

National Park Service
U.S. Department of the Interior

Southeast Utah Group



Fire and Fuels Management Plan

June 2005

Arches National Park

Canyonlands National Park

Hovenweep National Monument

Natural Bridges National Monument

EXPERIENCE YOUR AMERICA

FIRE AND FUELS MANAGEMENT PLAN
SOUTHEAST UTAH GROUP, NATIONAL PARK SERVICE

Approved by:

/s/ Laura E. Joss
Superintendent, Arches National Park

6/16/05
Date

/s/ Coralee S. Hays
Superintendent, Hovenweep and Natural Bridges
National Monuments

6/16/05
Date

/s/ Anthony J. Schetzle
General Superintendent, Southeast Utah Group

6/16/05
Date

FIRE AND FUELS MANAGEMENT PLAN

SOUTHEAST UTAH GROUP, NATIONAL PARK SERVICE

Summary:

The National Park Service (NPS) has developed a fire and fuels management plan for the four parks of the Southeast Utah Group (SEUG): Arches and Canyonlands National Parks, and Hovenweep and Natural Bridges National Monument. The plan will implement fire management policies and contribute toward resource management and fire management goals as defined in federal and NPS fire management policy and the National Fire Plan. Firefighter and public safety will be the highest priority of every fire management activity.

Long-term SEUG park-specific information is not available, but available fire records, information and observations suggest that fire was not a major element in most native plant communities of group parks. The most common wildland fire in the generally sparse vegetation of the SEUG parks is a one- or two-tree lightning strike in pinyon-juniper, that does not spread beyond one-tenth acre. Two exotic plants that have invaded extensively, cheatgrass and tamarisk, seem to have adaptations to fire which give them a competitive advantage over native plant species, so that fires may cause increased dominance of these exotics. Consequently, the fire management program includes fire suppression, prescribed fire only for the purpose of debris and slash pile disposal, and hazardous fuels reduction, but does not include wildland fire use.

The plan includes a variety of techniques to minimize the impacts of fire suppression (minimum impact suppression tactics, or MIST). These include confinement strategies employing existing fuel breaks when available, restrictions on the use of heavy equipment and retardant, involvement of archeologists in locating fire lines to avoid cultural resources, and protection of native riparian and grassland vegetation.

TABLE OF CONTENTS

I. INTRODUCTION	1
II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY	3
III. WILDLAND FIRE MANAGEMENT STRATEGIES	7
A. General Management Considerations	7
B. Wildland Fire Management Goals	8
C. Wildland Fire Management Options	9
D. Description of Fire Management Strategies by Fire Management Unit	11
1. Fire Management Unit: Arches National Park.....	11
2. Fire Management Unit: Hovenweep National Monument.....	16
3. Fire Management Unit: Natural Bridges National Monument	21
4. Fire Management Unit: Island in the Sky District, Canyonlands National Park	25
5. Fire Management Unit: Maze District, Canyonlands National Park	30
6. Fire Management Unit: Needles District, Canyonlands National Park	34
7. Fire Management Unit: Green and Colorado River Corridors, Arches and Canyonlands National Parks	39
IV. WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS.....	44
A. General Implementation Procedures	44
B. Wildland Fire Suppression	45
1. Range of Potential Fire Behavior.....	45
2. Preparedness Actions	46
3. Pre-attack Information	50
4. Initial Attack	51
5. Extended Attack and Large Fire Suppression.....	56
6. Exceeding WFIP and New Strategy Selection.....	58
7. Minimum Impact Suppression Tactics	58
8. Rehabilitation Guidelines	60
9. Records and Reports	60
C. Wildland Fire Use	61
D. Prescribed Fire	61
1. Planning and Documentation.....	61
2. Exceeding Prescribed Fire Burn Plan	64
3. Air Quality and Smoke Management	64
E. Non-fire Fuel Treatment Applications: Mechanical Treatment	65
1. Annual Activities to Prepare for and Implement the Program.....	65
2. Equipment and Seasonal Use Restrictions.....	66
3. Effects Monitoring Required	66
4. Format for Critiques of Monitoring Projects	66
5. Cost Accounting	66
6. Reporting and Documentation Requirements	67
7. Planned Project List.....	68
F. Emergency Rehabilitation and Restoration	68
V. Organizational and Budgetary Parameters.....	69

VI. Monitoring and Evaluation	76
VII. Fire Research.....	78
VIII. Public Safety	79
IX. Public Information and Education	81
X. Protection of Sensitive Resources.....	83
XI. Fire Critiques and Annual Plan Review	86
XII. Consultation and Coordination.....	87

APPENDICES

Appendix A - References Cited	
Appendix B - Maps of Developed Areas and Other Spatial Information in the SEUG	
Appendix C - Definitions of Terms	
Appendix D - National Environmental Policy Act (NEPA): Decision Memorandum on Action and for Application of Departmental Categorical Exclusion 1.12	
Appendix E - Cooperative Agreements	
Appendix F - Delegation of Authority Letter	
Appendix G - Fire Ecology Groups	
Appendix H - Wilderness Minimum Requirement Analysis	
Appendix I - Pre-Attack Information	
Appendix J - Moab Interagency Fire Center – Annual Operating Plan	
Appendix K - Great Basin Mobilization Guide	
Appendix L - National Mobilization Guide	
Appendix M - Utah Smoke Management Plan	
Appendix N - Fire Call-up List	
Appendix O - Fire Equipment Inventory	
Appendix P - Firewise Information	
Appendix Q - Wildland Fire Implementation Plan	
Appendix R - Wildland Fire Prevention Workload Analysis	
Appendix S - Wildland Fire Situation Analysis (WFSa)	
Appendix T - A Guide for Assessing Fire Complexity and Complexity Analysis Worksheet	
Appendix U - Agency Administrator’s Briefing Form	
Appendix V - Local Incident Commander Briefing Form	
Appendix W - Guidelines for Determining Need for Park Closure/Evacuations	

1. INTRODUCTION

A. Purpose and Need

Federal and NPS wildland fire policy requires that each park with vegetation capable of burning have an approved fire management plan (FMP). Such a plan is to guide a fire management program that is responsive to the park's natural and cultural resource objectives and to safety considerations for park visitors, employees, and developed facilities.

The four parks of the Southeast Utah Group, Arches and Canyonlands National Parks and Hovenweep and Natural Bridges National Monuments, encompass a similar range of vegetation communities. While this vegetation is capable of burning, wildland fire occurrence in the four parks has generally been of limited extent, with vegetation over much of the park areas so sparse and discontinuous that a fire will not spread beyond one or a few trees. Canyonlands and Arches have existing fire management plans, but these plans may not meet current federal fire policy and interagency requirements for fire management plans and terminology. Hovenweep and Natural Bridges do not currently have fire management plans.

This FMP will establish future management direction for fire-related management activities at Southeast Utah Group parks, in accordance with current federal wildland fire policy, based on analysis of alternatives and strategies that would protect NPS as well as adjacent-land resources and values. The plan selects strategies for the management of wildland fire and fuels in the parks, as determined by NPS and cooperating fire management organizations, in order to protect the resources and values of the parks and adjacent lands.

B. Laws and Policies Guiding This Plan

The FMP will implement fire management policies and help achieve resource management and fire management goals as defined in current federal wildland fire policies and reports, including:

- *Federal Wildland Fire Management Policy and Program Review*
- *Managing Impacts of Wildfires on Communities and the Environment*
- *Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy* (USDOJ/USDA)
- *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan*

Other authorities for implementing this plan include:

- Act establishing the National Park Service, as amended (16 USC 1 ff.)
- United States Department of the Interior Manual (910 DM 1.3).
- 1998 Departmental Manual 620 Chapter 1, Wildland Fire Management General Policy and Procedures.
- Annual Appropriations Acts for the Department of the Interior.
- National Park Service Management Policies, Sections 4.5, 5.3.1.2, and 6.3.9, 2001
- National Park Service Director's Order 18, Wildland Fire Management, 2003
- National Park Service Reference Manual 18, 1999

C. Planning and Collaboration Process

The FMP was developed in accordance with the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), Endangered Species Act, and other laws and policies, and through collaboration with other resource management agencies and the public. The NPS announced the planning process and solicited input with letters sent to tribes and federal and state agencies, and press releases in local newspapers and on park web sites. The NPS met with the Bureau of Land Management on several occasions, invited scoping input from other agencies (Forest Service, Fish and Wildlife Service, Utah and Colorado State Historic Preservation Offices, Utah State Parks, Utah State Division of Forestry, Fire, and State Lands, the Utah State School and Institutional Trust Lands Administration, the Moab Interagency Fire Center). The planning team reviewed portions of the BLM Fire Management Plan for Southeast Utah to ensure that the SEUG plan would be consistent with it. Two letters from the public suggested fire management issues and strategies and provided fire ecology information.

The underlying land management plans for SEUG units, general management plans (GMPs), are also developed in collaboration with the public, tribes and other agencies, and in accordance with NEPA, NHPA, and other laws. GMPs for Arches, Canyonlands and Natural Bridges were completed in 1989, 1978, and 1997, respectively. Development of a new GMP for Hovenweep is currently underway.

Comments and suggestions from agencies and the public were considered in the development of the plan. The NPS will also collaborate with other agencies, through the Moab Interagency Fire Center, in implementation of the plan.

II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

A. NPS Management Policies

Fire management in the National Park system is governed by Section 4.5 of the NPS Management Policies (2001):

Naturally ignited fire is a process that is part of many of the natural systems that are being sustained in parks. Human ignited fires often cause the unnatural destruction of park natural resources. Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet park resource management objectives while ensuring that firefighter and public safety are not compromised.

Each park with vegetation capable of burning will prepare a fire management plan and will address the need for adequate funding and staffing to support its fire management program. The plan will be designed to guide a program that responds to the park's natural and cultural resource objectives; provides for safety considerations for park visitors, employees, neighbors, and developed facilities; and addresses potential impacts to public and private property adjacent to the park. An environmental assessment developed in support of the plan will consider the effects on air quality, water quality, health and safety, and natural and cultural resource management objectives. Preparation of the plan and environmental assessment will include collaboration with adjacent communities, interest groups, state and federal agencies, and tribal governments.

All fires burning in natural or landscaped vegetation in parks will be classified as either wildland fires or prescribed fires. All wildland fires will be effectively managed through application of the appropriate strategic and tactical management options. These options will be selected after comprehensive consideration of the resource values to be protected, firefighter and public safety, and costs. Prescribed fires are those fires ignited by park managers to achieve resource management and fuel treatment objectives. Prescribed fire activities will include monitoring programs that record fire behavior, smoke behavior, fire decisions, and fire effects to provide information on whether specific objectives are met. All parks will use a systematic decision-making process to determine the most appropriate management strategies for all unplanned ignitions, and for any prescribed fires that are no longer meeting resource management objectives.

Parks ... must consider the resource impacts of suppression alternatives in their decisions... Parks will use methods to suppress wildland fires that minimize impacts of the suppression action and the fire, and are commensurate with effective control, firefighter and public safety, and resource values to be protected.

Suppression activities conducted within wilderness, including the categories of designated, recommended, potential, proposed, and study areas, will be consistent with the "minimum requirement" concept identified in Director's Order #41: Wilderness Preservation and Management.

Since the 2001 edition of the NPS Management Policies, the Department of Interior has established a new NEPA categorical exclusion (CE) for hazardous fuels reduction activities. A CE describes a category of actions which does not individually or cumulatively have a significant effect on the human environment and therefore normally does not require further analysis in an environmental assessment or environmental impact statement. This CE applies to fuels reduction activities that: (1) Will not be conducted in wilderness areas or where they would impair the suitability of wilderness study areas for preservation for wilderness; (2) will not include the use of herbicides or pesticides; (3) will not involve the construction of new permanent roads or other infrastructure; (4) will not include sales of vegetative material that do not have hazardous fuels reduction as their primary purpose; (5) will not exceed 1000 acres for mechanical hazardous fuels reduction activities and will not exceed 4500 acres for hazardous fuels reduction activities using fire; and (6) will only be conducted in wildland-urban interface or in Fire Condition Classes 2 or 3 in Fire Regime Groups I, II, or III, outside the wildland-urban interface. The NPS has determined that in limited instances parks conducting suppression and fuels reduction activities, which meet these guidelines, may use this CE in conjunction with fire management plans.

B. Park Enabling Legislation

Reasons for establishing the four parks of the Southeast Utah Group are set out in the enabling legislation for each park.

- Arches National Park was initially established by Presidential Proclamation in 1929, then enlarged by three subsequent proclamations and an act of Congress. These acts direct the preservation of extraordinary examples of wind-eroded sandstone and other features of geologic, prehistoric, historic and scientific interest, because of their educational and scenic value.
- Canyonlands National Park was created, then expanded, by acts of Congress in 1964 and 1971, “to preserve an area ... possessing superlative scenic, scientific, and archeologic features for the inspiration, benefit and use of the public.”
- Hovenweep National Monument was created then enlarged by several Presidential Proclamations, beginning in 1923, to preserve outstanding prehistoric ruins and archeological sites.
- Natural Bridges National Monument was reserved by several Presidential Proclamations, beginning in 1908, for the preservation of three extraordinary natural bridges, as much land as may be necessary for the proper protection thereof, and surrounding prehistoric ruins.

C. GMP Direction and Desired Conditions Related to Fire Management

General Management Plans (GMP) were completed for Canyonlands in 1978, for Arches in 1989, and for Natural Bridges in 1997. Hovenweep does not have a GMP, but development of one is underway. The scope, content and format of these GMPs is varied. All four SEUG parks have Statements for Management (SFM), which provide some GMP-level direction. These General Management Plans and/or Statements for Management provide broad guidance, generally directing preservation of natural ecosystems and cultural resources, and acknowledging the need for more specific resource information.

The Arches GMP refers to the park’s 1987 Fire Management Plan. It directs that “The important role of fire in the ecosystem will be restored by allowing natural fires to burn,” and that human-caused fires and fires near developments and the park boundary will be suppressed. The GMP also mentions control of exotic plants, and rehabilitation of previous vegetation disturbances, possibly through burning. The 1987 FMP postulates that over 50 years of fire suppression and livestock grazing have reduced the acreage

affected by fire in the park from natural or historic levels, based on research, theories or observations from other locations with somewhat similar plant communities. (However, park-specific fire history information relevant to this issue was limited, covering only 20 previous years [1961-1980], and did not clearly indicate that fire would have affected substantially larger areas of the park if not suppressed. During this period the only park fires were single- to several-tree fires in pinyon-juniper communities.)

The Canyonlands GMP (1978) direction on fire management is limited to a statement that “Additional research is necessary to formulate specific resource management plans (e.g. fire management...)” This is supplemented by the 1993 Statement for Management: “The role of fire prior to the arrival of European man is unknown in the park. The Anasazi may have set fires for their own purposes. Research is needed to develop a fire management plan if appropriate.” The SFM sets an objective to “Allow fire back in the park’s natural ecosystem. Revise the fire management plan to meet new guidelines and define the role of fire in the park.”

The Natural Bridges GMP includes fire management as an issue identified through the scoping process: “The predominant vegetation type in the park is the pinon-juniper community - a fire-tolerant vegetation type. The area has characteristics that make fire unlikely to spread over most of the park. However, human activity, especially in concentrated use areas like the campground and residential area, increases the potential for man-caused fire.” As for fire management guidance, the GMP simply directs that “a fire management plan would be developed to determine the most appropriate method of fire management.”

Hovenweep does not have a GMP, and the 1992 Statement for Management does not have fire-specific guidance. SFM objectives include protecting cultural resources from natural and human-caused impacts, health and safety of visitors and employees, and restoring natural conditions of the monument’s lands, especially the plant communities, altered by human activities.

Arches, Canyonlands, and Natural Bridges have studies identifying lands recommended or suitable for wilderness. NPS policy is to manage these lands as wilderness until Congress acts. The GMPs for Arches and Natural Bridges also direct that recommended or suitable wilderness lands be managed as wilderness.

D. Resource Management Plan Objectives Related to Fire Management

Resource management plans recognize that SEUG vegetation is generally not conducive to large fires, that fire may have played a role in the development of some vegetation communities, but that due to the lack of fire histories, the extent of the role of natural wildfire is not understood. These plans identify the need for research on pre-Columbian vegetation conditions and fire history to explain the natural role of fire in park ecosystems.

E. Fire Management Plan Direction

This plan will establish fire management strategies for Southeast Utah Group parks, based on national fire policies. Fire and fuels management will be conducted in ways that support the GMP and RMP objectives of preserving or restoring natural resources and ecosystems, cultural resources, and wilderness. Park-specific fire history research has not yet been completed for group parks; when such fire history information is available fire management strategies may be modified accordingly.

The presence of invasive exotic species (tamarisk, cheatgrass) which are now established and dominant in some parts of the parks presents obstacles to maintaining a natural fire regime. These species appear to support a regime of more frequent and intense fires than that in uninvaded native plant communities, and to gain a competitive advantage over native species when fire occurs. Fire and fuels management will need to recognize the altered fire regimes that have resulted from the prominence of these plants, and to be conducted so as to avoid exacerbating their invasion.

III. WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations

Fire management in SEUG parks is conducted in collaboration with the Bureau of Land Management, the Forest Service, the Utah Division of Forestry, Fire and State Lands, and local counties, through the Moab Interagency Fire Center (Utah units) and the Durango Interagency Dispatch Center (Hovenweep Colorado units). Navajo lands surrounding the Cajon unit are managed by the Navajo Nation and dispatched by the Flagstaff Fire Center. Annual operating plans spell out the roles of the cooperating agencies. Additional fire management support and collaboration is provided by the Area Fire Management Officer located at Mesa Verde National Park, who provides technical assistance to the group on all fire management matters.

SEUG fire management is guided by the core principles of the interagency “Ten-Year Comprehensive Strategy” (“A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment”):

1. Priority setting that emphasizes the protection of communities and other high-priority watersheds at-risk.
 - SEUG priorities for hazardous fuels reduction will be:
 - developed areas (Wildland Urban Interface), and
 - vegetation in fire-prone fuel types (fire regimes groups I, II, or III) that are moderately or significantly altered from historic ranges of fire frequency (fire conditions classes 2 or 3).
 - The plan also identifies information for prioritizing for fire suppression actions.
2. Collaboration among governments and broadly representative stakeholders
 - SEUG fire management planning and implementation will use a collaborative framework at the local, state/regional/tribal, and national levels, as described in the “Ten-Year Comprehensive Strategy Implementation Plan.”
3. Accountability through performance measures and monitoring for results.
 - Group parks will report, compile and monitor information needed to track fire and fuels management performance against established baselines.

Important values to be protected at SEUG parks include a variety of natural, cultural and wilderness resources. These values and their susceptibility to damage or loss by fire are discussed in more depth in the descriptions of the Fire Management Units (section III.D of this plan). Fire managers will balance the potential impacts of wildland fire with the potential impacts of fire suppression activities in choosing the appropriate management response.

SEUG parks, in accordance with NPS policy, will use Minimum Impact Suppression Tactics (MIST) in all fire management activities. MIST are defined as the application of techniques that effectively accomplish wildland fire management objectives while minimizing the impacts to cultural and natural

resources commensurate with ensuring public and firefighter safety and effective wildland fire control. Examples of MIST include using existing natural or constructed barriers to contain fires, and applying water to suppress fire activity and reduce fire spread, rather than digging and clearing new firelines.

SEUG landscapes are dominated by bare rock and vegetation that is too sparse to carry fire for long distances. The group does not have long term fire history information specific to group parks, but various observations, fire records dating back to the 1960s, and other lines of evidence suggest that wildland fire was not historically a frequent or prominent element in most of the vegetative communities of the group.

Fire records are available from 1988 to 2004 for all group parks, and additionally from 1961 to 1980 for Arches and from 1972 to 1983 for Canyonlands. From 1988 to 2004, there were 90 fires in the four group parks. From 1961 to 1980 there were 20 recorded fires in Arches, and from 1972 to 1983 there were 25 fires in Canyonlands. Over 75 percent of the fires during these periods were 0.25 acres or less, and 90 percent of the fires burned 10 acres or less. Most of these fires affected only one or two trees. There were five fires during these periods in the 100 to 300 acre range, and one fire of approximately 2500 acres which burned mostly BLM and private lands, but did cross over the Hovenweep boundary into the monument. Over 85 percent of the fires were lightning-caused; the remainder were human-caused. For the 1988 to 2004 period, the average acreage of human-caused fires (several of which occurred in fireprone tamarisk) was 44 acres, while the average acreage for lightning-caused fires was 2.5 acres (not including the anomalous 2500-acre fire at Hovenweep). Exact acreages are not available for the pre-1988 fire records.

Parts of SEUG parks have been invaded and are now dominated by exotic species such as cheatgrass and tamarisk, which alter the fire regime by increasing the extent and intensity of fires. In these areas, fire appears to give these exotics, which recover quickly after fire, a competitive advantage over native plants.

B. Wildland Fire Management Goals

The following goals, based on federal wildland fire policy, NPS and individual park policies and management plans, and characteristics of Southeast Utah Group parks, will guide SEUG fire management:

Goal 1: Make firefighter and public safety the highest priority of every fire management activity.

Goal 2: Manage wildland fire in concert with federal, state and local laws and policies.

Goal 3: Suppress all wildland fires to protect the public and firefighters, check fire from spreading outside park boundaries, and protect the natural, cultural and historic resources of the Southeast Utah Group parks.

Goal 4: Manage wildland fires so that SEUG resources (natural, cultural, and improvements) are protected from damage by suppression actions and fire.

Goal 5: Facilitate reciprocal fire management activities and relationships with cooperating fire management entities within and outside the Moab Interagency Fire Center zone.

Goal 6: Reduce wildland fire hazard around developed areas and, as appropriate, adjacent to cultural and historic sites.

Goal 7: Ensure to the greatest extent possible the preservation of wilderness characteristics in SEUG areas recommended or suitable for wilderness during fire management activities.

Goal 8: Keep the public informed of fire management activities.

C. Wildland Fire Management Options

The range of fire management options is limited in SEUG parks because of the lack of fire history information, the apparently limited role of fire in most natural SEUG vegetative communities, the altered fire regimes in communities invaded and dominated by exotic plants like tamarisk and cheatgrass, and the competitive advantage these species have over natives when fire occurs. Group parks also lack fire management staff. For these reasons, the SEUG will not employ wildland fire use and will only use prescribed fire for slash pile or debris burns. Under this plan the NPS will use the following wildland fire management options.

1. WILDLAND FIRE SUPPRESSION

Historically, all wildland fires have been suppressed at SEUG parks. Under this plan, group parks will continue to suppress all wildland fires, using the appropriate management response (AMR). The AMR is any specific action suitable to meet Fire Management Unit (FMU) objectives. Typically, the AMR ranges across a spectrum of tactical options (from monitoring to intensive management actions). Determination of the AMR will consider human safety, threat and potential damage to property, resources, and cost effectiveness. The SEUG will provide an appropriate management response (AMR) on all wildland fires, with emphasis on minimizing suppression costs, considering firefighter and public safety, and resources to be protected. AMR options for SEUG will include the following, based on the *Interagency Standards for Fire and Fire Aviation Operations* (the “Red Book”).

Appropriate Management Response Options

- **Monitoring**
Fire situations where inactive fire behavior and low threats require only periodic monitoring on-site or from a nearby location or aircraft.
- **Confinement**
Actions taken when fires are not likely to have resource benefit and an analysis of strategic alternatives indicates threats from the fire do not require costly deployment of large numbers of suppression resources for mitigation or suppression. Typically these fires will have little to no on-the-ground activity and fire movement remains confined within a pre-determined area bounded by natural barriers or fuel changes.

- **Initial Attack**
A planned response to a wildfire given the wildfire's potential fire behavior. The objective of initial attack is to stop the spread of the fire and put it out at least cost. This is an action where an initial response is taken to suppress wildfires consistent with firefighter and public safety and values to be protected.
- **Wildfire suppression with multiple strategies**
This action categorizes wildfires where a combination of tactics such as direct attack, indirect attack, and confinement by natural barriers are utilized to accomplish protection objectives as directed in a Wildland Fire Situation Analysis (WFSA).
- **Control and extinguishment**
These actions are taken on a wildfire when the selected WFSA alternative indicates a control strategy. Sufficient resources are assigned to achieve control of the fire with a minimum of acres burned.

2. PRESCRIBED FIRE (DEBRIS DISPOSAL)

Prescribed fire at SEUG parks will be limited to individual burns for the disposal of vegetative debris that is infeasible to dispose of by other means. Such debris may include slash piles that accumulate from cutting of hazardous fuels or exotic plants, and tumbleweeds (Russian thistle) that pile up against fence lines or other barriers. These burns would occur in areas surrounded by sand, slickrock, snow, or other surfaces that do not contain wildland fuels.

Debris burned in a wildland environment (including on snow covered ground) requires a prescribed fire burn plan. Any material being burned for debris disposal must be classified as permissible to burn under applicable federal, state, tribal, and local regulations. Group parks will follow all applicable guidance and regulations when using fire for debris disposal. NPS guidance on debris burning is found in RM-18.

3. NON-FIRE FUEL TREATMENT APPLICATIONS: MECHANICAL TREATMENT

SEUG parks will manage wildland fuels to reduce risks to human life, park developments and structures, and cultural and natural resources. Fuels around buildings, boundaries, roads, trails, camp and picnic areas, and cultural sites occasionally accumulate sufficient density to create hazards. Excessive fuels may be removed or modified to reduce the likelihood of ignition, potential fire intensity, potential damage and/or resistance to control. Herbaceous or woody fuels may be cut, cleared or pruned with hand tools or hand-operated power tools such as chainsaws, axes, machetes, hand clippers, power brush saws, shovels, or rakes. Cut slash or debris will be piled for later burning or broadcast.

D. Description of Fire Management Strategies by Fire Management Unit

1. FIRE MANAGEMENT UNIT: ARCHES NATIONAL PARK

a. PHYSICAL AND BIOTIC CHARACTERISTICS

Location: This FMU includes Arches National Park, except for the Colorado River corridor.

Primary Vegetation Type: Pinyon-juniper, blackbrush/desert shrub, riparian areas, grasslands, non-native tamarisk and native willow, cottonwood and other species in riparian areas.

Wildlife (non threatened/endangered species): mule deer, desert bighorn sheep, eight species of raptors, species of neo-tropical migrant birds, coyote, mountain lion, small mammals, reptiles

Predominant Soil Types: Rock outcrops, and shallow to deep, well drained, gently-sloping to moderately steep soils on cuestas, structural benches, valley floors and mesas. The park's surface is predominately bright red sandstone, with most of the soil being loose sand often in dunes and/or covered by cryptobiotic soil crust. Salt Valley is an exception, with its soil being derived from gray and blue mudstone and clays.

Significant Water Bodies: Salt Wash is a perennial or interrupted stream; Courthouse Wash is an intermittent stream. The Colorado River borders, but is outside of, the FMU. The general drainage in the park is from northwest to southeast into the Colorado River.

Topography/ Elevation: The 76,536 acre Arches National Park ranges from 4,000 to 5,653 above sea level. The park is part of the Colorado Uplift and contains ten exposed geologic units (Morrison, Summerville, Entrada, Kayenta, Wingate, Mancos Shale, Dakota and Chinle, of the Mesozoic, and Hermosa, of the Paleozoic). The park's rugged topography derives from massive anticlines and a collapsed salt dome, which forms the broad Salt Valley, dissected by canyons and smaller drainages. The Entrada sandstone contains most of the over 2000 natural arches for which the park is named. Fins, cliffs, pinnacles, balanced rocks, buttes, mesas, canyon, spires and natural bridges are among the diverse erosional forms found in the park.

Air Quality: Class I airshed.

Cultural Resources: Arches has numerous rock art panels, including both pictographs and petroglyphs, as well as lithic scatters, quarry sites and historic sites showing the full sequence of culture history. Wolfe Ranch National Historic District is located near Salt Wash. A number of other historic cabins related to grazing and mining are scattered throughout the park.

Affected T&E Species: southwestern willow flycatcher, bald eagle, various special concern species including the canyonlands biscuitroot plant, which occurs in very few locations outside of Arches.

Special Designations: Except for road corridors and developed areas, the park is included in recommended wilderness. Courthouse Wash and lower Salt Wash are eligible for designation into the National Wild and Scenic Rivers system.

Improvements: The headquarters area, just off highway 191, includes a visitor center and a number of administrative and residential buildings. A developed campground, picnic area, and administrative building are located at Devil's Garden. The main park road runs from park headquarters to Devils Garden. Several secondary roads branch off the main road. Parking lots and trails to major scenic features are scattered throughout the park along the roads. A map of park developments is found in appendix B.

b. FIRE MANAGEMENT OBJECTIVES

Suppression Objectives: Firefighter and public safety is first priority for all fire management actions. Human safety issues are associated with public and administrative facilities, recreational camping, hiking, mountain biking, and driving/sightseeing along the paved and unpaved roads, indicating immediate response in these areas to contain fire to the smallest area possible. Fires are infrequent and tend to be one- or two-tree events of less than one acre. Such fires should be monitored when they occur in isolated fuels and remote areas with natural barriers (rock formations, drainages) providing confinement. Initial attack should occur only in situations that would otherwise endanger people or when conditions encourage rapid or extensive spread of fire. Fire is undesirable in riparian areas as these areas are valuable wildlife habitat and fire seems to favor exotic plants (tamarisk, cheatgrass) over natives. Cottonwood, willow, and other native species should especially be protected from fire.

Fire Use Objectives: Wildland fire use is not appropriate in this FMU due to the amount of human activity and to the adverse effect on many native plant species.

Fuels Treatment Objectives: Developed areas will be assessed and mechanically treated if necessary to reduce hazard fuels. In most areas of the FMU the low fuel load does not necessitate fuels reduction. Slash piles resulting from exotic plant (tamarisk) control may be burned.

Post Fire Rehabilitation/Restoration Objectives: Where necessary, rehabilitation/restoration will be done to prevent excessive erosion or the invasion of noxious weeds and to restore a native vegetative community.

c. MANAGEMENT CONSIDERATIONS OR CRITERIA AFFECTING OPERATIONAL IMPLEMENTATION

- No impacts to cultural resources.
- No impacts to threatened/endangered species or habitat.
- Minimize alteration to wilderness characteristics, e.g. motorized equipment, ground surface disturbance from construction of firelines or helispots, from vehicle travel off-road, or from spike camps.
- Minimize impacts to native riparian plants, particularly cottonwoods.

- Keep roads open to visitor travel.
- Protect bighorn sheep habitat.
- Slash pile burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

d. HISTORIC ROLE OF FIRE

Fire is mainly the result of lightning strikes that ignite one-tree fires that are usually contained by natural barriers such as rock and drainages. Salt Valley grasslands appear potentially susceptible to fire but only one 100 acre fire has occurred in that area since the park was established. Long-term park-specific fire history information is not available, but since 1988 FMU has averaged about one fire per year, with a few years having several fires and nine years having none.

e. SPECIFICS OF THE WILDLAND FIRE MANAGEMENT SITUATION

Historic weather analysis: Climate is arid; average annual precipitation is approximately 9 inches. Thunderstorms, often without precipitation, are common from June to September. The wettest period is July through October, which receives about 45 percent of annual precipitation. May and June are generally the driest months, but intense rainstorms may occur in any month between spring and fall. Precipitation is dominated by relatively brief, heavy downpours, dropping up to 2 inches of rain in 24 hours. Storms are often very localized, with one watershed receiving a downpour while a neighboring one is virtually dry. Temperatures may reach the 90s or higher from mid-May through mid-September.

Fire season: Over 90 percent of SEUG fires from 1988 through 2004 occurred between May 1 and September 30.

Fuel characteristics and changes during fire season: Lightning strikes may ignite pinyon or juniper trees, but these trees are generally too sparsely distributed to carry a fire beyond one or two trees. Vegetation potentially susceptible to larger fires includes the Salt Valley grassland, and occasional dense tamarisk patches in canyon bottoms. Fuel moistures generally decline from spring through July, then level off or begin to increase with summer rains. Grasses typically cure by mid-June.

Fire regime alteration: Vegetation types and fire regimes in this FMU include:

- Pinyon-juniper, fire regime group III, condition class 2
- Desert shrub, fire regime group III, condition class 2
- Grassland, fire regime group II, condition classes 2 and 3
- Riparian, including tamarisk, fire regime group II, condition class 3, and native riparian vegetation, fire regime group III, condition class II

Control problems and dominant topographic features: This FMU includes steep rugged canyons and sandstone fins, with large areas of bare rock. Most of the park is within two to three miles of at least a four-wheel-drive road. Water is available from the river for helicopter bucket work. Wells and water systems are located at the headquarters area and at Devil's Garden. Grassland fires may move rapidly and may be best controlled by stopping fire at the edges of roads or where the vegetation changes to another type.

Values at Risk: Several facilities and recreation sites; important riparian resources, wilderness characteristics, cultural resources, possible threatened or endangered species. Historic resources related to the mining and ranching eras include cabins, corrals, and fences.

Communities at Risk: Wildland-urban interface near this unit is minimal, limited to a few residences and commercial/industrial developments along Highway 191 within one-quarter mile of this FMU. The Atlas uranium mill and tailings pile (decommissioned, with remediation planned or underway), on the Colorado River near the park, would probably require special hazardous/radioactive materials precautions if fire suppression were necessary.

f. FIRE MANAGEMENT STRATEGIES

Suppression:

- Confine or contain all fires, under all burning conditions. Least cost suppression tactics should be used to accomplish this objective. It is expected that most fires would be managed with a confinement strategy using natural fuel breaks.
- Fires that threaten state or BLM lands should be suppressed unless appropriate officials determine an alternative fire management action.
- Minimum impact suppression tactics will be used. Natural fuel breaks, wet line or foam line will be used when feasible, rather than line dug or scraped in soil.
- Fires in the Salt Valley grasslands should be fully suppressed within the constraints of fire fighter safety and appropriate management response.
- Fires in riparian areas should be fully suppressed within the constraints of fire fighter safety and appropriate management response. Cottonwood, willow, and other native species should especially be protected from fire. Natural barriers may be used to contain fires burning in pure tamarisk stands.
- Contain any fires within one-half mile of administrative buildings and facilities, camp and picnic grounds, and significant fire-sensitive cultural sites.

Constraints:

- Surface disturbance is to be minimized to protect cultural resources, soil crust and native vegetation.
- A qualified archeologist will be dispatched as soon as possible in order to identify cultural sites prior to fireline construction and other tactics and to recommend alternative line if necessary to avoid impacts. Construction of fireline may proceed if necessary without clearance prior to the arrival of an archeologist or when life or property are in imminent danger.
- Bulldozers and other heavy equipment will only be used if imminent threat to life or property, and will require Superintendent's approval on a case by case basis
- Aircraft and retardant will be considered only on a case-by-case basis, when imminent danger to life or property exists, and will require Superintendent's approval.
- Helicopter use should be restricted to a minimum
- In recommended wilderness, use of motorized pumps in the Colorado River, use of chainsaws, and/or helicopter landings will be considered to be the minimum requirement necessary for administering these areas as wilderness, under the following conditions:
 - In order to resolve emergencies involving human health and safety
 - In order to protect key natural or cultural resources:
 - fire-vulnerable cultural sites as determined by a park archeologist,
 - important T&E habitat, or mature cottonwoods, as determined by the resource advisor
 - (The wilderness minimum requirement analysis for these measures is in appendix H)

- In recommended wilderness, locations and otherwise-prohibited measures that do not meet the above conditions (e.g. motorized pumps in other locations, motorized vehicles off roads) will only be used if analyzed and documented through case-by-case minimum requirement analyses and approved by the Superintendent.
- Engines will be limited to roads
- No streams or springs within the park will be used for water sources, except with approval of the resource advisor on a case by case basis. Otherwise, water sources will be limited to the Colorado or Green Rivers, the park water system, or outside the park.

Wildland Fire Use:

- None

Prescribed Fire:

- Slash piles resulting from mechanical fuel treatment and exotic plant control may be burned. These burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

Non-Fire Fuels Treatment:

- Hazard fuels will be assessed around developed sites, and mechanical treatments will be conducted if necessary for the purpose of reducing overall hazardous fuel loadings and restoring native plant species.

Restoration/Rehabilitation:

- All burned areas will be evaluated by resource specialists to determine whether post-incident rehabilitation, e.g. seeding, is needed to prevent excessive erosion or the invasion of noxious weeds, or to restore a native vegetative community. If the evaluation shows that post-incident rehabilitation is necessary, a rehabilitation plan will be prepared and implemented in accordance with the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (620 DM3), supplemental guidance from fire management direction, and other applicable guidance.

Community Protection/Assistance:

- There is minimal wildland-urban interface adjacent to this FMU, limited to private land and the Atlas mill site and tailings pile south of Hwy 191. Hazard fuels will be monitored near the boundary and reduced if necessary.

Prevention:

- A fire prevention/education program is needed for park visitors, as well as housing area residents.
- Open fire bans will be implemented in conjunction with other state and federal Agencies when extreme heat and drought conditions require such restrictions.
- Coordination of early fire detection will be accomplished through the Moab Interagency Fire Center.

2. FIRE MANAGEMENT UNIT: HOVENWEEP NATIONAL MONUMENT

a. PHYSICAL/BIOTIC CHARACTERISTICS

Location: Hovenweep National Monument includes six detached units near the Utah-Colorado border. Five units are in Colorado; two units, including the monument headquarters, are in Utah.

Vegetation Types: Hovenweep's four Colorado units, consisting of 325 acres, lie predominantly in the pinyon/juniper (PJ) community with serviceberry, rabbitbrush, sagebrush and native grasses. The density of the P-J varies from moderate at the lowest unit (5300 feet - Holly), and increases as elevations rise (5800 feet - Cutthroat), becoming heavy at the highest unit (6600 feet - Goodman Point). Ips beetle infestation has affected the pinyon population to varying degrees, most extensively at Goodman Point where an estimated 30 to 50 percent die-off has occurred. Additionally, Goodman Point is surrounded to a great extent by agricultural lands containing alfalfa, pinto beans and safflower. The pinyon/juniper stands at the other Colorado units are part of the larger forests on surrounding BLM land. Hovenweep's two Utah units, consisting of 460 acres, are located on the south flank of Cajon Mesa, a 80,000 acre plateau covered by a range of plant communities. These include desert shrub-grasslands on the southernmost slope (Cajon unit), transitioning in a northerly direction to sage plain with a sparse distribution of juniper (Square Tower unit). In the canyon bottoms is a riparian community of hackberry, cottonwood, willow, desert shrubs and native grasses.

Wildlife (non-threatened/endangered species): Mule deer, mountain lion, coyote, fox, various rodents, raptors, various reptiles/amphibians, resident/migratory birds.

Soil Types: Rock outcrop and varying depths of well-drained, level to steep, eolian, residual and alluvial soils, on mesas, benches, hillsides, alluvial fans and terraces. Biological soil crusts (also known as cryptobiotic or cryptogamic) normally cover the undisturbed sandy soil surfaces between vascular plants.

Significant Water Bodies: None

Topography/Elevation: Elevation ranges from 5200 feet to 6600 feet. Terrain is rugged and moderately rolling, traversed by canyons and drainages 1 to 500 feet deep and up to a half-mile wide.

Air Quality: Class II airshed.

Cultural Resources: Archeological site density is very high to highest. The monument contains some of the best preserved archaeological sites in the region.

Affected Threatened/Endangered Species: Gunnison sage grouse, a special-concern species, may occur near the monument.

Special Designations: All of the Hovenweep units have been administratively listed on the National Register of Historic Places.

Improvements: The primary visitor and administrative facilities are located at the Square Tower unit and include a visitor center, maintenance yard/shop/outbuildings, employee residences, 31 site campground with restrooms, amphitheater, picnic area, and 1 mile of paved roadway.

b. FIRE MANAGEMENT OBJECTIVES

Suppression Objectives: Firefighter and public safety is first priority for all fire management actions. Visitor safety issues are derived from recreational activities - camping, hiking, scenic driving within and around the monument. Protection of cultural resources from fire damage is a primary concern, and protection of native riparian vegetation near springs (hackberry, cottonwood, willow) is also important. These factors, along with employee safety and protection of NPS buildings and infrastructure, indicate an immediate response to contain fire to the smallest area possible. Much of the FMU has a high density of archeological sites, but suppression actions have the potential to be more destructive to these sites than a fire itself. Fires are infrequent and tend to be one- or two-tree events of less than one acre. Such fires should be monitored when they occur in isolated fuels and remote areas with natural barriers (rock formations, drainages) providing confinement. Initial attack should occur only in situations that would otherwise endanger people or when conditions encourage rapid or extensive spread of fire. Fire is undesirable in riparian areas as these areas are valuable wildlife habitat and fire seems to favor exotic plants (tamarisk, cheatgrass) over natives. Cottonwood, hackberry, willow, and other native species should especially be protected from fire.

Fire Use Objectives: Wildland fire use for management purposes is not appropriate for this unit based on the small land area, level and concentration of human activity, proximity to small local communities, NPS infrastructure, and potential adverse effects of native plant species.

Fuels Treatment Objectives: Developed areas and ruins will be assessed and mechanically treated if necessary to reduce unsafe concentrations or classes of fuels. In most areas of the FMU the low fuel load does not necessitate fuels reduction. Slash piles resulting from fuel reduction, or tumbleweed piles, may be burned.

Post-Fire Rehabilitation/Restoration: When necessary, efforts will be undertaken to prevent excessive erosion, invasion of noxious non-native species and damage to cultural sites while encouraging the process of recovery to a natural state.

c. MANAGEMENT CONSIDERATIONS/CRITERIA AFFECTING OPERATIONAL IMPLEMENTATION

- Prevent impacts to cultural resources
- Prevent impacts to threatened/endangered species
- Minimize impacts to native plant species, particularly cottonwoods.
- Minimize ground surface disturbance and other impacts from motorized equipment, construction of firelines or helispots, from vehicle travel off-road or from spike camps.
- Keep roads open to visitor travel
- Slash pile burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

d. HISTORIC ROLE OF FIRE

Monument-specific fire history information is not available, but it does not appear that fire has played a significant role historically in shaping the ecosystem of the Hovenweep units. Sparse vegetation resulted in minimal fuels available to influence fire spread. The introduction of cheatgrass and its subsequent proliferation have changed this by providing more continuous light fuel coverage. In the summer of 1998, a fire burned an approximately 2500 acre expanse of sagebrush and cheatgrass just south of the Square Tower unit boundary. Around the Colorado units, the typical fire is lightning-caused, burning less than 20 acres, with an occasional 100 to 150 acre fire. Fire spread is limited by light fine fuel load, topography and fuel spacing. Only one other fire has been recorded at Hovenweep since 1988, a lightning strike of less than one-tenth acre.

e. SPECIFICS OF THE WILDLAND FIRE MANAGEMENT SITUATION

Historic Weather Analysis: The climate is arid with an average annual precipitation of ranging from 11 to 16 inches at the different units. Temperature averages: summer highs 95 to 100, lows 60 to 70; winter highs 40 to 45, lows 0 to 20. The wettest period is July through October, which accounts for about 45 percent of annual rainfall primarily in the form of localized thunderstorms, dominated by relatively brief, heavy downpours. June is generally the driest month of the year.

Fire season: Over 90 percent of SEUG fires from 1988 through 2004 occurred between May 1 and September 30.

Fuel characteristics and changes during fire season: The most likely locations in this FMU for fire are areas of more continuous pinyon-juniper such as Cutthroat and Goodman Point. Much of the FMU is too sparsely-vegetated to carry fire. Fuel moistures in most fuels generally decline from spring through July, then level off or begin to increase with summer rains. Grasses typically cure by late June.

Fire regime alteration: Vegetation types and fire regimes in this FMU include:

- Pinyon-juniper, fire regime group III, condition class 2
- Desert shrub, fire regime group III, condition class 2

Control problems and dominant topographic features: Uneven mesa top terrain interrupted by numerous steep, rugged canyons. Vehicle access is possible to some areas via BLM and county roads. Natural features often provide barriers to fire spread.

Values at risk: Cultural resources, natural resources, scenic values, Canyons of the Ancients N.M., adjacent private property at Goodman Point.

Communities at risk: Three residences on nearby private property at Goodman Point.

f. FIRE MANAGEMENT STRATEGIES

Suppression:

- This is a full suppression area. All fires should be confined or contained to 2 acres or less, 90% of the time, under all burning conditions.

- Minimum impact suppression tactics will be used. Natural fuel breaks, wet line or foam line will be used when feasible, rather than line dug or scraped in soil.
- Fires in riparian areas should be fully suppressed within the constraints of fire fighter safety and appropriate management response. Cottonwood, willow, and other native species should especially be protected from fire.
- Contain any fires within one-half mile of the visitor center, maintenance facilities, staff housing, campground, and significant fire-sensitive cultural sites.

Constraints:

- Surface disturbance is to be minimized to protect cultural resources, soil crust and native vegetation.
- A qualified archeologist will be dispatched as soon as possible in order to identify cultural sites prior to fireline construction and other tactics and to recommend alternative line if necessary to avoid impacts. Construction of fireline may proceed if necessary without clearance prior to the arrival of an archeologist or when life or property are in imminent danger.
- Bulldozers and other heavy equipment will only be used if imminent threat to life or property, and will require Superintendent's approval on case by case basis
- Aircraft and retardant will be considered only on a case-by-case basis, when imminent danger to life or property exists, and will require Superintendent's approval.
- Helicopter use should be restricted to a minimum
- All motorized firefighting vehicles will be restricted to existing roadways.
- No springs within the park will be used for water sources, except with approval of the resource advisor on a case by case basis. Otherwise, water sources will be limited to the monument water system or sources outside the park.

Wildland Fire Use:

- Wildland fire will not be used as a resource management tool at this time.

Prescribed Fire:

- Slash piles resulting from mechanical fuel treatment and/or exotic species control, and tumbleweed piles, may be burned. These burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

Non-Fire Fuels Treatments:

- At Goodman Point there has been substantial (30-50 percent) pinyon pine die-off from the Ips beetle infestation. The north boundary fence and surrounding vegetation act as a collection area for tumbleweeds rolling in from adjacent agricultural fields. Both of these problems present a potential for high fire danger will be assessed for possible fuel reduction.

Restoration/Rehabilitation:

- All burned areas will be evaluated by resource specialists to determine whether post-incident rehabilitation, e.g. seeding, is needed to prevent excessive erosion, the invasion of noxious weeds, or to restore a native vegetative community. If the evaluation shows that rehabilitation is necessary, a formal plan will be prepared and implemented in accordance with the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (620 DM3) with supplemental guidance from fire management, and any other applicable sources.

Community Protection/Assistance:

- There is no direct wildland-urban interface surrounding the Utah units or the Horseshoe-Hackberry, Holly or Cutthroat units. The Square Tower Unit is surrounded entirely by BLM land, but three and a half sections of private land lie just one-fourth mile to the southwest.
- There are a few scattered home sites within one to two miles of the Square Tower and Cajon units.
- The area surrounding the Goodman Point unit is predominantly private land with a small portion of the Canyons of the Ancients National Monument (BLM) abutting the east boundary. There are three private residences within one-fourth mile of the boundaries. Two lie across a two lane gravel road while the other is within 200 yards of the west boundary. Firefighting assistance would be available from the nearby communities of Cortez and Pleasant View, Colorado.
- Hazard fuels will be monitored at the boundaries near these wildland-urban interface areas and reduced if necessary.

Prevention:

- A fire prevention/education program is needed for park visitors, as well as for residents of the housing area and possibly of neighboring dwellings.
- Open fire bans will be implemented in conjunction with other state and federal agencies when extreme heat and drought conditions require such restrictions.
- Coordination of early fire detection will be accomplished through the Moab Interagency Fire Center.

3. FIRE MANAGEMENT UNIT: NATURAL BRIDGES NATIONAL MONUMENT

a. PHYSICAL/BIOTIC CHARACTERISTICS

Location: This FMU includes Natural Bridges National Monument, located in the midst of Cedar Mesa, a 500,000 acre pinyon-juniper woodland.

Vegetation Type: The mesa top is dominated by pinyon/juniper woodland intermixed with desert shrubs (mountain mahogany, serviceberry, buffaloberry, rabbitbrush), native grasses, and occasional stands of sagebrush. The canyon bottoms are a riparian community of willow, cottonwood, desert shrubs and native grasses.

Wildlife (non-threatened/endangered species): Mule deer, mountain lion, bear, raptors, various reptiles/amphibians, resident and migratory birds.

Soil Types: Rock outcrops and varying depths of well drained, level to steep, eolian, colluvial, and alluvial soils, on mesas, structural benches, and canyon bottoms. Biological soil crusts (also known as cryptobiotic or cryptogamic) normally cover the undisturbed sandy soil surfaces between vascular plants.

Significant Water Bodies: None.

Topography/Elevation: Mesa top average elevation 6,500 feet. Rugged, moderately rolling terrain traversed by numerous canyons and drainages up to 500 feet deep and up to .25 miles wide.

Air Quality: Class II airshed.

Cultural Resources: Density of archeological sites is very high to highest. Some of the best preserved archaeological sites in the region are within the monument, with especially significant wood resources for dating efforts.

Affected threatened/endangered species: peregrine falcon, Mexican spotted owl, various special concern species including kachina daisy.

Special Designations: The entire monument is listed on National Register of Historic Places. Areas below the canyon rims have been identified as suitable for wilderness. White and Armstrong Canyons have been found suitable for designation into the National Wild and Scenic Rivers system.

Improvements: NPS facilities include a visitor center, maintenance yard/shop, photovoltaic array and outbuilding, sewage lagoons, employee residences, 13-site campground, 11 miles of paved roadway with associated parking areas, overlooks, picnic area and pit toilet.

b. FIRE MANAGEMENT OBJECTIVES

Suppression Objectives: Firefighter and public safety is first priority for all fire management actions. Human safety issues derive from several recreational activities - camping, hiking, and scenic driving within the monument – along with employee safety and protection of NPS buildings and infrastructure, indicating immediate response to contain fire to the smallest area possible. The photovoltaic system at the headquarters area contains materials potentially explosive or otherwise hazardous (hydrogen gas, battery acid) if subjected to fire. Fires are infrequent and tend to be one- or two-tree events of less than one acre. Such fires should be monitored when they occur in isolated fuels and remote areas with natural barriers (rock formations, drainages) providing confinement. Initial attack should occur only in situations that would otherwise endanger people or when conditions encourage rapid or extensive spread of fire. Fire is undesirable in riparian areas as these areas are valuable wildlife habitat and fire seems to favor exotic plants (tamarisk, cheatgrass) over natives. Cottonwood, willow, and other native species should especially be protected from fire.

Fire Use Objectives: Wildland fire use for management purposes is not appropriate for this unit based on the amount of human activity and infrastructure present, and the adverse effect on many native plant species and cultural resources.

Fuels Treatment Objectives: Developed areas will be assessed and mechanically treated if necessary to reduce unsafe concentrations or classes of fuels. In most areas of the FMU the low fuel load does not necessitate fuels reduction. Slash piles resulting from fuel reduction may be burned.

Post-Fire Rehab/Restoration: When necessary, efforts will be undertaken to prevent excessive erosion, invasion of noxious non-native species and damage to cultural sites while encouraging the process of recovery to a natural state.

c. MANAGEMENT CONSIDERATIONS OR CRITERIA AFFECTING OPERATIONAL IMPLEMENTATION

- Prevent impacts to cultural resources

- Prevent impacts to threatened/endangered species
- Minimize impacts to native plant species, particularly cottonwoods.
- Avoid alteration to wilderness characteristics from motorized equipment, ground surface disturbance from construction of firelines or helispots, from vehicle travel off-road or from spike camps.
- Keep roads open to visitor travel
- Slash pile burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

d. HISTORIC ROLE OF FIRE

It does not appear that fire has played a significant role in shaping the ecosystem on the overall Cedar Mesa. The annual average rate of fire occurrence there is high with a disproportionately small amount of acreage burned – an average of 11 fires, totalling 36 acres, per year. There have not been any large fires recorded, although currently the potential does exist due to drought and pinyon pine die-off from insect infestation. This potential is mitigated by the following factors: fragmentation of the terrain by many canyons and drainages which act as natural fire breaks, sizable spacing between trees, and lack of significant understory. Long-term monument-specific fire history information is not available, but within the monument there have only been two fires, each less than one-tenth acre, recorded since 1988.

e. SPECIFICS OF THE WILDLAND FIRE MANAGEMENT SITUATION

Historical weather analysis: The climate is arid with an average annual precipitation of approximately 12.5 inches. Temperature averages: summer highs 90-100, lows 60-70; winter highs 35-45, lows 5-20. The wettest period is July through October, which receives about 45 percent of annual rainfall primarily in the form of localized thunderstorms, dominated by relatively brief, heavy downpours. June is generally the driest month. At 6500 feet in elevation, Natural Bridges receives substantially more snowfall in the winter months than surrounding lower areas, typically two to three storms with accumulations of 6 inches or more.

Fire season: Over 90 percent of SEUG fires from 1988 through 2004 occurred between May 1 and September 30.

Fuel characteristics and changes during fire season: The mesa-top areas, where most of the pinyon-juniper occurs, are the most likely locations in this FMU for fire. Much of the FMU is too sparsely-vegetated to carry fire. Fuel moistures in most fuels generally decline from spring through July, then level off or begin to increase with summer rains. Grasses typically cure by early July.

Fire regime alteration: Vegetation types and fire regimes in this FMU include:

- Pinyon-juniper, fire regime group III, condition class 2
- Desert shrub, fire regime group III, condition class 2
- Riparian, fire regime group III, condition class II

Control problems and dominant topographic features: Uneven mesa top terrain interrupted by numerous steep, rugged canyons. Vehicle access is possible to within one mile of most of the monument

by the paved loop drive or surrounding state highways and county roads. Natural features often provide significant barriers to fire spread.

Values at risk: Natural resources, scenic values, wilderness characteristics, cultural resources, threatened/endangered species, recreational infrastructure, NPS administrative/operational infrastructure.

Communities at risk: Wildland-urban interface within and bordering this unit is minimal, limited to the few administrative facilities and residences at the monument headquarters.

f. FIRE MANAGEMENT STRATEGIES

Suppression:

- This is a full suppression area. All fires should be confined or contained to 2 acres or less, 90% of the time, under all burning conditions.
- Minimum impact suppression tactics will be used. Natural fuel breaks, wet line or foam line will be used when feasible, rather than line dug or scraped in soil.
- Fires in riparian areas should be fully suppressed within the constraints of fire fighter safety and appropriate management response. Cottonwood, willow, and other native species should especially be protected from fire.
- Contain any fires within one-half mile of the visitor center, maintenance facilities, staff housing, photovoltaic system, campground, and significant fire-sensitive cultural sites.

Constraints:

- Surface disturbance is to be minimized to protect cultural resources, soil crust and native vegetation.
- A qualified archeologist will be dispatched as soon as possible in order to identify cultural sites prior to fireline construction and other tactics and to recommend alternative line if necessary to avoid impacts. Construction of fireline may proceed if necessary without clearance prior to the arrival of an archeologist or when life or property are in imminent danger.
- Bulldozers and other heavy equipment will only be used if imminent threat to life or property, and will require Superintendent's approval on case by case basis.
- Aircraft and retardant will be considered only on a case-by-case basis, when imminent danger to life or property exists, and will require Superintendent's approval.
- Helicopter use should be restricted to a minimum.
- In wilderness-suitable lands, use of chainsaws and helicopter landings will be considered to be the minimum requirement necessary for administering these areas as wilderness, under the following conditions:
 - In order to resolve emergencies involving human health and safety.
 - In order to protect key natural or cultural resources:
 - Fire-vulnerable cultural sites as determined by a park archeologist.
 - Important T&E habitat, or mature cottonwoods, as determined by the resource advisor.
 - (The wilderness minimum requirement analysis for these measures is in appendix H.)
- In wilderness-suitable lands, use of chainsaws and/or helicopter landings in situations that do not meet the above conditions, and use of other measures normally prohibited in wilderness (e.g. motorized vehicles off roads), will only be permitted if analyzed and documented through case-by-case minimum requirement analyses and approved by the Superintendent.
- All motorized firefighting vehicles will be restricted to existing roadways.

- No streams or springs within the park will be used for water sources, except with approval of the resource advisor on a case by case basis. Otherwise, water sources will be limited to the monument water system or sources outside the park.

Wildland Fire Use:

- Wildland fire will not be used as a resource management tool at this time.

Prescribed Fire:

- Slash piles resulting from mechanical fuel treatment and exotic plant control may be burned. These burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

Non-Fire Fuels Treatments:

- Hazard fuels will be assessed around developed sites, and mechanical treatments will be conducted if necessary for the purpose of reducing overall hazardous fuel loadings and restoring native plant species.

Restoration/Rehabilitation:

- All burned areas will be evaluated by resource specialists to determine whether post-incident rehabilitation, e.g. seeding, is needed to prevent excessive erosion, the invasion of noxious weeds, or to restore a native vegetative community. If the evaluation shows that rehabilitation is necessary, a formal plan will be prepared and implemented in accordance with the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (620 DM3) with supplemental guidance from fire management, and any other applicable sources.

Community Protection/Assistance:

- None needed. There is no wildland-urban interface adjacent to Natural Bridges N.M. The closest community is Blanding, which is 40 miles away.

Prevention:

- A fire prevention/education program is needed for park visitors, as well as housing area residents.
- Open fire bans will be implemented in conjunction with other state and federal agencies when extreme heat and drought conditions require such restrictions.
- Coordination of early fire detection will be accomplished through the Moab Interagency Fire Center.

4. FIRE MANAGEMENT UNIT: ISLAND IN THE SKY DISTRICT, CANYONLANDS NATIONAL PARK

a. PHYSICAL AND BIOTIC CHARACTERISTICS

Location: This FMU includes most of the Island in the Sky district, except for the Green and Colorado River corridors. The Island is the easiest district to visit in a short period of time, offering many pullouts with spectacular views along the paved scenic drive. Hiking trails and four-wheel-drive roads access backcountry areas for day or overnight trips.

Primary Vegetation Types: Vegetation varies with elevation change and topography, with mesa tops dominated by grasslands in deeper soils and pinyon-juniper in rocky areas. Below the mesa tops, barren areas and sparse desert shrub communities make up much of the FMU, with occasional grasslands on benches and terraces. Exotic cheatgrass has moved into most of the plant communities of the FMU. Grasses are the primary carrier of fire, particularly where cheatgrass is established. Riparian vegetation is found in canyon bottoms and around scattered seeps and springs. These pockets tend to be discontinuous, isolated and small in extent.

Wildlife (non-threatened/endangered species): mule deer, desert bighorn sheep, raptors, lizards, snakes, rabbits, kangaroo rats, coyotes, bobcats and mountain lions.

Predominant Soil Types: Rock outcrop, and very shallow to very deep, well-drained, gently sloping to very steep soils on benches, mesas, cuestas, hillsides, landslides, and escarpments. Biological soil crusts (also known as cryptobiotic or cryptogamic) normally cover the undisturbed sandy soil surfaces between vascular plants.

Significant Water Bodies: None within this FMU, but the Colorado and Green Rivers border it

Topography/Elevation: The FMU is characterized by generally horizontal strata, intricately eroded and dissected, leaving mesas, canyons, cliffs, benches and basins. The district is bounded by the canyons of the Green and Colorado Rivers. Elevation ranges from about 4000 feet along the rivers (a separate FMU) to 6300 feet on the mesa top, with the flat to gently sloping White Rim bench at intermediate elevations.

Air/Quality: Class I airshed.

Cultural Resources: Archeological resources in the Island in the Sky district are largely unknown. The only major study is a 1965-1966 survey completed by Floyd Sharrock of the University of Utah, which concentrated primarily on the Salt Creek drainage in the Needles district. Inventory work completed in 1983 prior to construction of the ISKY entrance road (and limited to the proposed road corridor) indicated that sites are present and probably in moderately dense numbers. Historical sites include cabins, fences, corrals, and trails associated with grazing activities.

Affected Threatened/Endangered Species: Mexican spotted owl (five observed nest sites), bald eagle, southwestern willow flycatcher, peregrine falcon and various other special concern species. Canyonlands is within the designated critical habitat for Mexican spotted owl.

Special Designations: The entire district, except for the road corridors and developed areas, is recommended wilderness.

Improvements: A paved road provides circulation on the mesa top, from the park entrance to Grand View Point and Upheaval Dome. Various developments are located along this road, including a park fee collection station at the park entrance, the district headquarters at Red Sea Flats, with a visitor center, employee housing, and maintenance facility, a frontcountry campground at Willow Flat, and a number of overlooks, trailheads, and picnic areas, each with parking lot. The White Rim Road is an unimproved 100-mile loop road at intermediate to low elevations, accessible by 4-wheel drive vehicles and bicycles, with several backcountry campsites with vault toilets. A few shorter dirt roads connect to one or both of these roads and access side canyons. Numerous hiking trails are scattered through the district. The air quality monitoring station is also maintained near the housing/maintenance area. A map of district developments is found in appendix B.

b. FIRE MANAGEMENT OBJECTIVES

Suppression Objectives: Firefighter and public safety is first priority for all fire management actions. Human safety issues are associated with public and administrative facilities, recreational camping, hiking, mountain biking, and driving/sightseeing along the paved and unpaved roads, indicating immediate response in these areas to contain fire to the smallest area possible. Fires are infrequent and tend to be one- or two-tree events of less than one acre. Such fires should be monitored when they occur in isolated fuels and remote areas with natural barriers (rock formations, drainages) providing confinement. Initial attack should occur only in situations that would otherwise endanger people or when conditions encourage rapid or extensive spread of fire. Fire is undesirable in riparian areas as these areas are valuable wildlife habitat and fire seems to favor exotic plants (tamarisk, cheatgrass) over natives. Cottonwood, willow, and other native species should be protected from fire.

Fire Use Objectives: Wildland fire use is not appropriate in this FMU due to the amount of human activity and to the adverse effect on many native plant species.

Fuels Treatment Objectives: Developed areas will be assessed and mechanically treated if necessary to reduce hazard fuels. In most areas of the FMU the low fuel load does not necessitate fuels reduction. Slash piles resulting from exotic plant (tamarisk) control may be burned.

Post Fire Rehabilitation/Restoration Objectives: Where necessary, rehabilitation/restoration will be done to prevent excessive erosion or the invasion of noxious weeds and to restore a native vegetative community.

c. MANAGEMENT CONSIDERATIONS OR CRITERIA AFFECTING OPERATIONAL IMPLEMENTATION

- No impacts to cultural resources.
- No impacts to threatened/endangered species or habitat.
- Minimize alteration to wilderness characteristics, e.g. motorized equipment, ground surface disturbance from construction of firelines or helispots, from vehicle travel off-road or from spike camps.
- Minimize impacts to native riparian plants, particularly cottonwoods.

- Keep roads open to visitor travel.
- Protect bighorn sheep habitat.
- Slash pile burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

d. HISTORIC ROLE OF FIRE

Vegetation is currently sparse and unlikely to sustain fire for significant distance in most of this FMU, with the possible exception of the grasslands on the mesa top and some side canyons infested by tamarisk. Widespread fire is uncommon and fire history is difficult to document by traditional methods. This FMU currently averages two to three fires per year; nearly all are lightning strikes in pinyon-juniper which do not spread beyond one or two trees. In general grasslands are thought to have naturally burned periodically, but grassland areas in Canyonlands, if uninvaded by exotic cheatgrass, tend to have discontinuous fuels that limit fire spread. Debate exists on whether or not fire plays an important role in affecting or maintaining the ecosystems found in the SEUG. Research into the question will be monitored closely and the Fire Management Plan revised as new information becomes available.

e. SPECIFICS OF THE WILDLAND FIRE MANAGEMENT SITUATION

Historical weather analysis: Climate is arid; average annual precipitation is approximately 9 inches. Thunderstorms, often without precipitation, are common from July through September. The wettest period is July through October, which receives about 45 percent of annual precipitation. June is generally the driest month, but intense rainstorms may occur in any month between spring and fall. Precipitation is dominated by relatively brief, heavy downpours, dropping up to 2 inches of rain in 24 hours. Storms are often very localized, with one watershed receiving a downpour while a neighboring one is virtually dry. Temperatures may reach the mid-80s or higher from mid-May through mid-September.

Fire season: Over 90 percent of SEUG fires from 1988 through 2004 occurred between May 1 and September 30.

Fuel characteristics and changes during fire season: The mesa-top areas, where most of the pinyon-juniper and grassland occurs, and a few side canyon bottoms with dense stands of tamarisk are the most likely locations in this FMU for fire. Much of the FMU is too sparsely-vegetated to carry fire. Fuel moistures generally decline from spring through July, then level off or begin to increase with summer rains. Grasses typically cure by mid-June.

Fire regime alteration: Vegetation types and fire regimes in this FMU include:

- Pinyon-juniper, fire regime group III, condition class 2
- Desert shrub, fire regime group III, condition class 2
- Grassland, fire regime group II, condition classes 2 and 3
- Riparian, including tamarisk, fire regime group II, condition class 3, and native riparian vegetation, fire regime group III, condition class II

Control problems and dominant topographic features: This FMU includes steep rugged canyons with large areas of bare rock and limited motor vehicle access. Much of the main mesa top, where most pinyon-juniper and grasslands in the FMU occur, is accessed by roads. Water is available from the river

for helicopter bucket work. Water for fire protection is stored at the district headquarters area and in engines available for response. Not enough water is stored to fight a large fire. Grassland fires may move rapidly and may be best controlled by stopping fire at the edges of roads or where the vegetation changes to another type.

Values at Risk: Several facilities and recreation sites; important riparian and cultural resources, threatened and endangered species, wilderness characteristics.

Communities at Risk: Wildland-urban interface within and bordering this unit is minimal, limited to a few residences and facilities. Other facilities near the park include Dead Horse Point State Park, unmanned oil/gas facilities, and BLM Campgrounds.

f. FIRE MANAGEMENT STRATEGIES

Suppression:

- Confine or contain all fires, under all burning conditions. Least cost suppression tactics should be used to accomplish this objective. It is expected that most fires would be managed with a confinement strategy using natural fuel breaks.
- Fires that threaten state or BLM land should be suppressed unless appropriate officials determine an alternative fire management action.
- Minimum impact suppression tactics will be used. Natural fuel breaks, wet line or foam line will be used when feasible, rather than line dug or scraped in soil.
- Fires in riparian areas should be fully suppressed within the constraints of fire fighter safety and appropriate management response. Cottonwood, willow, and other native species should especially be protected from fire. Natural barriers may be used to contain fires burning in pure tamarisk stands.
- Contain any fires within one-half mile of the Island in the Sky visitor center, maintenance facilities, staff housing, campground, and significant fire-sensitive cultural sites.

Constraints:

- Surface disturbance is to be minimized to protect cultural resources, soil crust and native vegetation.
- A qualified archeologist will be dispatched as soon as possible in order to identify cultural sites prior to fireline construction and other tactics and to recommend alternative line if necessary to avoid impacts. Construction of fireline may proceed if necessary without clearance prior to the arrival of an archeologist or when life or property are in imminent danger.
- Bulldozers and other heavy equipment will only be used if imminent threat to life or property, and will require Superintendent's approval on case by case basis
- Aircraft and retardant will be considered only on a case-by-case basis, when imminent danger to life or property exists, and will require Superintendent's approval.
- Helicopter use should be restricted to a minimum
- In recommended wilderness, use of motorized equipment (chainsaws, pumps, etc.) and helicopter landings will be considered to be the minimum requirement necessary for administering these areas as wilderness, under the following conditions:
 - In order to resolve emergencies involving human health and safety
 - In order to protect key natural or cultural resources:
 - fire-vulnerable cultural sites as determined by a park archeologist,
 - important T&E habitat, or mature cottonwoods, as determined by the resource advisor
 - (The wilderness minimum requirement analysis for these measures is in appendix H.)

- In recommended wilderness, use of motorized equipment (chainsaws, pumps, etc.) and/or helicopter landings in situations that do not meet the above conditions, and use of other measures normally prohibited in wilderness (e.g. motorized vehicles off roads), will only be permitted if analyzed and documented through case-by-case minimum requirement analyses and approval by the Superintendent.
- Engines will be limited to roads
- No streams or springs within the district will be used for water sources, except with approval of the resource advisor on a case by case basis. Otherwise, water sources will be limited to the Colorado or Green Rivers or outside the park.

Wildland Fire Use:

- None

Prescribed Fire:

- Slash piles resulting from mechanical fuel treatment and/or exotic plant control may be burned. These burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

Non-Fire Fuels Treatments:

- Hazard fuels will be assessed around developed sites, and mechanical treatments will be conducted if necessary for the purpose of reducing overall hazardous fuel loadings and restoring native plant species.

Restoration/Rehabilitation:

- All burned areas will be evaluated by resource specialists to determine whether post-incident rehabilitation, e.g. seeding, is needed to prevent excessive erosion or the invasion of noxious weeds, or to restore a native vegetative community. If the evaluation shows that post-incident rehabilitation is necessary, a rehabilitation plan will be prepared and implemented in accordance with the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (620 DM3), supplemental guidance from fire management direction, and other applicable guidance.

Community Protection/Assistance:

- None needed. There is no wildland-urban interface adjacent to this FMU.

Prevention:

- A fire prevention/education program is needed for park visitors, as well as housing area residents.
- Oil and gas facilities/exploration outside the park are a potential ignition source, and may need a fire prevention/education program.
- Open fire bans will be implemented in conjunction with other State and Federal Agencies when extreme heat and drought conditions require such restrictions.
- Coordination of early fire detection will be accomplished through MIFC.

5. FIRE MANAGEMENT UNIT: MAZE DISTRICT, CANYONLANDS NATIONAL PARK

a. PHYSICAL AND BIOTIC CHARACTERISTICS

Location: This FMU includes the Maze district and detached Horseshoe Canyon unit of Canyonlands National Park, not including the Green and Colorado River corridors. Improvements within the Maze and Horseshoe Canyon unit are minimal, limited to a few four-wheel roads and backcountry campsites. Adjacent to the Maze district is the Orange Cliffs unit of Glen Canyon National Recreation Area, which is not part of this FMU. The district headquarters for the Maze district, with housing and administrative facilities, is located at Hans Flat within GLCA.

Primary Vegetation Types: Mostly scattered desert shrub, some grasses, and occasional pinyon-juniper. Tamarisk, willows and cottonwoods can be found in some of the drainage bottoms. Large areas of bare rock.

Wildlife (non-threatened/endangered species): Small mammals, reptiles, limited populations of mule deer, desert bighorn sheep, coyote, mountain lion, and birds

Predominant Soil Types: Rock outcrop, and well-drained, shallow to very deep, gently sloping to steep soils that formed in residuum and eolian deposits derived from sandstone and shale; on escarpments, mesas, benches, cuerdas, landslides, escarpments, and valley floors. Biological soil crusts (also known as cryptobiotic or cryptogamic) normally cover the undisturbed sandy soil surfaces between vascular plants.

Significant Water Bodies: Limited to springs, seeps and ephemeral drainages. The Green and Colorado Rivers border, but are outside of, the FMU.

Topography/Elevation: Dissected canyon systems, mesas, benches, expanses of exposed bedrock. Elevation ranges from 4000 feet along the Green and Colorado Rivers (a separate FMU) to 6500 feet at the top of Elaterite Butte.

Air Quality: Class I airshed.

Cultural Resources: Horseshoe Canyon has several rock art panels of international significance. Both the Maze proper and the Doll House area also contain significant rock art panels. Other types of sites are also present, with site densities generally low in the uplands but relatively high in primary riparian areas.

Affected Threatened/Endangered species: Mexican spotted owl (five observed nest sites), southwestern willow flycatcher, peregrine falcon and various other special concern species. Canyonlands is within the designated critical habitat for Mexican spotted owl.

Special Designations: Except for road corridors, the Maze district is included in recommended wilderness. Barrier Creek (Horseshoe Canyon) has been identified as eligible for designation into the National Wild and Scenic Rivers system. Horseshoe Canyon and the Harvest Scene Pictograph Panel in the Maze proper have been listed on the National Register of Historic Places. Jasper Canyon, below the jump, is classified as a relict area (un-altered plant community) and entry is permitted only for scientific purposes.

Improvements: There are no major improvements within the Maze district. There are several minimally-developed campsites along four-wheel-drive roads. The district headquarters for the Maze district, with housing and administrative facilities, is located at Hans Flat within GLCA and outside of this FMU.

b. FIRE MANAGEMENT OBJECTIVES

Suppression Objectives: Firefighter and public safety is first priority for all fire management actions. Human safety issues are associated with public and administrative facilities, recreational camping, hiking, and driving/sightseeing along the paved and unpaved roads, indicating immediate response in these areas to contain fire to the smallest area possible. Other objectives include protection of cultural resources, native riparian vegetation and relict plant communities such as Jasper Canyon. Fires are not common in this area and tend to be one- or two-tree events of less than one acre. Such fires should be monitored when they occur in isolated fuels and remote areas with natural barriers (rock formations, drainages) providing confinement. Initial attack should occur only in situations that would otherwise endanger people or when conditions encourage rapid or extensive spread of fire. Fire is undesirable in riparian areas as these areas are valuable wildlife habitat and fire seems to favor exotic plants (tamarisk, cheatgrass) over natives. Cottonwood, willow, and other native species should be protected from fire.

Fire Use Objectives: Wildland fire use is not appropriate in this FMU due to the adverse effect on native plant species.

Fuels Treatment Objectives: The low fuel load in the FMU does not necessitate fuels reduction.

Post Fire Rehabilitation/Restoration Objectives: Where necessary, rehabilitation/restoration will be done to prevent excessive erosion or the invasion of noxious weeds and to restore a native vegetative community.

c. MANAGEMENT CONSIDERATIONS OR CRITERIA AFFECTING OPERATIONAL IMPLEMENTATION

- No impacts to cultural resources.
- No impacts to threatened/endangered species or habitat.
- Minimize alteration to wilderness characteristics, e.g. motorized equipment, ground surface disturbance from construction of firelines or helispots, from vehicle travel off-road or from spike camps.
- Minimize impacts to native riparian plants, particularly cottonwoods.
- Keep roads open to visitor travel.
- Protect bighorn sheep habitat.

d. HISTORIC ROLE OF FIRE

This is a very low fire occurrence area, averaging well under one fire per year. Fires that do occur are generally single pinyon or juniper tree fires, with average acreage burned less than 0.1 acre per fire.

e. SPECIFICS OF THE WILDLAND FIRE MANAGEMENT SITUATION

Historical weather analysis: Climate is arid; average annual precipitation is approximately 8.5 inches. Thunderstorms, often without precipitation, are common from July through September. The wettest period is July through October, which receives about 45 percent of annual precipitation. June is generally the driest month, but intense rainstorms may occur in any month between spring and fall. Precipitation is dominated by relatively brief, heavy downpours, dropping up to 2 inches of rain in 24 hours. Storms are often very localized, with one watershed receiving a downpour while a neighboring one is virtually dry. Temperatures may reach the 90s or higher from mid-May through mid-September.

Fire season: Over 90 percent of SEUG fires from 1988 through 2004 occurred between May 1 and September 30.

Fuel characteristics and changes during fire season: Lightning strikes may ignite pinyon or juniper trees, but these trees are generally too sparsely distributed to carry a fire beyond one or two trees. Fuel moistures generally decline from spring through July, then level off or begin to increase with summer rains. Grasses typically cure by mid-June.

Fire regime alteration: Vegetation types and fire regimes in this FMU include:

- Pinyon-juniper, fire regime group III, condition class 2
- Desert shrub, fire regime group III, condition class 2
- Grassland, fire regime group II, condition classes 2 and 3
- Riparian, including tamarisk, fire regime group II, condition class 3, and native riparian vegetation, fire regime group III, condition class II

Control problems and dominant topographic features: The unit is dominated by steep rugged canyons with large areas of bare rock and limited motor vehicle access.

Values at Risk: Wilderness characteristics, primitive campsites, cultural resources, threatened and endangered species

Communities at Risk: None

f. FIRE MANAGEMENT STRATEGIES

Suppression:

- Confine or contain all fires, under all burning conditions. Least cost suppression tactics should be used to accomplish this objective. It is expected that most fires would be managed with a confinement strategy using natural fuel breaks.
- Minimum impact suppression tactics will be used. Natural fuel breaks, wet line or foam line will be used when feasible, rather than line dug or scraped in soil.

- Fires in riparian areas and Jasper Canyon should be suppressed within the constraints of fire fighter safety and appropriate management response. Cottonwood, willow, and other native species should especially be protected from fire. Natural barriers may be used to contain fires burning in pure tamarisk stands.
- Contain any fires within one-half mile of significant fire-sensitive cultural sites.

Constraints:

- Surface disturbance is to be minimized to protect cultural resources, soil crust and native vegetation.
- A qualified archeologist will be dispatched as soon as possible in order to identify cultural sites prior to fireline construction and other tactics and to recommend alternative line if necessary to avoid impacts. Construction of fireline may proceed if necessary without clearance prior to the arrival of an archeologist or when life or property are in imminent danger.
- Bulldozers and other heavy equipment will only be used if imminent threat to life or property, and will require Superintendent’s approval on case by case basis
- Aircraft and retardant will be considered only on a case-by-case basis, when imminent danger to life or property exists, and will require Superintendent’s approval.
- Helicopter use should be restricted to a minimum
- In recommended wilderness, use of motorized pumps in the Green or Colorado Rivers, use of chainsaws, and/or helicopter landings will be considered to be the minimum requirement necessary for administering these areas as wilderness, under the following conditions:
 - In order to resolve emergencies involving human health and safety
 - In order to protect key natural or cultural resources:
 - fire-vulnerable cultural sites as determined by a park archeologist
 - important T&E habitat, or mature cottonwoods, as determined by the resource advisor
 - (The wilderness minimum requirement analysis for these measures is in appendix H.)
- In recommended wilderness, locations and otherwise-prohibited measures that do not meet the above conditions (e.g. motorized pumps in other locations, motorized vehicles off roads) will only be used if analyzed and documented through case-by-case minimum requirement analyses and approved by the Superintendent
- Engines will be limited to roads
- No streams or springs within the district will be used for water sources, except with approval of the resource advisor on a case by case basis. Otherwise, water sources will be limited to the Colorado or Green Rivers or outside the park.

Wildland Fire Use:

- None

Prescribed Fire:

- None

Non-Fire Fuels Treatments:

- None

Restoration/Rehabilitation:

- All burned areas will be evaluated by resource specialists to determine whether post-incident rehabilitation, e.g. seeding, is needed to prevent excessive erosion or the invasion of noxious weeds, or to restore a native vegetative community. If the evaluation shows that post-incident rehabilitation is necessary, a rehabilitation plan will be prepared and implemented in accordance with the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (620 DM3), supplemental guidance from fire management direction, and other applicable guidance.

Community Protection/Assistance:

- None

Prevention:

- A fire prevention/education program is needed for campers and hikers.

6. FIRE MANAGEMENT UNIT: NEEDLES DISTRICT, CANYONLANDS NATIONAL PARK

a. PHYSICAL AND BIOTIC CHARACTERISTICS

Location: This FMU includes the Needles district in Canyonlands National Park, except for the Colorado River corridor.

Primary Vegetation Type: Vegetation is mostly sparse pinyon-juniper, desert shrub and grasslands, scattered over extensive outcrops of bare rock. Potentially fireprone areas include tamarisk stands in riparian areas, denser sagebrush/saltbush/rabbitbrush communities on alluvial terraces, and grasslands invaded by cheatgrass.

Wildlife (non-threatened/endangered species): mule deer, desert bighorn sheep, raptors, lizards, snakes, rabbits, kangaroo rats, coyotes, bobcats and mountain lions.

Predominant Soil Types: Rock outcrop, and well-drained, shallow to very deep, gently sloping to steep soils that formed in residuum and eolian deposits derived from sandstone and shale; on escarpments, mesas, benches, cuerdas, landslides, escarpments, and valley floors. Biological soil crusts (also known as cryptobiotic or cryptogamic) normally cover the undisturbed sandy soil surfaces between vascular plants.

Significant Water Bodies: Salt Creek is an intermittent stream with perennial springs and pools, which extends across much of the FMU. The Colorado River borders, but is outside of, the FMU.

Topography/Elevation: The Needles FMU is a network of canyons, sandstone fins and spires, interspersed with flat or gently sloping benches, valley bottoms, parks and mesas. Elevation in the district ranges from about 4000 feet along the Colorado River (which is a separate FMU) to nearly 7000 feet in the southern part of the district.

Air Quality: Class I airshed.

Cultural Resources: The Salt Creek Archeological District, listed on the National Register of Historic Places, occupies the southeastern third of the Needles district, extending from the park boundaries about to the visitor center area and Elephant Canyon. The district has the highest density of archeological sites in the park. Other areas within the FMU also have high densities of archeological sites.

Affected Threatened/Endangered Species: The Needles district is particularly important for Mexican spotted owl, with 11 observed nest sites. Canyonlands is within the designated critical habitat for this species. Bald eagle, peregrine falcon, southwestern willow flycatcher, as well as several special concern species, also may occur.

Special Designations: The entire district, except for the road corridors and developed areas, is recommended wilderness. Upper Salt Creek, upstream from about the junction with the Angel Arch side canyon, has been identified as eligible for designation into the National Wild and Scenic Rivers system. Virginia Park is classified as a relict area (un-altered plant community) and entry is permitted only for scientific purposes.

Improvements: The district headquarters facilities, which include a park fee collection station, with a visitor center, employee housing, weather station, ranger station/maintenance facility, and a frontcountry campground, are in the Squaw Flat area. The main entrance road reaches the district from the east, and extends across Squaw Flat and northwest to Big Spring Canyon. Several viewpoints, trailheads and picnic areas are located along this road. Several four-wheel-drive roads extend through much of the district and access backcountry campsites with vault toilets. Scientific research equipment is located in Virginia Park. Numerous hiking trails are scattered through the district. A map of district developments is found in appendix B.

b. FIRE MANAGEMENT OBJECTIVES

Suppression Objectives: Firefighter and public safety is first priority for all fire management actions. Human safety issues are associated with public and administrative facilities, recreational camping, hiking, and driving/sightseeing along the paved and unpaved roads, indicating immediate response in these areas to contain fire to the smallest area possible. Other objectives include protection of cultural resources, native riparian vegetation, and the relict grassland in Virginia Park. Much of the FMU has a high density of archeological sites, but suppression actions have the potential to be more destructive to these sites than a fire itself. Fires are not common in this area and tend to be one- or two-tree events of less than one acre. Such fires should be monitored when they occur in isolated fuels and remote areas with natural barriers (rock formations, drainages) providing confinement. Initial attack should occur only in situations that would otherwise endanger people or when conditions encourage rapid or extensive spread of fire. Fire is undesirable in riparian areas as these areas are valuable wildlife habitat and fire seems to favor exotic plants (tamarisk, cheatgrass) over natives. Cottonwood, willow, and other native species should be protected from fire.

Fire Use Objectives: Wildland fire use is not appropriate in this FMU due to the amount of human activity and to the adverse effect on many native plant species and cultural resources.

Fuels Treatment Objectives: Developed areas will be assessed and mechanically treated if necessary to reduce hazard fuels. In most areas of the FMU the low fuel load does not necessitate fuels reduction. Slash piles resulting from fuel reduction or exotic plant (tamarisk) control may be burned.

Post Fire Rehabilitation/Restoration Objectives: Where necessary, rehabilitation/restoration will be done to prevent excessive erosion or the invasion of noxious weeds and to restore a native vegetative community.

c. MANAGEMENT CONSIDERATIONS OR CRITERIA AFFECTING OPERATIONAL IMPLEMENTATION

- No impacts to cultural resources
- No impacts to threatened/endangered species or habitat
- Minimize impacts to native riparian plants, particularly cottonwoods
- Minimize impacts to soil crusts
- Minimize alteration to wilderness characteristics, e.g. motorized equipment, ground surface disturbance from construction of firelines or helispots, from vehicle travel off-road or from spike camps
- Keep roads open to visitor travel
- Protect bighorn sheep habitat.
- Slash pile burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

d. HISTORIC ROLE OF FIRE

Vegetation is currently sparse and unlikely to carry fire for significant distance in much of this FMU, with the exception of areas invaded by cheatgrass and/or tamarisk and limited areas of somewhat dense sagebrush/saltbush on alluvial terraces. Long-term park-specific fire history information is not available, but this FMU currently averages about two fires per year; most are lightning strikes in pinyon-juniper which do not spread beyond one or two trees. In general grasslands are thought to have naturally burned periodically, but grassland areas in Canyonlands, if uninvaded by exotic cheatgrass, are generally too sparsely distributed to carry fire very far.

e. SPECIFICS OF THE WILDLAND FIRE MANAGEMENT SITUATION

Historical weather analysis: Climate is arid; average annual precipitation is approximately 8.5 inches. Thunderstorms, often without precipitation, are common from July through September. The wettest period is July through October, which receives about 45 percent of annual precipitation. June is generally the driest month, but intense rainstorms may occur in any month between spring and fall. Precipitation is dominated by relatively brief, heavy downpours, dropping up to 2 inches of rain in 24 hours. Storms are often very localized, with one watershed receiving a downpour while a neighboring one is virtually dry. Temperatures may reach the 90s or higher from mid-May through mid-September.

Fire season: Over 90 percent of SEUG fires from 1988 through 2004 occurred between May 1 and September 30.

Fuel characteristics and changes during fire season: Lightning strikes may ignite pinyon or juniper trees, but these trees are generally too sparsely distributed to carry a fire beyond one or two trees. Vegetation potentially susceptible to larger fires (grasslands, tamarisk, pockets of denser pinyon-juniper, sagebrush/saltbush, or other shrubs) is generally in canyon bottoms or open flats. Fuel moistures in most fuels generally decline from spring through July, then level off or begin to increase with summer rains. Grasses typically cure by mid-June.

Fire regime alteration: Vegetation types and fire regimes in this FMU include:

- Pinyon-juniper, fire regime group III, condition class 2
- Desert shrub, fire regime group III, condition class 2
- Grassland, fire regime group II, condition classes 2 and 3
- Riparian, including tamarisk, fire regime group II, condition class 3, and native riparian vegetation, fire regime group III, condition class II

Control problems and dominant topographic features: This FMU includes steep rugged canyons with large areas of bare rock. Most of the district is within two to three miles of at least a four-wheel-drive road. Water is available from the river for helicopter bucket work. A well and water system is located in the Squaw Flat headquarters area, where an engine is also stationed. Grassland fires may move rapidly and may be best controlled by stopping fire at the edges of roads or where the vegetation changes to another type.

Values at Risk: Several facilities and recreation sites; important cultural and riparian resources, threatened and endangered species, wilderness characteristics. Salt Creek supports the most extensive riparian ecosystem, other than the rivers, in the park, and the Salt Creek Archeological District contains the densest collection of prehistoric ruins in the park. Other cultural resource sites abound outside the district. Historic resources related to the mining and ranching eras include cowboy camps, cabins, corrals, and fences.

Communities at Risk: Wildland-urban interface within and bordering this unit is minimal, limited to a few residences and facilities. A privately-operated campground and store on state land, the Needles Outpost, adjoins the park east of the entrance.

f. FIRE MANAGEMENT STRATEGIES

Suppression:

- Confine or contain all fires, under all burning conditions. Least cost suppression tactics should be used to accomplish this objective. It is expected that most fires would be managed with a confinement strategy using natural fuel breaks.
- Fires that threaten state/private or BLM land should be suppressed unless appropriate officials determine an alternative fire management action.
- Minimum impact suppression tactics will be used. Natural fuel breaks, wet line or foam line will be used when feasible, rather than line dug or scraped in soil.
- Fires in riparian areas and Virginia Park should be fully suppressed within the constraints of fire fighter safety and appropriate management response. Cottonwood, willow, native grassland, and

other native species should especially be protected from fire. Natural barriers may be used to contain fires burning in pure tamarisk stands.

- Contain any fires within one-half mile of Squaw Flat visitor center, ranger/maintenance facilities, staff housing, campground, and significant fire-sensitive cultural sites.

Constraints:

- Surface disturbance is to be minimized to protect cultural resources, soil crust and native vegetation.
- A qualified archeologist will be dispatched as soon as possible in order to identify cultural sites prior to fireline construction and other tactics and to recommend alternative line if necessary to avoid impacts. Construction of fireline may proceed if necessary without clearance prior to the arrival of an archeologist or when life or property are in imminent danger.
- Bulldozers and other heavy equipment will only be used if imminent threat to life or property, and will require Superintendent's approval on case by case basis.
- Aircraft and retardant will be considered only on a case-by-case basis, when imminent danger to life or property exists, and will require Superintendent's approval.
- Helicopter use should be restricted to a minimum.
- In recommended wilderness, use of motorized pumps in the Green or Colorado Rivers, use of chainsaws, and/or helicopter landings will be considered to be the minimum requirement necessary for administering these areas as wilderness, under the following conditions:
 - In order to resolve emergencies involving human health and safety
 - In order to protect key natural or cultural resources:
 - fire-vulnerable cultural sites as determined by a park archeologist,
 - important T&E habitat, or mature cottonwoods, as determined by the resource advisor
 - (The wilderness minimum requirement analysis for these measures is in appendix H.)
- In recommended wilderness, locations and otherwise-prohibited measures that do not meet the above conditions (e.g. motorized pumps in other locations, motorized vehicles off roads) will only be used if analyzed and documented through case-by-case minimum requirement analyses and approved by the Superintendent.
- Engines will be limited to roads.
- No streams or springs within the district will be used for water sources, except with approval of the resource advisor on a case by case basis. Otherwise, water sources will be limited to the Colorado or Green Rivers, the district water system, or outside the park.
- No large fire camps will be allowed within the Salt Creek Archeological District. "Coyote camp" locations will be subject to archeological clearance prior to occupation.

Wildland Fire Use:

- None

Prescribed Fire:

- Slash piles resulting from mechanical fuel treatment and exotic plant control may be burned. These burns will require prescribed burn plans and consultation with the Utah Division of Air Quality.

Non-Fire Fuels Treatments:

- Hazard fuels will be assessed around developed sites, and mechanical treatments will be conducted if necessary for the purpose of reducing overall hazardous fuel loadings and restoring native plant species.

Restoration/Rehabilitation:

- All burned areas will be evaluated by resource specialists to determine whether post-incident rehabilitation, e.g. seeding, is needed to prevent excessive erosion or the invasion of noxious weeds, or to restore a native vegetative community. If the evaluation shows that post-incident rehabilitation is necessary, a rehabilitation plan will be prepared and implemented in accordance with the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (620 DM3), supplemental guidance from fire management direction, and other applicable guidance.

Community Protection/Assistance:

- There is minimal wildland-urban interface adjacent to this FMU, limited to the Needles Outpost near the district headquarters. Hazard fuels will be monitored near the boundary and reduced if necessary.

Prevention:

- A fire prevention/education program is needed for park visitors, as well as housing area residents
- Open fire bans will be implemented in conjunction with other state and federal agencies when extreme heat and drought conditions require such restrictions.
- Coordination of early fire detection will be accomplished through the Moab Interagency Fire Center.

7. FIRE MANAGEMENT UNIT: GREEN AND COLORADO RIVER CORRIDORS, ARCHES AND CANYONLANDS NATIONAL PARKS

a. PHYSICAL AND BIOTIC CHARACTERISTICS

Location: This FMU includes the areas along the Green and Colorado Rivers within both Arches and Canyonlands National Parks. (The boundary of Arches follows the Colorado River shoreline, so that the river itself borders the park but is outside of it.)

Primary Vegetation Type: Vegetation is primarily cottonwoods, willows, native grasses and non-native tamarisk with patches of cheatgrass and desert shrub. Tamarisk is the primary carrier of fire.

Wildlife (non-threatened/endangered species): mule deer, desert bighorn sheep, great blue heron, raptors, bird migration corridor

Predominant Soil Types: Rock outcrop, and shallow to deep, well drained, nearly level to moderately steep soils on valley floors, fans, benches, terraces, and cuestas. Above the high water line, biological soil crusts (also known as cryptobiotic or cryptogamic) normally cover the undisturbed sandy soil surfaces between vascular plants.

Significant Water Bodies: Colorado River, Green River.

Topography/Elevation: The rivers flow through large rugged canyons 800 to 1200 feet deep. Average elevation of the river shoreline is 4000 feet.

Air Quality: Both Arches and Canyonlands are Class I airsheds.

Cultural Resources: The river corridors and immediately adjacent side canyons contain an abundance of archeological and historic sites.

Affected Threatened/Endangered Species: southwestern willow flycatcher, Mexican spotted owl, bald eagle, peregrine falcon, four endangered fish species, various special concern species, including river otter.

Special Designations: Land areas in the FMU, except for the upper 15 miles of the eastern Green River shoreline (bordered by the White Rim road) and the Lathrop Canyon road terminus on the Colorado, are recommended wilderness. The river surface in Cataract Canyon is potential wilderness, while the remainder of the river surfaces in Canyonlands are non-wilderness. Both rivers within Canyonlands are identified as eligible for designation into the National Wild and Scenic Rivers system.

Improvements: There are no major improvements in this FMU. There are eight minimally-developed vehicle campsites along the Green River, which are occupied most nights during spring and fall, and a paved boat ramp and parking area on the Colorado in Arches. Highway 128 and several developed BLM campgrounds are across the river from Arches.

b. FIRE MANAGEMENT OBJECTIVES

Suppression Objectives: Firefighter and public safety is first priority for all fire management actions. Human safety issues are associated with recreational camping, river floating, hiking, mountain biking, and driving along the river, indicating full and immediate suppression. Fire is undesirable in riparian areas as these areas are valuable wildlife habitat and fire seems to favor exotic plants (tamarisk, cheatgrass) over natives. Full suppression is to be initiated on most fires. Cottonwood, willow, and other native species should especially be protected from fire.

Fire Use Objectives: Wildland fire use is not appropriate in this FMU due to the amount of human activity and the adverse effect on native plant species.

Prescribed Fire Objectives: Prescribed fire is not appropriate in this FMU due to the amount of human activity and the adverse effect on native plant species. Prescribed fire only for disposal of slash piles may be considered in a future version of the fire management plan, if tamarisk along the rivers is cut for fuel reduction and exotic species control.

Fuels Treatment Objectives: Tamarisk removal along the rivers is not currently feasible because of cost limitations, the magnitude of the infestation, the need for recurring treatment and potential for reinvasion from untreated areas, and the lack of structures at risk. Tamarisk reduction may be considered in future versions of the fire management plan or in an exotic plant management plan.

Post Fire Rehabilitation/Restoration Objectives: Where necessary, rehabilitation/restoration will be done to prevent excessive erosion or the invasion of noxious weeds and to restore a native vegetation community.

c. MANAGEMENT CONSIDERATIONS OR CRITERIA AFFECTING OPERATIONAL IMPLEMENTATION

- No impacts to cultural resources.
- No impacts to threatened/endangered species.
- Minimize impacts to native riparian plants, particularly cottonwoods.
- Minimize alteration to wilderness characteristics, e.g. motorized equipment, ground surface disturbance from construction of firelines, helispots, etc., or from vehicle travel.

d. HISTORIC ROLE OF FIRE

Fire was rare in riparian areas before the invasion of tamarisk. With the spread of tamarisk the river corridor has become susceptible to fire, which often kills native cottonwoods or willows, while tamarisk resprouts after fire. Long-term park-specific fire history information is not available, but average fire occurrence in this FMU is now about one fire, generally human-caused, ranging up to 100 acres, per 1 to 5 years.

e. SPECIFICS OF THE WILDLAND FIRE MANAGEMENT SITUATION

Historical weather analysis: Climate is arid; average annual precipitation is approximately 8.5 inches. Thunderstorms, often without precipitation, are common from July through September. The wettest period is July through October, which receives about 45 percent of annual precipitation. June is generally the driest month, but intense rainstorms may occur in any month between spring and fall. Precipitation is dominated by relatively brief, heavy downpours, dropping up to 2 inches of rain in 24 hours. Storms are often very localized, with one watershed receiving a downpour while a neighboring one is virtually dry. Temperatures may reach the 90s or higher from mid-May through mid-September.

Fire season: Over 90 percent of SEUG fires from 1988 to 2004 occurred between May 1 and September 30.

Fuel characteristics and changes during fire season: The primary fuel in this FMU is tamarisk, which occurs in narrow, dense bands along the shorelines. Fuel moistures in most fuels generally decline from spring through July, then level off or begin to increase with summer rains. Grasses typically cure by mid-June. Most fires in this unit are human-caused.

Fire regime alteration: Much of the river corridors are invaded by tamarisk, fire regime group II, condition class 3. Riparian areas with limited tamarisk are fire regime group III, condition class 2.

Control problems and dominant topographic features: This FMU contains steep rugged canyons with large areas of bare rock and limited motor vehicle access. The fireprone areas are dense tamarisk thickets generally within 200 feet of the river. Highway 128 is across the river from the Arches section, and a road reaches the lower end of this section on the Arches side at the Moab boat ramp. In Canyonlands, the upper 15 miles of the Green River is paralleled by the White Rim road, and roads approach the river

corridor at Shafer Canyon (just outside the park) and Lathrop Canyon. The quickest access to much of this FMU is by boat. Water is readily available. Fires in this type in the past have jumped the river.

Values at Risk: Several recreation sites; important river, riparian and cultural resources, threatened and endangered species, wilderness characteristics.

Communities at Risk: Wildland-urban interface along the NPS portions of this unit is minimal, limited to a few residences and commercial/industrial developments within one-quarter mile of this unit in Arches. The Atlas uranium mill and tailings pile (decommissioned, with remediation planned or underway), on the Colorado River near Arches, would probably require special hazardous/radioactive materials precautions if fire suppression was necessary.

f. FIRE MANAGEMENT STRATEGIES

Suppression:

- This is a full suppression area. Confine or contain all fires at 2 acres or less, 90% of the time, under all burning conditions. Cottonwood, willow, and other native species should especially be protected from fire.
- When fires are burning in pure tamarisk stands, natural barriers could be used to contain the fire.
- Wildland fire should be contained within 1/4 mile of all recreation sites, major fire-sensitive cultural sites, and along highway rights-of-way.
- Minimum impact suppression tactics will be used. Natural fuel breaks, wet line or foam line will be used when feasible, rather than line dug or scraped in soil.
- Fires in riparian areas should be fully suppressed within the constraints of fire fighter safety and appropriate management response.

Constraints:

- Bulldozers and other heavy equipment will only be used if imminent threat to life or property, and will require Superintendent's approval on a case by case basis.
- A qualified archeologist will be dispatched as soon as possible in order to identify cultural sites prior to fireline construction and other tactics and to recommend alternative line if necessary to avoid impacts. Construction of fireline may proceed if necessary without clearance prior to the arrival of an archeologist or when life or property are in imminent danger.
- Surface disturbance is to be minimized to protect cultural sites and native riparian vegetation.
- Aircraft and retardant will be considered only on a case-by-case basis, when imminent danger to life or property exists, and will require Superintendent's approval.
- Helicopter use should be restricted to a minimum and should avoid the river canyons as much as possible.
- In recommended wilderness, use of motorized pumps in the Green or Colorado Rivers, use of chainsaws, and/or helicopter landings will be considered to be the minimum requirement necessary for administering these areas as wilderness, under the following conditions:
 - In order to resolve emergencies involving human health and safety
 - In order to protect key natural or cultural resources:
 - fire-vulnerable cultural sites as determined by a park archeologist
 - important T&E habitat, or mature cottonwoods, as determined by the resource advisor
 - (The wilderness minimum requirement analysis for these measures is in appendix H.)

- In recommended wilderness, locations and otherwise-prohibited measures that do not meet the above conditions (e.g. motorized pumps in other locations, motorized vehicles off roads) will only be used if analyzed and documented through case-by-case minimum requirement analyses and approved by the Superintendent.
- Engines will be limited to roads.

Wildland Fire Use:

- None

Prescribed Fire:

- None

Non-Fire Fuels Treatments:

- None

Restoration/Rehabilitation:

- All burned areas will be evaluated by resource specialists to determine whether post-incident rehabilitation, e.g. seeding, is needed to prevent excessive erosion or the invasion of noxious weeds, or to restore a native vegetative community. If the evaluation shows that post-incident rehabilitation is necessary, a rehabilitation plan will be prepared and implemented in accordance with the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook (620 DM3), supplemental guidance from fire management direction, and other applicable guidance.

Community Protection/Assistance:

- There is minimal wildland-urban interface adjacent to Arches and Canyonlands.
- Residential, commercial, and former industrial lands along the Colorado River downstream from the highway 191 bridge may need assessments, fuel modification, and/or a Community Fire Plan
- Across the river from Arches, fuel modifications have been done near and within recreation sites. On the Arches side, fuel modifications near the Moab boat ramp and several BLM campgrounds may be considered in a future edition of the fire management plan, or in an exotic plant management plan.

Prevention:

- A fire prevention/education program is needed for river floaters, campers and hikers.

IV. WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

A. General Implementation Procedures

Fire management at SEUG units is conducted in cooperation with the Area Fire Management Officer at Mesa Verde National Park. Due to the light fire load, there are no full time fire positions for the SEUG. In the past, the fire management strategy for the SEUG units has been to suppress all fires. Under this new fire management plan, the SEUG and cooperators will continue to suppress all wildland fires, using the concept of “appropriate management response” (AMR). This concept considers firefighter safety, cost effectiveness, threat and potential damage to property and resources, and desired objectives, while maintaining the versatility to respond to varying fire intensities as conditions change. The AMR is an array of possible responses, which in SEUG parks will range from aggressive attack to less aggressive suppression strategies such as confinement. The AMR will be used to curtail the spread of fire and eliminate or reduce all fire threats to identified resources.

Fire management will include program areas such as preparedness (including mitigation, prevention and community education programs, community grant programs and assistance, training, qualifications, readiness, detection and aviation), initial attack, extended attack, and other management considerations.

A Wildland Fire Implementation Plan (WFIP) will be initiated for all wildland fires. The WFIP Stage I Initial Fire Assessment will be the responsibility of the initial attack Incident Commander. This assessment will provide the framework for determining the appropriate management response within the range of suppression-oriented responses. Since the SEUG Fire Management Plan requires suppression of all wildland fires, the requirement for a decision checklist as a part of the Stage I analysis will be considered to be met. The stage I analysis will include identification of the fire management unit(s) (FMU) encompassing a fire. Individual FMU descriptions within this fire management plan include listings of values to be protected, to guide management response. In general, the following values are most likely to be at risk from fire or suppression actions in SEUG units:

- Public and firefighter safety
- Developments, structures and campgrounds
- Cultural resources
- Native riparian vegetation, particularly cottonwood trees
- Wilderness characteristics
- Habitat for threatened and endangered species:
 - Mexican spotted owl (critical habitat/protected activity centers)
 - Southwestern willow flycatcher

B. Wildland Fire Suppression

1. RANGE OF POTENTIAL FIRE BEHAVIOR

Fire behavior varies widely throughout such a large land base as the SEUG. Variation in behavior is related to differences in fuel types, fuel loading, elevation, topography and seasons. Generalizations give a range of behavior by plant community/fuel type and seasons. Two fuel modeling schemes, the National Fire-Danger Rating System (NFDRS) and the Fire Behavior Prediction System (FBPC), are used as general guides to fuel modeling for the SEUG. The models do not fit perfectly with each plant community but can be used along with experience, fire history data and comparisons with similar plant communities in the region to predict fire behavior.

Desert shrub. Fuels in this type are mostly light and discontinuous. Fire behavior would primarily be low intensity. Flashy, fast burning fires could be expected especially on days with high winds, high temperature and low humidities. Most of the desert shrub communities contain areas without vegetation, which can act as natural fuel breaks. Generally, fires will burn quickly and consume all of the fuel in an area, but will be small in size. Suppression of fires in this fuel type can be accomplished by using these natural barriers and using limited suppression tactics. Fire behavior modeling of this fuel type is difficult because it does not fit well with any of the 13 models. The closest models would be one of the grass models such as NFDRS A-Western Annual Grasses, L-Western Perennial grasses, or FBPC #1, 2 or 3 grass models.

Pinyon-Juniper. The makeup of this plant community varies throughout southeast Utah because of variations in elevation, precipitation, soil type and history of disturbance. Lower elevations of this fuel type contain sparse fuels that consist mainly of individual trees and very little ground fuels. Fires are mainly restricted to one or two trees due to the lack of fuel continuity. Higher elevation pinyon-juniper stands have heavier fuel loads and a greater potential for problem fire behavior such as crowning, torching, spotting. FBPC brush models 4 and 6 and NFDRS models G and H are appropriate for this plant community.

Tamarisk. Tamarisk is a non-native plant species that has established itself in riparian areas throughout the western United States including southeast Utah. It is an aggressive invader and responds well to fire by sprouting within days of a fire. Mature tamarisk stands can have high fuel loads along with a natural volatility that causes these fuels to burn hot. Tamarisk stands tend to grow in highly dense patches with understories of thick dead fine fuels. All of these characteristics can make tamarisk fires flashy with high fire intensity. Tamarisk provides the greatest fire suppression challenge for SEUG managers. Brush models similar to chaparral (FBPC fuel model 4) are the best predictors for fire behavior.

Grasslands. Several areas throughout the four units consist of mainly grass cover. Spread is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires are surface fires that move rapidly through the cured grass and associated material. As with desert shrub, appropriate models include NFDRS A-Western Annual Grasses, L-Western Perennial grasses, or FBPC #1, 2 or 3 grass models.

2. PREPAREDNESS ACTIONS

Preparedness refers to annual planning, preparation and coordination activities that lead to a safe, efficient, and cost-effective fire management program in support of land and resource management objectives. Preparedness includes planned activities for the development and implementation of the wildland fire management program. These activities include staffing, training, fire prevention activities, education, provision and maintenance of support facilities, purchase of and contracting for equipment, supplies, support, planning and coordination, policy development and oversight, research, and interagency coordination.

Departmental policy requires that all personnel engaged in wildland fire suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG, *PMS-310-1*). The SEUG will conform strictly to the requirements of the NPS wildland fire management qualification and certification system.

Although SEUG has no specific wildland firefighter positions, employees will be encouraged to become qualified as wildland firefighters in order to support the SEUG's fire management program. The SEUG Fire Coordinator will be responsible for obtaining the training required to meet park needs for qualified wildland firefighters. When advanced or specialized training is necessary, the Fire Coordinator will work through the Area Fire Management Officer to obtain funding and enrollment. The Fire Coordinator will coordinate the Park's fire training needs with those of other nearby parks, cooperating agencies, and the region. SEUG wildland firefighters will attend an annual wildland firefighter safety refresher.

a. Fire Prevention, Education, and Community Assistance

A fire prevention and education program may be implemented in conjunction with other fire management and public safety agencies in Utah as well as part of ongoing interpretive programs to increase awareness of fire prevention, develop understanding of the dangers and benefits of fire, protect human life and property, and prevent damage to cultural resources, real property, and natural resources. Visitor contacts, bulletin board materials, handouts, and interpretive programs may be used to increase visitor and park neighbor understanding. The Mesa Verde Fire Management Office may provide assistance to the park for its fire prevention, education and community assistance programs.

SEUG employees will be provided with information about fire prevention, the wildland/urban interface, the objectives of the fire management program, and the dangers and benefits of prescribed fire and wildland fire. Employees will be kept informed about changes in the fire situation throughout the fire season.

Staff will work with the local fire departments and other agencies with fire management and public safety responsibilities to establish common protocols and procedures, identify training needs, conduct joint training, and develop strategies for safer and more efficient fire management operations.

b. Annual training needs

The major wildland fire training needs are for the annual fire refreshers for all fire fighters and drivers who will be assigned to fires. In addition to this training there are ample opportunities available through the Moab Interagency Fire Center (MIFC) and other sources such as the Utah

Wildland Fire Academy and the Colorado Wildland Fire Academy. Other opportunities for training are available through various federal and state fire management agencies. The main impediment to training is the lack of time and funds to support training, particularly the lack of funding for per diem and travel. Annually, five to ten employees attend the basic fire fighting school (S-130 and S-190) to become qualified as fire fighters. This basic course is generally offered several times in the local area.

The SEUG currently needs to expand competencies in wildland fire fighting to bring staff up to standard on a number of jobs. While there are adequate numbers of fire fighters available to support fire suppression within the park and to support other agencies, there is a deficiency in several supervisory competencies. The SEUG needs to have personnel trained up to the Squad Boss, Incident Commander Type 5 and Incident Commander Type 4 to meet NIFC guidelines for initial attack fires. In addition SEUG needs personnel trained as Engine Operators and Engine Bosses to appropriately man the two SEUG engines. SEUG needs to have adequately trained aviation assets such as Helicopter Crewmembers (HECN) and Helicopter Managers (HCWN). The benefits to having people trained in these functions overlaps into additional safety for emergency medical services and search and rescue activities as well as other projects requiring helicopter use. Lastly the park needs to maintain adequately trained aviation personnel to meet current requirements. Each employee needs the B-3 Helicopter/Airplane Safety course with a refresher every three years. The refresher can be accomplished online. Managers need the M-3 DOI Aviation Management Training for Supervisors. This class requires recurrency every three years and is not available online.

c. Readiness of Fire Equipment and Supplies

Each District Ranger of Canyonlands National Park and each Chief Ranger at Arches National Park and Natural Bridges and Hovenweep National Monuments is responsible for inventory and maintenance of the fire equipment and supplies assigned to their unit. Funding is provided by the Fire Management Program at Mesa Verde National Park which serves as the administrative umbrella for the SEUG fire management program. SEUG coordinates closely with the Moab Interagency Fire Cache for additional supplies and equipment, especially items needed to outfit individual fire fighters.

d. Fire Weather

The Southeast Utah Group does not collect fire weather information directly. Current fire weather information is collected from a series of Remote Automated Weather Stations (RAWS). There are five stations that provide weather information for the four parks in the Southeast Utah Group. These stations are:

RAWS Station	Number	Cover Type	Elevation
Bryson Canyon	422102	(Sagebrush, Pinyon-Juniper)	5,320
Carpenter Ridge	053808	(Ponderosa Pine)	8,088
Big Indian	422711	(Sagebrush, Pinyon-Juniper)	6,960
North Long Point	422710	(Ponderosa Pine, Sagebrush)	8,680
Kane Gulch	422712	(Sagebrush, Pinyon-Juniper)	6,600

The Big Indian RAWS is accessed for the most accurate fire weather data affecting Canyonlands and Arches National Parks. Kane Gulch RAWS provides the best fire weather data for Natural

Bridges and Hovenweep National Monuments. Additionally, spot weather forecasts can be ordered from the Grand Junction Colorado National Weather Service office.

e. Fire Danger (NFDRS)

The Moab Interagency Fire Center is the primary source for development of the fire danger determination through the use of fire danger ratings, inventory and break points. A detailed analysis of the process is available in appendix B of the Southeast Utah Interagency Wildland Fire Annual Operating Plan.

Preparedness activities during the fire season are based on the National Fire Danger Rating System (NFDRS). The NFDRS utilizes the Weather Information Management System (WIMS) to manipulate weather data and forecasts stored in the National Interagency Fire Management Integrated Database (NIFMID) to produce fire danger ratings within a pre-determined Fire Danger Rating Area (FDRA). The system is designed to calculate worst-case scenario fire danger. NFDRS will be used in four ways for the purposes of this plan. The first is to compute an Agency Planning Level (five tiers, 1 – 5), which will help agency personnel determine an appropriate state of readiness of suppression forces. The Dispatch Level (three tiers, low, moderate, high) is a decision tool for dispatchers to use when assigning initial attack resources to new fire starts. The Interagency Preparedness Level (five tiers, 1 – 5) is a derivative of the Agency Planning level and is used by dispatch to determine its staffing levels and for determining the interagency support available for out-of-area fires. The fourth application of NFDRS is to compute the Adjective Fire Danger rating (five tiers, low, moderate, high, very high, extreme) for the purpose of communicating fire danger to public and industrial interests.

The levels for the Southeast Utah Group are based on the Burning Index (BI), five day average for fuel model F. The BI reflects changes in fine fuel moisture content and windspeed. This is the same criterion that MIFC uses for low elevation (less than 7500 feet) Bureau of Land Management and state lands. The average BI value for the Big Indian RAWS ranges from about 30 to 100 between April 1 and October 30. Maximum BI values at the Big Indian station for this period range from 50 to 200, while minimum values range from 0 to 25

In order to define agency planning and dispatch levels, fire business break points are set. A fire business break point is a threshold at which a value of an index such as the Burning Index correlates to a change in historical fire activity. The Fire Family Plus software is used to establish the break points, through a statistical analysis based on historical weather and fire activity.

Agency Planning Level Break Points for the Southeast Utah South Zone Low Elevation Fire Danger Rating Area, which includes the SEUG parks except for the Hovenweep Colorado units, are as follows:

Agency Planning Level	Break Point Ranges (BI)
1	0 – 30
2	31 – 60
3	61 - 120
4	121 – 150
5	151+

f. Step Up Staffing Plan

Fire preparedness levels are established nationally by the National Interagency Fire Center, Boise, Idaho and in the Moab Interagency Zone by the Eastern Great Basin Geographic Coordination Center. These various levels identify the level of wildland fire activity, severity, and resource commitment area-wide. The group Step-Up Plan is linked to both the national and regional levels and identifies actions to be taken by SEUG personnel to ensure that an appropriate level of preparedness is obtained for the existing or potential situation. Step up plans are designed to increase presuppression actions in response to increasing fire danger. Each action in the five planning levels adds progressively to the actions taken in the lower preparedness level. Planning levels and corresponding actions are as follows:

Agency Planning Level 1 (Burning Index 0-30), low fire danger, no lightning activity forecast for the next three days. Park operations normal. No special visitor contacts for fire. Actions:

- Conduct training and other preparedness activities (complete fitness and other training by June 15)
- Monitor fire weather and post fire danger in visitor center.
- Provide current public information.
- Conduct prescribed fires, if approved.

Agency Planning Level 2 (Burning Index 31-60), moderate fire danger, lightning activity level 2 or lower. Park operations normal. No special visitor contacts for fire. Actions:

- All preseason equipment orders secured, fire caches inventoried and deficiencies corrected.
- Monitor fire weather and post fire danger in visitor center.
- Inform staff of any special fire weather advisories.
- Evaluate prescribed fires.
- Provide current public information.
- Complete preparedness activities.

Agency Planning Level 3 (Burning Index 61-120), high fire danger, lightning activity level 3 or lower. Park operations normal. Actions:

- Visitors verbally warned at contact stations and interpretive talks and walks.
- Monitor fire weather and post signs for high fire danger.
- Consider the need for fire restrictions.
- Ensure all NPS engines are prepared and all engine personnel trained on safe operations.
- Inform staff of any special fire weather advisories.
- Conclude existing prescribed fires, no new ignitions.
- Provide current public information.
- Monitor 3 to 5 day forecast.
- Maintain firefighter and individual dispatch availability.

Agency Planning Level 4 (Burning Index 121-150), very high fire danger, lightning activity 3. Park operations normal. Actions:

- Visitors verbally warned at contact stations and interpretive talks and walks.
- Consider the need for fire restrictions.
- Initiate severity funding request.

- Consider and implement ongoing park-specific closures as appropriate.
- Monitor fire weather and post signs for very high fire danger
- Brief staff daily about current fire weather, advisories, and park situation.
- No new ignitions of prescribed fires.
- Provide current public information.
- Monitor 3 to 5 day forecast.
- Superintendent or Acting Superintendent is on call seven days a week.
- Increase patrols of parks.
- Activate preparedness account with Area FMO.

Agency Planning Level 5 (Burning Index 151+), extreme fire danger, lightning activity level 4 or higher. Park operations would continue. Actions:

- Visitors verbally warned at contact stations and interpretive talks and walks.
- Consider further restrictions and closures.
- Consider the need for additional duty hours for personnel to be propositioned for initial attack operations.
- Monitor fire weather and post signs for extreme fire danger
- Brief staff daily about current fire weather, advisories, and park situation.
- Provide current public information.
- Monitor 3 to 5 day forecast.
- Superintendent or Acting Superintendent is on call seven days a week.
- Increase patrols of parks supported by employee overtime work.
- Preposition Incident Commander with a Type 6 engine and staff at parks and districts.
- Consider activation of severity request in coordination with other cooperators.

Additional planning level actions, which are up to the discretion of individual agencies, are listed in the Southeast Utah Interagency Wildland Fire Annual Operating Plan. The SEUG will implement fire related restrictions based on the actions of other public land agencies in the zone (e.g. smoking bans).

Severity Funding. The park may augment its basic initial attack capacity through the use of emergency presuppression funds. The use of these funds is linked to the National Fire Danger Rating System (NFDRS) and the park step-up plan. Emergency presuppression funds may be utilized to accomplish approved step-up plan activities, when the park is in staffing level 4 or 5. Emergency presuppression funding may also be used when there is a forecasted red flag warning or a forecasted lightning activity level of 3 or higher. The use of these funds will comply with the appropriate expenditures outlined in NPS-18, Section IV, Chapter 1. Authorization to open an emergency presuppression account will be obtained from the Intermountain Area Fire Management Office.

A more detailed analysis of staffing levels and presuppression activities can be found in the Southeast Utah Interagency Wildland Fire Annual Operating Plan.

3. PRE-ATTACK INFORMATION

A compilation of essential pre-attack information is available in each ranger office of the four units. This includes management, logistics, operations, and resource information, such as

emergency staff contact numbers, radio frequencies, standard procedures, and resource maps. It comprises information that any staff member would need in the case of a wildland fire. Much of this information is contained in the MIFC Annual Operating Plan, which includes information on all of the interagency partners in the Moab zone. Various pre-attack information is contained in the body of this fire management plan. Other elements are included in appendix B (maps of park facilities, roads and water sources), appendix E (interagency agreements), appendix F (delegation of authority), appendix I (pre-attack information), and appendix W (park closure and evacuation information). Resource information, including maps and/or descriptions for vegetation, cultural resources, threatened/endangered species habitat, sensitive plant populations, and wilderness, is available in the Resource Management and GIS offices of SEUG. Logistics and operations information is available from the SEUG or individual park Maintenance and Visitor/Resource Protection Divisions. An annual update to this set of maps and procedures will be done and copies provided to all NPS stations as well as interagency partners.

4. INITIAL ATTACK

Initial attack is an initial suppression action consistent with firefighter and public safety and the values to be protected. This strategy will be applied as the result of Stage I analysis under the appropriate management response process.

Initial attack forces comprise the first suppression personnel to arrive at a fire plus reinforcements arriving during the first burning period. The most qualified individual on scene will assume command of the incident and identify him/herself as the Incident Commander (IC) to resources on scene, and to Moab Interagency Fire Dispatch (MIFC). This will be communicated over the radio to Dispatch and to the remaining initial attack personnel on scene.

Initial attack resources include hand crews, engines, helicopters, smokejumpers, airtankers, and local cooperator resources. These resources are staffed by participating agencies in the MIFC management area, and dispatched based on proximity, regardless of jurisdiction. Air tankers, smokejumpers, and air attack resources are located at the Grand Junction Air Center and are ordered through MIFC. A type 3 helicopter is based at Moab and is also ordered through MIFC.

Initial attack on wildland fires is the primary responsibility of the on-scene Incident Commander with support from the park staff. The Incident Commander or his/her designee will size up the fire (stage I assessment) and report to the Moab Interagency Dispatch. Size-up will include:

- Fire name
- Location
- Access
- Terrain and fuels
- Size of fire
- Anticipated control problems
- Values threatened
- Cause (if known)
- Weather (winds, humidity, temperature)
- Resources on fire (number and type)
- Resources needed (if any)
- Fire behavior

If a wildland fire is detected and adequate information to complete a stage I assessment cannot be obtained, then a maximum of 24 hours may elapse before the WFSA documentation is completed.

The Incident Commander will relay size-up information, request personnel and equipment as needed, and supervise suppression actions. All park fires will be suppressed using MIST (Minimum Impact Suppression Tactics) and MIMT (Minimum Impact Management Tactics) techniques. The Incident Commander will stay current on weather forecasts and predicted fire behavior, and conduct fire operations until the fire is declared out or until relieved. The Incident Commander is responsible for completion of all fire documents, including a written fire report (Department of Interior DI 1202) submitted within five days after the fire is declared out. All Incident Commanders are responsible directly to the FMO or the Superintendent.

The initial attack crew will establish and protect the point of origin so that an investigation can determine or confirm the cause of the fire. That area should be treated as a crime scene and left undisturbed for future investigation. The crew should note (license number, make, color, etc.) non-emergency vehicles they observe while in route to the fire and give the information to an investigating officer. Evidence indicating arson will be protected and turned over to the investigating officer. The Incident Commander may request a fire investigator on all suspected arson fires.

The cause of ignition for each fire will be reported, using the Wildland fire Cause Determination Handbook (National Wildland fire Coordinating Group) as a guide. The FMO or his/her designee is responsible for wildland fire investigation and law enforcement.

Should the fire complexity increase to a level exceeding the qualifications and capability of the Initial Attack IC, that individual will advise Dispatch via the radio that a more qualified IC is required, and make recommendations for additional resources and overhead positions.

The Incident Commander will keep the adjacent landowners updated on fires which may impact their lands and/or resources. The Superintendent and FMO will be notified whenever there is a possibility of movement of a fire from one jurisdiction to another.

After the fire has been controlled, the Incident Commander or his/her representative will map the fire. Fires will remain staffed until declared controlled or out by the Incident Commander. The IC will determine continued staffing procedures. At a minimum, regular burning period checks will be made until the IC declares the fire out. No fires will be left unattended until the Incident Commander is certain that the fire will not escape existing control lines. The FMO will ensure all controlled fires are checked on subsequent days until the fire is declared out.

Night travel and work will be acceptable practices, except where deemed unsafe because of conditions such as weather, fire behavior, difficult or unfamiliar terrain, or lack of adequate radio contact.

Firefighters will maintain radio contact with MIFC while suppressing fires, and will check in at regular intervals. If the fire is in a location with poor or no radio communications (a "dead spot"), a relay will be set up and maintained while firefighters are in that area. Initial attack will be abandoned when adequate communications cannot be established.

a. Information used to set initial attack priorities

The NPS is responsible for initial attack on fires located inside the parks. Due to the nature of ignitions in the parks of the southeast Utah Group there is rarely more than one fire going on at a time. Therefore there is generally no conflict or competition for resources. In the event of a situation with multiple ignitions burning, resources could be drawn locally from cooperating agencies as needed. Should a situation develop in which numerous lightning strikes occur over a large portion of the lands protected by the Moab Interagency Fire Center, priorities may need to be established and NPS resources would be a part of that activity. Priority setting would involve a dialogue with initial attack forces, Moab dispatch and SEUG managers, based on reviewing firefighter safety, values at risk, fuels terrain etc. Priorities must be based on accurate size-ups given from the field. The importance of this cannot be overemphasized

Information sources for setting initial attack priorities include:

- Locations of park developed areas, campgrounds, and other high visitor-use areas, from park maps
- Other residences, developed areas, or high visitor-use areas near park boundaries, such as the Needles Outpost, campgrounds and buildings near Arches, and residences near Hovenweep
- Cultural resources, including National Register archeological districts, historic districts, and other cultural sites, from staff and Resource Management division information
- Threatened and endangered species information, including critical habitat, protected activity centers (PACs), and suitable habitat, from Resource Management division information
- Riparian areas and water sources, from Resource Management division information and staff
- Key habitat for other species of concern, from the Canyonlands backcountry management plan (bighorn sheep lambing areas) and other Resource Management division information
- Vegetation maps, from Resource Management division
- Wilderness (recommended or suitable), from wilderness recommendations and studies
- Relict areas, from the Canyonlands backcountry management plan (Jasper Canyon and Virginia Park), and Resource Management Division information (research natural areas)

b. Criteria for appropriate initial attack response

- Public and firefighter safety.
- Protection of cultural, historic, and natural resources.
- Protection of improvements and private property.
- Minimum fire-line construction and use of Minimum Impact Suppression Tactics (MIST).
- Available suppression resources and response times.
- Fire behavior as determined by fuels, weather, and topography.
- Availability of natural or existing manmade fuel breaks (rock outcrops, unvegetated areas, roads, etc.)
- Use aircraft and mechanized equipment only where necessary to support above-listed criteria.

c. Confinement as a Strategy

Federal fire policy allows managers to select the most appropriate suppression strategy using the concept of appropriate management response (AMR). In SEUG parks, AMR could range from confinement to more aggressive suppression actions. Firefighter safety will be the primary consideration in this decision. Values at risk, probability of success, consequences of failure, cost, management objectives, public and adjacent landowner concerns are some additional

considerations in selecting the most appropriate strategy. Confinement is a less aggressive strategy that takes advantage of favorable weather, fuel conditions and natural fuel breaks.

Confinement may be implemented as the initial attack action as long as it is not used to meet resource objectives. (Wildland Fire Use is the tool for employing fire for resource benefit.) This strategy will be considered as part of the Minimum Impact Suppression Tactics outlined in this plan.

A confinement action allows a fire to burn to a fuel break. Breaks could include natural barriers or manually and/or mechanically constructed firelines. Using existing fuel breaks could increase fire size, but could provide for firefighter safety, reduce costs and reduce disturbances on the ground from fire suppression activities. This strategy could allow managers to focus firefighting activities on an area of a fire where life, property, and natural or cultural resources are threatened, while allowing other areas to burn out naturally.

Confinement may also be selected through the Wildland Fire Situation Analysis process, when a fire is expected to exceed initial attack capability or planned management capability. When confinement is selected as the initial action, the same management process applies as for wildland fire use decisions. A long-term implementation plan is needed to guide the implementation of the confinement strategy. The wildland fire implementation plan (WFIP), prepared in stages, meets this requirement.

d. Response Times

Response time for initial attack ground resources to SEUG units is approximately 2 hours or less, depending on proximity, accessibility, and other variables.

e. Restrictions and special concerns

Fires will be suppressed as soon as control forces can be dispatched, unless firefighter safety is compromised or a fire is inaccessible and contained by geography or discontinuous fuels. Fires will be suppressed in the most fiscally responsible method possible.

Special consideration will be given to minimize the impact of suppression activities on cultural resources. Control lines will only be constructed as needed: preference will be for the use of topographic barriers, roads and trails. Digging will be kept to a minimum. The SEUG archeologist will be notified and a fireline-qualified archeologist will be on scene to locate line. The use of heavy equipment will be used only as a last resort effort to keep fire from destroying infrastructure or escaping NPS lands. Heavy equipment must be approved by the Superintendent.

On any fire, resource advisors and/or archeologists will be assigned. On any Type I-Type III fire, the objectives in the delegation of authority will provide direction for the Incident Management Team to include the utilization of a lead archeologist in their organization. Furthermore, the utilization of line archeologists assigned to divisions or crews will also be implemented. The line or division archeologist may work directly with hand crews or squads, but will report directly to the division group supervisor. The lead archeologist will be included in regularly scheduled team planning and strategy meetings and participate in the operational briefings. All resource advisors and archeologists that are assigned to the fireline will be Red Card qualified.

Three of the four group parks have lands recommended or suitable for wilderness, which NPS policy requires to be managed as wilderness. These lands are more specifically defined in individual park wilderness reports and maps, but in general, developed areas, 300- to 600-foot-wide road corridors in Arches and Canyonlands, and mesa top areas at Island in the Sky and Natural Bridges are excluded from wilderness. The following actions are generally prohibited in wilderness, except as necessary to meet the minimum requirements for the administration of the area as wilderness (including measures required in emergencies involving human health and safety): temporary roads, motorized vehicles or equipment, aircraft landings, other mechanical transport, structures or installations.

Under the following conditions, use of motorized pumps in the Green or Colorado Rivers, use of chainsaws, and/or helicopter landings will be considered to be the minimum requirement necessary for administering SEUG recommended or suitable wilderness lands as wilderness:

- In order to resolve emergencies involving human health and safety
- In order to protect key natural or cultural resources:
 - fire-vulnerable cultural sites as determined by a park archeologist
 - important T&E habitat, mature cottonwoods, native grasslands/relict areas (e.g. Virginia Park, Jasper Canyon), as determined by a resource advisor

The wilderness minimum requirement analysis for these measures and conditions is found in appendix H. Locations and otherwise-prohibited measures that do not meet these conditions (e.g. motorized pumps in other locations, motorized vehicles off roads) will only be used if analyzed and documented through case-by-case minimum requirement analyses and approved by the Superintendent.

Other actions involving aviation resources will be employed as follows. Aerial reconnaissance could be used to locate and size up fires as needed. Helitack resources could be used when deemed necessary by the duty officer or incident commander. This includes the use of helicopter bucket operations, however, in-park water sources will be limited to the Green and Colorado Rivers. Aerial delivery of retardant will not be permitted unless authorized by the park Superintendent or acting. No retardant will be used in riparian areas. All aviation resources will be ordered through MIFC. Smokejumpers will only be used when authorized by the park Superintendent or acting.

f. Other issues

Because of the small scale of Hovenweep units, fires may cross monument boundaries to or from other jurisdictions. The Hovenweep units extend across two states and are bordered by BLM, Navajo reservation, state, and private lands; fire suppression actions may involve the various federal, tribal, state, or county agencies serving these lands. Fires within HOVE units would be coordinated by the Moab fire center for Utah units and the Durango fire center for Colorado units. Roles and procedures are generally defined by Annual Operating Plans (AOP) for these fire centers. Hovenweep is not currently listed in the Durango fire center AOP, but is addressed under a statewide agreement for all Colorado NPS units; it will be added to the Durango AOP when the annual review/revision next occurs. The Cajon unit is surrounded by the Navajo reservation; fires outside of the unit would be under the jurisdiction of the Navajo Nation and the Bureau of Indian Affairs, and dispatched by the Flagstaff fire center. Fires inside the unit would be handled by the Moab Fire Center.

Jurisdictional issues may also arise at other locations on fires near or crossing SEUG park boundaries. One example would be fires along the Colorado River in or near Arches. A tract of approximately 130 acres along the Colorado River is within the boundary of the park but was granted to Grand County under a recreation and public purpose patent. The park is bordered by the Colorado River, while lands across the river are under the jurisdiction of the Bureau of Land Management or the state of Utah, or privately-owned. Several riverside fires in tamarisk have occurred in recent years, including one that started on the Grand County parcel, within the park boundary, but jumped the river and burned on both sides. Another example is the Needles Outpost, a privately-operated campground, convenience store and restaurant on leased state trust land adjoining the park boundary near the Needles district headquarters. Dispatch for fires in these areas would be handled by the Moab Fire Center, with protection responsibilities under the NPS, the BLM, and/or the county fire wardens and the state.

5. EXTENDED ATTACK AND LARGE FIRE SUPPRESSION

Extended attack occurs when a fire has not been contained or controlled by the initial attack forces and continues either until transition to a higher level incident management team is completed or until the fire has been controlled. In this situation, a higher level Incident Command organization (Types 3, 2 or 1) may be assigned to the incident. A Wildland Fire Situation Analysis (WFSA) will be completed to guide the re-evaluation of suppression strategies, and the Incident Commander will be provided a written delegation of authority from the Superintendent.

When complexity levels exceed initial attack capabilities, the appropriate Incident Command System (ICS) positions should be added commensurate with the complexity of the incident. The Incident Complexity Analysis and the Wildland Fire Situation Analysis assist the manager in determining the appropriate management structure to provide for safe and efficient fire suppression operations. When additional positions are required for management of wildland fires, the FMO or Acting will coordinate orders with the Incident Commander (IC) and MIFC or expanded dispatch. A unified command structure will be a consideration in all multijurisdiction incidents. The Superintendent will approve the WFSA and any revisions.

a. Extended Attack Needs

It is unlikely that an extended attack situation requiring resources above and beyond local management capabilities would occur in SEUG parks. The terrain and fuels present limited complexity and resistance to control. In the event that an overhead team would be dispatched to the area to fight multiple fires (a “complex”), the possibility exists for NPS lands to be included in initial attack responses by the overhead team. An NPS resource advisor would be consulted for any initial attack responses in the park by another agency.

Extended attack needs would be determined by considering the following:

- Threats to life, property, and park resources
- Availability of suppression forces

b. Implementation plan requirements – Wildland Fire Situation Analysis (WFSA) development

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 WFSA by the firefighting agency(s). Procedures and agency policy for the development of the WFSA are found in NPS RM-18.

The WFSA is a decision-making process in which the agency administrator or representative describes the situation, establishes objectives and constraints for the management of the fire, compares multiple strategic wildland fire management alternatives, evaluates the expected effects of the alternatives, selects the preferred alternative, and documents the decision. The format and level of detail required depends on the specific incident and its complexity. The key is to document the decision made. A WFSA will be completed whenever a fire escapes initial attack. The Superintendent, his/her representative, and the FMO or Incident Commander prepare the WFSA and any revisions. The WFSA will prescribe sensitive resource areas and appropriate methods for fighting fire in an SEUG park. 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.

An electronic copy of the WFSA can be found at www.fws.gov/fm/policy/HANDBOOK or at www.fs.fed.us/land/fire/wfsa.htm.

c. Complexity decision process for incident management transition

An Incident Complexity Analysis will be used as a guide for ICs, fire managers, and agency administrators to evaluate emerging fires in order to determine the level of management organization required to meet agency objectives. This will assist in identifying resource, safety, and strategic issues that will require mitigation.

The criteria for transition from initial attack to extended attack are as follows:

- the fire cannot be contained with initial attack resources within 2 operational periods of fire detection
- fire behavior exceeds capability of initial attack resources to contain the fire
- the fire threatens any park or non-park natural or cultural resource for which there may be public interest

The criteria for transition from extended attack to Type 1 or Type 2 incident management are as follows:

- fire behavior exceeds the capability of extended attack resources to contain the fire
- the fire threatens any park or non-park natural or cultural resource for which there may be public interest or concern
- firefighter and public safety has the potential to be significantly compromised.

Incident Complexity Analysis forms are available in the appendices to the *Interagency Standards for Fire and Fire Aviation Operations* (“Red Book”).

As an incident becomes more complex, the need for an incident management team or organization increases. To facilitate the FMO in assembling an efficient and effective organization, key managers should be involved during the early stages of complexity analysis.

The analysis is not a cure-all for the decision process; local fire history, current fire conditions, and management requirements must all be considered.

d. Delegation of Authority for Incident Commander

In the event of a transition to an Incident Management Team, the transfer of authority for wildland fire suppression is accomplished through the execution of a written limited delegation of authority from the Superintendent to the Incident Commander. The procedure facilitates the transition between incident management levels and is a component of the briefing package provided to the incoming incident management team. The Delegation of Authority form is contained in appendix F.

6. EXCEEDING WFIP AND NEW STRATEGY SELECTION

A WFIP has been exceeded when a fire cannot be suppressed during initial attack suppression actions, or when a prescribed fire becomes an escaped fire. When this occurs, a Wildland Fire Situation Analysis must be developed. The WFSA will develop a new strategy by which the fire should be managed.

7. MINIMUM IMPACT SUPPRESSION TACTICS

All fire management activities in SEUG parks will rely on tactics that produce a minimum amount of resource damage while maintaining the safety of firefighters, personnel, and the public as the highest priority. Decisions on suppression actions will be made by the Incident Commander within the scope of the delegation of authority.

There are two major concerns in the Southeast Utah Group in relation to Minimum Impact Suppression Tactics. These are the impact of fireline construction on archeological resources and on cryptobiotic soil crusts. These topics may not be a concern in other areas.

Given the rich archeological resources in the SEUG and the lack of documentation on many of these areas, fireline construction by digging handlines can be extremely damaging to cultural resources. Since these sites are undocumented, they could be damaged and the integrity lost without ever having been recorded. Artifacts could be exposed to the elements, context could be disturbed and artifacts could be exposed and then stolen. As a general rule artifacts survive fires better than they do the control effort.

Cryptobiotic soil crusts are widespread throughout the area and are sensitive to trampling and other disturbance. It is the general policy of park staff to avoid stepping on or walking through areas of undisturbed soil crust whenever possible. Since NPS lands in the SEUG have been recovering from grazing activities and are protected from off highway vehicle use, the crusts are in relatively good condition. Digging and trampling the crusts would be detrimental. Since crusts generally grow in areas with little plant overstory, avoiding crusts in fireline construction would not be generally difficult.

To protect these resources, minimizing ground disturbance will be a general goal. As much as possible, archeological sites and sensitive species will be identified during suppression actions,

protected and/or avoided. Fireline-qualified archeologists will accompany crews to assist in these activities.

Fireline construction will be minimized by taking advantage of natural barriers, rock outcrops, blackline, trails, roads and other existing fuel breaks wherever feasible. Clearing and scraping should be minimized. Fireline establishment using water would be the preferred method and may require the use of helicopters to supply water to the fire. When fireline is constructed it should be the minimum width necessary to contain the fire.

Mop-up should be done in a sensitive manner, employing water wherever possible, but digging should be kept to a minimum. When water is used, it should be applied as a fog spray. Boring and hydraulic action should be avoided. A preferred alternative would be to allow fuels within a containment area to burn out on their own with crews monitoring the fire. Aggressive mop-up would be used only in situations where the fire threatened to spot over the line.

The use of helicopters to support fire operations should avoid the construction of helispots as much as possible. Cargo should be transported with the use of a long line and hardened sites should be used as much as possible. Slickrock or wash bottoms would be best. Areas without trees would be best utilized for landing zones to keep from having to cut any trees. Tree cutting for helispot establishment will not be allowed.

Establishing fire camps should be avoided in the park whenever possible. If fire camps must be established they should be done on already disturbed areas such as maintenance bone yards, campgrounds or other hardened sites. In the backcountry, personnel camped should be kept to a minimum and utilize backcountry campsites wherever possible. "Coyote" camping by small groups would be acceptable.

The use of aerial retardant should be avoided unless there is an imminent threat to human life, property, or infrastructure, or the fire is near the park boundary and threatens to leave NPS lands. Water is preferable to foam or retardant. The use of heavy equipment would have the same constraints, to be used only if imminent threat to human life, property, or infrastructure, or if neighboring lands across the park boundary are threatened. Park water utility systems and the Green or Colorado Rivers may be used as water sources, but use of park springs, seeps, wetlands or other streams will require approval from the resource advisor on a case by case basis. The use of smokejumpers is not generally foreseen but might be used in unusual circumstances, and also would require the Superintendent's approval.

Other tactics include:

- Disturbed ground will be filled in and smoothed.
- Water barring may be necessary on areas prone to erosion.
- Stumps and obvious saw cuts will be camouflaged or flush cut.
- Cut logs or slash will be scattered.
- Camping areas and helispots will be restored.
- Litter, plastic flagging and other unnatural materials will be removed.
- Snags or trees will be felled only when essential for control of the fire or for safety of personnel.
- Limbing along the fireline will be done only as essential for the suppression effort and for safety.
- Under appropriate conditions, unburned material may be left within the final line.
- Cold trail the fire edge when practical.

8. REHABILITATION GUIDELINES

Following the suppression of the fire, all firelines, spike camps, and other disturbed areas will be rehabilitated to return the site to the way it appeared before the incident. The most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression tactics. The Incident Commander will initiate immediate rehabilitation actions. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential damage and hazards caused by the fire.

These actions may include:

- Construct waterbars to prevent erosion.
- Place “boneyards” of cut vegetation in a natural or random arrangement.
- Position cut ends of logs so as to be inconspicuous to visitors and camouflage where possible.
- Flush cut stumps, camouflage with soil and moss.
- Restoration of natural ground contours.
- Remove handline berms.

If re-vegetation or seeding is necessary, only native plant species will be utilized, and the Resource Management Division will be consulted for approval of the species chosen. Rehabilitation efforts should be initiated as soon as they can be safely implemented, which may be before the fire is declared controlled.

If extensive emergency rehabilitation is needed or if rehabilitation is needed to reduce the effects of a wildland fire then the park can request appropriate funding through the Burned Area Emergency Rehabilitation (BAER) fund. The BAER fund is administered through the NPS Branch of Fire and Aviation Management at the National Interagency Fire Center. The specifics of the policy can be found in 620 DM 3 DOI BAER Policy (2001). BAER project requests totaling \$300,000 or less can be approved by the Regional BAER Coordinator. Submissions over this amount are reviewed at the regional level, and forwarded to the Fire Management Program Center for approval. Requests for BAER funding must be made to the Area Fire Management Officer within 72 hours of control of the fire.

9. RECORDS AND REPORTS

The Moab Interagency Fire Center is the central processing center for all SEUG red card data and fire reports (DI-1202). In the spring of each year, personnel completing their annual fire refresher, or basic fire school, and pack test submit this information to MIFC. Additional training and recertification is also sent to MIFC during the spring fire training season. MIFC maintains a permanent hardcopy file for every SEUG employee and updates the permanent file as information is received. This information is input into the national SACS computer which generates the red cards for all individuals. The computer file is also a permanent record of fire fighter training, experience and competencies. Taskbooks are issued through the Mesa Verde National Park Fire Management Officer. Copies of the completed taskbook are kept in the employee’s permanent file at MIFC. At the end of the fire season each employee submits a record of his fire assignments during the fire season and this record is entered into the SACS computer. These records are necessary to ensure that employees have completed training assignments and have received the appropriate credit. The computer also ensures that employees are current in their job classifications and have served in that function as required

C. Wildland Fire Use (WFU)

This option has been rejected by the SEUG for several reasons. The land areas of Natural Bridges and Hovenweep are too small to realistically employ a wildland fire use program. Not enough is known about the natural role of fire in the ecosystems at Arches and Canyonlands to develop a WFU program at this time. Invasive exotic species, particularly tamarisk and cheatgrass, are colonizing significant acreage in group parks, and appear to gain a competitive advantage over native species from fire. There are also no qualified individuals at the SEUG to initiate wildland fire use.

D. Prescribed Fire

1. PLANNING AND DOCUMENTATION

a. Long-Term Prescribed Fire Strategy

Though an extensive program of prescribed fire at SEUG is not considered in this plan, individual burns may be used for disposal of vegetative debris that is infeasible to dispose of by other means. Such debris may include slash piles that accumulate from cutting of hazardous fuels or exotic plants, and tumbleweeds (Russian thistle) that pile up against fence lines or other barriers. The long-term prescribed fire strategy for the group is to burn this debris as necessary to prevent wildfire hazards from developing. These burns would occur in areas surrounded by sand, slickrock, snow, or other surfaces that do not contain wildland fuels.

Non-fire fuel treatment is discussed further in section E below. Purposes of slash pile and debris burning include:

- reduction of hazard fuel loading
- providing a safer environment for people (visitors and staff)
- protection of structures and improvements
- protection of cultural resources
- prevention of larger catastrophic fires

Debris burns would only be conducted during fall, winter or spring months when visitation is lower and weather conditions reduce the chance of the burn exceeding the perimeter of the site. These burns would follow prescription parameters defining safety, resource, and weather conditions for burning. Appropriate burn plans would be developed as necessary.

These burns would occur in limited portions of the fire management units, where slash or other debris has been piled. Piles would be located primarily in the vicinity of:

- park developments such as visitor centers, housing and/or campgrounds
- cultural sites such as the Hovenweep ruins and Wolfe Ranch (Arches)

- riparian areas

Pile burns would occur on sparsely-vegetated or bare ground within or near the following vegetation types.

- pinyon-juniper, fire regime group III, condition class 2
- desert shrub, fire regime group III, condition class 2
- riparian, fire regime group II or III, condition class 2 or 3

b. Annual activities to prepare and implement the program

These activities include scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

Debris burned in a wildland environment (including on snow covered ground) requires a prescribed fire burn plan. Approved burn plans will identify needed resources, individual responsibilities, and timelines. Any material being burned for debris disposal must be classified as permissible to burn under applicable federal, state, tribal, and local regulations.

If a determination is made that a specific slash pile or debris burn is required, that burn will be subject to the requirements of NEPA, the NHPA and other applicable regulations. All prescribed fire operations will adhere to NPS prescribed fire policies and procedures found in RM-18.

c. Personnel Needs

SEUG does not have sufficient personnel trained to manage a prescribed fire program. Personnel needed for a specific burn will be identified in the project's burn plan. The SEUG will participate in a coordinated approach to mutual prescribed fire programs with partners to be determined at the time of the burn.

d. Fire Weather, Effects, and Behavior Monitoring

Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and its ecological effects on park resources while building a historical record. Monitoring measures the parameters common to all fires: fuels, topography, weather, and fire behavior. During prescribed burning, monitoring will include mapping, weather, site and fuel measurements, and direct observation of fire characteristics such as flame length, rate of spread, and fire intensity. Operational monitoring provides a check to insure that the fire remains in prescription, and serves as a basis for evaluation and comparison of management actions in response to measured, changing fire conditions, and changes such as fuel conditions and species composition.

All prescribed fires will be monitored regardless of size. Information on mapping, weather observations and smoke monitoring will be recorded on all burns.

The Fire Coordinator will assure that assigned qualified personnel are used to monitor the behavior of prescribed fires. By being able to assess fire's potential, characterize and quantify its effects, and determine if it is within prescription, an efficient and flexible monitoring program will result.

The SEUG will use the fire monitoring protocols with adaptations described in the NPS *Fire Monitoring Handbook*. Fire monitoring support will be coordinated with the Area Fire Management Officer.

e. Format for critiques of prescribed fire projects

Critiques of prescribed fire (pile burn) projects will use the After Action Review (AAR), as described in the Interagency Standards for Fire and Aviation Operations (“Red Book”):

The AAR is a training tool intended for post-evaluation of an incident or project in order to sustain strengths and improve on weaknesses. It is performed immediately after the event by the personnel involved. The leader of the incident or project should lead this exercise in an informal setting, encouraging input on an assessment of what was planned, what actually happened, why did it happen, and what can be done the next time. This process should not be interpreted as an investigational review.

A form for the AAR can be found in the interagency Incident Response Pocket Guide.

f. Reporting and documentation requirements for accomplishments and escaped fires

The National Fire Plan Operations and Reporting System (NFPORS) is the required interagency system for managing and reporting accomplishments for work conducted under the National Fire Plan. The Hazardous Fuels module of the NFPORS is the national interagency standard for:

- Submitting proposed projects for funding,
- Tracking and managing the program,
- Reporting performance, measuring accomplishments and accountability.

NFPORS has business rules for reporting accomplishments for prescribed fire and hazardous fuel reduction. The fuels management targets and accomplishments to be tracked include acres treated in various categories, changes in fire condition classes, costs, and wildland urban interface (WUI) programs. The Department of Interior also has guidelines for reporting “treated or accomplished” acres under the Hazardous Fuel Reduction Operation subactivity.

NPS RM-18 directs that “all prescribed fire projects must be documented on a DI-1202, Individual Fire Report. The completed report must be input to the Shared Applications Computer System’s (SACS) fire reporting program within 10 working days after a fire has been declared out.” Required information and a post project evaluation form can be found in RM-18.

The Interagency Standards for Fire and Aviation Operations (“Red Book”) directs that

Escaped prescribed fires will receive an administrative review. The level and scope of the review will be determined by the injuries, damage, and cost associated with the escape.

A prescribed fire that escapes and requires an expenditure of suppression funds or results in property damage, injuries, or fatalities will be investigated.

NPS prescribed fire review direction is found in RM-18, chapters 10 and 13. NPS guidelines for investigations are described in RM-18, chapter 3.

Topics addressed in an escaped prescribed fire review can be found in the Red Book, chapter 19.

g. Past fuel treatment activities that effect planned actions

Slash from fuel treatment or exotic plant removal has been piled in Salt Creek and Horse Canyon in Canyonlands, and in Courthouse Wash and the Wolfe Ranch area in Arches. Maps of these locations are available from the SEUG Resource Management division.

h. Local prescribed fire burn plan requirements

Park prescribed fire burn plans will identify preplanned requirements (prescriptions) for initiating and continuing prescribed burn ignitions and operations. These prescriptions include:

- Maximum Manageable Area (MMA) for the fire
- Minimum number of fire crew
 - Specific skill certification requirements for the fire crew
 - Other fire-related staff requirements
 - Range of possible ignition dates
 - Pre-ignition site preparation requirements
 - Equipment needed on-site
 - Fuel model(s) used
- Acceptable temperature, humidity, wind direction, wind speed, and fuel moisture ranges
- Predicted fire behavior

2. EXCEEDING PRESCRIBED FIRE BURN PLAN

If a prescribed fire escapes the burn unit and immediate efforts at control are not successful, it will be declared a wildland fire and suppressed. A Wildland Fire Situation Analysis (WFSA) will be completed and additional personnel and resources ordered as determined by the Incident Commander. If the fire continues to burn out of control, additional resources will be called from the local and volunteer fire departments. An incident management team or other non-local resources may be requested to assume command of the fire.

3. AIR QUALITY AND SMOKE MANAGEMENT

a. Air Quality Issues

All prescribed fires will be conducted in accordance with all federal and state laws. Burns will be coordinated with and permitted through the Utah Interagency Smoke Management Program. It may be necessary to aggressively control fires when smoke affects a sensitive area or creates a significant public response. All fire activities may have to be curtailed when an extended inversion or air pollution episode is in effect. Traffic control measures will be undertaken in conjunction with local law enforcement agencies when such episodes occur. Complaints regarding smoke will be documented and communicated to the Superintendent.

b. Smoke Mitigation

All prescribed fires will be conducted in accordance with all federal and state laws. Burns will be coordinated with and permitted through the Utah Interagency Smoke Management Program. Arches and Canyonlands are Class I airsheds, while Hovenweep and Natural Bridges are Class II airsheds. The town of Moab is the closest community to any SEUG unit, thus is the most likely smoke-sensitive area. Most SEUG areas are remote from populated areas.

Various methods can be used to mitigate smoke impacts. Using favorable winds is a common method of keeping smoke away from sensitive areas. Timing of burns is also important. Burning during the warmer times of the day can help loft the smoke up and away from developed areas and roads. Ignitions can be shut down several hours before evening to avoid filling low areas with smoke during evening inversions.

E. Non-fire Fuel Treatment Applications: Mechanical Treatment

Hazard fuels at SEUG parks are primarily woody/shrubby vegetation. Fuels around buildings, boundaries, roads, trails, cultural sites, camp and picnic areas, and other sites occasionally accumulate sufficient density to create a hazard to real property, cultural resources, or human health and safety. SEUG parks will remove hazardous fuels as necessary to maintain defensible space around developed areas and some cultural resource sites. These fuels will generally be cut with chainsaws or hand tools and piled by hand for later burning.

Individual fuels management planning will be done for each SEUG unit. Differences in fuel types, terrain and acreage may necessitate that areas be handled differently. Priorities will be the protection of structures, developed areas and heavily visited areas. Other fuel management goals include protection of cultural and historic resources, protection of sensitive resources and unique features, and other biological goals.

1. ANNUAL ACTIVITIES TO PREPARE FOR AND IMPLEMENT THE PROGRAM

Annual activities may include:

- Surveys for threatened and endangered species, particularly Southwestern Willow Flycatcher, in riparian areas to be treated
- Cultural resource surveys may be needed for areas to be treated
- Budget requests
- Determine annual priorities and tentative schedule. Coordinate with park Superintendent and staff.
- Make arrangements for workers/crews

2. EQUIPMENT AND SEASONAL USE RESTRICTIONS (weather, species sensitivity, etc)

- Hazardous fuels treatment will be limited to non-wilderness areas
- Riparian areas and canyons may be threatened or endangered species habitat (southwestern willow flycatcher, Mexican spotted owl). Species surveys may need to be conducted, and work may need to occur outside nesting seasons (CANY, ARCH, NABR).
- Equipment would be limited to hand tools and hand-operated power tools
- Work in certain locations may need to be scheduled to avoid high-visitation periods

3. EFFECTS MONITORING REQUIRED

Monitoring will be conducted to determine whether management objectives were met. Procedures may include photo plots, vegetation transects, and/or visual assessments. Objectives for monitoring will defined in a monitoring plan.

Prior to fuel reduction activities, various environmental baseline parameters may be monitored, such as

- Fuel Conditions (fuel type, fuel load, plant phenology)
- Concerns and Values to be Protected
- Other Biological, Geographical or Sociological Data

Numbers of acres treated, cost, and changes in fire condition class will also be monitored.

Monitoring may also be conducted for short-term and long-term change (e.g. fuel reduction and vegetative change). This monitoring will be supplemented by additional ongoing monitoring of various resource categories conducted by the SEUG long-term monitoring program and through the Northern Colorado Plateau Inventory and Monitoring Network.

4. FORMAT FOR CRITIQUES OF TREATMENT PROJECTS

Topics to be considered in fuel treatment project critiques include short and long-term monitoring data, accomplishment of objectives, methodology, cost effectiveness, safety issues, and resource damage. Written project completion reports incorporating critique findings will be prepared and forwarded to the Area Fire Management Officer. Revision of project objectives and adjustments to the program will be considered when need is indicated by critiques or evaluations.

5. COST ACCOUNTING

The Wildland Fire Management appropriation provides funding for hazard fuels reduction. FIREPRO funding requests for individual projects, and documentation of individual project costs, are submitted to the Area Fire Management Officer.

Fuels management projects will be entered, approved, and funded using FIREPRO within the Shared Applications Computer System (SACS). Costs will be identified and tracked for each project by phase and activity.

The Hazardous Fuels module of the National Fire Plan Operations and Reporting System (NFPORS) is the national interagency standard for:

- Submitting proposed projects for funding,
- Tracking and managing the program,
- Reporting performance, measuring accomplishments and accountability.

Regional fire management officers or prescribed fire specialists have the authority to approve funding amounts for hazard fuels projects, and to update changes in approved funding in the SACS. Parks should receive prior approval from the regional or support fire office to conduct unfunded projects or to obligate funds greater than approved project amounts. Overhead support costs must be approved at the national level. Although there will be no overall ceiling to the amounts of funds that regions may approve annually, individual projects over \$250,000, or project overhead over \$75,000, must be approved by the Fire Management Program Center.

Within the lifespan of the SEUG fire management plan a new budgeting process will be initiated. Fire Program Analysis is an interagency fire planning process that will be put in place for Southeast Utah for 2007. At that time budgets will be developed through this process.

6. REPORTING AND DOCUMENTATION REQUIREMENTS

NPS RM-18 directs that all hazard fuel projects will be documented with the following information and stored in an individual project folder and maintained in the park's files. Individual parks may require additional information.

- Original Signed Project Plan
- All Maps
- Notification Checklist
- Permits
- Monitoring data
- Unit logs or other unit leader documentation
- Contracts

Parks are responsible for preparing a final report on each project. Information will include a narrative of the project operation, a determination of whether objectives were met, map of the area, photographs of the site, number of work hours, and final cost of the project. Acres treated for hazard fuel reduction (thinning and/or clearing) are documented on a DI-1202 report.

The National Fire Plan Operations and Reporting System (NFPORS) is the required interagency system for managing and reporting accomplishments for work conducted under the National Fire Plan. NFPORS has business rules for reporting accomplishments for prescribed fire and hazardous fuel reduction. The fuels management targets and accomplishments to be tracked include acres treated in various categories, changes in fire condition classes, costs, and wildland urban interface (WUI) programs. The Department of Interior also has guidelines for reporting "treated or accomplished" acres under the Hazardous Fuel Reduction Operation subactivity.

7. PLANNED PROJECT LIST

The following sites will be assessed for hazard fuels, and treated if necessary, to maintain defensible space around developed areas and to protect cultural resources. Site-specific planning and environmental analysis will be completed before fuels are cut.

- Hovenweep: The headquarters area will be assessed and treated if necessary. Dead or dying pinyon trees and tumbleweed piles at other units may also need to be treated.
- Natural Bridges: The developed areas have been treated, but need to be assessed to determine whether additional fuel reduction is needed
- Developed areas at ISKY and Needles

F. Emergency Rehabilitation and Restoration

On January 19, 2001, the Department of the Interior issued new policy on burned area emergency stabilization and rehabilitation. The specifics of the policy can be found in 620 DM 3 DOI BAER Policy (2001). The SEUG Fire Coordinator and Biologist, subject to review by the Group Fire Committee, will jointly formulate a rehabilitation plan for each fire. The BAER plan will be submitted to the Regional BAER Coordinator (Regional Prescribed Fire Specialist) through the Area Fire Management Officer for approval within 72 hours of the date the fire is declared controlled. BAER project requests totaling \$300,000 or less can be approved by the Regional Baer Coordinator. Submissions over this amount are reviewed at the regional level and forwarded to the NPS Fire Management Program Center for approval.

V. ORGANIZATIONAL AND BUDGETARY PARAMETERS

A. ORGANIZATIONAL STRUCTURE OF THE FIRE MANAGEMENT PROGRAM

This section discusses areas of responsibility for implementation of the fire management program by specific NPS positions. The purpose of this section is to clearly define areas of responsibility, provide clear direction and accountability, and further the development of a responsive fire management program.

1. Superintendents

The Group Superintendent has overall authority over Canyonlands and the other three parks of the group. Arches is supervised by its own Superintendent, and another Superintendent supervises both Hovenweep and Natural Bridges. Individual Superintendents are responsible for fire management at their parks, with technical duties and accompanying responsibilities delegated to staff members. Superintendents will be responsible for management of the program within Departmental and National Park Service policy and all relevant laws and regulations.

- a. Ensure that a comprehensive fire management program is adequately planned, staffed, implemented, and that the Fire Management Plan is reviewed annually and revised as necessary.
- b. Maintain and facilitate public and media relations pertaining to both suppression and prescribed fire.
- c. Approve prescribed fire plans.
- d. Authorizing official for certain special tactics, on case-by-case basis, as listed in the plan (aerial delivery of retardant, smokejumpers, heavy equipment).

2. Acting Superintendent

Is delegated all decision making responsibility when the Superintendent is absent from the park or otherwise not available.

3. Chief, Resource Management

- a. Coordinates fire research efforts, and serves as the primary resource advisor for project fires or prescribed fires.
- b. Serves as a member of the Fire Management Committee.
- c. Develops natural resource objectives for prescribed fire.
- d. Fire Management Officer's point of contact for planning and implementation of slash pile burns and mechanical fuel reduction.

- e. Oversees fire management planning.

4. CANY Chief Ranger/Wildland Fire Coordinator

The CANY Chief Ranger serves as the coordinator for the group wildland fire program and supervises the group fire duty officer.

- a. Responsible for implementation and execution of all aspects of the group fire management program except research.
- b. Responsible for overall coordination, direction, and supervision of wildland fire prevention, preparedness, and suppression and coordinates all wildland fire emergencies.
- c. Briefs the Superintendent on current and planned fire management activity.
- d. Reviews and recommends approval of the Fire Management Plan to the Superintendent.
- e. Serves as chair of the Fire Management Committee. Presents approved committee recommendations to the Superintendent.
- f. Responsible for overseeing all group fire management program activities. Reviews and administers the Fire Management Plan. Reviews the plan annually and recommends any necessary changes.
- g. Responsible for submission of fire situation reports to NPS Branch of Fire Management through the Area Fire Management Officer.
- h. Ensures that a briefing statement, delegation of authority, and Wildfire Situation Analysis (WFSA) approved by the Superintendent, are prepared for incoming Incident Management Teams.
- i. Prepares, reviews, and revises cooperative agreements with interagency cooperators. Maintains liaison with interagency cooperators through annual meetings to review agreements.
- j. For Canyonlands, responsible for completion of all fire reports (DI-1202s), and coordinates the timely entry of reports into the NPS Fire Management Computer System through the Area Fire Management Officer within 10 days of a fire.

5. CANY/Group Fire Duty Officer

- a. Responsible for initial attack and implementation of appropriate suppression response for Canyonlands, as recommended by the Fire Management Committee.
- b. Responsible for overseeing safe suppression of all wildland fires, demobilizations, and coordination of rehabilitation of the burned area with the Fire Management Committee.
- c. Responsible for providing fire-training opportunities to park personnel to maintain predetermined fire qualification skills in critical positions. Reviews, updates, and maintains fire training and fire experience records. Submits updated records to the Area Fire Management Officer.
- d. Ensures adequate inventory of equipment and supplies to efficiently implement the fire management program.

- e. Coordinates dispatch of park personnel for in-park fire assignments and to provide assistance to other Parks and agencies. Requisitions fire crews, or fire resources and supplies for use within the Park.
- f. Maintains technical references, maps, and aerial photos for the fire program.
- g. Responsible for completing the prevention analysis to determine the level and type of prevention effort required by Canyonlands. Ensures implementation of the approved group fire prevention program.

6. Individual Park Chief Rangers/Fire Coordinators

- a. Responsible for initial attack and implementation of appropriate suppression response for their parks, as recommended by the Fire Management Committee.
- b. Responsible for overseeing safe suppression of all wildland fires, demobilizations, and coordination of rehabilitation of the burned area with the Fire Management Committee.
- c. Ensures adequate inventory of equipment and supplies to efficiently implement the fire management program.
- d. Coordinates dispatch of Park personnel for in-park fire assignments and to provide assistance to other parks and agencies. Requisitions fire crews, or fire resources and supplies for use within the Park.
- e. Maintains technical references, maps, and aerial photos for the fire program.
- f. Responsible for completion of all fire reports (DI-1202s), and coordinate the timely entry of reports into the NPS Fire Management Computer System through the Area Fire Management Officer within 10 days of a fire.
- g. Responsible for completing the prevention analysis to determine the level and type of prevention effort required by the park.

7. Area Fire Management Officer

- a. The Area Fire Management Officer is the FIREPRO funded Fire Management Officer (FMO) for Mesa Verde National Park. The Area FMO provides the first level of technical assistance to the group for all fire management planning and implementation activities. This includes assistance for managing the use of fire management programs such as the National Fire Danger Rating System, the Weather Information Management System (WIMS), the NPS Wildland Fire Computer System (SACS), the resource ordering system (ROSS), the Incident Qualification and Certification System (IQCS), Fire Program Analysis (FPA), FIREPRO budgeting, etc.
- b. The Area FMO assists with the group's wildland fire qualification and certification program, fire monitoring, fire training and mobilizations, development of preparedness, suppression, wildland/urban interface, fuels management and prescribed fire operational plans, development of cooperative agreements with local and state agencies, and administration of Rural Fire Assistance Program grants to local fire departments.
- c. Group requests for assistance from the Area FMO will be coordinated through the Group Fire Coordinator. Requests should be made as far in advance as is practical.

- d. The Area FMO will assist the group in acquiring needed resources and equipment, and in preparing FIREPRO funding requests.
- e. Coordinates the development of specific prescribed fire plans and execution of approved prescribed fires in accordance with RM-18. Submits each prescribed fire plan to the park Superintendent for approval.
- f. The Area FMO may be requested to serve on an incident management team as an agency representative regarding fire management operations.
- g. The Southeast Utah Group has an inter-park agreement with Mesa Verde National Park to provide assistance with fire management operations through the Area FMO. A copy of the agreement is located at the SEUG headquarters office as well as Mesa Verde.

8. Moab Interagency Fire Center Manager

The Fire Center Manager has delegated authority to act on behalf of the four SEUG parks for the following responsibilities:

- a. Order and dispatch fire and aviation resources, in response to requests by Incident Commanders or in accordance with priorities set by the Moab BLM Fire Management Officer or acting, or as set by the Moab Interagency Fire Center Multi-Agency Coordinaton Group, in response to current and anticipated fire conditions.
- b. Provide day-to-day guidance and supervision to the Fire Center dispatch staff to ensure safe, efficient, and cost-effective incident logistical support and dispatching services.
- c. Coordinate requests for incident intelligence.
- d. Review and approve aviation use records (OAS-23).
- e. Approve fire program requests for leave and premium pay for Fire Center personnel.
- f. Hire Emergency Firefighters in accordance with Department of Interior Pay Plan for Emergency Workers.

9. Regional Fire Management Officer

The Regional Fire Management Officer (Regional FMO) has delegated authority for the management of the region's fire management program. The Regional FMO is responsible for planning, training, technical assistance, budget prioritization, coordination, and interagency issues for units of the National Park Service in the Intermountain Region. The Regional FMO assures that the regional fire management program is conducted accordance to established policy and procedures and that FIREPRO funds are used appropriately.

The Regional FMO represents the parks in the region to the NPS Fire Management Program Center, the Eastern Great Basin Coordination Center, and other regional and national fire management organizations.

10. Regional Fire Ecologist

The Regional Fire Ecologist provides technical assistance on fire ecology, prescribed fire and fuels treatment matters.

11. NPS Fire Management Program Center

The NPS Fire Management Program Center (FMPC) is located in Boise, Idaho and provides national leadership, direction, coordination and support for NPS fire, aviation and incident management. The primary purposes of the FMPC are:

- Achieving national mandates for firefighter, NPS employee and visitor safety.
- Protecting natural and cultural resources.
- Maximizing partnerships with federal, state, local and tribal entities, in order to achieve the greatest benefit for park resources.
- Achieving and maintaining the highest standard of professionalism, using state-of-art concepts, technologies and practices.

B. FIREPRO FUNDING

The annual wildland fire management appropriation provides FIREPRO funding for necessary expenses for fire planning and oversight functions, along with budgeted activities necessary to prepare for the normal fire season, and for the development and implementation of the wildland fire emergency suppression, emergency rehabilitation, and hazard fuels reduction program.

The SEUG parks are not base-funded FIREPRO parks and do not have FIREPRO funded positions. FIREPRO funding may be available for approved fire training, prevention, preparedness, suppression, prescribed fire, wildland/urban interface, fuels treatment, and burned area emergency stabilization and rehabilitation projects. Related equipment, personal protective equipment and supplies may be acquired with FIREPRO funding. Financial grants may be provided to qualifying local fire departments through the Rural Fire Assistance Grant Program (RFA). All FIREPRO funding requests are made through the Area Fire Management Officer.

C. FIRE MANAGEMENT ORGANIZATION

The Fire Management Committee will comprise the, the group Wildland Fire Program Manager/CANY Chief Ranger, the group Fire Duty Officer, the group and park Fire Coordinators, the group Chief of Resource Management, the group Biologist, the group Planner/Wilderness Coordinator, the group Facility Manager, the CANY Chief of Interpretation/Public Information Officer, the group Cultural Resource Manager, and the group Human Resource Officer. The CANY Chief Ranger will chair the Committee, and the Area Fire Management Officer may participate periodically. The Committee may request technical expertise from other individuals at any time. Each committee member will designate an alternate to serve in the event that the normal representative is unavailable.

In an effort to coordinate the group's fire management program with those of other nearby Colorado Plateau parks, representatives of the Area Fire Management Officer, the Fire Management Committee,

and those parks may meet to organize equipment and personnel needs relating to fire programs at each park.

The Fire Management Committee will convene at the request of the Group Fire Program Manager, Superintendents, or committee members. The primary purpose of the committee is to coordinate preparedness, suppression, and prescribed fire activities between the parks and divisions of the group, and between the group and cooperating agencies.

The committee may be convened during periods of elevated fire danger to coordinate preparedness activities. The committee will also be convened at other times to coordinate the group's prevention, suppression, wildland/urban interface, prescribed fire, and fuels treatment activities. As mentioned above, the committee will coordinate equipment and personnel needs with those of other nearby parks.

D. WILDLAND FIRE USE CERTIFICATION

The group has rejected the strategy of wildland fire use. This option was rejected due to the limited land area of Hovenweep and Natural Bridges, the lack of park-specific understanding on the natural role of fire in group parks, the presence of invasive exotic plant species which gain a competitive advantage over native plants from fire, and the lack of available qualified personnel required to manage these fires.

E. INTERAGENCY COORDINATION

The four parks of the Southeast Utah Group are under a group Superintendent and share various resources, including maintenance, resource management and administration. Through an interpark agreement, the Mesa Verde National Park Fire Management Officer serves as FMO and provides fire management support for the SEUG parks, as well as for seven other parks in the Four Corners area.. The Area FMO coordinates fire management needs between the SEUG parks, the Intermountain Region Fire Management Office, and the Eastern Great Basin Interagency Coordination Center.

Interagency cooperation is vital to the full realization of NPS fire management program objectives. The SEUG Utah units cooperate and share resources with other federal and state fire management agencies through the Southeast Utah Interagency Wildland Fire Annual Operating Plan (AOP). The Moab Interagency Fire Center coordinates mobilization and dispatch of fire resources (staff, equipment, and supplies), through procedures described in the AOP. The Fire Center is overseen by an oversight committee and a coordinating group, each with representation from the cooperating agencies. The Fire Center maintains inventories of available fire resources. The AOP is updated annually. Mobilization and dispatch for the Hovenweep Colorado units is coordinated by the Durango Interagency Dispatch Center, through the state of Colorado Interagency Fire Management Agreement. The Hovenweep Colorado units will be added to the AOP for the Durango Dispatch Center when the next annual review and update occurs. Arches also has a cooperative agreement for structural fire protection with the Moab Valley Fire Protection District.

The National Park Service is a member of the Interagency Cooperative Fire Agreement and the National Wildfire Coordinating Group (NWCG). Participating members of the agreement include the U.S. Forest Service of the Department of Agriculture, the Bureau of Indian Affairs, Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service of the Department of the Interior. Through additional agreements, state forestry and wildland fire agencies, private forestry companies, the Association of State Foresters, and many states participate in this agreement.

The principle objective of the Interagency Cooperative Fire Agreement is the cooperative and cost effective sharing of fire resources during national and regional emergencies. Through this agreement, a wide variety of fire resources and support services can be made available to units of the National Park Service. All requests for assistance through this agreement are directed to the Eastern Great Basin Coordination Center through the Area FMO.

F. KEY INTERAGENCY CONTACTS

- Fire Management Officer, Mesa Verde National Park / Four Corners Park Group
- Fire Management Officer, Bureau of Land Management, Moab
- Manager, Moab Interagency Fire Center

G. FIRE-RELATED AGREEMENTS

- Southeast Utah Interagency Wildland Fire Annual Operating Plan (Moab Interagency Fire Center)
- Delegation of Authority from Superintendent, SEUG, to Moab Interagency Fire Center Manager
- Interpark agreement between Mesa Verde Fire Management Office and Four Corners Park Group
- Cooperative agreement between Arches NP and Moab Valley Fire Protection District for structural fire protection
- Interagency Cooperative Fire Management Agreement for the state of Colorado, between NPS, other federal agencies, and Colorado State Forest Service

VI. MONITORING AND EVALUATION

The Southeast Utah Group will develop a monitoring program to assess accomplishments and to determine effects of wildland fire and management activities on cultural and natural resources. The program will use the recommended standards for fire monitoring outlined in the NPS *Fire Monitoring Handbook*. All fires will be monitored at the environmental level (level 1) and the reconnaissance stage of the fire observation level (level 2), as described in the *Handbook*. Slash pile or debris burns, which will generally be managed as prescribed fires, will also be monitored for the fire conditions stage of the fire observation level (level 2). This monitoring will be supplemented by additional ongoing monitoring of various resource categories conducted by the SEUG long-term monitoring program and through the Northern Colorado Plateau Inventory and Monitoring Network.

Monitoring Level 1: Environmental Monitoring

Environmental monitoring provides the basic background information needed for decision-making. The following types of environmental data can be collected. SEUG parks may require other additional types of environmental data due to the differences in management objectives and/or fire environments.

- Weather
- Fire Danger Rating
- Fuel Conditions
- Resource Availability
- Concerns and Values to be Protected
- Other Biological, Geographical or Sociological Data

Monitoring Level 2: Fire Observation

Fire observation (level 2) monitoring includes two stages. First, reconnaissance monitoring is the basic assessment and overview of the fire. Second, fire conditions monitoring is the monitoring of the dynamic aspects of the fire.

Reconnaissance Monitoring

Reconnaissance monitoring provides a basic overview of the physical aspects of a fire event. It is part of the initial fire assessment and the periodic revalidation of the Wildland Fire Implementation Plan. On some wildland fires this may be the only level 2 data collected. Data on the following variables is to be collected for all fires:

- Fire Cause (Origin) and Ignition Point
- Fire Location and Size
- Logistical Information
- Fuels and Vegetation Description
- Current and Predicted Fire Behavior
- Potential for Further Spread
- Current and Forecasted Weather
- Resource or Safety Threats and Constraints
- Smoke Volume and Movement

Fire conditions monitoring

The second portion of level 2 monitoring documents fire conditions. Data on the following variables may be collected for slash pile or debris burns. The group's management staff will select appropriate variables, establish frequencies for their collection, and document these standards in individual burn plans or in short or long-term implementation actions of Wildland Fire Implementation Plans.

- Topographic Variables
- Ambient Conditions
- Fuel Model
- Fire Characteristics
- Smoke Characteristics
- Holding Options
- Resource Advisor Concerns

VII. FIRE RESEARCH

Fire history research specific to the parks of the Southeast Utah Group has not been conducted. Various fire regime information is available from other areas on some of the plants and communities that occur in group parks, but these study areas generally vary from SEUG parks in climate, plant characteristics or composition, geology, and/or other factors. Additionally, a recent literature review (Baker and Shinneman, 2004) on fire regime in pinyon-juniper woodlands, one of the most extensive vegetation communities in SEUG parks, suggests that various generalizations and assessments on the condition and health of piñon–juniper woodlands in the western United States “are based on premature and likely incorrect conclusions about the natural fire regime in piñon–juniper woodlands. Local research is essential, at the present time, if effective, scientifically based restoration prescriptions are to be derived.”

A study is currently underway using repeat photography to compare current and historic vegetation conditions at the SEUG parks. Though not specifically about fire, this study will give some indication of how (or whether) vegetation conditions have changed over the last 100+ years. The earliest photos of the SEUG area go back to the 1870s. Another ongoing study, using soil parameters and associated understory community and fire history attributes to characterize stand age-structure of southwestern U.S. woodlands, may provide information relevant to SEUG parks. Various vegetation and soils research has been ongoing in the SEUG area for 15 years, and provides some incidental information and inferences related to fire.

Vegetation at group parks has been altered from pre-Columbian conditions by various forces, including livestock grazing, exotic species invasion, climate and precipitation, soil and stream channel erosion, river flow regulation from dams, and other hydrologic changes. Many of these changes were well-advanced by the 1930s, and may persist into the present, so that defining normal or “natural” vegetation communities and ecosystem processes, including the role of fire, is challenging.

Various observations from SEUG units related to natural fire regime seem to be inconsistent with common assumptions, theories or conclusions about the role of fire, and how it has been altered by human intervention, in plant communities similar to those in SEUG. SEUG-specific fire history research is needed to resolve these questions. Resource Management Plans for the group parks identify the need for research on dynamics of vegetation communities and ecosystems, including the role of fire, and a project statement (funding proposal) has been submitted for fire history research for the group parks.

VIII. PUBLIC SAFETY

Managing a fire management program is one of the highest-risk operations that a land management agency accomplishes. The first priority consideration in any fire management action is firefighter and public safety.

Safety issues in fire management relate to the risks to humans from high fire intensities and/or rates of spread that can occur in a normal fire season. There are several programs that concentrate on mitigating public and firefighter safety, including fire prevention (fire hazard awareness and preparedness), prescribed fire for burning of debris or slash piles (treatment of high fire risk areas with fire, thus increasing firefighter and public safety), and fuel hazard reduction (using mechanical treatments to reduce hazardous fuels). High risk areas where the public or wildland firefighters are at risk need to be addressed with planning for reduction of the hazards.

A. PUBLIC SAFETY ISSUES AND CONCERNS

The following public safety issues and concerns are important to the SEUG:

- Park visitor safety in and around structures.
- Park visitor safety in areas away from structures.
- Unknown SEUG visitors that come on park property from adjacent private or public lands unannounced.
- Park visitor safety in the Green and Colorado River corridors.
- Park visitor safety in riparian zones heavily infested with tamarisk.

B. PUBLIC SAFETY MEASURES

Public safety concerns will be specifically addressed in each Wildland Fire Situation Analysis (WFSAs), and Prescribed Fire Plan. The following public safety measures will be taken:

- Public safety messages should be developed as required and incorporated into the process of fire information dissemination.
- Trails and unimproved roads in the vicinity of wildland fires and prescribed fires (pile burns) will be closed if potentially hazardous conditions are present.
- Traffic control measures, including smoke warning signs, flashing signal lights, traffic cones, and either fire or law enforcement personnel, should be situated on roads where smoke intrusion incidents are anticipated to occur.
- To keep spectators at a safe distance from prescribed fires (pile burns), patrols will be assigned to each prescribed fire as needed.
- Local and adjacent landowners will be notified of upcoming pile burns, and updated with current situations on ongoing pile burns and wildland fires.

C. FIREFIGHTER SAFETY ISSUES AND CONCERNS

- Meeting appropriate fire qualifications.
- Equipped with proper PPE.

- Pass physical fitness standards relative to position assigned on a fire.
- Attend training in order to qualify personnel for position assigned to a fire.
- Entrapment, fatalities and/or serious injuries.
- Safety standards and guidelines will be followed.
- Job Hazard Analyses will be completed and used for all jobs.
- Safety meetings will be conducted and documented.
- Accident reviews will be conducted, completed and corrective actions taken.
- Aviation safety.

D. FIREFIGHTER SAFETY MEASURES

The following program requirements will be followed for SEUG to mitigate safety concerns and issues above.

- All fire personnel shall meet appropriate qualifications, including medical requirements, for all fire assignments (as per RM-18 and DO-18).
- Fire personnel shall be equipped with personal protective equipment appropriate to their incident assignments.
- All fire personnel and cooperators will comply with NWCG and NPS fitness and personal protective equipment standards while assigned to fire incidents except for initial action by mutual aid cooperators.
- Fire personnel assigned to fireline operations will complete a minimum of 32 hours of basic wildland fire training, and then annually a minimum of 16 hours of refresher (FFT1 and above), 8 hours refresher for FFT2, and safety training prior to incident assignments.
- All wildland fire incidents which result in human entrapment, fatalities, or serious injuries, or result in incidents with potential for the above, will be reported and investigated (reference DO-18).
- All safety standards and guidelines identified within the Interagency Incident Business Management Handbook and NRCG guidelines will be followed.
- Management of all wildland fire incidents will comply with interagency risk management standards.
- The Job Hazard Analysis (JHA) will be used for projects which present potential hazardous activities and for jobs which require employee use of out-of-the-ordinary personal protective equipment (PPE); refer to RM-18 for JHA process and format.
- Documented safety meetings will be conducted as needed under the supervision of the Suppression Manager and/or Prescribed Fire Manager.
- Accidents will be reviewed to determine areas needing improvement, not as punitive measures; normally held between the supervisor and employee.
- All safety protocols for the aviation program will be contained in the NPS Aviation Management Plan. The Interagency Helicopter Operations Guide (IHOG) is now used for NPS helicopter operations.

IX. PUBLIC INFORMATION AND EDUCATION

A. PUBLIC INFORMATION CAPABILITIES

The Southeast Utah Group has a public information officer (PIO), as does Arches. A trained fire PIO is also on staff at Arches and is available for group parks. The parks and the Moab Interagency Fire Center (MIFC) handle public information responsibilities on the typical small fires in SEUG parks. For large fires, the Fire Center could request a PIO if necessary as part of an Incident Management team. The group parks, the Moab Fire Center, and the BLM Fire Prevention and Mitigation Specialist (Fire Prevention Officer) carry out public information and education for preparedness and fire prevention as outlined in the Moab Interagency Fire Annual Operating Plan.

Fire warnings and restrictions are developed through discussion among the agencies of the Moab Interagency Zone (NPS, Bureau of Land Management, Forest Service, Utah Division of Forestry, Fire and State Lands), coordinated by the Fire Center, in order to communicate consistent messages across agency jurisdictions. Fire restrictions are then issued by the state Division of Forestry, Fire and State Lands. The SEUG Fire Coordinator and Fire Duty Officer will communicate with the Fire Center to track fire danger for SEUG parks, and will work with public information officers to publicize fire-related information such as fire danger warnings and restrictions.

B. STEP-UP PUBLIC INFORMATION

The step-up plan for the group is described in the preparedness section of chapter 4. The Annual Operating Plan for the Moab Interagency Fire Zone also includes a Fire Danger Operating and Preparedness Plan with procedures for agency, MIFC, and fire crew staff. Public information activities from the group step-up plan are as follows.

Agency Planning Level 1 (Burning Index 0-30), Low Fire Danger. Park operations normal. No special visitor contacts for fire.

- Monitor fire weather and post fire danger in visitor center.
- Provide current public information.

Agency Planning Level 2 (Burning Index 31-60), Moderate Fire Danger. Park operations normal. No special visitor contacts for fire.

- Monitor fire weather and post fire danger in visitor center.
- Provide current public information.
- Inform staff of any special fire weather advisories.

Agency Planning Level 3 (Burning Index 61-120), High Fire Danger. Park operations normal.

- Monitor fire weather and post signs for high fire danger.
- Provide current public information.
- Monitor 3 to 5 day forecast.
- Inform staff of any special fire weather advisories.
- Visitors verbally warned at contact stations and interpretive talks and walks.
- Consider the need for fire restrictions.

Agency Planning Level 4 (Burning Index 121-150), Very High Fire Danger. Park operations normal.

- Monitor fire weather and post signs for very high fire danger.
- Provide current public information.
- Monitor 3 to 5 day forecast.
- Brief staff daily about current fire weather, advisories, and park situation.
- Visitors verbally warned at contact stations and interpretive talks and walks.
- Consider the need for fire restrictions.
- Consider and implement ongoing park-specific closures as appropriate.
- Increase patrols of parks.

Agency Planning Level 5 (Burning Index 151+), Extreme Fire Danger. Park operations would continue.

- Monitor fire weather and post signs for extreme fire danger.
- Provide current public information.
- Monitor 3 to 5 day forecast.
- Brief staff daily about current fire weather, advisories, and park situation.
- Visitors verbally warned at contact stations and interpretive talks and walks.
- Consider further restrictions and closures.
- Increase patrols of parks supported by employee overtime work.

X. PROTECTION OF SENSITIVE RESOURCES

A. CULTURAL RESOURCES

1. Description

The SEUG parks and monuments protect a large number of significant cultural resources that are important in understanding the prehistory and history of the area. While some of these resources have been listed on the National Register of Historic Places, others await that attention, while still others have yet to be discovered.

In Canyonlands National Park, the Salt Creek Archeological District contains the remains of what was probably the most densely populated prehistoric occupation in the immediate area. Historic resources in the same general vicinity include the Kirks Cabin Complex, Cave Springs Cowboy Camp Complex and the Lost Canyon Cowboy Camp. These properties are listed on the Canyonlands Multiple Resource nomination. Horseshoe Canyon is home to the Great Gallery, the famous Barrier Canyon style rock art panel. Numerous small prehistoric storage sites as well as remnant historic sites from ranching and mining days also exist along the Colorado and Green River corridors. Approximately 1200 sites have been documented within the park. Since this represents the results of only about a two percent survey, many additional sites not yet located are suspected to exist.

In Arches National Park, the Wolfe Ranch Historical District protects several ranching-era buildings while the Arches National Park Multiple Resource nomination protects the Civilian Conservation Corps-era Rock House as well as a number of historic inscriptions scattered throughout the park. Additional sites in Arches include large lithic quarry sites, petroglyphs and pictographs, a few small prehistoric storage structures and additional remnants of the historic ranching era. Little formal survey activity has occurred outside the developed areas so not much is known about the potential for additional cultural resources within the rest of the park. Given the high site density in surrounding areas, it's likely that there is a similar prehistoric occupational pattern within the boundary of Arches.

Natural Bridges National Monument has recently been listed as a National Register District (August 2004) that includes nearly 500 prehistoric sites identified during a 100 percent survey of the uplands in the mid-1990s. Many of the sites that also exist within the canyon systems are part of that listing as well. Lithic scatters dominate the uplands while the canyons contain long-term habitation, ceremonial, and storage sites. Rock art abounds. The Owachomo Bridge Trail is a National Register-listed property and a good example of the kinds of historic resources that also exist within the monument.

Hovenweep National Monument was set aside to protect six non-contiguous units containing spectacular prehistoric architecture, the most famous being the prehistorically-late, multi-story tower perched on the canyon rim. Lithic scatters, field houses, check dams and small pueblos dot the surrounding landscape. Goodman Point unit was the first area in the United States set aside as a cultural preserve (1889) and contains the remains of perhaps one of the largest pueblos in the Four Corners area as well as one of the highest concentrations of prehistoric sites. Recent surveys at Goodman Point and Square Tower units have revealed at least 10,000 years of occupation in the area. All six of the Hovenweep National Monument Units have been administratively listed to the National Register.

2. Actions to prevent or mitigate negative impacts

In general, and with a few exceptions, the activities of fire suppression are usually more destructive to cultural resources than the actual fire itself. Below are identified actions that can help mitigate the potentially negative effects of fire suppression on cultural resources.

- An archeologist or para-archeologist must be on the fire line during initial attack, mop-up and rehabilitation to identify and attempt to avoid any archeological or historic resources.
- If at all possible, natural barriers or man-made roads and/or trails should be used as fire lines.
- Any fire lines that must be dug should be done so by hand. No bulldozers or other heavy equipment should be used, except in cases of imminent threat to human life, property, or infrastructure, with the Superintendent's approval.
- No retardant should be used unless property destruction is imminent and/or a fire is likely to leave NPS boundaries.
- Because the destructive properties of retardant on cultural resources have been demonstrated, clean up of retardant should be undertaken only under the direction of an archeologist trained in such cleanup.
- The proposed location of all backcountry fire camps must be cleared by an archeologist prior to occupation.

B. NATURAL RESOURCES

1. Description

Natural resources requiring special protection in the four SEUG parks include:

- Threatened/endangered species:
 - Mexican spotted owl. Canyonlands is included in designated critical habitat for this species, and 22 protected activity centers (PACs) centered on nest sites, generally in side canyons, have been designated.
 - Southwestern willow flycatcher uses riparian habitat, generally dense vegetation. This species has been observed on the Green and Colorado Rivers and in one side canyon, but nesting has not been detected.
 - Four listed fishes occur in the Green and Colorado Rivers. Effects on these species from fire management would probably be limited to activities or impacts in seasonally flooded backwaters, where spawning and/or recruitment occur.
 - Bald eagles may be winter visitors, but no nesting has been observed in group parks.
 - Various special concern species are important in group parks, including the Arches biscuitroot, desert bighorn sheep, peregrine falcon, and river otter.
- Water sources, including springs and seeps, are rare, important and sensitive in the desert environment of SEUG parks.
- Native riparian vegetation is also rare and important. The invasion of the exotic shrub tamarisk, which grows in dense thickets and tends to form a monoculture, threatens native riparian plants. Fires are much more intense in tamarisk, and tamarisk quickly and prolifically resprouts after fire, another factor that contributes to its displacement of natives.
- Biological soil crusts stabilize and provide nutrients for soil, aiding plant growth. Soil crusts are easily damaged or destroyed by trampling or other ground disturbance.

- Arches, Canyonlands and Natural Bridges have lands recommended or found suitable for wilderness designation. NPS wilderness management policies apply to these categories of wilderness, as well as others (study, proposed, designated), regardless of category.
- Air quality, including visibility. Long, clear views and high air quality are hallmarks of SEUG parks.
- Relict areas and research natural areas. Canyonlands has several relict areas, where plant communities remain unaltered by livestock grazing and other human impacts due to inaccessible topography. These areas are designated or proposed as Research Natural Areas. Fire in some of these areas may facilitate colonization by exotics such as cheatgrass and/or tamarisk, though some areas are so remote that even these plants may be unlikely to invade without human assistance. Excessive ground disturbance from suppression may also encourage the introduction of exotic plants.

2. Actions to prevent or mitigate negative impacts

As with cultural resources, the activities of fire suppression have the potential to be more destructive to natural resources than actual fires. Protective actions are described elsewhere in the plan, including in individual fire management unit descriptions (chapter III), and in Minimum Impact Suppression Tactics (chapter IV). The actions to protect cultural resources, above, also serve to protect natural resources. In general, fire management will emphasize minimizing ground disturbance and use of confinement strategies employing natural or existing fuel breaks.

C. DEVELOPMENTS AND INFRASTRUCTURE

1. Description

Developments and infrastructure requiring protection in the SEUG parks are primarily administrative and public-use buildings and facilities. Administrative headquarters, with visitor centers, staff housing, maintenance facilities and infrastructure are located at three Canyonlands districts and each of the other three SEUG parks. Most districts or parks also have camp and picnic grounds. Park and district developed area maps are included in appendix B.

2. Actions to prevent or mitigate negative impacts

Wildland-urban-interface mitigation techniques for reducing or eliminating potential wildland fire fuel hazards (appendix P) should be applied to prevent or reduce negative impacts to both historic and modern developments within the boundaries of SEUG parks. FIREWISE standards have been adopted as the national standard by the National Park Service; they should be applied to areas around park development to help reduce the risk from wildland fires. Very limited private development does exist adjacent to SEUG parks and the owners of these properties, along with other members of the general public, should be informed of methods of acceptable wildland fuel hazard mitigation through the group's public information programs and normal neighbor contact.

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

All wildland fires and prescribed fires (debris and slash pile burns) will involve some sort of review depending on the size and complexity. The purpose of this review is to recognize and document actions that were successful, and to identify and rectify actions that were unsafe or ineffective.

On smaller incidents, an informal After Action Review will take place with the resources on the fire. The AAR is a training tool intended for post-evaluation of an incident or project in order to sustain strengths and improve on weaknesses. It is performed immediately after the event by the personnel involved. The leader of the incident leads the exercise in an informal setting, encouraging input on an assessment of what was planned, what actually happened, why did it happen, and what can be done the next time. This process should not be interpreted as an investigational review. The format can be found in the Incident Response Pocket Guide (PMS #461, NFES #1077).

On larger, more complex fires, review and critique will be performed by the Fire Management Officer, the Incident Commander/Burn Boss and a representative of the SEUG (e.g Chief Ranger/Fire Coordinator, Chief of Resource Management, etc.). Prescribed or wildland fires involving an Incident Management Team or significant political, safety, or public issues should be reviewed by the Area Fire Management Officer. If a fire generates a major political or public concern, involves multiple serious injuries or a fatality, the Regional Fire Management Officer and the NPS Fire Management Program Center should participate in the review.

The Fire Management Officer will review the Fire Management Plan annually for currency and incorporate changes into the appendix. The fire management plan is subject to formal review every five years.

XII. CONSULTATION AND COORDINATION

The Southeast Utah Group announced the fire management planning process and invited public input on issues and alternatives to be addressed in the plan, through scoping notices posted on park web sites and sent to local newspapers. The group also requested input from federal and state agencies and Native American tribes:

- Bureau of Land Management (BLM):
 - Moab Field Office
 - Monticello Field Office
 - Richfield Office
 - Durango Public Lands Center
- Fish and Wildlife Service
- Manti-LaSal National Forest
- Utah Division of Forestry, Fire and State Lands
- State Historic Preservation Offices of Utah and Colorado
- Utah State and Institutional Trust Lands Administration
- 34 tribal organizations

Few comments were received from tribes or from the public. Two letters from the public suggested fire management issues and strategies and provided fire ecology information.

NPS staff regularly consulted with the Moab Interagency Fire Center during the planning process. Various information from agencies, particularly the Fire Center and the BLM, was incorporated into the plan.

Plan Contributors

Doug Paul, Assistant Fire Management Officer/Fuels Specialist, Mesa Verde National Park
Jeff Troutman, Chief of Resource Management, Southeast Utah Group
Chris Goetze, Cultural Resource Manager, Southeast Utah Group
Chris Nickel, Lead Ranger, Hovenweep National Monument
Gary Salamacha, Park Ranger, Arches National Park
Craig Hauke, Biologist, Southeast Utah Group
Dave Wood, Resource Management Planner, Southeast Utah Group
Peter Fitzmaurice, Chief Ranger, Canyonlands National Park
Paul Henderson, Chief of Interpretation, Canyonlands National Park
Marc Mullenix, Fire Management Officer, Mesa Verde National Park
Tony Schetzle, Superintendent, Southeast Utah Group
Laura Joss, Superintendent, Arches National Park
Corky Hays, Superintendent, Hovenweep and Natural Bridges National Monuments

Consultants

Dirk Johnson, Manager, Moab Fire Center
Dave Englemann, Fire Management Officer, Bureau of Land Management, Southeast Utah
Katie Juenger, Planning Coordinator, BLM Fire Management Division, Southeast Utah