WILDLAND FIRE MANAGEMENT PLAN

New River Gorge National River
Bluestone National Scenic River
Gauley River National Recreation Area

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EXECUTIVE SUMMARY

Fire management policies of the National Park Service (NPS) support the park's resource management goals. The primary resource management goal is restoration or maintenance of the historic scene and the associated cultural resources, and supporting native plant communities while providing for firefighter and public safety, protection of natural and cultural resources, and human developments from unwanted wildland fire.

This fire management plan contains the following program direction:

To guide the decision-making process where safety, social, political, and resource values are evaluated, and appropriate management response strategies are identified for wildland fires.

To provide a framework for fuels management strategies through the use of prescribed fire, mechanical, and chemical treatments.

To provide a platform to cooperate more fully in planning and implementing a wildland fire program across agency boundaries.

Program operations included in the plan are preparedness, prevention, suppression, and fuels management. Applicable resource goals and objectives are derived from approved agency resource and general management plans.

The plan is organized to combine the latest scientific knowledge, including regional and local studies, with a hierarchy of policy direction from Departmental and Agency to the Federal Wildland and Prescribed Fire Management Policy (1995 & 2001), to accomplish resource and fire management goals and objectives and research into the restoration of fire into the ecosystem. The intent of the plan is primarily operational in nature.

Compliance requirements with National Environmental Policy Act (NEPA) guidelines have been satisfied through development of an environmental assessment (EA). These requirements ensure a prudent assessment and balance between a federal action and any potential effects of that action, leading to consensus between fire managers, agency resource specialists, and the public. Any constraints or limitations imposed on the fire management program are also included.

List of Tables

I. INTRODUCTION

A. Reasons for Developing Fire Management Plan

The National Park Service's (NPS) Director's Order 18, November 2002 requires that all parks with vegetation capable of sustaining fire develop a fire management plan (FMP). This FMP was developed to provide direction and outline those actions that will be taken in meeting the fire management goals for the area.

B. Collaborative Process in Development of Fire Management Plan

The general management plan, statement for management, resource management plan, and the fire management plan are all developed with input from neighboring communities and cooperating agencies, as well as other NPS program management areas.

C. Implementation of Federal Fire Management Policy

This fire management plan will implement fire management policies and help achieve fire management goals defined in: (1) Federal Wildland Fire Management Policy and Program Review; (2) Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDOI/USDA); and (3) A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10 Year Comprehensive Strategy Implementation Plan.

D. Compliance

An environmental assessment serves as the National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) compliance. Documentation is in Appendix A of this plan.

E. Authorities for Implementation of Fire Management Plan

The authority for fire management is found in the National Park Service Organic Act (Act of August 25, 1916), which states that the Agency's purpose:

"... is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such

manner and by such means as will leave them unimpaired for the enjoyment of future generations."

This authority was further clarified in the National Parks and Recreation Act of 1978:

"Congress declares that...these areas, though distinct in character, are united...into one national park system.... The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

Related statutory authorities are the Weeks Act, Clean Air Act, Clean Water Act, Endangered Species Act, National Environmental Policy Act, Antiquities Act, West Virginia State Law, and others.

II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

A. NPS Management Policies as Related to Fire Management

NPS policy falls within Department of the Interior Manual 910 DM, 1, 2 and 3 which, in part, states:

"The presence or absence of natural fires within a given ecosystem is recognized as a potent factor stimulating, retarding or eliminating various components of the ecosystem. Most natural fires are lightning-caused and are recognized as natural phenomena which must be permitted to continue to influence the ecosystem if truly natural systems are to be perpetuated."

"The fire management program of all parks must be designed around park objectives. In natural systems this may include the need for some areas to proceed through succession toward climax while others are set back by fire. Natural zones should represent the full spectrum of the parks' dynamic natural vegetative patterns. Sharply defined zones or blocks of vegetation limited to certain species locked in over time are not natural and only rarely justified. In historic zones fires may be controlled or used to perpetuate the historic scene."

"Wildfires, whether on or adjacent to lands administered by the Department, which threaten life, structures, or are determined to be a

threat to natural resources or facilities under the Department's jurisdiction, will be considered emergencies and their suppression given priority over normal Departmental programs."

Specific guidance on wildland fire is contained in NPS Directors Order (DO-18) and attendant Reference Manual (RM-18) and “The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide” (1998).

B. Enabling Legislation and Purpose

The fire management plan covers all lands of New River Gorge National River (NERI), Gauley River National Recreation Area (GARI), and Bluestone National Scenic River (BLUE). Throughout this plan these three parks are collectively referred to as "the park".

The act to establish New River Gorge National River (P.L. 95-625) was passed November 10, 1978. The act states that the purpose of New River Gorge National River is to conserve and interpret the:

"outstanding natural, scenic, and historic values and objects in and around the New River Gorge and preserving as a free-flowing stream an important segment of the New River in West Virginia for the benefit and enjoyment of present and future generations..."

On October 26, 1988, the West Virginia Rivers Bill (P.L. 100-534) amended the boundaries of New River Gorge National River and established the Gauley River National Recreation Area and the Bluestone National Scenic River to:

"protect and enhance the natural, scenic, cultural, and recreational values...for the benefit of present and future generations."

There is specific legislation pertaining to Bluestone National Scenic River stating that the NPS will not interfere with the State of West Virginia's management of wildlife. This has been interpreted to include the use of prescribed fire to improve or maintain turkey habitat.

C. General Management Plan and Fire Management Goals

The general management plan (1982) is presently under revision. Until this revision is completed and approved park management is using the mission goals identified in its Government Performance and Results Act (GPRA) plan (2001) to bring about the following desired future conditions:

1. NERI/GARI/BLUE: Ecological integrity of natural resources is restored and/or maintained.

2. NERI/BLUE: Cultural resources and landscapes are preserved and protected.

3. NERI/GARI/BLUE: the free flowing character of river segments in the three park units is not further compromised.

4. NERI/GARI/BLUE: Visitors understand the value of resources and their responsibility to protect those resources.

5. NERI/GARI/BLUE: Scenic viewsheds and drives are maintained and enhanced through cooperative efforts with local communities.

6. NERI/GARI/BLUE: A system of land and water-based recreational opportunities is developed that allows visitors to safely experience the resources without impairing them.

7. BLUE: The primitive, undeveloped character is preserved: road access is only allowed in a few places.

D. Resource Management Plan and Fire Management Objectives

The protection of natural and cultural resources within the protection area is a fundamental requirement for its continued use and enjoyment by park visitors as a protected area of the National Park System. The goals of the draft resource management plan (1993) are consistent with the above listed documents, applicable laws, regulations and NPS policies and guidelines.

The specific fire management objectives that will be used to accomplish the resource and park goals are:

1. To protect human life, structures and facilities, and natural and cultural resources within the park from damage caused by wildfire.

2. To protect human life, property and the environment outside of the park from damage caused by fire and fire management activities originating within the park.

3. To quickly, efficiently and economically attack wildfires and/or assist in the suppression of wildfires within the mutual aid zone to prevent the spread of fire onto federal lands.

4. To use minimum impact suppression strategies that minimize damage to the park's natural and cultural resources.

5. To perpetuate natural resources and processes as naturally influenced by fire within the park.

E. Fire Management and Meeting Park Objectives

It is the policy of the NPS to allow natural processes to occur to the extent practical while meeting park unit management objectives. NPS Management Policies (1988) state:

"Fire is a powerful phenomenon with the potential to drastically alter the vegetative cover of any park. Fire may contribute to or hinder the achievement of park objectives. Park fire management programs will be designed around resource management objectives of the various management zones of the park".

The fire management program is guided by resource management objectives to protect cultural resources and perpetuate the natural resources and their associated natural processes. This plan will help achieve the objectives and directions described in the parent document, the resource management plan (RMP). The RMP defines major land management issues, describes past and current activities and establishes actions that will be taken in the future.

A GMP scoping meeting held in May 2003 developed desired future conditions and management prescriptions for 3 areas: exotics/invasive species/forest health, forest diversity, and other non-forest community types. The area having the greatest potential for the application of prescribed fire as a management action was *forest community diversity*. The desired future conditions for the three parks were:

- Sustain rim pine (Virginia, pitch, table mountain) communities.
- Sustain flat rock communities.
- Sustain riparian/floodplain forests.
- Sustain xeric oak forests.

These four desired future conditions would provide the rationale for any future application of prescribed fire and will likely be incorporated into the next GMP.

III WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations

Wildland fire in the park will be managed to enhance community protection, diminish risk and consequences of severe wildland fires and, to the extent possible, increase health of watersheds. To these ends the park will employ the following goals:

1. Improve prevention and suppression.
2. Reduce hazardous fuels.
3. Promote community assistance.
4. Promote ecosystem health.
5. Protect, preserve and interpret cultural resources.

A community-based approach to wildland fire issues will involve close collaboration and cooperation with neighboring agencies that have a vested interest in areas of wildland fire issues.

The NPS shares concurrent jurisdiction with the State of West Virginia for all lands within the legislative boundaries. The NPS is responsible for providing primary wildland fire protection on federal lands. Fire protection for private properties adjacent to federal lands is primarily provided by local volunteer fire departments in cooperation with the West Virginia Division of Forestry.

Public Law 100-534 included provisions allowing the State of West Virginia to manage fish and wildlife populations within the Bluestone National Scenic River under the terms of a pre-existing lease. Past practices under this lease have included habitat manipulations using both mechanical and prescribed fire methods to improve turkey habitat. A copy of this license can be found in Appendix B.

B. Wildland Fire Management Goals

The park is committed to the protection of life, property and the environment, as well as perpetuating natural resources and processes. The primary objective will be suppression of unwanted wildland fires. The secondary objective is to protect park facilities and natural and cultural

resources through a proactive fire management program. This program will utilize hazard fuel reduction, fire prevention, and limited prescribed fire as both research and management tools to accomplish the fire management objectives.

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

Goal 2: Suppress all unwanted and undesirable wildland fires, regardless of ignition source, to protect the public, private property, and natural and cultural resources of the park.

Goal 3: Manage wildland fires in concert with federal, state, and local air quality regulations.

Goal 4: Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities.

Goal 5: Reduce wildland fire hazard around developed areas and areas adjacent to cultural sites.

Goal 6: Use prescribed fire as a method of restoring and maintaining the cultural and natural landscape to meet resource objectives of the park.

C. Wildland Fire Options

Prescribed fire, mechanical, and chemical treatments may be used either sequentially or in conjunction with each other. The following is a discussion of available wildland fire options and their use in the park:

1. Wildland Fire Suppression: All unscheduled wildland fires in the park will be suppressed using the most appropriate management action. Determination of the most appropriate management action will consider human safety, threat and potential damage to property, resources, and cost effectiveness. Suppression may not be used to accomplish resource objectives.

2. Prescribed Fire: May be used for protection of cultural resources, historic scene restoration and maintenance, hazard fuel reduction, and natural resource objectives.

3. Wildland Fire Use: This option was rejected due to the linear shape of the park, the significant degree of wildland urban interface

along the park boundary, and the lack of available qualified personnel required to manage these fires.

4. Non-Fire Applications: The reduction or removal of fuels by mechanical or chemical methods are both options that may be used for objectives such as protection of resources, historic scene restoration and maintenance, private property, invasive species control, or other natural resource objectives.

D. Description of Wildland Fire Management Strategies by Fire Management Unit

For the purpose of management planning, all the park units will utilize the same management alternatives and will be considered as a single fire management unit. For response purposes the unit will extend one mile outside the jurisdictional boundary for initial, extended and support suppression actions as per the written agreement with the West Virginia Division of Natural Resources.

1. New River-Bluestone-Gauley Fire Management Unit

a. Physical and Biotic Characteristics

Topography: The Bluestone, Gauley, Meadow and New River gorges are deep troughs cut through the ancient Allegheny Plateau on the west slope of the Appalachian Mountains and are some of the more prominent landforms in the eastern United States. The New River region is a characteristically rugged complex of ridges, mountains, and narrow, steep-sided stream valleys. New River Gorge, itself, averages 1,000 feet in depth, making it one of the more spectacular canyons in the eastern United States.

New River Gorge features steep slopes and massive sandstone cliffs on the upper walls along its north-central reach. Further south, near Hinton, the gorge is wider and less steep with fewer prominent cliffs. Although proportionally smaller, the Gauley and Bluestone River Gorges are topographically similar and range from 300 to 1,200 feet in depth.

Geology: The New River is the only stream, which flows northwestward across the Appalachian Mountain system. One of the more remarkable features of the New River is that it is one of the oldest rivers in North America. The river is a remnant of the prehistoric Teays River system. New

River formed the headwaters of the Teays and is in essentially the same position now as it was then.

Rocks in the NERI are sedimentary formations deposited during the Mississippian and Pennsylvanian periods of the Paleozoic era. Rocks range in age from 340 to 280 million years. The older rocks are Mississippian strata and dominate the upper gorge between Hinton and Meadow Creek. Below Meadow Creek these rocks are confined mostly to lower elevations in the gorge and its tributaries, extending as far downriver as Thurmond. The overlying strata are from the coal bearing Pennsylvanian period. Below Thurmond both the gorge and adjacent ridges are composed chiefly of Pennsylvanian rocks, now the only strata exposed because of a regional northwesterly dip. The major formations in these two groups of rocks are named Hinton, Bluestone (Mississippian), Pocahontas, New River, and Kanawha (Pennsylvanian). This distribution of surface rocks corresponds closely to that of the Calvin and Dekalb soil series.

The Gauley River Basin is part of the unglaciated Allegheny Plateau where the age of the rock strata exceeds 300 million years before present. The high knobs and ridges are deeply dissected by young streams that create narrow canyons with steep slopes.

The Bluestone River contains considerable limestone substrate similar to the Ridge and Valley Providence.

Up to 7.1 million tons of surface-recoverable coal reserves lie within the boundary of New River Gorge National River (U.S. Department of the Interior, Bureau of Mines 1977; USDI, Geological Survey, 1977). Most of the coal reserves are between Thurmond and Meadow Creek. By definition, reserves are feasible to mine.

Natural gas is produced form Mississippian sandstone at about 2,000 feet deep on ridges and hills above the Gauley Bridge area. There is no evidence of significant deposits of metallic minerals. High-silica sandstones of sufficient quality for use in glassmaking exist and are mainly extractable in GARI.

Soils within the National River protection area are moderately deep silty or sandy loams, usually well drained,

very stony, and strongly acid. Normal acidity ranges between 4.5 and 5.5. Most of the soils lie on very steep (40 to 70) percent slopes. Soils are of low or moderate fertility, and generally unsuited for crops or pasture except in limited areas of gentle slope.

Between Hinton and Meadow Creek, the Calvin-Gilpin association of reddish brown silt loams derived from shale and siltstone dominates the river basin. These soils are moderately fertile and well suited for tree growth, but have severe erosion potential when de-stabilized.

From Meadow Creek to Claremont, the New River valley bottom and lower slopes continue to be dominated by Calvin-Gilpin soils. The upper slopes, ridgetops and tributaries, however, contain an association of Steep Rockland-Dekalb-Gilpin soils. Steep Rockland refers to areas of massive sandstone outcrops and broken cliffs from 10 to over 50 feet high found along the rims of the gorge. Dekalb soils are rocky, brown sandy loams that occupy the gorge walls and many of the ridgetops. Gilpin soils also occur on many ridgetops in this association. While these soils are permeable and rather doughty, they do not present a significant erosion hazard. Gilpin soils are also well suited for timber growth.

Between Claremont and the lower NERI protection boundary, the gorge is dominated entirely by the Steep Rockland-Dekalb-Gilpin association. The most common bank soils, however, are very stony silt loams of the Earnest series. These are moderately fertile colluvial soils limited by seasonally high water tables.

Vegetation: New River Gorge and its related tributaries are part of the mixed mesophytic forest region (Braun 1950) of central Appalachia. Deciduous trees and shrubs characterize this forest type. Although stand compositions vary from site to site depending of such factors as slope, exposure, depth of soil, and disturbance history, the most common large trees include species of the red and white oak groups, basswood, tulip poplar, sugar maple, buckeye, beech, hickory, and hemlock. The continuous span of this forest type is approximately 60 miles long by approximately 2 miles wide and is one of the largest in the nation.

Pine species (Virginia, pitch and table mountain pine) are components of the cliff and flatrock communities and are threatened by increased visitor use and an absence of fire. Several flat-rock communities of Virginia pine along with a number of rare plant species are found along the New River near Hinton.

River edges support elm, silver or red maple and sweet gum. Frequent associates include white ash, cucumber magnolia and sour gum. An even greater variety of low trees and shrubs add to the complexity of this vegetation. Among the common species are dogwood, striped maple, witch hazel, magnolia, rhododendron, mountain laurel, redbud, ironwood, spicebush, persimmon, hydrangea, and many others (Strausburg and Core 1964).

The geographic position of the New River combined with the topographic diversity of the gorge has led to the development of an unusually varied flora. Species with both northern and southern affinities along with disjunct populations of plants from other regions are found within the gorge. The gorge serves as a distributional corridor for plants between the eastern coastal plains and the Mississippi Valley and contains plants common to either of those regions but uncommon elsewhere in the central Appalachians. Floristic studies of New River Gorge have recorded 1,337 taxa in 478 genera and 123 families (Suiter, 1995). A list of flora found in the park can be referenced at: http://ice.ucdavis.edu/nps/sbypark.html.

Discrete associations common within the gorge include floodplain (riparian) forests of river birch, sycamore, and willow; hemlock-rhododendron stands in ravines; oak-hickory associations on drier ridgetops; and occasional stands of pitch pine on rocky outcrops. The largest wetland in the park is a small marsh near the head of Kates Branch. Other wetlands exist within the three parks. Several flat-rock communities are found along the NERI and GARI, with the best examples located at Brooks and Sandstone Falls on the New River.

Exotic Plants: Exotic (non-native) plants are a prominent part of the vegetation along the river corridor where roads, mines, railbeds, towns, and other disturbances generate appropriate habitat. Almost all of the exotics thrive on open or thinly wooded, disturbed ground where competition from

native plants is reduced. There have been 152 exotic taxa (Suiter, 1995) identified which comprise 13% of the NERI flora.

Nearly all of the exotic plant species found within the protection area are widespread throughout the eastern and/or southeastern states. Some exotic species that may be particularly deleterious at NERI are: purple loosestrife, Japanese knotweed, Japanese honeysuckle, Japanese stiltgrass, garlic mustard, kudzu, English ivy, tree of heaven, mautum olive, multiflora rose, privit and paulownia.

The paulownia (Paulownia tomentosa), a purple-flowering tree, is also an exotic that is abundant. It is notable in the gorge because it is being illegally harvested due to the commercial value of the wood.

Grafton and Grafton (1980) note that two introduced grasses, Eulalia viminea and Arthraxon hispidus, may be impacting native plants, but the extent of this effect is unknown. Both grasses inhabit waste places, roadsides, ditches, and open shores. A third grass species, Japanese stiltgrass (Microstegium vimineum), is a more recent arrival in the park and constitutes a very significant problem.

Data on the distribution and density of exotic plants is sketchy for the NERI and unknown for BLUE and GARI.

The role of fire in managing exotic species as well the effects of fire on rare or threatened species within the protection area has not been documented. Additional research into the use and effects of prescribed fire or wildfire on plant ecosystems is necessary.

Threatened and Endangered: The West Virginia Nongame Wildlife and Natural Heritage Program (NWNHP) is an on-going, computer assisted ecological inventory. A part of the West Virginia Division of Natural Resources, Wildlife Resources Section, the NWNHP follows methodologies used nationally by the Natural Heritage Network. The NWNHP maintains files on rare, threatened and endangered plants and animals, as well as unique natural communities (WV DNR - Endangered Species Checklist). Rare vascular plant surveys were completed in 1986 and 1995 for New River Gorge National River, 1990 for Gauley River National

Recreation Area, and 1992 for Bluestone National Scenic River.

More than 22 rare species are listed for NERI, 11 for GARI, and 19 for BLUE. According to Suiter (1995) there are 54 rare species for NERI, 22 of which are tracked by the NWNHP.

Only Virginia Spiraea (Virginia spiraea) is Federally listed as threatened (http://endangered.fws.gov/wildlife.html). This species occurs on the GARI and BLUE. A literature search does not provide any indication of the effect of fire on this species.

The candy darter (Etheostoma osburni), due to extirpations and/or low numbers at certain sites and a lack of recent data, has been listed as a species of concern in both states and consequently, at the federal level.

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Wildlife: A wide variety of wildlife and wildlife habitats are found within the protection area. In wooded habitats, whitetail deer, gray squirrel, fox squirrel, raccoon, opossum, skunk, fox, and various small rodents are the most common mammals. Black bears are occasionally sighted and are increasing in numbers. Open lands support abundant populations of ground hog, rabbit, crow, dove, blackbirds, and many other non-game species. The varied bird life is one of the most attractive features of the area. Birds are the wildlife most likely to be seen and heard by visitors and are prominent in all seasons, although number and diversity are greatest when spring and fall migrants arrive. Game birds of the forest include wild turkey and ruffed grouse.

A 1951 statewide mammal survey by the West Virginia Conservation Commission identified 60 species, about 40 of which probably occur in New River Gorge National River (Grafton and Grafton 1980). A 1987 biological survey of New River (VPI and SU 1987) that emphasized riparian zones documented over 100 species of birds, 30 species of small mammals and 41 herptiles. About 200 species of birds

and 22 species of herptiles have been documented for Gauley River National Recreation Area. There are 228 species of birds that are known or expected to inhabit the Bluestone National Scenic River (Hall 1971). Based on the work of Hall and Kelson (1959), 57 species of small mammals are known to exist in the upper New River and lower Bluestone river watersheds.

An incomplete listing has identified 19 species of rare herptiles, birds and mammals in the protection area. A list of fauna found in the park can be referenced at: http://ice.ucdavis.edu/nps/sbypark.html.

The New River and its tributaries comprise one of the most important warm water fisheries in the state. Its flow gradient and bottom type provide good spawning areas, while riffles and pools supply excellent habitat for a variety of fish. The river has good in-stream and riparian cover characteristics, further contributing to fish habitat quality. Water quality with respect to fish habitat is normally excellent and the river is highly productive, although a few tributary streams polluted by mine waste, sewage, and sediment from overland flow have diminished fish populations.

Practically all types of warm water game fish found in West Virginia occur in New River, including largemouth bass, smallmouth bass, flathead catfish, white bass, channel catfish, muskellunge, walleye, crappie, sunfish, and spotted bass. Overall, at least 58 species of fish, 6 species of crayfish and 6 species of freshwater mussel have been identified as established within the New River and its related drainages (Stauffer et al. 1980).

Air Quality: New River Gorge is classified as a Class II Air Quality area. A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter, as specified in the 1963 Clean Air Act (42 U.S.C. 7401 *et seq*.). Inversions are common and smoke from fires may linger in the valleys for a considerable period of time. The park monitors for ozone on a year round basis.

Two non-attainment areas are located east and west of New River Gorge. Greenbrier County is a non-attainment area due to ozone levels; Charleston, to the west, is a non-attainment area due to pollution from chemical and manufacturing plant

emissions. There is no monitoring in the park to determine the effect of these areas on the New River region.

Implementation of prescribed burns that entail 100 acres or less will have minimal smoke impacts to the scenic vistas with the majority of smoke produced lasting no more than one day before disspataing.

Cultural Resources:

Prehistoric Sites. The first archeological inventory of NERI identified 288 prehistoric sites in the vicinity of the park (Paul D. Marshall and Associates 1981). Since 1981, several archeological studies have been conducted in NERI, BLUE and most recently GARI (Baker & Associates, 1997). These studies and in-house investigations have increased the inventory to over 300 archeological sites. Estimates suggest the three parks may contain between 5000 and 7000 undiscovered archeological sites. The overwhelming numbers of sites (76 percent) were found in upland settings. These sites consisted primarily of rock overhangs, though a significant number were in streamside settings. The largest proportion of these sites was on the upper terraces and floodplains of the main river channels. Most of the sites were classified as camps. Sites identified as burial mounds were rare.

In most cases the cultural affiliation of specific sites could not be determined, because artifacts from which this information could be derived were not found. Where sites with identifiable components (such as artifact styles) were found, the largest number of components corresponded to Late Archaic times. It is known from sites investigated in the park vicinity that prehistoric occupation was continuous in the New River region from the Paleo-Indian to Historic periods.

Historic Sites. The earliest known exploration of the New River by a European, Abraham Woods, was in 1654. However, roads and related developments were slow coming to this rugged land. In 1790 completion of the state road spawned settlement in the area. The early valley-floor settlements gradually filled, forcing newcomers to move up the hollows and later onto the ridges and plateau areas. Today, small farm sites in the protection area still have log cabins and small log outbuildings dating from this early period.

Civil war activity was minimal within the protection boundary and was generally centralized in and around the Gauley River area where one significant campaign was waged.

The industrial boom began in 1873 with the completion of the Chesapeake & Ohio (C&O) Railroad. Coal mining, railroading, and logging characterized the more than three dozen company towns and hamlets, which blossomed in the gorge from 1873-1935.

Post World War II deterioration of the communities was swift and complete. By the 1960's nearly all the residents had moved from all three gorges and the townsites abandoned. The entire community of Lilly, along the Bluestone River, was condemned and its population moved by the U.S. Army Corp of Engineers because it was within the maximum flood depth of Bluestone Dam.

Appendix K of the General Management Plan/Environmental Assessment, 1982 "Historic Communities of New River Gorge", describes all known historic communities with the National River boundaries. Except where otherwise noted, these sites are located at the bottom of the gorge, along the river's edge.

More than fifty of these remaining structures are owned by the NPS and appear to be eligible for inclusion in National Register of Historic Places (New River Gorge National River 1982). Currently, 4 areas under federal ownership are included in the National Register of Historic Places: C&O Depot/Thurmond, Glen Jean Bank Building, Monk Stone, Kaymoor Mine Site and Structures, and the Trump/Lilly Farmsite.

Historic and cultural assessments of sites within the protection area are currently incomplete. As these research projects are finished, it is likely that significant numbers of sites will be identified and nominated to the National Register. More than 90% of the identified structures are in the interface zone and would be directly or indirectly threatened by wildland fire. Historic structures on the ridgetops are especially susceptible to a wildland fire starting at the gorge bottom and gaining intensity as it moves toward the rim. Most of the ignition sources from railroading and recreational activity are at the gorge bottom.

Adjacent Landownership: Most of the land adjacent to the park's boundary is privately owned. Individual landowners and railroad lands constitute the majority of land ownership.

b. Strategic and Measurable Fire Management Objectives

1. Ensure that all wildland and prescribed fire operations sustain no injuries to members of the public or firefighters.

2. 95% of all unscheduled wildland fires are controlled during initial attack (24 hours or 10 acres).

3. 100% of all prescribed fires are conducted consistent with Federal, State and local smoke management requirements.

4. Manage suppression actions so that rehabilitation costs are less than 10% of suppression costs.

c. Management Considerations

These constraints, considerations, or decision criteria will influence all fire management activities within the fire management unit.

1. No unacceptable impacts to cultural resources or threatened and endangered species.

2. Ensure socio-political economic impacts, including wildland urban interface (WUI), is considered in developing implementation plans.

3. Ensure that the public, organizations, and cooperating agencies are aware of any suppression or prescribed fire operation that may have an impact on them.

d. Historic Role of Fire

In an article in the Journal of Forestry (November 2001), authors Brose, Schuler, Van Lear and Berst noted the following:

Since vegetative associations stabilized about 4,000 years ago, the Appalachian mixed-oak forests have experienced three profoundly different fire regimes. Periodic low intensity surface fires lit by American Indians characterized the first regime, and this regime helped perpetuate oak as one of the dominant species groups. The Industrial Revolution led to

> *high intensity, stand replacing fires, causing extensive damage to the forests. Modern fire protection created a "no-fire" regime that permitted the forests to recover but allowed mesophytic species to begin replacing the oaks.*

In another article in BioScience (October 2003), Abrams noted that before European settlement white oak was the dominant oak species as red oak is less tolerant of fire. European settlement brought an abrupt change of land use practices. Land clearing and commercial logging resulted in large and stand replacing fires further reducing the number of all oak species.

Accompanying the present shift toward a mesophytic forest, changes in ownership and land use have further altered the fire regime on parkland. It can only be speculated what role this has had on fire occurrence (i.e. a fire inadvertently started by a landowner on private property twenty years ago might not now occur on the same land now under federal ownership). As a result, only broad generalizations can be made regarding the historic role of fire within the protection area.

Park fire records show that (1987-2003) 98% of wildland fires within the protection area are human caused. Brush, debris, and trash burning fires account for 15% of the total number of fires. This historic pattern still continues and is the primary threat along the entire private/federal interface zones within the protection area. Twelve percent of the fires have been attributed to trains or railroading activity. Changing land use patterns would have had little effect on this number since most tracks within the protection area are still active and the majority of lands along the railroad right of ways is currently federally owned.

From 1987 thru 2003 the park experienced an average of 6 fires a year. These fires burn an average of 70 acres per year. These fire are broken into the following size classes:

- Class A (<1/4 acre) 48%
- Class B (> ¼ acre, < 10 acres) 39%
- Class C (> 10 acres, < 100 acres) 13%
- Class D (> 100 acres, < 300 acres) 1%
- Class E (> 300 acres, < 1,000 acres) 1%

- Class F (> 1,000 acres, < 5,000 acres) <1%
- Class G (> 5,000 acres) <1%

Additional historical fire information is found in Appendix C

e. Wildland Fire Management Situation

1. Historical Weather Analysis:

The area has a markedly seasonal, continental climate. It is warm from May through September. Summer temperatures are normally near 85 degrees, although readings in the 90's are not unusual. November through March is seasonably cold. Severe winter weather is unusual and normally only lasts for short periods of time. The warm water of the New River tends to have a moderating influence on temperatures within the gorge. While winter temperatures near zero degrees F. are not uncommon on the exposed ridgetops, it seldom drops below 20 degrees F. in the gorge bottoms. As a result, green-up at the bottom of the gorge may begin as much as 3 weeks earlier then on the cooler ridgetops. This temperature differential also effects fall curing, which generally begins on the ridgetops and progresses to the gorge bottom. Topographical influences of the gorge on climate tend to increase the length of the fire season.

Average precipitation is 40.8 inches per year at Beckley and 35 inches at Bluestone Dam. Periods of severe drought are not uncommon and may occur at any time of the year. Table 1 shows a broad range of weather conditions measured over a 33 year period.

Table 1 Beckley, WV Weather Averages

Beckley, West Virginia
Elevation: 2504 feet Latitude: 37 47N Longitude: 081 07W

Average High Temperature Years on Record: 33

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°F	61	38	42	52	63	70	77	80	79	72	63	52	43

Average Low Temperature Years on Record: 33

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°F	42	21	23	32	41	49	56	61	59	53	42	34	26

Highest Recorded Temperature Years on Record: 33

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°F	96	69	74	81	86	87	90	94	96	89	81	78	73

Lowest Recorded Temperature Years on Record: 33

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
°F	-22	-22	-10	-5	11	23	32	41	36	30	18	4	-18

Average Precipitation Years on Record: 33

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
in.	40.8	3.1	2.8	3.6	3.4	4	3.7	4.6	3.5	3.3	2.7	2.9	3.2

Average Wind Speed Years on Record: 32

	YEAR	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
mph	11	12	12	12	12	10	9	8	9	9	11	11	11

Qwikcast.com

2. Fire Season:

Fire season within the protection area begins in March and ends in December. The spring season, March 1 - May 31, and the fall season, October 1 through December 31, are considered the most critical because of greater fire danger potential. Fairly large fires have also occurred in warm, sunny and dry late February days. Fire season dates are determined by West Virginia State Law (Laws of the Division of Natural Resources, Chapter 20-30-5). The parks will maintain full readiness throughout the legal season in so far as funding permits.

Precipitation and green-up are the controlling factors for the beginning and end of the spring fire season. The end of the fall fire season is dependent on frosts and snowfall. However, during those years in which there is minimal winter

precipitation and abnormally high temperatures, the spring fire season can start as early as February, and if the lack of precipitation continues through the spring, the fire season can last through the summer and into the fall, or until sufficient precipitation has occurred to adequately penetrate both surface and ground fuels.

3. Fuel Type and Characteristics:

Fire Behavior Fuel Model 1 (NFDRS model L)
Perennial grasses associated with scattered meadows. Fuel loadings may be up to 1 ton per acre (Burgan 1988). This fuel model is typically found throughout the protection area near old farmlands, reclaimed strip mines, and in grazing areas.

Fire Behavior Fuel Model 5 (NFDRS model D)
Eastern hardwood forest with a thick, almost impenetrable understory of rhododendron or mountain laurel up to 6 feet high. This fuel model is typical on the steep sloped portions of the gorges and along interior drainages.

Fire Behavior Fuel Model 6 (NFDRS model F)
Areas of thick post oak (Quercus stallata) and black locust (Robina pseudoacacia). This fuel model is typically found on abandoned, unreclaimed strip or deep mine areas or other areas of extremely disturbed soils and vegetation. Growing on thin strata of soil, it may overlay ignitable deposits of coal refuse.

Fire Behavior Fuel Model 8 (NFDRS model R)
Closed canopy stands of hardwoods that have leafed out. Fires are supported in a compact litter layer. This layer is mainly leaves, twigs and needles. Little undergrowth is present. Typical fuel loadings are 3 tons per acre (Burgan 1988). This fuel model is pedominate across the protection area throughout the summer.

Fire Behavior Fuel Model 9 (NFDRS model E)
Loose concentrations of litter in hardwood stands. Typical fuel loadings are 4.75 tons per acre (Burgan 1988). This is the primary characteristic fuel model throughout the fall fire season and during periods of late summer drought.

Fire Behavior Fuel Model 11 (NFDRS model K)
Eastern hardwood forest where slash and herbaceous material are intermixed. The spacing of the rather light fuel loading, shading from overstory, or aging of fine fuels can contribute to lowering fire potential. The < 3 inch material load is under 12 tons per acre (NFES 1981). This fuel type is typical of hardwood stands in which merchantable timber was largely removed before being acquired by the NPS.

Table 2 correlates the vegetation type, the National Fire Danger Rating System (NFDRS) and the Fire Behavior Prediction System (FBPS) fuel models.

Table 2: Fuel Models by Vegetation Type

Vegetation Type	NFDRS Fuel Model	Fire Behavior Fuel Model
Grasses	L	1
Brush	D	6
Pine/Hardwood Forest	R/E	8/9
Hardwood Shrub	D/F	5/6
Slash	K	11

4. Fire Regime Alteration:

Fire has not played a major role in shaping the character of the vegetation of park over the past 50 years. The exclusion of fire by aggressive control policies has allowed forest succession to progress toward the mixed-mesophytic forest type. As the pine species die they are largely being replaced by more tolerant hardwood species.

The progression toward the mixed-mesophytic forest type has led to a more closed canopy. The resulting increase in canopy shade has greatly favored the shade tolerant understory species the ericads such as mountain laurel (*Kalmia Latifolia*), white rhododendron or rosebay (*Rhododendron maximum)*, and blueberries (*Vaccinium sp*) and other shade tolerant species. This understory generates an increased fuel load that will burn as a surface fire under normal conditions, but can result in stand replacing fires under drought conditions.

5. Control Problems:

The slopes of the major drainages are typically very steep. The terrain above these drainages is generally located on rolling hills. Farms, subdivisions, individual houses, roads, and other developments are all common throughout the area. While these developments provide frequent breaks in the burnable vegetation and are good access for suppression resources, they also increase the values at risk and the probability of an ignition.

Control problems could range from extreme to low depending on site specifics and burning conditions. Under normal fire season conditions control problems could be expected to be low to moderate.

6. Elements Affecting Management:

The wildland urban interface situation is an important consideration for the park. The park is in a Class II airshed, but with the interface situation smoke from any fire management operation is a primary concern. Protection of neighboring private property, park developments and historic resources is of paramount importance.

IV WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

A. General Implementation Procedures

A wildland fire implementation plan (WFIP) will be initiated for all wildland fires. This plan will provide the framework for determining the appropriate management response. The WFIP Stage I: Initial Fire Assessment will be the responsibility of the incident commander or the park's FMO of unscheduled starts. As the park FMU only allows for suppression, the requirement for a decision checklist as a part of the stage I analysis can be considered met. Subsequently, stage I analysis may be satisfied at the programmatic level in the FMP through determinations made by combinations of values to be protected and/or fire behavior thresholds. A copy of the WFIP Stage I form can be found in Appendix D.

B. Wildland Fire Suppression

1. Range of Potential Fire Behavior:

The fire behavior described below can be expected under average spring and fall fire seasons conditions. A combination of drought, high wind, low humidity, and high temperatures can greatly increase expected fire behavior.

Fuel Model 1: Generally exhibits moderate intensities with average rates of spreads 50-70 chains per hour and flame lengths of 3-4 feet. The fine, continuous herbaceous fuels that are cured or are nearly cured govern fire spread. Fires are surface fires that move rapidly through the grass and associated materials.

Fuel Model 5: Generally exhibits high rates of spread, approximately 16-20 chains per hour, with average flame lengths of 3-4 feet. Fires are not very intense because surface fuel loads are light and the shrubs have little dead material. During drought periods, rhododendron fuels become volatile and increased fire behavior can be expected.

Fuel Model 6: Generally exhibits moderate to high intensities. Horizontal continuity with surface fuel components dictates intensities. Torching and spotting may occur under normal burning conditions. Moderate winds (greater than 8 mph mid-flame wind spread, MFWS) are required to carry fire through the shrub layer. Fire will drop to the ground at low wind speeds.

Fuel Model 8: Generally exhibits low rates of spread, approximately 8-10 chains per hour, with average flame lengths of 2-3 feet. Slow burning ground fires are typical with occasional flare-ups caused by heavy fuel concentrations. This fuel model is typical for winter, spring and summer periods where fuel compaction and moisture content are primary influences. Under severe weather conditions involving high temperatures, low relative humidities and high winds, moderate fire behavior may occur and pose fire hazards.

Fuel Model 9: Generally exhibit faster rates of spread (greater than 10 chains per hour) and longer flame lengths (greater than 4 feet) than fuel model 8. Typical of fall fires in

hardwood stands, however high winds can cause higher rates of spread than predicted because of spotting from rolling and blowing leaves. Concentrations of dead and down material will contribute to torching of trees, spotting and crowning.

Fuel Model 11: Generally exhibits moderate rates of spread, approximately 5-9 chains per hour, with average flame lengths of 3-4 feet. Fires are fairly active in both the "dead-and-down" fuel component and in the herbaceous material intermixed with the slash. Rates of spread greater than 9 chains per hour and flame lengths greater than 4 feet are possible where fuels are continuous or influenced by the wind.

Table 6 illustrates the comparative rates of spread and flame lengths for different fuel models at a fuel moisture content of 8%, a midflame windspeed of 5 miles/hour live and, if present, a fuel moisture of 100%.

Table 3 Fuel Model, Rate of Spread and flame Length

Fuel Model	Rate of Spread (chains/hr)	Flame Length (feet)
1	78	4
5	18	4
6	32	6
8	2	1
9	13	3.5
11	6	4

(Anderson, 1982)

2. Preparedness Actions

a. Fire Prevention, Community Education, and Assistance Programs

Human-caused ignitions within the protection area account for more than 98% of all documented fires. Development along the west-central boundary, near Beckley, increases yearly. These new sub-divisions result in acres of urban-interface abutting NPS property. Increased boundary pressures and visitation, acquisition of new property, traditional agricultural and industrial uses and arson, the potential for human-caused ignitions remains high.

An active wildfire prevention program is necessary to minimize the risk to life or property and the destruction of irreplaceable park resources.

The goals of this program are:

- Utilize agency guidelines and partnership efforts with cooperators to carryout an effective fire prevention program.

- Integrate prevention into park operations and encourage employee participation.

- Establish and update alternatives that will serve the local community and complement the programs established by local cooperating agencies.

- Utilize effective law enforcement patrols and investigation to deter intentional arson.

- Work with neighboring volunteer fire departments, West Virginia Division of Forestry to establish common protocols and procedures identify training needs, conduct joint training when possible and develop strategies for safer and more efficient fire management operations.

The following programs are established to direct the plan of the park.

Education: Maintain public awareness, understanding and support for visitors and neighbors by:

- Establishing centralized information points at all visitor centers and headquarters buildings. Locating signs, posters or bulletin boards with fire prevention messages in appropriate areas for exhibit. Disseminating printed material at the buildings and include such messages in all park printed material.

- Providing printed prevention material to park employees and increase prevention awareness through formal presentations, training and practice.

- Increasing visitor contacts during periods of high fire danger in developed and backcountry areas.

- Contacting adjoining property owners and educate park neighbors in methods to increase fire safety and promote fire prevention.

- Initiating media campaigns throughout the protection area to establish the NPS commitment to fire prevention through use of press releases, special news articles, photo opportunities and tours.

- Participating in local parades, fairs and other "outreach" programs to disseminate prevention and prescribed fire messages.

- Developing and present school programs designed to teach wildfire awareness, management and prevention.

Engineering:

- Evaluate park facilities, structures and developed areas for potential risks and hazards caused by proximity of hazard fuels.

- Integrate fire resistant construction techniques into park planning and contracting projects for new facilities.

- Develop projects that include but not be limited to, removing vegetation from around structures, creating firebreaks in high-risk areas, and using spark arresters on internal combustion engines and fireplaces. Projects will be coordinated with the district maintenance foreman. Fire resistant construction planning will be coordinated through the chief of maintenance.

Enforcement:

- Actively enforce and gain compliance with fire laws and regulations of the park.

- Aggressively investigate all fires where the cause is arson or unknown.

- Restrict fire use, public access and park operations as required in times of high fire danger.

b. Annual Training Activities:

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

The FMO will be responsible for organizing the training required to meet park expectations for red-carded firefighters. When advanced or specialized training is necessary, the FMO will work through the regional fire management office to obtain funding and enrollment. The FMO will coordinate the park's fire training needs with those of other nearby parks, cooperating agencies, and the region.

Basic wildfire training refreshers will be offered annually for red-carded firefighters. Additional training will be given in pump and engine operation, power saws, firefighter safety, fire weather and fire behavior, helicopter safety, and park prescribed fire objectives and activities. Extensive on-the-job training is encouraged and conducted at the field level. Whenever appropriate, the use of fire qualification position task books will be used to document fire experience of trainees.

In addition, during general seasonal orientation, all seasonal personnel will receive instruction in:

- Purpose and objectives of the fire management program.

- Prescribed fire actions conducted and planned.

- Use of fire in vegetation management.

- Public, employee, and firefighter safety during suppression and prescribed fire operations.

c. Annual Readiness Activities

Pre-Season Risk Analysis - A risk analysis will be prepared by the FMO prior to the beginning of fire season(s) and at any other period when the potential exists for critical fire activity. The risk analysis contains weather analysis, drought severity, and associated trends that may contribute to limits of acceptable control.

Supplies, Materials and Equipment - The park will maintain one fire cache in each district. Caches are located at Glen Jean and Grandview. Each district will maintain a "working" fire cache at a minimum level to outfit a 20 person crew; including personal protective equipment and handtools in each district.

The following outline details the calendar year fire management program for the park:

January:

- Permanent employees' physical fitness exams.

- Archive training and experience records of seasonal personnel.

February:

- Meetings with cooperators; final review and revision of interagency agreements.

- Submit proposed revisions of fire management plan to the regional FMO for review.

- Coordinate emergency dispatch procedures with the regional FMO and the Eastern Interagency Regional

Coordination Center at Shenandoah National Park.

- Inventory fire cache: all tools, equipment, kits, and supplies fire ready; order needed personal protective equipment and tools.
- Semi-annual service of slip-on pump, power saws, and other equipment.

March:

- Meeting with West Virginia Division of Forestry regarding smoke management.
- Permanent employees' physical fitness scores due.
- Meeting or discussion with representatives from the regional fire management office to review plans and current program.
- Review with concerned park staff of approved fire management plan revisions and plan prescribed fire activities.
- Meeting with cooperators to review approved fire management plan revisions.
- Distribution of fire management plan to cooperators.
- Preseason planning completed; all cooperative agreements revised and in effect.
- Issue red cards to permanent personnel.
- Annual firefighter training refresher.
- Coordinate fire weather program notification with nearby parks.

- Implement step-up plan and adjust level of readiness in response to changing fire danger levels.
- Probable start of spring fire season.
- Update the fire callout list.

April:

- Continue planning for prescribed fire program.
- Update fire experience and training records for red-carded personnel.

May:

- Maintain fire contacts with representatives from the regional fire management office, nearby park fire managers or FMOs, and cooperators.
- Continue planning for prescribed fire program.

June:

- Physical fitness testing for seasonal personnel.
- Draft FIREPRO budget request and submit to Northeast Region fire management office.
- Issue personal protective equipment to seasonal personnel, if necessary.
- Participate in annual seasonal fire training.
- Issue red-cards to seasonal personnel.

- Issue updated fire call-out list to the regional FMO, nearby parks, and cooperators.

- Probable end of spring fire season.

July:

- Conduct semi-annual service of slip-on pump, power saws, and other fire equipment.

August:

- Meet with finance personnel on status of outstanding fire orders or requisitions.

September:

- Update park fire callout list

October:

- Review interagency agreements, draft revisions as necessary, and submit to the chief park ranger for approval.

- Inventory fire cache and requisition replacement equipment and supplies to maintain approved levels.

- Submit proposals for annual training to superintendent for review.

- Forward nominations for interagency fire training to the regional FMO.

- Probable start of fall fire season.

- Preseason planning completed.

- Update the fire callout list.

- Implement step-up plan and adjust level readiness in response to changing fire danger levels.

November:

- Maintain fire contacts with representative from the regional fire management office, nearby park fire managers or FMOs and cooperators.

December:

- Archive weather records.
- Compile fire atlas for completed season from fire log; prepare annual summary report.
- Probable end of fall fire season.
- Forward outstanding fire reports to Northeast Region fire management office.

d. Fire Weather and Fire Danger

Weather Station: The station number is 464901. The location is at Grandview Ranger Station located approximately 10 miles northeast of Beckley, Raleigh County, West Virginia.

National Fire Danger Rating System: The BI is used to determine the breakpoints for the step-up staffing plan. The numeric range for each level is shown in Appendix E.

e. Step-Up Staffing Plan

This staffing assessment will be used in the event of multiple lightning or human-caused fires and carry over to prescribed fires. Minimum staffing levels will be considered annually in the fire management plan and the prescribed fire plan to prevent over-extension of out-of-park call-out commitments for overhead positions and crew personnel. The following actions will be taken to ensure adequate fire preparedness.

Level I: No activity necessary. Normal eight (8) hour tours of duty. Red-carded employees are available to

respond and take necessary action on any fire reported.

Level II: Normal eight (8) hour tours of duty. Fire equipment and supplies serviced and prepared for use. On-duty patrol rangers are in the field during afternoon hours with fire tools in patrol vehicles.

Level III: Normal eight (8) hour tours of duty. The park is prepared to respond to a fire. All relevant personnel know locations of red-carded personnel. Red-carded personnel have fire tools and personal protective equipment immediately available in their work vehicles or at their work site.

Level IV: All activities in preparedness level III are continued. Approval for expenditure of emergency preparedness funds resides at the park. Tours of duty may be extended to 7 days per week, ten (10) hours per day. Increased prevention and detection patrols are conducted. Minimums of two (2) red-carded firefighters are on duty during the burning period (to at least 1800 hours). Longer hours of coverage are initiated for certain key positions (chief park ranger/district ranger, FMO, natural resource specialist, park information officer). Lieu days and leave may be cancelled for red-carded firefighters. Cooperatives are contacted and activities coordinated (West Virginia Division of Forestry, volunteer fire departments) in an effort to provide consistent information to the public and park neighbors. High fire danger notices will be posted in visitor centers and at site bulletin boards.

Level V: All activities in preparedness level IV are continued. Minimums of four (4) red-carded firefighters are on duty during the burning period (to at least 2000 hours). All fires may be prohibited including the use of fire grates, grills, and stoves. Restrictions and closures of park areas may be deemed necessary. Interpretive activities will include a fire safety message.

3. Pre-Attack Plan

No written or formal pre-attack plan exists for the park. Volunteer fire departments each have developed their own protocols and procedures for initial attack of fires within the park boundary.

4. Initial Attack

Initial attack will be rapid and efficient for all wildfires in the park, or when assistance is requested from a cooperator. The FMO is responsible for initial attack and will assign an Initial Attack incident commander. The FMO will coordinate initial attack actions during extended emergency preparedness and severity periods and for cooperator mobilization requests. Size-up information will be recorded by the initial attack incident commander and forwarded to dispatch (Raleigh County Emergency Operations Center). Size-up information will also be used to complete stage 1 of the WFIP. Dispatch will relay the size-up information to the FMO who will make appropriate notification to the regional FMO, superintendent, and other park staff. The following information is shown in the NWCG Initial Response Pocket Guide, January 2002 and will be used to size-up the fire:

- Incident Name
- Location
- Jurisdiction
- Radio Frequencies
- Incident Size
- Fuel Type
- Wind Speed and Direction
- Slope and Aspect
- Best Access
- Special Hazards or Concerns
- Additional resource Needs

The incident commander is responsible for the fire until relieved or until the fire is declared out.

If initial attack is not successful at holding the fire under 10 acres or achieving control within 24 hours, or the incident commander determines that the fire situation will require a more complex organization, the FMO will assign an extended attack IC (Type III IC) and initiate an extended attack fire organization.

a. Priority Setting During Multiple Fire Occurrences:

- Vegetative cover map; any fire with continuous fuels up to and across the NPS boundary or structures.
- Cultural and historic site map.
- Park facility map.

b. Criteria For Appropriate Initial Attack Response Consistent with GMP/RMP Objectives:

- Public and firefighter safety.
- Protection of cultural, historic, and natural resources.
- Protection of improvements and private property.
- Minimum fire-line construction.
- Available suppression resources and response times.
- Fire danger as determined by fuels, weather, and topography.
- Use aircraft and mechanized equipment only where necessary to support above-listed criteria.

Charts for helping determining the appropriate management response are in Appendix F. These charts consider such

factors as fire danger, risk, threats, objectives, time of season, external influences, and complexity.

c. Confinement as a Strategy:

- Confinement may be used to minimize resource damage and to provide for firefighter safety.
- A confinement strategy may be selected for initial attack as long as it is not being used solely to meet resource management objectives.
- Resource benefits may be a by-product, but the strategy must be based upon the criteria listed above.
- A confinement strategy may also be selected in the WFSA process when initial attack has failed to contain a wildland fire.

d. Response Times:

Response Time for initial attack ground resources is approximately one hour or less depending on proximity, accessibility, and other such variables. Extended attack resources should be able to respond in two to six hours, again depending on proximity and availability. Aviation resources will have the greatest range of response time. This time can vary from two hours to an indefinite period of time depending on seasonality, regional severity, fire priorities, availability, and proximity. Air tankers are stationed in Knoxville, Tennessee, Asheville, North Carolina and at Weir's Cave Shenandoah Valley in Virginia during periods of high fire danger. These resources can be moved both seasonally and daily according to fire danger and occurrence.

e. Restrictions and Special Concerns:

The constraints on these strategies concern the manner in which a wildfire will be suppressed, or a prescribed fire will be managed. These constraints include:

- Use of rubber-tired vehicles (rather than tracked vehicles) involved in fire suppression, prescribed burning, and mechanical hazard fuels reduction projects to minimize the potential of disturbing archeological sites. Avoiding wet and fragile soils, staying on surfaced roads when possible, and making broad rather than sharp turns are other means of further reducing ground disturbance.

- Use of water and/or natural barriers as much as possible rather than construction of handlines to contain wildland and prescribed fires to minimize the potential of disturbing archeological sites.

- A suite of mitigation actions, used either individually or in combination, to reduce the potential effect of wildland fires and suppression actions on historic structures. These include blacklining around the structures, treating with fire retardant foam concurrent with fires, wrapping with heat reflective materials, and establishing sprinkler systems on and around structures concurrent with wildland fire suppression activities.

- Contact the park's natural and cultural resource specialists concurrent with the detection of wildland fires and during planning stages of hazard fuels reduction projects and prescribed burns.

- Monitor fire management activities and halt work if previously unknown cultural resources are located; protect and record newly discovered resources.

- Brief suppression, prescribed fire, and hazard fuels personnel about protecting cultural resources.

- In fire suppression operations, protection of structures and features will be more important than minimizing acres burned.

- Minimum impact suppression tactics would be employed in all tactical operations except as noted below.

- Fire retardant, if used, must be on the approved list of retardants used by the U.S. Forest Service and USDI Bureau of Land Management. Fire retardant would not be used within 300 feet of surface water resources.

- Motorized equipment would not normally be used off of established roadways in the park. However, due to potential rapid rates of spread and the emergency nature of fires near the boundary, off-road use of motorized equipment, such as all-terrain vehicles and wildland fire engines, may be authorized by the superintendent.

- All extended attack and prescribed fire operations would have a park employee designated and available to assist suppression operations as a resource advisor. If qualified employees were not available, a resource advisor would be ordered through the interagency dispatch system.

- Contact the park geologist concurrent with the detection of wildland fires and during hazard fuels reduction projects.

- Helicopters may be used to transport personnel, supplies and equipment. Improvement of landing sites would be kept to a minimum and would include consultation with the assigned resource advisor. Helibases and landing sites would be rehabilitated to pre-fire conditions to the extent reasonably possible.

- Suppression actions would avoid aerial and ground applications of retardant or foam within 300 feet of identified water sources.

- Except for spot maintenance to remove obstructions, no modifications would be made

to roadways, trails, water sources, or clearings. All sites where modifications are made or obstructions removed would be rehabilitated to pre-fire conditions to the extent reasonably possible.

- Earth moving equipment such as tractors, graders, bulldozers, or other tracked vehicles would not be used for fire suppression or prescribed fire. If special circumstances warrant extreme measures to ensure protection of life or particularly valuable resources, the superintendent may authorize the use of heavy equipment. Such use would probably be restricted to the park boundary near residences.

- Fireline location would avoid sensitive areas wherever possible. Such sensitive areas as identified by the park may include cultural or natural resources, pipelines, and other resources or facilities as may be damaged by fire suppression efforts.

- Following fire suppression activities, firelines would be re-contoured and water-barred.

- Unless required for suppression or safety reasons, snags should not be falled; they should be retained for wildlife benefit.

- Burned areas would not be reseeded unless there are overriding concerns about establishment of invasive non-native species. Any reseeding would be with native species and occur only with the superintendent's prior approval.

- Low level flights can be hazardous considering numerous telephone and power lines that cross the rivers and canyons of the park. Prior to any low level flight in the park a check will be made to identify any known aerial hazards that may be in the flight path. A map of these known hazards can be found in Appendix G.

f. Local Issues:

The park uses local volunteer fire departments and the State of West Virginia resources for assisting in initial and extended attack. This close alliance requires that the park work closely with these agencies in planning, training, preparedness, and other fire management issues.

The NPS will be the lead agency and responsible for managing all prescribed fires within the three parks including lands within the wildlife management area of the BLUE.

Many park visitors appropriately utilize fire to enhance their recreational experience. It is the park's policy that campfires or warming fires will be permitted within the protection area as long as the fire is used in accordance with NPS regulations and applicable West Virginia Forest Fire Laws.

Prescribed fires by lessees or cooperators will only be authorized when in compliance with National Wildfire Coordination Group (NWCG) requirements. Prescribed fires ignited under these terms, must comply with the prescribed fire regulations of the West Virginia Division of Forestry and applicable West Virginia State Forest Fire Laws. Fires ignited by lessees or cooperators under such existing agreements that exceed prescription will be considered wildfires and suppressed.

5. Extended Attack and Large Fire Suppression

a. Extended Attack Needs:

Extended attack needs will be determined by considering the following:

- Threats to life, property, and NPS resources.
- Availability of suppression forces.
- Current and expected fire behavior.

Additional resources and air support will be ordered through the Eastern Inter-Regional Coordination Center, Shenandoah National Park.

b. Implementation Plan Requirements - 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.

The WFSA is a decision process that employs a systematic and reasonable approach to determine the most appropriate management strategy for a particular situation. Reasonable management alternatives are identified, analyzed, and evaluated, and are consistent with the expected probability of success /consequences of failure. The superintendent shall approve the WFSA and any revisions. Evaluation criteria include firefighter safety, anticipated costs, resource impacts, and social, political, and environmental considerations. The evaluation of alternatives becomes the triggering mechanism for re-evaluation of the WFSA.

A written copy of a WFSA can be found in Appendix H. An electronic version can be found at the U.S. Forest Service website at http://www.fs.fed.us/fire/wfsa/.

c. Incident Management Transition:

The superintendent will approve requests to mobilize a local or national incident management team (Type II or I) into the park. The FMO will coordinate transitions to the incident management team. The superintendent or acting superintendent will represent the park at the initial meeting, issue the delegation of authority, approve the WFSA, and approve the agency advisor to the team.

Transition to an incident management team entails a briefing by the superintendent and a limited delegation of authority for the suppression of the fire(s). The briefing should address agency specific concerns, priorities, firefighter and public safety, economic and resource concerns, and other topics or issues of importance and relevance to the suppression effort.

d. Delegation of Authority:

An example of a delegation of authority from the superintendent to the incident commander is located in Appendix I.

e. Mobilization Plan: The purpose of the fire crew mobilization plan is to facilitate park-wide teamwork and to provide rapid initial attack for both in and out of park fires. This plan is located in Appendix J.

6. Exceeding WFIP and New Strategy Selection

A wildland fire implementation plan is a progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits. An example can be found in Appendix D.

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. Then, a wildland fire situation analysis must be developed. When completed the WFSA will develop a new strategy by which the fire should be managed.

7. Minimum Impact Suppression Tactics

- All fire management activities in the park will rely on tactics, which do a minimum amount of resource damage while maintaining the safety of firefighters, personnel, and the public as the highest priority.

- Complete minimum impact guidelines are listed in Appendix K.

8. Rehabilitation Guidelines

When suppression action is taken, rehabilitation is appropriate. 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 most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression tactics.

Rehabilitation work resulting from suppression actions will be charged to the corresponding suppression account. Work needed to rehabilitate the effects of the fire will be described in the BAER plan and will be submitted to the regional BAER coordinator (prescribed fire specialist) for approval within one week 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.

The incident commander in conjunction with the natural resource and/or cultural resource specialists will initiate rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential hazards caused by the fire:

- Backfill control lines, scarify, and seed with native species.
- Install water bars and construct drain dips on control lines to prevent erosion.
- Install check dams to reduce erosion potential in drainages.
- Flush cut stumps and camouflage with soil and moss.
- Place cut vegetative materials in random positions.
- Position felled and bucked material so as to be least noticeable to visitors and camouflage where possible.
- Restore natural ground contours.
- Remove all flagging, equipment and litter.
- Completely restore camping areas and improved helispots.
- Consider and plan more extensive rehabilitation or revegetation to restore sensitive impacted areas.

9. Records and Reports

The FMO is responsible for all fire related records and reports except the WFIP. This responsibility may be delegated to an incoming incident commander for any fire escaping initial attack.

C. Wildland Fire Use

This option was rejected due to the smaller size of the park units, the significant degree of wildland urban interface along the park boundary and the lack of available qualified personnel required to manage these fires.

D. Prescribed Fire

The park will give due consideration in scheduling the ignitions of prescribed fires in accordance with Chapter 20-3-10 of the Laws of the West Virginia Division of Natural Resources, if resource management objectives can be met.

1. Planning and Documentation

a. Annual Activities for Preparation and Implementation of Program

The 5-year plan can be found in Appendix L. The FMO will annually consider proposed burns and fuel reduction projects for the year. An assessment of the approved plans will identify need resources, individual responsibilities, and timelines. These activities include writing burn plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

b. Long-Term Prescribed Fire Strategy

The purpose of prescribed burning at the park is to protect and preserve the cultural resources of the park, manage vegetation, and reduce fuel loading. The fuels management program complements the fire management program by reducing fire hazards, decreasing the potential damage to park resources and outside lands, and minimizing risks to employees, residents and visitors. Prescribed fire objectives will be to:

- Reduce fuel accumulations around developed areas and along the park boundary.
- Reduce understory vegetation based on the results of fire history research.
- Manage vegetation to maintain vistas and to promote the growth of native vegetation.

- Assist with the establishment and maintenance of the historic scene.

- Restore and maintain fire adapted ecosystems.

c. Needed Personnel

The park may not have sufficient personnel to manage a prescribed fire. Personnel needed for a specific burn will be identified in the projects burn plan. The park will participate with other nearby agencies in a coordinated approach to mutual prescribed fire programs. The regional fire management office will assist this coordination when requested.

d. Fire Weather, Effects, and Behavior Monitoring

Monitoring of prescribed fires at park 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. In addition, ecological changes such as species composition and structural changes will be monitored for several years after a fire. This information will be very useful in adjusting the prescribed fire program to better meet short and long-term resource objectives.

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. The FMO will establish specific fire information guidelines for each fire to update intelligence about the fire.

The FMO will assure that assigned qualified personnel are used to monitor prescribed fires. The most efficient utilization of personnel for fires of low complexity will be to

utilize individuals with multiple qualifications when possible (ignition, holding, and monitoring). By being able to suppress the fire, assess its potential, characterize and quantify its effects, and determine if it is within prescription, an efficient and flexible monitoring program will result.

The park will use the fire effects monitoring protocols with adaptations described in NPS Fire Monitoring Handbook.

e. Prescribed Fire Project Critique

The FMO will critique each prescribed fire. A report detailing the actual burn will accompany any recommendations or changes deemed necessary in the program. This report will be submitted to the superintendent. A post-season critique of the fire management program, including the prescribed fire program, will be held each year by the FMO at the conclusion of the fall fire season.

The park will use the fire monitoring protocols described in NPS Fire Monitoring Handbook. Fire monitoring support will be coordinated with the area fire ecologist based at Shenandoah National Park.

f. Reporting and Documentation Requirements

All prescribed fire forms will be completed as outlined by the prescribed burn boss. A fire monitor will be assigned to collect all predetermined information and complete all necessary forms prior to, during, and after the fire. All records will be archived in the park's fire records for future use and reference.

The prescribed burn boss will prepare a final report on the prescribed fire for the FMO. Information will include a narrative of the fire operation, a determination of whether objectives were met, weather and fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn.

The forms necessary for documenting prescribed fire activities are outlined in RM-18 (Wildland Fire Management). The Individual Fire Report, DI-1202, is the responsibility of the prescribed burn boss. The Case Incident Report, 10-343, is also the responsibility of the prescribed burn boss,

and documents all personnel and equipment costs involved in the burn.

g. Historic Fuel Treatment Map

A historic fuel treatment map will be developed and located in Appendix M of this plan.

h. Local Prescribed Burn Plan Requirements

West Virginia forest fire laws state: "*The periods of each year between March 1 and May 31, inclusive, and October 1 and December 31, inclusive, are hereby designated as Forest Fire Seasons."*

The laws add: "*No person shall during ANY such fire season, except between the hours of 4:00 p.m. and 7:00 a.m. prevailing time, set on fire or cause to be set on fire any forest land, or any grass, grain, stubble, slash, debris, or other inflammable materials. Any fire set during this time shall be extinguished prior to 7:00 a.m. prevailing time. Such prohibition of fires between 7:00 a.m. and 4:00 p.m. prevailing time shall not be construed to include (1) small fires set for the purpose of food preparation, or providing light or warmth around which all grass, brush, stubble, or other debris has been removed for a distance of ten feet from the fire, and (2) burning which may be conducted at any time when the ground surrounding the burning site is covered by one inch or more of snow."*

While the park is not legally bound, it will attempt to comply with these laws, unless there exists compelling reason to conduct a prescribed burn in order to meet resource management objectives.

General parameters for debris burning are:

- Temperature: Less than or equal to normal average high temperature for the month, degree F.
- Wind Speed: Less than 10 mph.
- Relative Humidity: Greater than 40%.

- Fine Fuel Moisture: Surrounding fuels greater than 10%.

- Smoke Dispersal: Mixing heights equal to or greater than 500 meters.

2. Exceeding Prescribed Burn Plan

If the prescribed fire exceeds prescription, leaves the burn unit, and immediate suppression efforts fail the fire will be declared a wildfire 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 may be requested to assume command of the fire.

3. Air Quality and Smoke Management

a. Air Quality Issues:

The park is located in a Class II air quality area and is in a non-attainment area for ozone. The fire management plan will be in compliance with the Clean Air Act and West Virginia's Division of Air Quality requirements. The objectives for smoke management and compliance with the Clean Air Act are similar to those for fire management: to encourage a natural process so long as it does not endanger public health and safety. Smoke levels become unacceptable when they impair visibility to such a degree that they detract from visitor enjoyment of the primary park resource with emphasis on the vistas of the park. Dense smoke within the park is generally unacceptable, however, it may be tolerated for short periods if the winds assure good mixing. The park will also evaluate the forecasted impact of smoke on local communities and visitor safety. All of these considerations are difficult to quantify, monitor, and evaluate, and there will exist considerable room for discretion.

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:

The park will notify the West Virginia Division of Forestry (WVDF), at the time of any fire ignition. The Park Fire Management Officer will contact the National Weather Service (NWS) to verify the smoke management forecast and consult with the West Virginia Division of Air Quality during the initial fire assessment. For prescribed fires occurring in Summers or Mercer County, the NWS office in Blacksburg, VA will be notified. Burns occurring in Fayette, Raleigh and Nicholas Counties the NWS office in Charleston, WV will be notified. Thereafter, smoke characteristics will be evaluated daily along with the NWS smoke management forecast during prescribed fires. The FMO will provide WVDF with relevant field data for all prescribed fires.

In the fall, when the air stagnates and major burning is conducted around the region (and when there are east winds), smoke management may be a prominent consideration in the actual scheduling of prescribed fires at this time of the year.

The park will coordinate fire specific visibility monitoring. A process will be developed for implementation to determine if adverse impacts to air quality and visibility are occurring from management decisions.

To minimize the effects of smoke the following guidelines will be considered when planning a prescribed fire:

- A detailed smoke vector map will be included in every prescribed burn plan to identify sensitive areas and expected directional flow of smoke.

- Burning will be conducted only when: visibility exceeds 5 miles or when the fire weather forecast indicates the presence of an unstable airmass, afternoon mixing heights are 500 meters or greater, and ventilation rates (mixing height in meters X transport wind speed in meters per second) is 2000 or greater.

- Prescribed fires will not be ignited during West Virginia Division of Air Quality issued air pollution health advisory, alert, warning or emergency, or during temperature inversions. Local police will be used to mitigate traffic hazards from smoke.

4. Restrictions and Special Concerns:

- Prescribed fires will not be planned near cultural and other (e.g. pipelines, power lines) sensitive resources unless adequate planning has assured their protection.

- Prescribed fire wills not be planned within the riparian zones or floodplains on the three parks.

- Park staff will complete Section 106 consultation with the West Virginia State Historic Preservation Officer (SHPO) prior to implementing prescribed fire projects.

E. Non-Fire Fuels Treatment Applications

1. Mechanical Treatments and Other Applications

a. Annual Activities

The FMO will submit proposed project plans to the assistant chief park ranger for approval. The plans will identify needed resources, individual responsibilities, and timelines. These activities include writing project plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits. Proposed projects can be found in the park's 5-year plan located in Appendix L.

b. Equipment and Seasonal Restrictions

- Hazard fuels removal around historic structures would mitigate the potential for impacts from wildland fires. Park staff will complete Section 106 consultation with the West Virginia State

Historic Preservation Officer (SHPO) prior to implementing hazard fuel reduction projects.

- Park staff will complete Section 7 consultation with the U.S. Fish and Wildlife Service prior to implementing prescribed fire and hazard fuel reduction projects.

- Other standard cultural resource mitigation measures include the following: prior to doing treatment work, conduct an inventory of previously unsurveyed areas using an archeologist who meets the Secretary of the Interior's standards; dispose of slash in areas lacking cultural sites; avoid ground disturbance in areas containing known cultural sites; prior to implementation of work, protect character-defining elements of potential cultural landscapes.

- Off road vehicle or equipment will be reviewed for compliance and approved by the superintendent for each project.

- Off road vehicle use will be reviewed for compliance and approved by the superintendent for each project.

c. Required Monitoring

Monitoring will be done to determine if the project objectives were met. This monitoring may be through the use of photo plots, vegetation transects, or a visual assessment.

d. Critique Format

The project supervisor will meet with the FMO and the resource management specialist to critique the project. Accomplishment of objectives, methodology, cost effectiveness, safety issues, and resource damage are some of the topics to be discussed. A written project completion report incorporating the findings of the critique will be forwarded to the regional fire management office.

e. Cost Accounting

Individual project costs will be tracked by the park and submitted to the regional fire management office for review. Expenditures will not exceed the authorized project amount.

f. Reporting and Documentation

The FMO will maintain reports and documents. Pertinent fire information to be retained includes, but is not limited to; individual fire reports; incident action plans; outgoing and incoming correspondence; fire training schedules; qualification reports, weather data, situation reports, prescribed burn plans, and hazard fuels project reports.

Incident commanders are responsible to complete the DI-1202, Individual Fire Report and forward the original through the Subdistrict Ranger to the appropriate district ranger for review. The FMO will assign the park fire number and obtain a suppression account number through the National Fire Code System. The fire management program assistant will enter the completed DI-1202 into the NPS Wildland Computer System.

The DI-1202 will be accompanied by;

- Unit logs, personnel lists, and resource orders.
- Map of the fire area (copy of a 15 minute or 7 1/2 minute quad map, must show legal description).
- Dispatch log and telephone log.
- Aircraft documentation.
- Incident action plans.
- Photographs/slides/videos.
- Press clippings.
- Accident reports;
- Performance ratings.

- Other pertinent documents.

The FMO is responsible for maintaining the following systems:

- Situation reporting through use of the NPS wildland fire computer system, as required.
- Weather systems and fire behavior indices as required for step-up planning.

g. Annual Planned Project List

Any division chief may submit proposed projects to the FMO. The FMO will compile a list of these projects and submit them to the chief park ranger for approval and prioritization.

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 FMO and the natural resource specialist, subject to review by the superintendent, will jointly formulate a rehabilitation plan for each fire.

The BAER plan will be submitted to the regional BAER coordinator (prescribed fire specialist) for approval within one week of the date the fire is declared controlled. BAER project requests totaling $300,000 or less can be approved by the regional BAER coordinator (prescribed fire specialist). Submissions over this amount are reviewed at the regional level and forwarded to the NPS fire management program center for approval.

Rehabilitation is any action taken to restore an area to its pre-burn or natural condition. Incident commanders are responsible for immediate actions to mitigate the effects of fire suppression activities. Immediate rehabilitation actions will be outlined in the incident action plans.

Rehabilitation will occur on all fires according to the following standards and techniques:

- Remove all trash and debris from firelines, staging areas, helispots, incident command post and other incident locations. Attempt to return such areas back to their original condition.

- Flush cut all stumps that were disturbed or created on the incident.

- Scatter brush and debris from suppression activities over constructed firelines. Break-up slash piles.

- Remove dams constructed to enhance pumping operations in streams and creek beds.

- During mop-up operations, use cold trailing techniques and/or water or foam.

- Fill in firelines with leaf litter, and brush material. Construct water bars to prevent erosion when necessary.

- Reseed, with native grass seed, firelines outside of the park if significant impact was caused. Firelines inside the park may be seeded only if determined to be an erosion hazard and a plan is completed and approved by the resource management specialist.

V. ORGANIZATIONAL AND BUDGETARY PARAMETERS

A. Organization Structure of Fire Management Program

This section discusses areas of responsibility for implementation of the fire management program by specific park position. 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. An organization chart is located in Appendix N

Fire management is a park-wide program. It is the goal of the park to involve all employees as members of the fire management team. Those positions are listed below with their responsibilities.

1. SUPERINTENDENT

Approves:

- Fire management plan.

- Delegation of authority for incident management team.

- Prescribed burn plans.

- Provides final approval and daily review of wildland fire situation analysis.

2. CHIEF PARK RANGER

- Responsible for overall fire management program.

3. ASSISTANT CHIEF PARK RANGER

- Supervises the fire management program.
- Manages the aviation program.

4. CHIEF OF RESOURCE MANAGEMENT

- Responsible for the fire effects research program.
- Responsible for the planning of the management ignited prescribed fire program.

5. FIRE MANAGEMENT OFFICER

- Serve as fire management officer for NERI, GARI, BLUE, FRHI, ALPO, JOFL, FONE.
- Responsible for interagency coordination of fire program.
- Has overall responsibility for planning and implementation of all phases of the wildland fire management in park.
- Has overall responsibility for planning and implementing fire prevention program.
- Responsible for the implementation of the management ignited prescribed fire program.
- Plans and implements wildland fire management training program.

6. FORESTRY TECHNICIAN/ENGINE BOSS

- Responsible for the maintenance and management of the Glen Jean and Grandview wildland fire caches.

- Responsible for the maintenance and record keeping for fire management vehicles and equipment.
- Plans and implements initial attack program for NERI, GARI, BLUE.
- Responsible for maintaining the remote automated weather station (RAWS).

7. FIRE PROGRAM ASSISTANT

- Responsible for personnel timekeeping for fire management staff.
- Tracks FIREPRO budget.
- Maintains individual fire training and experience records for NERI, GARI, BLUE and satellite park employees.
- Responsible for tracking of all purchase records.
- Responsible for fire history and fire weather record keeping.
- Responsible for daily situation reporting.
- Documents, fills and tracks resource orders.
- Coordinates all travel for out of park resource orders.
- Transmits ICS-209 on large incidents.
- Responsible for extended attack fire dispatching.

8. RALEIGH CONTROL EMERGENCY OPERATIONS CENTER

- Contact point for smoke reports and initial attack response.

9. DISTRICT RANGERS

- Responsible for all fire investigations on district.

- Participates in park fire management program at level qualified.

- Provides employees for fire management operations and training as much as possible while still providing basic protection for the district.

- Ensure patrol vehicles during fire season(s)are equipped with a combination tool and a pulaski or council rake.

10. AREA FIRE ECOLOGIST

- The area fire ecologist is located at Shenandoah National Park. This individual is responsible for providing fire ecology assistance to the park.

- Requests for assistance from the area fire ecologist will be coordinated through the regional prescribed fire specialist and Shenandoah National Park. Requests should be made as far in advance as is practical.

- Requests for use of the fire effects monitors will be made to the area fire ecologist and the regional prescribed fire specialist.

- The area fire ecologist will provide fire ecology expertise and advice at the planning and implementation levels.

B. FIREPRO Funding

The park has four FIREPRO funded positions including a full time FMO, program assistant, subject-to-furlough forestry technician and a seasonal forestry technician. FIREPRO funding is also authorized for approved fire training, preparedness, suppression, equipment, personal protective equipment, and burned area emergency stabilization and rehabilitation projects. FIREPRO may additionally fund park approved fire and hazard fuel projects.

FIREPRO funds are managed through the Northeast Region fire management office. Requests for FIREPRO funding are made from the park FMO to the regional FMO.

C. Fire Management Organization

The assistant chief park ranger directly supervises the FMO. An organization chart can be found in Appendix N.

D. Wildland Fire Use Certification

This option was rejected due to the smaller size of the park units, the significant degree of wildland urban interface along the park boundary and the lack of available qualified personnel required to manage these fires.

E. Interagency Coordination

An agreement has been signed with the West Virginia Division of Forestry (WVDF) for the purposes of fire management. See Appendix O for a copy of the agreement.

F. Interagency Contacts by Function

See Appendix P.

G. Fire-Related Agreements

A memorandum of understanding provides for mutual response at the request of either the NPS or the West Virginia Division of Forestry. This agreement, through the West Virginia Division of Forestry, also serves as an agreement with the volunteer fire departments in the area. This document can be found in Appendix O.

VI. MONITORING AND EVALUATION

A. Monitoring Programs

The park will implement long and short term monitoring to access accomplishments, and determine the effects of management activities on cultural and natural resources.

The park will work closely with the fire ecologist at and the fire effects monitors located at Shenandoah National Park. The fire ecologist should be consulted concerning possible future prescribed fire plans with regard to potential fire effects and desired conditions. The fire effects monitors assist the park in establishing and reading vegetation plots, and monitoring erosion of earthworks resulting from prescribed fire activities.

B. NPS Fire Monitoring Handbook

This handbook will serve as the source document providing monitoring needs with minor adaptations made for local situations and conditions.

C. Fire Monitoring Plan

A fire monitoring plan is under development at this time and can be found in Appendix Q upon completion.

VII. FIRE RESEARCH

A. Previous and Ongoing Research

There has not been any fire research completed on site at the park. There has been substantial research completed in the areas of fire effects, occurrence, and vegetation that are relevant and applicable to the park's fire management program.

B. Needed Research

As the park's fire management plan is implemented and tested, additional research will inevitably be identified for such purposes as refining prescriptions, improving the understanding of fire behavior and fire effects, refining monitoring protocols, defining fire return cycles, describing fuels dynamics, describing the impacts on cultural resources, and other information needed for operational fire and resource management.

Fire research needs are identified in project statement, NERI-N-006.003 of the New River Gorge National River draft resource management plan (1993). Needs identified in this statement include:

- Study the effects of fire suppression on fire regime.
- Determine the historic role of wildfire in park ecosystem dynamics.
- Conduct a detailed fire history to determine the frequency, distribution, and severity of wildfire (ongoing).

Identified strategies will provide additional guidance for fire research projects in the park. The emphasis will remain on compiling historic information of fire events, determining desired fuel conditions, and continued data collection of fire effects in eastern deciduous forest types.

Fire research projects will be coordinated and guided through the natural resources management specialist.

VIII. PUBLIC SAFETY

A. Public Safety Issues and Concerns

The park is dedicated to ensuring the safety of each visitor and to all residents and property adjacent to the park's boundary with regards to its fire management program. The superintendent may close all or a portion of a unit, including roads and trails when wildfire or a prescribed fire pose an imminent threat to public safety.

B. Mitigation Safety Procedures

The park will implement a notification system to inform visitors of all fire activity through normal communication channels. A fire activity report will be updated, as significant changes occur to inform park personnel of potential fire threat. Areas of fire activity will be clearly signed at visitor centers and park unit bulletin boards. Residents adjacent to the park will be notified in advance of any prescribed fire, and if any fire poses a threat to burn outside the park's boundaries through law enforcement personnel.

IX. PUBLIC INFORMATION AND EDUCATION

The chief park ranger will coordinate fire information issues and activities with the superintendent's office. Public information and education projects will be proactive, support the fire management programs of the NPS, and compliment cooperator's programs to the fullest extent possible. Fire information will be shared with local, state and federal governments, media and interested user groups, neighbors and park employees.

A. Public Information Capabilities and Needs

The park is committed to keeping the public informed of its fire management program and activities. Educational opportunities will be developed to reach as many segments of the public as possible. This will include special interest groups, schools, neighbors, public organizations, and other groups. Materials and programs exist that will help deliver information concerning the role fire plays in preserving and protecting the cultural and natural resources of the park. The regional fire education, prevention, and information specialist is an available resource to the park

for consultation and support. Trained incident information officers are on staff, as of this writing. The park will continue to support the development of incident information officers who may be able to assist fire management staff with public information, particularly during fires.

B. Step-Up Public Information Activities

Information and education are important processes in public participation and (as in, public comment on this plan and related activities) acceptance of the managed fire program at park. The FMO will coordinate public information activities with the assistance of staff from interpretation, resource management, and public affairs and will provide the superintendent with accurate information regarding current fire situations and management activities. The FMO will provide accurate information regarding current fire situations and management activities. The public information program will be developed as follows:

- Concepts of the prescribed fire program will be incorporated, as appropriate, in park publications, brochures, and handouts.

- Prior to the ignition of prescribed fires, the park will notify or contact park neighbors who will or might be affected by fire, smoke or increased traffic in their area.

- During periods when prescribed fires are ignited, handouts will be prepared and distributed to all visitors entering areas of fire activity.

- The fire management program will be incorporated into visitor contacts, interpretive talks, walks, and tour programs, as appropriate. Particular attention will be given when fires are conspicuous from roads or visitor use areas.

- News releases will be distributed to the media as appropriate.

- The public information outlets of neighboring and cooperating agencies, and the regional office will be provided with all fire management information.

- The role of the fire management program at the park will be developed and discussed, as appropriate, in off-site programs and talks.

- The fire management program will be discussed in informal talks with employees of all divisions, concessionaires, contractors, volunteers, residents, and park neighbors.

- Emergency closures or restrictions may become necessary during periods of extreme or extended fire danger. Such closures will necessitate additional coordination and communication with the public and the media.

X. PROTECTION OF SENSITIVE RESOURCES

A. Cultural Resources Needing Protection and/or Treatment

Archeological Sites:

Low intensity fires should have minimal effect on sites that are at or below ground level. However, significant damage could be inflicted through suppression tactics. Therefore, minimal impact actions will be practiced when working on or near archeological resource areas.

Suppression strategies designed to minimize damage or disturbance to underground archeological or historic resources include:

- Restricting use of dozers or bladed equipment to life threatening situations only and with superintendent approval.

- Locating control lines away from potential sites when more damage could be anticipated from line construction than from fire effects.

Historic Sites:

Many cultural resources in the park are aboveground wooden-frame or wooden-frame stone reinforced structures. These remaining structures are at considerable risk from wildfire.

The best method of protecting vulnerable aboveground historic and cultural resources is through a continuing hazard fuel reduction program to remove adjacent fuels and prepare a "defendable space" around structures. Identified aboveground historic and cultural resources will be given high priority in suppression action. Additional suppression alternatives beyond preparing a defendable space include:

- Construction of control lines to protect cultural resources from fire.

- Use of firing techniques to "burn-out" surrounding fuels.

- Use of water and medium to high expansion class A foams to increase the defendable space and provide exposure protection.

- Utilization of structural engines and structurally trained firefighters to increase exposure protection. This option may be limited due to poor access for structural engines in most areas with identified cultural or historic resources.

In areas with multiple historic and cultural resource structures, structural triage may be necessary. Triage considerations should include, but are not limited to:

- Firefighter safety.

- Probability of success in protecting the structure.

- Value or significance of the structure.

The incident commander is responsible for making structural triage decisions based on weighing firefighter and public safety, probability of success, consequences of failure and the values at risk. When possible the park's cultural historian should be consulted prior to or during triage.

The planning of any fire management related project would include a review of the archeological/cultural/historic resources that are present or may be present in the area of operation. The park's cultural historian will be responsible to provide site inventory and identify areas of archeological/ cultural/ historic resources.

B. Natural Resources Needing Protection and/or Treatment

Fire suppression, fuels management, and prescribed fire activities should avoid riparian zones and floodplains within all three parks, to minimize impacts to federally listed species and rare plant communities. When these areas must be impacted suppression strategies and tactics should be designated that minimize effects on vegetation communities in these areas.

Gob piles may require treatment prior to ignition to avoid later expensive and complicated suppressions actions.

Fire suppression strategies and tactics that minimize the fire and smoke effects to bat hibernacula and roosting areas at the 30 mine openings at NERI and GARI.

C. Developments, Infrastructure, and Improvements Needing Protection and/or Treatment

As funding allows, a defensible space will be maintained around developments, infrastructure, and other improvements in the park.

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

The fire management plan will be reviewed and updated annually by the FMO. The annual review will focus on the operations, strategies, responsibilities, and coordination of the fire management program. A comprehensive revision of the fire management plan will be completed on a five-year schedule, beginning on the date of the final approval signature. The incident commander or the prescribed burn boss will initially critique Wildland and prescribed fires. This critique should take place with those directly involved in the management of the fire.

The FMO should review prescribed and wildland fires of significant size, cost, or where minor safety issues or minimal levels of public concern occur. These findings should be forwarded to the regional fire management office.

Prescribed or wildland fires involving an incident management team or significant political, safety, or public issues should be reviewed by the regional fire management office. If a fire generates a major political or public concern, involves multiple serious injuries or a fatality, the NPS fire management program center should conduct or participate in the review.

The FMO will review the fire management plan annually for currency and incorporate changes into the appendix. Changes to the appendices require approval of the chief park ranger. The fire management plan is subject to a comprehensive formal review every five years.

XII CONSULTATION AND COORDINATION

The following people were involved in the formulation and preparation of this fire management plan:

Babcock State Park, Dick Morris, Clifftop, West Virginia

District Wildlife Biologist, Larry Berry, Beckley, West Virginia

Fayette County Commission, Gene Carte, Fayetteville, West Virginia

New River Gorge National River, Peggy Ainslie, Forestry Technician, Beckley, West Virginia

New River Gorge National River, John Perez, Resource Management Specialist, Beckely West Virginia

New River Gorge National River, Bruce Miller, Fire Management Officer, Beckely West Virginia

Nicholas County Commission, Spurgeon Hinkle, Summersville, West Virginia

Raleigh County Commission, John Humphrey, Beckley, West Virginia

Shenandoah National Park, Doug Raeburn, Fire Ecologist, Luray, Virginia

Summers County Commission, Terry Berry, Summersville, West Virginia

Superintendent, Bluestone State Park, Hinton, West Virginia

Superintendent, Carnifax State Park, Summerville, West Virginia

Superintendent, Hawks Nest State Park, Ansted, West Virginia

Superintendent, Pipestem State Park, Pipestem, West Virginia

The Nature Conservancy, Charleston, West Virginia

Virginia Tech University, Dr. James E. Johnson, Professor of Forestry, Blacksburg, Virginia

U.S. Army Corps of Engineers, Dean Bonifacio, Hinton, West Virginia

U.S. Army Corps of Engineers, Paul Clemons, Summerville, West Virginia

U.S. Fish and Wildlife Service, Jeffery Towner, Field Supervisor, Elkins, West Virginia

U.S. Department of Agriculture, Natural Resource Conservation Service, Beaver, West Virginia

U.S. National Park Service, Northeast Region, Barbara J. Stewart, Fire Education Specialist, Charlottesville, Virginia

U.S. National Park Service, Northeast Region, Paul Head, Fire Management Officer, Boston, Massachusetts

U.S. National Park Service, Northeast Region, Douglas Wallner, Prescribed Fire Specialist, Philadelphia, Pennsylvania

West Virginia Department of Culture and History, Ms. Susan Pierce, Deputy State Historic Perservation Officer, Charleston, West Virginia

West Virginia Department of Environmental Quality, Division of Air Quality, Charleston, West Virginia

West Virginia Department of Environmental Quality, Division of Water Resources, Charleston, West Virginia

West Virginia Department of Parks and Recreation, Robert Mathis, Charleston, West Virginia

West Virginia Division of Forestry, Coy Mullins, Charleston, West Virginia

West Virginia Division of Forestry, Robert McBride, Beckley, West Virginia

West Virginia Division of Natural Resources, Non-Game and Natural Heritage Programs, Elkins, West Virginia

West Virginia Division of Natural Resources, Wildlife Resources, Paul Johnson, Charleston, West Virginia

Wildland Fire Associates, Elizabeth Anderson, Denver, Colorado

Wildland Fire Associates, Dan O'Brien, Central Point, Oregon

Wildland Fire Associates, Steve Petersburg, Rangely, Colorado

XIII. APPENDIX

APPENDIX A
Compliance Documents (NEPA and NHPA)

See accompanying Neri Fire Management Plan Environmental Assessment and Finding of No Significant Impact.

APPENDIX B
License for the Management of Fish, Wildlife, and Related Habitat at Bluestone National Scenic River

DEPARTMENT OF THE INTERIOR
License for the Management of Fish, Wildlife, and Related Habitat at Bluestone National Scenic River

The SECRETARY OF THE INTERIOR, acting through the NATIONAL PARK SERVICE (NPS), under the authority to continue management of wildlife and fisheries resources, including hunting and fishing by the State of West Virginia pursuant to Public Law 100-534, Title III, Section 301, hereby grants to the STATE OF WEST VIRGINIA, DIVISION OF NATURAL RESOURCES (Licensee/DNR), a license commencing on 1 January 2000 and ending on 31 December 2010, to occupy and use approximately 3,094 acres of land and adjacent water areas in the Bluestone National Scenic River (BNSR), West Virginia, otherwise known as the Bluestone River Unit of the Bluestone Wildlife Management Area (BWMA) as established by Public Law 100-534, Title III, 16 USC § 1274(a)(65), and outlined in red on the Map marked Exhibit A, attached hereto, solely for recreational, fish, wildlife, forest and wildlife habitat management purposes, for the remainder of the period of said License.

THIS LICENSE is granted subject to the following terms and conditions:

1. This license is subject to all existing and future easements, leases, licenses and permits heretofore granted or to be hereafter granted by the United States covering said lands; provided, however, that the Department of the Interior, will not enter into any new and/or renewals of existing easements, leases, license or permits which will adversely affect the operations of the Licensee under the provisions of said license or which will conflict with the scheduled program of the Licensee.

2. The right is hereby expressly reserved to the United States, its officers, agents and employees, to enter upon said lands and water areas at any time and to remove therefrom or cause to be removed therefrom cultural artifacts, natural history specimens or other materials.

3. The NPS Superintendent, in administering the BNSR area, shall consult with the Licensee relative to the effect of such action upon wildlife resources before developing facilities or permitting activities in the area covered by this license.

4. This License is granted upon the express condition that the United States of America, its agents and employees shall be free from all liabilities and claims for damages to property or injuries to persons, including death, and/or suits for or by reason of any such injury which may

arise from or be incident to the exercise of the privileges herein granted, or for damages to the property of the Licensee, or for damages to the property or injuries to the person of the Licensee's officers, agents, servants, or employees, members of the public, or any other persons who may be on said premises at its invitation or the invitations of any one of them, arising from any cause. The licensee will administer all claims for damages which may arise from or be incident to the exercise of the privileges granted herein.

5. On or before the expiration date of this license, its relinquishment by the Licensee, or revocation by the NPS, the Licensee shall vacate the said Government premises, remove all property of the Licensee therefrom and restore the premises to a condition satisfactory to the NPS Superintendent within a reasonable time. In any event if the Licensee shall fail or neglect to remove said property and so restore the premises, then at the option of the Secretary of the Interior said property shall become the property of the United States without compensation therefor, or the Secretary of the Interior may cause the property to be removed, and the premises to be restored, at the expense of the Licensee, and no claim for damages against the United States or its officers or agents shall be created by or made on account of such removal and restoration work.

6. The Licensee shall be responsible for restoration of and/or payment of compensation for any damage to Government property caused by activities undertaken pursuant to this License other than authorized wildlife management activities as set forth in Section 13 hereinafter, and shall exercise due diligence in the protection of all improvements, vegetation or other property of the United States located on said premises against damages from any and all other causes.

7. The Licensee, in the exercise of the privileges hereby granted, shall conform to such rules and regulations as may be prescribed by the Secretary of the Interior to govern the use of the said area and with the provisions of all applicable Federal laws, rules, and regulations, including, but not limited to, the National Environmental Policy Act (PL 91-190, 42 USC 4321 et seq., 83 Stat. 852, 42 USC 4332, as amended) and the National Historic Preservation Act (PL 89-665, 80 Stat 915-919, 16 USC 470 et seq.). Nothing in the Act (16 USC 1274) shall effect or impair the management by the State of WV of hunting, fishing, trapping and other wildlife activities in the Bluestone Unit of the BWMA to the extent permitted in this license agreement.

8. The NPS Superintendent may, at any time during the term of the license, after consultation with the Licensee relative to present or future management on lands included in the license, require the Licensee to make such changes and additions in activities as may be required to

conform with regulations prescribed by the Secretary of the Interior to govern the public use of the BNSR.

9. Ingress and egress to and from the said premises shall be afforded to the State by existing access roads (as shown on the attached Exhibit B), such interior roads as may be constructed with the prior approval of the Superintendent, and at such additional places over government-owned land as may be approved by the NPS Superintendent.

10. This license may be revoked by the Secretary of the Interior in the event the Licensee violates any of the terms and conditions of this license and fails to remedy any such violation(s) for a period of thirty (30) days after notice thereof in writing by the NPS Superintendent, BNSR, or upon one hundred twenty (120) days written notice for the convenience of the Government. The DNR may terminate this License by giving to the Secretary of the Interior, through the NPS Superintendent, at least thirty (30) days notice in writing.

11. The National Park Service has the primary responsibility for administration and management of the lands, resources, and facilities within the BNSR including wildlife habitat, vegetation, minerals, and water resources and other resources as authorized under Federal statutes. Nothing in the Act (16 USC 1274) shall effect or impair the management by the State of WV of hunting, fishing, trapping and other wildlife activities in the Bluestone Unit of the BWMA to the extent permitted in this license agreement. The exercise of the privileges hereby granted shall be without cost or expense to the Department of the Interior and shall be subject to the prior written approval of the NPS Superintendent. The Licensee shall submit a proposed annual plan of management activities to be undertaken within the said premises to the NPS Superintendent, BNSR on or before July 1, 2000, and annually thereafter. Such Annual Management Plan shall include, but is not limited to the following:

a. Plans for management activities to be undertaken by the Licensee or jointly by the NPS and the Licensee.

b. Plans for timber and other vegetation management.

c. Plans for planting and harvesting of crops.

d. Plans for the use of the premise including but not limited to the recreational taking of wildlife.

e. Performance Report for previous year. (Summary of objectives met or not met).

12. The following activities are permitted provided that the activities conform to general plans and specifications theretofore submitted by the Licensee and approved by the NPS Superintendent:

a. That the Licensee, its agents or contractors, may, create and/or manipulate lands and vegetation, plant seeds, shrubs, and trees upon said land as may be necessary for the purpose of this license and the administration thereof.

b. That the Licensee may take, trap, remove, release, restore, or otherwise manipulate, all forms of fish and wildlife as well as their associated habitats, conduct any scientific research and operate research equipment upon the said lands and waters.

c. The licensee may place upon said lands and waters such additional forms of fish and wildlife (except non-native species) as it may desire from time to time.

d. The licensee, shall have the right to open and close the area to hunting, fishing and trapping; provided that the closing of any water areas to public use generally for hunting, fishing and trapping shall be consistent with the laws for the regulation of fish and wildlife of the State of West Virginia.

e. The Licensee may negotiate agreements with lessees/permittees of the United States for the controlled use of lands desirable in the wildlife program so long as such agreements are not in conflict with the terms of the license with the NPS.

f. Consistent with its statewide program of fish and wildlife management, the Licensee shall enforce the forest, fish and wildlife laws and such orders and regulations as promulgated by the DNR and/or its director.

g. The Licensee shall not erect any signs or structures of any kind and perform no construction, clearing or other facility improvement work not specifically authorized herein without first securing the approval of the NPS Superintendent.

h. The Licensee shall not undertake, allow or sanction the use of any pesticides, including herbicides, insecticides, rodenticides, fungicides, and or fish toxicants on or within BNSR without the prior written approval of the NPS Superintendent.

13. The Licensee shall not issue any scientific collecting permits for the BNSR unless the applicant has obtained prior written approval of the NPS Superintendent.

14. No cuts or fills along the shoreline will be made or allowed by the Licensee without the prior written approval of the NPS Superintendent and before obtaining all required State and Federal permits.

15. The Licensee shall not discriminate against any person or persons because of race, religion, color or national origin in the conduct of its operations hereunder. All activities conduct pursuant to this License shall be in compliance with the requirements of Title VI of the Civil Rights Act of 1964 (78 Stat. 252; 42 USC Section 2000d et seq.) and the provisions of Exec. Order No. 11246, 3 CFR 339 (1964-65); Title V, Section 504 of the Rehabilitation Act of 1973 (87 Stat. 394; 29 USC Section 794); the Age Discrimination Act of 1975 (89 Stat. 728; 42 USC Section 6101 et seq.); and with all other Federal laws and regulations prohibiting discrimination on the grounds of race, color, national origin, handicap, religious or sex in providing for facilities and service to the public.

16. This agreement and the obligations of the NPS hereunder shall be subject to the availability of funding, and nothing herein contained shall be construed as binding the NPS to expend in one fiscal year any sum in excess of appropriations made by Congress or administratively allocated for the purpose of the agreement for the fiscal year, or to involve the NPS in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocations.

17. No Member of, Delegate to, or Resident Commissioner in, Congress shall be admitted to any share or part of this Agreement or to any benefit to arise therefrom, unless the share or part or benefit is for the general benefit of a corporation or company.

18. This agreement is subject to all laws, regulations and policies governing the NPS whether now in effect or hereafter adopted.

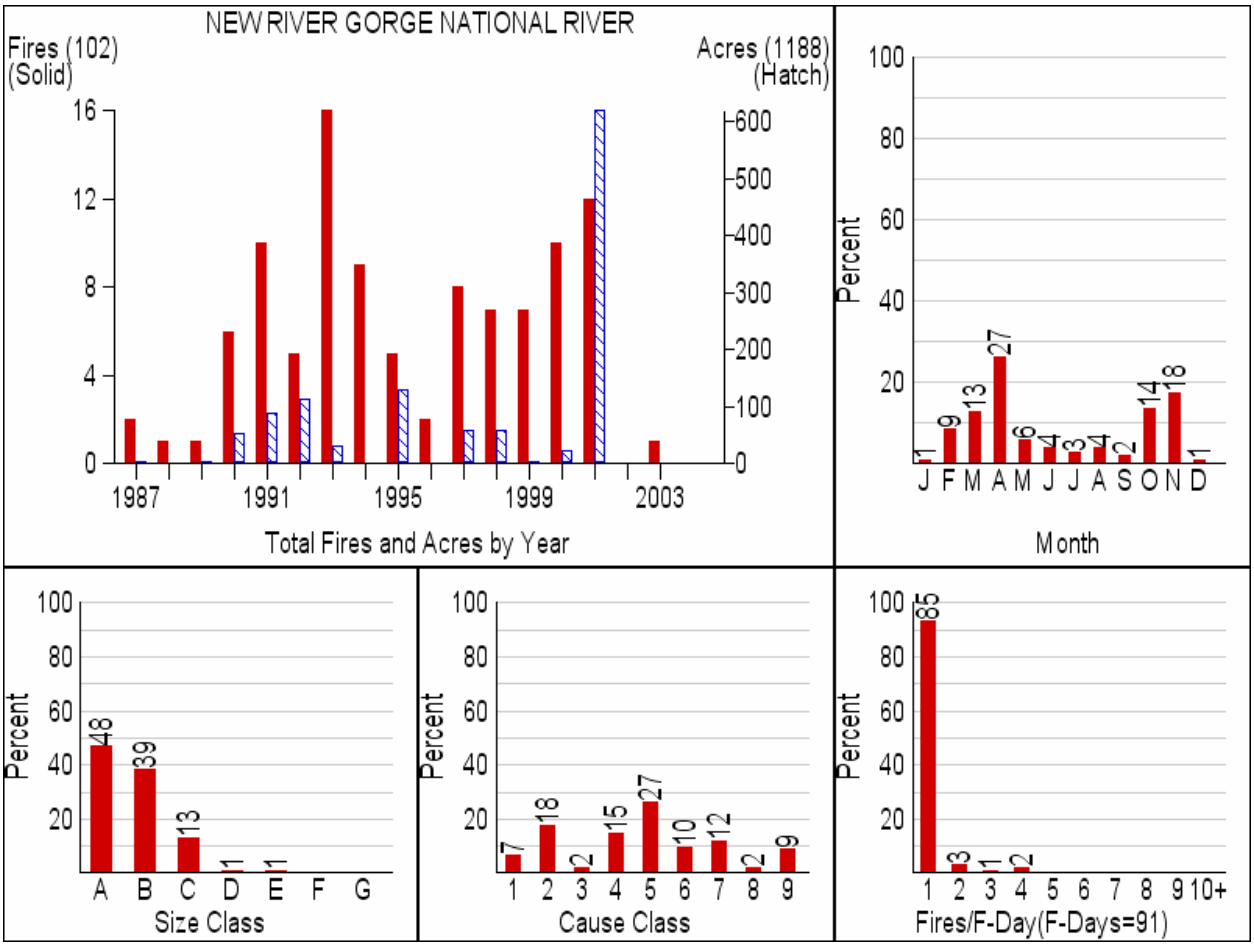
IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective duly authorized officers or representatives the day and year written below.

U.S. Department of the Interior, National Park Service

By_____
Marie Rust, Regional Director Date

By_____
State of West Virginia, Division of Natural Resources Date

APPENDIX C
Fire Occurrence Information



APPENDIX D
WILDLAND FIRE IMPLEMENTATION PLAN STAGE 1

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

DECISION CRITERIA CHECKLIST

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

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

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

Signature	Date

APPENDIX E
Step-Up Plan

Considerations in Rating Fire Danger:

Considerations in rating fire danger: The majority of wildfires (approximately 98%) within the protection area are human caused. The ready availability of human ignition sources result in the production of nearly infinite numbers of firebrands on a daily basis throughout the year. However, the number of days that these firebrands result in wildfires requiring suppression is predictable and appears to be directly related to low (1 hr.) fine fuel moistures and low relative humidities. Under extreme conditions, multiple starts are common; especially with railroad caused ignitions.

The Burning Index (BI) has traditionally been used both at New River Gorge National River and surrounding National Park Service areas to predict staffing needs. Research has shown the BI to be a useful tool in predicting the overall "seasonal profile" of the fire season for a particular area (NFDRS User's Guide 1985). And, since the BI is roughly 10 times the predicted flame length, it also allows some preplanning to identify resource needs during extreme burning conditions (i.e. a BI > 40 may indicate that direct attack using handcrews would not be possible).

As valid weather and fire data become available, FIREFAMILY or similar analysis will be used to re-define and to more accurately predict the fire staffing needs.

Selection of Fuel Models:

Eastern hardwood forest types predominate throughout the protection area and are best represented by NFDRS Fuel Models E and R. Fuel Model E will be used during the spring fire season, switching to Fuel Model R when new growth is complete and back to Fuel Model E for the fall fire season when foliage has matured and leaves begin to drop. Fuel Model R is typical of the summer fire season unless extreme drought conditions develop. Under extreme drought, Fuel Model E better describes the increased fuel loadings of cured and dead fuels. Fire danger ratings will be based on Fuel Model E when the Keetch-Byram Drought Index exceeds 400 or live fuel (foliar) moisture content drops below 100 percent.

Perennial grasses dominate the protection area that is in Climate Class 3. By definition, Climate Class 3 has a "green-up" period of 21 days. However, seasonal temperatures and precipitation may affect the actual time period required for grasses and shrubs to reach full turgor or dormancy. "Greenness Factors" will be used to smooth fire danger ratings in response to climatic conditions. Guidelines for the use of "Greenness Factors" are found in "1988 Revisions to the 1978 National Fire-Danger Rating System" (Burgan 1988).

Guidelines for the Use of Burning Index:

The park has selected the BI from the National Fire Danger Rating System as the key variable for establishment of staffing classes. The BI levels listed below are from Spring (March 1ST to May 31ST) and Fall (October 1ST to December 31ST) FIREFAMILY PLUS run completed on the years 1987 through 2003 on file in the NERI fire management office. The BI does not take into account human caused risk and the staffing class may be increased one level due to the threat of incendiary activity, or major recreational events in the prone areas.

STEP-UP MOBILIZATION

NERI Fire Mgmt. has selected the Burning Index from the National Fire Danger Rating System as the key variable for establishment of staffing classes. The BI levels listed below are from the Spring (March 1ST to May 31ST) and Fall (October 1ST to December 31ST) FIREFAMILY PLUS run completed on the years 1987 through 2003 on file in the New River Gorge National River fire management office. The BI does not take into account human caused risk and the staffing class may be increased one level due to the threat of incendiary activity, or major recreational events in the prone areas.

The BI for appropriate fuel model (E/R) based on the time of fire season (Spring/Fall vs. Summer) for the Grandview fire weather station will be used to determine the Staffing Class.

Fuel Model E

Staffing Class	Burning Index (BI)
I	0-8
II	9-18
III	19-37
IV	38-47
V	48+

Fuel Model R

Staffing Class	Burning Index (BI)
I	0-5
II	6-10
III	11-21
IV	22-27
V	28+

Adjective Classes

Adjective classes are designed for use as a fire prevention tool. The adjective describes for the public the relative severity of fire danger that currently exists.

The “Adjective Fire Danger” is used to determine where “Smokey’s Arm” points on the roadside sign. “Adjective Fire Danger”is expressed as five levels using the following descriptive words; LOW, MODERATE, HIGH, VERY HIGH, and EXTREME.

Adjective Classes are calculated within the NFDRS (National Fire Danger Rating System) processor using a combination of Ignition Component and the “Staffing Level” calculated for that day.

Staffing Class	**Adjective Fire Danger**				
I	LOW	LOW	LOW	MOD	MOD
II	LOW	MOD	MOD	MOD	HIGH
III	MOD	MOD	HIGH	HIGH	V HIGH
IV	MOD	HIGH	V HIGH	V HIGH	EXTREME
V	HIGH	V HIGH	V HIGH	EXTREME	EXTREME
IC	0 – 20	21 – 45	46 – 65	66 – 80	81 - 100

A. Emergency Conditions Requiring Response:

1. Park staffing class IV (Very High) or V (Extreme).

2. Any uncontained fire exceeding or expected to exceed 100 acres.

3. Red flag warning posted by the National Weather Service

4. Depletion or exhaustion of the park's firefighting resources.

5. Eastern Inter-Regional Coordination Center at staffing class IV or V.

B. The Following Emergency Response Will Be Initiated:

1. Immediate notification of the chief park ranger.

2. The chief park ranger will alert all on-call crew personnel of the situation and if needed organized suppression crews or additional equipment will be called from cooperating agencies or other NPS units.

3. The regional FMO will be alerted and appropriate emergency preparedness account established.

C. Out-of-Park Fires

1. Mutual Aid and Out-of-Region

   Staffing class I, II or III. The chief park ranger will be notified of all wildland fire resource requests for the park and will coordinate the mobilization of park resources.

   Staffing class IV or V. The chief park ranger will evaluate local fire danger and regional preparedness plans. Priority will be to assure the availability of adequate resources for park-wide initial attack. If additional resources are available, resource requests will be evaluated and mobilized as necessary.

2. Crew Module Response

   Staffing class I-V. The chief park ranger will confirm crew module rotation schedules with the Inter-Regional Coordination Center. The chief park ranger will coordinate the mobilization of park resources with the division chiefs and district rangers. Specific personnel must be identified for the crew module and a manifest prepared.

APPENDIX F
Charts For Determining Appropriate Management Response

Wildland and Prescribed Fire Management Policy, Implementation Procedures Reference Guide, April 1998

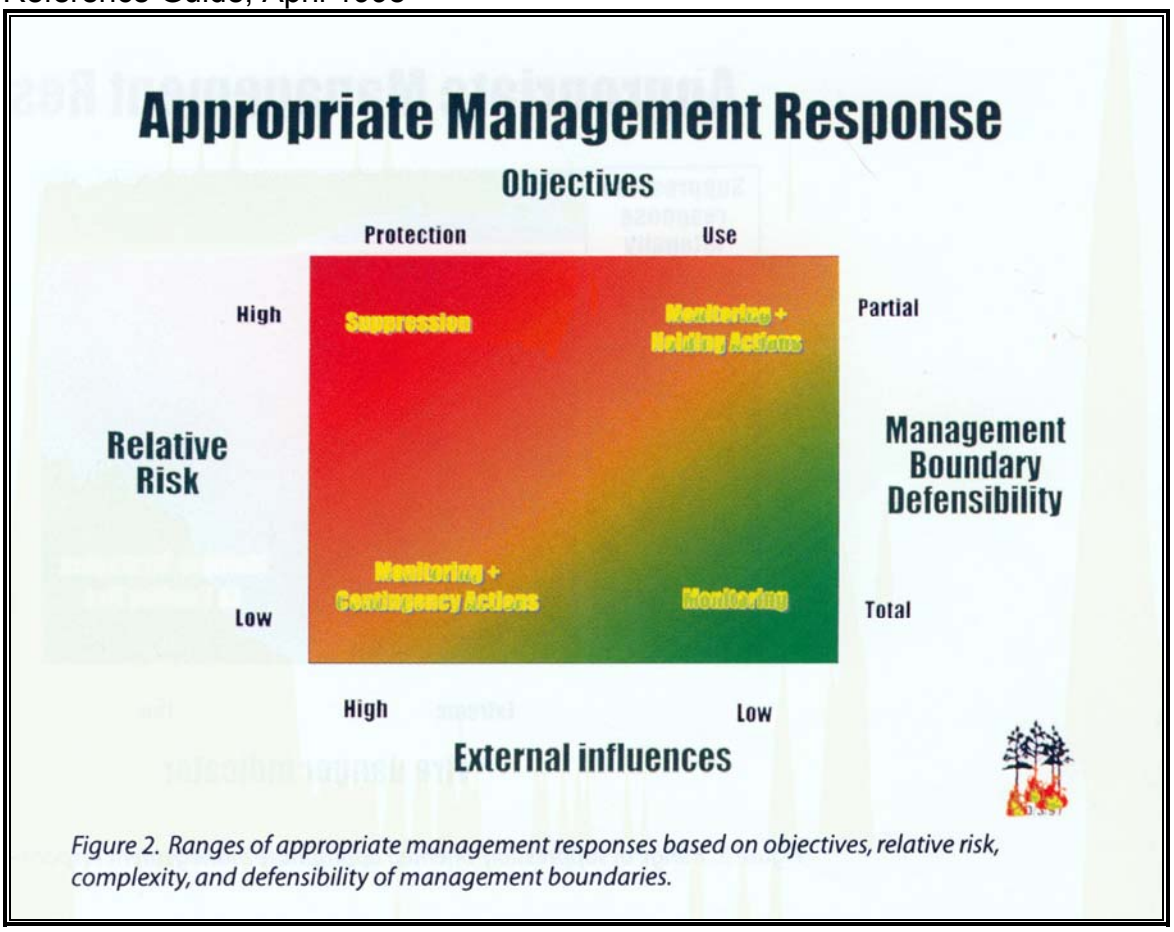


Figure 2. Ranges of appropriate management responses based on objectives, relative risk, complexity, and defensibility of management boundaries.

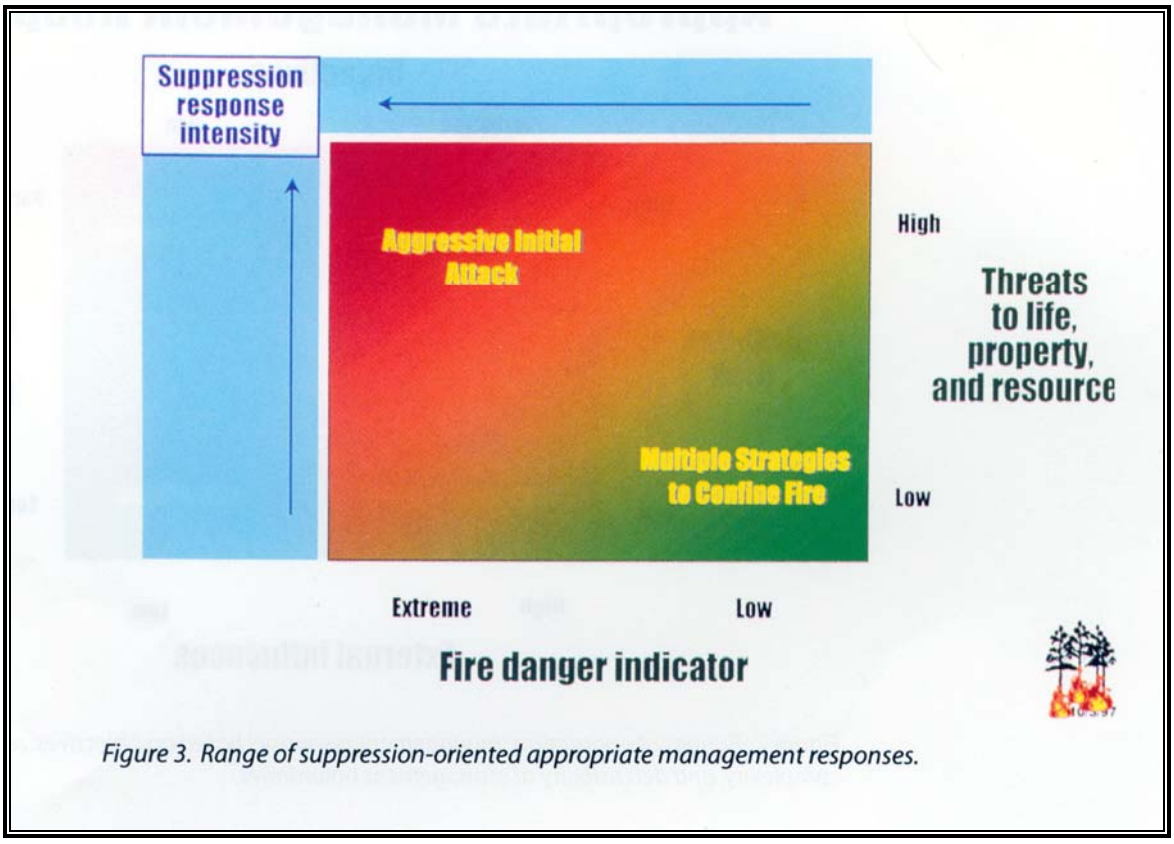


Figure 3. Range of suppression-oriented appropriate management responses.

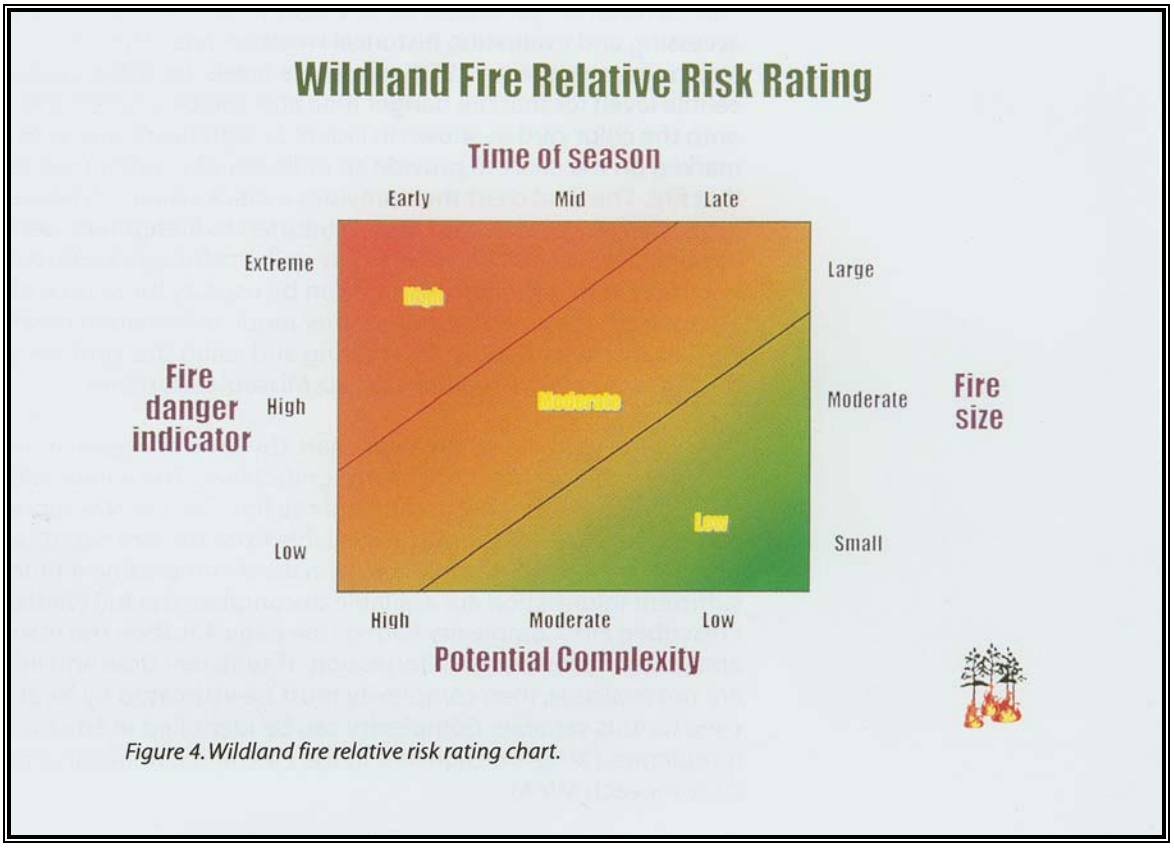
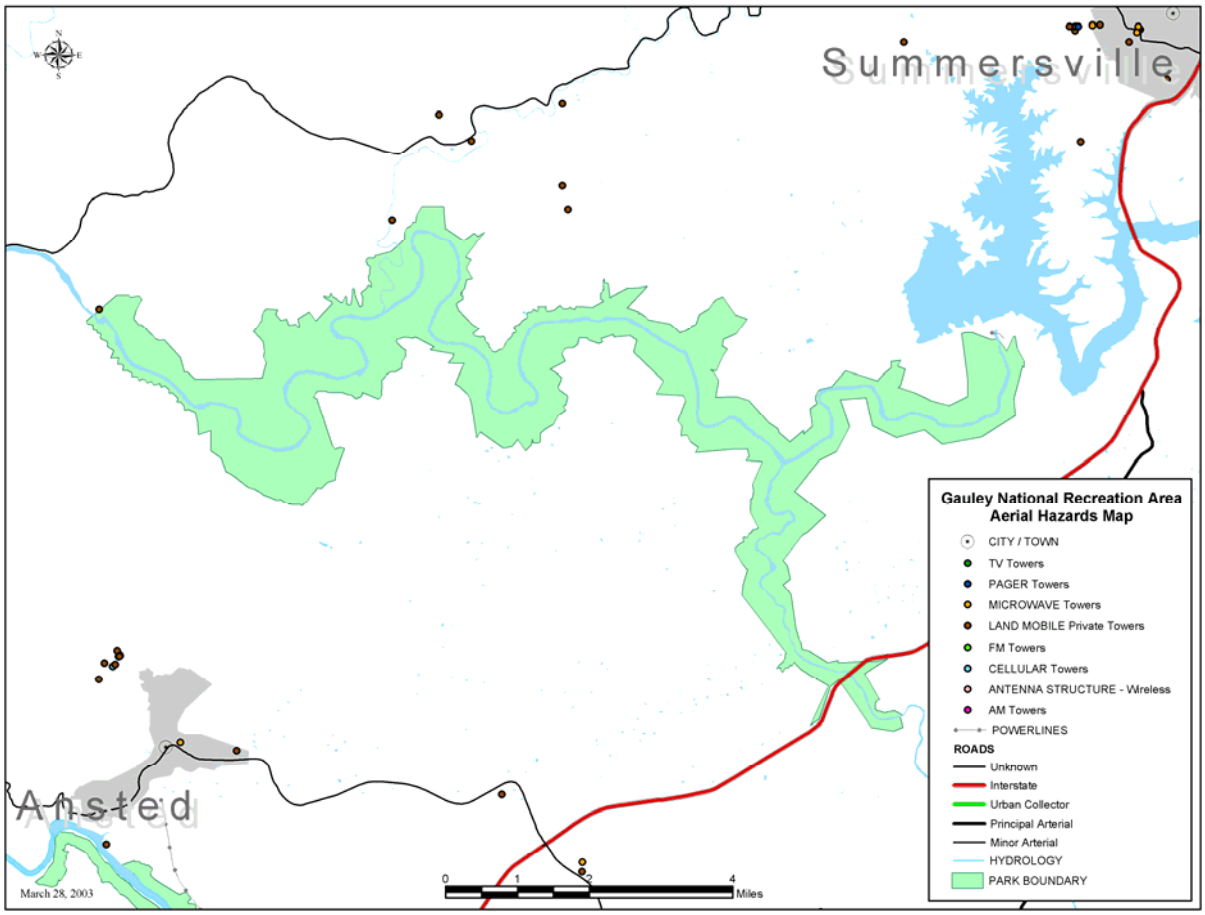


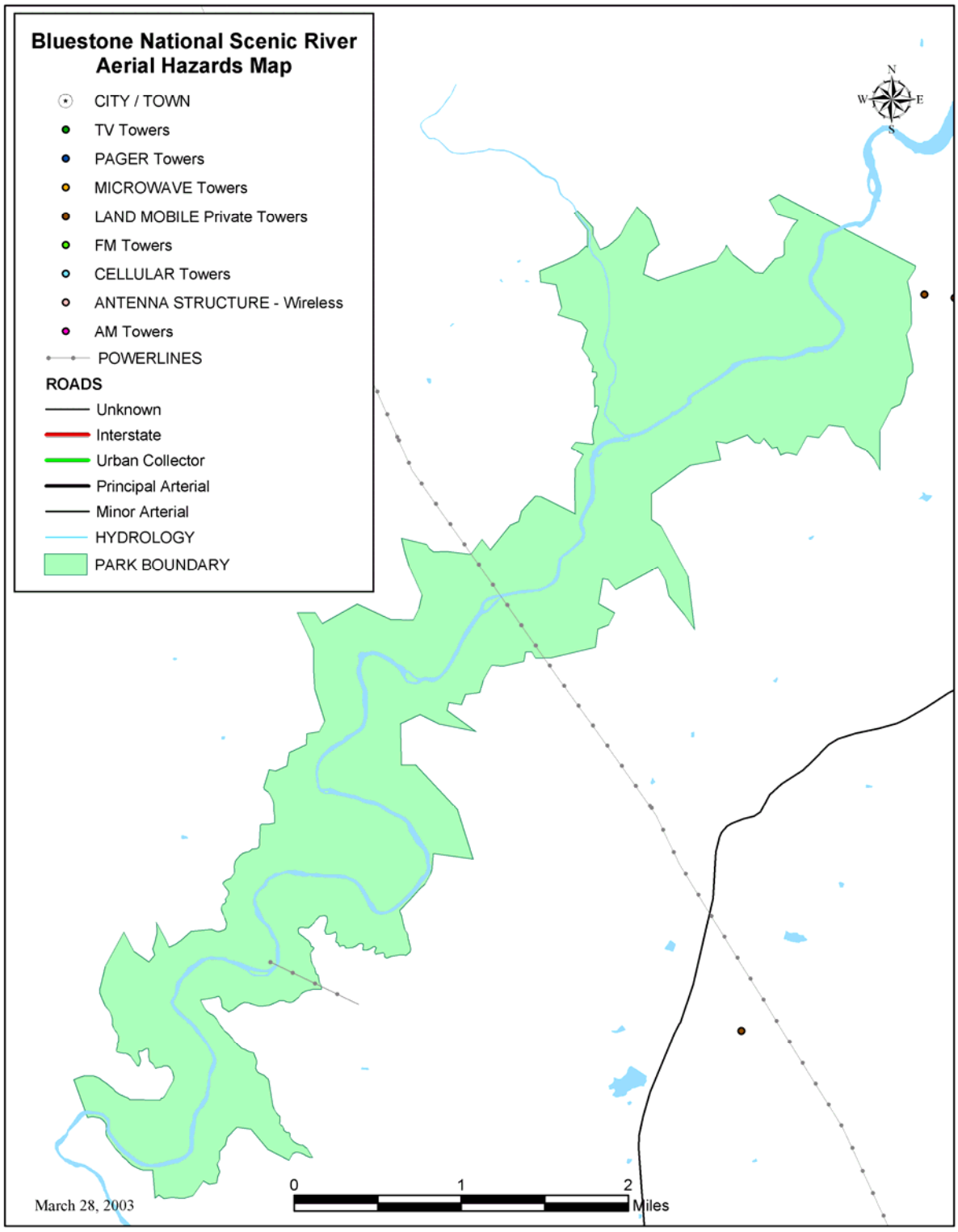
Figure 4. Wildland fire relative risk rating chart.

APPENDIX G
Aerial Hazards

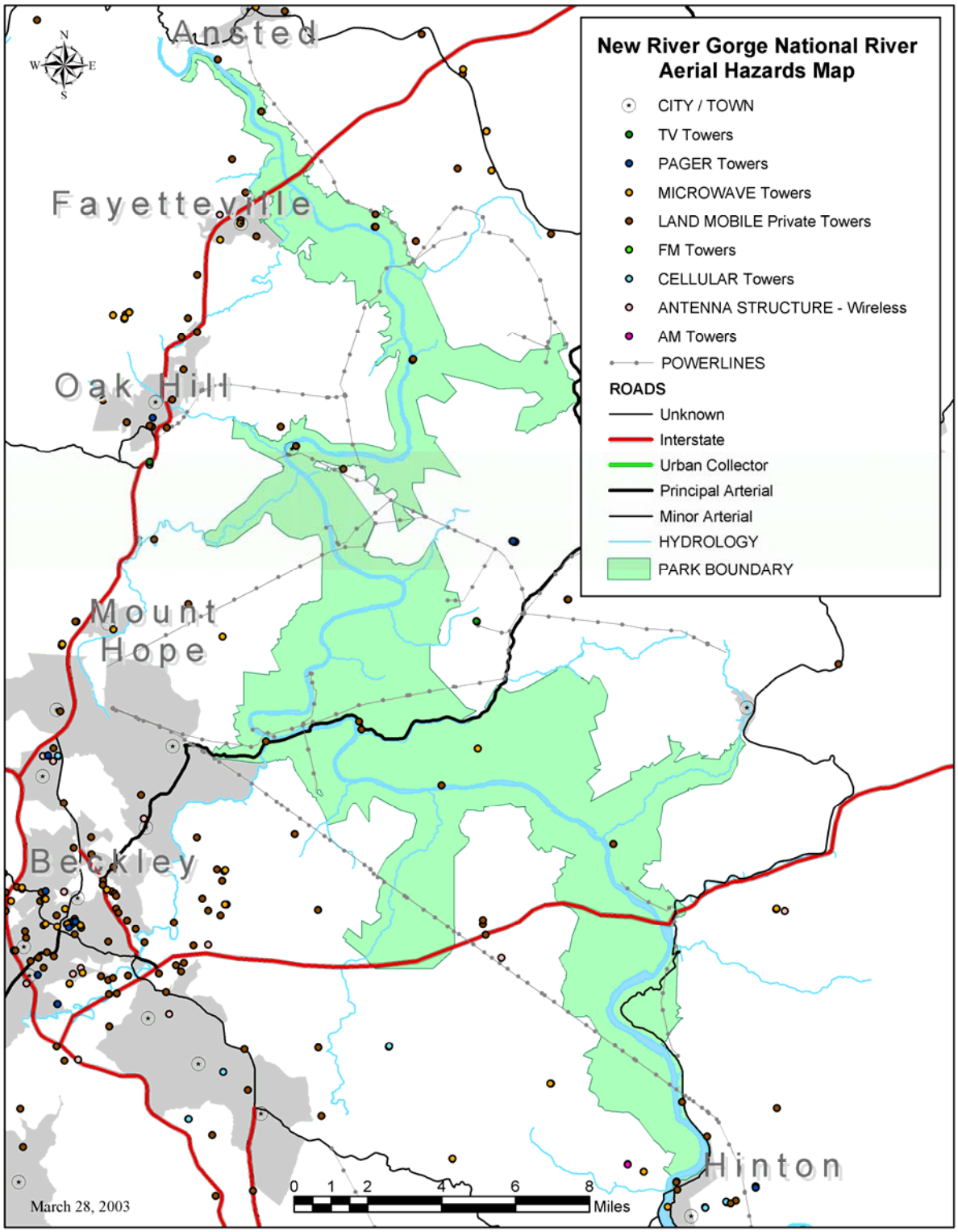
Gauley National Recreation Area



Bluestone National Recreation Area



New River Gorge National Recreation Area



Appendix H
Wildland Fire Situation Analysis (WFSA)

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

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

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

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

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

E. Fire Name: Self-explanatory.

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

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

H. Date/Time Prepared: Self-explanatory.

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

I. Wildland Fire Situation Analysis	
To be completed by the Agency Administrator(s)	
A. Jurisdiction(s)	B. Geographic Area
C. Unit(s)	D. WFSA #
E. Fire Name	F. Incident #
G. Accounting Code	
H. Date/Time Prepared_____@_____	
I. Attachments	
Complexity Matrix/Analysis* Risk Assessment/Analysis* Probability of Success* Consequences of Failure * Maps* Decision Tree** Fire Behavior Projections* Calculations of Resource Requirements * Other (specify) * Required ** Required by FWS	

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

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

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

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

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

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

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

II. Objectives and Constraints

To be Completed by the Agency Administrator(s)

A. Objectives: (Must be specific and measurable)

1. Safety

   Public

   Firefighter

2. Economic

3. Environmental

4. Social

5. Other

B. Constraints:

Section III. Alternatives (This page is completed by the Fire Manager and/or incident commander.)

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

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

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

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

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

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

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

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

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

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

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

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

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

IV. Evaluation of Alternatives			
To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander			
A. Evaluation Process	**A**	**B**	**C**
Safety Firefighter			
Aviation			
Public			
Sum of Safety Values			
Economic			
Forage			
Improvements			
Recreation			
Timber			
Water			
Wilderness			
Wildlife			
Other (specify)			
Sum of Economic Values			
Environmental			
Air			
Visual			
Fuels			
T & E Species			
Other (specify)			
Sum of Environmental Values			
Social			

Employment			
Public Concern			
Cultural			
Other (Specify)			
Sum of Social Values			
Other			

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

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

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

C. External and Internal Influences: Assign information and data occurring at the time the WFSA is signed. Identify the Preparedness Index (1 through 5) for the National and Geographic levels. If available, indicate the Incident Priority assigned by the MAC Group. Designate the Resource Availability status. This information is available at the Geographic Coordination Center, and is needed to select a viable alternative. Designate "yes," indicating an up-to-date weather forecast has been provided to, and used by, the Agency Administrator(s) to evaluate each alternative. Assign information to the "Other" category as needed by the Agency Administrator(s).

Section VI. Decision

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

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

Fire Behavior
Projections_____

VI. Decision

The Selected Alternative is:

_____

Rationale:

_____ _____
Agency Administrator's Signature Date/Time

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

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

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

VIII. Daily Review

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

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

Date	Time	By						

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

VIII. Objectives Final Review
The elements of the selected alternative were met on: _____ _____ Date Time By:_____ (Agency Administrator(s)

A GUIDE FOR ASSESSING FIRE COMPLEXITY

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

Use of the Guide:

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

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

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

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

GLOSSARY OF WFSA TERMS

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

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

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

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

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

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

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

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

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted	**Yes**	**No**
1. Burning index (from on-site measurement of weather conditions predicted to be above the 90% level using the major fuel model in which the fire is burning.	___	___
2. Potential exists for "blowup" conditions (fuel moisture, winds, etc.).	___	___
3. Crowning, profuse or long-range spotting.	___	___
4. Weather forecast indicating no significant relief or worsening conditions.	___	___
Total:	___	___

B. RESOURCES COMMITTED

1. 200 or more personnel assigned.	___	___
2. Three or more divisions.	___	___
3. Wide variety of special support personnel.	___	___
4. Substantial air operation which is not properly staffed.	___	___

5. Majority of initial attack resources committed. ___ ___

Total ___ ___

C. RESOURCES THREATENED

1. Urban interface. ___ ___
2. Developments and facilities. ___ ___
3. Restricted, threatened or endangered species habitat. ___ ___
4. Cultural sites. ___ ___
5. Unique natural resources, special designation zones or wilderness. ___ ___
6. Other special resources. ___ ___

Total ___ ___

D. SAFETY

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

Total ___ ___

E. OWNERSHIP **Yes/No**

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

Total ___ ___

F. EXTERNAL INFLUENCES

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

G. CHANGE IN STRATEGY

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

H. EXISTING OVERHEAD

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

Signature_____

Date_____ Time_____

APPENDIX I
Limited Delegation of Authority

LIMITED DELEGATION OF AUTHORITY

To: _____, Incident Commander

From: Superintendent, New River Gorge National River; Bluestone National Scenic River; Gauley River National Recreation Area

Subject: Limited Delegation of Authority

As of _____hours, on this date _____, I have delegated limited authority to manage the _____ fire in _____ _____. As superintendent I have ultimate responsibility for protection of park resources and the lives of the park's visitors and employees. Your expertise in the area of wildland fire incident management will assist me in fulfilling that responsibility during the present situation. My considerations for management of this fire are:

1. Provide for firefighter, park visitor, resident and neighbor safety.

2. I would like the fire managed using the most appropriate strategy that foremost considers, safety, economic cost, and probability of success and consequences of failure. The selected strategy should be implemented using minimum impact management tactics.

3. Key cultural features requiring priority protection are:
_____
_____
_____
_____

4. Key resource considerations are:
_____
_____
_____
_____

5. Restrictions for suppression actions are: no tracked or wheeled vehicles in the following areas, except when human life is at immediate risk:

_____
_____
_____
_____

Helicopters, powersaws, portable pumps and leaf blowers may be used as required. Chemical retardant is authorized as stipulated in the park's fire management plan.

6. My agency advisor/representative will be:

7. Manage the fire cost effectively for the values at risk.

8. Provide training opportunities for park and local firefighters to the extent possible.

9. Minimize disruption of visitor access to the park consistent with pubic safety.

_____
Superintendent, New River Gorge National River; Bluestone National Scenic River; Gauley River National Recreation Area

Date:_____

APPENDIX J
Mobilization Plan

I. PURPOSE and PRIORITY The purpose of the fire crew mobilization plan is to facilitate park-wide teamwork and to provide rapid initial attack for both in and out of park fires.

As shown in the park's emergency operations plan, controlling wildland fire is only lower in priority than saving human life, caring for the injured and protecting park resources. Fire resources are a park-wide responsibility and will take priority over routine, scheduled work projects for all divisions, as necessary.

II. OBJECTIVES

A. To have two squads (six persons each) available to initial attack park wildfires from March 15 through December 15 according to an approved step-up plan.

B. To assure firefighter availability for mutual aid response with park cooperators and regional crew module commitments, consistent with park operational needs.

C. To designate, by division, specific numbers of personnel required to be immediately available for initial attack.

D. To provide supervisors flexibility when determining the organizational level at which fire assignments will be made and when planning and scheduling crew assignments.

E. To ensure the rapid deployment of initial attack resources to report fire incidents.

F. To allow designated personnel to plan daily activities, including off duty hours, so that they are prepared to respond, fully equipped, at mobilization.

III. INITIAL ATTACK COMPLEMENT

Park Division	Firfighter Type II	Firefighter Type I	Crew Boss	TOTAL
Resource Management & Visitor Protection	16	2	4	22
Maintenance	5			5
Interpretation & Visitor Services	3			3
TOTAL	24	2	4	30

Number of personnel needed per position

IV. CREW DESIGNATION PLAN

A. At the beginning of each fire season, the chief park ranger will prepare a list of available wildland fire personnel for both in-park and out-of-park fires.

B. The crew complement, by division, will remain the same throughout the fire season. By doing this, each division will know the specific number of personnel required for initial attack.

C. Each division chief will determine who makes the actual name assignment for each position to be filled. District rangers will designate RMVP personnel from their districts.

D. All positions will be filled with qualified personnel. Trainee assignments will be provided when possible.

E. Crew bosses, squad bosses and firefighters should be rotated to provide experience opportunities to all qualified park personnel. The chief park ranger will maintain a list of qualified and previously dispatched personnel to facilitate mobilization opportunities to all red-carded personnel.

F. The designated employees will perform their normal duties during their normal daily shift, unless fire occurs.

G. Designated employees will be expected to have their initial attack and overnight gear immediately available for fire response.

APPENDIX K
Minimum Impact Suppression Tactics Guidelines

General Discussion

Suppression tactics will have an impact on the landscape. Following the minimum impact suppression tactics (MIST) guidelines outlined below can reduce the degree of long-term impacts associated with wildland fire suppression tactics. It is important that decision makers are aware of the long-term impacts fire suppression tactics can have on the landscape, and very carefully weigh those long-term impacts to fire suppression safety issues related to wildland fire incidents. The following are MIST standards that will be used in the park. Also refer to RM-18, Chapter 9, Exhibit 5

Tactical Standards

- Fireline construction will be minimized by taking advantage of natural barriers, rock outcrops, trails, roads, streams, and other existing fuel breaks.
- Firelines will be the minimum width necessary to halt the spread of the fire and will be placed to avoid impacts to natural and cultural resources vulnerable to the effects of fire and fire suppression activities.
- Limbing along the fireline will be done only as essential for the suppression effort and for safety.
- Unburned material may be left within the final line.
- Clearing and scraping will be minimized.
- Snags or trees will be felled only when essential for control of the fire or for safety of personnel.
- Where possible, on site archeological clearance will be obtained prior to line construction.

Terminating the Fire

- The route to the fire from the nearest trail or road will be flagged. Flagging will be removed by the last person to leave the area.
- All equipment and debris will be removed from the area for proper disposal.

- Before leaving the fire, rehabilitation will be completed to eliminate impacts from the suppression effort.
- Restoration of fire area.
- Backfill cup trenches and scarify wide firelines.
- Construct waterbars to prevent erosion.
- Place “boneyards” 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.

Aircraft

Helicopters

- Minimize use.
- Restore helispots.

Retardant Aircraft

- No retardant will be used within 300 feet of a riparian area without the approval of the superintendent, unless there is immediate and grave danger to life safety and high value property loss.
- Use water drops where practical.
- Minimize number of drops to what is essential for control of the fire.

APPENDIX L
Five Year Plan

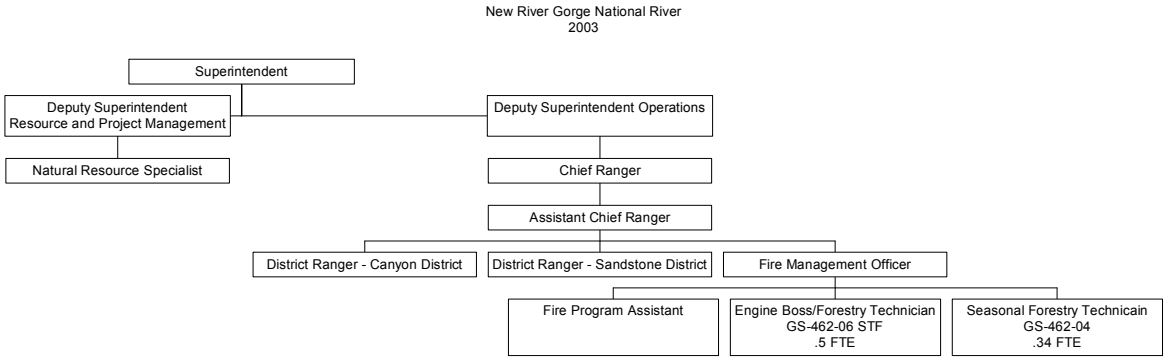
LIST OF ONGOING HAZARD FUEL REDUCTIONS IN THE WILDLAND URBAN INTERFACE

PARK	COUNTY	STATE	CONGRESSIONAL DISTRICT	PROJECT NAME	WUI COMMUNITY NAME	YEAR(S) TREATMENT OCCURRED (NO MORE THAN LAST 5)	SACS PROJECT NUMBER	PROJECT SIZE	FUEL TYPE (GRASS, BRUSH, SLASH, TIMBER)	TREATMENT METHOD (MECHANICAL, CHEMICAL, Rx FIRE, OTHER)	NEXT SCHEDULED TREATMENT (YEAR)	TREATMENT INTERVAL
NERI	Fayette	WV	3	Canyon Rim	Lansing	2000	0001	15	Brush	Mechanical	2003	3 - 5 yrs
NERI	Raleigh	WV	3	Grandview	Grandview	1996-2000	9501,0001	15	Brush	Mechanical	2001	2 - 4 yrs
NERI	Summers	WV	3	SVCRX	Sandstone	2005		0.4	Grass	RX	TBD	TBD

APPENDIX M
Historic Fuels Treatment Map

This plan is under development.

APPENDIX N
Organization Chart



APPENDIX O

Agreement Between the United States Department of the Interior National Park Service and the State of West Virginia Division of Forestry

**Memorandum of Understanding between the
United States Department of the Interior
New River Gorge National River
and the
West Virginia Division of Forestry
dated January 1, 2004**

Article I. Background and Objectives

This Agreement for wildland fire protection cooperation is entered into this 1st day of January 2004 by and between the United States Department of the Interior, National Park Service, acting through the Superintendent of New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River, hereinafter referred to as the National Park Service and the West Virginia Division of Forestry hereinafter referred to as the Division of Forestry.

Whereas authority for the execution of agreements between the National Park Service and other agencies and instrumentalities for mutual aid and assistance in wildland fire protection is contained in Public Law 84-46; The Reciprocal Fire Protection Act of May 27, 1955 (69 Stat. 66; 42 U.S.C. 1856), The Disaster Relief Act of May 22, 1974 (88 Stat. 143; 42 U.S.C. 5121), Public Law 100-428, as amended by Public Law 101-11, April 7, 1989; The Wildfire Suppression Assistance Act of 1989, National Park Service Acts as amended (67 Stat. 495; 16 U.S.C. 1b) and the United States Department of Interior Departmental Manual (590 DM and 910 DM); and

Whereas authority for the execution of agreements between the Division of Forestry and other agencies and instrumentalities for mutual aid and assistance in wildland fire protection is contained in West Virginia State Code, 19-1A-3 and 19-1A-4 and 20-3-14; and

Whereas the National Park Service has accepted responsibility for the protection and management of certain lands and other resources in the State of West Virginia that make up New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River; and

Whereas the Division the of Forestry has been created under the laws of the State of West Virginia to protect and perpetuate the forest and wildland resources of the State of West Virginia; and

Whereas, the National Park Service and the State of West Virginia share concurrent legislative jurisdiction over the lands that make up New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River; and

Whereas, it is the mutual desire of the National Park Service and the Division of Forestry to work in harmony for the common purpose of protecting from the ravages of uncontrolled wildfires the forest and other wildland resources within the State of West Virginia for the best interest of the people of West Virginia and the United States;

NOW, THEREFORE, this Agreement is designed to set forth in specific manner as a cooperative protection agreement which will be equally beneficial to both parties, as follows:

Article II. Statement of Work

1. The National Park Service agrees:

    a. To cooperate with the Division of Forestry in the protection from wildfire of all National Park Service administered lands and watersheds that make up New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River.

    b. To make available in wildfire emergencies and upon the request of the Division of Forestry, such National Park Service facilities, equipment and personnel under the administrative control of New River Gorge National River as would normally be used to control wildfires, provided that they are not needed at that time for fire suppression operations by the National Park Service.

c. To make available, by National Park Service consent and upon request of the Division of Forestry for wildland fire preparedness activities, such National Park Service facilities, equipment and personnel under the administrative control of New River Gorge National River as would normally be used in wildland fire preparedness work, provided that they are not needed by the National Park Service at that time for other National Park Service responsibilities and operations.

d. To make available for wildfire detection, fire preparedness, fire suppression, search and rescue, evacuation, and other emergency operations and upon the request of the Division of Forestry, such aircraft that may be in the service of the National Park Service and under the administrative control of New River Gorge National River within the State of West Virginia, provided that they are not needed at that time for National Park Service responsibilities and operations. National Park Service supplied aircraft and aircraft personnel will operate under the rules, regulations and requirements of the Office of Aircraft Services, United States Department of the Interior, at all times. All passengers and cargo in National Park Service supplied aircraft will be transported at all times according to Office of Aircraft Services rules and regulation as found in the United States Department of the Interior Departmental Manual 351 DM 1.

e. To initiate at the time of any assistance request, Federal requisition documents necessary to obtain reimbursement for Division of Forestry costs directly related to said assistance and as specified and allowed for in other sections of this Agreement.

2. The Division of Forestry agrees:

a. To cooperate with the National Park Service in the protection from wildfire all National Park Service administered lands and that make up New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River.

b. To make available in wildfire emergencies and upon the request of the National Park Service, such Division of Forestry, facilities, equipment and personnel as would normally be used to control wildfires, provided that they are not needed at that time for fire suppression operations on private or non-federal lands by the Division of Forestry.

c. To make available, by Division of Forestry consent and upon request of the National Park Service for wildland fire preparedness activities, such Division of Forestry, facilities, equipment and personnel as would normally be used in wildland fire preparedness work, provided that they are not needed by the Division of Forestry at that time for other Division of Forestry responsibilities and operations.

d. To make available for wildfire detection, fire preparedness, fire suppression, search and rescue, evacuation, and other emergency operations and upon the request of the National Park Service, such aircraft that may be in the service of the Division of Forestry, provided that they are not needed at that time for Division of Forestry responsibilities and operations. Division of Forestry supplied aircraft and aircraft personnel will operate under State rules, regulations and requirements governing their use and operation. Division of Forestry aircraft utilized by the National Park Service will also meet all applicable rules, regulations and requirements of the Office of Aircraft Services, United States Department of the Interior, that pertain to "Associate Aircraft" as found in the United States Department of the Interior Departmental Manual 351 DM 4. All National Park Service passengers and cargo will be transported at all times according to Office of Aircraft Services rules and regulations as found in the United States Department of the Interior Departmental Manual 351 DM 1.

e. To use the minimum fire suppression actions necessary to protect life and property on lands administered by the National Park Service or over which the National Park Service holds an easement or other legal interest as part of New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River. Every effort should be made to insure the protection of the natural, ecological, scenic and cultural values for which these lands and easements were acquired and to minimize permanent damage to said lands and easements.

3. The National Park Service and the Division of Forestry mutually agree:

a. That the scope of this agreement applies only to all National Park Service lands and firefighting resources that are under the administrative

control of the Park Superintendent for New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River and to all lands within the State of West Virginia for which the Division of Forestry has responsibilities and to all firefighting resources under the control of the Director of the Division of Forestry.

b. To cooperate in the prevention, preparedness, and suppression of wildfires in the State of West Virginia, with particular emphasis on lands and watersheds administered by the National Park Service as part of New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River and areas adjacent to those lands.

c. To provide protection from wildfire all lands and watersheds administered by the National Park Service as part of New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River in the State of West Virginia. This includes identifying and taking initial attack suppression actions on any wildland fire within 1 mile and threatening National Park Service resources.

d. To promote a unified approach by all interested parties to the problems related to the prevention of wildfires within and adjacent to lands administered by the National Park Service as part of New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River in the State of West Virginia.

e. To cooperate in the formulation and application of practical plans and programs for the prevention, preparedness and suppression of wildfires.

f. To conform with the National Wildfire Coordinating Group (NWCG) program, including the Wildland Fire Qualification Guide 310-1 whenever working under the terms and conditions of this agreement. Whenever either party conducts NWCG certified training courses, the sponsoring party will provide the other party with the opportunity to attend said training courses if trainee positions beyond the needs of the sponsoring party are available.

g. In compliance with the Fair Labor Standards Act no person under 18 years old will be used in hazardous or arduous duties on lands under federal jurisdiction.

h. To provide by consent of each party such facilities, equipment and personnel required to supply single resources and/or assemble a combined NWCG rated fire crew for interagency dispatch to national fire emergencies as requested by interagency fire coordinators, provided that they are not needed by either party at that time for other responsibilities and duties.

i. To keep each other informed of fire weather information and related fire prevention and fire preparedness requirements. When either party determines that an emergency closure may be required, the other party will be informed as to the intended time and conditions of the closure so as to facilitate coordination of the actions to be taken.

j. To promptly furnish each other with the information necessary for fire statistical report purposes.

k. To designate, within fifteen (15) working days of the effective date of this Agreement, an employee to act as liaison for each party for the purpose of administering this Agreement.

l. To meet jointly when necessary, for the discussion of matters related to the application of this Agreement, and to provide for other meetings at administrative levels for the discussion of matters relevant to the prevention, preparedness and suppression of wildfires.

m. Biannually in February and in September, the employees designated as liaison for the National Park Service and the Division of Forestry will meet to:

(1) Exchange information necessary for the coordination of prevention, preparedness and suppression plans, including such items as detection, communications, training, equipment, crew dispatch, key personnel, phone numbers, unit numbers, radio frequencies, reports, etc..

(2) Provide information on the availability of aircraft for use by each party for the coming year and the terms and conditions under which such aircraft may be obtained and utilized.

(3) Submit to his or her immediate superior's recommendations for any needed revisions, deletions or additions to this Agreement.

n. Either party may initiate suppression actions on wildfires endangering lands or watersheds administered by the National Park Service as part of New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River.

o. The party receiving the initial report of a wildfire shall determine the jurisdiction involved. The receiving party shall then take immediate suppression action if the fire falls within its jurisdictional area. If the fire falls outside the jurisdictional area of the receiving party, that party will immediately notify the second party and offer suppression assistance. In all cases, the receiving party shall immediately notify the second party and the appropriate local agency (fire department) of the reported fire and of the actions taken by the receiving party. As a general rule, during the initial attack phase of any fire suppression operation, if the fire is burning on National Park Service administered lands, the National Park Service shall have command responsibility for the fire upon arrival. If the fire is burning on privately owned or non-federal public lands, the Division of Forestry or local jurisdiction (pursuant to West Virginia State Code) shall have command responsibility for the fire upon arrival.

p. In the event of a wildfire burning simultaneously on both private or non-federal public lands and lands administered by the National Park Service or if the objectives of a suppression operation on any lands considered within the scope of this Agreement can best be met through joint command, it is mutually agreed that the entire suppression operation shall be directed through a unified command, utilizing common objectives. The operation may be directed by a single incident commander, agreed to by representatives of both parties. As a general rule, the incident commander on such fires will be from the agency which has the greatest acreage of resources threatened by the fire at the time of the decision. If a single incident commander is designated, an agency representative from the second party will be appointed to assist the incident commander. The agency representative will provide information, guidance and advice to the incident commander concerning agency specific policies and regulations related to the incident and the involved wildland resources. Any delegation of command authority to

an incident commander for extended attack of wildfires burning on National Park Service administered lands will be done by the Park Superintendent through a written delegation of authority.

q. The National Park Service and the Division of Forestry shall share responsibility for the conduct of investigations as to the cause of any wildfires that occur on National Park Service administered lands. For individual fires, this responsibility may be assumed by one of the two parties through the mutual agreement of the both parties. Both parties retain the discretionary authority to prosecute any individuals found to have caused a wildfire. Prosecution will be made under the appropriate State and Federal laws; except that the Division of Forestry will initiate action in State Court for the enforcement of any State law and the National Park Service will initiate action in Federal Court for the enforcement of any Federal law.

r. In any action taken within the scope of this Agreement, fire fighting personnel in the employ of the National Park Service will adhere to all applicable National Park Service rules, regulations and standards governing wildland fire suppression operations and safety. Fire fighting personnel in the employ of, contracted by or requested by the Division of Forestry will adhere to all applicable State rules, regulations and standards governing wildland fire suppression operations and safety. This rule will apply regardless of the land ownership on which the fire is burning.

s. Each party will assume the costs of their respective wildfire control actions for the first twenty-four (24) hour period. Under unusual circumstances where prolonged assistance extending beyond the first twenty-four (24) hour period may be necessary, the party requesting assistance will reimburse the party providing assistance for costs directly related to that assistance, subject to the availability of funds and provided that said assistance was specifically requested by the Incident Commander and, in the case of the National Park Service, only the costs of those Division of Forestry resources used on National Park Service lands will be reimbursed to the Division of Forestry. Those costs that are reimbursable under the terms of this Agreement include the actual costs of supplies and materials (food, gasoline, oil, extinguishing agents, etc.) and personnel incurred by the assisting party. Repair or replacement of equipment damaged or destroyed while operating under the terms of this Agreement will be negotiated on a case by case basis by the employees designated as liaison for the National Park Service and the Division of Forestry.

t. Requests for reimbursement of costs will include an itemized listing of all costs and must be submitted by the party providing assistance to the party requesting assistance within thirty (30) days of the completion of each individual assistance activity as specified and allowed for in other sections of this Agreement.

u. The Comptroller General of the United States and the Auditor of the State of West Virginia or any duly authorized representative shall, until the expiration of three years after each payment under this Agreement, or for the time periods for the particular records specified in the Federal Procurement Regulations (41 CFR Part 1-20), have access to and the right to examine any directly pertinent book, documents or records of the signatory involving payments authorized under this Agreement.

v. By execution of this Agreement, both parties hereto expressly waive any and all claims against each other party for compensation for any loss, damage, personal injury or death occurring in consequence of the performance of this Agreement.

w. Nothing in this Agreement shall be construed as limiting or affecting in any way the authority of the National Park Service in connection with the proper administration and protection of all lands and other resources under its jurisdiction within the State of West Virginia that make up New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River, in accordance with the purpose for which the lands contained therein were acquired.

x. Nothing in this Agreement shall be construed as abrogating the legal responsibility of the Division of Forestry to provide wildfire protection for all the lands of the State of West Virginia, including those administered by the National Park Service as part of New River Gorge National River, Gauley River National Recreation Area, and Bluestone National Scenic River.

y. Each and every provision of this Agreement is subject to the laws and regulations of the State of West Virginia and the United States of America as applicable.

Article III. Term of Agreement

The term of this Agreement shall be for five (5) years from the day and year first above written. The conditions of this agreement will be comprehensively reviewed and revised 30 months from the date of execution to insure its continued applicability if so desired by either party. It is understood that when mutually agreed upon by the National Park Service and the Division of Forestry, nothing shall preclude the extension of this Agreement for another five (5) year period by the execution of a written agreement between the National Park Service and the Division of Forestry, incorporated by reference into this Agreement.

Article IV. Key Officials

The Superintendent of New River Gorge National River and his or her authorized representative, and the Director of the Division of Forestry and his or her authorized representative shall be responsible for administering this Agreement.

Article V. Property Management

Neither party is obligated to acquire, maintain or dispose of any property, real or personal, under the terms of this Agreement.

Article VI. Anti-Deficiency

Nothing contained herein shall be construed as binding the National Park Service or the Division of Forestry to expend in any one fiscal year any sum in excess of appropriations made by Congress or the West Virginia Legislature or administratively allocated by both agencies for the purpose of this Agreement for the fiscal year, or to involve the National Park Service or the Division of Forestry in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocations.

Total reimbursements made in any one calendar year under the terms of this Agreement may not exceed five-hundred-thousand dollars ($500,000.00) without the expressed prior written approval of the National Park Service Fire Director, Branch of Fire and Aviation Management.

Article VII. Reports

Each party will provide the other party with fire reports and copies of all vital correspondence directly related to this Agreement. Reports and correspondence will be directed to the signatories of this Agreement or their representatives and will be provided within fifteen (15) working days of the date of said report or correspondence.

Article VIII. Termination

This Agreement shall become effective when signed by the parties hereto and shall continue in force unless termination by mutual agreement or by either party upon sixty (60) days written notice to the other party of their intent to do so.

Article IX. Amendments

Amendments to this Agreement may be proposed by either party and shall become effective upon the signing by both parties of an amendment memorandum.

Article X. Required Clauses

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

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

Signatures

This Agreement constitutes the full, complete and entire agreement between the National Park Service and the Division of Forestry. No modification or amendments of this Agreement shall be binding on any part hereto unless such modification or amendment shall be in writing, executed in duplicate by the National Park Service and the Division of Forestry, attached to this Agreement and incorporated in and by references made a part of this Agreement.

In witness whereof, the parties have set their hands and seals the day and year first above written.

Witness:

United States Department of the Interior
National Park Service

by _/s/_____ 02/17/04
Calvin F. Hite, Superintendent Date
New River Gorge National River

Witness:

West Virginia Division of Forestry

by __/s/_____ 03/10/04
Charles R. Dye, Director Date
West Virginia Division of Forestry

Amendment 1

Designation of Authorized Representatives

Authorized Representative for the National Park Service:

Bruce Miller
Fire Management Officer
New River Gorge National River
PO Box 246
Glen Jean, WV 25846
Ph (304) 763-3145

2) Authorized Representative for the West Virginia Division of Forestry:

Charles T. Cover
District Forester
West Virginia Division of Forestry
330 Harper Park Drive, Suite J
Beckley, WV 25801
Ph (304) 256-6775

Approved By:

/s/ Date 02/17/04
Calvin Hite, Superintendent

/s/ Date 03/11/04
Charles R. Dye, Director

APPENDIX P
Park and Neighboring Agency Fire Contact Information

New River Gorge National River
P.O. Box 246
104 Main St.
Glen Jean, WV 25846-0246 Fax 304-465-0591

Name	Work Phone	Cell Phone/Pager	Home Phone
Calvin Hite Superintendent	304-465-0508		
Mike Hunter Assistant Superintendent	304-465-0508		
Deborah Darden Assistant Superintendent	304-465-6509		
Gary Hartley Chief Park Ranger	304-465-0508 x218	304-640-8801	
Trudy Hess Fire Program Assistant	304-763-3145 x10	361-4569	
Bruce Miller Fire Management Officer	304-763-3145 x23	304-640-8782	
John Perez Resource Management Specialist	304-465-6537		
Paul Head Regional Fire Management Officer	617-223-5067	800-759-8888	978-461-0722
Doug Wallner Regional Prescribed Fire Specialist	215-597-7140	215-266-2612	856-988-1063
David Fuerst Cultural Resource Manager	304-465-6530		

Neighboring Agencies

Division of Natural Resources
Director Ed Hamrick
State Capitol
Building 3, Room 669
Charleston, WV 25305 304-558-2754

Division of Natural Resources
Wildlife Resources Section
Curtis I. Taylor, Chief
Capitol Complex, Bldg 3, Room 812
1900 Kanawha Blvd, East
Charleston, WV 25305 304-558-3147

WV DEP
Division of Water Resources
414 Summers Street
Charleston, WV 25311 304-558-2107

US Environmental Protection Agency
William Arguto
Region 3
1650 Arch St.
Philadelphia, PA 19103

National Weather Service
Weather Forecast Office Blacksburg
1750 Forecast Drive
Blacksburg, VA 24060 (540)-552-0084

National Weather Service
400 Parkway Road
Charleston WV 25309

The Nature Conservency
PO Box 3754
Charleston, WV 25337

WV Chapter of The Nature Conservancy
Russ McClain, Conservation Ecologist
PO Box 250
Elkins, WV 26241 304-637-0160

WV Division of Forestry
Charles R. Dye
1900 Kanawha Blvd. East
Charleston, WV 25305 304-558-3446

WV Division of Forestry
PO Box 187
Summersville, WV 26651 304-872-0830

Raleigh County Commission
John Humphrey
116 ½ N. Heber St.
Beckley, WV 25801 304-255-9146

Fayette County Commission
PO Box 304
Fayetteville, WV 25840 304-574-4290

Nicholas County Commission
Tom Blankenship
700 Main St.
Summersville, WV 26657 304-872-7830

Summers County Commission
Terry Berry
PO Box 97
Hinton, WV 25951 304-466-7100

Parks And Recreation
John Pope Jr., Chief
Capitol Complex
Building 3, Room 714
Charleston, WV 25303 304-558-2764

U.S. Fish & Wildlife Service
Field Supervisor
694 Beverly Pike
Elkins, WV 26241

Carnifax Ferry State Park
Superintendent Mark Mengele
Rt.2, Box 435
Summersville, WV 26651 304-872-0825

Division of Forestry
District Forester Tom Cover
330 Harper Park Drive
Beckley, WV 25801 304-256-6775

College of Natural Resources
Dr. James E. Johnson, Professor of Forestry
324 Cheatham Hall
Virginia Tech
Blacksburg, VA 24061 540-231-5481

WV DEP
Division of Air Quality
7012 MacCorkle Ave., S.E.
Charleston, WV 25304 304-926-3647

US Dept. of Agriculture
Natural Resource Conservation Service
1224 Airport Rd.
Beaver, WV 25813

Division of Natural Resources
Non-Game & Natural Heritage Programs
Jim Vanderhorst
PO Box 67
Elkins, WV 25241 304-637-0245

Division of Natural Resources
Natural Heritage Program
Wildlife Resources Section
Brian R. McDonald, Coordinator
PO Box 67
Elkins, WV 26241 304-637-0245

Ms. Susan M. Pierce
Deputy State Historic Preservation Officer
Dept. of Culture & History
Cultural Center
Capitol Complex
Charleston, WV 25305

Hinton Corp. of Engineers
Resource Manager
701 Miller Ave.
Hinton, WV 25951 304-466-1234

Summersville Corp. of Engineers
Resource Manager
Rt.2 Box 470
Summersville, WV 26651 304-872-3412

Babcock State Park
Attn: Dick Morris
HC 35, Box 150
Clifftop, WV 25831 304-438-3004

Hawks Nest State Park
Attn: Tom Shriver
PO Box 857
Ansted, WV 25813 304-658-5212

Pipestem State Park
Attn: Steve Bolar
PO Box 150
Pipestem, WV 25979 304-466-1800

Bluestone State Park
Attn: Keith Cooper
HC 78, Box 3
Hinton, WV 25951 304-466-2805

Larry Berry
District Wildlife Biologist
2006 Robert C. Byrd Dr.
Beckley, WV 25801 304-256-6947

Jim Akers, Mayor
125 N. Court St.
Fayetteville, WV 25840 304-574-0255

Emmett Pugh, Mayor
PO Box 2514
Beckley, WV 25802 304-256-1750

Cleo Matthew, Mayor
PO Box 477
Hinton, WV 25951 304-466-3255

Barbara Hickman, Mayor
PO Box 1245
Oak Hill, WV 25901 304-469-9541

Stanley Adkins, Mayor
PO Box 525
400 N. Broad St.
Summersville, WV 26651 304-872-1211

Melanie Dragan, Mayor
HC Box 184
Thurmond, WV 25936 304-574-3546

Pete Hobbs, Mayor
PO Box 798
Ansted, WV 25812 304-658-4666

Tom Neal, Mayor
PO Box 490
Gauley Bridge, WV 25085 304-632-2504

Beckley Fire Dept.
213 S. Kanawha St.
Beckley, WV 25801 304-256-1780

Coal River VFD
PO Box 248
Arnett, WV 25007 304-934-6641

Beaver VFD
PO Box 101
Beaver, WV 25813 304-252-5824

Bradley/Prosperity VFD
PO Box 331
Bradley, WV 25818 304-877-2340

Clear Creek VFD
PO Box 26
Clear Creek, WV 25044 304-877-2669

Coal City VFD
PO Box 1207
Coal City, WV 25823 304-683-3945

Ghent VFD
PO Box 99
Ghent, WV 25843 304-787-5880

Lester VFD
PO Box 102
Lester, WV 25865 304-934-6622

Mabscott VFD
PO Box 176
Mabscott, WV 25871 304-253-5654

Rhodell VFD
PO Box 201
Rhodell, WV 25915 304-683-3420

Sophia Area VFD
PO Box 1160
Sophia, WV 25921 304-683-3409

Sophia City FD
PO Box 1248
Sophia, WV 25921 304-683-9802

Trap Hill VFD
PO Box 130
Glen Daniel, WV 25844 304-934-7772

Whitesville VFD
PO Box 145
Whitesville, WV 25209 304-854-1639

Green Sulphur VFD
PO Box 12
Sandstone, WV 25985 304-466-2610

Summers County VFD
PO Box 914
Hinton, WV 25951 304-466-2389

Ansted Certified FD
PO Box 419
Ansted, WV 25812 304-658-4394

Gauley River FD
PO Box 70
Belva, WV 26656 304-632-1851

Oak Hill FD
PO Box 398
Oak Hill, WV 25901 304-465-0598

Fayetteville FD
PO Box 812
Fayetteville, WV 25840 304-574-0712

Gauley Bridge FD
PO Box 640
Gauley Bridge, WV 25085 304-632-1810

Kesslers Cross Lanes VFD
PO Box 246
Kesslers Cross Lanes, WV 26675

Wilderness VFD
PO Box 150
Mt. Lookout, WV 26678

APPENDIX Q
Fire Monitoring Plan

New River Gorge National River
Fire Effects Monitoring Plan

III INTRODUCTION

This document provides direction and reference information for fire effects monitoring of prescribed burns at New River Gorge National River.

Minimum requirements for monitoring before, during, and after prescribed burns are outlined here. All prescribed burns will require a monitoring plan, which must be based on project objectives. Objectives may dictate more comprehensive monitoring than the minimum requirements can address.

This plan also provides the Park's guidelines for setting project objectives, developing a monitoring plan and choosing sampling methods. It is intended to standardize the monitoring protocol to the extent possible. A variety of approved methods and data sheets are included in the appendices.

Burn plans without a monitoring plan will not be authorized. Line officers are ultimately responsible for assuring that fire effects monitoring is carried out, reported, and coordinated with resource managers from all affected disciplines.

GOALS & OBJECTIVES

The following are specific goals and objectives for fire effects monitoring in the Park:

- Use monitoring results to determine whether fire managers are meeting management objectives
- Document and analyze both short-term and long-term prescribed fire effects on vegetation.
- Document fire behavior to allow managers to validate burn prescriptions and compare them to fuels and resource objectives.
- Detect unforeseen results of prescribed and wildland fire use programs
- Follow trends in plant communities where fire effects literature exists, or research has been conducted
- Determine if the implementation of the Fire Management Plan and prescribed fire treatment is occurring as predicted
- Identify areas where additional research is needed.

BACKGROUND

2002 the Brookside prescribed fire was the first prescribed fire to be conducted at New River Gorge National River (NERI). The Brookside prescribed fire was conducted as a research project with the Park and Virginia Polytechnic Institute and State University (VPI). Pre and Post fire effects monitoring were conducted by students from VPI. The prescribed fire program at NERI is still evolving and additional prescribed fire projects are in the early stages of development. For research purposes, it is anticipated that no more than 10 prescribed fires will be conducted in oak, oak-pine, and oak-hickory communities totaling 70—100 acres over the initial 5 year period. In addition, approximately 70 acres of prescribed burning may be planned and conducted cooperatively with the West Virginia Department of Natural Resources on the Bluestone National Scenic River for wildlife management purposes over the initial 5 year period.

The National Park Service has standardized requirements for fire

effects monitoring of all prescribed burning, contained in the NPS Fire Monitoring Handbook. The original handbook has been revised and is constantly evolving at the Service's monitoring program grows to meet expanding fire management needs.

REQUIRED MONITORING

The National Environmental Policy Act mandates that monitoring and evaluation be conducted to mitigate human actions that alter landscapes or environments. Prescribed fire projects fall under this category, and therefore must provide for this monitoring.

The Resource Management Plan for New River Gorge National River is currently under development and will address monitoring and evaluation of all projects conducted under the auspices of the plan.

Monitoring allows quantitative measurement of the progress and results of projects. Table 1 displays the monitoring standards that will be met for vegetation manipulation projects.

Table 1. Minimum Acceptable Levels of Rx Fire Monitoring

Inventory • Landscape scale mapped data • Usually not collected by fire effects monitors unless project-level data is needed	Project map including plant community or habitat types
Pre–Burn • Data collected pre-burn	Map of project area showing burn unit boundaries, fuel types, plant community or habitat types, and any sensitive plant or animal species locations (including invasive species) that require special actions to be taken Live and dead fuel moisture information Installation of pre-burn photopoints or vegetation plots, as determined by objectives

	Monitoring plan – (attached to burn plan)
During Burn • Data collected during burn; often includes fire behavior, weather and smoke characteristics	Weather observations recorded at least every hour to include: Temperature, relative humidity, wind speed and direction Fire behavior: rate of spread, flame length, other specific prescription elements related to time and location of weather observations Smoke dispersal direction and height related to time and location of weather observations Live and dead fuel moisture samples collected on site the day of burn for later comparison Firing pattern and type of ignition used must be documented
Immediate Post-Burn • Data collected immediately post burn, but occasionally up to 3 years post-burn	Perimeter map of burn Number of burned and unburned acres in the unit, mapped Retakes of photopoints if established prior to burn If a fuels reduction burn, woody fuel and duff reduction, tree/shrub percent mortality
Long Term Fire Effects • Data often collected up to 20 years post-burn.	Retakes of photopoints if established prior to burn 1 and/or 3 year post-burn walk-through to detect new invasives presence, and further walk-throughs if they are detected If an invasive plant treatment burn, annual monitoring is required

MONITORING PLANS

Every burn plan will include a monitoring plan, which outlines how the requirements for monitoring are addressed. If project objectives dictate that additional data collection is needed, the plan will address these also.

Monitoring plans will include:

1. Map(s) of burn unit showing and describing plant community or habitat types
2. Measurable and quantifiable monitoring objectives tiered from management objectives

3. GPS locations and descriptions of monitoring plots and/or photopoints
4. Monitoring methods used, including monitoring schedule

A monitoring plan template and example are included in NERI Fire Effects Reference Guide.

SETTING OBJECTIVES

Measurable project objectives are crucial to project monitoring and are often used to evaluate project effectiveness. The use of non-quantifiable project objectives in the past has led to this effort in adopting a discrete system that will help in the development of measurable objectives. Once measurable objectives are established, they can be monitored. Table 2 shows how objectives can be put into measurable terms.

Table 2. Components of a Measurable Monitoring Objective

Component	Example
1. Target population	Native bunch grasses
2. Time frame	Two years post burn
3. Direction and amount of change / trend *-or-* Target / threshold condition	Increase by 40-60% *-or-* At least 40% cover
4. Variable to be measured	Percent cover
5. Location	Sandstone Visitor Center
6. Statistical certainty	80%

Measurable Objective Example: *"Increase the percent cover of native bunch grasses at Sandstone Visitor Center by 40-60% (or "to at least 40%") two years post burn with 80% statistical certainty."*

Furthermore, the way monitoring objectives are stated will determine the amount of plots required, and the statistical methods used in data analysis. Coordination among all involved staff will help determine appropriate objective setting methods and evaluation.

An attempt will be made to coordinate project objectives within all project records such as burn plans, NEPA documentation, monitoring plans etc.

IV DATA COLLECTION

Appropriate sampling methods for long-term fire effects will be developed according to objectives set by management staff. The choices of sampling methods will be guided by agency protocols and regional staff recommendations, however customary, peer-reviewed and/or published methods are required. Consideration should also be given to available resources.

Data collection is made possible by incorporating monitoring talent from multi- and interagency efforts. While it is unimportant who is doing monitoring, fire effects monitors should be competent in local plant identification. Correct species identification will reduce sampling error incurred inherent in monitoring programs.

Table 3 shows many of the accepted methodologies for measuring prescribed fire monitoring variables.

Table 3. Established Fire Effects Monitoring Methods for New River Gorge National River		
Monitoring Variable	**Method**	**Appendix A Page Number or Other Source**
INVENTORY		
Project Area Map	GIS or Hand drawn	Map Source
Project Area Vegetation Maps Showing Community or Habitat Types	GIS, Aerial Photography, Inventory Data	Botanist
PRE-BURN		
Fuel Moisture	(Norum and Miller 1984) Method Drying Oven or Computrac	3
Photopoint Installation	FMH	31 – 38
Pre-Burn Plot Installation (see immediate and long term fire effects sections, below)	(see immediate and long term fire effects sections, below)	
DURING BURN		
Weather Observations: Temp. RH Wind Cloud Cover	On-Site Fire Monitor	Fireline Handbook; Field Observer Reference p. 19
Fire Behavior: Rate of Spread Flame length Flame Height Flame Zone depth	On-Site Fire Monitor	
Smoke: Plume Height Color Drift Direction	On-Site Fire Monitor	
Fuel Moistures (for later comparison) Live Dead	(Norum and Miller 1984) method Drying Oven or Computrac	3
IMMEDIATE POST-BURN		

(First Order Fire Effects)		
Perimeter Map	GPS, Satellite Imagery, Aerial Photography	
Burn Severity	Hand Drawn with Severity Categories based on (Ryan and Noste 1983) or Satellite Imagery based on (Key and Benson 1999)	10, 2
Treatment Acreage Breakdown	Dot Grid or GIS	
Woody Fuels and Duff Reduction	Brown 1982 Method	13 - 22
Shrub Mortality	Shrub Transect or "Belt" (Nested Frequency, FMH, or Macroplot)	48 - 57
Tree Mortality	FMH, Macroplot,	2, 60
Scorch Height	FMH	2
LONG-TERM (Second Order Fire Effects)		
Random Plot Location	GIS Applications, Grid Map Method, or XY Coordinates Method	23
Ground Cover	Point Samples	46, 59
Species Diversity	FMH Veg. Line, Line-Point Intercept	2, 59
Herbaceous Vegetation Frequency	Nested Frequency	24 - 47
Herbaceous Cover or Composition	Line intercept, Line-point intercept (Macroplot), FMH Veg. Line	48 - 57, 59, 2

(Table 4 continued)

Shrub Vegetation Canopy Cover, age class, height	Line Intercept FMH Veg. Line Sampling	48 – 57, 2
Shrub Density, Height, Age class	Shrub Transect or "Belt" (Nested Frequency, FMH, or Macroplot)	48 – 57, 2, 60
Riparian Plant Community or Habitat Type Size	Cross-Section, Greenline	64, 65
Riparian Woody Species Density, Age Class, Mortality and	Woody Species Regeneration	72

Regeneration		
Tree Density, DBH, canopy class	FMH, Macroplot, or FIREMON Tree Data Method	2, 60, 2
Tree Canopy Cover	Densiometer	86
Tree Mortality	FMH, Macroplot, or FIREMON Tree Data Method	2, 60, 2
Tree Seedling / Resprout Density and Height	FMH, Macroplot, or FIREMON Tree Data Method	2, 60, 2
Photopoint	FMH	31 - 38
Fuel Loading	Brown 1982 Method, Photo Index, Burgan and Rothermel	13 - 22

SCHEDULING

Monitoring plans should be initiated at the time project objectives are determined. Ideally this would occur prior to or as part of the NEPA process. Monitoring plans must be provided in a timely manner in order to ensure pre-burn data is collected and monitoring is scheduled. This will require coordination with fire effects monitors and other cooperating personnel. Advanced planning is necessary so that monitoring efforts can be scheduled so that plots can be re-read in the same phenological stage as previous visits.

During each burn, a qualified prescribed fire monitor should be designated to collect weather, fire behavior, and smoke data. On-site fuels samples should be collected for later comparison with this data.

DATA STORAGE AND ACCESS

V A plot folder will be established for all fire effects plots. See Table 1 in NERI Fire Effects Reference Guide for a complete list of the plot folder contents. A duplicate folder will be stored at a separate location.

VI

VII A project file is also maintained for each burn project and the file normally resides at the New River Gorge National River Fire Management Office. Along with appropriate NEPA documents, burn plan and associated records, all fire effects monitoring data and any analyses will be included.

It is possible that several agencies may be involved in fire effects monitoring in the future, presenting data access complications. The storage requirements in this plan are intended to allow all involved agencies convenient access to the up-to-date data. In the absence of common network access, data must be shared via disk format.

DATA ANALYSIS AND SUMMARY REPORTS

Monitoring data analysis will occur after the fire season ends. Fire effects data can be analyzed with the FMH software, other statistical software, or spreadsheet. An end-of-season monitoring report will be completed and/or presented by February 15 for each preceding field season.

A fire effects summary report of each project will be prepared following treatment, and updated as any further post-burn monitoring occurs. Managers may request that the summary is also provided in an oral presentation.

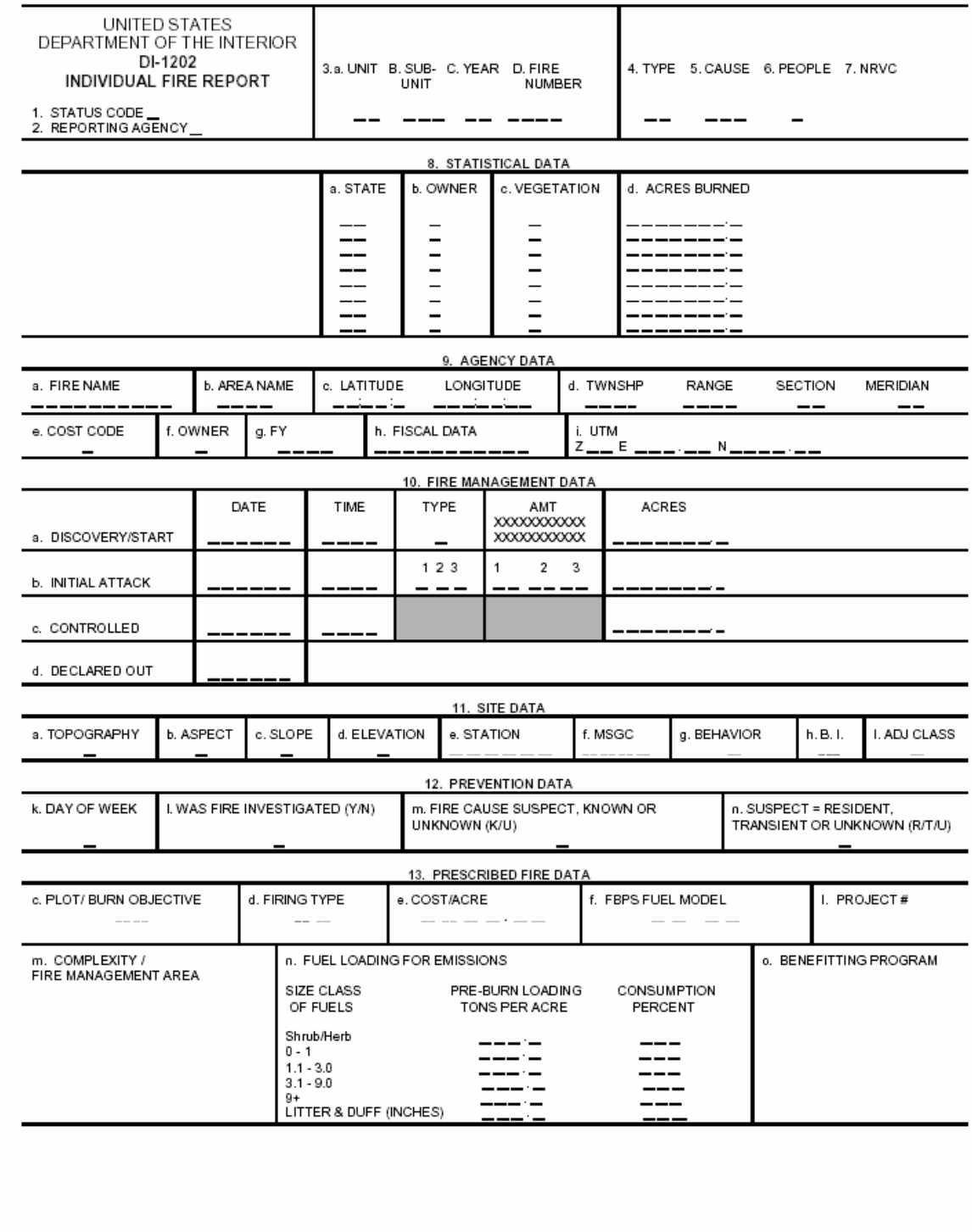
VIII GIS AND MAPPING

All projects monitored under this plan must have a mapped burn perimeter. This information is important for project implementation and other aspects of the fire program including prescribed and wildfire pre-planning.

Where applicable and determined by project objectives, burn severity can be mapped by hand or with satellite imagery. The *Ryan and Noste* (*1983)* severity categories should be followed for appropriate map coarseness and format. GIS produced severity maps should follow methods from *Key and Benson 1999*.

Any associated GIS maps that will be kept for long-term monitoring will be prepared according to New River Gorge National River GIS standards. Standard metadata will be included. GIS maps will be stored in the Park database where they will be available for use.

APPENDIX R
Individual Fire Report Form, DI 1202



UNITED STATES
DEPARTMENT OF THE INTERIOR
DI-1202
INDIVIDUAL FIRE REPORT

1. STATUS CODE
2. REPORTING AGENCY

3.a. UNIT B. SUB-UNIT C. YEAR D. FIRE NUMBER

4. TYPE 5. CAUSE 6. PEOPLE 7. NRVC

8. STATISTICAL DATA

a. STATE	b. OWNER	c. VEGETATION	d. ACRES BURNED

9. AGENCY DATA

a. FIRE NAME	b. AREA NAME	c. LATITUDE LONGITUDE	d. TWNSHP RANGE SECTION MERIDIAN

e. COST CODE	f. OWNER	g. FY	h. FISCAL DATA	i. UTM
				Z E N

10. FIRE MANAGEMENT DATA

	DATE	TIME	TYPE	AMT XXXXXXXXXXX XXXXXXXXXXX	ACRES
a. DISCOVERY/START					
b. INITIAL ATTACK			1 2 3	1 2 3	
c. CONTROLLED					
d. DECLARED OUT					

11. SITE DATA

a. TOPOGRAPHY	b. ASPECT	c. SLOPE	d. ELEVATION	e. STATION	f. MSGC	g. BEHAVIOR	h. B. I.	I. ADJ CLASS

12. PREVENTION DATA

k. DAY OF WEEK	l. WAS FIRE INVESTIGATED (Y/N)	m. FIRE CAUSE SUSPECT, KNOWN OR UNKNOWN (K/U)	n. SUSPECT = RESIDENT, TRANSIENT OR UNKNOWN (R/T/U)

13. PRESCRIBED FIRE DATA

c. PLOT/ BURN OBJECTIVE	d. FIRING TYPE	e. COST/ACRE	f. FBPS FUEL MODEL	I. PROJECT #

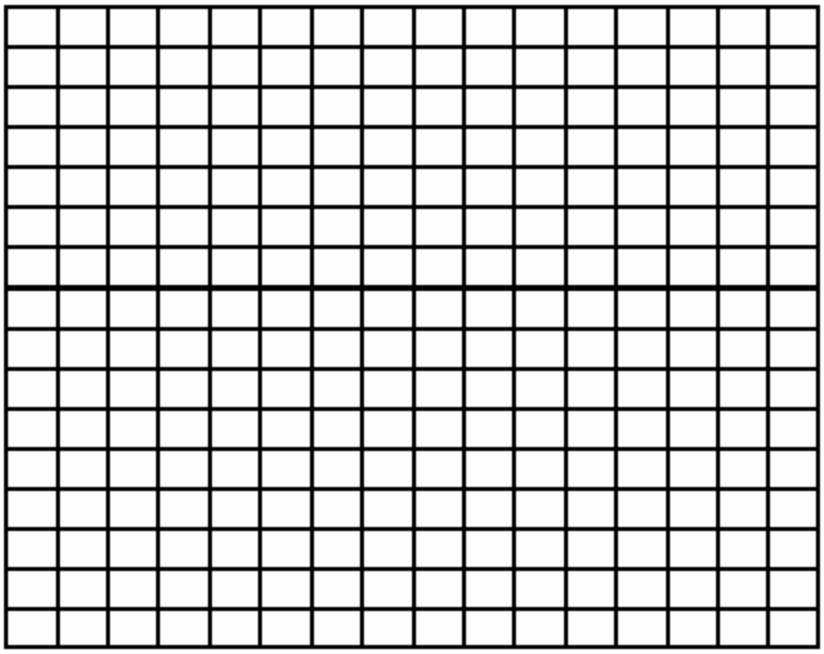
m. COMPLEXITY / FIRE MANAGEMENT AREA	n. FUEL LOADING FOR EMISSIONS			o. BENEFITTING PROGRAM
	SIZE CLASS OF FUELS	PRE-BURN LOADING TONS PER ACRE	CONSUMPTION PERCENT	
	Shrub/Herb			
	0 - 1			
	1.1 - 3.0			
	3.1 - 9.0			
	9+			
	LITTER & DUFF (INCHES)			

NARRATIVE - Enter information about the fire.

TITLE INFORMATION - (Mandatory)
Submitted by:
Submitted Title:
Submitted Date:
Entered by:
Entered Title:
Entered Date:

MAP: - (Optional)

LOCATION PLAT SCALE: " = 1 MILE



APPENDIX S
Fire Equipment Inventory

CANYON FIRE INVENTORY

ITEM	UNIT	CANYON	20 PERSON	ISSUED	TOTAL
046 STHIL CHAINSAW	EA	1			1
038 STHIL CHAINSAW	EA	2			2
026 STHIL CHAINSAW	EA	4			4
HOMELITE CHAINSAW	EA	1			1
FS 280 BRUSHCUTTER--FIRE	EA	2			2
BR340 BLOWER-PROJECT	EA	1			1
MARK 111 PUMP KIT	EA	1			1
SHINDAIWA PUMP KIT	EA	1			1
KING RADIO-HANDHELD	EA	1			1
					0
PERSONAL PROTECTIVE GEAT					0
BRUSH JACKET XS	EA				0
BRUSH JACKET S	EA				0
BRUSH JACKET M	EA	3			3
BRUSH JACKET L	EA	1			1
BRUSH JACKET XL	EA	4			4
BRUSH JACKET XXL	EA	1			1
					0
NOMEX, SHIRT XS	EA	1			1
NOMEX, SHIRT S	EA	12			12
NOMEX, SHIRT M	EA	15			15
NOMEX, SHIRT L	EA	11			11
NOMEX, SHIRT L LONG	EA	2			2
NOMEX, SHIRT XL	EA	9			9
NOMEX, SHIRT XL LONG	EA	3			3
					0
NOMEX, PANTS 8	EA	7			7
NOMEX, PANTS 10	EA	1			1
NOMEX, PANTS 12	EA				0
NOMEX, PANTS 14	EA	5			5
NOMEX, PANTS 16	EA	2			2
NOMEX, PANTS 28	EA	2			2
NOMEX, PANTS 30	EA	7			7
NOMEX, PANTS 32	EA	16			16
NOMEX, PANTS 34	EA	9			9
NOMEX, PANTS 36	EA	15			15
NOMEX, PANTS 38	EA	15			15
NOMEX, PANTS 40	EA	2			2
					0
GLOVES, SMALL	EA	6			6
GLOVES, MED	EA	15			15
GLOVES, LARGE	EA	8			8
GLOVES, XLARGE	EA	5			5
					0

FIRE SUPPLIES				0
HEADLAMP	EA	6	20	26
HELMET	EA	7	20	27
GOGGLES	EA	11	20	31
SHROUDS	EA	7		7
FIELD PACK, IA GEAR	EA	11	20	31
FIELD PACK, COMPLETE	EA	5		5
RED PACK	EA	20		20
RED PACK /SLEEPING BAG	EA	5		5
SLEEPING BAG / PAPER	EA		20	20
SLEEPING BAG / CLOTH	EA	12		12
FIRE SHELTER	EA	23	20	43
TARPS	EA	3		3
BELT WEATHER KIT	EA	1	1	2
MEALS READY TO EAT	EA	2	7	9
1-QT DISPOSABLE WATER	EA	92	100	192
10 PERSON FIRST AID KIT	EA	2	2	4
INDIVIDUAL FIRST AID KIT	EA	13	20	33
RADIO CHEST HARNESS	EA	3		3
BRIEFCASE-GRAY	EA	2		2
BATTERY AA	EA	72		72
BATTERY D	EA			0
FLAGGING	RO	20		20
GREEN BAGS	EA	4		4
REI SOLOLITE TENT	EA	3		3
4 QT METAL CANTEEN	EA	4		4
4 QT NYLON DUCK	EA			0
				0
FIRE TOOLS				0
FIRE RAKE	EA	78		78
SHOVEL	EA	26		26
PULASKI	EA	47		47
COMBINATION TOOL	EA	10		10
DOUBLE BIT FELL AX	EA	5		5
BRUSHOOK	EA	3		3
DRIP TORCH	EA	5		5
				0
WATER HANDLING SUPPLIES	EA			0
BACKPACK PUMP	EA	25	10	35
MOP-UP KIT 6 PERSON	EA	2		2
HOSE, .75 GARDEN HOSE	EA	1		1
HOSE, 50' SYNTHETIC	EA	3		3
HOSE, SYN 100' 1"	EA	4		4
HOSE, SYN 100' 1.5"	EA	8		8
HOSE, CJRL 1"	EA	6		6
HOSE, CJRL 1.5"	EA	9		9
HOSE, LINEN 1"	EA	4		4
HOSE, LINEN 1.5"	EA	5		5
HOSE, SUCTION 8"	EA	7		7
1" FORESTER NOZZLE	EA	1		1

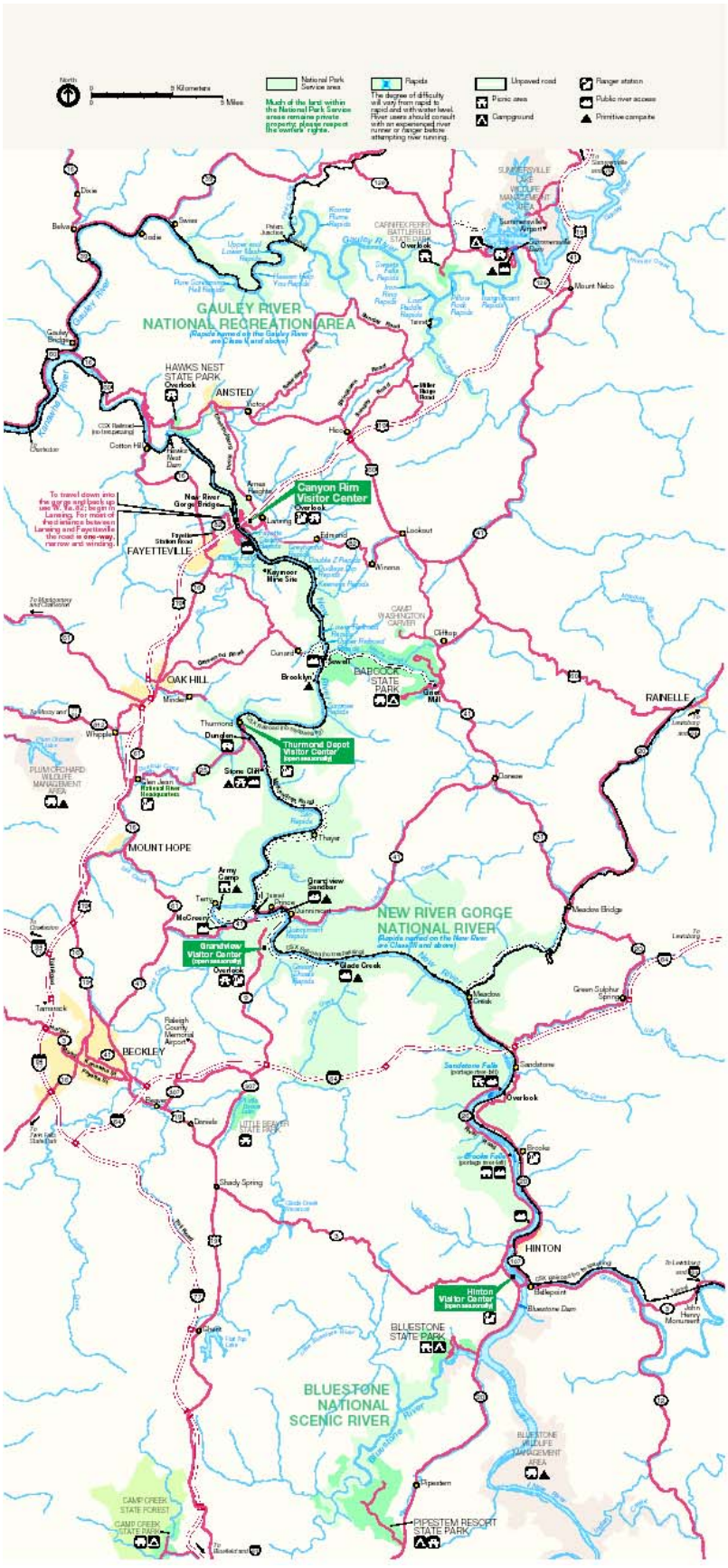
1" KK NOZZLE	EA	1	1
1" PLASTIC NOZZLE	EA	8	8
1.5 " PLASTIC NOZZLE	EA	5	5
ADAPTER 1.5 NPSH TO 1.5 NH	EA		0
ADAPTER 1.5 NH TO 1.5 NPSH	EA	1	1
INCREASER 1.5" TO 2	EA	1	1
INCREASER 1.5" TO 2.5"	EA	1	
REDUCER 1" TO .75"	EA	8	8
REDUCER 1.5 TO 1"	EA	20	20
REDUCER 2.5" TO 1.5"	EA	1	1
GATED WYE 1"	EA	2	2
GATED WYE 1.5"	EA	6	6
IN-LINE TEE 1.5"	EA	17	17
	EA	1	1
WRENCH, SPANNER	EA	5	5
HOSE CLAMP	EA	3	3
SHUTOFF VALVE 1.5	EA	3	3
SIEMESE VALVE 1"	EA	1	1
COLLASPABLE PAIL	EA	8	8
DOUBLE MALE 1.5"	EA	1	1
DOUBLE MALE 1"	EA	1	1
DOUBLE FEMALE 1.5	EA	1	1
DOUBLE FEMALE 1"	EA		0
HANDPRIMER	EA		0
PRESSURE RELIEF VALVE	EA	1	1
CHECK VALVE	EA		0
PIPE WRENCH 24"	EA	1	1
WETTING AGENT	EA		0
500 GAL PUNPKIN	EA	1	1
SYLVEX	EA	3	3
	EA		0
GENERAL SUPPLIES			0
BACKFIRE FUSES	EA	23	23
48QT COOLER	EA	2	2
5 GAL COOLER	EA	1	1
			0
BLACK & DECKER DRILL	EA	1	1
BLACK & DECKER GRINDER	EA	1	1
BATTERY CHARGER	EA	1	1
FOAM PROPORTIONOR	EA	1	1

INVENTORY LIST GV CACHE					Date: 06/07/04
ITEM	20 PERSON	SUPPLY	ISSUED	DIFFERENCE	TOTAL
Brush Jackets-					
XS		3			3
S		0			0
M		0			0
L		1			1
XL		4			4
XXL		0			0
Nomex Shirts-					
XS		7			7
S		21			21
M		12			12
L		4			4
XL		2			2
XXL		10			10
Nomex Pants-					
Women					
8		5			5
10		3			3
12		5			5
14		5			5
16		2			2
Nomax Cover All's		2			2
Nomex Pants-					
Mens-					
26-30x30		1			1
28x30		12			12
28-32x30		1			1
30x30		10			10
30-34x30		4			4
30x34		5			5
30-34x34		5			5
32x30		0			0
32x34		1			1
32-36x34		3			3
34x30		0			0
34x34		3			3
34-38x34		12			12
36x30		1			1
36x34		16			16
38x30		0			0
38x34		1			1

38-42x34		3			3
40x34		2			2
40-44x34		5			5
Gloves-					
S		6			6
M		15			15
L		8			8
XL		5			5
Face Shrouds (R-2222)		18			18
Flight Helmets		4			4
Hard Hats		15			15
Hard Hats W/Screen		1			1
Chin Staps		9			9
Goggles (dust/smoke)		30			30
Safety Glasses		18			18
Ear Plugs		1/2 box			
First Aide Kit (Fireline Crew)		3			3
First Aide Kit (Personnal)		13			13
Chaps-					
Size 30		1			1
Size 32		2			2
PACKS:					
Red Pack		9			9
Red Pack w/Sleeping Bag		3			3
Red Duffle Bag Large		8			8
Red Duffle Bag Medium		2			2
Red Duffle Bag		1			1
I.A. Gear (Complete)		14			14
I.A. Gear Main Pack		5			5
I.A. Gear Hip Pack		9			9
I. A. Gear Belt					
I.A. Gear Harness					
I.A. Gear Canteen Case					
Fire Shelters (Instructional)		0			0
Fire Shelters (Fireline-Yellow)		0			0
Fire Shelters (Fireline-Blue)		24			24
Fire Shelter Carrying Case (Yellow)		4			4
Fire Shelter Chest Pack Carrying Case (Black)		2			2
SLEEPING BAGS:					
Green/Yellow		9			9
Blue		1			1
Solar Blanket		1			1
Tents		15			15

Belt Weather Kit		2			2
Belt Weather Kit Case		1			1
Meals Ready To Eat		0			0
1-Qt. Disposible Canteen		14			14
Water Bandoleers- 4 Qt.		4			4
Radio Chest Harness		3			3
Compasses		0			0
Signal Mirrors		0			0
Fuel Bottles		4			4
Breifcase- Gray		3			3
AA Batteries		72			72
D Batteries (Case)		8			8
Headlamps- AA Type		13			13
Headlamps- D Type (Box)		3			3
Parachute Cord (Roll)		1			1
FSS Pack Sacks		2			2
Insect Repellent- 1oz. Bottles		9			9
Jumper Cables		1			1
Chock Blocks		1			1
Fiberglass Tape (Rolls)		0			0
Duct Tape		0			0
Flagging: (Rolls)					0
Orange		1			1
Yellow		0			0
Pink		9			9
Blue/White		3			3
Blue		1			1
Red		0			0
White		4			4
Green		0			0
Hazard Flagging Yellow/Black		0			0
Fire Line (Do Not Cross)		0			0
Tent Flys- 9 ft. X 10 ft. (Blue)		5			5
Tent Flys-16 ft. X 24 ft. (Yellow)		1			1

APPENDIX T
Fire Management Unit Map


GAULEY RIVER
NATIONAL RECREATION AREA
HAWKS NEST
STATE PARK
ANSTED
Canyon Rim
Visitor Center
FAYETTEVILLE
OAK HILL
BABCOCK
STATE
PARK
RAINELLE
Thurmond Depot
Visitor Center
MOUNT HOPE
NEW RIVER GORGE
NATIONAL RIVER
Grandview
Visitor Center
BECKLEY
HINTON
Hinton
Visitor Center
BLUESTONE
STATE PARK
BLUESTONE
NATIONAL
SCENIC RIVER
PIPESTEM RESORT
STATE PARK

APPENDIX U
Park Unit Vegetation Maps

This plan is under development.

Appendix V
National Fire Plan
Glossary of Wildland Fire Terms

A

Aerial Fuels: All live and dead vegetation in the forest canopy or above surface fuels, including tree branches, twigs and cones, snags, moss, and high brush.

Aerial Ignition: Ignition of fuels by dropping incendiary devices or materials from aircraft.

Air Tanker: A fixed-wing aircraft equipped to drop fire retardants or suppressants.

Agency: Any federal, state, or county government organization participating with jurisdictional responsibilities.

Anchor Point: An advantageous location, usually a barrier to fire spread, from which to start building a fire line. An anchor point is used to reduce the chance of firefighters being flanked by fire.

Aramid: The generic name for a high-strength, flame-resistant synthetic fabric used in the shirts and jeans of firefighters. Nomex, a brand name for aramid fabric, is the term commonly used by firefighters.

Aspect: Direction toward which a slope faces.

B

Backfire: A fire set along the inner edge of a fireline to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

Backpack Pump: A portable sprayer with hand-pump, fed from a liquid-filled container fitted with straps, used mainly in fire and pest control. (See also Bladder Bag.)

Bambi Bucket: A collapsible bucket slung below a helicopter. Used to dip water from a variety of sources for fire suppression.

Behave: A system of interactive computer programs for modeling fuel and fire behavior that consists of two systems: BURN and FUEL.

Blackline: In fire suppression, a blackline denotes a condition where there is no unburned material between the line and the fire edge.

Bladder Bag: A collapsible backpack portable sprayer made of neoprene or high-strength nylon fabric fitted with a pump. (See also Backpack Pump.)

Blow-up: A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm. (See Flare-up.)

Brush: A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

Brush Fire: A fire burning in vegetation that is predominantly shrubs, brush, and scrub growth.

Bucket Drops: The dropping of fire retardants or suppressants from specially designed buckets slung below a helicopter.

Buffer Zones: An area of reduced vegetation that separates wildlands from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

Bump-up Method: A progressive method of building a fire line on a wildfire without changing relative positions in the line. Work is begun with a suitable space between workers. Whenever one worker overtakes another, all workers ahead move one space forward and resume work on the uncompleted part of the line. The last worker does not move ahead until completing his or her space.

Burn Out: Setting fire inside a control line to widen it or consume fuel between the edge of the fire and the control line.

Burning Ban: A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

Burning Conditions: The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

Burning Index: An estimate of the potential difficulty of fire containment as it relates to the flame length at the most rapidly spreading portion of a fire's perimeter.

Burning Period: That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

C

Campfire: As used to classify the cause of a wildland fire, a fire that was started for cooking or warming that spreads sufficiently from its source to require action by a fire control agency.

Candle or Candling: A single tree or a very small clump of trees that is burning from the bottom up.

Chain: A unit of linear measurement equal to 66 feet.

Closure: Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

Cold Front: The leading edge of a relatively cold air mass that displaces warmer air. The heavier cold air may cause some of the warm air to be lifted. If the lifted air contains enough moisture, the result may be cloudiness, precipitation, and thunderstorms. If both air masses are dry, no clouds may form. Following the passage of a cold front in the Northern Hemisphere, westerly or northwesterly winds of 15 to 30 or more miles per hour often continue for 12 to 24 hours.

Cold Trailing: A method of controlling a partly dead fire edge by carefully inspecting and feeling with the hand for heat to detect any fire, digging out every live spot, and trenching any live edge.

Command Staff: The command staff consists of the information officer, safety officer, and liaison officer. They report directly to the incident commander and may have assistants.

Complex: Two or more individual incidents located in the same general area, which are assigned to a single incident commander or unified command.

Contain a fire: A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

Control a fire: The complete extinguishment of a fire, including spot fires. Fireline has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

Control Line: All built or natural fire barriers and treated fire edge used to control a fire.

Cooperating Agency: An agency supplying assistance other than direct suppression, rescue, support, or service functions to the incident control effort; e.g., Red Cross, law enforcement agency, telephone company, etc.

Coyote Tactics: A progressive line construction duty involving self-sufficient crews that build fire line until the end of the operational period, remain at or near

the point while off duty, and begin building fire line again the next operational period where they left off.

Creeping Fire: Fire burning with a low flame and spreading slowly.

Crew Boss: A person in supervisory charge of usually 16 to 21 firefighters and responsible for their performance, safety, and welfare.

Crown Fire (Crowning): The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

Curing: Drying and browning of herbaceous vegetation or slash.

D

Dead Fuels: Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

Debris Burning: A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

Defensible Space: An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

Deployment: See Fire Shelter Deployment.

Detection: The act or system of discovering and locating fires.

Direct Attack: Any treatment of burning fuel, such as by wetting, smothering, or chemically quenching the fire or by physically separating burning from unburned fuel.

Dispatch: The implementation of a command decision to move a resource or resources from one place to another.

Dispatcher: A person employed who receives reports of discovery and status of fires, confirms their locations, takes action promptly to provide people and equipment likely to be needed for control in first attack, and sends them to the proper place.

Dispatch Center: A facility from which resources are directly assigned to an incident.

Division: Divisions are used to divide an incident into geographical areas of operation. Divisions are established when the number of resources exceeds the span-of-control of the operations chief. A division is located with the Incident

Command System organization between the branch and the task force/strike team.

Dozer: Any tracked vehicle with a front-mounted blade used for exposing mineral soil.

Dozer Line: Fire line constructed by the front blade of a dozer.

Drip Torch: Hand-held device for igniting fires by dripping flaming liquid fuel on the materials to be burned; consists of a fuel fount, burner arm, and igniter. Fuel used is generally a mixture of diesel and gasoline.

Drop Zone: Target area for air tankers, helitankers, and cargo dropping.

Drought Index: A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers.

Dry Lightning Storm: Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

Duff: The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, leaves, and immediately above the mineral soil.

E

Energy Release Component (ERC): The computed total heat released per unit area (British thermal units per square foot) within the fire front at the head of a moving fire.

Engine: Any ground vehicle providing specified levels of pumping, water, and hose capacity.

Engine Crew: Firefighters assigned to an engine. The Fireline Handbook defines the minimum crew makeup by engine type.

Entrapment: A situation where personnel are unexpectedly caught in a fire behavior-related, life-threatening position where planned escape routes or safety zones are absent, inadequate, or compromised. An entrapment may or may not include deployment of a fire shelter for its intended purpose. These situations may or may not result in injury. They include "near misses."

Environmental Assessment (EA): EAs were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

Environmental Impact Statement (EIS): EISs were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis, and an array of action alternatives allowing managers to see the probable effects of decisions on the environment. Generally, EISs are written for large-scale actions or geographical areas.

Equilibrium Moisture Content: Moisture content that a fuel particle will attain if exposed for an infinite period in an environment of specified constant temperature and humidity. When a fuel particle reaches equilibrium moisture content, net exchange of moisture between it and the environment is zero.

Escape Route: A preplanned and understood route firefighters take to move to a safety zone or other low-risk area, such as an already burned area, previously constructed safety area, a meadow that won't burn, or natural rocky area that is large enough to take refuge without being burned. When escape routes deviate from a defined physical path, they should be clearly marked (flagged).

Escaped Fire: A fire that has exceeded or is expected to exceed initial attack capabilities or prescription.

Extended Attack Incident: A wildland fire that has not been contained or controlled by initial attack forces, and for which more firefighting resources are arriving, en route, or being ordered by the initial attack incident commander.

Extreme Fire Behavior: "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One of more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, and strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

F

Faller: A person who fells trees. Also called a sawyer or cutter.

Field Observer: Person responsible to the Situation Unit Leader for collecting and reporting information about an incident obtained from personal observations and interviews.

Fine (Light) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Fingers of a Fire: The long narrow extensions of a fire projecting from the main body.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fire Behavior Forecast: Prediction of probable fire behavior, usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

Fire Behavior Specialist: A person responsible to the Planning Section Chief for establishing a weather data collection system and for developing fire behavior predictions based on fire history, fuel, weather, and topography.

Fire Break: A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire Cache: A supply of fire tools and equipment assembled in planned quantities or standard units at a strategic point for exclusive use in fire suppression.

Fire Crew: An organized group of firefighters under the leadership of a crew leader or other designated official.

Fire Front: The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

Fire Intensity: A general term relating to the heat energy released by a fire.

Fire Return Interval: The time between fires that may be expressed as either a range or average and applies to both natural and anthropogenic ignitions.

Fire Line: A linear fire barrier that is scraped or dug to mineral soil.

Fire Load: The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

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

Fire Perimeter: The entire outer edge or boundary of a fire.

Fire Season: 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities is regulated by state or local authority.

Fire Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

Fire Storm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface indrafts, near and beyond the perimeter, and sometimes by tornado-like whirls.

Fire Triangle: Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) necessary for combustion and flame production; removal of any of the three factors causes flame production to cease.

Fire Use Module (Prescribed Fire Module): A team of skilled and mobile personnel dedicated primarily to prescribed fire management. These are national and interagency resources, available throughout the prescribed fire season, that can ignite, hold, and monitor prescribed fires.

Fire Weather: Weather conditions that influence fire ignition, behavior, and suppression.

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

Firefighting Resources: All people and major items of equipment that can or potentially could be assigned to fires.

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forb: A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

Fuel: Combustible material. Includes vegetation, such as grass, leaves, ground litter, plants, shrubs and trees that feed a fire. (See Surface Fuels.)

Fuel Bed: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Fusee: A colored flare designed as a railway warning device and widely used to ignite suppression and prescription fires.

G

General Staff: The group of incident management personnel reporting to the incident commander. They may each have a deputy, as needed. Staff consists

of operations section chief, planning section chief, logistics section chief, and finance/administration section chief.

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in coordination and effective utilization

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, punchy wood, peat, and sawdust that normally support a glowing combustion without flame.

H

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fireline built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head Fire: A fire spreading or set to spread with the wind and/or upslope.

Head of a Fire: The side of the fire having the fastest rate of spread.

Heavy Fuels: Fuels of large diameter such as snags, logs, and large limb wood that ignite and are consumed more slowly than flash fuels.

Helibase: The main location within the general incident area for parking, fueling, maintaining, and loading helicopters. The helibase is usually located at or near the incident base.

Helispot: A temporary landing spot for helicopters.

Helitack: The use of helicopters to transport crews, equipment, and fire retardants or suppressants to the fire line during the initial stages of a fire.

Helitack Crew: A group of firefighters trained in the technical and logistical use of helicopters for fire suppression.

Holding Actions: Planned actions required to achieve wildland prescribed fire management objectives. These actions have specific implementation timeframes for fire use actions but can have less sensitive implementation demands for suppression actions.

Holding Resources: Firefighting personnel and equipment assigned to do all required fire suppression work following fireline construction but generally not including extensive mop-up.

Hose Lay: Arrangement of connected lengths of fire hose and accessories on the ground, beginning at the first pumping unit and ending at the point of water delivery.

Hotshot Crew: A highly trained fire crew used mainly to build fireline by hand.

Hotspot: A particular active part of a fire.

Hotspotting: Reducing or stopping the spread of fire at points of particularly rapid rate of spread or special threat, generally the first step in prompt control, with emphasis on first priorities.

I

Incident: A human-caused or natural occurrence, such as wildland fire, that requires emergency service action to prevent or reduce the loss of life or damage to property or natural resources.

Incident Action Plan (IAP): Contains objectives reflecting the overall incident strategy and specific tactical actions and supporting information for the next operational period. The plan may be oral or written. When written, the plan may have a number of attachments, including: incident objectives, organization assignment list, division assignment, incident radio communication plan, medical plan, traffic plan, safety plan, and incident map.

Incident Command Post (ICP): Location at which primary command functions are executed. The ICP may be co-located with the incident base or other incident facilities.

Incident Command System (ICS): The combination of facilities, equipment, personnel, procedure and communications operating within a common organizational structure, with responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Incident Commander: Individual responsible for the management of all incident operations at the incident site.

Incident Management Team: The incident commander and appropriate general or command staff personnel assigned to manage an incident.

Incident Objectives: Statements of guidance and direction necessary for selection of appropriate strategy(ies), and the tactical direction of resources. Incident objectives are based on realistic expectations of what can be accomplished when all allocated resources have been effectively deployed.

Infrared Detection: The use of heat sensing equipment, known as Infrared Scanners, for detection of heat sources that are not visually detectable by the normal surveillance methods of either ground or air patrols.

Ignition Component: The Ignition Component is a number that relates the probability that a fire will result if a firebrand is introduced into a fine fuel complex.

Initial Attack: The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

J

Job Hazard Analysis: This analysis of a project is completed by staff to identify hazards to employees and the public. It identifies hazards, corrective actions, and the required safety equipment to ensure public and employee safety.

Jump Spot: Selected landing area for smokejumpers.

Jump Suit: Approved protection suit worn by smokejumpers.

K

Keech Byram Drought Index (KBDI): Commonly used drought index adapted for fire management applications, with a numerical range from 0 (no moisture deficiency) to 800 (maximum drought).

Knock Down: To reduce the flame or heat on the more vigorously burning parts of a fire edge.

L

Ladder Fuels: Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

Large Fire: 1) For statistical purposes, a fire burning more than a specified area of land e.g., 300 acres. 2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

Lead Plane: Aircraft with pilot used to make dry runs over the target area to check wind and smoke conditions, topography, and to lead air tankers to targets and supervise their drops.

Light (Fine) Fuels: Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a timelag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

Lightning Activity Level (LAL): A number, on a scale of 1 to 6, which reflects frequency and character of cloud-to-ground lightning. The scale is exponential, based on powers of 2 (i.e., LAL 3 indicates twice the lightning of LAL 2).

Line Scout: A firefighter who determines the location of a fire line.

Litter: Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

Live Fuels: Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

M

Micro-Remote Environmental Monitoring System (Micro-REMS): Mobile weather monitoring station. A Micro-REMS usually accompanies an incident meteorologist and ATMU to an incident.

Mineral Soil: Soil layers below the predominantly organic horizons; soil with little combustible material.

Minimum Impact Suppression Tactics (MIST): To use the minimum amount of resources necessary to effectively achieve the fire management protection objectives consistent with land and resource management objectives

Mobilization: The process and procedures used by all organizations, federal, state and local for activating, assembling, and transporting all resources that have been requested to respond to or support an incident.

Modular Airborne Firefighting System (MAFFS): A manufactured unit consisting of five interconnecting tanks, a control pallet, and a nozzle pallet, with a capacity of 3,000 gallons, designed to be rapidly mounted inside an unmodified C-130 (Hercules) cargo aircraft for use in dropping retardant on wildland fires.

Mop-up: To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

Multi-Agency Coordination (MAC): A generalized term which describes the functions and activities of representatives of involved agencies and/or jurisdictions who come together to make decisions regarding the prioritizing of incidents, and the sharing and use of critical resources. The MAC organization is not a part of the on-scene ICS and is not involved in developing incident strategy or tactics.

Mutual Aid Agreement: Written agreement between agencies and/or jurisdictions in which they agree to assist one another upon request, by furnishing personnel and equipment.

N

National Environmental Policy Act (NEPA): NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions.

National Fire Danger Rating System (NFDRS): A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels.

National Wildfire Coordinating Group: A group formed under the direction of the Secretaries of Agriculture and the Interior and comprised of representatives of the U.S. Forest Service, Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service, and Association of State Foresters. The group's purpose is to facilitate coordination and effectiveness of wildland fire activities and provide a forum to discuss, recommend action, or resolve issues and problems of substantive nature. NWCG is the certifying body for all courses in the National Fire Curriculum.

Nomex ®: Trade name for a fire resistant synthetic material used in the manufacturing of flight suits, pants, and shirts used by firefighters (see Aramid).

Normal Fire Season: 1) A season when weather, fire danger, and number and distribution of fires are about average. 2) Period of the year that normally comprises the fire season.

O

Operations Branch Director: Person under the direction of the operations section chief who is responsible for implementing that portion of the incident action plan appropriate to the branch.

Operational Period: The period of time scheduled for execution of a given set of tactical actions as specified in the Incident Action Plan. Operational periods can be of various lengths, although usually not more than 24 hours.

Overhead: People assigned to supervisory positions, including incident commanders, command staff, general staff, directors, supervisors, and unit leaders.

P

Pack Test: Used to determine the aerobic capacity of fire suppression and support personnel, and assign physical fitness scores. The test consists of walking a specified distance, with or without a weighted pack, in a predetermined period of time, with altitude corrections.

Paracargo: Anything dropped, or intended for dropping, from an aircraft by parachute, by other retarding devices, or by free fall.

Peak Fire Season: That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.

Personnel Protective Equipment (PPE): All firefighting personnel must be equipped with proper equipment and clothing in order to mitigate the risk of injury from, or exposure to, hazardous conditions encountered while working. PPE includes, but is not limited to: 8-inch high-laced leather boots with lug soles, fire shelter, hard hat with chin strap, goggles, ear plugs, aramid shirts and trousers, leather gloves, and individual first aid kits.

Preparedness: Condition or degree of being ready to cope with a potential fire situation.

Prescribed Fire: Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

Prescribed Fire Plan (Burn Plan): This document provides the Prescribed Burn Boss information needed to implement an individual prescribed fire project.

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

Prevention: Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

Project Fire: A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

Pulaski: A combination chopping and trenching tool, which combines a single-bitted axe-blade with a narrow adze-like trenching blade fitted to a straight handle. Useful for grubbing or trenching in duff and matted roots. Well-balanced for chopping.

R

Radiant Burn: A burn received from a radiant heat source.

Radiant Heat Flux: The amount of heat flowing through a given area in a given time, usually expressed as calories/square centimeter/second.

Rappelling: Technique of landing specifically trained firefighters from hovering helicopters; involves sliding down ropes with the aid of friction-producing devices.

Rate of Spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

Reburn: The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has reburned.

Red Card: Fire qualification card issued to fire rated persons showing their training needs and their qualifications to fill specified fire suppression and support positions in a large fire suppression or incident organization.

Red Flag Warning: Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

Rehabilitation: The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

Relative Humidity (RH): The ratio of the amount of moisture in the air, to the maximum amount of moisture that air would contain if it were saturated. The ratio of the actual vapor pressure to the saturated vapor pressure.

Remote Automatic Weather Station (RAWS): An apparatus that automatically acquires, processes, and stores local weather data for later transmission to the GOES Satellite, from which the data is re-transmitted to an earth-receiving station for use in the National Fire Danger Rating System.

Resources: 1) Personnel, equipment, services, and supplies available, or potentially available, for assignment to incidents. 2) The natural resources of an area, such as timber, crass, watershed values, recreation values, and wildlife habitat.

Resource Management Plan (RMP): A document prepared by field office staff with public participation, and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

Resource Order: An order placed for firefighting or support resources.

Retardant: A substance or chemical agent that reduces the flammability of combustibles.

Run (of a fire): The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

Running: A rapidly spreading surface fire with a well-defined head.

S

Safety Zone: An area cleared of flammable materials used for escape in the event the line is outflanked, or in case a spot fire causes fuels outside the control line to render the line unsafe. In firing operations, crews progress so as to maintain a safety zone close at hand allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuel breaks; they are greatly enlarged areas, which can be used with relative safety by firefighters and their equipment in the event of a blowup in the vicinity.

Scratch Line: An unfinished preliminary fire line hastily established or built as an emergency measure to check the spread of fire.

Severity Funding: Funds provided to increase wildland fire suppression response capability necessitated by abnormal weather patterns, extended drought, or other events causing abnormal increase in the fire potential and/or danger.

Seral: Relating to, or constituting an ecological series of ecological communities formed in ecological succession.

Single Resource: An individual, a piece of equipment and its personnel complement, or a crew or team of individuals with an identified work supervisor that can be used on an incident.

Size-up: To evaluate a fire to determine a course of action for fire suppression.

Slash: Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps, and broken understory trees or brush.

Sling Load: Any cargo carried beneath a helicopter and attached by a lead line and swivel.

Slop-over: A fire edge that crosses a control line or natural barrier intended to contain the fire.

Smokejumper: A firefighter who travels to fires by aircraft and parachute.

Smoke Management: Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

Smoldering Fire: A fire burning without flame and barely spreading.

Snag: A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

Spark Arrester: A device installed in a chimney, flue, or exhaust pipe to stop the emission of sarks and burning fragments.

Spot Fire: A fire ignited outside the perimeter of the main fire by flying sparks or embers.

Spot Weather Forecast: A special forecast issued to fit the time, topography, and weather of each specific fire. These forecasts are issued upon request of the user agency and are more detailed, timely, and specific than zone forecasts.

Spotter: In smokejumping, the person responsible for selecting drop targets and supervising all aspects of dropping smokejumpers.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Staging Area: Locations set up at an incident where resources can be placed while awaiting a tactical assignment on a three-minute available basis. Staging areas are managed by the operations section.

Strategy: The science and art of command as applied to the overall planning and conduct of an incident.

Strike Team: Specified combinations of the same kind and type of resources, with common communications, and a leader.

Strike Team Leader: Person responsible to a division/group supervisor for performing tactical assignments given to the strike team.

Structure Fire: Fire originating in and burning any part or all of any building, shelter, or other structure.

Suppressant: An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

Suppression: All the work of extinguishing or containing a fire, beginning with its discovery.

Surface Fuels: Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branchwood, downed logs, and stumps interspersed with or partially replacing the litter.

Swamper: (1) A worker who assists fallers and/or sawyers by clearing away brush, limbs and small trees. Carries fuel, oil, and tools, and watches for dangerous situations. (2) A worker on a dozer crew who pulls winch line, helps maintain equipment, etc., to speed suppression work on a fire.

Swatter: A hand tool used in implementing suppression tactics typically involving fine fuels. The tool consists of a flexible flap attached to a handle that is used by swatting burning material in order to extinguish the fire.

T

Tactics: Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

Temporary Flight Restrictions (TFR): A restriction requested by an agency and put into effect by the Federal Aviation Administration in the vicinity of an incident, which restricts the operation of nonessential aircraft in the airspace around that incident.

Terra Torch ®: Device for throwing a stream of flaming liquid, used to facilitate rapid ignition during burn out operations on a wildland fire or during a prescribed fire operation.

Test Fire: A small fire ignited within the planned burn unit to determine the characteristic of the prescribed fire, such as fire behavior, detection performance, and control measures.

Timelag: Time needed under specified conditions for a fuel particle to lose about 63 percent of the difference between its initial moisture content and its equilibrium moisture content. If conditions remain unchanged, a fuel will reach 95 percent of its equilibrium moisture content after four timelag periods.

Torching: The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

Two-way Radio: Radio equipment with transmitters in mobile units on the same frequency as the base station, permitting conversation in two directions using the same frequency in turn.

Type: The capability of a firefighting resource in comparison to another type. Type 1 usually means a greater capability due to power, size, or capacity.

U

Uncontrolled Fire: Any fire that threatens to destroy life, property, or natural resources,

Underburn: A fire that consumes surface fuels but not trees or shrubs. (See Surface Fuels.)

V

Vectors: Directions of fire spread as related to rate of spread calculations (in degrees from upslope).

Volunteer Fire Department (VFD): A fire department of which some or all members are unpaid.

W

Water Tender: A ground vehicle capable of transporting specified quantities of water.

Weather Information and Management System (WIMS): An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource management agencies. Provides timely access to weather forecasts, current and historical weather data, the National Fire Danger Rating System (NFDRS), and the National Interagency Fire Management Integrated Database (NIFMID).

Wet Line: A line of water, or water and chemical retardant, sprayed along the ground, that serves as a temporary control line from which to ignite or stop a low-intensity fire.

Wildland Fire: Any nonstructure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Implementation Plan (WFIP): A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. Provides a record of decisions.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas outlined in fire management plans.

Wildland Urban Interface: The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Wind Vectors: Wind directions used to calculate fire behavior.

APPENDIX W
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