

# WILDLAND FIRE MANAGEMENT PLAN

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## Fredericksburg and Spotsylvania National Military Park

Prepared by: \_\_\_\_\_ Date: \_\_\_\_\_  
Fire Management Officer, Division of Natural Resource Management & Visitor Protection,  
Fredericksburg and Spotsylvania National Military Park

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_  
Area Fire Management Officer, Shenandoah National Park

Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_  
Northeast Region Fire Management Office

Recommended by \_\_\_\_\_ Date: \_\_\_\_\_  
Chief Ranger, Division of Natural Resource Management & Visitor Protection, Fredericksburg  
and Spotsylvania National Military Park

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_  
Superintendent, Fredericksburg and Spotsylvania National Military Park

## EXECUTIVE SUMMARY

Fire management policies of the National Park Service (NPS) support the Park's resource management goals. An overriding goal is restoration or maintenance of the historic scene and the associated cultural resources, 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 from which 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. 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.

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## **I. INTRODUCTION**

### **A. Reasons for Developing Fire Management Plan**

The National Park Service's 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 Virginia Department of Forestry, Virginia Department of Conservation & Recreation Natural Heritage Program, neighboring communities, and other National Park Service program management areas.

### **C. Implementation of Federal Fire Management Policy**

This Fire Management Plan (FMP) 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 D of this plan.

An Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI) have been prepared for this FMP and placed in Appendix D to comply with the National Environmental Policy Act (NEPA).

All of the lands and structures within the park are listed on the National Register. Proposed prescribed fire will be reviewed for compliance with Section 106 of the National Historic Preservation Act (NHPA). The approved NHPA documents will be included in Appendix D.

## **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 wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."*

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, Virginia State Law, and others.

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## **II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY**

### **A. NPS Management Policies as Related to Fire Management**

It is the policy of the National Park Service to allow natural processes to occur to the extent practical while meeting Park unit management objectives. NPS Management Policies (2006) state "Wildland fires may contribute to or hinder the achievement of park management objectives, and management response to each wildland fire is determined by whether or not the fire occurs within prescription as identified in the park's fire management plan. . . . Fire management consists of a program of activities designed to meet management objectives for protection of resource values, life, and property and, where appropriate, for using naturally ignited and human-ignited wildland fires as management tools. Park fire management programs designed specifically to meet park resource management objectives—including allowing fire to perform its natural role as much as practicable—will ensure that firefighter and public safety are not compromised." Specific guidance on wildland fire is contained in Directors Orders (DO-18) and attendant Reference Manual (RM-18) for the National Park Service, and the "Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide" (2006).

## **B. Enabling Legislation and Purpose**

The federal government first moved to recognize those who fought and died on the four battlefields when it established the Fredericksburg National Cemetery on July 15, 1865, in accordance with the National Cemetery Act of July 17, 1862. The War Department administered the Cemetery as a landscape memorial and to "secure, as far as possible, the decent internment..." of fallen Union soldiers. A few veterans from American wars after the Civil War are buried here. However, the vast majority of the dead, more than 15,000 of them, are casualties of the War Between the States.

Fredericksburg and Spotsylvania County Battlefields Memorial National Military Park was authorized by Congress on February 14, 1927. A general statement of the purpose reads as follows:

*"... commemorate the Civil War battles of Fredericksburg, Spotsylvania Court House, Wilderness, and Chancellorsville.. and to mark and preserve for historical purposes the breastworks, earthworks, gun emplacements, walls, or other defenses or shelters... used by the armies...."*

By Executive Order 6166 in 1933, control of the park was transferred from the War Department to the National Park Service. Thus the purpose of Fredericksburg and Spotsylvania NMP was further clarified by the earlier Organic Act of 1916.

The Historic Sites Act of 1935 directed that the National Park Service should help implement "...a national policy to preserve for public use historic sites, buildings and objects of national significance..." Boundary legislation in 1989 enlarged the park's boundary without affecting its mission.

The principal cultural resources of the Park are the core areas of the battlefields where the Army of Northern Virginia, the Army of the Potomac fought between 1861 and 1865. These historic patterns are defined by structures like earthworks, archeological sites, farm buildings, property lines formed by fences, marking trees that identify fields and woodlot boundaries, and strategic military positions formed by swamps, hills, or other physiographic features.

## **C. General Management Plan and Fire Management Objectives**

The park's General Management Plan, (GMP, 1986) states in "The Plan" section that:

*"Resources management and land protection recommendations will be implemented to preserve and protect the park setting."*

In addition, the GMP established the following general resources management objectives related to fire management activities:

- Manage the natural resources of the park in a manner that complements the [historical] purpose of the park.

- Create visitor appreciation for the historical environmental conditions and scenes on the battlefield, by removing or adding vegetation in areas of great historical significance, to the extent possible, to duplicate as closely as possible the scene during the 1860's within the historical zone.
- Protect earthworks, road traces, and other battle-related features from damaging changes caused by either natural or human forces, by selective vegetation management and limiting access to them.
- Identify, evaluate, protect, maintain, and interpret the park's cultural resources to preserve their original fabric and workmanship and, where necessary, stabilize and rehabilitate them in a manner consistent with legislative mandates and NPS policies

#### **D. Resource Management Plan Fire Management Objectives**

The Fire Management Plan is a component of and an appendix to the Resources Management Plan. It integrates fire management objectives with other resource management programs. Activities described in this plan support the effort to restore a sense of the historic scene representative of the Civil War.

The objectives of the park's RMP relating to fire provide for the preservation, restoration, maintenance, and protection of the cultural and natural resources of the park. These objectives are embodied in the following resource management plan projects:

1. FRSP-N-007.026, Develop a Fire Management Program to Include Prescribed Fire Component
2. FRSP-N-008.008, Develop Open Fields Management Plan
3. FRSP-N-011.032, Develop Exotic Plant Management Plan
4. FRSP-C-015.025, Investigate and Stabilize Earthworks
5. FRSP-C-016.026, Restore Historic Ground Cover

#### **E. Fire Management and Meeting Park Objectives**

Through this Fire Management Plan the Park will be able to utilize fire as a tool for vegetation management. The FMP, especially the prescribed fire components, provide a detailed action program that is consistent with NPS Management Policy and DO-18 (Wildland Fire Management) and will assist the Park in its efforts to preserve, restore, maintain, and protect the Civil War earthworks and the cultural landscape. Also, with this plan, the Park will be able to implement prescribed fire as a vegetation management action recommended by the Earthworks Landscape Management Manual and reduce hazardous fuels.

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### III WILDLAND FIRE MANAGEMENT STRATEGIES

#### A. General Management Considerations

The FMP is a component of and an appendix to the RMP. It integrates fire management objectives with other resource management programs. Through this FMP the park will be able to utilize fire as a tool for vegetation management. The FMP, especially the prescribed fire components, provide a detailed action program that is consistent with NPS Management Policy and DO-18 and that will assist the park in its efforts to preserve, restore, maintain, and protect the cultural and natural landscape.

Actions to be implemented through this FMP to meet the objectives of the GMP and the RMP:

- The park may initiate prescribed fire to manage vegetation on earthworks.
- Prescribed fire will be used throughout the park to promote the establishment of native grasses on earthworks and open fields, thereby reducing the detrimental effects of mechanical mowing.
- The park may initiate prescribed fire in the park to reduce hazard fuels.
- Prescribed fire may be used when necessary to aid in the restoration of historic and prehistoric fire regimes.
- Prescribed fire may be used when applicable to aid in the restoration and/or maintenance of plant species that need fire for growth and/or rejuvenation.
- The park may use prescribed fire to control exotic vegetation, if it is found that the specific exotic vegetation will respond to fire in an appropriate manner.

Activities described in this plan are part of the effort of restoring a sense of the historic and aesthetic scene that was in place during the Civil War.

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

Active participation in ongoing fire prevention programs by local, city, and state fire suppression agencies will be conducted on and off park property to protect human life and to prevent damage to cultural or historical resources and visitor services.

The park's fire management program will utilize wildland fire as a tool to preserve, restore, maintain, and protect the integrity of the FRSP.

The fire management policy for Fredericksburg and Spotsylvania NMP is to suppress all wildland fire and all prescribed fire that escapes prescription while allowing for the utilization of prescribed fire for the purpose of vegetation management and hazardous fuel load reduction.

## **B. Wildland Fire Management Goals**

These goals are programmatic in direction and are intended to provide safe and effective implementation of the fire management plan.

**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 and historic 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 Management Options**

The following is a discussion of available wildland fire options and their use in the Park:

**1. Wildland Fire Suppression:** All 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.

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

**3. 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.

Prescribed fire, mechanical, and chemical treatments may be used either sequentially or in conjunction with each other.

## **D. Description of General Physical and Biotic Characteristics**

The park is comprised of four separate Civil War battlefields: Fredericksburg, Spotsylvania Courthouse, Chancellorsville and Wilderness. The park also includes four related sites: Salem Church, Chatham Manor, Jackson Shrine and the Fredericksburg National Cemetery. The park has an authorized acreage of 9,440 acres. The Federal Government currently owns 7,342 acres of these authorized lands.

These four main Park units will be addressed as individual fire management units. The information below will apply to all of the Fire Management Units. At the end of this section, the individual fire management units will be described.

### **1. Physical and Biotic Characteristics**

#### **Location**

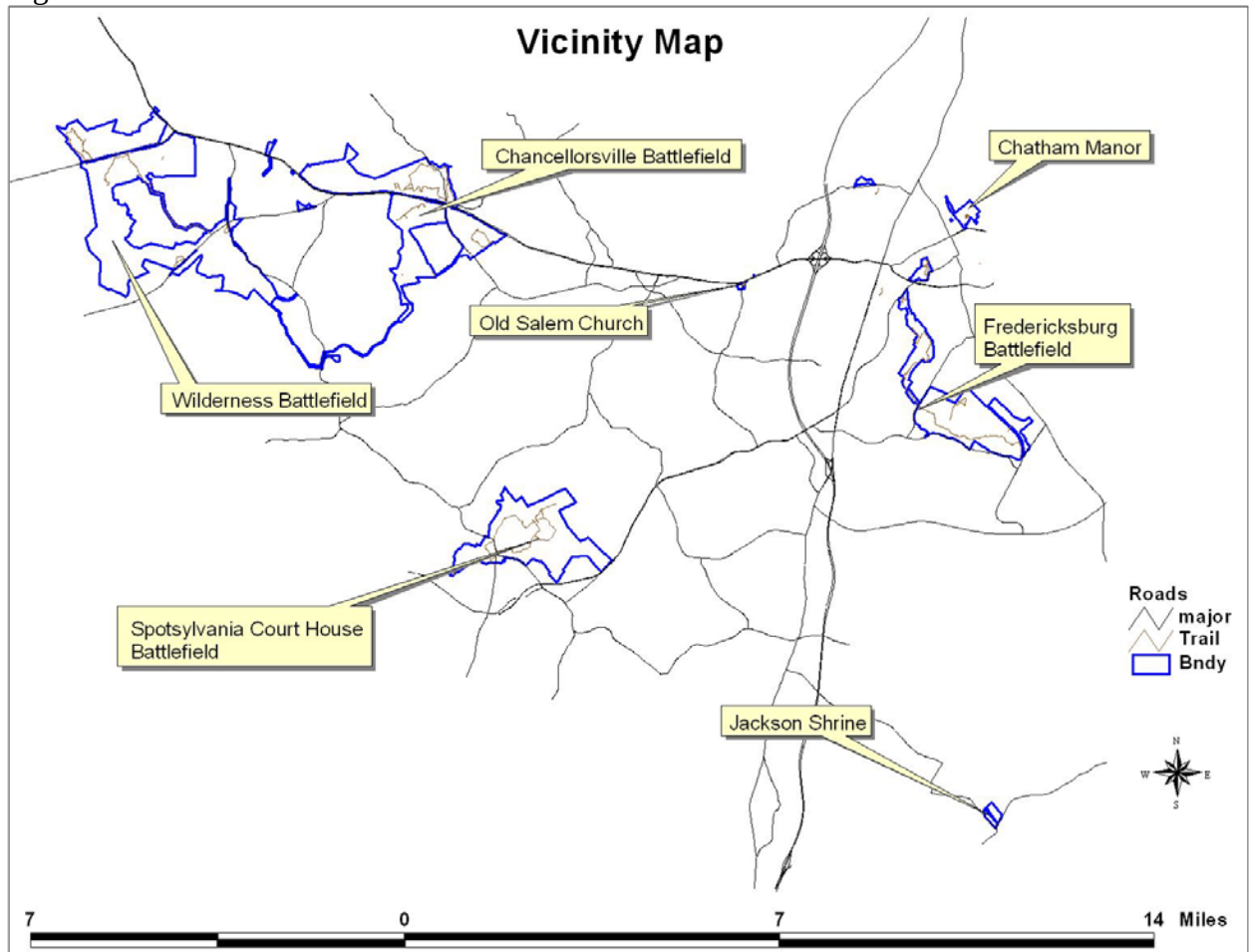
FRSP is a non-contiguous parcel of land that is scattered over 145 square miles and is a part of four counties and one independent city. The park is located in the counties of Caroline, Orange, Spotsylvania, and Stafford, and in the city of Fredericksburg. The Fredericksburg region is part of Virginia's urban corridor that stretches north to Washington, D.C., and south to Richmond, VA. The park lies approximately midway between Washington, D.C. and Richmond, each city is approximately 55 miles distant. The park lies in the Rappahannock and York River basins of central Virginia. The Latitude and Longitude coordinates for Spotsylvania Courthouse Battlefield are 38 degrees 12 minutes North Latitude and 77 degrees 36 minutes West Longitude.

#### **Resources Protected**

The park contains more than 37 miles of Civil War earthworks, 23 miles of trails, 29 miles of roadways, 102 miles of boundary, 1,100 acres of open fields, and 5,600 acres of forest. In addition the park has significant terrain features, historic roads and traces, structures, house sites, ruins, cemeteries, monuments, markers, and historic objects. It supports an eastern North American riparian and woodland habitat on a substrate of the Appalachian Piedmont and the

Atlantic Coastal Plain. The park provides rich forest and wetlands, developed parkland, farmsteads, and historic landscapes.

Figure 1.



### Adjacent Landowners

The land adjacent to the Park is rapidly undergoing conversion from rural farmland and commercial forest to residential communities and commercial development. It is estimated that 40% of the boundary is in some stage of development.

### Topography

The elevation of Fredericksburg and Spotsylvania NMP ranges from more than 500 feet near the western boundary of Wilderness Battlefield, to near sea level, along the Rappahannock River below Chatham Manor. The battlefield sites at Chancellorsville, Wilderness, and Spotsylvania Courthouse are located in the Piedmont physiographic province of the eastern United States. The battle for Fredericksburg occurred along the ridge that forms the fall line separating the

Piedmont from the Coastal Plain province. Fredericksburg Battlefield is in an urban environment that extends from Marye's Heights in Fredericksburg along the ridge overlooking the Rappahannock River. The floodplain below the ridge is flat to gently rolling. The peneplain beyond the ridge is a series of Piedmont terraces cut by numerous small streams. Chatham Manor lies in the Coastal Plain province, an area characterized by gentle slopes. Numerous streams and swamps on gently rolling wooded plateaus dissect Chancellorsville, Wilderness, and Spotsylvania Courthouse Battlefields.

## **Geology, Soils**

Approximately 90% of the park is in the Piedmont physiographic province, and about 10% is on the Coastal Plain. The fall line divides the park roughly from Chatham Manor through Fredericksburg Battlefield, with Lee Drive being the line of demarcation. Jackson Shrine is also located on the Coastal Plain. Granite, gneiss, and schist of the Paleozoic and Precambrian ages dominate bedrock of the Piedmont area. The Battlefields contain deep, well-drained sandy loam soils with clayey or loamy subsoil. These soils are categorized as being medium textured, strongly acidic, and low in fertility. The Coastal Plain consists mainly of the Sunderland and Brandywine terraces, which support large sand mining operations in the region.

## **Climate**

The regional climate is characterized by mild winters and warm, humid summers. The mean annual temperatures is 56 degrees Fahrenheit. The average summer temperature is 75 degrees Fahrenheit. Daytime highs during the summer are in the upper 80s, and nighttime lows are in the lower 60s. Daytime highs in the winter are in the upper 40s, and nighttime lows are in the middle 20s. The growing season, defined as the period between the average date of the last spring freeze (April 23) and the average date of the first fall freeze (October 17), is 178 days.

Precipitation is well distributed throughout the year, with the minimum amount in August and the maximum in February. The annual average precipitation, some of which occurs in the form of snowfall, is 40 inches.

Snowfall in the Fredericksburg area averages 16 inches a year, but yearly amounts are extremely variable. Thunderstorm activity occurs on about 40 days each year, which is near the average for the Commonwealth of Virginia.

## **Hydrology**

Numerous streams and swamps on gently rolling wooded plateaus dissect Chancellorsville, Wilderness, and Spotsylvania Courthouse Battlefields. Chancellorsville Battlefield lies on the divide separating the watershed of the Rappahannock River from the Po and the Ni rivers, and Spotsylvania Courthouse Battlefield lies between the drainage areas of the Po and the Ni rivers. The site of the Wilderness Battlefield is in the Wilderness Run drainage, which flows north into the Rapidan River. Streams in the park generally have good sustained flows. The availability of groundwater varies with the underlying rock formations, but in most areas of the two counties, an adequate supply of water may be obtained from springs and wells. Water quality depends on

the chemical content of both underground and surface waters, the tidal influence of larger surface streams, and the degree of contamination from residential and industrial development.

### **Threatened and Endangered Species**

Except for occasional transient species, no federally listed or proposed endangered or threatened wildlife (50 CFR 17.11, 10/01/05) are known to be endemic to Fredericksburg and Spotsylvania NMP except for the small whorled pogonia. The small whorled pogonia, *Isotria medeoloides* was found in the park in 2006. No other federally listed or proposed endangered or threatened plant species occur in the park (50 CFR 17.12, 10/01/05). From 1989 to 1991, the Virginia Department of Conservation and Recreation's Division of Natural Heritage conducted an inventory for "Natural Heritage Resources" in FRSP. Natural Heritage Resources include "the habitat of rare, threatened, or endangered plant and animal species, rare or state significant natural communities or geologic sites, and similar features of scientific interest". Two populations of the state-rare plant, Red Milkweed *Asclepias rubra* were recorded in the 1993 final report (Ludwig, 1993). The plants were found at two locations. The first location, adjacent to Stuart Drive, had one sterile plant when observed in July 1990. The second location, in the headwaters of Little Hunting Run, is in a partially open, low-nutrient groundwater seepage area. Nine sterile plants were observed in October 1992. Management recommendations provided in the 1993 final report include monitoring the long-term health of the plant population, land use, and management practices and consulting with Department of Natural Heritage staff to avoid negative impacts to the rare plant should land use or management practices change. The red milkweed has been found, and indeed, flourishing in Spotsylvania Courthouse Battlefield, in an area that has been burned repeatedly for the last four years, and it was not seen previously in this location.

### **Wildlife**

The interspersed types of vegetative types provides habitats for a wide variety of wildlife in the park. Open land wildlife includes rabbits, groundhogs, quail, mourning dove, hawks, owls, field sparrows and several other bird species normally found in cropland, pasture, and meadows.

Woodland wildlife includes white-tailed deer, gray squirrels, raccoon, opossum, wild turkey, ruffed grouse, woodpeckers and warblers. Wetland wildlife includes beaver, mink, muskrat, ducks, geese, and other water birds that live along streams, in ponds, marshes, and swamps. There is also a wide variety of reptiles and amphibians.

For a list of known wildlife recorded for the park please refer to the park's natural resource management files.

### **Vegetation**

The forest community structure of park lands responds to two major factors: Past land use and soil conditions. The forest patterns reflect past land use in successional stages from pioneer community types (pine) to disturbance climax communities (oak-hickory). The vegetation of the battlefields is classified as oak-hickory forest in the temperate deciduous biome. Typical tree

species include oaks, hickories, red maple, sweetgum, and yellow poplar. Subcanopy trees consist of dogwood, red cedar, tupelo, mountain laurel and sassafras. Shrub species include blackberries, poison ivy, and American hazelnut. Virginia pine and shortleaf pine are found in areas recently cultivated or pastured. The vegetation of Chatham ranged from mixed hardwood forests to landscaped formal gardens to farm fields. Above Chatham Lane, there are predominantly grassy meadows with a cedar hedgerow. The steeply sloping portion of the site contains primarily deciduous hardwoods, including yellow poplar, hickory elm, and dogwood. A dense ground cover consists mainly of honeysuckle, greenbrier, arrowwoods, and blueberries. Since woodlands have been repeatedly disturbed, opportunistic exotic plants have invaded the native woodlands, and in some cases, reached possible problem stages. These problem plants are: Japanese honeysuckle, English ivy, kudzu vine, princess tree, ailanthus, vinca and mimosa.

### **Forest Insects and Diseases**

In 1989, the park experienced its first defoliation from the invasion the exotic Gypsy Moth. An Integrated Pest Management Program has been implemented to control pest damage to the cultural and natural resources of the park.

### **Air Quality**

The area surrounding the park has experienced a surge of growth in the past 15 years as a result of increased use of I-95 as a major north-south transportation corridor. This expansion has resulted in new industries, increased development, and traffic adjacent to the park. In 1992, Stafford County was listed as a "non-attainment" area under the Clean Air Act, suggesting serious air quality problems. Hydrocarbon pollution from three major areas, Washington, D.C., Richmond, VA, and Fredericksburg metro areas, are potential contributors to the decline of air quality in the park. Air pollution may be causing yet undetermined impacts on the park's natural and cultural resources. The park was classified as a Class II park in the clean air act of 1977. This designation relates to the amount of air quality degradation that is allowable. This classification allows only moderate amounts of degradation of the existing air quality condition.

### **Cultural Resources**

On four separate occasions, the main eastern armies of the United States and the Confederate States fought major battles in and around Fredericksburg, Virginia. The Fredericksburg and Spotsylvania NMP preserves portions of the four battlefields and the sites associated with them. The woods and fields of the battles are the primary resources of the park. A number of historic structures dating from the mid-19th century add to the park's significance: more than 37 miles of earthworks built by the soldiers, Salem Church, the house where Stonewall Jackson died, Ellwood, Chatham Manor, and several other structures that were landmarks on the historic fields. More than 15,000 Federal soldiers killed in or near Fredericksburg are buried in the national cemetery.

## **Cultural Landscapes**

Although the park does not have any Cultural Landscape Reports, the park is in the process of having these documents completed. The cultural landscapes of the Park consist of the core areas of the battlefields where the Army of Northern Virginia, and the Army of the Potomac fought between 1862 and 1864. The military strategies of the battles of the Civil War relied heavily upon the terrain. Hills, watercourses, and other physiographic features helped to define tactical and strategic military positions. The landscape dictated the placement of defensive fortifications, which remain today around Fredericksburg, in part, as units of the Park. The pattern of field to forest is often extremely important in interpreting battles.

It is likely that reestablishment of native warm season grasses in open fields will be recommended in the future Cultural Landscape Reports. Prescribed fire will be used to maintain the presence of these grasses.

The scenic views and visibility of the earthworks are extremely important to the visitor's understanding of the battles that took place in this area. The cultural landscape is a critical component of the Park's interpretive programs.

A principle objective of the Park is to approximate the historic scene where possible, and to preserve the earthen structures using the best management practices while affording the visitor the opportunity to see these historic structures.

## **2. Historic Role of Fire**

The lands of Fredericksburg and Spotsylvania NMP were inhabited prior to European settlement by Native Americans of the Manahoac, and Algonquin tribes. Reports of early settlers show that the Native Americans of this area frequently burned large areas of woodlands. These fires and those caused by lightning favored fire resistant oak species and eliminated less resistant trees. Thus in the pre-settlement era this area hosted an oak-hickory forest created by a regular fire disturbance. After European settlement and during the Civil War much of the area was logged to provide fuel for local iron furnaces. Land that was not logged was cleared and planted in tobacco. Abusive agricultural practices led to widespread land abandonment in the late 1700's. This resulted in an increase in cedar and virginia pine. The relatively short lifespan of virginia pine led to hardwood dominated forests. During the Civil war much of the land of the Fredericksburg area was either cleared or in the early stages of reforestation. In the early 1900's farm land in the area was abandoned, leading to early successional development and high fuel loading. Present day battlefields consist of a mosaic of forest stands in various stages of successional development.

Six major fires have occurred in the park in current fire record keeping history. Three fires of approximately 20 acres in size in 1956, 1966, and 1977 and there were three fires in 1981, 1995, and 2008 of between 10 and 20 acres.

Small fires (less than 10 acres in size) occur on the average of two per year. Most of the fires occurring on or adjacent to the park are human caused.

Table 1. Fire Size and Frequency by Decade

|             |          |          |              |
|-------------|----------|----------|--------------|
| 1954 - 1960 | 4 fires  | 26 acres | 1 > 10 acres |
| 1961 - 1970 | 15 fires | 33 acres | 1 > 20 acres |
| 1971 - 1980 | 23 fires | 57 acres | 1 > 20 acres |
| 1981 - 1990 | 30 fires | 33 acres | 2 > 8 acres  |
| 1991 - 2000 | 27 fires | 22 acres | 5 > 1 acre   |
| 2001 - 2009 | 23 fires | 17 acres | 1 > 12 acres |

A trend toward later successional, more shade tolerant deciduous species like beech and maple has occurred at the expense of the pines and oaks. Likewise, shade tolerant understories of flowering dogwood and American holly have become more prevalent, and invading species like Japanese honeysuckle have become more pervasive. The woods also have become thicker, with more underbrush and brambles.

Whether or not fire exclusion is good or bad is subject to some debate. Certainly the pre-Columbian North American Indians burned areas repeatedly, so that the near exclusion of fire that we have today is undeniably a unique situation. Fire should be viewed as a useful vegetation management tool. The fire history report completed for the Park states that if the desire is to create a more open forest, with grassy or herbaceous ground vegetation and more pines, then fire can be beneficial. If, on the other hand, the intent is to allow the forests to thicken and darken, with more deciduous species and more woody understories and vines, then fire suppression is most beneficial.

The preference is to maintain the pine and hardwood forest within their historic range of variability, in order to meet cultural landscape, visibility, and natural resource objectives. Without some form of a disturbance regime the desired overstory will not be maintained. Prescribed fire may be used periodically to provide this disturbance.

#### **E. Description of Wildland Fire Management Strategies by Fire Management Unit**

1. Because of the size of the park, the homogeneity of the policy towards the FMU, and the general site characteristics of the park, all of the land of Fredericksburg and Spotsylvania NMP will be designated as a single wildland fire management unit. However, each battlefield will be broken out for specific information on each fuel type and battlefield.

a. see D.1.

#### **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. Implementation**

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 rare, threatened, and endangered species.
2. Ensure socio-political economic impacts, including wildland urban interface (WUI), are 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 Fire Role . . . see D.2.**

#### **e. Fire Dependent Ecosystems . . . N/A**

#### **f. Wildland Fire Management Situation**

##### **1) Historical Weather Analysis:**

The regional climate is characterized by mild winters and warm, humid summers. The mean annual temperatures is 56 degrees Fahrenheit. The average summer temperature is 75 degrees Fahrenheit. Daytime highs during the summer are in the upper 80s, and nighttime lows are in the lower 60s. Daytime highs in the winter are in the upper 40s, and nighttime lows are in the middle 20s. The growing season, defined as the period between the average date of the last spring freeze (April 23) and the average date of the first fall freeze (October 17), is 178 days.

Precipitation is well distributed throughout the year, with the minimum amount in August and the maximum in February. The annual average precipitation, some of which occurs in the form of snowfall, is 40 inches.

Snowfall in the Fredericksburg area averages 16 inches a year, but yearly amounts are extremely variable. Thunderstorm activity occurs on about 40 days each year, which is near the average for the Commonwealth of Virginia.

Prevailing winds are generally southwesterly during the summer and northwesterly during the winter, with average windspeeds of 9-10 mph and peak velocities of 60-70 mph during storms. Electrical storms with accompanying strong winds are frequent during the late spring and

summer, especially during frontal passages. The Park is rated at a National Fire Danger Rating Service (NFDRS) climate class 3.

## **2) Fire Season:**

The fire season at Fredericksburg is based on historical weather and fire occurrence statistics as analyzed by the Virginia Department of Forestry. There are normally two fire seasons. A spring fire season occurs from approximately mid-March to June. A fall fire season occurs from approximately mid-October to December. Depending on the specific weather of any particular year the seasons may be shorter or longer and, therefore, may start earlier or last longer.

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. 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 Characteristics:** The Park's vegetation for fire management purposes is described in terms of fuel types. Similar vegetation types typically burn in the same manner, and are thus better described as fuel rather than vegetation. Two fuel classification systems are used, each having a different management application. The National Fire Danger Rating System Fuel Models (A through U) are designed to help determine the type and number of resources needed to manage an area. The Fire Behavior Fuel Models (1 through 13) are used to help develop strategies, tactics, and predict imminent fire behavior. The Park's fuels can be divided into three broad categories: Grass, Timber, and Slash.

**Grass Fuels:** The grass fuel types (short and tall) are primarily located in open fields maintained by mowing, or on earthworks planted in native tall grasses, primarily little bluestem and broomsedge. Fires within the grass fuel models of the Park are of low to moderate intensity, and of short duration and are governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Fires within this fuel type spread very rapidly under the influence of wind and topography. Flame lengths of 3 to 6 feet are common depending on fine fuel moisture content, height of the grass, and wind intensity with rates of spread of 50 to 80 chains per hour. Intensity is generally sufficient to consume all herbaceous surface fuels, kill shrubs, and scorch trees where present.

The most intense fires in the grass group are found in fuel model 3 (tall grasses). This grass group displays high rates of spread under the influence of wind. Fires in the grass group fuel models exhibit some of the faster rates of spread under similar weather conditions, averaging 104 chains/hour and with flame lengths of 12 feet.

Herbaceous vegetation usually increases in both density and vigor following fires. It is expected that the native responsive grass dominated by the genus *Andropogon sp.* will replace other herbaceous and exotic vegetation following fire.

**Timber Fuels:** Fires within the mixed hardwood/pine forests of the Park are generally restricted to surface fuels, consume leaf litter and branchwood, and reduce reproduction. Under most conditions, such fires are of low intensity and short duration. Flame lengths of 2 feet or less are common. Fire spread is influenced primarily by wind and topography. Fire effects include the removal of surface fuels, occasional scorching of trees, and the reduction of young woody reproduction.

Larger mature trees (greater than 6" diameter breast height) are susceptible to basal fire injury, but fire does not generally reduce diameter growth unless the crowns are appreciably damaged by fire. Damage to the cambium of larger trees is directly related to season of fire occurrence, intensity, duration of heat, bark thickness, and frequency of burning. Trees are generally less susceptible to fire injury during the dormant season. Seedlings and saplings of tree species other than oak-hickory are readily killed by fire.

Fire plays a significant role in both the mixed pine and oak forest types in the Park. While the mixed oak forests may not be dependent on fire for the short-term maintenance of these forests, fire may still play a significant role in the regeneration of and long-term maintenance of oak species on poor quality sites. Conversely, mixed pine forests with a component of loblolly or Virginia pines, are dependent on fire for the maintenance of this pine species.

Under unusual conditions (Burning Index of 45-50+), surface fires may torch out and occasionally crown where ladder fuels exist. The extent of such fire behavior is rather limited. Under these conditions fire intensity may be sufficient enough to consume organic matter of mineral soil. Such conditions occur only during periods of severe and infrequent drought.

**Slash Fuels:** The pine/hardwood slash falls into the low range of values used to describe Fire Behavior Fuel Models 11 and 13. The slash is a product of landscape maintenance. It is intended to reduce this accumulation of debris vegetation through periodic burning. As such, moderate to high rates of spread and fire intensity can be expected. Fire effects include the reduction of dead and down woody fuel, which would be the purpose of vegetation debris burning.

**Table 2: Fuel models by vegetation type.**

The table also correlates the NFDRS and Fire Behavior Prediction System (FBPS) fuel models.

| Vegetation Type      | NFDRS Fuel Model | Fire Behavior Fuel Model |
|----------------------|------------------|--------------------------|
| Grasses              | L/N              | 1/3                      |
| Pine/Hardwood Forest | E/R              | 8/9                      |

|                        |     |       |
|------------------------|-----|-------|
| <b>Hardwood Forest</b> | E/R | 8/9   |
| <b>Slash</b>           | K/I | 11/13 |

**Fuel Type Descriptions:** Fire Behavior Fuel Model (FBPS) 1 is used for short annual or perennial grasses of one foot or less. FBPS 3 is used for tall grasses averaging 2.5 to 3 feet in height. Locations of these fuel models are the roadside meadows and open earthworks of the different battlefield units.

The FBPS for the timber group is 8/9, where 8 is characterized by closed canopy stands of short-needle conifers or hardwoods that have leafed out. Little undergrowth is present and it is mainly the litter layer that carries the fire. FBPS 9 is typical of the oak-hickory forest stands as well as long-needle conifer stands. These fuel models characterize most of the forested areas of the Park units.

The slash fuel models, FBPS 11/13, are for the vegetation debris disposal area. These fuel models will help to identify the expected fire behavior during debris burns.

#### **4) Fire Regime Alteration:**

Fire has not played a major role in shaping the character of the vegetation of Park over the past 75 years. In fact, the exclusion of fire by aggressive fire control policies of the Virginia Department of Forestry and the local county fire departments has allowed forest succession to progress toward the oak-hickory climax. Where pine and oak occurs, they are often being replaced by more shade tolerant hardwood species.

#### **5) Control Problems:**

The Park units are generally located on flat or rolling hills. The low ground is occupied by rivers, creeks (running, dry and intermittent), wetlands, and fields. 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 moderate 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 all of the Park units. The extent of this interface is expected to increase as growth in the outskirts of the City of Fredericksburg increases. 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 the Park's

cultural resources is of paramount importance. Suppression actions pose a greater threat to these cultural resources than the actual effects of a fire.

## **2. Battlefield Units**

### **A. Fredericksburg Battlefield**

#### **1.) Fuel Types**

Fredericksburg Battlefield contains fuel types that correspond to Fire Behavior Fuel Models 1, 3, 8 and 9.

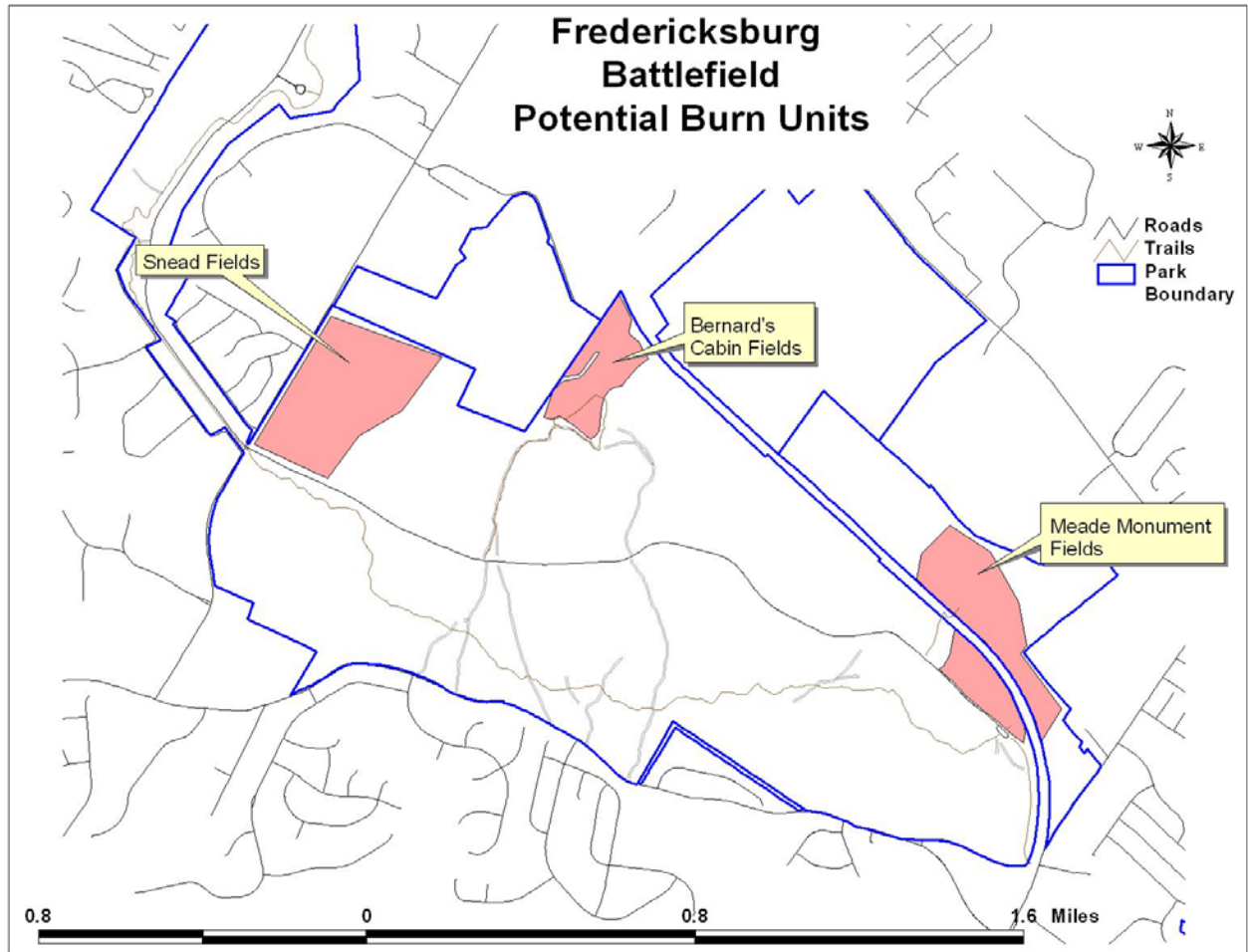
#### **2) Fuel Loading**

Fuel loads were estimated in three representative stands within Fredericksburg Battlefield. Fuel quantities (5.4 – 7.0 tons/acre) were lower than the average values found in photo series guides for similar mature forests in the northeast. The oak loads were considerably lower than mean oak loads found in similar forests in Richmond National Battlefield Park (RNBK). The Virginia Pine – Sweetgum stand contained fuel loads which were lower than the photo series guides and RNBK levels.

#### **3) Fire Behavior**

Because of the low fuel loads determined for the representative stands, the majority of stands within Fredericksburg Battlefield are not a threat for large scale wildland fires.

Figure 2.



## **B. Chancellorsville Battlefield**

### **1) Fuel Type**

Chancellorsville Battlefield contains fuel types that correspond to Fire Behavior Fuel Models 1, 3, 8, and 9.

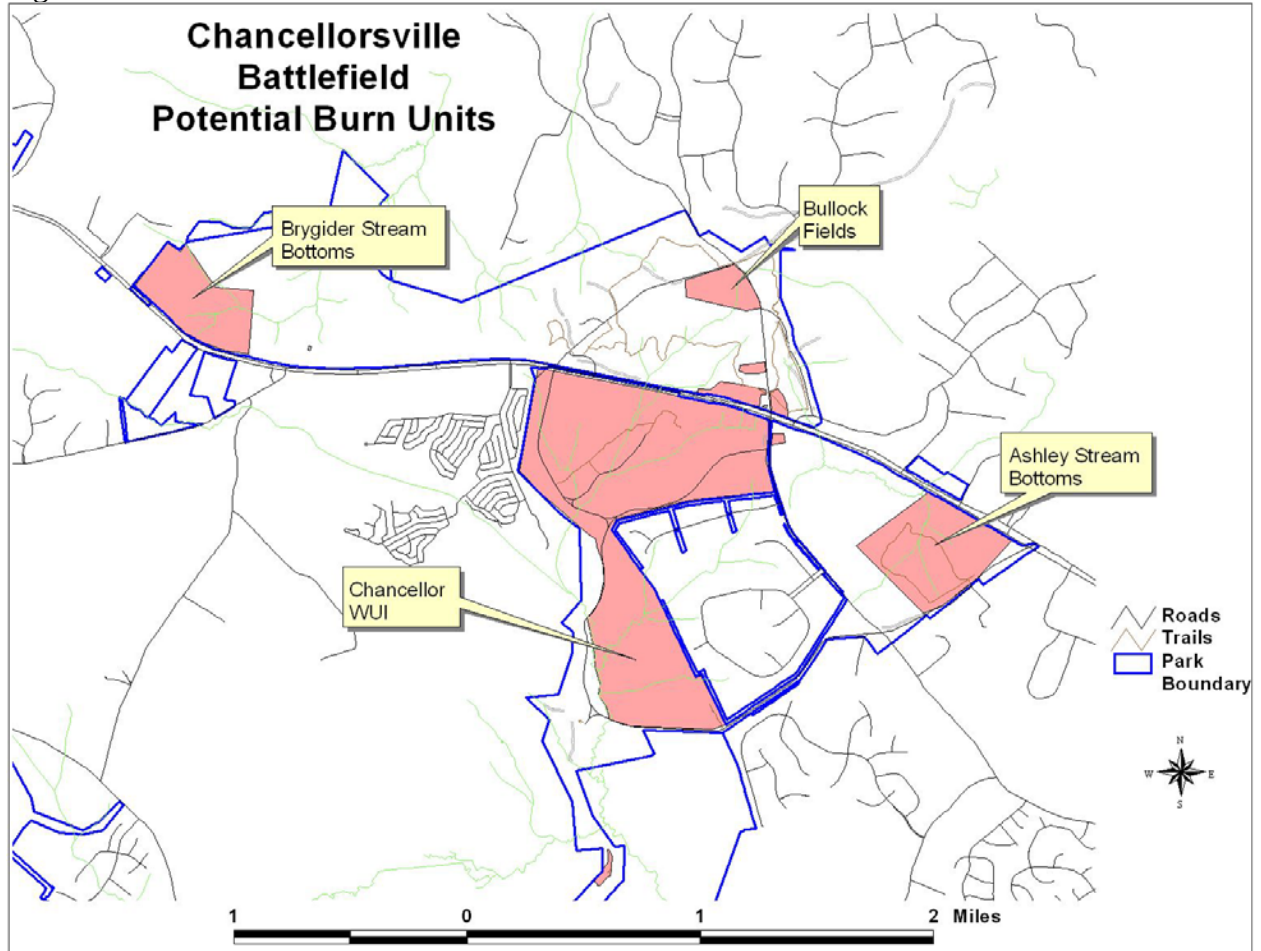
### **2) Fuel Loading**

Fuel Loads were estimated for six representative stands within Chancellorsville Battlefield. The majority of representative stands were chosen from the more flammable pine and oak-pine mixtures to evaluate the overall fuel hazard in this Battlefield. Mature oak fuel loads (7.2 tons/acre) were similar to the average values found in the photo series guides for similar oak stands in the northeast and lower than values found in RNB. The pine and pine-oak loading was considerably lower than values found in similar photo series guides and at RNB.

### **3) Fire Behavior**

Because of the high frequency of blueberry ground cover, Chancellorsville Battlefield has a higher risk of ground fires than the other battlefields under extremely dry conditions.

Figure 3.



## C. Wilderness Battlefield

### 1) Fuel Types

Wilderness Battlefield contains fuel types that correspond to Fire Behavior Fuel Models 1, 3, 8, 9, and 10.

### 2) Fuel Loading

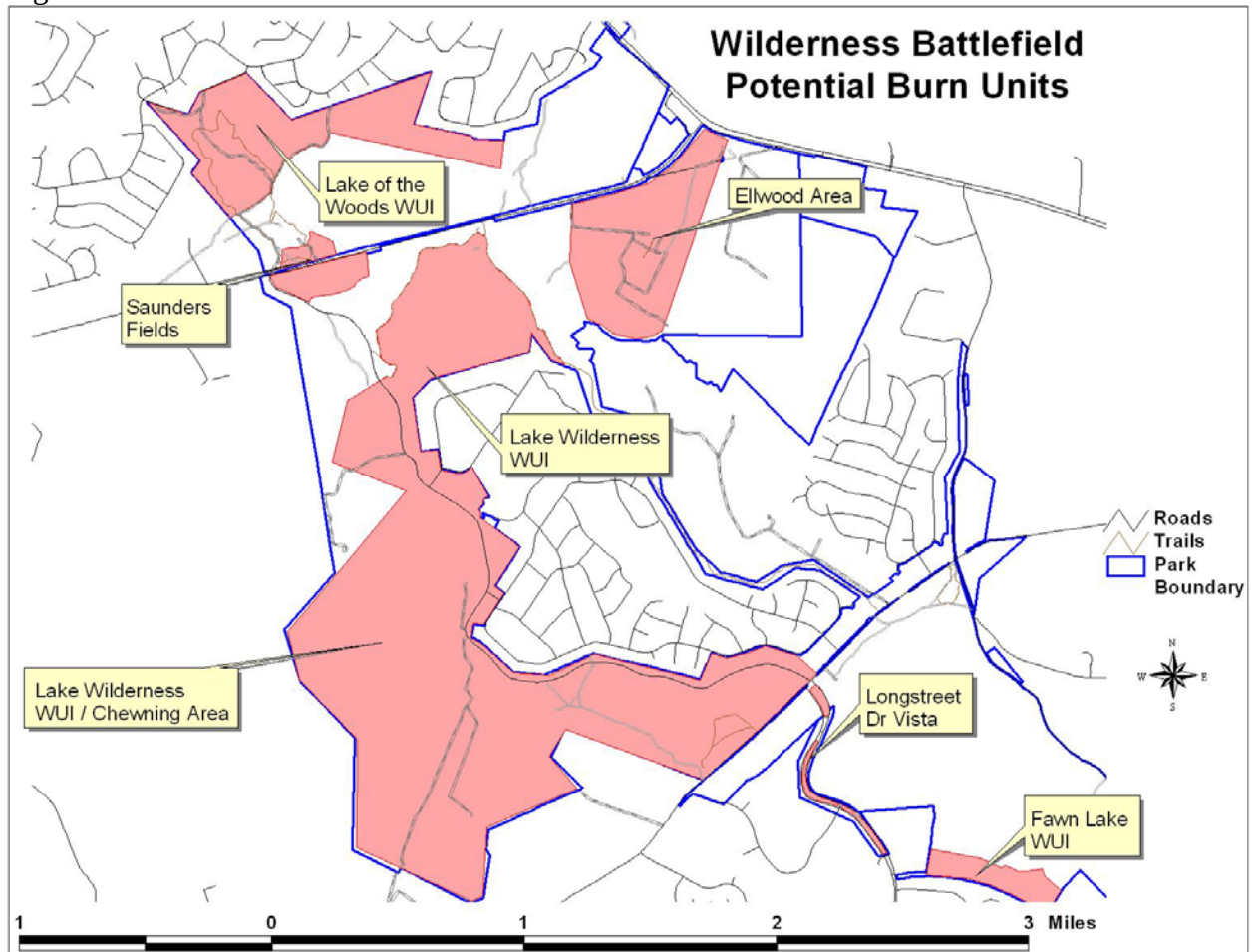
Fuel loads in oak-pine and pine-oak stands (6.7 - 14.5 tons/acre) were below the average loads found in similar stands characterized in the photo series guides with Fuel Models 8 and 9. An

area located along the south side of RT. 20 contains a stand of Virginia Pine that has heavier fuel loads and corresponds to a Fuel Model 10.

### 3) Fire Behavior

Wildland fire hazard in Chancellorsville Battlefield remains low during normal climatic conditions due to the relatively small amounts of fine fuels.

Figure 4.



## D. Spotsylvania Courthouse Battlefield

### 1) Fuel Types

Spotsylvania Battlefield contains fuels which correspond to Fire Behavior Fuel Models 1, 3, 8, and 9.

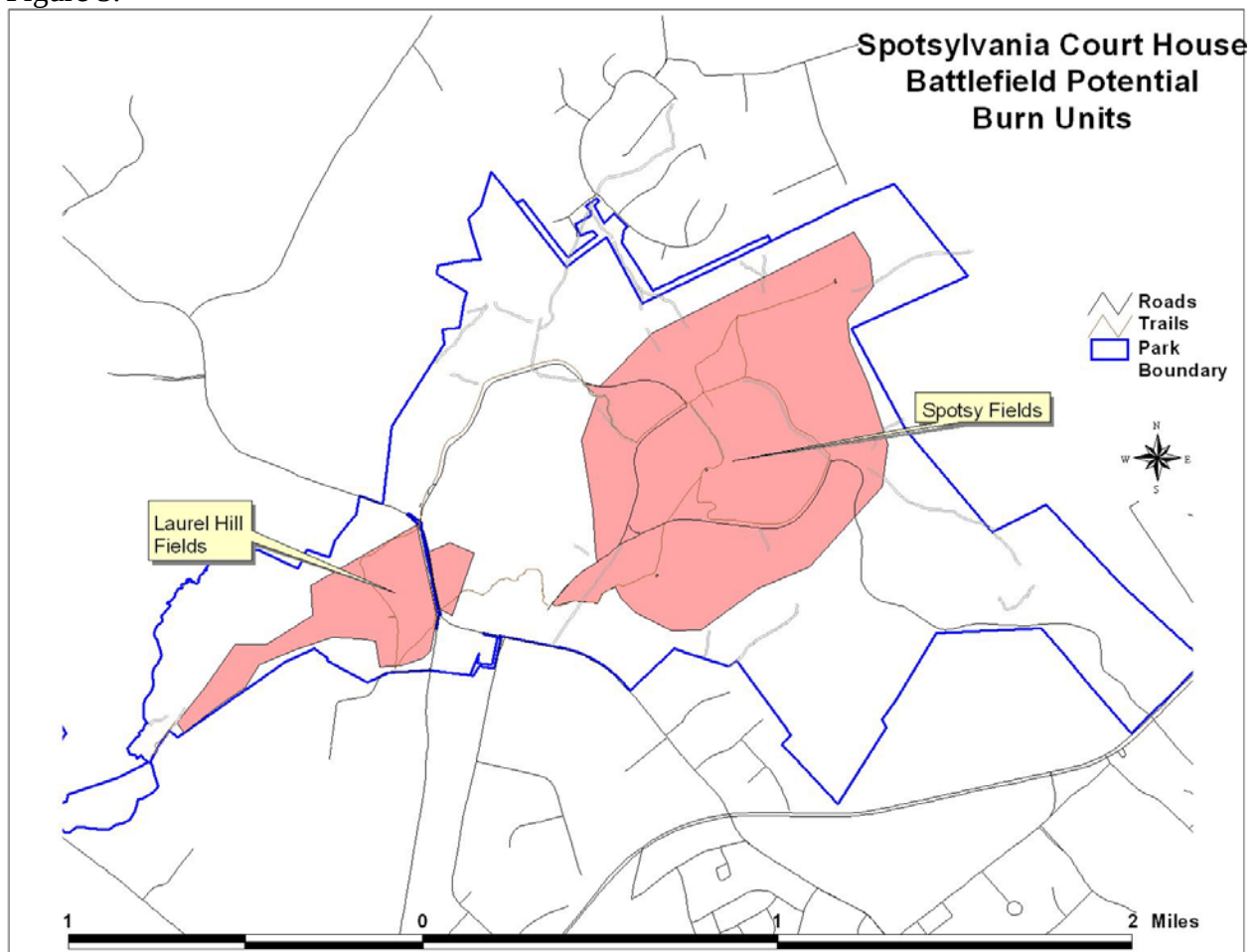
## 2) Fuel Loading

Fuel quantities in Spotsylvania Battlefield mature oak stands (3.89 - 4.08 tons/acre) were lower than the average values found in photo series guides for similar oak-hickory stands in the northeast. Fuel loadings in Loblolly (3.73 tons/acre) and Virginia Pine (3.71 tons/acre) stands were also lower than average values found in guides for similar southeastern pine stands.

## 3) Fire Behavior

Wildland fire hazard in Spotsylvania Battlefield remains low during normal climatic conditions due to the relatively small amounts of fine fuels.

Figure 5.



## IV WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

### A. Firefighter and Public Safety

1. All actions defined in the Fire Management Plan will conform to safety policies defined in agency and departmental policy, including, but not limited to:

- a. *Interagency Standards for Fire and Fire Aviation Operations* (NFES 2724).
- b. *NPS Director's Order 18*.
- c. *NPS Reference Manual 18*, Standards for Operations and Safety chapter.

2. Firefighter and public safety is our first priority. This Fire Management Plan and activities defined within reflect this commitment. The commitment to and accountability for safety is a joint responsibility of all firefighters, managers, and administrators. Individuals must be responsible for their own performance and accountability. Every supervisor, employee, and volunteer is responsible for following safe work practices and procedures, as well as identifying and reporting unsafe conditions. All firefighters, fireline supervisors, fire managers, and agency administrators have the responsibility to ensure compliance with established safe firefighting practices.

## **B. Air Quality and Smoke Management**

### **1. 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 Virginia's Emission Standards for Open Burning. Prescribed fires will not be scheduled for June, July, or August in order to comply with the emission standards. The Commonwealth's Emission Standards for Open Burning can be found at: <http://www.deq.state.va.us/pdf/airregs/440.pdf>

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. The Virginia Department of Environmental Quality will set the gross parameters of public health. 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 Chief Ranger and Superintendent.

The Park must comply with Virginia's Smoke Management Plan. Specific requirements can be found in the "Operational Guidance for the Smoke Management Program, Directive 1-4-601".

## **C. General Implementation Procedures**

The Wildland Fire Decision Support System (WFDSS) is in the process of replacing the Wildland Fire Implementation Plan (WFIP) and the Wildland Fire Situation Analysis (WFSa). This system will be used as soon as it is available as decision support tool that helps agency administrators and wildland fire managers make informed decisions for all unplanned ignitions.

The WFDSS project included recent advances in fire behavior modeling, geospatial analysis, remote sensing (e.g., LANDFIRE), and weather and climate forecasting.

The goal of this system is to provide an improved decision support network that documents and supports simple and complex decisions, as well as enabling users to access a variety of information in one place.

There are three response levels in the new WFDSS, historically, 99% of all fires in FRSP will fall under RL1.

- RL1- Response Level 1 requires little analysis for the majority of our fires -98% based on our historic IA Success
- RL2- As incidents escape initial attack, more analysis needs to be completed to inform and support decisions. It is up to the user to decide analysis is important for the decision.
- RL3 – Long term incidents (which are the least amount of incidents) require the most analysis. Users can still choose what is appropriate.

A WFDSS will be initiated for all wildland fires. EICC will be notified during fire starts so that they can initiate WFDSS. This will be the responsibility of the Incident Commander or the Park's Fire Management Officer.

## **D. 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.

In FBPS fuel model 9, fires run through the surface litter faster than model 8 (7.5 chains/hour) and have longer flame lengths (averaging 2.6 feet). Fall fires in hardwoods are predictable, but high winds will actually cause higher rates of spread than predicted because of spotting caused by rolling and blowing leaves. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning.

The slash group, represented by FBPS fuel models 11 and 13, will demonstrate fire behavior that could be fairly active. However, because of the location of the debris burning area, the shading from the overstory and the aging of the fine fuels can contribute to limiting the fire potential. As the fine fuels burn and intensity builds up, and the larger fuels start burning, active flaming will occur with the potential of generating firebrands. Care should be taken in windy conditions to look for spotting problems.

Table 3 Illustrates the comparative rates of spread and flame lengths for different fuel models at a fuel moisture content of 8%, 0% slope and a midflame windspeed of 5 miles/hour. These factors represent conditions associated with average expected fire behavior.

**Table 3 Fuel Model, Rate of Spread and flame Length**

| <b>Fuel Model</b> | <b>Rate of Spread (chains/hr)</b> | <b>Flame Length (feet)</b> |
|-------------------|-----------------------------------|----------------------------|
| <b>1</b>          | 78                                | 4                          |
| <b>3</b>          | 104                               | 12                         |
| <b>8</b>          | 1.6                               | 1                          |
| <b>9</b>          | 7.5                               | 2.6                        |

## **2. Preparedness Actions**

### **a. Fire Prevention, Community Education, and Assistance Programs**

An appropriate fire prevention program may be conducted in conjunction with other agencies to protect human life and property, and prevent damage to cultural resources or physical facilities. Fire prevention activities will be based upon fire history and current conditions. Particular attention will be paid to past ignition sources.

An integral part of the fire prevention program is that all employees, cooperators, and contractors be mindful of their own activities that could lead to unwanted ignitions. Setting a good example will aid the Park's credibility with its neighbors. Public contact staff will look for opportunities to integrate fire prevention and safety messages into informal and formal visitor contacts.

It is essential that employees be well informed about fire prevention and the objectives of the Park's fire management program. Further, employees, cooperators, and contractors must be kept informed about changes in existing conditions throughout the fire seasons.

Prior to, during, and after a prescribed fire, employees need to relate to the visiting public, Park neighbors, and other constituencies the beneficial effects of prescribed fires as opposed to unwanted human-caused fires.

During periods of extreme fire danger, fire prevention messages will be delivered to the visiting public and Park neighbors. These messages may be in the form of informal contacts by interpretive, maintenance or law enforcement staff, a press release to area newspapers, posts on the Park's website, or by such means staff determine as necessary and appropriate. Emergency restrictions regarding fires or area closures may become necessary. Such restrictions, when imposed, will be consistent with those implemented by cooperators.

When prescribed fires are burning in the Park, signs at Visitor Centers and Park unit bulletin boards will be used to supplement visitor contacts. These signs will be used to administratively direct, inform, guide, and caution visitors about existing fire conditions and prescribed fire

activities. The Park will also post information on its website and share information with interested parties by e-mail or whatever means are most effective.

Park staff will work with the neighboring Volunteer Fire Departments, Virginia Department of Forestry and other agencies with fire management responsibilities 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.

#### **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. Park will conform strictly to the requirements of the NPS wildland fire management qualification and certification system

The Park Fire Management Officer will be responsible for organizing the training required to meet Park expectations for red-carded firefighters. When advanced or specialized training is necessary, the Park Fire Management Officer will work through the Regional Fire Management Office to obtain funding and enrollment. The Park Fire Management Officer 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**

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

##### **January:**

Permanent employees' physical fitness exams.

Permanent employees' physical fitness scores due.

Update the fire callout list.

Update fire experience and training records for red-carded personnel.

Submit updated red-carded personnel records and physical fitness scores to the Area Fire Management Officer (FMO).

Archive training and experience records of seasonal personnel.

**February:**

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

Coordinate emergency dispatch procedures with the Regional FMO and both the Area FMO at Shenandoah NP (SHEN) and the Emergency Incident Coordination Center (EICC) at Shenandoah NP.

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 Virginia Department of Forestry regarding upcoming prescribed fire activities (staffing, smoke, information, etc.).

Meeting or discussion with the Area FMO at Shenandoah and the Regional FMO to review plans and current program.

Meeting of Park Fire Committee to review 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, as needed.

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.

**April:**

Maintain fire contacts with Area FMO, Regional FMO, nearby Park fire coordinators or FMOs, and cooperators.

Continue planning for prescribed fire program.

**May:**

Maintain fire contacts with Area FMO, Regional FMO, nearby Park fire coordinators or FMOs, and cooperators.

Continue planning for prescribed fire program.

**June:**

Physical fitness testing for seasonal personnel.

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, SHEN EICC, Area FMO, 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.

**September:**

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

**October:**

Review Interagency Agreements, draft revisions as necessary, and submit to the Superintendent for approval.

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

Forward nominations for interagency fire training to the Area FMO and the Regional FMO.

Probable start of fall fire season.

**December:**

Meeting of Park Fire Committee to review fire season and formulate program changes.

Compile Fire Atlas for completed season from fire log; prepare annual summary report.

Probable end of fall fire season.

Forward outstanding fire reports to the Area FMO at Shenandoah NP.

#### **d. Fire Weather and Fire Danger**

**Weather Station:** Station Number is 442301. It's a manual station. The location is at Fredericksburg Battlefield located in Spotsylvania County VA.

**National Fire Danger Rating System:** The Burning Index (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 elevated fire danger or the occurrence of multiple fires. Minimum staffing levels will be considered annually 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. Park is totally prepared to respond to a fire. Location of red-carded personnel are known to all relevant personnel. Red-carded personnel have fire tools and personal protective equipment immediately available in their work vehicles or at their work site. Slip-on pump is loaded onto pick-up and ready to respond.

**Level IV:** All activities in Readiness Class III are continued. Approval for expenditure of emergency preparedness funds is obtained from the Park's Superintendent. The Superintendent is notified of conditions. Once emergency funding is secured, tours of duty are 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 as necessary (Chief Ranger, Park Fire Coordinator, Natural Resource Specialist, Park Information Officer). Lieu days and leave may be cancelled for red-carded firefighters. Cooperators are contacted and activities coordinated (Virginia Department of Forestry, County 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 Readiness Class IV are continued. Minimums of four (4) red-carded firefighters are on duty during the burning period (to at least 2000 hours). All fires are 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. Preparedness Plan**

The Preparedness Plan is a comprehensive set of documents that provide management direction for wildland fire operations, including initial response and incident management activities. These actions are based on the goals, objectives, and wildland fire management strategies identified in the Fire Management Plan, as well as established local level procedures for wildland fire operations. Actions for initial response and incident management may be based on factors such as the time of year, burning conditions, resource commitment and fire activity. The Preparedness Plan will be reviewed annually and is included in appendix H. The NPS requires the following elements in the Preparedness Plan:

- Initial Response, Dispatch, and Notification Plan
- Strategic fire size-up procedures
- List of park personnel available to assist with wildland and prescribed fires, including fire qualification
- Annual Delegation of Authority from the Superintendent
- Job Hazard Analyses for fire and fire aviation activities
- Identified location of the current copy of the *Agency Administrator's Guide to Critical Incident Management* (NFES 1356)
- Identified location of current fire cache inventory
- Structure protection inventory and needs
- Identified location of procedures for park evacuation and closure
- Minimum impact tactics guidelines that are used in the park, and where needed, wilderness (minimum tool) considerations

Volunteer fire departments have developed their own protocols and procedures for initial attack of fires within the Park boundary.

### **4. Initial Attack**

#### **a. Priority setting during multiple fire occurrences:**

Vegetative cover map; any fire with continuous fuels up to and across the park 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 WFDSS process when an initial response has failed to contain a wild fire. This strategy may also be used to minimize resource damage and to provide for firefighter safety.

**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. An air tanker is stationed in Knoxville, Tennessee during the fire season. During periods of high fire danger there are tankers staged at Weir's Cave in the Shenandoah Valley

**e. Restrictions and Special Concerns:**

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

1. Civil War earthworks may be burned but will not be damaged in suppression or prescribed fire activities. No disturbance of mineral soil will be tolerated. Straw will be placed on burned earthworks to prevent erosion, if bare mineral soil is exposed, to prevent undue erosion.
2. No firelines will be constructed on earthworks or steep slopes.
3. No new roads will be created.
4. Operating vehicles off existing roads will be done in consideration of soil conditions. Operation of tracked vehicles or use of rubber-wheeled vehicles during wet soil conditions will not be allowed.
5. Park trails and roads will be used for fire containment lines wherever possible so as to preclude the disturbance of soil.
6. No retardant will be used without the approval of the Superintendent (or designee), unless there is immediate and grave danger to life, safety, and high value property loss.

**f. Local Issues:**

The Park depends on local volunteer fire departments and Commonwealth of Virginia resources for 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.

**5. Extended Attack and Large Fire Suppression**

**a. Implementation plan requirements – Wildland Fire Decision Support System (WFDSS) development:**

When a fire continues beyond the initial response, a decision will be made through WFDSS.

The WFDSS is a decision process that employs a systematic and reasonable approach to determine strategies 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 WFDSS outputs 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 decisions.

A description of the WFDSS process can be found in Appendix G. Guidance regarding the use of WFDSS may be found at [http://wfdss.usgs.gov/wfdss/WFDSS\\_Home.shtml](http://wfdss.usgs.gov/wfdss/WFDSS_Home.shtml).

**b. Complexity Decision Process for Incident Management Transition:**

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.

**c. Delegation of Authority:**

A suggested format for a limited delegation of authority from the Superintendent to the Incident Commander is located in Appendix H of this plan. However, the specifics of the delegation are dependent upon the nature of the incident and park concerns.

**6. Minimum Impact Suppression Tactics**

- All fire management activities in the Park will rely on tactics, as policy, which do a minimum amount of resource damage while maintaining the safety of firefighters, personnel, and the public as the highest priority.
- Superintendent approval is needed for off road use of vehicles, bulldozers, and mechanized equipment.
- Complete minimum impact guidelines are listed in Appendix H.

**7. Rehabilitation Guidelines**

When a suppression action is taken, rehabilitation may be necessary. On January 19, 2001, the Department of the Interior issued new policies 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.

The Incident Commander and the Natural Resource Manager will initiate rehabilitation. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential damage and hazards caused by the fire:

These actions may include:

- Backfilling of control lines, scarify, and seed with native species.
- Installation of water bars and construction of drain dips on control lines to prevent erosion.
- Installation of check dams to reduce erosion potential in drainages.
- The placement of cut vegetative materials in random positions.
- Positioning felled and bucked material so as to be least noticeable to visitors.
- Restoration of natural ground contours.
- Removal of all flagging, equipment and litter.
- Complete restoration of camping areas and improved helispots.
- Consideration and planning for more extensive rehabilitation or revegetation to restore sensitive impacted areas.
- Straw will be placed on civil war earthworks when bare mineral soil has been exposed.

The Park Fire Management Officer and the Natural Resource Manager, subject to review by the Park Fire Committee, will jointly formulate rehabilitation plans for each fire. Rehabilitation efforts should be initiated as soon as they can be safely implemented, which may be before the fire is declared controlled.

Rehabilitation work resulting from suppression actions will be charged to the corresponding suppression account. Rehabilitation work needed to rehabilitate the effects of the fire will be described in the BAER plan, and will be submitted to the Region 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 Fire Management Program Center for approval.

## **8. Records and Reports**

The Fire Management Officer 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.

## **E. Wildland Fire Use**

This option was rejected due to the small 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.

## **F. Fuels Management**

### **1. Fuels Planning and Documentation**

The fuels management program will implement fire management policies and help achieve resource management and fire management goals as 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 (ISDOI/USDA); and (3) A Collaborative Approach for Reducing Wildland Fire Risks To Communities and the Environment: 10-Year Comprehensive Strategy Implementation Plan. The Multi-year plans themselves are included as an Appendix to this plan.

#### **a. Identify Participants**

The following personnel are needed to develop and update the fuels treatment program.

Park FMO  
Natural Resource Manager  
GIS Specialist  
Cultural Resources Manager

#### **b. Identify Candidate Projects**

All open fields are eligible for fuels management in order to maintain the historic open scenes, reduce the fuel needed to bush-hog all of the open areas, and in some areas, provide a safe way for personnel and natural resources to manage steep or wet open areas.

In addition, certain areas within the park may be managed with fire to open up forested areas, to remove underbrush to improve historic sightlines, to treat earthworks to remove brush and encourage grasses, and as a Wildland-Urban Interface (WUI) tool to reduce fuel loading on the park boundary.

#### **c. Describe Project Prioritization Criteria.**

The fields that are currently managed solely by prescribed fire will be the highest priority, with fields being maintained by bush-hogging being second priority, and thirdly, wooded areas for historical sightlines, along with forested fuel treatments for WUI areas will be third priority.

#### **d. Updating the Fuels Treatment Plan**

The fuels treatment plan will be reviewed annually, and if necessary, updated to accommodate new information and personnel.

### **2. General Fuels Management Implementation Procedures**

#### **a. Annual Activities for Preparation and Implementation of Program**

The Fire Management Committee will annually meet to consider proposed burns 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. Activities Statement**

The activities proposed in this Fire Management Plan will be planned and implemented in accordance with Reference Manual 18, Fuels management chapter and the Interagency Standards for Fire and Fire Aviation Operations.

#### **c. General Fuels Management Strategy**

The purpose of fuels management at the Park is to protect and preserve the cultural resources of the Park, manage vegetation, reduce fuel loading, produce natural resource benefits and reduce threats to adjacent lands outside of the park. 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, adjacent neighbors and visitors.

#### **d. Equipment and seasonal use restrictions**

Equipment will be limited to wheeled vehicles only, and they are required to stay off of the park's earthworks. There are no seasonal use restrictions in this park.

#### **e. Required Personnel**

The Park usually does not have sufficient personnel to manage a prescribed fire. Personnel needed for a specific burn will be identified in the project's burn plan. The Park will participate with other nearby Parks in a coordinated approach to mutual prescribed fire programs with Richmond NBP, Colonial NHP, Petersburg NB, Appomattox NHP, and Shenandoah NP.

A Type 2 burn boss, at least two crew boss qualified persons, and preferably a fire effects monitor, along with a total contingent of 12 personnel – including the above mentioned persons.

### **3. Prescribed Fire**

#### **a. Fire Weather, Effects, and Behavior Monitoring**

Monitoring of prescribed fires at the 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 Park Fire Management Officer will establish specific fire information guidelines for each fire to update intelligence about the fire.

The Park Fire Management Officer will assure that assigned qualified personnel are used to monitor the behavior of 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 monitoring protocols with adaptations described in NPS Fire Effects Monitoring Handbook. Fire monitoring support will be coordinated with the Area Fire Ecologist.

Prescribed fire will not be used when complete incineration of large fuels (>3 inches in diameter) will be likely to occur.

#### **b. Prescribed Fire Project Critique**

The Fire Management Committee 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 critique of the fire management program, including the prescribed fire program, will be held each year by the Fire Management Committee at the conclusion of the fall fire season.

#### **c. Reporting and Documentation Requirements**

All prescribed fire forms will be completed as outlined by the Prescribed Fire 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 Fire Burn Boss will prepare a final report on the prescribed fire for the Chief Ranger. 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, and the Incident Record, is the responsibility of the Park Fire Management Officer and documents all personnel and equipment costs involved in the burn.

#### **d. Historic Fuel Treatment Map**

A historic fuel treatment database can be found in the park's GIS.

#### **e. Local Prescribed Burn Plan Requirements**

Parameters for RX burns are:

Temperature: Less than or equal to normal average high temperature for the month.

Mid-flame Wind Speed: Less than 10 mph.

Relative Humidity: Greater than 10%.

Fine Fuel Moisture: Surrounding fuels greater than 5%.

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

Parameters for debris burning are:

Temperature: Less than or equal to normal average high temperature for the month.

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.

#### **f. Prescribed fire planning and Implementation**

Prescribed fire planning and implementation will be in accordance with RM 18, Fuels Management chapter and Interagency Prescribed Fire Implementation Procedures Reference Guide.

### **4. Non-Fire Fuels Treatment Applications**

The Fire Management Committee will annually meet to consider proposed mechanical and/or chemical fuels treatment projects for the year. An assessment of the approved project plans will identify need resources, individual responsibilities, and timelines. These activities include writing project plans, scheduling of resources, coordinating with neighboring agencies and communities, and obtaining necessary permits. Planning and implementation of non-fire fuels management projects will be in accordance with Reference Manual 18, Fuels Management Chapter.

#### **a. Equipment and Seasonal Restrictions**

Off road vehicle or equipment use is prohibited unless the Resource Manager determines that there is little or no risk to natural or cultural resources. This determination may be weather dependent.

#### **b. 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.

### **c. Planning and Implementation of non-fire projects**

The planning and implementation of non-fire fuels management projects will be in accordance with RM 18, Fuels Management Chapter.

## **5. 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 \(2001\)](#). Emergency stabilization and rehabilitation actions will be in accordance with Reference Manual 18, Burned Area Emergency Response chapter 19 and the Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook. The Park Fire Management Officer and the Natural Resource Manager, subject to review by the Park Fire Committee, will jointly formulate a rehabilitation plan for each fire. The BAER plan will be submitted to the Region 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 Fire Management Program Center for approval.

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## **V. ORGANIZATIONAL AND BUDGETARY PARAMETERS**

### **A. Organization Structure of Fire Management Program**

#### **A. Areas of Responsibility and Organization**

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. The Superintendent is responsible to periodically assess and certify by signature that the continued appropriate management response (AMR) strategy, including Wildland fire use actions, are acceptable. The park superintendent will meet the performance requirements stated in the Interagency Standards for Fire and Fire Aviation Operations.

#### **B. Organizational Structure**

This section discusses areas of responsibility for implementation of the fire management program by specific Park position. There may be instances that the same person functions in two areas of responsibility, e.g., the Natural Resource Manager and the Park Fire Management Officer may be the same person.

### **1. Superintendent**

Fire management at Fredericksburg and Spotsylvania National Military Park is the responsibility of the Superintendent, with technical duties and accompanying responsibilities delegated to the park's Fire Management Officer. The Superintendent will be responsible for management of the program within Departmental and National Park Service policy, Director's Order 18 Wildland Fire Management (DO-18), and all relevant laws and regulations.

- a. Ensures that a comprehensive fire management program is adequately planned, staffed, implemented, and that the Fire Management Plan is reviewed annually and revised as necessary.
- b. Maintains and facilitates public and media relations pertaining to both suppression and prescribed fire.
- c. Approves prescribed fire plans.

## **2. Acting Superintendent**

Is delegated all decision making responsibility when the Superintendent is absent from the Park.

## **3. Chief Ranger**

- a. Responsible for implementation and execution of all aspects of the Fire Management Program except research.
- b. Responsible for overall coordination, direction, and supervision of wildfire prevention, preparedness, and suppression. Has line authority over the Park Fire Management Officer, and coordinates all wildfire emergencies.
- c. Briefs the Superintendent on current and predicted fire management activity.
- d. Recommends approval of the Fire Management Plan to the Superintendent.
- e. Serves as chair of the Fire Management Committee. Presents approved committee recommendations to the Superintendent.
- f. Assists in the development of the Delegation of Authority for signature by the Superintendent.

## **4. Natural Resource Manager**

- a. Coordinates fire research efforts, and serves as the primary resource advisor for project fires or prescribed fires.
- b. Serves as a member of the Fire Management Committee.
- c. Develops Natural Resource Objectives for prescribed fire.
- d. Plans and coordinates prescribed fires.

**5. Park Fire Management Officer / Fire Management Coordinator**

- a. Responsible for fire management program activities. Prepares and administers the Fire Management Plan and the annual budget. Revises the plan annually and incorporates any necessary changes.
- b. Advises and informs the Chief Ranger of all fire activity information in priority manner.
- c. Responsible for completing the prevention analysis to determine the level and type of prevention effort required by the Park. Ensures implementation of the approved fire prevention program.
- d. Responsible for initial attack and implementation of appropriate suppression response as recommended by the Fire Management Committee.
- e. Responsible for the overseeing of safe suppression of all wildfires, demobilization, and rehabilitation of the burned area.
- f. Responsible for submission of fire situation reports to NPS Branch of Fire Management, Area FMO, and the Regional Fire Management Officer.
- g. Responsible for providing fire-training opportunities to Park personnel to maintain predetermined fire qualification skills in critical positions. Reviews, updates, and maintains fire training and fire experience records. Submits updated records to the Area FMO at Shenandoah.
- h. Ensures adequate inventory of equipment and supplies to efficiently implement the fire management program.
- i. Develops the annual prescribed fire program, including writing prescribed fire plans and conducting approved prescribed fires.
- j. Ensures the preparation of individual prescribed fire plans in accordance with RM-18, and submits each prescribed fire plan to the Superintendent for approval.

- k. Ensures that both a briefing statement and delegation of authority are prepared for incoming Incident Management Teams.
- l. Coordinates dispatch of Park personnel for in-Park fire assignments or to provide assistance to other Parks and agencies. Requisitions fire crews, or fire resources and supplies for use within the Park.
- m. Prepares, reviews, and revises cooperative agreements with interagency cooperators. Maintains liaison with interagency cooperators through annual meetings to review agreements.
- n. Maintains technical references, maps, and aerial photos for the fire program.
- o. Responsible for completion of all fire reports (DI-1202s), and coordinates the timely entry of reports into the NPS Fire Management Computer System with the Regional Fire Management Officer within 10 days of a fire.
- p. Serves as a member of the Fire Management Committee. Prepares necessary evaluation information for each fire, provides timely update of current and predicted fire behavior, and provides technical advice and recommendations to the committee.
- q. Coordinates initial attack of wildfires.

## **6. Fire Management Committee**

- a. The Fire Management Committee will be comprised of the Chief Ranger, Supervisory Historian, Chief of Maintenance, Park Fire Management Officer, and the Natural Resource Manager. The Chief Ranger will chair the Committee. The Committee may request technical expertise from other individuals at any time. Each committee member will designate an alternate to serve in the event that the normal representative is unavailable.
- b. The Fire Management Committee will convene at the request of the Park Fire Management Officer, Chief Ranger, or Superintendent. The primary purpose of the Committee is to coordinate preparedness, suppression, and prescribed fire activities between the Park's division's, and between the Park and cooperating agencies.

### **1. Committee Actions During Prescribed Burns**

During any active prescribed burn, the Chief Ranger, representing the Committee, will brief the Superintendent at least once daily, and as often as necessary, on the current fire situation.

Alternatives and recommendations for any change in the management strategy for the fire will be presented. During the progress of any prescribed burn, the Prescribed Burn Boss will ensure that a contingency plan is prepared should the burn exceed prescription. The Superintendent has final and complete authority for all fire management decisions.

## **2. Committee Actions During Suppression Fires**

Any fire being managed as a suppression fire that threatens to exceed the initial attack capabilities will have a qualified Incident Commander assigned to manage the fire. If a fire extends beyond one operational period, the Incident Commander will use the WFDSS process.

## **3. Committee Actions During Non-Fire Periods**

The Committee may be convened during periods of high fire danger to coordinate preparedness activities. The Committee will also be convened at other times to coordinate the Park's prescribed fire activities. As mentioned above, the Committee will coordinate equipment and personnel needs with those of other nearby Parks with prescribed fire programs.

# **C. Area Fire Management Organization**

## **1. Area Fire Management Officer**

- a. The Area Fire Management Officer is the Fire Management Officer at Shenandoah NP. As the Area FMO, this individual is responsible for providing fire management assistance to the Park
- b. Requests for assistance from the Area FMO will be coordinated through Shenandoah NP. Requests should be made as far in advance as is practical.
- c. The Area FMO will provide fire management expertise and advice at the planning and implementation levels.
- d. The Area FMO will help the Park arrange for needed resources and equipment, and will assist in preparing FIREPRO/FPA funding requests.

- e. The Area FMO may be requested to serve as the agency representative regarding activities with an incident management team.

## **2. Area Fire Ecologist**

- a. The Area Fire Ecologist is the Fire Ecologist at Shenandoah NP. This individual is responsible for providing fire ecology assistance to the Park.
- b. Requests for assistance from the Area Fire Ecologist will be coordinated through Shenandoah NP. Requests should be made as far in advance as is practical.
- c. Requests for use of the Fire Effects Monitors will be made to the Area Fire Ecologist.
- d. The Area Fire Ecologist will provide fire ecology expertise and advice at the planning and implementation levels.

## **D. Fire Program Analysis (FPA)**

This park is located in the Northern Appalachian Fire Planning Unit (FPU) – designated as SA\_VA\_001, which covers western Virginia and western Maryland and eastern Kentucky. The Mountains-To-The-Sea Fire (MTTS) Fire Management Unit (FMU) consists of the seven Virginia NPS units that includes this park, as well as Appomattox Court House National Historical Park, Booker T. Washington National Monument, Maggie L. Walker National Historic Site, Petersburg National Battlefield, Richmond National Battlefield Park, and Shenandoah National Park. Fredericksburg and Spotsylvania National Military Park is its own Fire Workload Area (FWA).

The Park does not have any FPA funded positions. FPA does fund approved fire and hazard fuel projects. FPA funding is also authorized for approved fire training, preparedness, suppression, equipment, personal protective equipment, and burned area emergency stabilization and rehabilitation projects.

FPA funds are managed through the Northeast Region Fire Management Office. Requests for FPA funding are made from the Park to the Regional Fire Management Office through the Area Fire Management Office at Shenandoah.

## **E. Interagency Coordination**

A Memorandum of Understanding (MOU) has been signed with the Virginia Department of Forestry (VDF) for the purposes of fire management. See Appendix L for a copy of the MOU.

Memoranda of Understanding should be developed and entered into with the county of Spotsylvania, for the purposes of fire management, fire suppression, and fire training. An

MOU is currently under review that will formalize cooperation between the state, U.S. Forest Service, U.S. Fish & Wildlife Service, and the NPS. The purposes of this agreement will be for fire suppression, fire prevention, fire training, and support during management-ignited fires. Contacts with these agencies should be made at least annually to discuss the aspects of the MOUs and the Park's fire management program.

#### **F. Interagency Contacts by Function**

See Appendix E.

#### **G. Fire-Related Agreements**

See Appendix E.

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## **VI. MONITORING AND EVALUATION**

### **A. Monitoring Programs**

The park will implement long and short term monitoring to assess accomplishments and to determine the effects of management activities on cultural and natural resources. Monitoring of prescribed fires is intended to provide information for quantifying and predicting fire behavior and its ecological effects on park resources while building a historical record.

It measures 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. Monitoring will help to define the effectiveness of the fire management program by assessing the vegetative effects of fire. This information will be very useful in adjusting the prescribed fire program to better meet short and long-term resource objectives.

There are two types of monitoring described in this report, burn day fire effects monitoring observations (FEMO) and permanent plot monitoring. During prescribed burning, FEMO monitoring includes, weather, fire behavior and fire effects observations. Permanent monitoring plots are installed and read before and after the burn to gather pre- and post-burn vegetation data. These plots are read during the growing season.

The Northeast Region Fire Effects Monitoring Crew began monitoring fire effects at the park in 2004. This Monitoring Plan describes procedures for monitoring the effects prescribed fire and non-fire (primarily brush-hogging) treatments used to treat vegetation in the Spotsylvania Fields Monitoring Unit at Fredericksburg and Spotsylvania National Military Park.

### **B. Fire Monitoring Plan**

A Fire Monitoring Plan has been developed at this time and can be found in Appendix N.

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## **VII. FIRE RESEARCH**

### **A. Previous and Ongoing Research**

The park has compiled a fire history that can be found in the park's GIS. Fire research will be coordinated through the Natural Resource Manager of the park. Fire effects research has and is being conducted regarding vegetation, soil, and plant succession, in conjunction with the prescribed fire program in the park. The data for the research and analysis of the data is being overseen by the fire effects crew out of Shenandoah National Park. This research will be analyzed and used in the decision process regarding fire management.

### **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 regimes, describing fuels dynamics, describing the impacts on cultural resources, and other information needed for operational fire and resource management.

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## **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, neighbors and political audiences 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**

### **A. Public Information Capabilities and Needs**

The Park is committed to keeping the public informed of its fire management program and activities. Materials such as the park newsletter can 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.

### **B. Step-Up Public Information Activities**

Information and education are important processes in public acceptance of the managed fire program at Park. The Park Fire Management Officer will provide the Superintendent with 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.
- During periods when prescribed fires are ignited, handouts will be prepared and posted for all visitors entering areas of fire activity.
- The fire management program will be incorporated into visitor contacts, interpretive talks, walks, and tour programs. 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.

As outlined in the prevention section, 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.

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## **X. PROTECTION OF SENSITIVE RESOURCES**

### **A. Archeological/Cultural/Historic Resources Needing Protection and/or Treatment**

The greatest resource concern is with the earthworks located throughout the various units of the Park. Protection of these resources is focused on prohibiting any activity that causes surface erosion and maintaining a vegetative cover that precludes the presence of trees where practical. Prescribed fire may be used to maintain predetermined sites, and care will be taken to avoid ground disturbance in all fire management operations. Intentional ground disturbance will be avoided at all costs, unless human life or personal or improved property is threatened in a Wildland fire. Prescribed fire will not be used when complete incineration of large fuels (>3 inches in diameter) will be likely to occur.

### **B. Natural Resources Needing Protection and/or Treatment**

There are no known natural resources needing special protection or treatment.

### **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.

### **D. NEPA/NHPA compliance**

Refer to appendix D for more information.

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## **XI. REVIEWS OF FIRE MANAGEMENT PROGRAMS, PROGRAM COMPONENTS, WILDLAND FIRES, AND THE FIRE MANAGEMENT PLAN**

- A. All Wildland fires and fire-related incident will be reviewed in accordance with Reference Manual 18, and the Interagency Standards for Fire and Fire Aviation Operations.

- B. The Park Fire Management Committee 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.
- C. The Fire Management Plan will be updated annually and that the park will document the process. An update to the FMP will be prepared if indicated.
- D. The FMP will be comprehensively reviewed at least every five years

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## **XII CONSULTATION AND COORDINATION**

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

Gregg Kneipp, Natural Resource Manager, Park Fire Management Officer,  
Fredericksburg and Spotsylvania National Military Park, National Park Service,  
Fredericksburg, Virginia

Melissa Forder, Fire Ecologist, Shenandoah National Park, Luray, Virginia

Jeff Koenig, Area Fire Management Officer, Shenandoah National Park, Luray, VA

Douglas Wallner, Regional Fire Management Officer, Northeast Region U.S. National  
Park Service, Philadelphia, Pennsylvania

Thomas Snoddy, Forester, Spotsylvania and Stafford Counties, Virginia Department of  
Forestry

Ed Furlow, Forester, Orange County, Virginia Department of Forester

Matthew Coleman, Forester, Caroline County, Virginia Department of Forester

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### **XIII. APPENDIX**

- A. References cited
- B. Definitions
- C. Species lists
- D. Compliance for FMP and Fuels Management Program  
(NEPA and NHPA)
- E. Fire call-up list, preparedness inventory, cooperative agreements
- F. Communication and Education Plan
- G. Fire Monitoring Plan
- H. Preparedness Plan
  - 1. Initial Response, Dispatch, and Notification Plan
  - 2. Strategic fire size up procedures
  - 3. List of Personnel including fire quals
  - 4. Annual Delegation of Authority from Park Superintendent
  - 5. FireJHA
  - 6. Identify location of current copy of Agency Administrator's Guide to Critical Incident Management (NFES 1356)
  - 7. Current Fire Cache Inventory
  - 8. Structure protection inventory and needs
  - 9. Identify location of procedures for park evacuation and closure
  - 10. Minimum impact tactics guidelines that are unique to the park and, where needed, wilderness (minimum tool) considerations
- I. Multi-year fuels treatment plan
- J. Fire Prevention Plan (NA, park fire occurrences does not require this document)
- K. Rental Agreements – NA
- L. Contracts for Suppression and Prescribed Fire Resources – NA
- M. Notification Procedure and contact list in the event of serious injury or death
- N. Specific details and standards for Burned Area Emergency Response and fire Rehabilitation – NA

## **APPENDIX A**

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## **APPENDIX B**

### **Definitions**

#### **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.

**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 or 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 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 Management Unit (FMU):** A new designation, part of FPA, to show costs and planning for an area.

**Fire Perimeter:** The entire outer edge or boundary of a fire.

**Fire Planning Unit (FPU):** An organizational entity whose purpose is cooperative fire management planning and implementation. Fire Planning Units are associated with a specific land base that can be described spatially. The boundaries of Fire Planning Unit land base are not predefined by Agency administrative unit boundaries. Fire Planning Units may consist of a single agency unit, multiple agency units, or any combination of single or multiple agency units and subunits. Lands included in a Fire Planning Unit may be contiguous or non-contiguous.

**Fire Program Analysis (FPA):** to provide managers with a common interagency process for fire management planning and budgeting to evaluate the effectiveness of alternative fire management strategies through time, to meet land management goals and objectives. FPA will reflect fire objectives and performance measures for the full scope of fire management activities.

**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.

**Fire Workload Area -** An area or areas within an FMU that share one or more characteristics that distinguish it from the rest of the FMU.

**Firefighting Resources:** All people and major items of equipment that can or potentially could be assigned to fires.

**FIREPRO:** The historical method used for funding the fire program nationwide.

**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 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.

**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.

**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.

**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 sparks 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.

## 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 Decision Support System (WFDDSS)** – A system developed to assist fire managers and analysts in making strategic and tactical decisions for fire incidents. It is designed to replace the WFSA (Wildland Fire Situation Analysis), Wildland Fire Implementation Plan (WFIP), and Long-Term Implementation Plan (LTIP) processes with a single process that is easier to use, more intuitive, linear, scalable, and progressively responsive to changing fire complexity.

**Wildland Fire Use:** The management of naturally ignited wildland fires to accomplish specific pre-stated 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 C

Listed here are the Species of Concern known to occur in the park.

| Common Name | Scientific Name                 |
|-------------|---------------------------------|
| Copperhead  | <i>Agkistrodon contortrix</i>   |
| Bald Eagle  | <i>Haliaeetus leucocephalus</i> |

## Species List - Flora

A flora surveys has been conducted by K. Taverna 2008 and J.C. Ludwig and C.A. Pague 1991 for the park. The surveys are referenced in the bibliography and made a part of this appendix.

## APPENDIX D.

### Compliance for FMP and Fuels Management Program

## APPENDIX E

### Fire Call-up List, Preparedness Inventory, Cooperative Agreements, Step-Up Plan

#### Fire Call-Up List

| Name             | Qualification                |
|------------------|------------------------------|
| Carrico, Regina  | FFT2                         |
| George, Linda    | PTRC                         |
| Howard, Bob - AD | CRWB                         |
| Johnson, Craig   | FFT2                         |
| Kelly , Keith    | CRWB, ICT4                   |
| Kneipp, Gregg    | CRWB, ENGB, RXB2, ICT4, FALB |
| Lochart, Charles | FFT2                         |
| Reifinberg, John | FFT2, FALC                   |
| Roland, Matt     | FFT1, ICT5                   |
| Smith, Mike      |                              |
| Soper, Marie     | FFT1                         |
| Stoddard, John   | FFT2, FALB                   |

## STEP-UP PLAN

The park's Step-Up Plan specifies staffing class levels based upon the Burning Index (BI). Each staffing class level will have a corresponding set of actions that the park will initiate to meet potential fire problems. Staffing Class I-III level actions are funded by the park, while actions taken at the IV and V staffing class levels are supported with emergency funds. The Park Fire Management Officer (FPC) or the Chief Ranger will charge these funds to an E11 account, authorized by the park's Superintendent. During the park's two fire seasons (mid-February-May and mid-October-December), the park's Burning Index will be obtained from the Park FMO at Fredericksburg and Spotsylvania NMP. The BI will be calculated from data collected at the fire weather station#44501 located in the park. The staffing classes for Fredericksburg and Spotsylvania NMP are:

| Staffing Class | Burning Index | Adjective Class |
|----------------|---------------|-----------------|
| I              | 0-7           | Low             |
| II             | 8-15          | Moderate        |
| III            | 16-29         | High            |
| IV             | 30-35         | Very High       |
| V              | 36+           | Extreme         |

### Step-Up Plan:

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#### Staffing Class Activity

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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.

**Fire Conditions:** Fires will present a low level of control difficulty. Fires occurring at this level can be controlled with existing forces.

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.

**Fire Conditions:** Fires will present a moderate level of control activity. Multiple fires in the same burning period will begin to affect other services. Wind speed will determine severity of fire spread. Fire fuels will be dry. Effectiveness of initial attack forces will be critical. Response time will be important.

III. Normal eight (8) hour tours of duty. Park is totally prepared to respond to a fire. Location of red-carded personnel are known to all relevant personnel. Red-carded personnel have fire tools and personal protective equipment immediately available in their work vehicles or at their work site. Slip-on pump is ready to respond.

**When Burning Index is 16-29:** Normal tours of duty for patrol rangers is to include weekends and coverage to 1800 hours.

**Step-up to Staffing Class IV** if one or more of the following conditions exist:

- a. A high visitation period is determined to pose an exceptional human-caused risk of wildland fire;
- b. Hunting season opens;
- c. Red Flag Warning is posted for Region V of Virginia Department of Air Pollution Control Administrative Regions;
- d. Eastern Inter-Regional Coordination Center at Staffing Class IV or V.

**Fire Conditions:** Fire will present a high level of control difficulty. All park red-carded personnel may be involved in control efforts, especially if there is a large fire. Light fuels are very dry. Heavy fuels are nearly dry. Fires will spread rapidly. Multiple fire situations are very possible. Quick response and short control time is critical. Spotting may occur. Mop-up will be more difficult and time-consuming.

IV. All activities in Staffing Class III are continued. Approval for expenditure of emergency preparedness funds is obtained from the Regional Fire Management Officer. The Superintendent is notified of conditions. Increased prevention and detection patrols are conducted. A red-carded firefighter is on duty during the burning period (to at least 1800 hours). Longer hours of coverage are initiated for certain key positions (Chief Ranger, Park FMO, Natural Resource Management Specialist, Park Information Officer). Lieu days and leave may be cancelled for red-carded firefighters. Cooperatives are contacted and activities coordinated (Virginia Department of Forestry, County 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.

**Fire Conditions:** Fires will be extremely difficult to control. Initial attack and reinforcing crews will have difficulty controlling a fire at this level. Only effective initial attack with the proper resources will allow effective control. Light fuels are extremely dry, heavy fuels are dry.

V. All activities in Staffing Class IV are continued. All fires are 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.

**Fire Conditions:** Temperatures are high and relative humidity is low. All fire fuels are very dry. Fires ignite easily and spread rapidly. May require airdrops.

## **APPENDIX F**

### **Communication and Education Plan**

Information and education are important processes in public acceptance of wildland fire at Fredericksburg and Spotsylvania NMP. The Chief Ranger will coordinate all public information activities with the assistance of the Supervisory Park Ranger. The Park Fire Coordinator will provide accurate information regarding current fire situations and management activities.

The park will work with the NPS Fire Prevention, Education and Information Specialist working at VICC further inform the public about the park's wildland fire management program.

The public information program will be developed as follows:

1. Concepts of the prescribed fire program will be incorporated, as appropriate, in park publications, brochures, and handouts.
2. During periods when prescribed fires are ignited, handouts will be prepared and distributed to all visitors entering areas of fire activity.
3. The fire management program will be incorporated into visitor contacts, interpretive talks, walks, and tour programs. Particular attention will be given when fires are conspicuous from roads or visitor use areas.
4. News releases will be distributed to the media as appropriate.
5. The public information outlets of neighboring and cooperating agencies and the regional office will be provided with all fire management information.
6. The role of the fire management program at Fredericksburg and Spotsylvania NMP will be developed and discussed, as appropriate, in off-site programs and talks.
7. The fire management program will be discussed in informal talks with employees of all divisions, concessionaires, contractors, volunteers, residents, and park neighbors.

**Appendix G**  
**Wildland and Prescribed Fire Monitoring Plan**  
**See Plan located in NRM office**

**Appendix H.**

**Preparedness Plan**

**H.1. Initial Response, Dispatch, and Notification Plan**

The park will respond with the park's engine on all initial dispatches, all other red carded personnel will respond as appropriate and as requested, as soon as possible after being notified.

**H.2. Strategic Fire Size Up Procedures**

The guidelines from the IRPG and Fireline Handbook will be used.

**H.3. List of Personnel**

| Name             | Qualification                |
|------------------|------------------------------|
| Carrico, Regina  | FFT2                         |
| George, Linda    | PTRC                         |
| Howard, Bob - AD | CRWB                         |
| Johnson, Craig   | FFT2                         |
| Kelly , Keith    | CRWB, ICT4                   |
| Kneipp, Gregg    | CRWB, ENGB, RXB2, ICT4, FALB |
| Lochart, Charles | FFT2                         |
| Reifinberg, John | FFT2, FALC                   |
| Roland, Matt     | FFT1                         |
| Stoddard, John   | FFT2, FALB                   |

#### H.4. LIMITED DELEGATION OF AUTHORITY

**To:** \_\_\_\_\_, Incident Commander

**From:** Superintendent, , Fredericksburg and Spotsylvania National Military Park

**Subject:** Limited Delegation of Authority

As of \_\_\_\_\_ hours, on this date \_\_\_\_\_, I have delegated limited authority to manage the \_\_\_\_\_ fire in the Fredericksburg and Spotsylvania National Military Park.

As Superintendent I have ultimate responsibility for protection of the Fredericksburg and Spotsylvania National Military Park's 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:  
Historic building and earthworks
4. Restrictions for suppression actions are: no tracked vehicles anywhere in the park unless human life, personal property, or cultural resources are threatened. Helicopters, powersaws, portable pumps and leaf blowers may be used as required. Chemical retardant is authorized as stipulated in the Parkway'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 public safety.

\_\_\_\_\_  
Superintendent, Fredericksburg and Spotsylvania National Military Park

\_\_\_\_\_  
Date

## H.5. Fire JHA

|                                                               |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                  |
|---------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| United States Department of Interior<br>NATIONAL PARK SERVICE | 1.WORK PROJECT/ACTIVITY<br><br><b>Wildland / RX Fires</b> | 2.LOCATION<br><br>FRSP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3.UNIT<br><br>All                |
| JOB HAZARD ANALYSIS (JHA)                                     | 4.NAME OF ANALYST<br>BILL GABBERT                         | 5.JOB TITLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 6.DATE PREPARED<br><br>1/02/2007 |
| 7. TASKS/PROCEDURES                                           | 8. HAZARDS                                                | 9. ABATEMENT ACTIONS<br>ENGINEERING CONTROLS – SUBSTITUTION -<br>ADMINISTRATIVE CONTROLS - PPE                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                  |
| Prescribed fire                                               | Qualifications                                            | ALL personnel MUST meet National Fire Qualification System, physical fitness, experience, and training requirements.                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |
|                                                               | Tools                                                     | Use proper tool for the job.<br>Maintain tools in good condition.<br>Maintain spacing while working and walking.<br>Avoid swing tools toward body.<br>Use tool guards when not in use or travel mode.                                                                                                                                                                                                                                                                                                                              |                                  |
|                                                               | Potentially Inexperienced Personnel                       | Read DO# 18 Health and Safety section.<br>Have new personnel obtain proper training. All burn personnel shall meet age, health and physical requirements established for regular firefighting duties as stated in RM-18 and FMP.<br>Pre-burn safety briefings prior to each day of burning to clarify assignments, organization, responsibilities, communications, hazards, weather and expected fire behavior.<br>Supervisory control at all times.<br>Have inexperienced firefighters work with a safe, experienced firefighter. |                                  |
|                                                               | Foot travel                                               | Wear appropriate boots, 8" leather tops with non-skid soles.<br>Use caution when walking on wet rocks, logs, and sticks; step over logs, not on them.<br>Carry tools on the downhill side.<br>Plan and select safe routes, watch for changes in ground surface, slick spots, or unusual hazards.                                                                                                                                                                                                                                   |                                  |
|                                                               | Animals/insect bites                                      | Be aware of your surroundings and select a safe travel route.<br>Avoid potentially dangerous animals, insects, and snakes. Do NOT pursue or play with or otherwise harass animals.<br>Person's known to have allergic reactions should carry appropriate prescription drugs at all times.<br>Identify those persons with reactions to bites ahead of activity.                                                                                                                                                                     |                                  |
|                                                               | Becoming lost                                             | Individuals should become familiar with area in a briefing prior to activity.<br>Individuals should carry map and compass and be skilled in their use.                                                                                                                                                                                                                                                                                                                                                                             |                                  |

Fredericksburg and Spotsylvania National Military Park  
Fire Management Plan  
February 2010

|                                                               |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |
|---------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| United States Department of Interior<br>NATIONAL PARK SERVICE | 1.WORK PROJECT/ACTIVITY<br><br><b>Wildland / RX Fires</b> | 2.LOCATION<br><br>FRSP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 3.UNIT<br><br>All                |
| JOB HAZARD ANALYSIS (JHA)                                     | 4.NAME OF ANALYST<br>BILL GABBERT                         | 5.JOB TITLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 6.DATE PREPARED<br><br>1/02/2007 |
| 7. TASKS/PROCEDURES                                           | 8. HAZARDS                                                | 9. ABATEMENT ACTIONS<br>ENGINEERING CONTROLS – SUBSTITUTION -<br>ADMINISTRATIVE CONTROLS - PPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |
|                                                               | Vehicle travel (to and from work site)                    | Be alert; anticipate the actions of other drivers.<br>Do not assume other drivers see you or will yield right-of-way.<br>Review defensive driving techniques before driving to burn site.<br>Do not operate vehicles if not properly maintained; perform inspections on vehicles and other equipment.<br>Anticipate other traffic on narrow roads.<br>When parking, leave vehicle in low gear or “park”, set parking brake, chock wheels.<br>Personnel must wear seat belts at all times when vehicle is in motion.<br>Person operating vehicle must be licensed for that type of vehicle.<br>Use spotter when backing.<br>Drive an appropriate speed for weather and road conditions.<br>Anticipate animals/pedestrians entering highway.<br>Passengers should assist in watching for wildlife.<br>Never exceed speed limits.<br>Follow at a safe distance.<br>Never exceed passenger capacity of the vehicle. |                                  |
|                                                               | Fatigue                                                   | Provide plenty of fresh water and meals as needed.<br>No personnel assigned to one shift may be assigned to the Next shift.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                  |
|                                                               | Heat exhaustion                                           | Have fresh water available. Drink plenty of fluids before, during, and after the assignment.<br>Pace your self on hot days.<br>Ensure you are getting enough salt in your food.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |
|                                                               | Poison ivy/oak                                            | Be able to identify plants.<br>Communicate location of plants to other personnel.<br>DO NOT breathe smoke from burning plants.<br>If exposed, remove and wash clothing as soon as possible.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                  |
|                                                               | Injuries                                                  | Wear PPE.<br>All injuries will be reported to burn boss.<br>First aid kits will be available.<br>Minor injuries will be addressed on site, all others will follow medical plan.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |
|                                                               | Chain saw use                                             | Sawyers will have completed S-212 and if not red-carded for saw work or inexperienced must work under the supervision of a safe, experienced sawyer.<br>Cut from the uphill side. Call out warnings when felling trees.<br>Always inform those working below when potential exists for rolling material.<br>Be aware of burned out snags and/or widow makers – use spotters to alert sawyer of dangers.<br>Wear proper PPE, including chaps – both sawyer and swamper.<br>Avoid contacting the tip of the bar with objects to prevent kickback.<br>Use proper felling techniques, including using wedges where necessary.                                                                                                                                                                                                                                                                                       |                                  |

Fredericksburg and Spotsylvania National Military Park  
Fire Management Plan  
February 2010

|                                                               |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |
|---------------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| United States Department of Interior<br>NATIONAL PARK SERVICE | 1.WORK PROJECT/ACTIVITY<br><br><b>Wildland / RX Fires</b> | 2.LOCATION<br><br>FRSP                                                                                                                                                                                                                                                                                                                                                                                    | 3.UNIT<br><br>All                |
| JOB HAZARD ANALYSIS (JHA)                                     | 4.NAME OF ANALYST<br>BILL GABBERT                         | 5.JOB TITLE                                                                                                                                                                                                                                                                                                                                                                                               | 6.DATE PREPARED<br><br>1/02/2007 |
| 7. TASKS/PROCEDURES                                           | 8. HAZARDS                                                | 9. ABATEMENT ACTIONS<br>ENGINEERING CONTROLS – SUBSTITUTION -<br>ADMINISTRATIVE CONTROLS - PPE                                                                                                                                                                                                                                                                                                            |                                  |
| Drip Torch Use and Fueling                                    | Snag injuries                                             | During all stages of the fire, but especially during mop up and patrol, be especially cautious of stump holes and fire weakened snags!<br>Avoid high hazard areas.<br>Wear protective gear (hard hats).                                                                                                                                                                                                   |                                  |
|                                                               | General public                                            | No untrained personnel will be allowed on the burn. Post signs on roads and trailheads to warn public of potential smoke and fire hazards.<br>If non-fire personnel arrive on scene of project, notify the burn boss and escort to a safe location.<br>If resistance is encountered, dispatch should be notified and Law Enforcement rangers should respond.<br>Document all steps and contacts.          |                                  |
|                                                               | Mixing fuel                                               | Mix fuel only in well-ventilated area and away from sources of ignition.<br>Transport fuel only in approved, labeled containers secured in vehicle beds.<br>NO SMOKING within 25' of mixing and filling area.<br>Do not fill containers in pickups with bed liners.<br>Avoid creating mix ratios in excess of 1 part gas to 3 parts diesel.                                                               |                                  |
|                                                               | Fueling                                                   | Any person who spills fuel on clothing will be removed from the burn until contaminated clothing is replaced.<br>Fuel containers will be appropriately marked.<br>Avoid contact with eyes and skin.                                                                                                                                                                                                       |                                  |
|                                                               | Igniting                                                  | Always have an escape route.<br>Maintain LCES.<br>Follow the Standard Fire Orders and Watch Out Situations.<br>Wear PPE as listed above.<br>Be aware of overhead hazards.<br>Use extra caution on slopes.<br>Maintain communications with other lighters and RX Fire Ignition Specialist.<br>Hand Held radios shall be provided to all lighters.<br>Lighters shall be trained in the use of Drip Torches. |                                  |
|                                                               | Fuel spills                                               | Use funnel and spout when filling torches from Gerry cans.<br>Avoid fueling in riparian areas to prevent habitat damage.                                                                                                                                                                                                                                                                                  |                                  |
|                                                               | Burns                                                     | Wear Personal Protective Equipment (PPE).<br>Implement LCES, follow Standard Fire Orders and Watch Out Situations.<br>Be alert to shifts in wind direction.<br>Everyone will receive a briefing; make certain that assignments are understood.                                                                                                                                                            |                                  |
|                                                               | Back injury                                               | When lifting heavy boxes (torches), use proper lifting techniques and protect lower back. Enlist help as needed.                                                                                                                                                                                                                                                                                          |                                  |
|                                                               | Poisoning                                                 | Material Safety Data Sheets (MSDS) for diesel, gas will be located in vehicle carrying fuel to burn unit.                                                                                                                                                                                                                                                                                                 |                                  |

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|                                                               |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                  |
|---------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| United States Department of Interior<br>NATIONAL PARK SERVICE | 1.WORK PROJECT/ACTIVITY<br><br><b>Wildland / RX Fires</b> | 2.LOCATION<br><br>FRSP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 3.UNIT<br><br>All                |
| JOB HAZARD ANALYSIS (JHA)                                     | 4.NAME OF ANALYST<br>BILL GABBERT                         | 5.JOB TITLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 6.DATE PREPARED<br><br>1/02/2007 |
| 7. TASKS/PROCEDURES                                           | 8. HAZARDS                                                | 9. ABATEMENT ACTIONS<br>ENGINEERING CONTROLS – SUBSTITUTION -<br>ADMINISTRATIVE CONTROLS - PPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  |
| Mop Up                                                        | Eye injury: burns, cuts, flying debris                    | Wear proper PPE.<br>Identify hazards such as stumps holes, snags, bee nests, etc.<br>Proper use of hand tools at all times.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                  |
| Holding                                                       | Smoke                                                     | Wear PPE.<br>Rotate personnel out of heavy smoke every one-hour for fresh air.<br>Be alert to potential rolling material; dig trenches if needed.<br>Personnel shall follow all guidelines in the NWCG Fireline Handbook chapter on Firefighting Safety.<br>Ensure that tools remain in safe condition through periodic inspection and repair.<br>Monitor employee performance periodically to ensure proper techniques are used.<br>Maintain safe working distance from other crew members.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                  |
|                                                               | ATV Operation accidents                                   | Only trained personnel will use ATV's.<br>Regular firefighting PPE will be used: Gloves on.<br>Chinstrap down. Eye protection.<br>Use sturdy loading ramps for loading and unloading.<br>Maintain control of ATV by shifting weight of the operator appropriately to negotiate proper turning.<br>Extra fuel will not be carried on an ATV if the ATV is outfitted with an ATV drip torch.<br>Do not haul passengers.<br>Do not over load machine or cargo racks.<br>Do not forge deep or swift water.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                  |
|                                                               | Personal injury, puncture wounds, cuts.                   | Carry a first aid kit.<br>Have a portable radio with you.<br>Stay alert and avoid long hours of operation.<br>Wear helmet with chinstrap, eye protection, and gloves.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                  |
|                                                               | Portable pump use                                         | Keep pump clean and free of excess dirt. Obtain proper training before using pump, ENOP qualified person needs to be present.<br>Make sure pump is primed before beginning to pump.<br>Do not rest any body part on pump. Wear eye and ear protection.<br>If pump is not working properly stop the pump and fix. Obtain help if needed.<br>Warn personnel that pump is hot.<br>Always give pump time to warm up before operating at peak performance.<br>Allow two minute cool down before shutting off.<br>Make sure pump is cool before refueling. Do not touch exhaust or other parts of the pump.<br>Make sure fuel is not excessively old and properly mixed.<br>Do not smoke near pump during refueling. Wipe up any spills.<br>Fuel must be stored in properly marked container and replaced in compartment when done.<br>Make sure water source is adequate. Make sure suction valve is at least a foot under water and use a shovel or bucket to keep obstructions away from the suction end.<br>If water is deep do not work in the water. Use a shovel to |                                  |

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|                                                               |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                  |
|---------------------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| United States Department of Interior<br>NATIONAL PARK SERVICE | 1.WORK PROJECT/ACTIVITY<br><br><b>Wildland / RX Fires</b> | 2.LOCATION<br><br>FRSP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 3.UNIT<br><br>All                |
| JOB HAZARD ANALYSIS (JHA)                                     | 4.NAME OF ANALYST<br>BILL GABBERT                         | 5.JOB TITLE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6.DATE PREPARED<br><br>1/02/2007 |
| 7. TASKS/PROCEDURES                                           | 8. HAZARDS                                                | 9. ABATEMENT ACTIONS<br>ENGINEERING CONTROLS – SUBSTITUTION -<br>ADMINISTRATIVE CONTROLS - PPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                  |
|                                                               |                                                           | <p>extend the suction hose into the water. Set up drafting site in least hazardous area feasible.</p> <p>Use proper lifting techniques when moving pump. Ask for assistance if needed. Always wear PPE, especially eye and ear protection.</p> <p>Wear an ear speaker or stand a distance away from the pump to remain in radio communication with other burn personnel.</p> <p>Monitor the pressure and keep pressure safe, if pressure is too high and difficult to hold onto let go and run out of the way.</p> <p>Always make sure hose is secure and tight and make sure pressure is not so high that hose is at risk of blowing.</p> <p>Always wear hard hats and gloves while handling hoses.</p> <p>When pulling hose, use proper techniques and only lift as much you can handle.</p> <p>Use proper rolling techniques, always lift with bent knees using your legs not your back. If hurt notify your supervisor.</p> <p>Never drink stream, lake or pond water.</p> |                                  |
|                                                               | Emergency Evacuation Procedure                            | <p>On site NPS personnel will be designated as medical responders and shall have first aid equipment to initiate treatment.</p> <p>Notify dispatch to request medical response from responsible medical first responders. Provide type of injury, location, access and number of patients. Refer to Medical Plan in project's IAP.</p> <p>Identify EMT's and available medical equipment on project during briefing / tailgate safety session. Notify supervisor of injury. Complete necessary paperwork.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                  |
|                                                               | Communications                                            | <p>All personnel must have a radio or be within verbal contact range of someone who does.</p> <p>Personnel will use frequencies identified in the communications plan.</p> <p>Movement through heavy brush and vines can cause volume or channel knobs to switch. Check knobs frequently to ensure they are on.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                  |
| 10. SUPERVISOR'S SIGNATURE                                    | 11. TITLE                                                 | 12. DATE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                  |

**H.6. Agency Administrator's Guide to Critical Incident Management is located in the Chief Ranger's Office (CRO)**

## H.7. Current Fire Cache Inventory

### Wilderness Battlefield

| <i>Item</i>    | <i>Quantity</i> |
|----------------|-----------------|
| Brush Axe      | 2               |
| Canteen        | 2               |
| D-Cell Battery | 8               |
| Drip Torch     | 2               |
| Fire Rake      | 2               |
| Gloves (pair)  | 2               |
| Goggle         | 2               |
| Hard Hat       | 2               |
| Headlamp       | 2               |
| McLeod's Rake  | 2               |
| Nomex Shirt    | 2               |
| Pulaski        | 2               |
| Shovel         | 2               |

### Stonewall Jackson Shrine

| <i>Item</i>    | <i>Quantity</i> |
|----------------|-----------------|
| Backpack Pumps | 2               |
| Brush Axe      | 2               |
| Canteen        | 1               |
| Fire Rake      | 2               |
| Gloves (pair)  | 1               |
| Goggle         | 2               |
| Hard Hat       | 2               |
| Headlamp       | 2               |
| McLeod's Rake  | 2               |
| Mop            | 1               |
| Nomex Shirt    | 2               |
| Pulaski        | 2               |
| Shovel         | 1               |
| Water Bottle   | 2               |

### Spotsylvania Battlefield

| <i>Item</i>    | <i>Quantity</i> |
|----------------|-----------------|
| Brush Axe      | 2               |
| Canteen        | 2               |
| D-Cell Battery | 8               |
| Drip Torch     | 2               |
| Fire Rake      | 2               |
| Gloves (pair)  | 1               |
| Goggle         | 2               |
| Hard Hat       | 2               |
| Headlamp       | 2               |
| McLeod's Rake  | 2               |
| Nomex Shirt    | 2               |
| Pulaski        | 2               |
| Shovel         | 1               |
| Water Bottle   | 1               |

### Fredericksburg Battlefield

| <i>Item</i>                              | <i>Quantity</i> |
|------------------------------------------|-----------------|
| Brush Axe                                | 7               |
| Canteen                                  | 1               |
| Chainsaw Helmet<br>(with ear protection) | 1               |
| Fire Rake                                | 13              |
| Goggle                                   | 5               |
| Hoe                                      | 1               |
| Leaf Blower                              | 1               |
| Loppers                                  | 3               |
| McLeod's Rake                            | 5               |
| Mop                                      | 1               |
| Pulaski                                  | 8               |
| Shovel                                   | 4               |
| Spring Rake                              | 3               |

### Chancellorsville Battlefield

| <i>Item</i>              | <i>Quantity</i> |
|--------------------------|-----------------|
| Axe (multi-purpose)      | 1               |
| Bladder Bag              | 3               |
| Bladder Bag (w/o nozzle) | 1               |

|                                          |    |
|------------------------------------------|----|
| Bladder Bag Cover                        | 1  |
| Bow Saw                                  | 1  |
| Brush Axe                                | 4  |
| Brush Blade                              | 1  |
| Chainsaw (Stihl 028 AV Super)            | 1  |
| Chainsaw Helmet<br>(with ear protection) | 1  |
| Chaps                                    | 2  |
| Crowbar (large)                          | 1  |
| Drip Torch                               | 4  |
| Fire Rake                                | 12 |
| Flagging Ribbon (box)                    | 8  |
| Gasoline/Chain Oil Container (5L)        | 1  |
| Hard Hat                                 | 5  |
| Headlamp                                 | 3  |
| Hose (50' 1 1/2")                        | 14 |
| Hose (50' 1")                            | 3  |
| Hose (50' 1 1/2") *Spare                 | 1  |
| Hose (50' 1") *Spare                     | 2  |
| Hose (Adaptaflex multipurpose)           | 1  |
| Leaf Blower                              | 1  |
| Loppers                                  | 1  |
| McLeod's Rake                            | 8  |
| MRE                                      | 25 |
| Pack and web gear                        | 2  |
| Pulaski                                  | 4  |
| Pump Kit (Mark 3 * with fuel container)  | 1  |
| Shovel                                   | 8  |
| Spring Rake                              | 1  |
| Water Bottle                             | 1  |
| Winch Cable                              | 3  |

#### Chancellorsville Fire Cabinets

| <i>Item</i>                | <i>Quantity</i> | <i>Item</i>                       | <i>Quantity</i> |
|----------------------------|-----------------|-----------------------------------|-----------------|
|                            |                 | Sleeping Bag                      | 1               |
| Brush Jacket               | 1               | Sleeping Bag (w/o shell)          | 1               |
| Canteen                    | 1               | Sleeping Mat                      | 1               |
| Eagle Pack Fire Line       | 1               | Tent Bags (red)                   | 3               |
|                            |                 | Tent (Eureka 2-man, 3-<br>season) | 4               |
| Ear Protection (box)       | 1               | Water Bottle                      | 1               |
| Ear Protection (loose bag) | 2               | Water Bottle Case                 | 21              |
| EMT First Aid Kit          | 3               | Webbing (w/o pack)                | 2               |
| ESS Lens                   | 12              | Wedge                             | 2               |
| File Handle (box)          | 2               | Wooden Wedge (box)                | 2               |
| Fire Bag (green)           | 1               | Yellow Bag (Extras)               | 5               |
| Fire Shelter (old)         | 2               |                                   |                 |
| Fire Shelter (w/o case)    | 2               |                                   |                 |
| First Aid Kit (personal)   | 3               |                                   |                 |
| Flagging Tape (blue)       | 5               |                                   |                 |

|                                         |    |
|-----------------------------------------|----|
| Flagging Tape (yellow)                  | 1  |
| Flagging Tape (pink)                    | 1  |
| Fly Tent                                | 2  |
| Goggle                                  | 8  |
| Goggle Retainer                         | 3  |
| Headlamp (old)                          | 10 |
| Headlamp (new)                          | 8  |
| Headlamp Bulbs (bag)                    | 2  |
| Helmet (old)                            | 4  |
| Helmet (red w/chinstrap and suspension) | 4  |
| Helmet Suspension                       | 1  |
| Jumpsuit                                | 1  |
| Leather Work Gloves, pair (S)           | 1  |
| Leather Work Gloves, pair (M)           | 4  |
| Leather Work Gloves, pair (L)           | 5  |
| Leather Work Gloves, pair (XL)          | 8  |
| Lightstick (box)                        | 8  |
| Line Gear (yellow)                      | 3  |
| Metal Wedge (box)                       | 2  |
| Nomex Shirt (S)                         | 10 |
| Nomex Shirt (M)                         | 14 |
| Nomex Shirt (L)                         | 4  |
| Nomex Shirt (XL)                        | 4  |
| Pants (28" waist)                       | 7  |
| Pants (30" waist)                       | 6  |
| Pants (32" waist)                       | 16 |
| Pants (34" waist)                       | 2  |
| Pants (36" waist)                       | 6  |
| Pants (40" waist)                       | 2  |
| Radio Holsters                          | 3  |
| Red Bag                                 | 6  |
| Respirator                              | 2  |
| Shroud                                  | 5  |

**H.8.** Location of procedures for park structure protection inventory and needs are located in the park's Panic Book, located in each park office and residence

**H.9.** Location of procedures for park evacuation and closure are located in the park's Panic Book, located in each park office and residence.

#### **H.10. M.I.S.T. 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.

### **Aircraft**

#### **Helicopters**

- Minimize use.
- Restore helispots.

#### **Retardant Aircraft**

- Retardant drops require Superintendent’s approval.
- Use water drops where practical.
- Minimize number of drops to what is essential for control of the fire.

## **APPENDIX I**

### **Multi-year fuels treatment plan**

#### Tentative 5-year Burn Plan

| <b>Name of Burn Unit</b>         | <b>Fiscal Year</b> | <b>Acreage</b> | <b>Dates</b> | <b>Reason</b>                         | <b>Season</b> |
|----------------------------------|--------------------|----------------|--------------|---------------------------------------|---------------|
| Spotsy Fields                    | 2010               | 130            | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |
| Brygider/Ashley stream<br>bottom | 2010               | 10             | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |
| Spotsy Fields                    | 2011               | 130            | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |
| Spotsy Fields                    | 2012               | 80             | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |
| Brygider/Ashley stream<br>bottom | 2012               | 10             | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |
| Spotsy Fields                    | 2013               | 80             | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |
| Spotsy Fields                    | 2014               | 80             | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |
| Brygider/Ashley stream<br>bottom | 2014               | 10             | Feb-Apr      | Fuels reduction,<br>scene maintenance | Spring        |

## **APPENDIX M**

Notification Procedure and contact list in the event of serious injury or death  
See document located at the Chief Ranger's Office (CRO)

