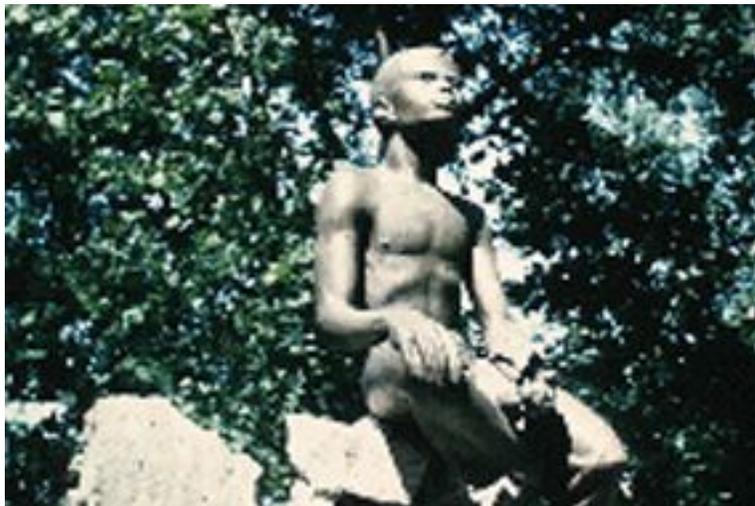


WILDLAND FIRE MANAGEMENT PLAN

George Washington Carver National Monument

May 2004



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EXECUTIVE SUMMARY

Fire management policies of the National Park Service (NPS) support George Washington Carver National Monument'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 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) and appropriate consultation. 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.

| | Page |
|---|-------------|
| Executive Summary | 2 |
| Table of Contents | 3 |
| List of Tables | 3 |
| 1. Historic Weather Averages (Joplin, MO) | 17 |
| 2. Fuel Models by Vegetation Type | 18 |
| 3. Fuel Model, Rate of Spread, and Flame Length | 22 |
| I. Introduction | 8 |
| A. Reasons for Developing Fire Management Plan | 8 |
| B. Collaborative Process In Development | 8 |
| C. Implementation of Federal Fire Management Policy | 8 |
| D. Compliance | 9 |
| E. Authorities for Implementing This Plan | 9 |
| II. Relationship to Land Management Planning and Fire Policy | 10 |
| A. NPS Management Policies Concerning Fire | 10 |
| B. Enabling Legislation and Purpose of Park | 10 |
| C. General Management Plan Goals Pertaining to Fire Management | 10 |
| D. Resource Management Plan/Fire Management Objectives | 11 |
| E. Fire Management and Meeting Park Objectives | 11 |
| III. Wildland Fire Management Strategies | 11 |
| A. General Management Considerations | 11 |
| B. Wildland Fire Management Goals | 12 |
| C. Wildland Fire Options | 12 |

| | |
|--|-----------|
| D. Description of Wildland Fire Management Strategies by Fire Management Unit | 13 |
| IV. Wildland Fire Management Program Components | 20 |
| A. General Implementation Procedures | 20 |
| B. Wildland Fire Suppression | 20 |
| C. Wildland Fire Use | 36 |
| D. Prescribed Fire | 36 |
| E. Non-Fire Fuel Treatment Applications | 42 |
| F. Emergency Rehabilitation and Restoration | 43 |
| V. Organizational and Budgetary Parameters | 44 |
| A. Organizational Structure of Fire Management Program | 44 |
| B. FIREPRO Funding | 48 |
| C. Fire Management Organization | 48 |
| D. Wildland Fire Use Certification | 48 |
| E. Interagency Coordination | 49 |
| F. Interagency Contacts | 49 |
| G. Fire Related Agreements | 49 |
| VI. Monitoring and Evaluation | 49 |
| A. Monitoring Programs | 49 |
| B. NPS Fire Monitoring Handbook | 50 |
| C. Fire Monitoring Plan | 50 |
| VII. Fire Research | 50 |
| A. Previous and Ongoing Research | 50 |
| B. Needed Research | 50 |

| | |
|---|-----------|
| VIII. Public Safety | 50 |
| A. Public Safety Issues and Concerns | 50 |
| B. Mitigating Safety Issues | 51 |
| IX. Public Information and Education | 51 |
| A. Public Information Capabilities and Needs | 51 |
| B. Step Up Public Information Activities | 51 |
| X. Protection of Sensitive Resources | 52 |
| A. Archeological/Cultural/Historic Resources Needing Protection | 52 |
| B. Natural Resources Needing Protection | 52 |
| C. Developments, Infrastructure, and Improvements Needing Protection | 53 |
| XI. Fire Critiques and Annual Plan Review | 53 |
| XII. Consultation and Coordination | 53 |
| XIII. Appendices | 54 |
| A. References Cited | 54 |
| B. Definitions | 56 |
| C. Flora and Fauna Species List | 75 |
| D. Documents (NEPA and NHPA) | 98 |
| E. Supplemental Information | 99 |
| 1. Interagency Fire Agreements | 99 |
| a. Missouri Department of Conservation | 99 |
| b. Carthage Fire Department | 102 |
| c. Diamond Volunteer Fire Department | 105 |

George Washington Carver National Monument
Fire Management Plan

| | |
|--|-----|
| 2. NPS Interpark Fire Agreement | 108 |
| 3. Fire Call-Up List | 113 |
| 4. Preparedness Inventory | 114 |
| 5. Agency and Interagency Contacts | 116 |
| F. Wildland and Prescribed Fire Monitoring Plan | 117 |
| G. Pre-Attack Plan | 118 |
| H. Long-term Prescribed Fire and Hazard Fuel Reduction Plan | 119 |
| 1. Multi-Year Prescribed Fire Schedule | 119 |
| 2. Hazard Fuels Reduction Areas and Schedule | 119 |
| I. Fire Prevention Plan | 120 |
| J. Rental Equipment Agreements | 121 |
| K. Contracts for Suppression and Prescribed Fire Resources | 122 |
| L. Burned Area Emergency Stabilization and Rehabilitation Plan | 123 |
| M. Charts For Determining Appropriate Management Response | 124 |
| N. Wildland Fire Situation Analysis | 126 |
| O. Limited Delegation of Authority | 142 |
| P. Minimum Impact Suppression Tactics Guideline | 144 |
| Q. Step-Up Staffing Plan | 146 |
| R. Historic Fuels Treatment Map | 147 |
| S. Area and Fire Unit Maps | 148 |
| 1. Area Map | 148 |
| 2. Fire Unit Map | 149 |
| T. Park Vegetation Map | 150 |

George Washington Carver National Monument
Fire Management Plan

| | |
|--|-----|
| U. Wildland Fire Implementation Plan, Stage I Form | 151 |
| V. Individual Fire Report (DI 1202) | 153 |

I. INTRODUCTION

A. Reasons for Developing Fire Management Plan

George Washington Carver National Monument is composed of a 210-acre tract of land that was part of the 240-acre farm of Moses Carver. This farm was the birthplace and home of George Washington Carver until he was approximately twelve years old. The park contains the 1881 Moses Carver home, the Carver family cemetery, and tallgrass prairie areas that were farm fields in George Washington Carver's day. There are also documented archaeological sites that include the location of the cabin where George Washington Carver was born, two other homes sites belonging to relatives of Moses Carver, and some small prehistoric lithic scatters.

The National Park Service's Director's Order 18, (December 2003) states that all parks with vegetation capable of sustaining fire must develop a Fire Management Plan (FMP). Approximately ninety percent of the 210 acres of land within the George Washington Carver National Monument are burnable and would benefit from periodic, prescribed fires. Land that can sustain fire is comprised of restored prairie, agricultural fields, lawns, wetlands, and mixed oak forests. In addition, the use of prescribed fire as a resource management tool is expected to meet an important vegetation management objective and act as a tool for controlling or eradicating invasive exotic species.

The park is in the process of reevaluating the existing cultural landscape, and through an upcoming General Management Plan revision, may begin planning to change the management of some areas of the park to a more Carver period agrarian setting. In the event that a new cultural agrarian setting plan is adopted, the Fire Management Plan will be revisited to address changes in vegetation types and fuel loads.

B. Collaborative Process in Development of Fire Management Plan

The General Management Plan, Statement for Management, Resource Management Plan, and the Fire Management Plan are all developed with input from neighboring communities and cooperating agencies, as well as other 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 (1995); (2) Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and

Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDO/USDA) (2000); and (3) A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10 Year Comprehensive Strategy Implementation Plan (2001).

D. Compliance

In compliance with the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) and a Finding of No Significant Impact (FONSI) have been prepared for this Fire Management Plan, and placed in Appendix D.

All of the lands and structures within the park, with the exception of park operation facilities, are listed on the National Register of Historic Places. Proposed prescribed fire plans will be reviewed for compliance with Section 106 of the National Historic Preservation Act.

E. Authorities for Implementing This Plan

The authority for fire management is found in the National Park Service Organic Act (Act of August 25, 1916), which states 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."

Authorities to enter into agreements with other Federal bureaus and agencies; with state, county, and municipal governments; and with private communities, corporations, groups and individuals are cited in Director's Order-20 (Agreements).

The authority for rendering emergency fire or rescue assistance outside of the National Park System is the Act of August 8, 1953 (16USC 1b(1)), and the Department Manual (910 DM).

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

II. RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

A. NPS Management Policies Concerning Fire

It is the policy of the National Park Service to allow natural processes to occur to the extent practical while meeting park management objectives. NPS Management Policies (1988) state "Fire is a powerful phenomenon with the potential to drastically alter the vegetative cover of any Park. Fire may contribute to or hinder the achievement of park objectives. Park fire management programs will be designed around resource management objectives and the various management zones of the park". Specific guidance on wildland fire is contained in Directors Order, DO-18 (2003) and attendant Reference Manual, RM-18 (2004) for the National Park Service, and "The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide" (1998).

B. Enabling Legislation and Purpose of Park

George Washington Carver National Monument was authorized by Congress as a unit of the National Park Service in the Act of July 14, 1943 (57 Stat. 563). The park is listed on The National Register of Historic Places (NRHP.) A general statement of the purpose for the Monument was included in Section 2 of the Act, which states:

The property acquired under the provisions of section 1 of this Act shall constitute the George Washington Carver National Monument and shall be a national memorial to George Washington Carver. The Director of the National Park Service, under the direction of the Secretary of Interior, shall have the supervision, management, and control of such national monument, and shall maintain it and preserve it in a suitable and enduring manner, which in his judgment will provide for the benefit and enjoyment of the people of the United States. (16 U.S.C. sec 450aa-1.

C. General Management Plan Goals Pertaining to Fire Management

The General Management Plan was completed in 1997. The plan's management goals and desired objectives that relate to fire management are as follows:

- Preserve and restore the agrarian setting to the 1860-1870 period.

- Manage cultural and natural resources to memorialize Carver's life in a dignified and inspirational manner.
- Evaluate the human/natural/cultural resources and utilize them to a greater extent.
- Manage the park's resources so they can be used to help interpret how the boyhood farm and surrounding area influenced Carver as an adult.

D. Resources Management Plan/Fire Management Objectives

The Fire Management Plan is subordinate to the Resources Management Plan. It integrates fire management objectives with other resource management programs. The goals of the park's resource management program are as follows:

- To study the park's flora, fauna, and natural systems to provide baseline data;
- To protect natural and cultural resources by identifying and mitigating threats to them; and,
- To restore the natural and cultural resources that are damaged, lacking, or absent due to past operations and activities of humans.

E. Fire Management and Meeting Park Objectives

The FMP - especially the prescribed fire components - provides a detailed action program that is consistent with NPS Management Policy and DO-18 (Wildland Fire Management). The plan will also assist the park in attaining two objectives: reconstructing the rural Missouri environment of Carver's childhood, and creating a visitor understanding.

III WILDLAND FIRE MANAGEMENT STRATEGIES

A. General Management Considerations

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

1. Improve prevention and suppression of wildland fires.

2. Reduce hazardous fuels.
3. Promote community assistance.

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

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 hazards 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 Options

The following is a discussion of available wildland fire options and their use at 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. Resource objectives **will not** be a criterion in the choice of appropriate management response.

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

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

4. Non-Fire Applications: The reduction or removal of fuels by mechanical or chemical methods are options that may be used for objectives such as protection of resources and private property, historic scene restoration and maintenance, invasive species control, or meeting other natural resource objectives. Type of chemical treatments will be addressed at a later date within an integrated pest management plan or resource management plan.

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

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

1. George Washington Carver National Monument Fire Management Unit

George Washington Carver National Monument is comprised of a 210-acre tract of land that was part of the 240 acres farm of Moses Carver. The perimeter of the boundary is 2.5 miles. The park is located in Newton County, Missouri, near the town of Diamond. The site is 13 miles southeast of Joplin and 14 miles northeast of Neosho. Area and park maps are shown in Appendix S.

a. Physical and Biotic Characteristics

1. Topography: The topography of the park is generally low rolling hills with a mean elevation of 1060 feet and a vertical relief of 40 feet.

2. Geology/Soils: A thin layer of soil covers beds of stratified limestone interspersed with layers of boulders and chert, an impure form of flint. These rocks are of marine origin and belong to the Mississippian Series, of Lower Carboniferous age. The park's soils map, extrapolated from the Soil Survey of Newton County, Missouri (1982) can be found Figure 2 of the Resource Management Plan. The map shows the park within the Hoberg-Keeno association, which is

characterized by gentle to moderately sloping, moderately well drained, silty and cherty soils on uplands and terraces.

3. Climate: The park is located in a temperate climate zone with weather conditions ranging from extreme heat and humidity in the summer to cold, icy conditions in the winter.

4. Hydrology: Three small streams (Carver, Harkins and Williams) occur in the park. The latter two flow into Carver Branch, which is a tributary of Shoal Creek. There are two springs (Carver and Williams) in the park that are of historical and natural significance. All of these hydrologic features usually flow on a year round basis. Several areas experience wet conditions throughout much of the year, but none have been classified as wetlands.

5. Threatened and Endangered Species: No federally endangered or threatened species are known to occur in the park. Current listings of these species can be found at the following websites:

<http://www.nature.nps.gov/biology/endangeredspecies/Index.htm>

<http://www.conservation.state.mo.us/nathis/endangered/>

6. Wildlife: For a list of wildlife recorded in the park see Appendix C.

7. Vegetation: For a list of plant species recorded in the park see Appendix C.

8. Fire Effects: Park vegetation is best described by Kuchler Type: *Mosaic of bluestem prairie and oak-hickory forest*. Prairie-forest transition plants are highly adapted to fire. The trees have thick bark and sprout from the root crown after fire injury or top-kill. Fire - perhaps more than any other factor - maintained grasslands and the park-like aspect found in the area. Fire regime is closely related to the extent of gallery forests; their limited extent prior to European settlement has been attributed at least in part to frequent grass fires that prevented establishment of woody vegetation. The effects of fire suppression have become apparent through increase in woody stem density and cool-season exotic grasses.

<http://www.fs.fed.us/database/feis/kuchlers/index.html>

9. Air Quality: The park is classified as a Class II airshed by the Environmental Protection Agency (EPA). Newton County is in attainment for all of the EPA listed nonattainment pollutants. A professional lichen study conducted in 1991 found no significant threats to the park's air quality. Monitoring stations in the nearby four-state area collect data on suspended particles, heavy metals, fine

particles, and pollutants such as sulfur dioxide, nitrogen dioxide, ozone, and carbon dioxide.

10. Cultural Resources: The Park contains many significant cultural and archeological sites. These include prehistoric aboriginal artifacts, as well as numerous sites associated with the Carver family. Significant structures and sites include: the Birthplace Site, Moses Carver House, Carver Family Cemetery, Robert Housely Gilmore Site, and the William Moore Williams Site. The location and additional descriptions of these sites are described in the park Resource Management Plan.

11. Adjacent Landownership: The Park is surrounded by privately owned land that is predominantly rural agricultural in nature.

b. Strategic and Measurable Fire Management Objectives

1. Ensure that wildland and prescribed fire operations sustain no injuries to members of the public or firefighters.
2. 95% of all wildland fires are controlled during initial attack (24 hours or 10 acres).
3. 100% of all prescribed fires are conducted consistent with Federal, State, and local smoke management requirements.
4. Manage suppression actions so that rehabilitation costs are less than 10% of suppression costs.

c. Management Considerations

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

1. No unacceptable impacts to cultural resources or threatened and endangered species are permitted.
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 Role of Fire

The following description of the fire history of the area was taken from *An Ozark Fire History*, by Richard Guyette, Mavis Dey and Dan Dey in 1999:

“The area vegetation has been shaped by humans and wildland fires for thousands of years. Fires caused by natural ignition like lightning consist of 1% of modern day fires. People of the Mississippian culture used fire as a tool to create conditions to benefit farming and hunting. For hundreds, if not thousands of years the most important reason for deliberately setting fires has been to maintain grasslands by preventing the forest from taking over.

French Jesuits, such as Father Vivier, were the first to describe the Missouri landscape. In 1750, he writes, "wherein trees are almost as thinly scattered as in our public promenades. This is partly due to the fact that the savages set fire to the prairies toward the end of autumn, when the grass is dry; the fire spreads everywhere and destroys most of the young trees." Later travelers, including Henry Rowe Schoolcraft, who traveled through the Ozarks in 1819, described a landscape of prairies, oak savannas and oak-pine forests shaped by fire.

Site-specific fire histories developed in parts of the Missouri reveal that human population and culture are closely linked to the frequency and intensity of fire over the last 400 years. Where population density was greater than one person per square mile, fires occurred every one to five years. In more sparsely populated areas fires burned every 10 to 30 years on average.

Before European settlement, widespread fires burned over large portions of the Ozarks. Fire scar data compiled from a number of different sites show that extensive fires occurred in 1728, 1753, 1772, 1777, 1780, 1795, and 1800. Extreme drought combined with fires set during Native American migrations and territorial conflicts set the stage for these conflagrations.

Migrations of tribes pushed westward by Euro-American settlement of the eastern United States coincided with an increase once again in fire frequency between 1780 and 1820. Exponential increases in human population may explain the increase in fire frequency from 1810 to 1850.”

e. Wildland Fire Management Situation

1. Historical Weather Analysis:

The park is located in a temperate climate zone with weather conditions ranging from extreme heat and humidity in the summer to cold, icy conditions during the winter. Annual precipitation averages 38.1 inches. Monthly precipitation averages show two wet periods; one being April through July and the other from September through October with the rest of the months being fairly uniform in amount. June through September is the warmest period while December through February is the coolest. Temperatures can vary from above 100 to below zero. Electrical storms with accompanying strong winds are frequent during the spring through early fall, especially during frontal passages. The park is rated at a National Fire Danger Rating Service (NFDRS) climate class 3.

Table 1 Historic Weather Averages for Joplin Missouri

Joplin, Missouri Elevation: 980 feet Latitude: 37 08N Longitude: 094 29W

| Average High Temperature Years on Record: 14 | | | | | | | | | | | | | |
|---|------|------|------|------|------|-----|------|------|------|------|------|------|------|
| | YEAR | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
| °F | 68 | 44 | 48 | 54 | 68 | 77 | 86 | 90 | 91 | 84 | 72 | 56 | 48 |
| Average Low Temperature Years on Record: 14 | | | | | | | | | | | | | |
| | YEAR | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
| °F | 48 | 26 | 29 | 34 | 47 | 57 | 66 | 69 | 69 | 60 | 50 | 36 | 29 |
| Highest Recorded Temperature Years on Record: 14 | | | | | | | | | | | | | |
| | YEAR | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
| °F | 115 | 77 | 80 | 85 | 91 | 95 | 103 | 115 | 106 | 105 | 94 | 81 | 76 |
| Lowest Recorded Temperature Years on Record: 14 | | | | | | | | | | | | | |
| | YEAR | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
| °F | -8 | -8 | -5 | -5 | 19 | 30 | 48 | 52 | 46 | 36 | 24 | 8 | -1 |
| Average Precipitation Years on Record: 14 | | | | | | | | | | | | | |
| | YEAR | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
| in. | 38.1 | 1.8 | 2.1 | 2.6 | 3.6 | 5 | 4.8 | 5.1 | 2.5 | 3.6 | 3.4 | 1.8 | 1.9 |
| Average Number of Rainy Days Years on Record: 14 | | | | | | | | | | | | | |
| | YEAR | Jan. | Feb. | Mar. | Apr. | May | Jun. | Jul. | Aug. | Sep. | Oct. | Nov. | Dec. |
| Days | 68.1 | 4.2 | 4.9 | 5.7 | 6.5 | 7.2 | 7.6 | 7.9 | 4.9 | 5.8 | 5.5 | 3.4 | 4.5 |

Qwikcast.com

2. Fire Season:

The park experiences two fire seasons: the spring fire season runs from approximately mid-February to the end of April, and the fall season runs from approximately mid-October to the end of November. Precipitation and green-up are the controlling factors that determine 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 early. If drought conditions continue through the spring, the fire season can last through summer and into fall, or until sufficient precipitation has occurred to adequately penetrate both surface and ground fuels.

3. Fuel Type and Characteristics:

Fuels at the park can be divided into three broad categories: Grass, Timber, and Slash. The grass fuel types (short and tall) are primarily located in open fields maintained by mowing and prescribed fire. The remainder of the fire management unit is in forest cover of mixed hardwood.

Table 2 identifies the fuel models by vegetation type. The table also correlates the NFDRS and Fire Behavior Prediction System (FBPS) fuel models.

Table 2. Fuel Models by Vegetation Types

| VEGETATION | NFDRS FUEL MODEL | FIRE BEHAVIOR FUEL MODEL (FBFM) |
|------------------------|------------------|---------------------------------|
| Grasses | L/N | 1/3 |
| Hardwood Forest | E/R | 8/9 |
| Slash | K | 11 |

Deeming, J. & Lancaster, J. & Fosberg, M. & Furman, R. & Schroeder, M. 1972. National Fire Danger Rating System

FBPS Fuel Model 1 is used for short annual or perennial grasses of one foot or less. This represents the pastureland in the park. FBPS fuel model 3 is used for tall grasses averaging 2.5 to 3 feet in height. This fuel model is representative of the prairie in the park.

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. These fuel models characterize most of the forested areas of the park.

The slash fuel model, FBPS 11 is for the vegetation debris disposal that accumulates with such activities as maintenance and site clearing. This fuel model will help to identify the expected fire behavior during debris burns.

4. Fire Regime Alteration:

Although fires have certainly historically occurred in the park there is no record of any occurrence other than prescribed fire actions implemented for prairie restoration.

Fire has not played a major role in shaping the character of the vegetation of the park since the 1930s. Fire exclusion by aggressive fire control policies has allowed forest succession to progress toward the mixed hardwood climax with woody species encroaching onto abandoned fields.

5. Control Problems:

The park is located on gentle sloping ground with some low hills. Farms, individual houses, roads, and other small developments are common throughout the area. While these developments provide frequent breaks in the continuity of fuels and provide good access for suppression resources, they also increase the values at risk and the probability of an ignition.

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

6. Elements Affecting Management:

The wildland urban interface situation is an important consideration for the park even though there are not presently any subdivisions in the immediate vicinity. High visitation and use by school groups and the public to the park's trails and facilities have the potential to be affected by fire management operations and need to be coordinated whenever possible. The park is in an EPA Class II airshed, but with the proximity of neighboring residents and vehicle traffic on roads immediately adjacent to the park boundary, smoke from any fire management operation is a primary concern from the standpoint of safety and health. Protection of the park's cultural resources is of paramount importance. Suppression actions may pose a greater threat to these cultural resources than the actual effects of a fire.

7. Fire History:

There are no records of reported wildland fires occurring within the park, however the Missouri Department of Conservation gives the following five-year average for wildland fire ignitions in Missouri:

| | |
|----------------------|-----|
| Lightning | >1% |
| Camping | 1% |
| Smoking | 4% |
| Debris Burning | 58% |
| Arson | 20% |
| Equipment Use | 3% |
| Railroads | 1% |
| Children | 1% |
| Miscellaneous Causes | 12% |

<http://www.conservation.state.mo.us/forest/fire/stats.htm>

IV WILDLAND FIRE MANAGEMENT PROGRAM COMPONENTS

A. General Implementation Procedures

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

B. Wildland Fire Suppression

1. Range of Potential Fire Behavior:

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

Fire spread in Fire Behavior Fuel Model (FBFM) 1 is governed by the fine, very porous, and continuous herbaceous fuels that have cured or are nearly cured. Surface fires are fires that move rapidly through the cured grass and

associated material. Generally, fires are of moderate intensity with average rates of spread of 50 to 80 chains/hour and flame lengths of 3 to 4 feet.

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

Slow-burning surface fires with low flame lengths are generally the case in FBFM 8 as is evidenced by the one-foot flame lengths and average rate of spread of 1.6 chains/hour.

Fire is supported in the compact litter layer. This fuel model is typical for winter, spring, and summer periods where fuel compaction and moisture content are primary influences. The fuels pose fire hazards under severe weather conditions involving high temperatures, low humidities, and high winds.

In FBFM 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 may cause higher rates of spread than predicted because of spotting from 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 FBFM 11, demonstrates fire behavior that can be active. However, depending on the location of the debris burning area, shading from the overstory, and aging of fine fuels, fire activity may decrease. As fine fuels burn and intensity builds up, and larger fuels start burning, active flaming will occur with the potential of generating firebrands. Care should be taken in windy and/or dry conditions to look for spot fires.

Table 3 illustrates the comparative rates of spread and flame lengths for different fuel models under average conditions (fuel moisture content of 8% and a mid-flame windspeed of 5 miles/hour).

Table 3. Comparative Rates of Spread and Flame Lengths for Fuel Models

| FIRE BEHAVIOR FUEL MODEL | RATE OF SPREAD (Chains/Hour) | FLAME LENGTH (Feet) |
|-------------------------------------|---|--------------------------------|
| 1 | 78 | 4 |
| 3 | 104 | 12 |
| 8 | 1.6 | 1 |
| 9 | 7.5 | 2.6 |
| 11 | 6 | 3.5 |

Andrews, P. 1986. BEHAVE

2. Preparedness Actions

a. Fire Prevention, Community Education, and Assistance Programs

The park will work to cooperate with other agencies to develop and implement an active fire prevention program to protect human life and property, and prevent damage to cultural resources or physical facilities.

A program of public education regarding potential fire danger may be implemented when staffing levels IV or V are reached. Visitor contacts, bulletin board materials, handouts, and interpretive programs will be utilized to increase park visitor and neighbor awareness of fire hazards.

It is essential that park employees be well informed about fire prevention and the objectives of the fire management program. Further, employees must be kept informed about changes in existing conditions throughout the fire season.

Trained employees, such as park interpretative staff, need to relate to the public the beneficial effects of prescribed fires as opposed to unplanned human-caused or natural fires. Information must be included to emphasize the potential severity of human-caused wildland fires and how to prevent them.

During periods of extreme or prolonged fire danger, fire prevention messages will be included in interpretive programs. Emergency restrictions regarding fires or area closures may become necessary. Such restrictions, when imposed, will usually be consistent with those implemented by cooperators.

When prescribed fires are burning in the park, signs at the Visitor Center and 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.

Park staff will work with the Diamond Volunteer Fire Department, Carthage Fire Department, Missouri Department of Conservation, and other agencies with fire management responsibilities to establish common protocols and procedures, identify training needs, cooperate on prevention, 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 departmental personnel engaged in prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG, 310-1). The DOI incident qualification system meets or exceeds all NWCG standards. The park will conform strictly to the requirements of the NPS wildland fire management qualification and certification system.

The Park Fire Coordinator will be responsible for organizing the training required to meet agency requirements for red-carded firefighters. The Park Fire Coordinator will assist the Area FMO by providing a list of red-carded employees to develop needed fire training. When advanced or specialized training is necessary, the Park Fire Coordinator will work through the Area FMO to obtain funding and enrollment. The Area FMO, stationed at Ozark National Scenic Riverways, will coordinate the park's fire training needs with those of other nearby Parks, cooperating agencies, and the region.

The Area FMO will evaluate training needs for park personnel with their input. A priority will be placed on qualifying personnel as Type 1 and 2 firefighter, and Incident Commander Type 4 and 5. The Area FMO will be contacted about needed courses and regional funding for park participation. Park supervisors may be contacted about employee interest in participating in fire suppression.

In addition, during general seasonal orientation, all seasonal personnel should 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 the park. These activities need to be coordinated with the Area FMO.

An annual preparedness activity schedule follows:

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 FMO at Ozark National Scenic Riverways.
- Archive training and experience records of seasonal personnel.

February

- Meetings with cooperators; final review and revision of interagency agreements.
- Review and coordinate emergency dispatch procedures with the Area FMO and the Missouri-Iowa Interagency Dispatch Center in Rolla, Missouri.
- Semi-annual service of any mechanized fire equipment.
- Inventory fire cache and order all necessary fire items to maintain a fully stocked fire cache. Update the inventory list and make sure all equipment is in a fire ready condition.
- Review Step-Up Plan.

George Washington Carver National Monument
Fire Management Plan

- Check established procedure for utilizing suppression and emergency preparedness accounts with the Area FMO.

March:

- Meeting or discussion with Area FMO to review plans and current program.
- Meeting of appropriate park staff to review approved Fire Management Plan revisions and plan prescribed fire activities.
- Pre-season planning completed; all cooperative agreements revised and in effect.
- Issue red cards to qualified permanent personnel.
- Coordinate fire weather program notification with nearby parks.
- Implement Step-Up Plan and adjust level of readiness in response to changing fire danger levels.

February 15 - April 30 (spring fire season)

- Equip park vehicles with fire tools.
- Post fire danger posters as needed.
- Operate all mechanized fire equipment at least twice a month.

May:

- Draft FIREPRO budget request and submit to Area FMO and Region.

June:

- Physical fitness testing for seasonal personnel.
- Issue personal protective equipment to seasonal personnel, if necessary.
- Participate in annual seasonal fire training.

George Washington Carver National Monument
Fire Management Plan

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

July:

- Conduct semi-annual service of all mechanized fire equipment.

September:

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

October 15 - November 30 (fall fire season):

- Review spring activities to ensure that all pertinent pre-season activities are carried out as necessary for fall fire season.

December:

- Critique fire season. Evaluate individual performance of park staff to correct deficiencies and recommend personnel for training as possible.
- Review and revise Fire Management Plan as necessary.
- 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.
- Submit proposals for annual training to Superintendent for review.
- Forward nominations for interagency fire training to the Area FMO and Regional FMO.
- Meeting of appropriate park staff to review season and formulate program changes.
- Forward outstanding fire reports to Area FMO and to Region.

d. Fire Weather and Fire Danger

Weather Station: The closest weather station is operated by the Missouri Department of Conservation in St. Charles MO (Station number 236901; latitude 37:40:01; longitude 093:52:58; elevation 1,235').

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 Q.

e. Step-Up Staffing Plan

The park's step-up plan will be determined from data collected at the Missouri Department of Conservation (MDC) fire weather station located at Springfield. These indices will be forwarded to the MDC office in Neosho where they will be provided, upon request, to the park, the Area FMO, or when the Missouri Department of Conservation deems it appropriate. The BI ranges determining adjective classes for the park can be found in Appendix Q.

The Burning Index (BI) is based on the National Fire Danger Rating System (NFDRS). The BI integrates the effects of weather, fuels, topography, and other factors to estimate potential fire behavior, and the corresponding amount of effort required to contain a fire. The staffing classes relate to the expected severity of fire conditions.

Fire days are broadly divided into four staffing classes by the Missouri Department of Conservation, according to the intensity of danger factors as indicated by the Burning Index (BI).

Each staffing class level has a corresponding set of actions that will be initiated to meet potential fire problems. Staffing Class Low, Moderate, and High level actions are funded by the park while actions taken at the extreme level are supported with emergency funds. The Park Fire Coordinator will obtain these funds from the Area FMO. The Superintendent has the authority to raise or lower the staffing class by one level based on such situations as heavy holiday use, predicted weather, and other unusual factors that may affect the start of a fire.

3. Pre-Attack Plan

No written or formal pre-attack plan exists for the park. Volunteer fire departments each have developed their own protocols and procedures for initial attack of fires within the park boundary. These rural fire departments have received funded training and wildland equipment support through the NPS Rural Fire Assistance (RFA) program.

4. Initial Attack

a. Priority Setting During Multiple Fire Occurrences

In the event of multiple occurrences of wildland fires, the following will be used to set priorities of initial attack:

- Vegetative cover map; any fire with continuous fuels up to and across the monument 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 to assist in determining the appropriate management response are in Appendix M. These charts consider such factors as fire danger, risk, threats, objectives, and time of season, external influences, and complexity.

c. Confinement as a Strategy:

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

d. Response Times:

Response Time for initial attack ground resources is approximately one hour or less depending on proximity, accessibility, and other such variables. Extended attack resources should be able to respond in two to six hours depending on proximity and availability. Aviation resources 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.

e. Restrictions and Special Concerns:

The entire park is listed on the National Register of Historic Places. Excepted structures are the Visitor Center, Maintenance Building, Fire Suppression Pump Building, Comfort Station, Well #2 Building, Discovery Center Trailer, and three Mission 66 Period Housing Structures. These have been determined to be non-contributing elements of the Monument and are not on the National Register of Historic Places. This classification necessitates constraints on the strategies that guide the management of suppression efforts and prescribed fire operations. These constraints include:

- Under no circumstance, except imminent loss of life, will The Carver family cemetery be damaged or altered.
- Archeological resources must be protected. Therefore, dozing, creating firelines, ditching, or other earthwork activities will not take place over known sites, will be evaluated on a case-by-case basis, and must be monitored at all times by an archaeologist. Disturbance of the soil below 5-6 inches in any location is prohibited without the approval of the Superintendent.
- The only mechanized equipment allowed unless otherwise authorized by the Superintendent, will be chainsaws, portable and mobile pumps, backpack blowers, fire engines, all terrain vehicles (ATVs), and devices used for heat or fire detection.

- No retardant will be used without the consent of the Superintendent.
- No new roads will be created.
- Dead or live standing trees will not be cut unless firefighter, public safety, or suppression actions are compromised.
- Operation of vehicles off existing roads will only be allowed in appropriate of soil conditions.
- Human-caused fires will require an investigation and report by law enforcement personnel, preferably trained in wildland fire cause investigation.
- In the event of the threat of life or the potential for extensive property damage, the Superintendent may amend these constraints.

f. Local Issues:

The park depends on local volunteer fire department 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.

Suppression qualification standards of cooperator fire personnel will be accepted at that entity's standards while under that entity's supervision. Cooperators must meet NWCG standards while under NPS supervision. The closest additional force's dispatch concept will be utilized whenever a wildfire escapes initial attack and threatens to exceed the park's capability to control. In some cases it may be necessary to follow jurisdictional boundaries rather than closest forces. During Initial attack personnel will meet their agency standards.

g. Suppression Equipment:

The recommended equipment for fire suppression at the park includes: all necessary personal protective equipment for each qualified person, foam, bladder bags, rakes, leaf blowers, flappers, pumps, hose lays, chain saws, shovels, pulaskis, drip torches, and fuses. Any equipment use that has the potential to disturb soil at a depth greater than 5-6 inches should not be used unless the Park

Ranger (Resource Management) or the Superintendent approves the use of such equipment.

5. Extended Attack and Large Fire Suppression

a. Extended Attack Needs:

Due to the small size of the park and the fuels involved, extended attack is unlikely. However, should this situation arise, extended attack needs will be determined by considering the following:

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

b. Implementation Plan Requirements – Wildland Fire Situation Analysis (WFSA) Development:

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

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

A written copy of a WFSA can be found in Appendix N. An electronic version can be found at the U. S. Forest Service website at:

<http://www.fs.fed.us/fire/wfsa/>.

c. Incident Management Transition:

Transition to an Incident Management Team entails a briefing by the Superintendent and a limited Delegation of Authority for the suppression of the fire(s). The briefing should address agency specific concerns, priorities, firefighter and public safety, economic

and resource concerns, and other topics or issues of importance and relevance to the suppression effort.

d. Delegation of Authority:

A Delegation of Authority from the Superintendent to the Incident Commander is located in Appendix O.

6. Exceeding WIFIP and New Strategy Selection

A Wildland Fire Implementation Plan is a progressively developed assessment and operational management plan that documents the analysis and selection of strategies, and describes the appropriate management response. Resource benefit cannot be a consideration when selecting the most appropriate management action for suppression fires. An example can be found in Appendix M.

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

7. Minimum Impact Suppression Tactics

MIST is not intended to represent a separate or distinct classification of firefighting tactics but rather a mind set - how to suppress a wildfire while minimizing the long-term effects of the suppression action. MIST is the concept of using the minimum tool to safely and effectively accomplish the task. MIST should be considered for application on all fires in all types of land management.

While MIST emphasizes suppressing wildland fire with the least impact to the land, actual fire conditions and good judgment will dictate the actions taken. Consider what is necessary to halt fire spread and containment within the fireline or designated perimeter boundary, while safely managing the incident. Use of MIST **will not** compromise firefighter safety or the effectiveness of suppression efforts. Safety zones and escape routes will be a factor in determining fireline location.

- All fire management activities in the park will rely on tactics that cause 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 P.

8. 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 Park Ranger (Resource Management) will initiate rehabilitation actions. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential damage and hazards caused by the fire:

These actions may include:

- 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.
- Flush cutting of stumps and camouflaging with soil and moss.
- The placement of cut vegetative materials in random positions.
- Positioning felled and bucked material so as to be least noticeable to visitors and camouflage where possible.
- 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.

The Park Fire Coordinator and/or the Area FMO 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 (Regional Fire Ecologist) 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 Fire Management Officer. Submissions over this amount are reviewed at the regional level and forwarded to the NPS Fire Management Program Center for approval.

9. Records and Reports

The Park Fire Coordinator 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.

a. Fires

All fires will be sequentially assigned a fire number by calendar year. The Incident Commander will fill out a DI-1202 (Individual Fire Report) after the fire is declared out. A designated member of the park staff will review all DI-1202's for accuracy and completeness before a copy is mailed to the Area FMO. The original will be kept in the park files.

An Individual Fire Report form will be filed by fire number with each year having a separate folder. A complete park report will include the following attachments if applicable:

- Any written policies, guidelines, or authority statements signed by the Superintendent.
- Copies of equipment purchase or personnel request orders.
- All situation maps.
- Personnel lists (including Individual Fire Fighter Time Reports (OF 288).
- Approved Prescribed Fire Plan.
- Fire Behavior Analyst Report/Post Burn Evaluation.
- Press clippings.

- Accident reports.
- All weather data reports and records.
- Burning permits and air quality clearances for prescribed burns.
- Documentation of all financial charges made against the assigned fire account number.
- Rehabilitation Plan.

b. Daily Situation Report

All wildland fires will be closely monitored. The following information regarding the status of the fire will be relayed to the Area and Regional FMO by 9:30 a.m. daily for entry into the nationwide fire summary report via the Shared Applications Computer System (SACS). The fire coordinator will be responsible for contacting the Regional FMO or Area FMO. Specific applicable information may also need to be provided to the Missouri-Iowa Interagency Dispatch Center in Rolla, Missouri.

- Fire name and start date (only for the first day).
- Present fire behavior.
- Estimate of acreage burned in last 24 hours.
- Direction of spread.
- Rate of Spread.
- Type of fuels on ground.
- Windspeed, temperature, and relative humidity on-site readings.
- Number of personnel and equipment committed to the fire.
- Resources threatened and whether or not actions need to be re-evaluated.
- Document all cultural resources encountered, affected visibility, archaeological, or cultural landscape features.
- Estimated control date.

- Judgment of the ability of local forces to control the fire.
- Anytime BI's reach the 90th percentile and the park moves into Staffing Class IV and V.

c. Individual Training and Experience

Every employee who has had training or fire experience in the past year will complete an Employee Master Record Update Form. This will be minimally done once a year after the fire season. Additional training or experience can be entered into the system at any time. If the training or experience qualifies an individual for additional qualifications, a new red card may be issued. The Park Fire Coordinator will keep the originals and send copies to the Area FMO for entry into the SACS computer. Employees who are not in the computer but wish to participate in the fire program will fill out an initial Employee Master Record Update Form.

C. Wildland Fire Use

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

D. Prescribed Fire

1. Planning and Documentation

a. Annual Activities for Preparation and Implementation of Program

Within the parameters defined in the park's 5-year plan, the Fire Management Coordinator will annually meet to review all proposed prescribed fires burn for that year. The multi-year plan can be found in Appendix H. An assessment of the approved plans will identify need resources, individual responsibilities, and timelines. These activities include writing prescribed fire burn plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

b. Long-Term Prescribed Fire Strategy

The purpose of prescribed fire at the park is to protect and preserve the cultural resources of the park, manage vegetation, and reduce fuel loading. The fuels management program compliments the fire management program by reducing fire hazards, decreasing the potential damage to park resources and adjacent lands, and

minimizing risks to employees, residents, and visitors. Prescribed fire objectives will be designed to:

- Reduce fuel accumulations around developed areas and along the park boundary.
- Reduce understory vegetation.
- Manage vegetation to maintain vistas, promote the growth of native vegetation, and control woody/invasive/exotic vegetation.
- Assist with the establishment and maintenance of the desired cultural scene.

c. Needed Personnel

The park does not have sufficient personnel to manage a prescribed fire. Personnel needed for a specific prescribed fire 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 Ozark National Scenic River, Wilson's Creek National Battlefield, and Buffalo National River. The Area and Regional Fire Management Offices will assist this coordination.

d. 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 the 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 vegetation structure 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.

Fire weather and fire behavior will be monitored on all prescribed fires regardless of size. Fire effects on fuels and vegetation will be monitored on a parkwide basis according to NPS standards outlined in the NPS Fire Monitoring Handbook (FMH), 2002.

All prescribed fires will be monitored regardless of size. The Area Fire Ecologist will establish specific fire information guidelines for each fire to update intelligence about the fire.

The Prescribed Burn Boss will ensure that assigned qualified personnel are used to monitor prescribed fires. The most efficient utilization of personnel for fires of low complexity will be to utilize individuals with diverse experience (ignition, holding and monitoring). An efficient and flexible monitoring program is predicated by selection of the appropriate tactics, assessment of their potential, and the ability to characterize and quantify the resulting effects to determine if the fire is within prescription and is meeting identified resource goals and objectives.

Fire monitoring support will use protocols with adaptations described in the NPS Fire Monitoring Handbook and will be coordinated with the Area Fire Ecologist based at Ozark National Scenic Riverways.

e. Prescribed Fire Project Critique

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

f. Reporting and Documentation Requirements

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

The Park Fire Coordinator will prepare a final report on the prescribed fire for the Chief Park Ranger. Information will include a narrative of the fire operation, a determination of whether objectives were met, description of any resources adversely affected and why, weather and

fire behavior data, map of the burn area, photographs of the burn, number of work hours, and final cost of the burn.

The forms necessary for documenting prescribed fire activities are outlined in RM-18 (Wildland Fire Management). The Individual Fire Report, DI-1202, is the responsibility of the park fire coordinator. The Case Incident Report, 10-343, is the responsibility of the Prescribed Burn Boss, and documents all personnel and equipment costs involved in the burn.

g. Historic Fuel Treatment Map

A historic fuel treatment (prescribed fire and mechanical treatments) map will be developed and located in Appendix R of this plan.

h. Prescribed Fire Plan Requirements

RM 18 differentiates between the requirements for implementing prescribed fire and debris disposal. For further information see RM 18, Chapter 10, sections VI and VII. The requirements for prescribed fires and debris disposal are shown below:

Prescribed Fire:

- Original signed prescribed fire plan.
- Checklist of pre-burn prescribed fire activities.
- All reviewer comments.
- All maps.
- Notification checklist.
- Permits such as burn, smoke, etc.
- Monitoring data.
- Weather forecasts.
- Agency administrator Go/No-Go pre-ignition approval.
- Operational Go/No-Go checklist.
- Incident action plan(s)

- Unit logs, daily validation, or other unit leader documentation.
- Press releases, public comments, and complaints.
- Smoke dispersal information.
- Post fire analysis.
- Individual Fire Report (DI-1202) must be reported in SACS.

Debris Disposal:

- Has virtually no chance to exceed the perimeter of the non-wildland environment.
- Will not damage surrounding natural or cultural resources.
- Does not present a safety threat to crewmembers.
- Will not require curtailment during the burning operation.
- Will not require a prescribed fire burn boss or fire-qualified personnel to implement.
- Requires no follow-up monitoring to evaluate environmental impacts.

2. Exceeding Prescribed Fire Plan

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

3. Air Quality and Smoke Management

a. Air Quality Issues:

The park is located in a Class II air quality area and is in an attainment area for all EPA nonattainment pollutants. Fire

management activities will be in compliance with the Clean Air Act. Missouri does not have a smoke permit requirement at this time. The objectives for smoke management and compliance with the Clean Air Act are similar to those for fire management: to encourage a natural process so long as it does not endanger public health and safety. Smoke levels become unacceptable when they impair visibility to such a degree that they detract from visitor enjoyment of the primary park resource, with emphasis on the vistas of the park. Dense smoke within the park is generally unacceptable, however, it may be tolerated for short periods if the winds ensure 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 Park Ranger and Superintendent.

b. Smoke Mitigation:

The Park will notify the Missouri Department of Conservation, as well as surrounding assisting agencies, at the time of any fire ignition. The Park Fire Coordinator will contact the National Weather Service (NWS), Springfield, MO to verify the smoke management forecast, and consult with the State during the initial fire assessment. Thereafter, smoke characteristics will be evaluated daily along with the NWS smoke management forecast during prescribed fires.

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

- Include a detailed smoke vector map in every prescribed fire plan to identify sensitive areas and expected directional flow of smoke.
- Burning will be conducted only when: visibility exceeds 5 miles or when the fire weather forecast indicates the presence of an unstable airmass, afternoon mixing heights are 500 meters or greater, and ventilation rates (mixing height in

meters X transport wind speed in meters per second) is 2000 or greater.

- Smoke Dispersal: Mixing heights equal to or greater than 500 meters.
- Use backing and flanking fires when possible to minimize particulate emissions.
- Mop-up stumps, snags, and other hot spots to reduce residual smoke.
- Obtain a fire weather forecast from the National Weather Service, Springfield, MO prior to ignition of the prescribed fire.
- Keep media and other public affairs offices informed of fire and smoke dispersal conditions throughout the duration of the project.
- Provide traffic control, and efforts with local police to mitigate traffic hazards from smoke.

E. Non-Fire Fuel Treatment Applications

1. Mechanical Treatments and Other Applications

a. Annual Activities

The Park Fire Management Coordinator will annually consider proposed mechanical and/or chemical fuels treatment projects for the year. Assessments of the approved project plans will identify needed resources, individual responsibilities, and timelines. These activities include writing project plans, scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

b. Equipment and Seasonal Restrictions

The same restrictions apply to mechanical treatments as to prescribed and suppression fires. Off road vehicle or equipment use is prohibited unless the Superintendent determines that there is little or no risk to the cultural resources. This determination may be weather dependent.

c. Required Monitoring

Monitor of mechanical treatments is essential to ensure that treatment objectives are being met and that no unwanted effects are occurring. The

Area Fire Ecologist will recommend the recommended levels of monitoring in the Monitoring Plan (to be developed).

At a minimum, Brown's lines to determine dead and downed fuels should be installed and photo points should be established.

d. Critique Format

The project supervisor will meet with the Park Fire Coordinator and/or the Park Ranger (Resource Management) to critique the project. Accomplishment of objectives, methodology, cost effectiveness, safety issues, and resource damage are some of the topics to be discussed. A written project completion report incorporating the findings of the critique will be forwarded to the Superintendent and the Area FMO.

e. Cost Accounting

Individual project costs will be tracked by the park and the Area FMO and submitted to the Regional Fire Management Office for review. Expenditures should not exceed the authorized project amount. The Park will consult with the MWR FMO in advance if project cost overruns are anticipated.

f. Reporting and Documentation

All project forms will be completed as outlined by the Park Fire Coordinator Boss. A fire monitor will be assigned to collect all predetermined information and complete all necessary forms prior to, during, and after completion of the the project. All records will be archived in the park for future use and reference.

The forms necessary for documenting prescribed fire activities are outlined in NPS-Directors Orders #18 and Reference Manual #18. The Individual Fire Report (DI-1202), the Case Incident Report (10-343), personnel and equipment costs are the responsibility of the Park Fire Coordinator.

g. Annual Planned Project List

Any division chief may submit proposed projects to the Park Fire Coordinator. The Park Fire Coordinator will compile a list of these projects and submit them to the Superintendent for approval and prioritization.

F. Emergency Rehabilitation and Restoration

On January 19, 2001, the Department of the Interior issued new policy on burned area emergency stabilization and rehabilitation. The specifics of the policy can be found in 620 DM 3 [DOI BAER Policy \(2001\)](#). The Park Fire Coordinator and the

Natural Resource Specialist will jointly formulate a rehabilitation plan for each fire. The plans are then forwarded to the Area FMO, then the Regional BAER Coordinator, to request funding.

The Burned Area Emergency Rehabilitation Plan (BAER) will be submitted to the Region BAER Coordinator (Regional Fire Ecologist) for approval within one week of the date the fire is declared controlled. BAER project requests totaling \$300,000 or less can be approved by the Regional BAER Coordinator. Submissions over this amount are reviewed at the regional level and forwarded to the NPS Fire Management Program Center for approval.

V. ORGANIZATIONAL AND BUDGETARY PARAMETERS

A. Organizational Structure of Fire Management Program

Various areas of responsibility for implementation of the fire management program at the park are identified by specific Park position. The Superintendent may assign the Park Fire Coordinator responsibilities as a collateral duty to an individual's position. The purpose of this section is to clearly define areas of responsibility, provide clear direction and accountability, and further the development of a responsive wildland fire management program. See the Inter-Park Agreement (Appendix E.2.), for further clarification.

1. Superintendent

Wildland fire management at the park is the responsibility of the Superintendent, with technical duties and accompanying responsibilities delegated to staff members. The Superintendent will be responsible for management of the program within Departmental and National Park Service policy, Directors Orders #18, Reference Manual # 18, and all relevant laws and regulations.

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

- Approves of the use of mechanized, ground disturbing equipment, as appropriate.

2. Acting Superintendent

The Acting Superintendent is delegated all decision making responsibility when the Superintendent is absent from the park.

3. Park Ranger (Resource Management)

- Responsible for implementation and execution of all aspects of the Fire Management Program except research.
- Responsible for overall coordination, direction, and supervision of fire prevention, preparedness, and suppression.
- Briefs the Superintendent on current and predicted fire management activity.
- Recommends approval of the Fire Management Plan to the Superintendent.
- Ensures that the Delegation of Authority is consistent with park objectives before submitting for signature by the Superintendent.
- Evaluates all plans to ensure resources are not adversely affected or, for cultural resources, cumulative effects do not occur.
- Coordinates fire research efforts, and serves as the primary resource advisor for all fires, both planned and unplanned in conjunction with the Area Fire Ecologist.
- Develops Resource Objectives for prescribed fire in conjunction with the Area Fire Ecologist.

5. Park Fire Coordinator

- Advises and informs the Park Ranger (Resource Management) of all fire activity information.
- Responsible for initial attack coordination with responding Incident Commander and implementation of appropriate suppression response.

George Washington Carver National Monument
Fire Management Plan

- Responsible for the coordination with the Incident Commander to provide oversight of safe suppression of all wildland fire with an unplanned ignition source as well as demobilization and rehabilitation of the burned area. Ensures adequate inventory of equipment and supplies to efficiently implement the fire management program.
- Ensures that both a briefing statement and delegation of authority are prepared for incoming Incident Management Teams.
- In cooperation with the Area FMO, coordinates dispatch of park personnel for fire assignments, or to provide assistance to other Parks and agencies. Requisitions fire crews, fire resources, and supplies for use within the park.
- In cooperation with the Area FMO, prepares, reviews, and revises cooperative agreements with interagency cooperators. Maintains liaison with interagency cooperators through annual meetings to review agreements.
- Maintains technical references, maps, and aerial photos for the fire program.
- 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 Area FMO within 10 days of a fire.
- 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.

6. Chief Park Ranger

- Coordinates and prepares all press releases and public information activities.
- Provides interested staff training necessary to support the fire program.
- Allows staff opportunity to participate in fire activities. Approves staff participation in fire activities.
- Support fire activities by promoting and encouraging the development and issuance of site bulletins and the use of interpretive and educational programs.

- Is the first line supervisor to the Park Fire Coordinator.

7. Area Fire Management Officer

- Responsible for fire management program activities. Prepares and administers the Fire Management Plan and the annual FIREPRO budget. Revises the plan annually and incorporates any necessary changes.
- 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.
- The Area FMO is responsible for providing fire management assistance to the Park.
- Ensures the preparation of individual prescribed fire plans in accordance with DO #18 and RM #18, and submits each prescribed fire plan to the Superintendent for approval.
- Develops the annual prescribed fire program, including writing prescribed fire plans and conducting approved prescribed fires.
- Responsible for providing fire training opportunities to the 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 Regional FMO.
- Responsible for submission of fire situation reports to NPS Branch of Fire Management and the Regional FMO.
- Requests for assistance from the Area FMO will be coordinated through the Superintendent at Ozark National Scenic Riverways. Requests should be made as far in advance as is practical.
- The Area FMO will provide fire management expertise and advice at the planning and implementation levels.
- The Area FMO will help the park arrange for needed resources and equipment, and in preparing FIREPRO funding requests.
- The Area FMO may be requested to serve as the agency representative regarding activities with an incident management team.

8. Area Fire Ecologist

- The Area Fire Ecologist is the Fire Ecologist at Ozark Scenic Riverway. This individual is responsible for providing fire ecology assistance to the park.
- Requests for assistance from the Area Fire Ecologist will be coordinated through the Fire Management Officer at Ozark National Scenic Riverways. Requests should be made as far in advance as is practical.
- Requests for use of the Fire Effects Monitors will be made to the Area Fire Ecologist.
- The Area Fire Ecologist will provide fire ecology expertise and advice at the planning and implementation levels.
- Responsible for Fire Monitoring Plan
- Supervises fire effects crew

B. FIREPRO Funding

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

FIREPRO funds are managed through the Midwest Region Fire Management Office. Requests for FIREPRO funding are made from the park to the Regional Fire Management Office through the Area Fire Management Office.

C. Fire Management Organization in Relation to Park Structure

Although the Natural and Cultural Resources Division has overall responsibility for the fire management program, successful implementation requires the cooperative effort of all divisions. The Park Fire Coordinator or the Park Ranger (Resource Management) will make any necessary arrangements to secure the use of other divisions' fire qualified personnel. The appropriate Division Chief or Superintendent must approve this request for assistance. Park staff will provide resource advisors for assignment to fires within the park during suppression operations, and conduct post-fire research projects as necessary to assess fire effects. Resource advisors may be from Cultural Resources (archeology, cultural site location, etc.), Natural Resources (fire effects, suppression techniques, GIS, etc.), and Maintenance (equipment availability, utilities, etc.).

D. Wildland Fire Use Certification

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

E. Interagency Coordination

An agreement has been signed with the Missouri Department of Conservation for the purposes of fire management. See Appendix E for a copy of the MOU.

Separate agreements have been signed with the Diamond Volunteer Fire Department and the Carthage Fire Department for the purposes of fire management, fire suppression, and fire training. These agreements can be found in Appendix E. Contacts with these agencies should be made at least annually to discuss the aspects of these agreements and the park's fire management program.

F. Interagency Contacts

See Appendix E

G. Fire Related Agreements

Agreements with Missouri Department of Conservation, Carthage Fire Department and Diamond Volunteer Fire Department can be found in Appendix E. An Interpark Agreement can also be found in Appendix E.

VI. MONITORING AND EVALUATION

A. Monitoring Programs

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

The park will work closely with the Area Fire Ecologist and the Fire Effects Monitors located at Ozark National Scenic Riverways. The Area Fire Ecologist should be consulted concerning possible future prescribed fire plans with regard to potential fire effects and desired conditions. The Fire Effects Monitors assist the park in establishing and reading vegetation plots.

B. NPS Fire Monitoring Handbook

The Fire Monitoring Handbook will serve as the source document providing monitoring guidance.

C. Fire Monitoring Plan

A Fire Monitoring Plan is under development at this time and can be found in Appendix F upon completion.

VII. FIRE RESEARCH

A. Previous and Ongoing Research

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

B. Needed Research

As the park's Fire Management Plan is implemented and tested, additional research will inevitably be identified for such purposes as refining prescriptions, improving the understanding of fire behavior and fire effects, refining monitoring protocols, defining desired future vegetation conditions, fire return cycles, describing the impacts on cultural resources, and other information needed for operational fire and resource management. Funding for fire research is available thru FIREPRO. The Area Fire Ecologist will coordinate fire research.

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 the park (including roads and trails) when wildland fire or a prescribed fire poses an imminent threat to public safety. The Superintendent may close the park or areas of the park due to high fire danger.

B. Mitigating Safety Procedures

The park will notify visitors of all fire activity through existing 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 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. Educational opportunities will be developed to reach as many segments of the public as possible. This may include special interest groups, schools, public organizations, and other groups. Materials and programs exist that will help deliver information concerning the role fire plays in preserving and protecting the cultural and natural resources of the park.

The Ozark 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 the park. The Chief Park Ranger will coordinate all public information activities and 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 distributed to all visitors entering areas of fire activity.
- The fire management program will be incorporated into visitor contacts, interpretive talks, walks, and tour programs. 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, 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 the park's 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.

X. PROTECTION OF SENSITIVE RESOURCES

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

The park has valuable archeological, cultural, and historic resources including prehistoric use of the area. The potential exists for significant resources to be uncovered during fire activities that disturb the mineral soils of the park. Therefore, fire management activities entailing soil disturbance activities will be closely coordinated and monitored.

Consultation with the State Historic Preservation Office (SHPO) must be considered if any potential exists to cumulatively or adversely affect any cultural resources and all effects must be evaluated on a case-by-case basis.

B. Natural Resources Needing Protection and/or Treatment

Other than migratory bald eagles and other nesting birds, there are no known natural resources needing special protection or treatment. Prescribed fire will be used as a vegetation management treatment tool.

Additional protective measures must be considered as new information emerges from the I&M and Vital Signs programs.

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

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

XI. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

Fire reviews will be conducted in accordance with Directors Orders #18 and Reference Manual #18. Each review will be documented and filed with the final fire report. The Park Fire Coordinator will retain a copy for the park's files.

The Area FMO will be responsible for completing an annual fire summary report. The report will contain the number of fires by type, acres burned by fuel type, cost summary, personnel utilized, and fire effects.

The Area FMO and park staff will review the Fire Management Plan annually for currency and incorporate changes into the appendix. The Fire Management Plan is subject to formal review every five years.

The Incident Commander or the Prescribed Burn Boss will initially critique wildland and prescribed fires. This critique should take place with those directly involved in the management of the fire.

The Fire Management Coordinator 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 Area Fire Management Office.

Prescribed or wildland fires involving an Incident Management Team, or fires involving significant political, safety, or public issues should be reviewed by the Regional Fire Management Office. If a fire generates a major political or public concern, and/or involves multiple serious injuries or a fatality, the NPS Fire Management Program Center should conduct or participate in the review.

XII. CONSULTATION AND COORDINATION

The Park Fire Coordinator and Chief Park Ranger are responsible for coordination and consultation with cooperators regarding fire management activities. Activities include involvement with county fire departments, state forestry and air quality board, nearby federal parks and forests, and the National Weather Service.

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

Elizabeth Anderson, Wildland Fire Associates, Denver, Colorado

Scott Bentley, Superintendent, George Washington Carver National Monument, Diamond, Missouri

Bill Bloodworth, Area Fire Management Officer, Ozark National Scenic Riverways, Van Buren, Missouri

Harry Hansen, Chief of Maintenance, George Washington Carver National Monument Diamond, Missouri

Lana Henry, Chief Park Ranger, George Washington Carver National Monument Diamond, Missouri

Rob Klein, Area Fire Ecologist, Ozark National Scenic Riverways, Van Buren, Missouri

Dena Matteson, Park Ranger (Resource Management), George Washington Carver National Monument, Diamond, Missouri

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

Roger Schmidt, Missouri Department of Conservation, Neosho, Missouri

Angela Smith, Area Fire Education /Education Specialist, Ozark National Scenic Riverways, Van Buren, Missouri

Gary Smith, District Forester, Missouri Department of Conservation, Neosho, Missouri

XIII. APPENDICES

A. References Cited:

Andrews, P. 1986. **BEHAVE: Fire Behavior Prediction and Fuel Modeling System- BURN Subsystem, Part 1.** USDA For. Ser. Gen. Tech. Rep. INT-194.

Castillon, 1983. **A Soil Survey of George Washington Carver National Monument.**

Deeming, J. & Lancaster, J. & Fosberg, M. & Furman, R. & Schroeder, M. 1972. **National Fire Danger Rating System**. USDA For. Ser. Res. Pap. RM-84.

Guyette, Richard & Dey, Mavis & Dey, Dan 1999. **An Ozark Fire History**.
<http://www.conservaion.state.mo.us/conmag/1999/03/1.html>

Managing the Impacts of Wildfires on Communities and the Environment – a Report to the President, August 2000.
<http://www.fireplan.gov/reports/7-19-en.pdf>

National Fire Plan, **A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment-10 Year Comprehensive Strategy**.
http://www.nifc.gov/fire_policy/index.htm

Qwikcast.com, *Weather Records and Averages*
[Qwikcast.com - the weather in a minute!](http://www.qwikcast.com)

Review and Update of the 1995 Federal Wildland Fire Management Policy, January 2001.
http://www.nifc.gov/fire_policy/index.htm

USDA, Forest Service. 2002. Rocky Mountain Research Station, Fire Sciences Laboratory. **Fire Effects Information System**. Internet address:
<http://www.fs.fed.us/database/feis/index.html>

USDI, National Park Service. 2003. **Director's Order 18 - Wildland Fire Management**.

USDI/USDA, 1995. **Final Report: Federal Wildland Fire Management Policy and Program**.

USDI, National Park Service. 2002. **Fire Monitoring Handbook**.

USDI, National Park Service. 2004. **Reference Manual 18 - Wildland Fire Management**.

Zimmerman, G. & Bunnell, D.1998. **Wildland and Prescribed Management Policy – Implementation Procedures Reference Guide**. National Interagency Fire Center. Boise, Idaho.

B. Definitions
National Fire Plan

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 firestorm. (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 comparatively high surface area-to-volume ratios, 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 Perimeter: The entire outer edge or boundary of a fire.

Fire Season: 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

Fire Shelter: An aluminized tent offering protection by means of reflecting radiant heat and providing a volume of breathable air in a fire entrapment situation. Fire shelters should only be used in life-threatening situations, as a last resort.

Fire Shelter Deployment: The removing of a fire shelter from its case and using it as protection against fire.

Fire Storm: Violent convection caused by a large continuous area of intense fire. Often characterized by destructively violent surface indrafts, near and beyond the perimeter, and sometimes by tornado-like whirls.

Fire Triangle: Instructional aid in which the sides of a triangle are used to represent the three factors (oxygen, heat, fuel) necessary for combustion and flame production; removal of any of the three factors causes flame production to cease.

Fire Use Module (Prescribed Fire Module): A team of skilled and mobile personnel dedicated primarily to prescribed fire management. These are national and interagency resources, available throughout the prescribed fire season, that can ignite, hold, and monitor prescribed fires.

Fire Weather: Weather conditions that influence fire ignition, behavior, and suppression.

Fire Weather Watch: A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

Fire Whirl: Spinning vortex column of ascending hot air and gases rising from a fire and carrying aloft smoke, debris, and flame. Fire whirls range in size from less than one foot to more than 500 feet in diameter. Large fire whirls have the intensity of a small tornado.

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

Flame Height: The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

Flame Length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

Flaming Front: The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

Flanks of a Fire: The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

Flare-up: Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

Flash Fuels: Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash that ignite readily and are consumed rapidly when dry. Also called fine fuels.

Forb: A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

Fuel: Combustible material. Includes vegetation, such as grass, leaves, ground litter, plants, shrubs and trees that feed a fire. (See Surface Fuels.)

Fuel Bed: An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

Fuel Loading: The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

Fuel Model: Simulated fuel complex (or combination of vegetation types) for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Fuel Moisture (Fuel Moisture Content): The quantity of moisture in fuel expressed as a percentage of the weight when thoroughly dried at 212 degrees Fahrenheit.

Fuel Reduction: Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

Fuel Type: An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

Fusee: A colored flare designed as a railway-warning device and widely used to ignite suppression and prescription fires.

G

General Staff: The group of incident management personnel reporting to the incident commander. They may each have a deputy, as needed. Staff consists of operations section chief, planning section chief, logistics section chief, and finance/administration section chief.

Geographic Area: A political boundary designated by the wildland fire protection agencies, where these agencies work together in coordination and effective utilization

Ground Fuel: All combustible materials below the surface litter, including duff, tree or shrub roots, punchy wood, peat, and sawdust that normally support a glowing combustion without flame.

H

Haines Index: An atmospheric index used to indicate the potential for wildfire growth by measuring the stability and dryness of the air over a fire.

Hand Line: A fireline built with hand tools.

Hazard Reduction: Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

Head 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 comparatively high surface area-to-volume ratios, 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, and 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, grass, 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 Implementation Plan (WFIP): A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative suppression strategies against selected environmental, social, political, and economic criteria. Provides a record of decisions.

Wildland Fire Use: The management of naturally ignited wildland fires to accomplish specific 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.

C. Flora and Fauna Species List

| 0 Amphibian Records for George Washington Carver NM | | | |
|---|--|----------------------|------------------------|
| Scientific Name | Common Name | Presence | Residence Status |
| 144 Bird Records for George Washington Carver NM | | | |
| Scientific Name | Common Name | Presence | Residence Status |
| Podilymbus podiceps | Pied-billed Grebe | present | non-reproducing |
| Pelecanus erythrorhynchos | American White Pelican | anomalous/accidental | non-reproducing |
| Phalacrocorax auritus | Double-crested Cormorant | present | non-reproducing |
| Ardea herodias | Great Blue Heron | present | reproducing population |
| Butorides striatus | Green-backed Heron | present | non-reproducing |
| Aix sponsa | Wood Duck | present | non-reproducing |
| Anas acuta | Northern Pintail | present | non-reproducing |
| Anas clypeata | Northern Shoveler | present | non-reproducing |
| Anas crecca | Green-winged Teal | present | non-reproducing |
| Anas discors | Blue-winged Teal | present | non-reproducing |
| Anas platyrhynchos | Mallard | present | non-reproducing |
| Branta canadensis | Canada Goose | present | non-reproducing |
| Cathartes aura | Turkey Vulture | present | non-reproducing |
| Accipiter cooperii | Cooper's Hawk | present | non-reproducing |
| Accipiter striatus | Sharp-shinned Hawk | present | non-reproducing |
| Buteo jamaicensis | Red-tailed Hawk | present | non-reproducing |
| Buteo lagopus | Rough-legged Hawk | present | non-reproducing |
| Buteo swainsoni | Swainson's Hawk | present | non-reproducing |
| Circus cyaneus | Northern Harrier | present | non-reproducing |
| Falco sparverius | American Kestrel | present | non-reproducing |
| Phasianus colchicus | Ring-necked Pheasant | anomalous/accidental | non-reproducing |
| Colinus virginianus | Northern Bobwhite | present | reproducing population |
| Charadrius vociferus | Killdeer | present | non-reproducing |
| Gallinago gallinago | Common Snipe | present | non-reproducing |
| Tringa flavipes | Lesser Yellowlegs | present | non-reproducing |
| Tringa melanoleuca | Greater Yellowlegs | present | non-reproducing |
| Columba livia | Rock Dove | present | non-reproducing |
| Zenaida macroura | Mourning Dove | present | non-reproducing |
| Coccyzus americanus | Yellow-billed Cuckoo | present | non-reproducing |
| Coccyzus erythrophthalmus | Black-billed Cuckoo | present | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|----------------------------|---|---------|------------------------|
| Asio flammeus | Short-eared Owl | present | non-reproducing |
| Bubo virginianus | Great Horned Owl | present | non-reproducing |
| Strix varia | Barred Owl | present | non-reproducing |
| Chordeiles minor | Common Nighthawk | present | non-reproducing |
| Chaetura pelagica | Chimney Swift | present | non-reproducing |
| Archilochus colubris | Ruby-throated Hummingbird | present | non-reproducing |
| Ceryle alcyon | Belted Kingfisher | present | non-reproducing |
| Colaptes auratus | Northern Flicker | present | non-reproducing |
| Dryocopus pileatus | Pileated Woodpecker | present | non-reproducing |
| Melanerpes carolinus | Red-bellied Woodpecker | present | non-reproducing |
| Melanerpes erythrocephalus | Red-headed Woodpecker | present | non-reproducing |
| Picoides pubescens | Downy Woodpecker | present | reproducing population |
| Picoides villosus | Hairy Woodpecker | present | non-reproducing |
| Sphyrapicus varius | Yellow-bellied Sapsucker | present | non-reproducing |
| Contopus virens | Eastern Wood-Pewee | present | non-reproducing |
| Empidonax flaviventris | Yellow-bellied Flycatcher | present | non-reproducing |
| Empidonax traillii | Willow Flycatcher | present | non-reproducing |
| Empidonax virescens | Acadian Flycatcher | present | non-reproducing |
| Sayornis phoebe | Eastern Phoebe | present | non-reproducing |
| Myiarchus crinitus | Great Crested Flycatcher | present | non-reproducing |
| Tyrannus forficatus | Scissor-tailed Flycatcher | present | non-reproducing |
| Tyrannus tyrannus | Eastern Kingbird | present | non-reproducing |
| Eremophila alpestris | Horned Lark | present | non-reproducing |
| Hirundo pyrrhonota | Cliff Swallow | present | non-reproducing |
| Hirundo rustica | Barn Swallow | present | non-reproducing |
| Stelgidopteryx serripennis | Northern Rough-winged Swallow | present | non-reproducing |
| Corvus brachyrhynchos | American Crow | present | reproducing population |
| Cyanocitta cristata | Blue Jay | present | reproducing population |
| Parus atricapillus | Black-capped Chickadee | present | non-reproducing |
| Parus bicolor | Tufted Titmouse | present | reproducing population |
| Parus carolinensis | Carolina Chickadee | present | reproducing population |
| Sitta carolinensis | White-breasted Nuthatch | present | non-reproducing |
| Certhia americana | Brown Creeper | present | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|--------------------------|--|---------|------------------------|
| Thryomanes bewickii | Bewick's Wren | present | non-reproducing |
| Thryothorus ludovicianus | Carolina Wren | present | non-reproducing |
| Troglodytes aedon | House Wren | present | non-reproducing |
| Troglodytes troglodytes | Winter Wren | present | non-reproducing |
| Polioptila caerulea | Blue-gray Gnatcatcher | present | non-reproducing |
| Regulus calendula | Ruby-crowned Kinglet | present | non-reproducing |
| Regulus satrapa | Golden-crowned Kinglet | present | non-reproducing |
| Catharus fuscescens | Veery | present | non-reproducing |
| Catharus minimus | Gray-cheeked Thrush | present | non-reproducing |
| Catharus ustulatus | Swainson's Thrush | present | non-reproducing |
| Hylocichla mustelina | Wood Thrush | present | non-reproducing |
| Sialia sialis | Eastern Bluebird | present | reproducing population |
| Turdus migratorius | American Robin | present | non-reproducing |
| Dumetella carolinensis | Gray Catbird | present | non-reproducing |
| Mimus polyglottos | Northern Mockingbird | present | reproducing population |
| Toxostoma rufum | Brown Thrasher | present | non-reproducing |
| Bombycilla cedrorum | Cedar Waxwing | present | non-reproducing |
| Lanius ludovicianus | Loggerhead Shrike | present | non-reproducing |
| Sturnus vulgaris | European Starling | present | non-reproducing |
| Vireo bellii | Bell's Vireo | present | non-reproducing |
| Vireo flavifrons | Yellow-throated Vireo | present | non-reproducing |
| Vireo gilvus | Warbling Vireo | present | non-reproducing |
| Vireo griseus | White-eyed Vireo | present | non-reproducing |
| Vireo olivaceus | Red-eyed Vireo | present | non-reproducing |
| Dendroica cerulea | Cerulean Warbler | present | non-reproducing |
| Dendroica coronata | Yellow-rumped Warbler | present | non-reproducing |
| Dendroica discolor | Prairie Warbler | present | non-reproducing |
| Dendroica palmarum | Palm Warbler | present | non-reproducing |
| Dendroica petechia | Yellow Warbler | present | non-reproducing |
| Dendroica pinus | Pine Warbler | present | non-reproducing |
| Dendroica striata | Blackpoll Warbler | present | non-reproducing |
| Dendroica virens | Black-throated Green Warbler | present | non-reproducing |
| Geothlypis trichas | Common Yellowthroat | present | non-reproducing |
| Helmitheros vermivorus | Worm-eating Warbler | present | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|---------------------------|---|---------|------------------------|
| Mniotilta varia | Black-and-white Warbler | present | non-reproducing |
| Oporornis agilis | Connecticut Warbler | present | non-reproducing |
| Oporornis formosus | Kentucky Warbler | present | non-reproducing |
| Parula americana | Northern Parula | present | non-reproducing |
| Protonotaria citrea | Prothonotary Warbler | present | non-reproducing |
| Seiurus aurocapillus | Ovenbird | present | non-reproducing |
| Seiurus motacilla | Louisiana Waterthrush | present | non-reproducing |
| Setophaga ruticilla | American Redstart | present | non-reproducing |
| Vermivora ruficapilla | Nashville Warbler | present | non-reproducing |
| Wilsonia canadensis | Canada Warbler | present | non-reproducing |
| Wilsonia pusilla | Wilson's Warbler | present | non-reproducing |
| Piranga olivacea | Scarlet Tanager | present | non-reproducing |
| Cardinalis cardinalis | Northern Cardinal | present | reproducing population |
| Guiraca caerulea | Blue Grosbeak | present | non-reproducing |
| Passerina cyanea | Indigo Bunting | present | non-reproducing |
| Pheucticus ludovicianus | Rose-breasted Grosbeak | present | non-reproducing |
| Spiza americana | Dickcissel | present | non-reproducing |
| Ammodramus henslowii | Henslow's Sparrow | present | non-reproducing |
| Ammodramus savannarum | Grasshopper Sparrow | present | non-reproducing |
| Chondestes grammacus | Lark Sparrow | present | non-reproducing |
| Junco hyemalis | Dark-eyed Junco | present | non-reproducing |
| Melospiza georgiana | Swamp Sparrow | present | non-reproducing |
| Melospiza lincolni | Lincoln's Sparrow | present | non-reproducing |
| Melospiza melodia | Song Sparrow | present | non-reproducing |
| Passerculus sandwichensis | Savannah Sparrow | present | non-reproducing |
| Passerella iliaca | Fox Sparrow | present | non-reproducing |
| Pipilo erythrophthalmus | Rufous-sided Towhee | present | non-reproducing |
| Poocetes gramineus | Vesper Sparrow | present | non-reproducing |
| Spizella arborea | American Tree Sparrow | present | non-reproducing |
| Spizella pallida | Clay-colored Sparrow | present | non-reproducing |
| Spizella passerina | Chipping Sparrow | present | non-reproducing |
| Spizella pusilla | Field Sparrow | present | non-reproducing |
| Zonotrichia albicollis | White-throated Sparrow | present | non-reproducing |
| Zonotrichia leucophrys | White-crowned Sparrow | present | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|----------------------|--------------------------------------|---------|------------------------|
| Zonotrichia querula | Harris' Sparrow | present | non-reproducing |
| Agelaius phoeniceus | Red-winged Blackbird | present | non-reproducing |
| Euphagus carolinus | Rusty Blackbird | present | non-reproducing |
| Icterus galbula | Northern Oriole | present | non-reproducing |
| Icterus spurius | Orchard Oriole | present | non-reproducing |
| Molothrus ater | Brown-headed Cowbird | present | non-reproducing |
| Quiscalus quiscula | Common Grackle | present | non-reproducing |
| Sturnella magna | Eastern Meadowlark | present | reproducing population |
| Sturnella neglecta | Western Meadowlark | present | non-reproducing |
| Carduelis pinus | Pine Siskin | present | non-reproducing |
| Carduelis tristis | American Goldfinch | present | reproducing population |
| Carpodacus purpureus | Purple Finch | present | non-reproducing |
| Passer domesticus | House Sparrow | present | reproducing population |

17 Fish Records for George Washington Carver NM

| Scientific Name | Common Name | Presence | Residence Status |
|-------------------------|--|----------|------------------------|
| Campostoma anomalum | central stoneroller | present | reproducing population |
| Ctenopharyngodon idella | grass carp | present | reproducing population |
| Notropis nubilus | Ozark minnow | present | reproducing population |
| Phoxinus erythrogaster | southern redbelly dace | present | reproducing population |
| Pimephales notatus | bluntnose minnow | present | reproducing population |
| Pimephales promelas | fathead minnow | present | reproducing population |
| Semotilus atromaculatus | creek chub | present | reproducing population |
| Ameiurus natalis | yellow bullhead | present | reproducing population |
| Oncorhynchus mykiss | rainbow trout | present | reproducing population |
| Gambusia affinis | western mosquitofish | present | reproducing population |
| Cottus carolinae | banded sculpin | present | reproducing population |
| Lepomis cyanellus | green sunfish | present | reproducing population |
| Lepomis humilis | orangespotted sunfish | present | non-reproducing |
| Lepomis macrochirus | bluegill | present | reproducing population |
| Micropterus dolomieu | smallmouth bass | present | reproducing population |
| Micropterus salmoides | largemouth bass | present | reproducing population |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|-----------------------|-------------------------------------|---------|------------------------|
| Etheostoma spectabile | orangethroat darter | present | reproducing population |
|-----------------------|-------------------------------------|---------|------------------------|

| 17 Mammal Records for George Washington Carver NM | | | |
|---|---------------------------------------|----------|------------------------|
| Scientific Name | Common Name | Presence | Residence Status |
| Didelphis virginiana | Virginia opossum | present | reproducing population |
| Cryptotis parva | Least shrew | present | reproducing population |
| Canis familiaris | Domestic dog | other | reproducing population |
| Canis latrans | Coyote | present | reproducing population |
| Vulpes vulpes | Red fox | present | reproducing population |
| Procyon lotor | Raccoon | present | reproducing population |
| Felis silvestris | House cat | other | reproducing population |
| Equus caballus | Horse | other | non-reproducing |
| Odocoileus virginianus | White-tailed deer | present | reproducing population |
| Marmota monax | Woodchuck | present | reproducing population |
| Peromyscus leucopus | White-footed mouse | present | reproducing population |
| Peromyscus maniculatus | Deer mouse | present | reproducing population |
| Reithrodontomys fulvescens | Fulvous harvest mouse | present | reproducing population |
| Sigmodon hispidus | Hispid cotton rat | present | reproducing population |
| Microtus ochrogaster | Prairie vole | present | reproducing population |
| Mus musculus | House mouse | present | reproducing population |
| Sylvilagus floridanus | Eastern cottontail | present | reproducing population |

| 11 Reptile Records for George Washington Carver NM | | | |
|--|---|-------------------|------------------------|
| Scientific Name | Common Name | Presence | Residence Status |
| Chelydra serpentina | Snapping turtle | present | reproducing population |
| Graptemys geographica | Common map turtle | present | reproducing population |
| Terrapene carolina | Eastern box turtle | present | reproducing population |
| Trionyx muticus | Smooth softshell | present | reproducing population |
| Eumeces anthracinus | Coal skink | present | reproducing population |
| Eumeces fasciatus | Five-lined skink | present | reproducing population |
| Eumeces laticeps | Broad-headed skink | present | reproducing population |
| Eumeces tetragrammus | Four-lined skink | unreliable record | reproducing population |
| Elaphe obsoleta | Rat snake | present | reproducing population |
| Nerodia rhombifer | Diamondback water snake | present | reproducing population |
| Pituophis melanoleucus | Pine snake | present | reproducing population |
| Thamnophis sirtalis | Common garter snake | present | reproducing population |

| 607 Plant Records for George Washington Carver NM | | | |
|---|-------------|----------|------------------|
| Scientific Name | Common Name | Presence | Residence Status |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|-------------------------------------|---|-----|------------------------|
| Asplenium platyneuron | Ebony spleenwort | N/A | non-reproducing |
| Woodsia obtusa | Bluntlobe cliff fern | N/A | non-reproducing |
| Juniperus virginiana | Eastern redcedar | N/A | non-reproducing |
| Alisma subcordatum | American water plantain | N/A | reproducing population |
| Sagittaria latifolia | Broadleaf arrowhead | N/A | reproducing population |
| Zannichellia palustris | Horned pondweed | N/A | non-reproducing |
| Potamogeton crispus | Curly pondweed | N/A | non-reproducing |
| Potamogeton foliosus | Leafy pondweed | N/A | non-reproducing |
| Najas guadalupensis | Southern waternymph | N/A | reproducing population |
| Arisaema dracontium | Greendragon | N/A | non-reproducing |
| Arisaema triphyllum | Jack in the pulpit | N/A | reproducing population |
| Lemna minor | Common duckweed | N/A | reproducing population |
| Commelina caroliniana | Carolina dayflower | N/A | reproducing population |
| Commelina communis | Asiatic dayflower | N/A | reproducing population |
| Commelina erecta | Whitemouth dayflower | N/A | non-reproducing |
| Tradescantia ernestiana | Ernest's spiderwort | N/A | reproducing population |
| Tradescantia ohiensis | Bluejacket | N/A | reproducing population |
| Agropyron repens | Quackgrass | N/A | non-reproducing |
| Agrostis eliottiana | Elliott's bentgrass | N/A | reproducing population |
| Agrostis hyemalis | Winter bentgrass | N/A | reproducing population |
| Agrostis perennans | Upland bentgrass | N/A | reproducing population |
| Agrostis stolonifera | Creeping bentgrass | N/A | non-reproducing |
| Alopecurus carolinianus | Carolina foxtail | N/A | non-reproducing |
| Andropogon gerardii | Big bluestem | N/A | reproducing population |
| Andropogon gerardii var. paucipilus | Sand bluestem | N/A | non-reproducing |
| Andropogon virginicus | Broomsedge bluestem | N/A | reproducing population |
| Aristida oligantha | Prairie threeawn | N/A | reproducing population |
| Avena sativa | Common oat | N/A | non-reproducing |
| Bouteloua curtipendula | Sideoats grama | N/A | reproducing population |
| Bromus arvensis | Field brome | N/A | non-reproducing |
| Bromus japonicus | Japanese brome | N/A | reproducing population |
| Bromus purgans | Arctic brome | N/A | reproducing population |
| Bromus racemosus | Bald brome | N/A | non-reproducing |
| Bromus secalinus | Rye brome | N/A | non-reproducing |
| Bromus sterilis | Poverty brome | N/A | non-reproducing |
| Bromus tectorum | Cheatgrass | N/A | reproducing population |
| Chasmanthium latifolium | Indian woodoats | N/A | reproducing population |
| Cinna arundinacea | Sweet woodreed | N/A | reproducing population |
| Cynodon dactylon | Bermudagrass | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

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|---|--|-----|------------------------|
| Dactylis glomerata | Orchardgrass | N/A | reproducing population |
| Diarrhena americana | American beakgrain | N/A | reproducing population |
| Dichanthelium acuminatum | Tapered rosette grass | N/A | non-reproducing |
| Dichanthelium acuminatum var. implicatum | Western panicgrass | N/A | non-reproducing |
| Dichanthelium acuminatum var. lindheimeri | Lindheimer panicgrass | N/A | non-reproducing |
| Dichanthelium boscii | Bosc's panicgrass | N/A | non-reproducing |
| Dichanthelium clandestinum | Deertongue panicgrass | N/A | reproducing population |
| Dichanthelium commutatum | Variable panicgrass | N/A | reproducing population |
| Dichanthelium dichotomum | Cypress panicgrass | N/A | reproducing population |
| Dichanthelium latifolium | Broadleaf rosette grass | N/A | reproducing population |
| Dichanthelium malacophyllum | Softleaf rosette grass | N/A | reproducing population |
| Dichanthelium oligosanthes | Heller's rosette grass | N/A | reproducing population |
| Dichanthelium oligosanthes var. scribnerianum | Scribner's rosette grass | N/A | non-reproducing |
| Dichanthelium sphaerocarpon | Roundseed panicum | N/A | reproducing population |
| Dichanthelium sphaerocarpon var. isophyllum | Roundseed panicum | N/A | non-reproducing |
| Digitaria filiformis | Slender crabgrass | N/A | reproducing population |
| Digitaria sanguinalis | Hairy crabgrass | N/A | reproducing population |
| Echinochloa muricata | Rough barnyardgrass | N/A | reproducing population |
| Eleusine indica | Indian goosegrass | N/A | reproducing population |
| Elymus villosus | Hairy wildrye | N/A | reproducing population |
| Elymus virginicus | Virginia wildrye | N/A | reproducing population |
| Elymus virginicus var. glabriflorus | Virginia wildrye | N/A | reproducing population |
| Eragrostis capillaris | Lace grass | N/A | reproducing population |
| Eragrostis cilianensis | Stinkgrass | N/A | non-reproducing |
| Eragrostis intermedia | Plains lovegrass | N/A | non-reproducing |
| Eragrostis pectinacea | Tufted lovegrass | N/A | reproducing population |
| Eragrostis pilosa | Indian lovegrass | N/A | non-reproducing |
| Eragrostis spectabilis | Purple lovegrass | N/A | reproducing population |
| Eragrostis trichodes | Sand lovegrass | N/A | non-reproducing |
| Festuca obtusa | Nodding fescue | N/A | reproducing population |
| Festuca paradoxa | Clustered fescue | N/A | reproducing population |
| Festuca pratensis | Meadow fescue | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

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|--------------------------------------|--|-----|------------------------|
| Glyceria striata | Fowl mannagrass | N/A | reproducing population |
| Hordeum pusillum | Little barley | N/A | reproducing population |
| Koeleria pyramidata | Prairie Junegrass | N/A | non-reproducing |
| Leersia oryzoides | Rice cutgrass | N/A | reproducing population |
| Leersia virginica | Whitegrass | N/A | non-reproducing |
| Leptoloma cognatum | Fall witchgrass | N/A | reproducing population |
| Lolium perenne | Perennial ryegrass | N/A | reproducing population |
| Melica nitens | Threeflower melicgrass | N/A | reproducing population |
| Muhlenbergia frondosa | Wirestem muhly | N/A | reproducing population |
| Muhlenbergia glabriflora | Inland muhly | N/A | non-reproducing |
| Muhlenbergia schreberi | Nimblewill muhly | N/A | reproducing population |
| Muhlenbergia sylvatica | Woodland muhly | N/A | reproducing population |
| Muhlenbergia tenuiflora | Slender muhly | N/A | non-reproducing |
| Panicum anceps | Beaked panicum | N/A | reproducing population |
| Panicum capillare | Witchgrass | N/A | reproducing population |
| Panicum dichotomiflorum | Fall panicgrass | N/A | reproducing population |
| Panicum flexile | Wiry panicgrass | N/A | reproducing population |
| Panicum rigidulum | Redtop panicgrass | N/A | reproducing population |
| Panicum virgatum | Switchgrass | N/A | reproducing population |
| Paspalum laeve var. circulare | Field paspalum | N/A | reproducing population |
| Paspalum laeve var. pilosum | Field paspalum | N/A | reproducing population |
| Paspalum pubiflorum var. glabrum | Hairyseed paspalum | N/A | reproducing population |
| Paspalum setaceum var. muehlenbergii | Thin paspalum | N/A | reproducing population |
| Phleum pratense | Timothy | N/A | non-reproducing |
| Poa annua | Annual bluegrass | N/A | reproducing population |
| Poa compressa | Canada bluegrass | N/A | non-reproducing |
| Poa pratensis | Kentucky bluegrass | N/A | reproducing population |
| Poa sylvestris | Woodland bluegrass | N/A | non-reproducing |
| Schizachyrium scoparium | Little bluestem | N/A | reproducing population |
| Secale cereale | Cultivated rye | N/A | non-reproducing |
| Setaria faberi | Japanese bristlegrass | N/A | reproducing population |
| Setaria geniculata | Yellow bristlegrass | N/A | reproducing population |
| Setaria glauca | Bristlegrass | N/A | reproducing population |
| Setaria viridis | Green bristlegrass | N/A | reproducing population |
| Sorghastrum avenaceum | Yellow Indiangrass | N/A | reproducing population |
| Sorghum halepense | Johnsongrass | N/A | non-reproducing |
| Sphenopholis obtusata var. major | Slender wedgescale | N/A | reproducing population |
| Sporobolus asper | Dropseed | N/A | reproducing population |
| Sporobolus neglectus | Puffsheath dropseed | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

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|----------------------------------|---|-----|------------------------|
| Tridens flavus | Purpletop tridens | N/A | reproducing population |
| Triticum cylindricum | Jointed goatgrass | N/A | reproducing population |
| Vulpia octoflora | Sixweeks fescue | N/A | reproducing population |
| Carex amphibola var. turgida | Eastern narrowleaf sedge | N/A | reproducing population |
| Carex bicknellii | Bicknell's sedge | N/A | reproducing population |
| Carex blanda | Eastern woodland sedge | N/A | reproducing population |
| Carex brevior | Fescue sedge | N/A | reproducing population |
| Carex bulbostylis | Eastern narrowleaf sedge | N/A | non-reproducing |
| Carex caroliniana | Carolina sedge | N/A | non-reproducing |
| Carex cephalophora | Ovalleaf sedge | N/A | reproducing population |
| Carex cristatella | Crested sedge | N/A | non-reproducing |
| Carex davisii | Davis' sedge | N/A | non-reproducing |
| Carex festucacea | Fescue sedge | N/A | non-reproducing |
| Carex frankii | Frank's sedge | N/A | reproducing population |
| Carex gracilescens | Slender looseflower sedge | N/A | reproducing population |
| Carex gracillima | Graceful sedge | N/A | non-reproducing |
| Carex granularis | Limestone meadow sedge | N/A | reproducing population |
| Carex gravida | Heavy sedge | N/A | non-reproducing |
| Carex hirsutella | Fuzzy wuzzy sedge | N/A | reproducing population |
| Carex hystericina | Bottlebrush sedge | N/A | non-reproducing |
| Carex leavenworthii | Leavenworth's sedge | N/A | reproducing population |
| Carex lupulina | Hop sedge | N/A | non-reproducing |
| Carex lurida | Shallow sedge | N/A | reproducing population |
| Carex molesta | Troublesome sedge | N/A | non-reproducing |
| Carex muehlenbergii | Muhlenberg's sedge | N/A | non-reproducing |
| Carex muehlenbergii var. enervis | Muhlenberg's sedge | N/A | reproducing population |
| Carex normalis | Greater straw sedge | N/A | reproducing population |
| Carex oligocarpa | Richwoods sedge | N/A | reproducing population |
| Carex retroflexa | Reflexed sedge | N/A | reproducing population |
| Carex shortiana | Short's sedge | N/A | reproducing population |
| Carex straminea | Eastern straw sedge | N/A | non-reproducing |
| Carex vulpinoidea | Fox sedge | N/A | reproducing population |
| Cyperus acuminatus | Tapertip flatsedge | N/A | reproducing population |
| Cyperus aristatus | Bearded flatsedge | N/A | reproducing population |
| Cyperus esculentus | Chufa flatsedge | N/A | reproducing population |
| Cyperus filiculmis | Great Plains flatsedge | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

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|----------------------------|---|-----|------------------------|
| Cyperus lancastricensis | Manyflower flatsedge | N/A | non-reproducing |
| Cyperus ovularis | Globe flatsedge | N/A | reproducing population |
| Cyperus strigosus | Strawcolored flatsedge | N/A | reproducing population |
| Cyperus tenuifolius | Low spikesedge | N/A | non-reproducing |
| Cyperus virens | Green flatsedge | N/A | non-reproducing |
| Eleocharis acicularis | Needle spikerush | N/A | non-reproducing |
| Eleocharis erythropoda | Bald spikerush | N/A | reproducing population |
| Eleocharis obtusa | Blunt spikesedge | N/A | reproducing population |
| Eleocharis ovata | Ovate spikerush | N/A | non-reproducing |
| Eleocharis smallii | Small's spikerush | N/A | reproducing population |
| Fimbristylis annua | Annual fimbry | N/A | reproducing population |
| Fimbristylis autumnalis | Slender fimbry | N/A | reproducing population |
| Scirpus atrovirens | Green bulrush | N/A | reproducing population |
| Scirpus pendulus | Rufous bulrush | N/A | reproducing population |
| Scirpus validus | Softstem bulrush | N/A | non-reproducing |
| Juncus acuminatus | Tapertip rush | N/A | non-reproducing |
| Juncus biflorus | Bog rush | N/A | non-reproducing |
| Juncus diffusissimus | Slimpod rush | N/A | non-reproducing |
| Juncus interior | Inland rush | N/A | non-reproducing |
| Juncus marginatus | Grassleaf rush | N/A | non-reproducing |
| Juncus secundus | Lopsided rush | N/A | non-reproducing |
| Juncus tenuis | Poverty rush | N/A | non-reproducing |
| Smilax bona-nox | Saw greenbrier | N/A | reproducing population |
| Smilax ecirrata | Upright carrionflower | N/A | non-reproducing |
| Smilax herbacea | Smooth carrionflower | N/A | reproducing population |
| Smilax hispida | Bristly greenbrier | N/A | reproducing population |
| Allium bivalve | Crowpoison | N/A | non-reproducing |
| Allium canadense | Meadow garlic | N/A | reproducing population |
| Allium vineale | Wild garlic | N/A | non-reproducing |
| Camassia scilloides | Atlantic camas | N/A | reproducing population |
| Polygonatum biflorum | King Solomon's seal | N/A | non-reproducing |
| Smilacina racemosa | Feather Solomon's seal | N/A | reproducing population |
| Trillium sessile | Toadshade | N/A | reproducing population |
| Trillium viride | Wood wakerobin | N/A | non-reproducing |
| Iris shrevei | Shreve's iris | N/A | non-reproducing |
| Sisyrinchium angustifolium | Narrowleaf blueeyed grass | N/A | reproducing population |
| Sisyrinchium campestre | Prairie blueeyed grass | N/A | non-reproducing |
| Achillea millefolium | Common yarrow | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

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|--|--|-----|------------------------|
| <i>Ageratina altissima</i> | White snakeroot | N/A | reproducing population |
| <i>Ambrosia artemisiifolia</i> | Annual ragweed | N/A | reproducing population |
| <i>Ambrosia bidentata</i> | Lanceleaf ragweed | N/A | non-reproducing |
| <i>Ambrosia trifida</i> | Great ragweed | N/A | reproducing population |
| <i>Amphiachyris dracunculoides</i> | Prairie broomweed | N/A | reproducing population |
| <i>Antennaria neglecta</i> | Field pussytoes | N/A | reproducing population |
| <i>Anthemis cotula</i> | Stinking chamomile | N/A | non-reproducing |
| <i>Arctium minus</i> | Lesser burdock | N/A | non-reproducing |
| <i>Artemisia ludoviciana</i> | Louisiana sagewort | N/A | non-reproducing |
| <i>Aster azureus</i> | Skyblue aster | N/A | reproducing population |
| <i>Aster ericoides</i> | Heath aster | N/A | reproducing population |
| <i>Aster lateriflorus</i> | Calico aster | N/A | reproducing population |
| <i>Aster parviceps</i> | Smallhead aster | N/A | non-reproducing |
| <i>Aster patens</i> var. <i>patentissimus</i> | Late purple aster | N/A | non-reproducing |
| <i>Aster pilosus</i> | White oldfield aster | N/A | reproducing population |
| <i>Aster praealtus</i> | Willowleaf aster | N/A | non-reproducing |
| <i>Aster sagittifolius</i> | Swordleaf wood aster | N/A | non-reproducing |
| <i>Bidens cernua</i> | Nodding beggartick | N/A | non-reproducing |
| <i>Bidens frondosa</i> | Devil's beggartick | N/A | reproducing population |
| <i>Bidens polylepis</i> | Bearded beggarticks | N/A | reproducing population |
| <i>Boltonia asteroides</i> var. <i>latisquama</i> | White doll's daisy | N/A | non-reproducing |
| <i>Brickellia eupatorioides</i> var. <i>corymbulosa</i> | False boneset | N/A | non-reproducing |
| <i>Cirsium altissimum</i> | Tall thistle | N/A | reproducing population |
| <i>Cirsium discolor</i> | Field thistle | N/A | non-reproducing |
| <i>Cirsium vulgare</i> | Bull thistle | N/A | reproducing population |
| <i>Conoclinium coelestinum</i> | Blue mistflower | N/A | reproducing population |
| <i>Conyza canadensis</i> | Canadian horseweed | N/A | non-reproducing |
| <i>Coreopsis grandiflora</i> | Largeflower tickseed | N/A | reproducing population |
| <i>Cosmos bipinnatus</i> | Garden cosmos | N/A | reproducing population |
| <i>Echinacea pallida</i> | Pale purple coneflower | N/A | reproducing population |
| <i>Eclipta alba</i> | False daisy | N/A | reproducing population |
| <i>Elephantopus carolinianus</i> | Carolina elephantsfoot | N/A | reproducing population |
| <i>Erechtites hieraciifolia</i> | American burnweed | N/A | non-reproducing |
| <i>Erigeron annuus</i> | Eastern daisy fleabane | N/A | reproducing population |
| <i>Erigeron strigosus</i> | Prairie fleabane | N/A | non-reproducing |
| <i>Eupatorium perfoliatum</i> | Common boneset | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

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|---|--|-----|------------------------|
| <i>Galinsoga quadriradiata</i> | Shaggysoldier | N/A | non-reproducing |
| <i>Gamochaeta purpurea</i> | Spoonleaf purple everlasting | N/A | non-reproducing |
| <i>Gnaphalium obtusifolium</i> | Rabbit tobacco | N/A | reproducing population |
| <i>Helenium amarum</i> | Yellowdicks | N/A | non-reproducing |
| <i>Helenium autumnale</i> | Common sneezeweed | N/A | non-reproducing |
| <i>Helianthus grosseserratus</i> | Sawtooth sunflower | N/A | non-reproducing |
| <i>Helianthus hirsutus</i> | Hairy sunflower | N/A | reproducing population |
| <i>Helianthus petiolaris</i> | Prairie sunflower | N/A | non-reproducing |
| <i>Helianthus tuberosus</i> | Jerusalem artichoke | N/A | reproducing population |
| <i>Heliopsis helianthoides</i> | Sunflower heliopsis | N/A | non-reproducing |
| <i>Heliopsis helianthoides</i> ssp. <i>scabra</i> | Smooth oxeye | N/A | non-reproducing |
| <i>Heterotheca pilosa</i> | Soft goldenaster | N/A | reproducing population |
| <i>Hieracium longipilum</i> | Hairy hawkweed | N/A | reproducing population |
| <i>Krigia cespitosa</i> | Weedy dwarfdandelion | N/A | reproducing population |
| <i>Krigia virginica</i> | Virginia dwarfdandelion | N/A | non-reproducing |
| <i>Lactuca canadensis</i> | Canada lettuce | N/A | reproducing population |
| <i>Lactuca floridana</i> | Woodland lettuce | N/A | reproducing population |
| <i>Lactuca saligna</i> | Willowleaf lettuce | N/A | non-reproducing |
| <i>Lactuca serriola</i> | Prickly lettuce | N/A | non-reproducing |
| <i>Leucanthemum vulgare</i> | Oxeyedaisy | N/A | non-reproducing |
| <i>Matricaria matricarioides</i> | Disc mayweed | N/A | non-reproducing |
| <i>Prenanthes aspera</i> | Rough rattlesnakeroot | N/A | reproducing population |
| <i>Pyrrhopappus carolinianus</i> | Carolina desertchicory | N/A | reproducing population |
| <i>Ratibida pinnata</i> | Pinnate prairie coneflower | N/A | non-reproducing |
| <i>Rudbeckia hirta</i> | Blackeyed Susan | N/A | reproducing population |
| <i>Rudbeckia laciniata</i> | Cutleaf coneflower | N/A | non-reproducing |
| <i>Rudbeckia triloba</i> | Browneyed Susan | N/A | reproducing population |
| <i>Silphium integrifolium</i> | Wholeleaf rosinweed | N/A | reproducing population |
| <i>Silphium laciniatum</i> | Compassplant | N/A | reproducing population |
| <i>Silphium perfoliatum</i> | Cup plant | N/A | reproducing population |
| <i>Solidago altissima</i> | Canada goldenrod | N/A | reproducing population |
| <i>Solidago boottii</i> | Boott's goldenrod | N/A | non-reproducing |
| <i>Solidago canadensis</i> | Canada goldenrod | N/A | non-reproducing |
| <i>Solidago gigantea</i> ssp. <i>serotina</i> | Giant goldenrod | N/A | reproducing population |
| <i>Solidago radula</i> | Western rough goldenrod | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|---|--|-----|------------------------|
| <i>Solidago rigida</i> | Stiff goldenrod | N/A | reproducing population |
| <i>Solidago ulmifolia</i> | Elmleaf goldenrod | N/A | reproducing population |
| <i>Sonchus oleraceus</i> | Common sowthistle | N/A | non-reproducing |
| <i>Taraxacum laevigatum</i> | Rock dandelion | N/A | non-reproducing |
| <i>Taraxacum officinale</i> | Common dandelion | N/A | reproducing population |
| <i>Verbesina virginica</i> | White crownbeard | N/A | reproducing population |
| <i>Vernonia arkansana</i> | Arkansas ironweed | N/A | non-reproducing |
| <i>Vernonia baldwinii</i> | Balwin's ironweed | N/A | reproducing population |
| <i>Vernonia missurica</i> | Missouri ironweed | N/A | reproducing population |
| <i>Xanthium strumarium</i> | Rough cocklebur | N/A | reproducing population |
| <i>Callitriche deflexa</i> var. <i>austinii</i> | Terrestrial waterstarwort | N/A | non-reproducing |
| <i>Callitriche heterophylla</i> | Larger waterstarwort | N/A | non-reproducing |
| <i>Lobelia cardinalis</i> | Cardinalflower | N/A | non-reproducing |
| <i>Lobelia inflata</i> | Indian tobacco | N/A | reproducing population |
| <i>Lobelia siphilitica</i> | Great blue lobelia | N/A | reproducing population |
| <i>Lobelia spicata</i> | Palespike lobelia | N/A | reproducing population |
| <i>Triodanis biflora</i> | Clasping Venus' lookingglass | N/A | reproducing population |
| <i>Triodanis perfoliata</i> | Clasping Venus' lookingglass | N/A | reproducing population |
| <i>Lonicera japonica</i> | Japanese honeysuckle | N/A | reproducing population |
| <i>Sambucus canadensis</i> | American elder | N/A | reproducing population |
| <i>Symphoricarpos orbiculatus</i> | Coralberry | N/A | reproducing population |
| <i>Viburnum lentago</i> | Nannyberry | N/A | reproducing population |
| <i>Viburnum prunifolium</i> | Blackhaw | N/A | reproducing population |
| <i>Viburnum rufidulum</i> | Rusty blackhaw | N/A | reproducing population |
| <i>Valerianella radiata</i> | Beaked cornsalad | N/A | reproducing population |
| <i>Sabatia angularis</i> | Rosepink | N/A | non-reproducing |
| <i>Amsonia tabernaemontana</i> | Eastern bluestar | N/A | non-reproducing |
| <i>Apocynum cannabinum</i> | Indianhemp | N/A | reproducing population |
| <i>Apocynum sibiricum</i> | Indianhemp | N/A | non-reproducing |
| <i>Vinca minor</i> | Common periwinkle | N/A | non-reproducing |
| <i>Asclepias amplexicaulis</i> | Clasping milkweed | N/A | non-reproducing |
| <i>Asclepias hirtella</i> | Green milkweed | N/A | non-reproducing |
| <i>Asclepias incarnata</i> | Swamp milkweed | N/A | non-reproducing |
| <i>Asclepias purpurascens</i> | Purple milkweed | N/A | non-reproducing |
| <i>Asclepias tuberosa</i> | Butterfly milkweed | N/A | non-reproducing |
| <i>Asclepias viridiflora</i> | Green milkweed | N/A | reproducing population |
| <i>Asclepias viridis</i> | Green antelopehorn | N/A | reproducing population |
| <i>Hackelia virginiana</i> | Beggarslice | N/A | reproducing population |
| <i>Myosotis verna</i> | Spring forget me not | N/A | reproducing population |
| <i>Phryma leptostachya</i> | American lopseed | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

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|----------------------------------|--|-----|------------------------|
| <i>Verbena canadensis</i> | Rose mock vervain | N/A | reproducing population |
| <i>Verbena hastata</i> | Swamp verbena | N/A | non-reproducing |
| <i>Verbena simplex</i> | Narrowleaf vervain | N/A | reproducing population |
| <i>Verbena stricta</i> | Hoary verbena | N/A | non-reproducing |
| <i>Verbena urticifolia</i> | White vervain | N/A | non-reproducing |
| <i>Agastache nepetoides</i> | Yellow giant hyssop | N/A | non-reproducing |
| <i>Hedeoma hispida</i> | Rough falsepennyroyal | N/A | reproducing population |
| <i>Lamium amplexicaule</i> | Henbit deadnettle | N/A | reproducing population |
| <i>Lamium purpureum</i> | Purple deadnettle | N/A | reproducing population |
| <i>Lycopus americanus</i> | American waterhorehound | N/A | reproducing population |
| <i>Lycopus rubellus</i> | Taperleaf waterhorehound | N/A | reproducing population |
| <i>Marrubium vulgare</i> | Horehound | N/A | non-reproducing |
| <i>Mentha X piperita</i> | Peppermint | N/A | reproducing population |
| <i>Monarda fistulosa</i> | Wildbergamot beebalm | N/A | reproducing population |
| <i>Nepeta cataria</i> | Catnip | N/A | reproducing population |
| <i>Physostegia virginiana</i> | Obedient plant | N/A | reproducing population |
| <i>Prunella vulgaris</i> | Common selfheal | N/A | reproducing population |
| <i>Pycnanthemum tenuifolium</i> | Narrowleaf mountainmint | N/A | non-reproducing |
| <i>Salvia pitcheri</i> | Pitcher sage | N/A | reproducing population |
| <i>Scutellaria lateriflora</i> | Blue skullcap | N/A | reproducing population |
| <i>Teucrium canadense</i> | Candad germander | N/A | reproducing population |
| <i>Plantago aristata</i> | Largebracted plantain | N/A | reproducing population |
| <i>Plantago lanceolata</i> | Narrowleaf plantain | N/A | non-reproducing |
| <i>Plantago major</i> | Common plantain | N/A | non-reproducing |
| <i>Plantago pusilla</i> | Dwarf plantain | N/A | reproducing population |
| <i>Plantago rugelii</i> | Blackseed plantain | N/A | reproducing population |
| <i>Plantago virginica</i> | Virginia plantain | N/A | non-reproducing |
| <i>Cephalanthus occidentalis</i> | Common buttonbush | N/A | reproducing population |
| <i>Diodia teres</i> | Poorjoe | N/A | reproducing population |
| <i>Galium aparine</i> | Stickywilly | N/A | reproducing population |
| <i>Fraxinus americana</i> | White ash | N/A | non-reproducing |
| <i>Fraxinus pennsylvanica</i> | Green ash | N/A | non-reproducing |
| <i>Gratiola neglecta</i> | Clammy hedgehyssop | N/A | reproducing population |
| <i>Leucospora multifida</i> | Narrowleaf paleseed | N/A | reproducing population |
| <i>Linaria texana</i> | Texas toadflax | N/A | non-reproducing |
| <i>Lindernia anagallidea</i> | Yellowseed false pimpernel | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

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|--------------------------------------|---|-----|------------------------|
| Lindernia dubia | Moistbank pimpernel | N/A | reproducing population |
| Mimulus alatus | Sharpwing monkeyflower | N/A | reproducing population |
| Mimulus ringens | Ringen monkeyflower | N/A | non-reproducing |
| Penstemon digitalis | Talus slope penstemon | N/A | reproducing population |
| Scrophularia marilandica | Carpenter's square | N/A | reproducing population |
| Verbascum blattaria | Moth mullein | N/A | non-reproducing |
| Verbascum thapsus | Common mullein | N/A | reproducing population |
| Veronica arvensis | Corn speedwell | N/A | non-reproducing |
| Veronica peregrina | Neckweed | N/A | reproducing population |
| Justicia americana | American waterwillow | N/A | non-reproducing |
| Ruellia humilis | Fringeleaf wild petunia | N/A | reproducing population |
| Ruellia strepens | Limestone wild petunia | N/A | non-reproducing |
| Datura stramonium | Jimsonweed | N/A | non-reproducing |
| Physalis angulata | Cutleaf groundcherry | N/A | reproducing population |
| Physalis heterophylla | Clammy groundcherry | N/A | reproducing population |
| Physalis longifolia | Longleaf groundcherry | N/A | reproducing population |
| Physalis longifolia var. subglabrata | Longleaf groundcherry | N/A | non-reproducing |
| Physalis pumila | Dwarf groundcherry | N/A | non-reproducing |
| Solanum americanum | American black nightshade | N/A | reproducing population |
| Solanum carolinense | Carolina horsenettle | N/A | reproducing population |
| Solanum rostratum | Buffalobur nightshade | N/A | non-reproducing |
| Cuscuta pentagona | Fiveangled dodder | N/A | non-reproducing |
| Cuscuta polygonorum | Smartweed dodder | N/A | non-reproducing |
| Convolvulus arvensis | Field bindweed | N/A | non-reproducing |
| Ipomoea hederacea | Ivyleaf morningglory | N/A | reproducing population |
| Ipomoea pandurata | Man of the earth | N/A | reproducing population |
| Ellisia nyctelea | Aunt Lucy | N/A | reproducing population |
| Mollugo verticillata | Green carpetweed | N/A | non-reproducing |
| Chenopodium album | Lambsquarters | N/A | reproducing population |
| Chenopodium ambrosioides | Mexican tea | N/A | non-reproducing |
| Chenopodium pumilio | Clammy goosefoot | N/A | non-reproducing |
| Amaranthus hybridus | Slim amaranth | N/A | non-reproducing |
| Amaranthus retroflexus | Redroot amaranth | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

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|----------------------------------|--|-----|------------------------|
| Amaranthus rudis | Tall amaranth | N/A | non-reproducing |
| Amaranthus spinosus | Spiny amaranth | N/A | reproducing population |
| Mirabilis albida | White four o'clock | N/A | reproducing population |
| Phytolacca americana | American pokeweed | N/A | reproducing population |
| Claytonia virginica | Virginia springbeauty | N/A | reproducing population |
| Portulaca oleracea | Little hogweed | N/A | non-reproducing |
| Agrostemma githago | Common corncockle | N/A | reproducing population |
| Arenaria serpyllifolia | Thymeleaf sandwort | N/A | non-reproducing |
| Cerastium glomeratum | Sticky chickweed | N/A | non-reproducing |
| Cerastium vulgatum | Big chickweed | N/A | reproducing population |
| Dianthus armeria | Deptford pink | N/A | reproducing population |
| Sagina decumbens | Beach pearlwort | N/A | non-reproducing |
| Saponaria officinalis | Bouncingbet | N/A | non-reproducing |
| Silene antirrhina | Sleepy silene | N/A | non-reproducing |
| Silene regia | Royal catchfly | N/A | non-reproducing |
| Silene stellata | Widowsfrill | N/A | non-reproducing |
| Stellaria media | Common chickweed | N/A | reproducing population |
| Polygonum amphibium var. emersum | Longroot smartweed | N/A | non-reproducing |
| Polygonum arenastrum | Ovalleaf knotweed | N/A | reproducing population |
| Polygonum convolvulus | Black bindweed | N/A | reproducing population |
| Polygonum erectum | Erect knotweed | N/A | non-reproducing |
| Polygonum hydropiperoides | Swamp smartweed | N/A | reproducing population |
| Polygonum lapathifolium | Curlytop knotweed | N/A | reproducing population |
| Polygonum pensylvanicum | Pennsylvania smartweed | N/A | reproducing population |
| Polygonum persicaria | Spotted ladythumb | N/A | non-reproducing |
| Polygonum punctatum | Dotted smartweed | N/A | reproducing population |
| Polygonum ramosissimum | Bushy knotweed | N/A | reproducing population |
| Polygonum sagittatum | Arrowleaf tearthumb | N/A | non-reproducing |
| Polygonum scandens | Climbing false buckwheat | N/A | non-reproducing |
| Polygonum virginianum | Jumpseed | N/A | reproducing population |
| Rumex acetosella | Common sheep sorrel | N/A | reproducing population |
| Rumex altissimus | Pale dock | N/A | reproducing population |
| Rumex crispus | Curly dock | N/A | non-reproducing |
| Rumex obtusifolius | Bitter dock | N/A | non-reproducing |
| Barbarea vulgaris | Garden yellowrocket | N/A | reproducing population |
| Brassica juncea | India mustard | N/A | non-reproducing |
| Brassica nigra | Black mustard | N/A | reproducing population |
| Camelina microcarpa | Littlepod falseflax | N/A | non-reproducing |
| Capsella bursa-pastoris | Shepherd's purse | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

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|-------------------------------------|---|-----|------------------------|
| Cardamine parviflora var. arenicola | Sand bittercress | N/A | reproducing population |
| Draba brachycarpa | Shortpod whitlowgrass | N/A | non-reproducing |
| Lepidium densiflorum | Common pepperweed | N/A | reproducing population |
| Lepidium virginicum | Virginia pepperweed | N/A | non-reproducing |
| Rorippa palustris ssp. glabra | Fernald's yellowcress | N/A | reproducing population |
| Sibara virginica | Virginia winged rockcress | N/A | reproducing population |
| Sisymbrium officinale | Hedgemustard | N/A | non-reproducing |
| Bumelia lanuginosa | Gum bumelia | N/A | non-reproducing |
| Diospyros virginiana | Common persimmon | N/A | reproducing population |
| Abutilon theophrasti | Velvetleaf | N/A | non-reproducing |
| Callirhoe alcaeoides | Light poppymallow | N/A | non-reproducing |
| Callirhoe digitata | Winecup | N/A | non-reproducing |
| Hibiscus laevis | Halberdleaf rosemallow | N/A | reproducing population |
| Malva rotundifolia | Common mallow | N/A | reproducing population |
| Sida spinosa | Prickly fanpetals | N/A | reproducing population |
| Androsace occidentalis | Western rockjasmine | N/A | non-reproducing |
| Centunculus minimus | Chaffweed | N/A | non-reproducing |
| Lysimachia ciliata | Fringed loosestrife | N/A | reproducing population |
| Populus deltoides | Eastern cottonwood | N/A | non-reproducing |
| Salix caroliniana | Coastal plain willow | N/A | reproducing population |
| Salix discolor | Pussy willow | N/A | non-reproducing |
| Salix nigra | Black willow | N/A | non-reproducing |
| Hypericum drummondii | Nits and lice | N/A | reproducing population |
| Hypericum mutilum | Dwarf St. Johnswort | N/A | reproducing population |
| Hypericum punctatum | Spotted St. Johnswort | N/A | reproducing population |
| Hypericum sphaerocarpum | Roundseed St. Johnswort | N/A | reproducing population |
| Viola X napae | Common blue violet | N/A | non-reproducing |
| Viola bicolor | Field pansy | N/A | reproducing population |
| Viola missouriensis | Missouri violet | N/A | reproducing population |
| Viola pubescens | Downy yellow violet | N/A | reproducing population |
| Viola sororia | Common blue violet | N/A | reproducing population |
| Passiflora lutea var. glabriflora | Yellow passionflower | N/A | non-reproducing |
| Corylus americana | American hazelnut | N/A | reproducing population |
| Quercus macrocarpa | Bur oak | N/A | non-reproducing |
| Quercus marilandica | Blackjack oak | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

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|---|---|-----|------------------------|
| <i>Quercus muehlenbergii</i> | Chinkapin oak | N/A | reproducing population |
| <i>Quercus nigra</i> | Water oak | N/A | non-reproducing |
| <i>Quercus palustris</i> | Pin oak | N/A | non-reproducing |
| <i>Quercus phellos</i> | Willow oak | N/A | non-reproducing |
| <i>Quercus shumardii</i> | Shumard's oak | N/A | non-reproducing |
| <i>Quercus stellata</i> | Post oak | N/A | reproducing population |
| <i>Quercus velutina</i> | Black oak | N/A | reproducing population |
| <i>Liquidambar styraciflua</i> | Sweetgum | N/A | non-reproducing |
| <i>Platanus occidentalis</i> | American sycamore | N/A | reproducing population |
| <i>Carya cordiformis</i> | Bitternut hickory | N/A | reproducing population |
| <i>Juglans nigra</i> | Black walnut | N/A | reproducing population |
| <i>Humulus lupulus</i> | Common hop | N/A | reproducing population |
| <i>Celtis laevigata</i> | Sugarberry | N/A | reproducing population |
| <i>Celtis occidentalis</i> | Common hackberry | N/A | non-reproducing |
| <i>Celtis tenuifolia</i> | Dwarf hackberry | N/A | reproducing population |
| <i>Ulmus americana</i> | American elm | N/A | reproducing population |
| <i>Ulmus rubra</i> | Slippery elm | N/A | reproducing population |
| <i>Maclura pomifera</i> | Osageorange | N/A | reproducing population |
| <i>Morus alba</i> | White mulberry | N/A | reproducing population |
| <i>Morus rubra</i> | Red mulberry | N/A | reproducing population |
| <i>Boehmeria cylindrica</i> | Smallspike false nettle | N/A | non-reproducing |
| <i>Laportea canadensis</i> | Canadian woodnettle | N/A | reproducing population |
| <i>Parietaria pensylvanica</i> | Pennsylvania pellitory | N/A | reproducing population |
| <i>Pilea pumila</i> | Canadian clearweed | N/A | non-reproducing |
| <i>Sassafras albidum</i> | Sassafras | N/A | reproducing population |
| <i>Asimina triloba</i> | Common pawpaw | N/A | non-reproducing |
| <i>Ceratophyllum demersum</i> | Coon's tail | N/A | reproducing population |
| <i>Ceratophyllum muricatum</i> | Prickly hornwort | N/A | reproducing population |
| <i>Corydalis aurea</i> ssp. <i>occidentalis</i> | Scrambledeggs | N/A | reproducing population |
| <i>Corydalis crystallina</i> | Mealy fumewort | N/A | non-reproducing |
| <i>Corydalis micrantha</i> | Smallflower fumewort | N/A | non-reproducing |
| <i>Podophyllum peltatum</i> | Mayapple | N/A | reproducing population |
| <i>Cocculus carolinus</i> | Carolina coralbead | N/A | non-reproducing |
| <i>Menispermum canadense</i> | Common moonseed | N/A | non-reproducing |
| <i>Delphinium virescens</i> | Carolina larkspur | N/A | reproducing population |
| <i>Ranunculus abortivus</i> | Littleleaf buttercup | N/A | reproducing population |
| <i>Ranunculus fascicularis</i> | Early buttercup | N/A | reproducing population |
| <i>Ranunculus micranthus</i> | Rock buttercup | N/A | reproducing population |
| <i>Ranunculus recurvatus</i> | Blisterwort | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

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|---|--|-----|------------------------|
| Chaerophyllum procumbens | Spreading chervil | N/A | reproducing population |
| Chaerophyllum tainturieri | Hairyfruit chervil | N/A | non-reproducing |
| Cicuta maculata | Spotted water hemlock | N/A | non-reproducing |
| Cryptotaenia canadensis | Canadian honewort | N/A | reproducing population |
| Daucus carota | Queen Anne's lace | N/A | reproducing population |
| Daucus pusillus | American wild carrot | N/A | non-reproducing |
| Eryngium yuccifolium | Button eryngo | N/A | non-reproducing |
| Osmorhiza claytonii | Clayton's sweetroot | N/A | non-reproducing |
| Perideridia americana | Eastern yampah | N/A | non-reproducing |
| Ptilimnium nuttallii | Laceflower | N/A | non-reproducing |
| Sanicula canadensis | Canadian blacksnakeroot | N/A | reproducing population |
| Sanicula gregaria | Clustered blacksnakeroot | N/A | non-reproducing |
| Spermolepis inermis | Red River scaleseed | N/A | non-reproducing |
| Torilis arvensis | Spreading hedgeparsley | N/A | non-reproducing |
| Celastrus scandens | American bittersweet | N/A | reproducing population |
| Euonymus atropurpurea | Eastern wahoo | N/A | non-reproducing |
| Ilex decidua | Possumhaw | N/A | reproducing population |
| Cornus amomum ssp. obliqua | Silky dogwood | N/A | non-reproducing |
| Cornus drummondii | Roughleaf dogwood | N/A | non-reproducing |
| Cornus florida | Flowering dogwood | N/A | reproducing population |
| Cornus foemina ssp. racemosa | Gray dogwood | N/A | non-reproducing |
| Acalypha rhomboidea | Virginia threeseed mercury | N/A | reproducing population |
| Acalypha virginica | Virginia threeseed mercury | N/A | reproducing population |
| Croton capitatus | Hogwort | N/A | reproducing population |
| Croton glandulosus var. septentrionalis | Vente conmigo | N/A | non-reproducing |
| Croton monanthogynus | Prairie tea | N/A | reproducing population |
| Euphorbia corollata | Flowering spurge | N/A | reproducing population |
| Euphorbia cyathophora | Fire on the mountain | N/A | reproducing population |
| Euphorbia dentata | Toothed spurge | N/A | non-reproducing |
| Euphorbia humistrata | Spreading sandmat | N/A | reproducing population |
| Euphorbia maculata | Spotted sandmat | N/A | reproducing population |
| Phyllanthus caroliniensis | Carolina leafflower | N/A | non-reproducing |
| Tragia urticifolia | Nettleleaf noseburn | N/A | reproducing population |
| Amorpha canescens | Leadplant | N/A | non-reproducing |
| Amorpha fruticosa | Desert indigobush | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

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|---------------------------------------|---|-----|------------------------|
| Amorpha fruticosa var. oblongifolia | Desert indigobush | N/A | non-reproducing |
| Amphicarpaea bracteata | American hogpeanut | N/A | non-reproducing |
| Cassia fasciculata | Sleepingplant | N/A | reproducing population |
| Cassia marilandica | Maryland wild sensitive plant | N/A | reproducing population |
| Cassia nictitans | Partridge pea | N/A | reproducing population |
| Cercis canadensis | Eastern redbud | N/A | reproducing population |
| Cladrastis kentukea | Kentucky yellowwood | N/A | non-reproducing |
| Desmanthus illinoensis | Prairie bundleflower | N/A | reproducing population |
| Desmodium canescens | Hoary ticktrefoil | N/A | reproducing population |
| Desmodium illinoense | Illinois ticktrefoil | N/A | reproducing population |
| Desmodium paniculatum | Panickedleaf ticktrefoil | N/A | reproducing population |
| Desmodium sessilifolium | Sessileleaf ticktrefoil | N/A | reproducing population |
| Desmodium viridiflorum | Velvetleaf ticktrefoil | N/A | non-reproducing |
| Gleditsia triacanthos | Honeylocust | N/A | reproducing population |
| Glycine max | Soybean | N/A | non-reproducing |
| Lespedeza stipulacea | Korean clover | N/A | non-reproducing |
| Lespedeza striata | Japanese clover | N/A | reproducing population |
| Lespedeza stuevei | Tall lespedeza | N/A | reproducing population |
| Lespedeza violacea | Violet lespedeza | N/A | reproducing population |
| Medicago sativa | Alfalfa | N/A | non-reproducing |
| Melilotus alba | White sweetclover | N/A | reproducing population |
| Melilotus officinalis | Yellow sweetclover | N/A | reproducing population |
| Psoralea psoraloides var. eglandulosa | Sampson's snakeroot | N/A | reproducing population |
| Robinia pseudoacacia | Black locust | N/A | non-reproducing |
| Schrankia nuttallii | Nuttall's mimosa | N/A | reproducing population |
| Strophostyles leiosperma | Slickseed fuzzybean | N/A | reproducing population |
| Stylosanthes biflora | Sidebeak pencilflower | N/A | reproducing population |
| Tephrosia virginiana | Virginia tephrosia | N/A | reproducing population |
| Trifolium campestre | Field clover | N/A | reproducing population |
| Trifolium dubium | Suckling clover | N/A | non-reproducing |
| Trifolium hybridum | Alsike clover | N/A | reproducing population |
| Trifolium pratense | Red clover | N/A | reproducing population |
| Trifolium repens | White clover | N/A | non-reproducing |
| Vicia dasycarpa | Winter vetch | N/A | reproducing population |
| Impatiens capensis | Jewelweed | N/A | reproducing population |
| Geranium sphaerospermum | Carolina geranium | N/A | non-reproducing |
| Oxalis stricta | Common yellow oxalis | N/A | reproducing population |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|-------------------------------------|--|-----|------------------------|
| Oxalis violacea | Violet woodsorrel | N/A | reproducing population |
| Ammannia auriculata | Eared redstem | N/A | reproducing population |
| Ammannia coccinea | Valley redstem | N/A | reproducing population |
| Cuphea viscosissima | Blue waxweed | N/A | reproducing population |
| Lythrum alatum | Winged lythrum | N/A | reproducing population |
| Rotala ramosior | Lowland rotala | N/A | reproducing population |
| Gaura longiflora | Longflower beeblossom | N/A | non-reproducing |
| Ludwigia alternifolia | Seedbox | N/A | non-reproducing |
| Ludwigia palustris | Marsh seedbox | N/A | non-reproducing |
| Oenothera biennis | Common eveningprimrose | N/A | reproducing population |
| Oenothera laciniata | Cutleaf eveningprimrose | N/A | non-reproducing |
| Oenothera linifolia | Threadleaf eveningprimrose | N/A | non-reproducing |
| Polygala sanguinea | Purple milkwort | N/A | non-reproducing |
| Ceanothus americanus | New Jersey tea | N/A | non-reproducing |
| Ampelopsis cordata | Heartleaf peppervine | N/A | non-reproducing |
| Parthenocissus quinquefolia | Virginia creeper | N/A | reproducing population |
| Vitis aestivalis | Summer grape | N/A | non-reproducing |
| Vitis cinerea | Graybark grape | N/A | reproducing population |
| Vitis vulpina | Frost grape | N/A | reproducing population |
| Ribes missouriense | Missouri gooseberry | N/A | reproducing population |
| Penthorum sedoides | Ditch stonecrop | N/A | non-reproducing |
| Agrimonia parviflora | Harvestlice | N/A | non-reproducing |
| Agrimonia pubescens | Soft agrimony | N/A | non-reproducing |
| Crataegus berberifolia | Barberry hawthorn | N/A | non-reproducing |
| Crataegus calpodendron | Pear hawthorn | N/A | non-reproducing |
| Crataegus coccinioides | Kansas hawthorn | N/A | non-reproducing |
| Crataegus crus-galli | Cockspur hawthorn | N/A | reproducing population |
| Crataegus nitida | Glossy hawthorn | N/A | non-reproducing |
| Crataegus pruinosa | Waxyfruit hawthorn | N/A | reproducing population |
| Crataegus punctata | Dotted hawthorn | N/A | non-reproducing |
| Crataegus reverchonii | Reverchon's hawthorn | N/A | non-reproducing |
| Crataegus viridis | Green hawthorn | N/A | non-reproducing |
| Fragaria virginiana ssp. grayana | Virginia strawberry | N/A | reproducing population |
| Geum canadense | White avens | N/A | reproducing population |
| Geum vernum | Spring avens | N/A | non-reproducing |
| Potentilla recta | Sulphur cinquefoil | N/A | reproducing population |
| Potentilla simplex | Common cinquefoil | N/A | reproducing population |
| Prunus americana | American plum | N/A | non-reproducing |

George Washington Carver National Monument
Fire Management Plan

| | | | |
|------------------------|---|-----|------------------------|
| Prunus hortulana | Hortulan plum | N/A | reproducing population |
| Prunus serotina | Black cherry | N/A | reproducing population |
| Rosa carolina | Carolina rose | N/A | reproducing population |
| Rosa micrantha | Smallflower sweetbrier | N/A | reproducing population |
| Rosa multiflora | Multiflora rose | N/A | reproducing population |
| Rosa setigera | Climbing rose | N/A | non-reproducing |
| Rubus argutus | Sawtooth blackberry | N/A | reproducing population |
| Rubus flagellaris | Northern dewberry | N/A | reproducing population |
| Rubus occidentalis | Black raspberry | N/A | reproducing population |
| Rubus ostryifolius | Highbush blackberry | N/A | reproducing population |
| Rubus pensilvanicus | Pennsylvania blackberry | N/A | reproducing population |
| Acer negundo | Boxelder | N/A | reproducing population |
| Acer rubrum | Red maple | N/A | reproducing population |
| Acer saccharinum | Silver maple | N/A | reproducing population |
| Acer saccharum | Sugar maple | N/A | reproducing population |
| Ptelea trifoliata | Common hoptree | N/A | non-reproducing |
| Cotinus obovatus | American smoketree | N/A | reproducing population |
| Rhus copallinum | Dwarf sumac | N/A | reproducing population |
| Rhus glabra | Smooth sumac | N/A | reproducing population |
| Toxicodendron radicans | Eastern poison ivy | N/A | reproducing population |

Source(s) of Occurrence Data

NPS, 1993 Data provided by U.S. National Park Service, 1993.
<http://endeavor.des.ucdavis.edu/nps/park.asp?park=USAGWCA0A>

D. Documents (NEPA and NHPA)

Insert here.

E. Supplemental Information

1. Interagency Fire Agreements

a. Missouri Department of Conservation

**MEMORANDUM OF UNDERSTANDING
MUTUAL AID WILDLAND FIRE AGREEMENT
BETWEEN
GEORGE WASHINGTON CARVER NATIONAL MONUMENT
AND
MISSOURI DEPARTMENT OF CONSERVATION**

ARTICLE I. Background and Objectives

The Act of August 8, 1958, 16 U.S.C. § 1b.1; the Act of May 27, 1955, 42 U.S.C. § 1856(a). The Revised Missouri Statutes 1959; Article 4, Section 40(a) of Missouri State Constitution, and Chapter 254

ARTICLE II. Statements of Work

The purpose of this agreement is to set forth the terms and conditions under which the parties hereto will furnish mutual assistance in preventing, detecting and suppressing fires on lands lying within the boundaries of George Washington Carver National Monument or in the Neosho Forest District, and in furnishing search and rescue assistance.

The Superintendent, George Washington Carver National Monument may, when requested by the Missouri Department of Conservation, furnish available fire equipment, rescue equipment and personnel to assist in the suppression of wildfires or to assist in search and rescue operations within the Neosho Forest District.

The Missouri Department of Conservation, when requested by the Superintendent, may furnish available fire equipment, rescue equipment and necessary personnel to assist in the suppression of wildfires or to assist in search and rescue operations within George Washington Carver National Monument.

Each agency shall provide, to the other agency, a list of the responsible persons with their telephone numbers to be contacted in an emergency. Annually, each agency will provide the other agency with an updated list.

Each agency shall provide, to the other agency, copies of appropriate fire management plans including maps of the areas involved and the types of action to be taken. Whenever changes are made to any of these plans, a copy of the revised plan will be forwarded to the other agency.

Nothing in this agreement shall be construed to prevent either agency from suppressing fires on adjacent lands if such fires endanger property in the responding agency's area of responsibility. Either agency, upon discovery of a fire, may upon notifying the other agency, take immediate action to suppress the fire in the other agency's protection zone in order to save life or property.

Should George Washington Carver National Monument personnel provide initial attack, either within or outside the park, all available fire qualified personnel will be utilized under the direction of the highest rated Incident Command System Qualification Cardholder or the Park Superintendent. Upon the arrival of the Missouri Conservation, their Incident Commander will assume overall direction of the fire suppression efforts, and National Park Service personnel will provide support. Due to the small amount of acreage found within the park, it is highly unlikely that a wildfire would go beyond an initial attack. Should a wildfire outside the park extend beyond the first burning period, park personnel will continue to provide support as required by the Missouri Department of Conservation.

Either agency providing training for its own personnel in fire suppression, fire prevention, or search and rescue shall offer training to personnel of the other agency when such opportunities exist.

ARTICLE III. Terms of Agreement

It is understood that each agency waives all claims against the other agency for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement. It is understood that initial attack costs will be borne by the providing agency with the costs of additional forces or prolonged action assumed by the agency on whose land the fire occurred.

This Memorandum of Understanding becomes effective upon approval by both parties and remains in effect for five years or until cancelled in writing by either party upon 60 days notice. At the end of five years, all parties to the agreement shall reassess the benefits derived from this agreement and determine if the agreement shall be extended/renewed for another five years. All parties to the agreement shall meet semiannually to discuss the practical arrangement of this

agreement. The terms of this Memorandum of Understanding may be changed or modified upon mutual agreement of both parties.

ARTICLE IV. Key Officials

This agreement is entered into between the MISSOURI DEPARTMENT OF CONSERVATION, acting by and through the District Forester, Neosho Forest District, Neosho, Missouri, and the NATIONAL PARK SERVICE, acting by and through the Superintendent, George Washington Carver National Monument, Diamond, Missouri.

ARTICLE IX. Required Clauses

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

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

SIGNATURES

IN WITNESS WHEREOF, the parties hereto have executed this agreement on the dates shown below.

MISSOURI DEPARTMENT OF CONSERVATION

**GEORGE WASHINGTON
CARVER NATIONAL
MONUMENT**

/s/
District Forester,
Missouri Department of Conservation

April 4, 1997 --
Date

/s/
Superintendent,
George Washington Carver
National Monument

April 4, 1997
Date

b. Carthage Fire Department

**MEMORANDUM OF UNDERSTANDING MUTUAL AID FIRE AGREEMENT BETWEEN
GEORGE WASHINGTON CARVER NATIONAL MONUMENT AND CARTHAGE FIRE
DEPARTMENT**

Article I. Background and Objectives

Public Law 84-46, 69 Stat. 66, 42 USC 1856 (a) (May 27, 1955), Departmental Manual, 910 DM, Public Law 83-230, 67 Stat. 49E (August 8, 1953), Article 4, Section 40 (a) Missouri State Constitution, Chapter 254 Missouri Revised Statutes.

Article II. Statement of Work

The purpose of this agreement is to set forth the terms and conditions under which the parties hereto will furnish mutual assistance in preventing, detecting and suppressing fires on lands lying within the boundaries of George Washington Carver National Monument or in the Carthage Fire District and providing search and rescue assistance. The Superintendent, George Washington Carver National Monument, may when requested by the Carthage Fire Department, furnish available fire equipment, rescue equipment and personnel to assist in the suppression of wildfire or in search and rescue operations within Jasper or Newton County.

The Carthage Fire Department, when requested by the Superintendent, may furnish fire equipment, rescue equipment and the necessary personnel to assist in the suppression of structural and/or wildland fires operations within the boundaries of George Washington Carver National Monument.

Each agency shall provide to the other agency a list of responsible persons, with their telephone numbers, to be contacted in an emergency. Annually or as necessary, each agency will provide the other agency with an updated list.

The Superintendent, George Washington Carver National Monument, will provide to the Carthage Fire Department an annual familiarization tour of the monuments buildings, and access points.

Each agency shall provide to the other agency copies of appropriate fire management plans including maps of the areas involved and the types of action to be taken.

Whenever changes are made to any of these plans, a copy of the revised plan will be forwarded to the other agency.

Nothing in this agreement shall be construed to prevent either agency from suppressing fires on adjacent lands if such fires endanger property in the responding agency's area of responsibility. Either agency, upon discovery of a fire may upon notifying the other agency, take immediate action to suppress the fire in the other agency's protection zone in order to save life or property.

Should George Washington Carver National Monument personnel provide initial attack either within or outside of the park, all available fire qualified personnel will be utilized. In the case of a wildfire, park personnel will be under the direction of the highest rated Incident Command System Qualification Cardholder or the Park Superintendent; and in the case of a structural fire, under the direction of the parks superintendent or his/her designee. Upon the arrival of the Carthage Fire Department, it's highest ranking officer will assume overall direction of fire suppression efforts, and National Park Service

personnel will provide support. Due to the small amount of acreage within the park, it is highly unlikely that a wildfire within the park would go beyond an initial attack. Should a wildfire outside of the park extend beyond the first burning period, monument personnel will continue to provide support as required by the Carthage Fire Department.

Either agency providing training for its own personnel in fire suppression, fire prevention, or search and rescue shall offer training to personnel of the other agency when such opportunities exist.

Article III. Terms of Agreement

The obligation of the Carthage Fire Department is limited to the sending, upon emergency calls, such men and equipment as, in the sole opinion of the senior Carthage Fire Department Officer on duty, may be available at the time such call is received.

It is understood that each agency waives all claims against the other agency for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement. It is understood that initial attack costs will be borne by the providing agency with the cost of additional forces or prolonged action assumed by the agency on whose land the fire occurred.

Carthage Fire Department for each fire call requested by George Washington Carver National Monument personnel will be through a mutual aid agreement between the Diamond Fire Department and/or the Missouri Department of Conservation.

This Memorandum of Understanding becomes effective upon approval by both parties and remains in effect for five years or until cancelled in writing by either party upon 60 days notice. At the end of five years, all parties to this agreement shall reassess the benefits derived from this agreement and determine if the agreement shall be extended/renewed for another five years. All parties to the agreement should meet annually or when deemed necessary to discuss the practical arrangement of the agreement. The terms of this Memorandum of Understanding may be changed or modified upon mutual agreement of both parties.

Article IV. Key Officials

This agreement is entered into between the Carthage Fire Department, acting by and through the Chief, Carthage Fire Department, and the National Park Service, acting by and through the Superintendent, George Washington Carver National Monument, Diamond, Missouri.

Article VIII. Termination

Either signatory to this agreement may terminate the agreement with 60 days notice in writing.

Article IX. Required Clauses

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

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

Signatures

George Washington Carver National Monument
Fire Management Plan

IN WITNESS WHEREOF, the parties hereto have executed this agreement on the dates shown below.

CARTHAGE FIRE DEPARTMENT

/s/ _____

Carthage Fire Department

4/4/97 _____

Date

GEORGE WASHINGTON CARVER NATIONAL MONUMENT

/s/ _____

Superintendent, George Washington Carver

National Monument

4/4/97 _____

Date

c. Diamond Volunteer Fire Department

**MEMORANDUM OF UNDERSTANDING MUTUAL AID FIRE AGREEMENT
BETWEEN
GEORGE WASHINGTON CARVER NATIONAL MONUMENT
AND
DIAMOND RURAL VOLUNTEER FIRE DEPARTMENT**

Article I. Background and Objectives

Public Law 84-46, 69 Stat. 66, 42 USC 1856 (a)(May 27, 1955), Departmental Manual, 910 DM Public Law 83-230, 67 Stat. 495 (August 8, 1953), Article 4, Section 40 (a) Missouri State Constitution, Chapter 254 Missouri Revised Statutes.

Article II. Statement of Work

The purpose of this agreement is to set forth the terms and conditions under which the parties hereto will furnish mutual assistance in preventing, detecting and suppressing fires on lands lying within the boundaries of George Washington Carver National Monument or within the Neosho Forest District and in providing search and rescue assistance.

The Superintendent, George Washington Carver National Monument, may when requested by the Diamond Rural Fire Department, furnish available fire equipment, rescue equipment and personnel to assist in the suppression of wildfires or in search and rescue operations within the Neosho Forest District.

The Diamond Rural Fire Department, when requested by the Superintendent, may furnish fire equipment, rescue equipment and the necessary personnel to assist in the suppression of wildfires and structural fires and in search and rescue operations within George Washington Carver National Monument.

Each agency shall provide to the other agency a list of responsible persons, with their telephone numbers, to be contacted in an emergency. Annually, each agency will provide the other agency with an updated list.

Each agency shall provide to the other agency, copies of appropriate fire management plans including maps of the areas involved and the types of action to be taken.

Whenever changes are made to any of these plans, a copy of the revised plan will be forwarded to the other agency.

Nothing in this agreement shall be construed to prevent either agency from suppressing fires on adjacent lands if such fires endanger property in the responding agency's area of responsibility. Either agency, upon discovery of a fire may upon notifying the other agency, take immediate action to suppress the fire in the other agency's protection zone in order to save life or property. Should George Washington Carver National Monument personnel provide initial attack either within or outside of the park, all available fire qualified personnel will be utilized. In the case of a wildfire, they will be under the direction of the highest rated Incident Command System Qualification Cardholder or the Park Superintendent; and in the case of a structural fire, under the direction of the park's structural fire coordinator. Upon the arrival of the Diamond Rural Fire Department, their

highest ranking officer will assume overall direction of fire suppression efforts, and National Park Service personnel will provide support. Due to the small amount of acreage within the park, it is highly unlikely that a wildfire within the park would go beyond an initial attack. Should a wildfire outside of the park extend beyond the first burning period, park personnel will continue to provide support as required by the Diamond Rural Fire Department.

Either agency providing training for its own personnel in fire suppression, fire prevention, or search and rescue shall offer training to personnel of the other agency when such opportunities exist.

Article III. Terms of Agreement

It is understood that each agency waives all claims against the other agency for compensation for any loss, damage, personal injury, or death occurring in consequence of the performance of this agreement. It is understood that initial attack costs will be borne by the providing agency with the cost of additional forces or prolonged action assumed by the agency on whose land the fire occurred.

This Memorandum of Understanding becomes effective upon approval by both parties and remains in effect for five years or until cancelled in writing by either party upon 60 days notice. At the end of five years, all parties to this agreement shall reassess the benefits derived from this agreement and determine if the agreement shall be extended/renewed for another five years. All parties to the agreement shall meet semiannually to discuss the practical arrangement of the agreement. The terms of this Memorandum of Understanding may be changed or modified upon mutual agreement of both parties.

Article IV. Key Officials

This agreement is entered into between the Diamond Rural Fire Department, acting by and through the Chief, Diamond Rural Fire Department, and the National Park Service, acting by and through the Superintendent, George Washington Carver National Monument, Diamond, Missouri.

Article V. Termination

Either signatory to this agreement may terminate the agreement with 60 days notice in writing.

Article VI. Required Clauses

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

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

IN WITNESS WHEREOF, the parties hereto have executed this agreement on the dates shown below.

DIAMOND RURAL FIRE DEPARTMENT

GEORGE WASHINGTON CARVER
NATIONAL MONUMENT

George Washington Carver National Monument
Fire Management Plan

Chief
Diamond Rural Fire Department

Superintendent
George Washington Carver National
Monument

Date

Date

2. Area NPS Fire Agreement

Interpark Agreement
Between:

Ozark National Scenic Riverways Fire Management
and
Effigy Mounds National Monument
Fort Larned National Historic Site
Fort Scott National Historic Site
George Washington Carver National Monument
Harry S Truman National Historic Site
Herbert Hoover National Historic Site
Jefferson National Expansion Memorial
Ulysses S. Grant National Historic Site, and
Wilson's Creek National Battlefield

ARTICLE I. PURPOSE

The FIREPRO process arranges for the funding of the fire staff to support the eight National Park Service units listed above. This grouping is known as the Ozark Fire Management Cluster (OZAR). These positions will be referred to in this document collectively as the "Fire Staff". The purpose of this agreement is to define the mutual responsibilities of the Fire Staff and staffs from the National Park Service units listed above in Missouri, Iowa, Kansas and Illinois in terms of fire management activities.

At certain times of the year, accomplishment of specific fire management objectives (FIREPRO budget submission, project planning, fire management planning, wildfire suppression, preparedness, capitalized equipment request, training request, prescribed fire/fuels planning and implementation) requires expertise and time allocations that may not be fully available in each of the non-firepro staffed parks. The establishment of a Ozark Fire Management Cluster alleviates this situation where the permanent Fire Management Officer and fire staff at Ozark National Scenic Riverways are made available to provide technical and professional assistance to the listed above parks in Missouri, Iowa, Kansas and Illinois. This provides greater capability for each park to fully complete their fire management planning and implement the desired fire management program.

ARTICLE II. RESPONSIBILITIES

The duties of the Fire Staff will include providing professional and technical support for the fire management programs at all Ozark Fire Management Cluster units.

A. Specific responsibilities of the Fire Management Staff include:

George Washington Carver National Monument
Fire Management Plan

1. Assist in the development and implementation of wildland fire prevention, preparedness, suppression, and aviation programs through site visits, program reviews, inspections, and other staff work.
 2. Assist in coordination of fire-related reports, correspondence, preparation and/or review of fire management plans, and aviation plans. Participate in other fire management planning as requested.
 3. Assist in coordination and implementation of prescribed fire programs, fuel treatments, Wildland Urban Interface Initiative and community assistance programs.
 4. Coordinate, through appropriate zone coordination centers, mobilization of National Park Service personnel for fire assignments.
 5. Develop, coordinate, and conduct fire-related training as necessary to meet wildland fire needs of the units and interagency needs according to approved fire management plans, and local and national guidelines.
 6. Manage fire qualification and training records in the Shared Applications Computer System (SACS), including: initial record input; updating fitness scores, training, experience, and issue incident qualification cards. The Fire Staff will provide an annual timetable to each unit fire coordinator for transferring the information to the Fire Program Assistant so that it can be input into the SACS.
 7. Communicate with respective units on issues and concerns prior to representing the Ozark Fire Cluster at meetings, conferences, seminars and other functions as requested and required.
 8. Coordinate National Park Service role in the interagency fire community; developing interagency agreements, cooperative agreements, and other agreements necessary for carrying out wildland fire management.
 9. Prepare, review and return for approval prescribed fire plans developed for each park.
 10. Assist with implementation of prescribed fire including providing staff and coordinating fire resources for project preparation and execution.
- B. Responsibilities of the superintendents of the Ozark Fire Management Cluster include:
1. Make requests for assistance through the fire management office with sufficient lead-time to meet due dates and set-up meetings. Each unit superintendent will designate a unit fire coordinator who requests program assistance, budget, and training needs through the Fire Management Officer.
 2. Submit fire experience and fire training records (using the EZ form), physical fitness scores, physical exam results (pass or fail), individual fire reports (DI-1202), availability reports, and situation reports, following established times and due dates. Unit fire coordinators will be

George Washington Carver National Monument
Fire Management Plan

responsible for maintaining fire readiness to the level identified in the park's fire management plan.

3. Notify the Fire Staff as soon as practical of any fire restrictions, closures, or fire occurrences.
4. Participate in the overall fire management of the Missouri, Iowa, Kansas and Illinois units of the National Park Service by committing to sharing of training and available personnel upon request.
5. The Chief Ranger of Ozark National Scenic Riverways will be the official supervisor of the Fire Management Officer (FMO). The other Superintendents will also work closely with the FMO and will provide input to the Ozark National Scenic Riverways' Chief Ranger for the FMO's performance appraisal.

ARTICLE III. WORK GROUP

The Fire Management Staff Officer will facilitate a Fire Management Work Group, which meets at least once a year to review budget inputs prior to submission, review the Interpark Agreement, and prioritize work plan activities. The Work Group will be composed of the Fire Coordinators from the park units covered by this Agreement and the fire staff for the Ozark Fire Management Cluster.

ARTICLE IV. FUNDING

Program costs (e.g. travel/per diem, communication, supplies and materials) incurred by the Fire Staff will be charged to FIREPRO accounts. In addition, any costs associated with the work group may be funded through FIREPRO accounts assigned to each park unit. If personnel are working on a project which has been individually funded, such as a prescribed fire, the overtime and travel costs for personnel may be paid from the appropriate project funds. The annual budget request will be reviewed and concurred with by the Work Group so that any supplemental requests, i.e.: physical exams, personal protective equipment, training, cache items, capital equipment, and hazard fuel reduction projects, are reflected in the annual budget request.

ARTICLE V. LOCATION OF THE FIRE STAFF

While it needs to be clear that the fire staff serves all eight parks, they will be located at Ozark National Scenic Riverways.

ARTICLE VI. TERM OF AGREEMENT

The term of this Agreement will be 5 years, beginning in fiscal year 2003. It is renewable at the end of each five-year period by written letter of agreement signed by each of the superintendents of the Ozark Fire Management Cluster.

George Washington Carver National Monument
Fire Management Plan

This agreement will be reevaluated yearly between the parks and the fire management staff at the annual program review and evaluation.

Amendments to this Agreement can be made at any time subject to the written concurrence and approval of all superintendents. Participating parks may withdraw from this agreement at anytime by formally notifying the Ozark National Scenic Riverways Superintendent.

This agreement does not make any commitments by any of the parks concerning structure, assignment or designation of positions within the Ozark Fire Management Cluster. That restructuring process will continue to evolve as a separate process and is not bound by this agreement.

Superintendent
Effigy Mounds National Monument

Date _____

Superintendent
Fort Larned National Historic Site

Date _____

Superintendent
Fort Scott National Historic Site

Date _____

Superintendent
George Washington Carver National Monument

Date _____

Superintendent
Harry S. Truman National Historic Site

Date _____

Superintendent
Herbert Hoover National Historic Site

Date _____

Superintendent
Jefferson National Expansion Memorial
& Ulysses S. Grant National Historic Site

Date _____

George Washington Carver National Monument
Fire Management Plan

Superintendent
Wilson's Creek National Battlefield

Date _____

Superintendent
Ozark National Scenic Riverways

Date _____

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3. Fire Call-Up List

| Name | Qualifications | Telephone |
|---------------|------------------|---------------------|
| Dena Matteson | Resource Advisor | 417-325-4151 (work) |

4. Preparedness Inventory

| Fire equipment | Number | Comments |
|-------------------------------|---------------|-----------------|
| Air Mattress | 1 | |
| Axe | 2 | |
| Backpacks (yellow) | 3 | |
| Belt Pack (yellow) | 1 | |
| Belts (green) | 6 | |
| Booster Hose | 1 | |
| Chaps | 3 | |
| Collars ? | 7 | |
| Face Masks | 5 | |
| Fire Handbook (1989) | 1 | |
| Fire Pants 34 x 30 | 2 | |
| Fire Pants 26 x30 | 1 | |
| Fire Pants 28 x 34 | 2 | |
| Fire Pants 30 inch | 1 | |
| Fire Pants 30 x 30 | 1 | |
| Fire Pants 32 inch | 1 | |
| Fire Pants 32 x 30 | 1 | |
| Fire Pants 32 x 34 | 2 | |
| Fire Pants 34 x 34 | 2 | |
| Fire Pants 36 inch | 2 | |
| Fire Pants 36 x 34 | 2 | |
| Fire Pants 38 x 30 | 1 | |
| Fire Pants 38 x 34 | 1 | |
| Fire Pants 40 x 30 | 1 | |
| Fire Pants 40 x 32 | 0 | |
| Fire Pants 40 x 34 | 1 | |
| Fire Pants size 8 | 1 | |
| Fire Shelter | 1 | |
| Fire Swatter | 3 | |
| First Aid Kits | 3 | *1open |
| Goggles | 8 | |
| Helmets w/ Lights | 2 | |
| Jackets (yellow) large | 1 | |
| Jackets (yellow) med | 1 | |
| Jackets (yellow) small | 0 | |
| Jackets (yellow) xl | 0 | |
| McCloud rake | 2 | |
| Nozzles | 10 | |
| Personal Gear Packs (red) | 5 | |

George Washington Carver National Monument
Fire Management Plan

| | | |
|--------------------------------|----|--------------------|
| Pitch Fork Rake | 1 | |
| Pulaski | 2 | |
| Sack for belt (yellow & small) | 13 | |
| Shirts Yellow 14.5 x 32 small | 2 | |
| Shirts Yellow 15.5 x 33 med | 7 | |
| Shirts Yellow 16.5 x 34 large | 5 | |
| Shirts Yellow 17.5 x 35 xl | 5 | |
| Sleeping Bag (green) | 1 | |
| Water bag 4qt (yellow) | 1 | |
| Water Bag w/ nozzle (black) | 5 | 5 *1 missing parts |
| Water Bag w/ nozzle (yellow) | 5 | 5 *2 missing parts |
| Water bottle holders (white) | 13 | |
| Water bottles | 7 | |
| Water sack (plastic) | 3 | |
| Water tank (metal) | 2 | *very old looking |

5. Agency and Interagency Contacts

George Washington Carver National Monument

5646 Carver Road, Diamond, MO 64840-8314

Phone: 417-325-4151

| Name | Work Phone |
|--|--------------------------|
| Scott Bentley Superintendent | 417-325-4151 |
| Lana Henry Chief Park Ranger | 417-325-4151 |
| Dena Matteson Park Ranger (Resource Management) | 417-325-4151 |
| Angela Smith Area Fire Prevention/Education Specialist | 573-323-8092 |
| Bobby Bloodworth Area Fire Management Officer | 573-323-4236, ext 225 |
| Vacant Area Fire Ecologist | 573-323-8248 |
| Fred Bird Regional Fire Management Officer | 402-221-3475 |

Cooperating Agencies

| Organization | Phone | Address |
|---|------------------------------|--|
| Missouri-Iowa Interagency Dispatch Center | 573-341-7455 573-341-7484 | 401 Fairgrounds Road Rolla, MO 65401 |
| Missouri Department of Conservation | 417-451-4158 | 1510 South U.S. 71 Neosho MO 64850 |
| National Weather Service | 417-869-4491 | 5805 West Highway EE Springfield, MO 65802-8400 |
| Diamond Volunteer Fire Department | 417-325-7112 | 301 E Market St Diamond, MO 64840-7211 |
| Carthage Fire Department | 417-237-7100 | 401 West Chestnut Carthage, MO |

F. Wildland and Prescribed Fire Monitoring Plan

This plan is under development and will be inserted when approved

G. Pre-Attack Plan

There is no Pre-Initial Attack Plan for the park. All initial attack and pre-attack planning is done by the Missouri Department of Conservation.

George Washington Carver National Monument
Fire Management Plan

H. Long-Term Prescribed Fire and Hazard Fuel Reduction Plan

| <i>Fisca Year</i> | <i>Burn Unit Name</i> | <i>Acres Total</i> | <i>Acres Grassland</i> | <i>Acres Woods</i> | <i>Project Type</i> | <i>Project Classification</i> |
|-----------------------|--|------------------------|----------------------------|------------------------|---------------------|-------------------------------|
| 2005 | Unit 4/South Central Carver Branch | 21 | 11 | 10 | RX Burn | Hazard Fuel Reduction |
| 2005 | Unit 1 | 4 | 4 | 0 | RX Burn | Hazard Fuel Reduction |
| 2005 | Unit 2 | 3.5 | 3 | 0.5 | RX Burn | Hazard Fuel Reduction |
| 2005 | 7/East Carver Branch/North Central Carver Branch | 82 | 51 | 31 | RX Burn | Hazard Fuel Reduction |
| Totals | | 110.5 | 69 | 41.5 | | |
| 2006 | Unit 4/South Central Carver Branch | 21 | 11 | 10 | RX Burn | Hazard Fuel Reduction |
| 2006 | Unit 5 | 42 | 42 | 0 | RX Burn | Hazard Fuel Reduction |
| 2006 | Unit 3 | 3 | 3 | 0 | RX Burn | Hazard Fuel Reduction |
| 2006 | Unit 6/West Carver Branch | 17 | 15 | 2 | RX Burn | Hazard Fuel Reduction |
| 2006 | Unit 7b/Southeast Carver Branch | 5 | 3 | 2 | RX Burn | Hazard Fuel Reduction |
| Totals | | 67 | 63 | 4 | | |
| 2007 | 7/East Carver Branch/North Central Carver Branch | 82 | 51 | 31 | RX Burn | Hazard Fuel Reduction |
| 2007 | Unit 1 | 4 | 4 | 0 | RX Burn | Hazard Fuel Reduction |
| 2007 | Unit 2 | 3.5 | 3 | 0.5 | RX Burn | Hazard Fuel Reduction |
| 2007 | Unit 8/Harkin's Area | 4.5 | 1.5 | 3 | RX Burn | Hazard Fuel Reduction |
| Totals | | 94 | 59.5 | 34.5 | | |
| 2008 | Repeat 2005 | | | | | |
| 2008 | Unit 4/South Central Carver Branch | 21 | 11 | 10 | RX Burn | Hazard Fuel Reduction |
| 2008 | Unit 5 | 42 | 42 | 0 | RX Burn | Hazard Fuel Reduction |
| 2008 | Unit 3 | 3 | 3 | 0 | RX Burn | Hazard Fuel Reduction |
| 2008 | Unit 6/West Carver Branch | 17 | 15 | 2 | RX Burn | Hazard Fuel Reduction |
| 2008 | Unit 7b/Southeast Carver Branch | 5 | 3 | 2 | RX Burn | Hazard Fuel Reduction |
| Totals | | 67 | 63 | 4 | | |
| 2009 | Repeat 2006 | | | | | |
| 2009 | 7/East Carver Branch/North Central Carver Branch | 82 | 51 | 31 | RX Burn | Hazard Fuel Reduction |
| 2009 | Unit 1 | 4 | 4 | 0 | RX Burn | Hazard Fuel Reduction |
| 2009 | Unit 2 | 3.5 | 3 | 0.5 | RX Burn | Hazard Fuel Reduction |
| 2009 | Unit 8/Harkin's Area | 4.5 | 1.5 | 3 | RX Burn | Hazard Fuel Reduction |
| Totals | | 94 | 59.5 | 34.5 | | |

I. Fire Prevention Plan

At this time the park does not perceive a need for a Fire Prevention Plan

J. Rental Equipment Agreements

No rental equipment agreements exist at this time.

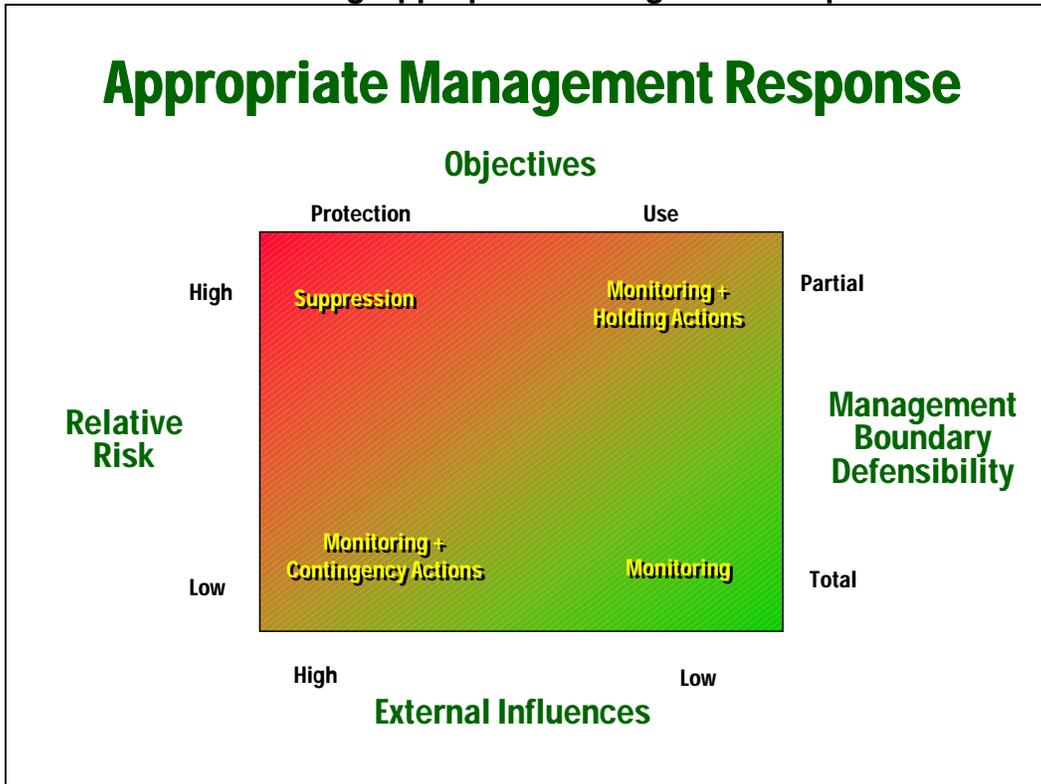
K. Contracts for Suppression and Prescribed Fire Resources

No contracts for suppression or prescribed fire resources exist at this time.

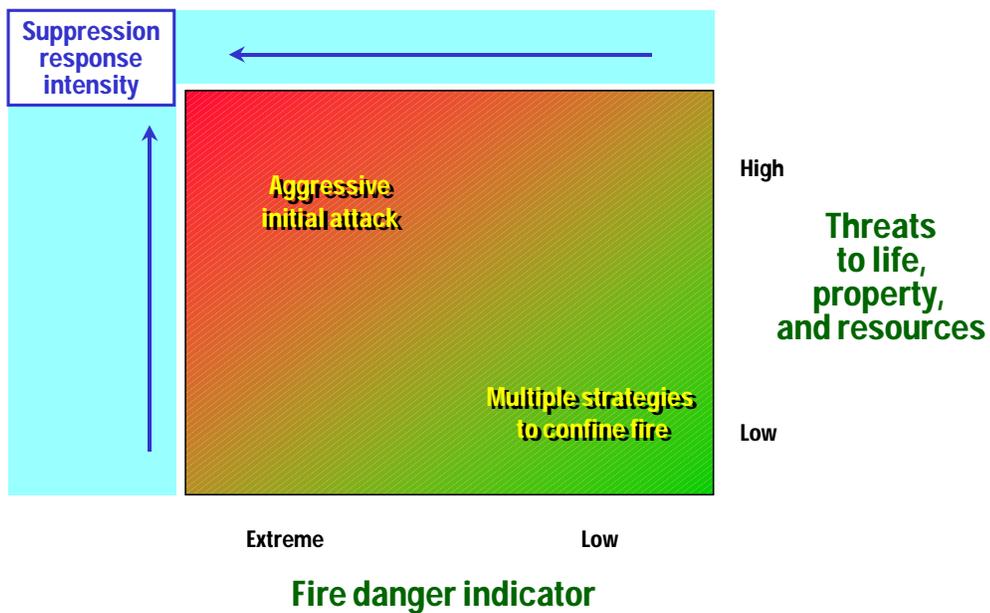
L. Burned Area Emergency Stabilization and Rehabilitation Plan

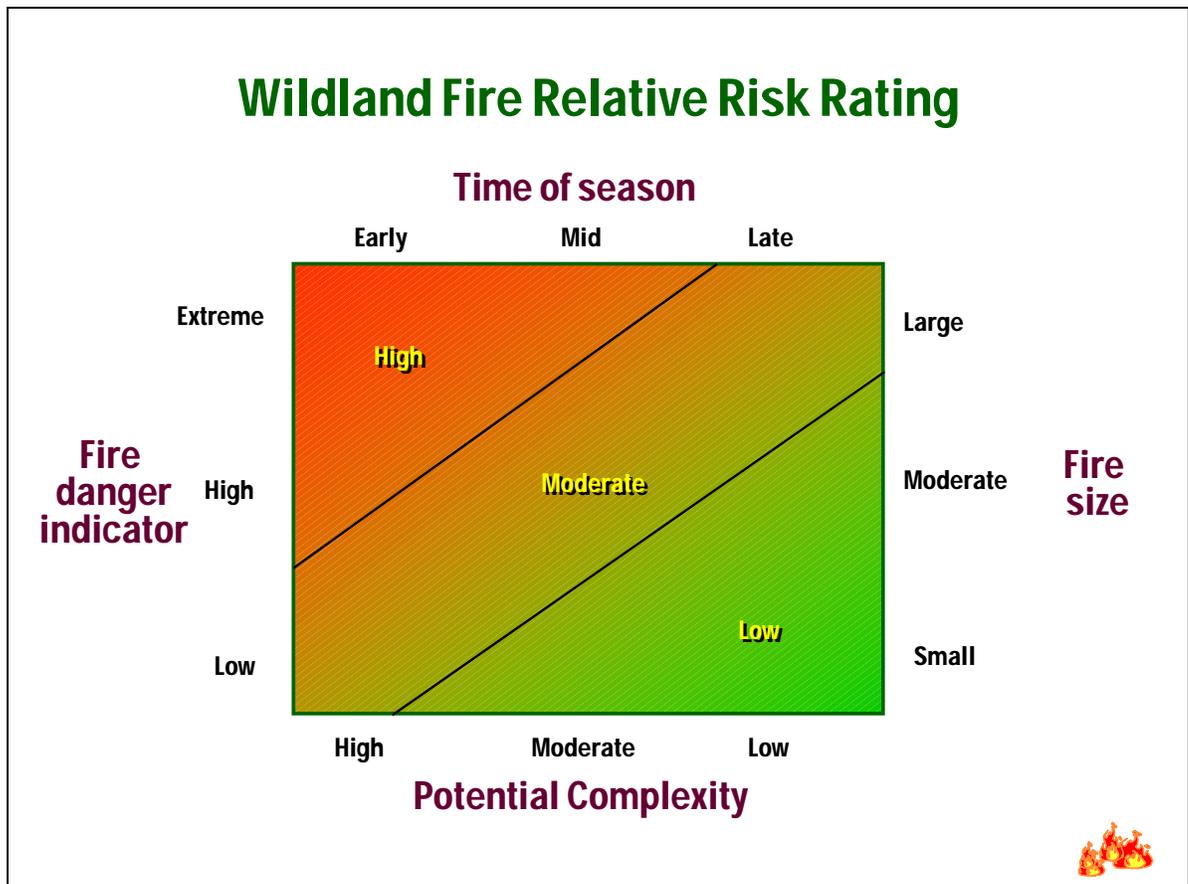
A separate plan does not exist at this time. Initial actions and procedures are described in Rehabilitation Guidelines (IV,B,8) and are further described in [DOI BAER Policy \(2001\)](#).

M. Charts For Determining Appropriate Management Response



Appropriate Management Response





Zimmerman, G. & Bunnell, D. 1998. Wildland and Prescribed Management Policy – Implementation Procedures Reference Guide
http://www.fs.fed.us/fire/fireuse/wildland_fire_use/ref_guide/refguide.doc

N. Wildland Fire Situation Analysis (WFSA)

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

- A. Jurisdiction(s):** *Assign the agency or agencies that have or could have fire protection responsibility, e.g., USFWS, BLM, etc.*
- B. Geographic Area:** *Assign the recognized "Geographic Coordination Area" the fire is located in, e.g., Northwest, Northern Rockies, etc.*
- C. Unit(s):** *Designate the local administrative unit(s), e.g., Hart Mountain Refuge Area, Flathead Indian Reservation, etc.*
- D. WFSA #:** *Identify the number assigned to the most recent WFSA for this fire.*
- E. Fire Name:** *Self-explanatory.*
- F. Incident #:** *Identify the incident number assigned to the fire.*
- G. Accounting Code:** *Insert the local unit's accounting code.*
- H. Date/Time Prepared:** *Self-explanatory.*
- I. Attachments:** *Check here to designate items used to complete the WFSA. "Other could include data or models used in the development of the WFSA. Briefly describe the "other" items used.*

| | |
|--|--------------------|
| I. Wildland Fire Situation Analysis | |
| <i>To be completed by the Agency Administrator(s)</i> | |
| A. Jurisdiction(s) | B. Geographic Area |
| C. Unit(s) | D. WFSA # |
| E. Fire Name | F. Incident # |
| G. Accounting Code: | |
| H. Date/Time Prepared _____ @ _____ | |
| I. Attachments | |
| <ul style="list-style-type: none"> - Complexity Matrix/Analysis * - Risk Assessment/Analysis * <ul style="list-style-type: none"> Probability of Success * Consequences of Failure * - Maps * - Decision Tree ** - Fire Behavior Projections * - Calculations of Resource Requirements * - Other (specify) <p>*Required</p> <p>**Required by FWS</p> | |

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

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

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

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

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

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

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

II. Objectives and Constraints

To be Completed by the Agency Administrator(s)

A. Objectives (Must be specific and measurable)

1. Safety

- Public

- Firefighter

2. Economic

3. Environmental

4. Social

5. Other

B. Constraints

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

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

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

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

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

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

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

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

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

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

George Washington Carver National Monument
Fire Management Plan

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

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

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

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

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

George Washington Carver National Monument
Fire Management Plan

| | | | |
|------------------------------------|--|--|--|
| Water | | | |
| Wilderness | | | |
| Wildlife | | | |
| Other (specify) | | | |
| <i>Sum of Economic Values</i> | | | |
| <i>Environmental</i> | | | |
| Air | | | |
| Visual | | | |
| Fuels | | | |
| T & E Species | | | |
| Other (specify) | | | |
| <i>Sum of Environmental Values</i> | | | |
| <i>Social</i> | | | |
| Employment | | | |
| Public Concern | | | |
| Cultural | | | |
| Other (Specify) | | | |
| <i>Sum of Social Values</i> | | | |
| <i>Other</i> | | | |

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

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

B. Pertinent Data: Data for this Section has already been presented, and is duplicated here to help the Agency Administrator(s) confirm their selection of an

alternative. Final Fire Size is displayed in Section III.D. Complexity is calculated in the attachments and displayed in Section III.H. Costs are displayed on page 4. Probability of Success/Consequences of Failure is calculated in the attachments and displayed in Section III.G.

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

Section IV. Decision

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

| V. Analysis Summary | | | |
|---|---|---|---|
| <i>To be Completed by the Agency Administrator(s) and Fire Manager / Incident Commander</i> | | | |
| Alternatives | A | B | C |
| A. Compliance with Objectives | | | |
| Safety | | | |
| Economic | | | |
| Environmental | | | |
| Social | | | |
| Other | | | |
| B. Pertinent Data | | | |
| Final Fire Size | | | |
| Complexity | | | |
| Suppression Cost | | | |
| Resource Values | | | |
| Probability of Success | | | |
| Consequences of Failure | | | |

C. External / Internal Influences

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

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

VI. Decision

The Selected Alternative is:

Rationale:

Agency Administrator's Signature

Date/Time

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

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

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

| VIII. Daily Review | | | | | | | | | |
|--|------|----|---|--|--|---|---|---|--|
| <i>To be completed by the Agency Administrator(s) or Designate</i> | | | | | | | | | |
| Selected to be reviewed daily to determine if still valid until containment or control | | | | | | | | | |
| | | | P R E P A R E D N E S S L E V E L | I N C I D E N T P R I O R I T Y | R E S O U R C E A V A I L A B I L I T Y | W E A T H E R F O R E C A S T | F I R E B E H A V I O R P R O J E C T I O N S | W F S A V A L I D | |
| Date | Time | By | | | | | | | |
| | | | | | | | | | |

are negative, and there are fewer than three positive responses in the primary factors (A-G), a Type II team should be considered. If the answers to all questions in H are negative, it may be advisable to allow the existing overhead to continue action on the fire.

GLOSSARY OF WFSA TERMS

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

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

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

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

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

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

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

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

FIRE COMPLEXITY ANALYSIS

A. FIRE BEHAVIOR: Observed or Predicted

Yes/No

1. Burning Index (from on-site measurement of weather conditions predicted to be above the 90% level using the major fuel model in which the fire is burning.

- | | | |
|---|-----|-----|
| 2. Potential exists for "blowup" conditions (fuel moisture, winds, etc.). | ___ | ___ |
| 3. Crowning, profuse or long-range spotting. | ___ | ___ |
| 4. Weather forecast indicating no significant relief or worsening conditions. | ___ | ___ |
| Total: | ___ | ___ |

B. RESOURCES COMMITTED

- | | | |
|---|-----|-----|
| 1. 200 or more personnel assigned. | ___ | ___ |
| 2. Three or more divisions. | ___ | ___ |
| 3. Wide variety of special support personnel. | ___ | ___ |
| 4. Substantial air operation which is not properly staffed. | ___ | ___ |
| 5. Majority of initial attack resources committed. | ___ | ___ |
| Total | ___ | ___ |

C. RESOURCES THREATENED

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

D. SAFETY

- | | | |
|---|-----|-----|
| 1. Unusually hazardous fire line conditions. | ___ | ___ |
| 2. Serious accidents or facilities. | ___ | ___ |
| 3. Threat to safety of visitors from fire and related operations. | ___ | ___ |

- | | | |
|--|-----|-----|
| 4. Restricted and/or closures in effect or being considered. | ___ | ___ |
| 5. No night operations in place for safety reasons. | ___ | ___ |
| Total | ___ | ___ |

E. OWNERSHIP

Yes/No

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

F. EXTERNAL INFLUENCES

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

G. CHANGE IN STRATEGY

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

H. EXISTING OVERHEAD

- | | | |
|---|-----|-----|
| 1. Worked two operational periods without achieving initial objectives. | ___ | ___ |
|---|-----|-----|

- | | | |
|--|-----|-----|
| 2. Existing management organization ineffective. | ___ | ___ |
| 3. IMT overextended themselves mentally and/or physically. | ___ | ___ |
| 4. Incident action plans, briefings, etc., missing or poorly prepared. | ___ | ___ |
| Total | ___ | ___ |

Signature_____

Date_____ Time_____

O. Limited Delegation of Authority

LIMITED DELEGATION OF AUTHORITY

To: _____, Incident Commander

From: Superintendent, George Washington Carver National Monument

Subject: Limited Delegation of Authority

As of _____ hours, on this date _____, I have delegated limited authority to manage the _____ fire in the George Washington Carver National Monument.

As Superintendent I have ultimate responsibility for protection of the George Washington Carver National Monument's resources and the lives of the 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, visitor, resident and neighbor safety.
2. I would like the fire managed using the most appropriate strategy that foremost considers, safety, economic cost, and probability of success and consequences of failure. The selected strategy should be implemented using minimum impact management tactics.

3. Key cultural features requiring priority protection are:

4. Key resource considerations are:

5. Restrictions for suppression actions are: no tracked or wheeled vehicles in the following areas:

except when human life is at immediate risk. Helicopters, powersaws, portable pumps, and leaf blowers may be used as required. Chemical retardant is authorized as stipulated in the 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 park consistent with public safety.

Superintendent, George Washington Carver National Monument

Date

P. Minimum Impact Suppression Tactics Guidelines

General Discussion

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

Also refer to RM-18, Chapter 9, Exhibit 5

Tactical Standards

- Taking advantage of natural barriers, rock outcrops, trails, roads, and streams will minimize Fireline construction, 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. The last person to leave the area will remove flagging.
- All equipment and debris will be removed from the area for proper disposal.
- Before leaving the fire, rehabilitation will be completed to eliminate impacts from the suppression effort.

Restoration of Fire Area

- Backfill cup trenches and scarify wide firelines.
- Construct waterbars to prevent erosion.
- Place “boneyards” in a natural or random arrangement.
- Position cut ends of logs so as to be inconspicuous to visitors and camouflage where possible.
- Flush cut stumps, camouflage with soil and moss.

Aircraft

Helicopters

- Minimize use.
- Restore helispots.

Retardant Aircraft

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

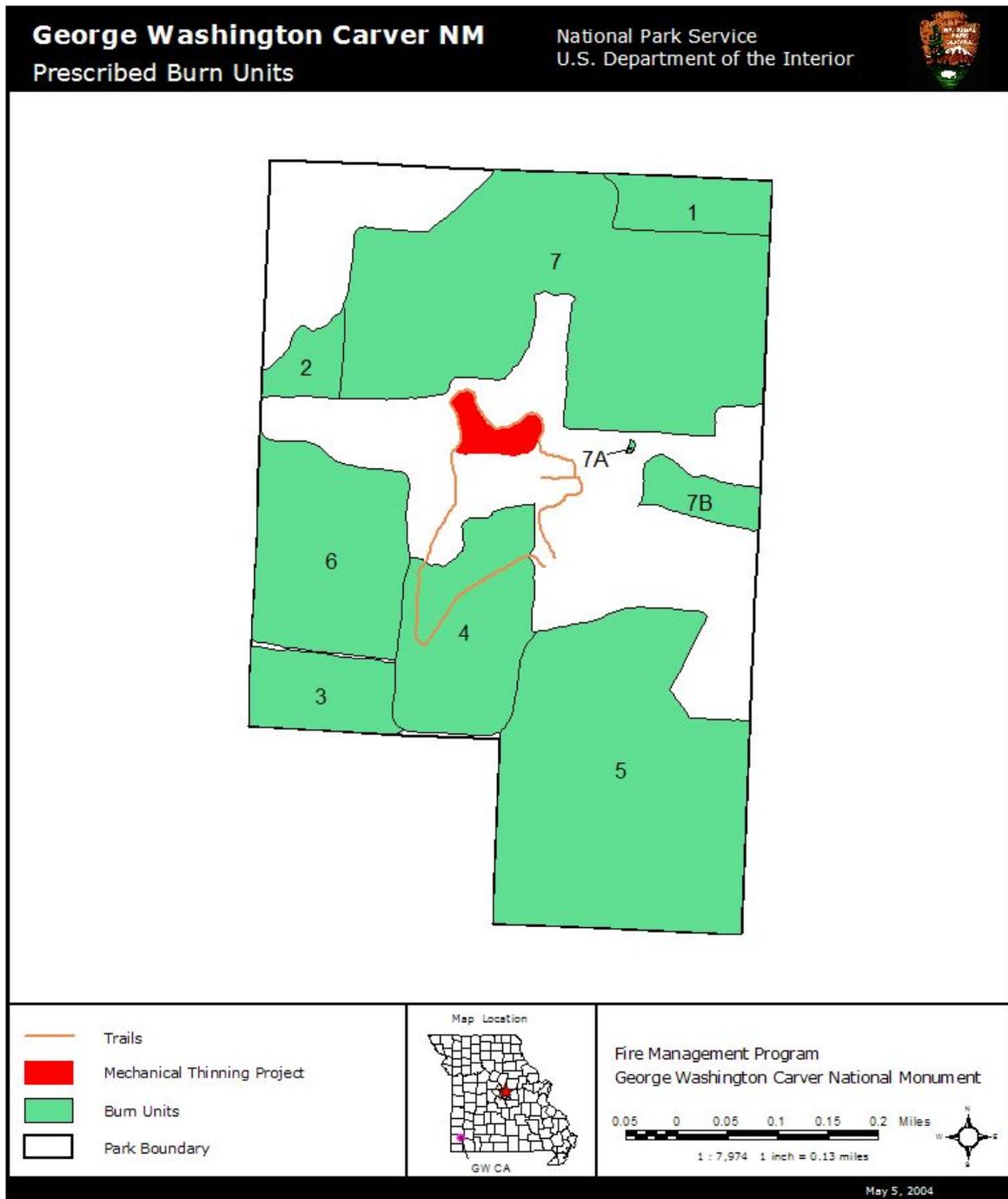
Q. Step-Up Staffing Plan

| | | |
|--|--|--|
| <p>Low Fire Danger</p> | <p>Open burning is usually safe with proper containers and precautions under low fire danger conditions. However, residents should always check on local ordinances that prohibit open burning under any conditions. Escaped fires are easy to extinguish. No fire crew staffing is planned for low fire danger conditions.</p> | <p>Burning index <20.</p> |
| <p>Moderate Fire Danger</p> | <p>Open burning is usually safe with the proper precautions under moderate fire danger conditions. Burning should be done in the early morning and late evening to avoid windier conditions at midday. Escaped fires can be contained with proper fire-fighting equipment. Partial fire crew staffing is planned for moderate fire danger.</p> | <p>Burning index = 21-30.</p> |
| <p>High Fire Danger</p> | <p>Any open burning is discouraged during high fire danger. Windy conditions, low humidity and dry fuels contribute to high fire danger. Fires escape control easily and containment is difficult, endangering human safety and property. Partial or full fire staffing is planned, depending on local burning conditions.</p> | <p>Burning index = 31-45.</p> |
| <p>Extreme Fire Danger</p> | <p>Open burning should not be attempted during extreme fire danger. Local authorities may impose burning bans. High winds and extended dry periods lead to extreme burning conditions. Open fires can quickly escape and are very difficult to control. Spot fires occur ahead of the main fire, and erratic burning conditions make fires difficult to control even for experienced fire fighters. Full fire crew staffing is planned for extreme burning conditions.</p> | <p>Burning index >45.</p> |

Missouri Department of Conservation [Fire Danger Adjectives](#)

At preparedness levels IV and V the park will initiate public awareness actions in order to help make park visitors and the public aware of the high fire danger. These actions may include press releases, posting bulletin boards, including message in interpretive talks and presentations, and interagency messages designed to increase public awareness.

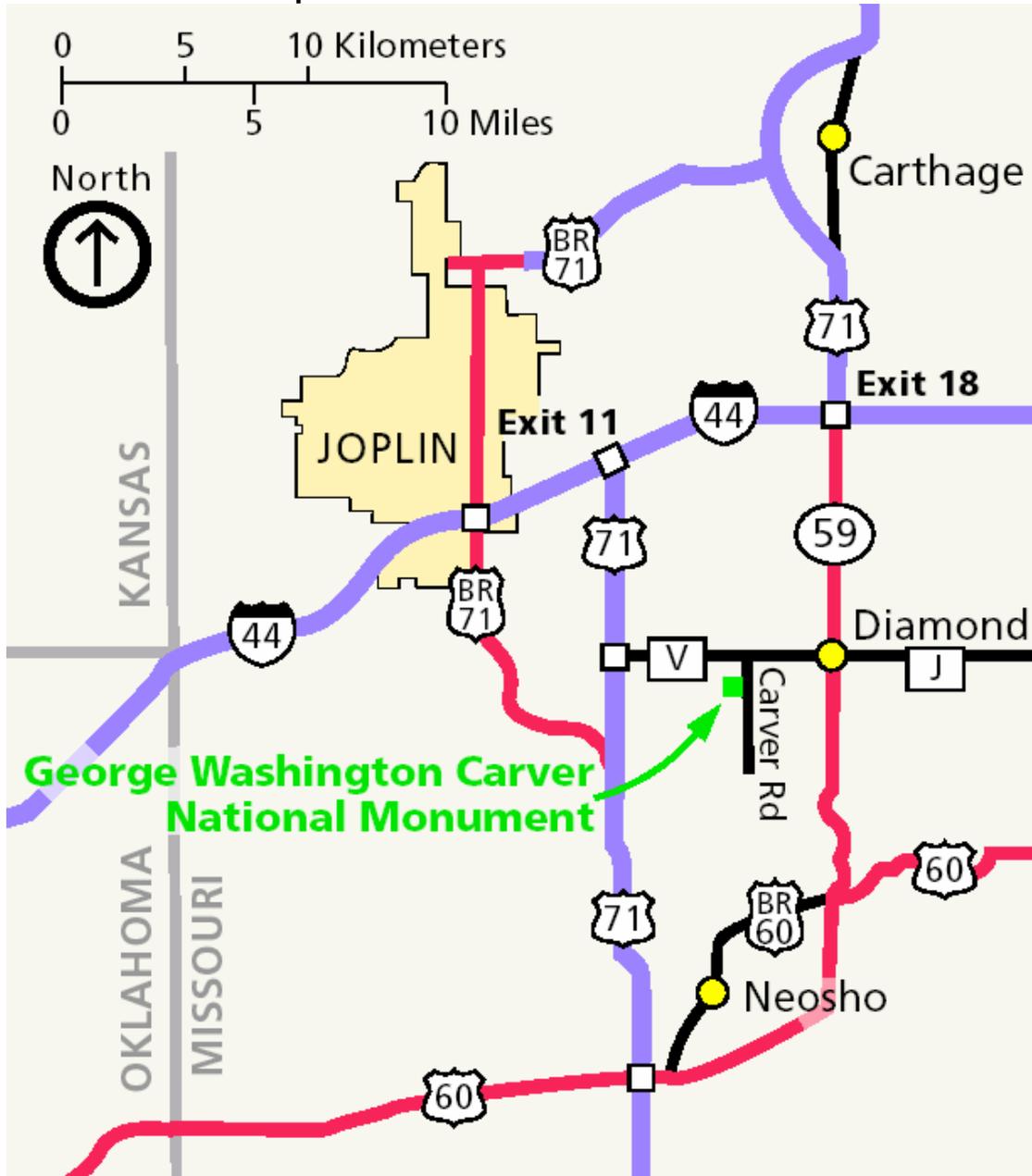
R. Historic Fuels Treatment Map



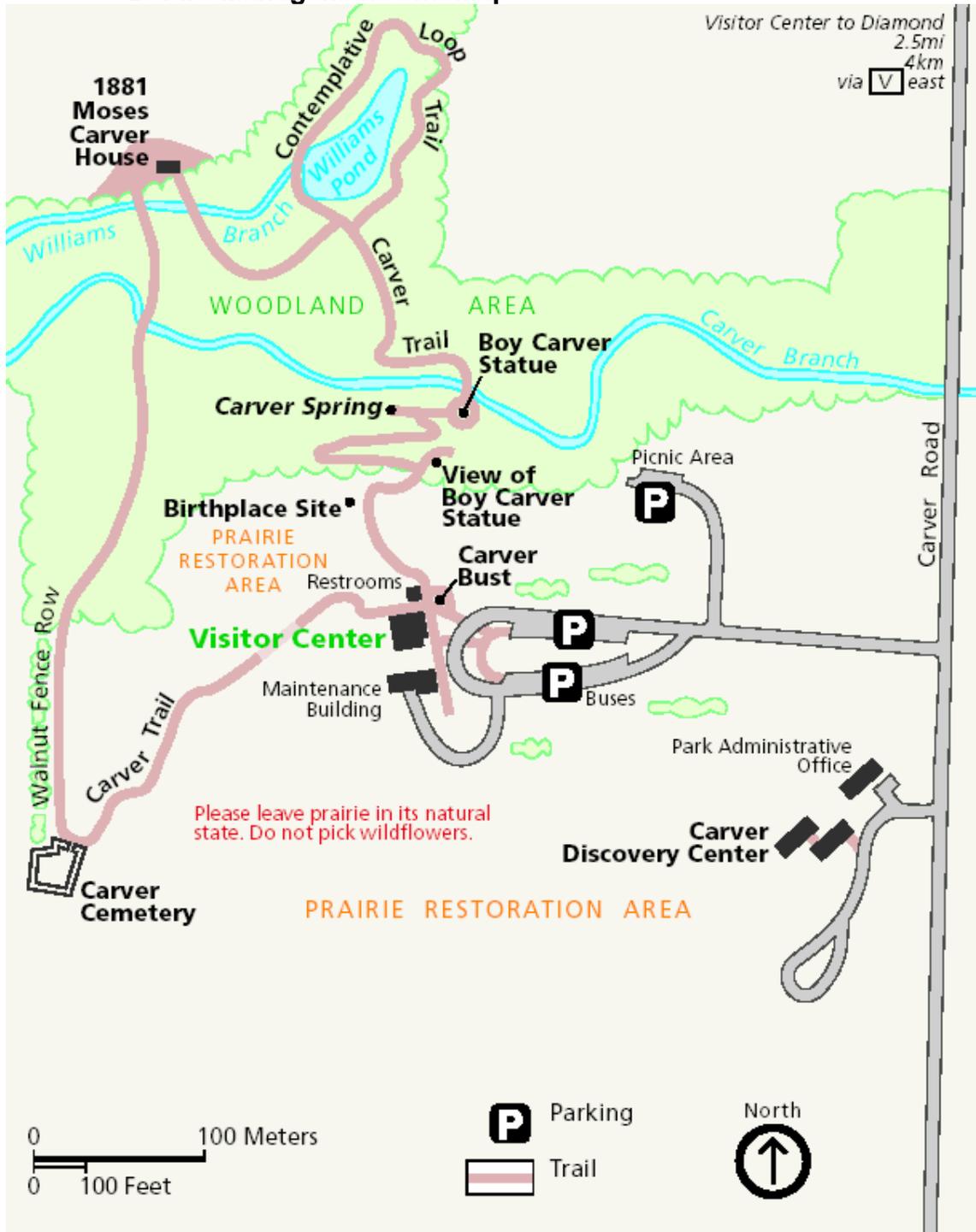
c:\work\gwca\fire_history_gwca\proj1.apr

S. Area and Fire Management Unit Maps

1. Area Map



2. Fire Management Unit Map



U. Park Vegetation Map

Currently being developed and will be inserted when approved.

V. WILDLAND FIRE IMPLEMENTATION PLAN

STAGE 1

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

| | |
|---------------------------|--|
| Availability of Resources | |
|---------------------------|--|

DECISION CRITERIA CHECKLIST

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

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

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

W. Individual Fire Report (DI 1202)

| | | | | | | | | |
|--|--------------------------------|--|---|---------------------------------|------------------------|---|----------|--------------|
| UNITED STATES DEPARTMENT OF THE INTERIOR DI-1202 INDIVIDUAL FIRE REPORT | | 3. a. UNIT b. SUB-UNIT c. YEAR d. FIRE NUMBER --- --- --- --- | 4. TYPE 5. CAUSE 6. PEOPLE 7. NRVC --- --- --- --- | | | | | |
| 1. STATUS CODE __ 2. REPORTING AGENCY __ | | | | | | | | |
| 8. STATISTICAL DATA | | | | | | | | |
| | | a. STATE | b. OWNER | c. VEGETATION | d. ACRES BURNED | | | |
| | | --- | --- | --- | ----- | | | |
| | | --- | --- | --- | ----- | | | |
| | | --- | --- | --- | ----- | | | |
| | | --- | --- | --- | ----- | | | |
| | | --- | --- | --- | ----- | | | |
| | | --- | --- | --- | ----- | | | |
| 9. AGENCY DATA | | | | | | | | |
| a. FIRE NAME | b. AREA NAME | c. LATITUDE | LONGITUDE | d. TWNSHP | RANGE | SECTION | MERIDIAN | |
| ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | |
| e. COST CODE | f. OWNER | g. FY | h. FISCAL DATA | i. UTM | | | | |
| --- | --- | --- | ----- | Z | E | N | --- | |
| 10. FIRE MANAGEMENT DATA | | | | | | | | |
| a. DISCOVERY/START | DATE | TIME | TYPE | AMT XXXXXXXXXX XXXXXXXXXX | ACRES | | | |
| ----- | ----- | ----- | --- | ----- | ----- | | | |
| b. INITIAL ATTACK | ----- | ----- | 1 2 3 | 1 2 3 | ----- | | | |
| c. CONTROLLED | ----- | ----- | --- | --- | ----- | | | |
| d. DECLARED OUT | ----- | ----- | | | | | | |
| 11. SITE DATA | | | | | | | | |
| a. TOPOGRAPHY | b. ASPECT | c. SLOPE | d. ELEVATION | e. STATION | f. MSGC | g. BEHAVIOR | h. B. I. | i. ADJ CLASS |
| --- | --- | --- | --- | ----- | --- | --- | --- | --- |
| 12. PREVENTION DATA | | | | | | | | |
| k. DAY OF WEEK | l. WAS FIRE INVESTIGATED (Y/N) | | m. FIRE CAUSE SUSPECT, KNOWN OR UNKNOWN (K/U) | | | n. SUSPECT = RESIDENT, TRANSIENT OR UNKNOWN (R/T/U) | | |
| --- | --- | | --- | | | --- | | |
| 13. PRESCRIBED FIRE DATA | | | | | | | | |
| c. PLOT/ BURN OBJECTIVE | d. FIRING TYPE | e. COST/ACRE | f. FBPS FUEL MODEL | | i. PROJECT # | | | |
| ----- | --- | ----- | ----- | | ----- | | | |
| m. COMPLEXITY / FIRE MANAGEMENT AREA | | n. FUEL LOADING FOR EMISSIONS | | | o. BENEFITTING PROGRAM | | | |
| | | SIZE CLASS OF FUELS | PRE-BURN LOADING TONS PER ACRE | CONSUMPTION PERCENT | | | | |
| | | Shrub/Herb | --- | --- | | | | |
| | | 0 - 1 | --- | --- | | | | |
| | | 1.1 - 3.0 | --- | --- | | | | |
| | | 3.1 - 9.0 | --- | --- | | | | |
| | | 9+ | --- | --- | | | | |
| | | LITTER & DUFF (INCHES) | --- | --- | | | | |

George Washington Carver National Monument
Fire Management Plan

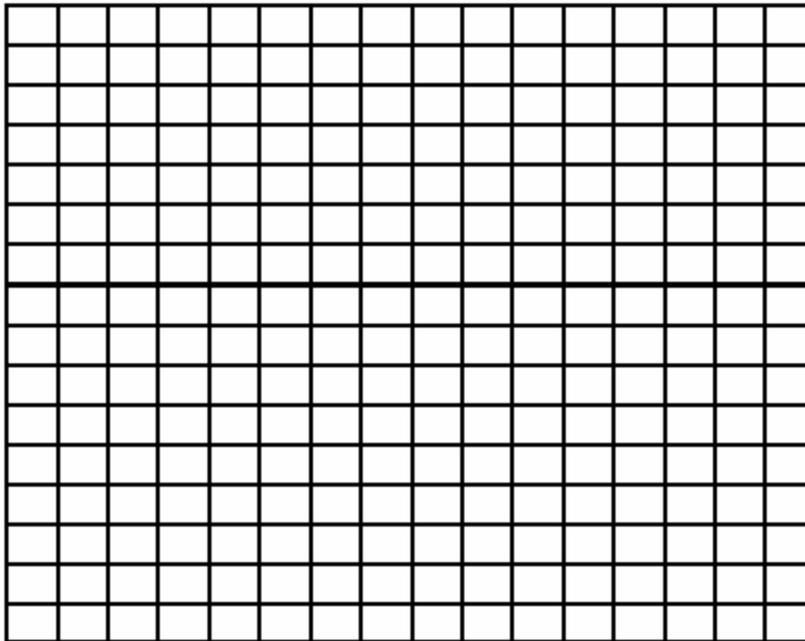
NARRATIVE - Enter information about the fire.

TITLE INFORMATION - (Mandatory)

Submitted by:
Submitted Title:
Submitted Date:
Entered by:
Entered Title:
Entered Date:

MAP: - (Optional)

LOCATION PLAT SCALE: " = 1 MILE



Prepared for:

**George Washington Carver National
Monument**

National Park Service

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