

3. Chief Ranger

During any fire operations, wildfire suppression, or prescribed fires, acts as liaison between the Park, other agencies and general public.

D. Interagency Coordination And Agreements

The park maintains an excellent working relationship with the City of Hot Springs Fire Department, Morning Star Volunteer Fire Department and Piney Volunteer Fire Department. Memoranda of Understanding with the two volunteer departments are included in **Appendix E**. The city department is relied upon to provide initial attack on fires in the interface which usually start on private land and threaten park resources.

The AOICC is managed by the National Forests in Arkansas and can be contacted for assistance at any time circumstances dictate. This contact will bring any resources necessary to the assistance of the park. The center is located at Hot Springs, AR.

E. Key Interagency Contacts

City of Hot Springs Fire Department, 6970	Fire Chief, Ed Davis	(501) 321-
Morning Star Volunteer Fire Department,	Fire Chief, James Stine	(501) 262-5552
Piney Volunteer Fire Department,	Fire Chief, Tim McDorman	(501) 767-6836
Arkansas Forestry Commission	District Forester, Dennis Sharp	(501) 984-5733

F. Fire-Related Agreements

The following table lists the townships and fire departments responsible for protection and the agreement date. These agreements cover only wildland and structural fire suppression. The agreements are located in **Appendix E**.

Table 4 – Agreements with Local Fire Departments

Fire Department	Township Protected	Agreement Date
City of Hot Springs Fire Department	City of Hot Springs	9/02
Morning Star Volunteer Fire Department	Morning Star	10/01
Piney Volunteer Fire Department	Piney	10/01
Arkansas Forestry Commission	All	10/02

VI. MONITORING AND EVALUATION

Fire effects monitoring is an adaptive management tool that allows a park to determining if prescribed fire objectives are being met, and if undesirable effects are occurring. This is generally conducted through the establishment of permanent vegetation plots in predetermined monitoring unit, which are read prior to a prescribed fire and at specified intervals following the fire. If objectives are not being met or undesirable effects are occurring, the prescriptions could be modified, alternative treatments could be conducted, objectives could be modified, or research could be proposed. No monitoring program is currently in place as prescribed fire has not been employed on the Park since 1988.

The Fire Monitoring Handbook (NPS 2003) provides guidance on setting up a monitoring program and provides standardized monitoring protocols.

All park units conducting prescribed fire are required to complete a fire monitoring plan. The completed plan will become **Appendix F** to this plan.

VII. FIRE RESEARCH

A. Previous and Ongoing Fire Related Research

There have been no significant fire related research projects on the park.

B. Fire Research Needs

Several research needs were identified by park staff. The needs are listed below with a brief explanation of the project/need.

- Review General Land Office Survey notes to capture vegetative state of the area at the time of Public land Survey.
- Conduct an ethnographic fire history study to determine effects of Native American burning on pre-European vegetation.
- Produce current vegetation map and forest inventory to determine potential fuel loads after mechanical treatment.
- Using interactive species list at University of California, Davis conduct literature search of fire effects on those species listed as threatened, endangered or of special concern by state and Federal agencies.
- Presettlement fire regime.

VIII. 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 park is of concern. Significant residential and business development is located near or adjacent to the Park. The flaming front of a fire can, potentially, put unsuspecting residents, members of the visiting public and employees at risk. For this reason, areas affected by fire of any cause will be closed to the public. Adjacent landowners will be notified when any fire, particularly wildfire, is a threat to off-park residential areas.

B. Mitigation

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

- General public will be made aware of wildfires and prescribed fires through press releases and general interpretive presentations.
- The general public will not be allowed access to any active fire.
- Safety briefings will be conducted for participating 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 or vehicular traffic. Warning signs will be posted along roadways as necessary.
- Risk analysis will be conducted for all wildfires. All fire personnel will review the "18 situations that Shout Watch Out", the “10 Standard Fire Orders", and follow all other fireline safety standards and SOPs.

IX. PUBLIC INFORMATION AND EDUCATION

A. Capability and Needs

Because visitors usually visit the Bathhouse Row area of the Park first, the Visitor Center provides an excellent opportunity for fire information dissemination. To further public information and education, the following guidelines will be followed before and during any fire:

- Timely and accurate information will be provided to the media, residents, and park 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 available to park visitors and general public.
- The prescribed fire program will be discussed in informal contacts with park personnel, park neighbors and visitors.
- Adjacent landowners will be notified when any fire, particularly wildfire, is a threat to off-park residential areas.

B. Response to Increasing Fire Activities

When the staffing class is at class 4 or 5, information will be prominently displayed in the Visitor Center and at other contact points including the Gulpha Gorge Campground, the Hot Springs Mountain Observation Tower, trailheads and other contact points. Patrol activity on the park will be increased to detect potential fires and to monitor visitor activity. At staffing class 5 it may become necessary to close portions of the park to protect both resources and the public.

X. PROTECTION OF SENSITIVE RESOURCES

A. Archeological/Cultural/Historic Resources

1. Resources

Thirty state recognized archeological sites are located within the Park; at least one is eligible for the National Register of Historic Places. Other sites are known to exist and will be state registered after survey and recording. Bathhouse Row is a National Historic Landmark; it consists of eight bathhouses constructed between 1892 and 1923, plus an Administration Building (1936) and several contributing structures and areas. The Fordyce-Ricks Estate is listed on the National Register of Historic Places and includes both NPS-owned structures and in-holdings; most were built before 1920. Numerous other Register-eligible historic structures and cultural landscapes also exist in the park. All historic structures in the Park will be protected in any fire. The City of Hot Springs Fire Department will be the primary suppression force involved. Some remnant masonry structures are found on the Park. These will be noted and protected as necessary during wildland suppression and prescribed fire operations.

2. Mitigation

When a wildfire is reported in the Park, efforts will be made to identify and protect known sites from fire damage and damage associated with suppression activities. The following mitigation actions will be taken:

- Surveys will be conducted prior to prescribed fires for structural remains, archeological site and other cultural resources.
- Resource base maps showing archeological and historical site locations will be given to archeologists and fire bosses on the firelines.
- When numerous cultural resources are threatened by a fire, archeologists will be present to help mitigate the impacts of fire suppression and rehabilitation on cultural resources.
- Priority will be given to monitoring heavy equipment, especially bulldozers and graders, through all aspects of the suppression and rehabilitation efforts.
- Archeologists serving on a fireline as technical specialists must hold a current red card to perform their specific advisory duties.
- Line archeologists will be equipped with appropriate standard firefighting safety equipment.
- Special flagging will be used to identify archeological and historical sites.
- A photographic record will be kept of all archeological materials uncovered during fire management and rehabilitation activities, and both updated Arkansas and NPS site forms will be filled out to document and assess exposed and discovered sites.
- The Cultural Resource Management Specialist will coordinate all activities of line archeologists with fire bosses.
- 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 Graves Protection and Repatriation Act (NAGPRA).
- 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.
- No construction of handlines will occur in connection with prescribed fire.

B. Natural Resources

1. Resources

The vegetation of the Park consists of mixed stands of oak and hickory interspersed with shortleaf pine on the more exposed slopes and ridge tops The Park supports dense forest cover, most of which is at least second growth, as timber cutting for a variety of purposes was pervasive in the 1800s and early 1900s. There is a stand of old growth shortleaf pine (*Pinus echinata*) located on the north slope of Sugarloaf Mountain. Core samples have indicated ages of several hundred years. (Witsell, 2003) There is also a rare Novaculite glade outcrop. Both communities are registered under the Arkansas Natural Heritage Program.

A specific species of concern that has potential to be adversely affected is chinquapin (Castanea pumila v. ozarkensis). This species is listed by the Arkansas Natural Heritage Commission as rare to uncommon/common. Several stands of chinquapin are found in the Park. Other rare species includes *Asplenium gravese* (Graves spleenwort), *Galium arkansanum* (a bedstraw), Strephanthus obtusiolius (a twistflower), and *Phormidium treleasei* (a blue-green algae).

Water resources are an important resource, as the entire park acts as a recharge zone for the hot springs.

2. Mitigation

The following mitigations will be applied to protect sensitive natural resources:

- During a prescribed fire, chinquapins will be protected by using a foam or wetline around the stand.
- Stream crossings would be limited to set and existing locations.
- Log jams/debris would be left in streams to protect fish and aquatic insect habitat.

Special restrictions apply to aerially-applied retardant and different types of foam suppressant use (see IV.B.4.e).

C. Infrastructure

1. Unit Infrastructure

Much of the Park infrastructure is within the City of Hot Springs and structural fire protection is provided by the Hot Springs Fire Department. There are about 30 in-holdings in the park. Numerous locations with residential or business development are located along the boundary.

2. Mitigation

For Park facilities in the downtown area, there are no specific pre-fire mitigation measures required. In-holdings, public utilities and concession facilities will be protected in coordination with cooperators. Suppression actions will address protection priorities according to Federal policy. Firefighter and public safety will always be the highest priority, property and natural resources follow when human health and safety will not be compromised.

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

A. Introduction

1. Scope

All fires and fire-related incidents will be reviewed.

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 ensure 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. After Action Review

After Action Reviews (AAR) are informal reviews of operational and support functions conducted during a fire incident or activity. They are usually conducted by the Incident Commander or project supervisor and should examine what was planned, what actually occurred, and what changes, if any, need to be implemented in order to ensure organizational efficiency. It is recommended that AARs be conducted on a regular (daily; operational period) or as deemed necessary basis.

2. "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.

3. 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 contains a sample Close-Out Review with Incident Management Team.

4. 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.

5. 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.

6. 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 provides an outline for final reports of fire reviews. RM 18,

Chapter 13, Exhibit 3 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.

7. 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 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 provides specific directions for conducting an entrapment or shelter deployment review. RM 18, Chapter 13, Exhibit 5 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.

XII. CONSULTATION AND COORDINATION

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

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Bishop, Coby, Park Ranger (Law Enforcement), Hot Springs National Park, AR

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DeCoster, Jim, Fire Ecologist, National Park Service, Omaha, NE

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Williams, Michael, Data Manager, Heartland I&M Network, National Park Service, Republic, MO

XIII. APPENDICES

APPENDIX A

A. References Cited

Publications:

Anderson, H.E. 1982. Aids to Determining Fuel Models for Estimating Fire Behavior. General Technical Report INT-122. Ogden, UT: Forest Service, Intermountain Forest and Range Experiment Station

Brown, James K., ed. 2000. Wildland fire in ecosystems: effects of fire on flora. Gen. Tech. Rep. RMRS-GTR-42-vol. 2. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Deeming, J.E.; Burgan, R.L.; Cohen, J.D. 1977. The National Fire Danger Rating System -1978. General Technical Report INT-39. Ogden, UT: Forest Service, Intermountain Forest and Range Experiment Station

Ford-Robertson, F. C. 1971. Terminology of forest science technology practice and products. Washington, DC: Society of American Foresters. 370 p.

Johnson F.L. and G. D. Schnell. 1985. Wildland Fire History and the Effects of Fire on Vegetative Communities at Hot Springs National Park, Arkansas. University of Oklahoma, Oklahoma Biological Survey; Final Report to National Park Service, Santa, Fe, New Mexico.

Ladd D. 1991. Reexamination of the Role of Fire in Missouri Oak Woodlands. *Proceedings of the Oak Woods Management Workshop*. Eastern Illinois University, Charleston, IL.

McPherson, G.; Wade, E.; Phillips, C. B. 1990. Glossary of wildland fire management terms. Bethesda, MD: Society of American Foresters.

National Park Service, RM-18: Wildland Fire Management, 2001.

National Park Service Fire Monitoring Handbook (2003)

National Park Service; USDA Forest Service; Bureau of Indian Affairs; U.S. Fish and Wildlife Service; Bureau of Land Management. 1999. Wildland prescribed fire management policy: Implementation procedures reference guide. Boise, ID: U.S. Department of the Interior, National Park Service, National Interagency Fire Center. 102 pp.

National Wildfire Coordinating Group. 1995. Glossary of wildland fire terminology. Boise, ID: National Interagency Fire Center, National Fire and Aviation Support Group.

NWCG. 2000. Wildland and Prescribed Fire Qualifications System Guide, 310-1

Petrides, George A. 1972 A Field Guide to Trees and Shrubs. The Peterson Field Guide Series, 11. Houghton Mifflin, Boston, MA 428 pp.

Rothermel, R.C. 1983. How to Predict the Behavior of Forest and Range Fires. General Technical Report INT-143. Ogden, UT: Forest. Service, Intermountain Forest and Range Experiment Station

Rowe, J. S. 1983. Concepts of fire effects on plant individuals and species. In: Wein, Ross W.; MacLean, David A., editors. The role of fire in northern circumpolar ecosystems. New York: John Wiley and Sons: 135-154.

Smith, Jane Kapler, ed. 2000. Wildland fire in ecosystems: effects of fire on fauna. Gen. Tech. Rep. RMRS-GTR-42-vol. 1. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

Southern Forest Fire Laboratory Staff. 1976. Southern Forestry Smoke Management Guidebook, USDA Forest Service , General Technical Report SE-10, Asheville, NC, Southeast Forest Experiment Station

Stanturf, J.A., D. W. Wade, T. A. Waldrop, D. K. Kennard, and G. L. Achtemeier. 2001. Background Paper Fire: Fire in Southern Forest Landscapes. In *Southern Forest Resource Assessment Draft Report*, USDA Forest Service, Southern Research Station and Southern Region. Accessed on the World Wide Web at http://www.srs.fs.fed.us/sustain/report/fire/fire.htm

USDA-USDI. 2002. Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook. 151 pp.

Internet Reference Sites:

2001 Federal Fire Policy Review (http://www.nifc.gov/fire_policy/index.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.

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

Fire Frequency – 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 Return 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 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).

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 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.

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.

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.

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.

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.

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.

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.

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.

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

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

USFS – United States Forest Service

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 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.

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

APPENDIX C

C. Species Lists

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

APPENDIX D

D. NEPA and NHPA Compliance

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

* *Appendix D has a separate numbering system* *

APPENDIX E

E. Annual Revision Documents

1. Fire Call-up List

HOT SPRINGS NATIONAL PARK

FIREFIGHTER QUALIFICATIONS

Name:	Qualifications:
Abbot, Walter	FFT2, ENOP, FALA
Adams, Jeremy	FFT2
Biggs, Justin	FFT2
Bishop, Coby	FFT2
Bishop, Richard	FFT2
Blaeuer, Mark	FFT2
Caylor, Douglas (Randy)	FFT2
Harris, Beverly	DRC, PTRC, EDSD(T)
Herron, Joseph	FFT2
McCormick, Ricky	FFT2
McKelvey, Robert	ENGB, FFT1
Pickens, Derrick	FFT2
West, Kyle	FFT2
Huzinec, John (AD)	FFT2, FALA

2. Preparedness Inventory

Table 4 – Fire Cache Inventory

Fire Cache Inventory		
Date here		
Item	**On Hand**	**Stocking Level**
PPE		
Fire Shelter (complete unit)		5
Nomex pants (misc. sizes, jeans)		5
Nomex pants, 32 x 34		5
Nomex pants, 34 x 34		5
Nomex shirt, large		5
Ear Plugs, 1 box		1
Glasses, safety, clear		5
Gloves, large		5
Goggles, clear		5
Hard Hat		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	4	5
Hose, 1.5" 100 ft. cotton	7	
Hose, 1.5" 100 ft. synthetic	34	30
Hose, 1.5" 50 ft. cotton	6	
Hose, 1.5" 50 ft. syn/rubber lined	7	
Hose, 3/4" 50 ft.	2	5
Miscellaneous Supplies		
Batteries, AA, 1 box (24 ea.)	0	3
Batteries, D, 1 box (8 ea.)	0	3
Canteen case, cloth	13	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	

3. Cooperative Agreements

Agreement Number CA7300 0 2 0001
Page 1 of 3

GENERAL AGREEMENT
BETWEEN
THE UNITED STATES DEPARTMENT OF THE INTERIOR
HOT SPRINGS NATIONAL PARK
AND
CITY OF HOT SPRINGS, ARKANSAS
FOR
FIRE PROTECTION

This agreement is entered into by and between the National Park Service (hereinafter "NPS" or "Depositor"), United States Department of the Interior, acting through the Superintendent of Hot Springs National Park, Hot Springs, Arkansas, and the City of Hot Springs, acting through its appointed Fire Chief.

ARTICLE I - BACKGROUND AND OBJECTIVES

Responsibility for fires within the city limits rests with the City, while protection for national park lands lies with the National Park Service. Hot Springs City Fire Department is primarily equipped, experienced and trained to control structural fires. Hot Springs National Park is comparably specialized in the handling of wildfires. It is to the advantage of each agency to utilize the other's capabilities in their respective area of expertise, with the shared objective of fire prevention/suppression and the protection of life and property from fire. It is therefore agreed that Hot Springs National Park and the City of Hot Springs will coordinate their efforts in the prevention, detection and suppression of all wildland fires and structural fires.

ARTICLE II - AUTHORITY

This agreement is authorized by the Act of August 25, 1916 as amended, 16 U.S.C. Secs. 1 and 1b and the Act establishing Hot Springs National Park, 16 U.S.C. Secs. 361 et seq., which authorize cooperative assistance to nearby fire prevention agencies.

ARTICLE III - STATEMENT OF WORK

Each agency agrees to provide the other:

1) With available assistance in fire suppression as requested.
2) With an emergency telephone directory for fire notification use.
3) Notice of fires on or threatening structures or lands under the other's jurisdiction.
4) Initial suppression action when it is in the best interest of both agencies.
5) Assistance in planning and prevention of wildfires and structural fires.

ARTICLE IV - TERM OF AGREEMENT

This agreement will 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 IX that follows.

Agreement Number GA7300 02 0001
Page 2 of 3

ARTICLE V KEY OFFICIALS

All communications and notices regarding this Agreement will be directed to the following key official(s) for each party.

A. For the NPS:

Superintendent
P. O. Box 1860
Hot Springs, AR 71902
Telephone (501) 623-2824

B. For the City:

Fire Chief
P. O. Box 700
Hot Springs, AR 71902
Telephone (501) 321-6856

ARTICLE VI - PRIOR APPROVAL

Not Applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

Not Applicable.

ARTICLE VIII - PROPERTY UTILIZATION

Not Applicable

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 will meet promptly to discuss the reasons for the notice and to try to resolve their differences.

ARTICLE X - STANDARD CLAUSES

Nothing contained herein shall be construed as limiting in any way the responsibility and authority as defined by law, of the National Park Service and the City of Hot Springs, in the protection of lands and resources under their respective administrations.

The National Park Service and the City waive all claims against each other for compensation for any loss, damage, personal injury or death occurring in consequence of activities pursuant to this General Agreement. In the execution of this Agreement, employees or agents of the city are not considered employees of the National Park Service.

Agreement Number CA7300 20001
Page 3 of 3

Nothing herein shall obligate the National Park Service to expend in any one fiscal year funds in excess of that appropriated by Congress for that year for the purposes set forth herein. Similarly, nothing contained herein shall obligate the City of Hot Springs or its Board of Directors to expend funds in excess of those available for that year for the purposes set forth herein.

During the performance of this Agreement, the participants agree to abide by the terms of Executive Order 11246 on 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, 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.

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: Roger Giddings
Name: Roger Giddings
Title: Superintendent
Date: 9/25/02

FOR THE CITY OF HOT SPRINGS:

Signature:
Name: Kent D. Myers
Title: City Manager
Date: 9/24/02

Cooperative Agreement
between
The United States Department of the Interior
National Park Service
and
Morning Star Volunteer Fire Department

This Cooperative Agreement (hereinafter Agreement) is made and entered into by the Department of the Interior, National Park Service (NPS) and the Morning Star Volunteer Fire Department, for the purpose of enhancing the fire protection capability of the Morning Star Volunteer Fire Department.

Article I -BACKGROUND AND OBJECTIVES

The objectives of this Agreement are to provide assistance in training, equipment purchase and prevention activities on a cost-share basis. To increase firefighter safety, enhance the fire protection capabilities of rural fire departments, and enhance protection in the urban-wildland interface. To increase the coordination between local, State, and Federal fire fighting resources.

The public will benefit by having reduced fire losses, the development of fire prevention programs, and the reduction of occurrence and intensity of wildland fire within the urban interface.

Article II -AUTHORITY

This Agreement is hereby entered into by authority of:

Title IV of the Department of the Interior and Related Agencies Appropriations Act,
2001, Act of October 11, 2000, Pub. Law. No.106-291, 114 Stat. 922. 1006-1010, has appropriated funds for fire suppression operations, burned area rehabilitation, hazard fuel reduction, and rural fire assistance and sets forth provisions governing the fund's use.

Article III -STATEMENT OF WORK

A. The Morning Star Volunteer Fire Department agrees to:

1. Training: Provide/attend wildland fire suppression training (includes costs of associated travel in accordance with Federal Travel Regulations). Assist in the planning and coordination of the wildland fire training course(s). Provide wildland fire training instructors. Provide wildland fire training materials and conference room facilities.

2. Equipment purchase: Work with the NPS to identify and purchase wildland fire fighting equipment with the funds obligated by this Agreement. The purchased equipment may include fuses, hoses, adapters, nozzles, drip torches, tools, radios, engines, trucks, pumps, pump packages, and personal protective equipment.

3. The Morning Star Volunteer Fire Department agrees to meet a cost share at a minimum of 10% (which may include in-kind services or supplies) of Federal funds identified by the NPS for the program.

B. The NPS agrees to:

1. Training: Assist in identifying training opportunities and developing training plans for rural firefighters. Provide instructor(s) for wildland training course(s). Provide wildland fire training material and conference room facilities.

2. Equipment Purchase: Will purchase all equipment and/or facilitate the transfer within applicable regulations (Transfer of Property). Types of equipment may include, but are not limited to, trucks, engines, pumps, pump packages, personal protective equipment, tools, supplies, materials, office equipment, etc.

Article IV -TERMS OF AGREEMENT

This Agreement shall become effective on the date of signature of the NPS Superintendent and the Chief of Morning Star Volunteer Fire Department shall remain in effect until September 30,2002, unless terminated in accordance with the provisions of 43 *CFR Subpart* C, *Section* 12.84. This Agreement may be renewed for subsequent fiscal years (not to exceed a total of five years), subject to the availability of Federal funding, or by mutual written modification signed by both parties to this Agreement. Amendments to this Agreement may be proposed by either party and shall become effective upon approval by both parties.

Article V -Key Officials

The key officials specified in this Agreement are considered to be essential to ensure maximum coordination and communications between the parties and the work being performed. Upon written notice, either may designate an alternate to act in place of the designated key officials in an emergency or otherwise.

A. **For the NPS:**

Key Official

Roger Giddings, Superintendent
Hot Springs National Park
P. 0. Box 1860
e-mai1: roger-giddings@nps.gov
Telephone: 501/624-3383 Ext 620
Facsimile: 501/624-1037

B. For the Morning Star Volunteer Fire Department

Key Official

James Stine, Chief
115 Chad St.
Hot Springs, Arkansas 71901

Article VI - AWARD AND PAYMENT

Chargeable Appropriation: The Chargeable appropriation for this Agreement is Account Number 7300-RFAS-244 in the amount of $5,000.00 for the Morning Star Volunteer Fire Department. Nothing in this Agreement shall be construed as binding the NPS to expend in any fiscal year any sum in excess of the appropriation made by Congress for the purposes of this Agreement in that fiscal year.

Article VII -PRIOR APPROV AL

In accordance with *0MB CircularA-110 and 43 CFR Part 12*. (Note: If applicable list items requiring oral or written approval if other than shown in regulations reference above.)

Article VIII -REPORTS AND/OR DELIVERABLES

Submit one copy of an annual performance report to the NPS within ninety (90) days after September 30, the end of the Federal government's fiscal year. The performance report must be prepared in accordance with *43 CFR, Subpart C, Section 12.80* and address items such as a comparison of actual accomplishments with established goals, reasons why goals may not have been met cost overruns, and any other pertinent information.

Article IX -PROPERTY UTILIZATION

Any NPS property used or other property acquired under this Agreement, including intangible property such as copyrights and patents shall be governed by the provisions of *43 CFR, Subpart C, Section 12.71 through 12.74*.

Article X -MODIFICATION AND TERMINATION

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

B. Termination of this Agreement may be effected only in accordance with *0MB Circular A -110 and 43 CFR Part 12*.

Article XI -GENERAL AND SPECIAL PROVISIONS

A. General Provisions

1. OMB Circulars and Other Regulations -The following OMB Circulars and other regulations are incorporated by reference into this Agreement.

   (a) *0MB CircularA-110, as codified by* 43 *CFR Part* 12, *SubpartF,* "Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and other Non Profit Organizations."

2. **Non-Discrimination** -All activities pursuant this Agreement shall be in compliance with the requirements of Executive Order 11246; Title VI of the *Civil Rights Act of 1964,* as amended, (78 Stat. 252; 42 U.S.C. 2000d et seq.); Title V, Section 504 of the *Rehabilitation Act of 1973,* as amended, (87 Stat. 394; 29 U.S.C. 6101 et seq.); and all other Federal laws and regulations prohibiting discrimination on grounds of race, color, sexual orientation, national origin, disabilities, religion, age, or sex.

3. **Liability** -The Morning Star Volunteer Fire Department shall be fully responsible for the acts and omissions of its employees, members, and representatives connected with the performance of this Agreement.

B. Special Provisions

ADVERTISING AND ENDORSEMENTS

Morning Star Volunteer Fire Departments must obtain prior NPS approval before releasing any information to the public which refers to the Department of the Interior, any bureau or employee (by name or title), or this Agreement. The specific text, layout, photographs, etc., of the proposed release must be submitted to the NPS along with the request for approval:

FOR THE MORNING STAR VOLUNTEER FIRE DEPARTMENT	**FOR THE NATIONAL PARK SERVICE**
Signature: _____	Signature _____
Name: James Stine	Name: Roger Giddings
Title: Fire Chief Morning Star Volunteer Fire Department	Title: Superintendent Hot Springs National Park
Date: _____	Date: _____

Cooperative Agreement
between
The United States Department of the Interior
National Park Service
and
Piney Volunteer Fire Department

This Cooperative Agreement (hereinafter Agreement) is made and entered Department of the Interior, National Park Service (NPS) and the Piney Volunteer Fire Department, for the purpose of enhancing the fire protection capability of the Piney Volunteer Fire Department.

Article I -BACKGROUND AND OBJECTIVES

The objectives of this Agreement are to provide assistance in training, equipment purchase, and prevention activities on a cost-share basis. To increase firefighter safety, enhance the fire protection capabilities of rural fire departments, and enhance protection in the urban-wildland interface. To increase the coordination between local, State, and Federal fire fighting resources.

The public will benefit by having reduced fire losses, the development of fire prevention programs, and the reduction of occurrence and intensity of wildland fire within the urban interface.

Article II -AUTHORITY

This Agreement is hereby entered into by authority of:

Title IV of the Department of the Interior and Related Agencies Appropriations Act, 2001, Act of October 11, 2000, Pub. Law No.106-291, 114 Stat. 922.1006-1010, has appropriated funds for fire suppression operations, burned area rehabilitation, hazardous fuel reduction, and rural fire assistance and sets forth provisions governing the fund's use.

Article III -STATEMENT OF WORK

A. The Piney Volunteer Fire Department agrees to:

1. Training: Provide/attend wildland fire suppression training (includes costs of associated travel in accordance with Federal Travel Regulations). Assist in the planning and coordination of the wildland fire training course(s). Provide wildland fire training instructors. Provide wildland fire training materials and conference room facilities.

2. Equipment purchase: Work with the :NPS to identify and purchase wildland fire fighting equipment with the funds obligated by this Agreement. The purchased equipment may include fuses, hoses, adapters, nozzles, drip torches, tools, radios, engines, trucks, pumps, pump packages, and personal protective equipment.

3. The Piney Volunteer Fire Department agrees to meet a cost share at a minimum 10% (which may include in-kind services or supplies) of Federal funds identified by the :NPS for the program.

B. The :NPS agrees to:

1. Training: Assist in identifying training opportunities and developing training plans for rural firefighters. Provide instructor(s) for wildland training course(s). Provide wildland fire training material and conference room facilities.

2. Equipment Purchase: Will purchase all equipment and/or facilitate the transfer within applicable regulations (Transfer of Property). Types of equipment may include, but are not limited to, trucks, engines, pumps, pump packages, personal protective equipment, tools, supplies, materials, office equipment, etc.

Article IV -TERM OF AGREEMENT

This Agreement shall become effective on the date of signature of the NPS Superintendent and the Chief of Piney Volunteer Fire Department and shall remain in effect until September 30, 2002, unless terminated in accordance with the provisions of *43 CFR Subpart* C, *Section 12.84*. This Agreement may be renewed for subsequent fiscal years (not to exceed a total of five years), subject to the availability of Federal funding, or by mutual written modification signed by both parties to this Agreement. Amendments to this Agreement may be proposed by either party and shall become effective upon approval by both parties.

Article V -KEY OFFICIALS

The key officials specified in this Agreement are considered to be essential to ensure maximum coordination and communications between the parties and the work being performed. Upon written notice, either may designate an alternate to act in place of the designated key officials in an emergency or otherwise.

A. **For the NPS:**
Key Official

Roger Giddings, Superintendent
Hot Springs National Park
P. 0. Box 1860
Hot Springs, Arkansas 71902
e-mail: roger_giddings@nps.gov
Telephone 501/624-3383 Ext 620
Facsimile: 501/624-1037

B. **For the Piney Volunteer Fire Department**
Key Official

Tim McDorman, Chief
120 Mid-America Blvd.
Hot Springs, Arkansas 71913

Article VI -AWARD AND PAYMENT

Chargeable Appropriation: The Chargeable appropriation for this Agreement is Account Number 7300-RFAS-244 in the amount of $5,000.00 for the Piney Volunteer Fire Department. Nothing in this Agreement shall be construed as binding the NPS to expend in any fiscal year any sum in excess of the appropriation made by Congress for purposes of this Agreement in that fiscal year.

Article VII -PRIOR APPROV AL

In accordance with *OMB CircularA-110 and 43 CFR Part 12*. (Note: If applicable, list items requiring oral or written approval if other than shown in regulations referenced above.)

Article VIII -REPORTS AND/OR DELIVERABLES

Submit one copy of an annual performance report to the NPS within ninety (90) days after September 30, the end of the federal government's fiscal year. The performance report must be prepared in accordance with *43 CFR, Subpart C, Section 12.80* and address items such as a comparison of actual accomplishments with established goals, reasons why goals may not have been met, cost overruns, and any other pertinent information.

Article IX -PROPERTY UTILIZATION

Any NPS property used or other property acquired under this Agreement, including intangible property such as copyrights and patents shall be governed by the provisions of *43 CFR, Subpart C, Section 12.71 through 12.74.*

Article X -MODIFICATION AND TERMINATION

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

B. Termination of this Agreement may be effected only in accordance with *OMB Circular A -110 and 43 CFR Part 12*.

Article XI -GENERAL AND SPECIAL PROVISIONS

A. General Provisions

1. OMB Circulars and Other Regulations -The following OMB Circulars and other regulations are incorporated by reference into this Agreement.

   (a) *OMB Circular A-110, as codified by 43 CFR Part 12, Subpart F,* "Uniform Administrative Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and other Non Profit Organizations."

   (b) *OMB Circular A -122 "Cost Principles for Non-Profit Organizations* ".

2. **Non-Discrimination-** All activities pursuant this Agreement shall be in compliance with the requirements of Executive Order 11246; Title VI of the *Civil Rights Act of 1964*, as amended, (78 Stat. 252; 42 U.S.C. 2000d et seq.); Title V, Section 504 of the *Rehabilitation Act of 1973*, as amended, (87 Stat. 394; 29 U.S.C. 794); the *Age Discrimination Act of 1975* (89 Stat. 728; 42 U.S.C. 6101 et seq.); and all other federal laws and regulations prohibiting discrimination on grounds of race, color, sexual orientation, national origin, disabilities, religion, age, or sex.

6. **Liability** -The Piney Volunteer Fire Department shall be fully responsible for the acts and omissions of its employees, members, and representatives connected with the performance of this Agreement.

B. Special Provisions ,

Advertising and Endorsements

Piney Volunteer Fire Department must obtain prior NPS approval before releasing any information to the public which refers to the Department of the Interior, any bureau or employee (by name or title), or this Agreement. The specific text, layout, photographs, etc., of the proposed release must be submitted to the NPS along with the request for approval.

Article XII -SIGNATURES

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

FOR THE PINEY VOLUNTEER FIRE DEPARTMENT

FOR THE NATIONAL PARK SERVICE

Signature: _____

Signature: _____

Name: Tim McDorman

Chief

Piney Volunteer Fire Dept.

Date: _____

Name: Roger Giddings Title: Fire

Title: Superintendent

Date: _____

Agreement Number CA 3600 2000 2
Page 1 of 3

GENERAL AGREEMENT
BETWEEN
THE UNITED STATES DEPARTMENT OF THE INTERIOR
HOT SPRINGS NATIONAL PARK
AND
ARKANSAS FORESTRY COMMISSION
FOR
WILDLAND FIRE PROTECTION

This agreement is entered into by and between the National Park Service (hereinafter "NPS" or "Depositor"), United States Department of the Interior, acting through the Superintendent of Hot Springs National Park and the Arkansas State Forestry Commission.

ARTICLE I - BACKGROUND AND OBJECTIVES

Responsibility for wildland fire control on lands within the exclusive federal jurisdiction of Hot Springs National Park lies with the National Park Service. Responsibility for wildland fire protection and suppression in every area of the state, except within corporate city limits and on federal property, lies with the Arkansas Forestry Commission. It is to the mutual advantage of each agency and of the public served, to minimize response time and fire damage to resources by sharing manpower and equipment as outlined in this agreement.

ARTICLE II - AUTHORITY

This agreement is authorized by the Congressional act establishing the National Park Service on August 25, 1916 (39 Stat. 535) as amended, and the Act establishing Hot Springs National Park on March 4, 1921 (41 Stat. 1407), and Public Law 280 of August 8, 1953 (67 Stat. 495) which authorizes cooperative assistance to nearby fire prevention agencies. Arkansas Act 294 of 1931, as amended, created the Arkansas Forestry Commission and authorized it to cooperate with interested parties in the prevention, detection and suppression of wildfires. Act 409 of 1947, as amended, gives the Commission the authority to enter into contracts and agreements with the U.S. Government.

ARTICLE III - STATEMENT OF WORK

Each agency agrees to provide the other:

1) Upon request, available assistance in emergency fire suppression in the immediate vicinity of Hot Springs National Park.
2) A telephone directory for emergency notification use.
3) Notice of fires on or threatening lands under the other's jurisdiction.
4) Use of the agency's local radio frequency for emergency communication use.
5) Initial suppression action when it is in the best interest of both agencies.
6) Assistance in planning and prevention of wildfires.

Agreement Number GA7300026002
Page 2 of 3

ARTICLE IV - TERM OF AGREEMENT

This Agreement will 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 IX that follows

ARTICLE V - KEY OFFICIALS

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

A. For The NPS:

Superintendent
P. O. Box 1860
Hot Springs, AR 71902
Telephone (501) 623-2824

B. For The State:

State Forester
3821 West Roosevelt Road
Little Rock, AR 72204-6396
Telephone (501) 296-1940

ARTICLE VI - PRIOR APPROVAL

Not Applicable.

ARTICLE VII - REPORTS AND/OR OTHER DELIVERABLES

Not Applicable.

ARTICLE VIII - PROPERTY UTILIZATION

Not Applicable.

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 will meet promptly to discuss the reasons for the notice and to try to resolve their differences.

ARTICLE X - STANDARD CLAUSES

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

Agreement Number GA7300020002
Page 3 of 3

The National Park Service and the Arkansas Forestry Commission waive all claims against each other for compensation for any loss, damage, personal injury or death occurring in consequence of activities pursuant to this General Agreement. In the execution of this Agreement, employees or agents of the Forestry Commission are not considered employees of the National Park Service

Nothing herein shall obligate the National Park Service to expend in any one fiscal year funds in excess of that appropriated by Congress for that year for the purposes set forth herein

During the performance of this agreement, the participants agree to abide by the terms of Executive Order 11246 on 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, 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.

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: Roger Giddings
Name: Roger Giddings
Title: Superintendent
Date: 10/15/02

FOR THE ARKANSAS FORESTRY COMMISSION:

Signature: John T. Shannon
Name: John T. Shannon
Title: State Forester
Date: 10/9/02

APPENDIX E

4. Sample Delegation of Authority

Hot Springs National Park
Hot Springs, AR

Limited Delegation of Authority

As of 1800, November 20, 2001, I have delegated authority to manage the West Side 1 fire, number 0102, Hot Springs National Park, to Incident Commander, John Doe and his Incident Management Team.

The fire which originated as an arson fire on November 19, 2001, is burning in habitat adjacent to the Hot Springs 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, and suspected archeological sites.

4. Restrictions for suppression actions are: no tracked vehicles will be utilized.

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

6. My agency advisor will be Park Fire Coordinator, Steve Rudd.

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

8. Providing training opportunities for park personnel is requested to strengthen our organizational capabilities.

Superintendent, Hot Springs National Park
November 20, 2001

APPENDIX F

F. Wildland and Prescribed Fire Monitoring Plan

There is no current Monitoring Plan for Hot Springs. A plan will be developed and implemented prior to application of prescribed fire on the park.

APPENDIX G

G. Pre-Attack Plan

Table 5 – Pre-Attack Plan

Function/Item	Available	Needed	Not Needed
Command			
Pre-attack WFSA			
Pre-positioning Needs			
Draft Delegation of Authority	X		
Management Constraints	X		
Interagency Agreements	X		
Evacuation Procedures			
Structural Protection Needs	X		
Closure Procedures			
Operations			
Water Sources			
Control Line Locations			
Natural Barriers	X		
Safety Zones			
Flight Routes/Restrictions			
Staging Area Locations	X		
Helispot/Helibase Locations			
Logistics			
ICP Location	X		
Roads/Trails with Limitations	X		
Utilities	X		
Medical Facilities	X		
Stores/Restaurants/Services	X		
Rental Equipment Sources			
Construction Contractors			
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			
Vegetation/Fuel Maps			
Hazard Maps (ground and aerial)			
Special Visitor Use Areas			
Land Ownership Status	X		
Archeological/Cultural Resource Maps	X		
Sensitive Plant Area Maps			

APPENDIX H

H. Step-up Plan

Table 6 – Step-up Plan

Staffing Class	Fuel Model	Burning Index	Step up Actions
SC-1	E/9	0-9	Park will continue with normal operations
SC-2	E/9	9-14	Park will continue with normal operations
SC-3	E/9	15-32	Actions in SC-2 plus Chief Ranger will know the location and availability of fire qualified personnel. Equip all vehicles with fire suppression tools. Current fire weather forecasts will be broadcast park-wide daily.
SC-4	E/9	33-40	Actions in SC-3 Arkansas Group FMO may request emergency preparedness account from region. FMO may call a meeting with the Superintendent, Chief Ranger and concerned agency representatives to coordinate resource needs. Implement the fire prevention program as defined in Fire Prevention Plan. Coordinate aerial detection with Arkansas Interagency Coordination Center (AOICC). Selected personnel may be put on standby status at selected staging areas. Single Resource Patrols will be initiated to increase unwanted wildland fire detection and to deter arson ignitions. Will assign a dispatcher on any wildland fire, as needed. May supplement park personnel with outside overhead, crews and equipment as unwanted wildland fire occurrence increases. Current fire weather forecasts will be broadcast park-wide daily.
SC-5	E/9	41+	Actions in SC-4 plus

Staffing Class	Fuel Model	Burning Index	Step up Actions
			Conduct wildland fire surveillance with assigned suppression personnel. Bring in outside overhead, crews and equipment and place on standby at staging areas with in park if indices are predicted to maintain trigger levels for extended period. Contact will be made with the Superintendent, Chief Ranger, 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 park boundary. Visitor restrictions and/or park closures may be considered. Assign special law enforcement/fire qualified personnel to high fire risk areas. Maintain close communications with local fire agencies to provide mutual assistance as defined in Memoranda of Understanding. May assign a fulltime dispatcher on any wildland fire for fire time accounting and to maintain an accurate record of fire radio traffic.

APPENDIX I

I. Long-term Prescribed Fire and Hazard Reduction Plan

Hot Springs NP does not currently have plans to utilize prescribed fire. With the approval of the Fire Management Plan prescribed fire will become an option that can be considered. Hazard fuel reduction projects are associated with the Wildland Urban Interface (WUI). Protection of adjacent private property and reducing the potential for unwanted, difficult to control wildland fires on park lands is the goal of the projects. They meet the goals set forth under the 2000 National Fire Plan. Past projects have been completed using both federal employees and contracted resources; the option is available to HSNP management based on funding and resource availability. Project development and submittal for approval and funding will be coordinated between the HSNP staff, the Area Fire Management Officer at Buffalo National River, and the Midwest Region Fire WUI Specialist.

Hot Spring National Park
Wildland Urban Interface Fuels Reduction Plan
FY04 – FY10

Fiscal Year	Project Name	Acres
FY04	Southern Boundary	17.5
FY05	Dead Chief	12.7
FY06	Maintenance to BHR	10.0
FY07	Pullman Avenue	5.5
FY08	West Mountain	16.0
FY09	Park Avenue	20.5
FY10	Blacksnake/Gulpha Gorge	49.5

APPENDIX J

J. Fire Prevention Plan

Hot Springs National Park lies within an area of the continental United States where the climate is usually moist and hot during the summer months (primarily May – early September). A split fire season is typically experienced, with the spring season occurring from February - April (prior to green-up) and the fall season occurring from late October – early December (after leaf-fall). However, droughts can occur on irregular basis and lead to increased potential for vegetation fires at any time of the year.

A prevention analysis was conducted in 1999 to rate specific areas of the park as to the relative fire hazard (fuels), value (property and resource) and risk (to firefighters and the public). Being an urban park subject to relatively high use for its size, risk factors tend to be in the moderate–to-high levels for most areas. A long history of wildland fire suppression combined with little fuels mitigation work indicates a moderate hazard exists for most areas. Values tend to be high in those areas that coincidentally tend to be the focus of human activity. Overall priorities for prevention activities at Hot Springs NP are:

Priority #1:	Bathhouse Row; Hot Springs Mountain Tower; Gulpha Gorge Campground
Priority #2:	Hot Springs/North Mountain Trail System/Urban Interface; Highway 7/Stonebridge/DeSoto Park; Cedar Glade Road; North Sunset Trail/Sugarloaf Mountain; Blacksnake Road; South Sunset Trail; West Mountain Drive and Trail
Priority #3	Indian Mountain; Northeast Sunset Trail/Northeast corner of park

The park will coordinate with local cooperators to ensure that fire prevention messages are communicated to the public in an appropriate and timely manner. Specific fire prevention activities at the park will be based on current and predicted fire danger as identified in the park's Step-up Plan. These activities will commence as follow:

Staffing Class 3

- Chief Ranger to ensure all employees are aware of fire danger level (e-mail)
- Patrol rangers to verbally remind visitors contacted of fire danger level

Staffing Class 4 (in addition to the activities listed for Staffing Class #3)

- Post fire danger signs at appropriate trailheads, overlooks, and highway pullouts.
- Restrict smoking to developed areas only.
- Ban use of charcoal at campground: Propane stoves only.
- Have fire danger information available at visitor center, park headquarters, and Hot Springs Mountain Tower.
- Coordinate with local cooperators to ensure fire prevention messages broadcast/published by the media include reference to Hot Springs National Park.

Staffing Class 5 (in addition to the activities listed for Staffing Class #3 and #4)

- Patrol rangers to hand out written literature to contacted visitors informing them of fire danger level.
- Restrict smoking in all areas except Bathhouse Row.
- Close trailheads and overlooks to use if deemed possible. Patrol at least every two hours.
- Close and/or patrol trails as possible, concentrating on those (parts) that receive the most frequent use.

APPENDIX K

K. Rental Equipment Agreements

None at this time. (Resources ordered through normal dispatch channels)

APPENDIX L

L. Contracts for Suppression and Prescribed Fire Resources

None at this time. (Resources ordered through normal dispatch channels)

APPENDIX M

M. Wildland Fire Implementation Plan, Stage 1

Fire Name					
Fire Number					
Jurisdiction(s)					
Administrative Unit(s)					
FMP Unit(s)					
Geographic Area					
Management Code					
Start Date/Time					
Discovery Date/Time					
Current Date/Time					
Current Size					
Location:	Legal Description(s)	T.	R.	Sec.	Sub.
	Latitude				
	Longitude				
	UTM:				
	County:				
	Local Description				
Cause					
Fuel Model/Conditions					
Current Weather					
Predicted Weather					

Availability of Resources	

DECISION CRITERIA CHECKLIST

Decision Element	Yes	No
Is there a threat to life, property, or resources that cannot be mitigated?		
Are potential effects on cultural and natural resources outside the range of acceptable effects?		
Are relative risk indicators and/or risk assessment results unacceptable to the appropriate Agency Administrator?		
Is there other proximate fire activity that limits or precludes successful management of this fire?		
Are there other Agency Administrator issues that preclude wildland fire use?		

The Decision Criteria Checklist is a process to assess whether or not the situation warrants continued wildland fire use implementation. A "Yes" response to any element on the checklist indicates that the appropriate management response should be suppression-oriented.

Recommended Response Action (check appropriate box)	NO-GO (Initial attack/suppression action)	
	GO (Other appropriate management response)	

Signature	Date

Wildland Fire Situation Analysis (WFSA)

Section I, WFSA Information Page (*This page is completed by the Agency Administrator(s).*

A. Jurisdiction(s): *Assign the agency or agencies that have or could have fire protection responsibility, e.g., USFWS, BLM, etc.*

B. Geographic Area: *Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northwest, Northern Rockies, etc.*

C. Unit(s): *Designate the local administrative unit(s), e.g., Hart Mountain Refuge Area, Flathead Indian Reservation, etc.*

D. WFSA #: *Identify the number assigned to the most recent WFSA for this fire.*

E. Fire Name: *Self-explanatory*.

F. Incident #: *Identify the incident number assigned to the fire*.

G. Accounting Code: *Insert the local unit's accounting code.*

H. Date/Time Prepared: *Self-explanatory.*

I. Attachments: *Check here to designate items used to complete the WFSA. "Other could include data or models used in the development of the WFSA. Briefly describe the "other" items used.*

APPENDIX N

N. Wildland Fire Situation Analysis

I. Wildland Fire Situation Analysis	
To be completed by the Agency Administrator(s)	
A. Jurisdiction(s)	B. Geographic Area
C. Unit(s)	D. WFSA #
E. Fire Name	F. Incident #
G. Accounting Code:	
H. Date/Time Prepared _____@_____	
I. Attachments	

- Complexity Matrix/Analysis *
- Risk Assessment/Analysis *
  - Probability of Success *
  - Consequences of Failure *
- Maps *
- Decision Tree **
- Fire Behavior Projections *
- Calculations of Resource Requirements *
- Other (specify)

*Required

**Required by FWS

Section II. Objectives and Constraints (*This page is completed by the Agency Administrator(s).*

A. Objectives: Specify objectives that must be considered in the development of alternatives. Safety objectives for firefighter, aviation, and public must receive the highest priority. Suppression objectives must relate to resource management objectives in the unit resource management plan.

Economic objectives could include closure of all or portions of an area, thus impacting the public, or impacts to transportation, communication, and resource values.

Environmental objectives could include management objectives for airshed, water quality, wildlife, etc.

Social objectives could include any local attitudes toward fire or smoke that might affect decisions on the fire.

Other objectives might include legal or administrative constraints, which would have to be considered in the analysis of the fire situation, such as the need to keep the fire off other agency lands, etc.

B. Constraints: List constraints on wildland fire action. These could include constraints to designated wilderness, wilderness study areas, environmentally or culturally sensitive areas, irreparable damage to resources or smoke management/air quality concerns. Economic constraints, such as public and agency cost, could be considered here.

II. Objectives and Constraints
To be Completed by the Agency Administrator(s)
A. Objectives (Must be specific and measurable) 1. Safety - Public - Firefighter 2. Economic 3. Environmental 4. Social 5. Other **B. Constraints**

Section III. Alternatives (*This page is completed by the Fire Manager and/or Incident Commander.)*

A. Wildland Fire Management Strategy: Briefly describe the general wildland fire strategies for each alternative. Alternatives must meet resource management plan objectives.

B. Narrative: Briefly describe each alternative with geographic names, locations, etc., that would be used when implementing a wildland fire strategy. For example: "Contain within the Starvation Meadows' watershed by the first burning period."

C. Resources Needed: Resources described must be reasonable to accomplish the tasks described in Section III.B. It is critical to also look at the reality of the availability of these needed resources.

D. Final Fire Size: Estimated final fire size for each alternative at time of containment.

E. Estimated Contain/Control Date: Estimates of each alternative shall be made based on predicted weather, fire behavior, resource availability, and the effects of suppression efforts.

F. Cost: Estimate all incident costs for each alternative. Consider mop-up, rehabilitation, and other costs as necessary.

G. Risk Assessment: Probability of Success/Consequences of Failure: Describe probability as a percentage and list associated consequences for success and failure. Develop this information from models, practical experience, or other acceptable means. Consequences described will include fire size, days to contain, days to control, costs, and other information such as park closures and effect on critical habitat. Include fire behavior and long-term fire weather forecasts to derive this information.

H. Complexity: Assign the complexity rating calculated in "Fire Complexity Analysis" for each alternative, e.g., Type II, Type I.

I. Map: A map for each alternative should be prepared. The map will be based on the "Probability of Success/Consequences of Failure" and include other relative information.

III. Alternatives (*To be completed by FMO / IC*)			
	A	B	C
A. Wildland Fire Strategy			
B. Narrative			
C. Resources Needed			
Handcrews			
Engines			
Dozers			
Airtankers			
Helicopters			
Other			
D. Final Size			
E. Est. Contain/ Control Date			
F. Costs			
G. Risk Assessment			
- Probability of Success			
- Consequence Of failure			
H. Complexity			
I. Attach maps for each alternative			

Section IV. Evaluation of Alternatives (*This page is completed by the Agency Administrator(s), FMO and/or Incident Commander.)*

A. Evaluation Process: Conduct an analysis for each element of each objective and each alternative. Objectives shall match those identified in Section II.A. (Those listed are defaults only – not all will be applicable to every fire – add or delete as appropriate for each incident.) Use the best estimates available and quantify whenever possible. Provide ratings for each alternative and corresponding objective element. Fire effects may be negative, cause no change, or may be positive. Examples are: 1) a system which employs a "-" for negative effect, a "0" for no change, and a "+" for positive effect; 2) a system which uses a numeric factor for importance of the consideration (soils, watershed, political, etc.) and assigns values (such as -1 to +1, - 100 to +100, etc.) to each consideration, then arrives at a weighted average. If you have the ability to estimate dollar amounts for natural resource and cultural values, this data is preferred. Use those methods which are most useful to managers and most appropriate for the situation and agency. To be able to evaluate positive fire effects, the area must be included in the resource management plan and consistent with prescriptions and objectives of the fire management plan.

Sum of Economic Values: Calculate for each element the net effect of the rating system used for each alternative. This could include the balance of:
Pluses (+) and minuses (-), numerical rating (-3 and +3), or natural and cultural resource values in dollar amounts. (Again, resource benefits may be used as part of the analysis process when the wildland fire is within a prescription consistent with approved Fire Management Plans and in support of the unit's Resource Management Plan.)

IV. Evaluation of Alternatives			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
A. Evaluation Process	A	B	C
Safety Firefighter			
Aviation			
Public			
Sum of Safety Values			
Economic			
Forage			
Improvements			
Recreation			
Timber			
Water			
Wilderness			

Wildlife			
Other (specify)			
Sum of Economic Values			
Environmental			
Air			
Visual			
Fuels			
T & E Species			
Other (specify)			
Sum of Environmental Values			
Social			
Employment			
Public Concern			
Cultural			
Other (Specify)			
Sum of Social Values			
Other			

Section V. Analysis Summary (*This page is completed by the Agency Administrator(s) and Fire Manager and/or Incident Commander.)*

A. Compliance with Objectives: Prepare narratives that summarize each alternative's effectiveness in meeting each objective. Alternatives that do not comply with objectives are not acceptable. Narrative could be based on effectiveness and efficiency. For example: "most effective and least efficient," "least effective and most efficient," or "effective and efficient." Or answers could be based on a two-tiered rating system such as "complies with objective" and "fully complies with or exceeds objective." Use a system that best fits the manager's needs.

B. Pertinent Data: Data for this Section has already been presented, and is duplicated here to help the Agency Administrator(s) confirm their selection of an alternative. Final Fire Size is displayed in Section III.D. Complexity is calculated in the attachments and displayed in Section III.H. Costs are displayed on page 4. Probability of Success/Consequences of Failure is calculated in the attachments and displayed in Section III.G.

C. External and Internal Influences: Assign information and data occurring at the time the WFSA is signed. Identify the Preparedness Index (1 through 5) for the National and Geographic levels. If available, indicate the Incident Priority assigned by the MAC Group. Designate the Resource Availability status. This information is available at the Geographic Coordination Center, and is needed

to select a viable alternative. Designate "yes," indicating an up-to-date weather forecast has been provided to, and used by, the Agency Administrator(s) to evaluate each alternative. Assign information to the "Other" category as needed by the Agency Administrator(s).

Section IV. Decision

Identify the alternative selected. Must have clear and concise rationale for the decision, and a signature with date and time. Agency Administrator(s) signature is mandatory.

V. Analysis Summary			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
Alternatives	A	B	C
A. Compliance with Objectives			
Safety			
Economic			
Environmental			
Social			
Other			
B. Pertinent Data			
Final Fire Size			
Complexity			
Suppression Cost			
Resource Values			
Probability of Success			
Consequences of Failure			
C. External / Internal Influences			
National & Geographic Preparedness Level _____ Incident Priority _____			
Resource Availability _____			
Weather Forecast (long-range) _____			
Fire Behavior Projections _____			

National & Geographic
Preparedness Level _____
Incident Priority _____
Resource Availability _____
Weather Forecast
(long-range) _____
Fire Behavior Projections _____

VI. Decision

The Selected Alternative is: _____
Rationale:

_____ _____
Agency Administrator's Signature Date/Time

Section VII. Daily Review (This Section is completed by the Agency Administrator(s) or designate.)

The date, time, and signature of reviewing officials are reported in each column for each day of the incident. The status of Preparedness Level, Incident Priority, Resource Availability, Weather Forecast, and WFSA validity is completed for each day reviewed. Ratings for the Preparedness Level, Incident Priority, Resource Availability, Fire Behavior, and Weather Forecast are addressed in Section V.C. Assign a "yes" under "WFSA Valid" to continue use of this WFSA. A "no" indicates this WFSA is no longer valid and another WFSA must be prepared or the original revised.

Section VIII. Final Review (This Section is completed by the Agency Administrator(s). A signature, date, and time are provided once all conditions of the WFSA are met.).

VIII. Daily Review

To be completed by the Agency Administrator(s) or Designate

Selected to be reviewed daily to determine if still valid until containment or control

			PREPAREDNESS LEVEL	INCIDENT PRIORITY	RESOURCE AVAILABILITY	WEATHER FORECAST	FIRE BEHAVIOR PROJECTIONS	WFSA VALID
Date	Time	By						

If WFSA is no longer valid, a new WFSA will be completed!

VIII. Objectives Final Review

The elements of the selected alternative were met on:

_____ _____
Date Time

By:_____
(Agency Administrator(s)

A GUIDE FOR ASSESSING FIRE COMPLEXITY

The following questions are presented as a guide to assist the Agency Administrator(s) and staff in analyzing the complexity or predicted complexity of a wildland fire situation. Because of the time required to assemble or move an Incident Management Team to wildland fire, this checklist should be completed when a wildland fire escapes initial attack and be kept as a part of the fire records. This document is prepared concurrently with the preparation of (and attached to) a new or revised Wildland Fire Situation Analysis. It must be emphasized this analysis should, where possible, be based on predictions to allow adequate time for assembling and transporting the ordered resources.

Use of the Guide:

1. Analyze each element and check the response "yes" or "no."

2. If positive responses exceed, or are equal to, negative responses within any primary factor (A through G), the primary factor should be considered as a positive response.

3. If any three of the primary factors (A through G) are positive responses, this indicates the fire situation is, or is predicted to be, Type I.

4. Factor H should be considered after all the above steps. If more than two of these items are answered "yes," and three or more of the other primary factors are positive responses, a Type I team should be considered. If the composites of H are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF WFSA TERMS

Potential for blow-up conditions - Any combination of fuels, weather, and topography excessively endangering personnel.

Rate or endangered species - Threat to habitat of such species or, in the case of flora, threat to the

species itself.

Smoke management - Any situation which creates a significant public response, such as smoke in a metropolitan area or visual pollution in high-use scenic areas.

Extended exposure to unusually hazardous line conditions - Extended burnout or backfire situations, rockslide, cliffs, extremely steep terrain, abnormal fuel situation such as frost killed foliage, etc.

Disputed fire management responsibility - Any wildland fire where responsibility for management is not agreed upon due to lack of agreements or different interpretations, etc.

Disputed fire policy - Differing fire policies between suppression agencies when the fire involves multiple ownership is an example.

Pre-existing controversies - These may or may not be fire management related. Any controversy drawing public attention to an area may present unusual problems to the fire overhead and local management.

Have overhead overextended themselves mentally or physically - This is a critical item that requires judgment by the responsible agency. It is difficult to write guidelines for this judgment because of the wide differences between individuals. If, however, the Agency Administrator feels the existing overhead cannot continue to function efficiently and take safe and aggressive action due to mental or physical reasons, assistance is mandatory.

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted	**Yes/No**		
1. Burning Index (from on-site measurement of weather conditions predicted to be above the 90% level using the major fuel model in which the fire is burning.		___	___
2. Potential exists for "blowup" conditions (fuel moisture, winds, etc.).	___	___	
3. Crowning, profuse or long-range spotting.	___	___	
4. Weather forecast indicating no significant relief or worsening conditions.	___	___	
Total:	___	___	
B. RESOURCES COMMITTED			
1. 200 or more personnel assigned.	___	___	
2. Three or more divisions.	___	___	
3. Wide variety of special support personnel.	___	___	
4. Substantial air operation which is not properly staffed.	___	___	
5. Majority of initial attack resources committed.	___	___	
Total	___	___	
C. RESOURCES THREATENED			
1. Urban interface.	___	___	
2. Developments and facilities.	___	___	
3. Restricted, threatened or endangered species habitat.		___	___
4. Cultural sites.	___	___	
5. Unique natural resources, special designation zones or wilderness.	___	___	
6. Other special resources.	___	___	
Total	___	___	
	Yes/No		

D. SAFETY

1. Unusually hazardous fire line conditions.		___	___
2. Serious accidents or facilities.		___	___
3. Threat to safety of visitors from fire and related operations.		___	___
4. Restricted and/or closures in effect or being considered.		___	___
5. No night operations in place for safety reasons.		___	___
	Total	___	___

E. OWNERSHIP

1. Fire burning or threatening more than one jurisdiction.	___	___	
2. Potential for claims (damages).		___	___
3. Conflicting management objectives.		___	___
4. Disputes over fire management responsibility.		___	___
5. Potential for unified command.		___	___
	Total	___	___

F. EXTERNAL INFLUENCES

1. Controversial wildland fire management policy.		___	___
2. Pre-existing controversies/relationships.		___	___
3. Sensitive media relationships.		___	___
4. Smoke management problems.		___	___
5. Sensitive political interests.		___	___
6. Other external influences.		___	___
	Total	___	___

	Yes/No
G. CHANGE IN STRATEGY	

1. Change in strategy to control from confine or contain.		___	___
2. Large amount of unburned fuel within planned perimeter.		___	___
3. WFSA invalid or requires updating.		___	___
	Total	___	___

H. EXISTING OVERHEAD

1. Worked two operational periods without achieving initial objectives.		___	___
2. Existing management organization ineffective.		___	___
3. IMT overextended themselves mentally and/or physically.		___	___
4. Incident action plans, briefings, etc., missing or poorly prepared.		___	___
	Total	___	___

Signature_____

Date_____ Time_____