AZTEC RUINS NATIONAL MONUMENT
FIRE MANAGEMENT PLAN

Purpose and Need

The National Park Service's (NPS) Management Policy (2001) and NPS Director's Order 18 both require that each park with vegetation capable of burning will prepare a wildland fire management plan to guide a fire management program that is responsible to the Park's natural and cultural resource objectives and to safety considerations for Park visitors, employees, and developed facilities. Aztec Ruins National Monument (Park) contains vegetation within its authorized boundary capable of burning, and therefore needs a Fire Management Plan (Plan).

Completion of the Plan is critical to any management decision. The following is a summary of fire management needs:

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

- Provide a framework for fuels management strategies through the use of mechanical treatments and prescribed fire.

- Provide a framework to be able to plan and implement a wildland fire program across agency boundaries.

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I. INTRODUCTION

A. General Background

The National Park Service (NPS) administers the Park, which is located in Northwest New Mexico. The broad mission of the NPS at Aztec Ruins is to conserve and protect the cultural and natural resources and provide for their enjoyment.

Aztec Ruins National Monument was established in 1923 by presidential proclamation in recognition of a "ruin of great antiquity and historical interest" and "with a view to the preservation of said ruin for the enlightenment and culture of the Nation." Its boundaries were increased over the years to its present authorized boundaries of approximately 320 acres. All the lands presently administered by the Park—about 257 acres-- fall within the City of Aztec.

The Fire Management Plan will help achieve the goals of the Park by developing strategies that will help protect the Park from impacts of fire and fire suppression actions. This Plan meets the requirement of the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA). The Plan was completed through coordination and collaboration with park neighbors, constituent groups, stakeholders, cooperators, and partners.

Because of the park's small size and light fire load, there has been no established fire program. Ultimate responsibility for fire management is under the Park's Superintendent. The Area Fire Management Officer from nearby Mesa Verde National Park (Mesa Verde) provides support. Designation of a park staff member as Fire Coordinator is essential to all phases of fire management. The Park currently has no qualified wildland firefighters, nor is it likely that this situation will change in the future. Because of this, the Park will depend heavily on the Mesa Verde fire program for support and interagency partners for suppression actions.

The Park will review and update the Fire Management Plan annually. Annual review is essential to ensure that the Plan continues to conform to current laws, objectives, procedures and strategies. A comprehensive plan revision, and National Environmental Policy Act (NEPA) compliance review, is required every five years. AZRU will provide a digital copy of each approved Plan and all subsequent amendments to the NPS Fire Management Program Center (FMPC), located at the National Interagency Fire Center (NIFC), in Boise, Idaho.

B. Collaborative Processes used in Plan Development

This plan has involved local agency cooperators including Aztec Volunteer Fire Department, the State of New Mexico, the Bureau of Land Management and the Forest Service. The Plan will implement the policies and support the achievement of goals identified in the Federal Wildland Fire Management Policy and Program Review (1996), Managing Impacts of Wildfires on Communities and Environment and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (1999), and A Collaborative Approach for Reducing Wildland Fire Risks to Communities and Environment: 10-year Comprehensive Strategy Implementation Plan (2002). Authority for development and implementation of the fire management program at the Park is included in the National Park Service Organic Act, August 25, 1916. Servicewide fire management policy is expressed in the NPS Directors Order #18 (DO #18 – Wildland Fire Management Guidelines) and NPS Reference Manual #18. The Interagency Standards for Fire and Fire Aviation Operations (the Red Book) references, or supplements policy for the National Park Service fire and fire aviation management operations. The document is updated and released annually.

Planning also included the input from neighboring communities and other NPS program management areas.

The Superintendent is responsible for assuring policy compliance and the technical and operational soundness of the Plan before he or she approves it. Before approving the Plan, the Superintendent sought the review and advice of park staff, area and regional staff, and other fire professionals.

C. Authorities

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

"... is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."
This authority was further clarified in the National Parks and Recreation Act of 1978:

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

Additional statutory authorities are:

- The General Authorities Act of 1970
- Public Law 87–213, Sept. 8, 1961 " An Act authorizing the establishment of a national historic site at Aztec Ruins, San Juan County, New Mexico
- The Clean Air Act, Clean Water Act
- The Endangered Species Act
- The Antiquities Act.

D. Implementation of Federal Fire Management Policy

This Plan will implement fire management policies and help achieve resource management and fire management goals defined in:

- Federal Wildland Fire Management Policy and Program Review (1995)
- Managing Impacts of Wildfires on Communities and the Environment, and Protecting People and Sustaining Resources in Fire Adapted Ecosystems – A Cohesive Strategy (USDOI/USDA, 2002)
- A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10 Year Comprehensive Strategy Implementation Plan (2001)
- The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide (1998)
- Managing the Impacts of Wildfires on Communities and The Environment (2002)
- National Fire Plan (2001)
- 10-Year Comprehensive Strategy (2001)
- Implementation Plan, 10-Year Comprehensive Strategy (2001)
- National Park Service Management Policies (2001)
- Aztec Ruins National Monument Site General Management Plan (1989)
- The Interagency Standards for Fire and Fire Aviation Operations (The Red Book) states, references, or supplements policy for the NPS fire management operations (USDI/USDA 2005).

E. Environmental and Cultural Compliance

Wildland fire suppression is conducted within the Park as an emergency action (fire preparedness and suppression actions are generally exempt from the regulatory requirements of the National Environmental Protection Act [NEPA]).

Other elements of this plan associated with wildland fire management (prescribed fire, fuel management, burned area rehabilitation, etc.) are non-emergency actions. These activities are subject to the requirements of NEPA, the National Historic Preservation Act (NHPA) and other applicable regulations.

This plan meets National Environmental Policy Act and National Historical Preservation Act requirements for all activities described in the plan. The FMP incorporated a programmatic approach to the National Environmental Policy Act that covers all activities described in the fire management plan.

The proposed action is categorically excluded from further documentation under NEPA in accordance with 516 DM 2, Appendix 1, 1.12 because it meets all the specified criteria for the use of this categorical exclusion as described in the *Federal Register* (Vol 68, No. 108, pages 33814-33824) as follows: Hazardous fuels reduction activities using mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing will not exceed 1,000 acres. All activities will be limited to areas in the wildland urban interface and Condition Classes 2 or 3 in Fire Regime Groups I, II or III outside the wildland urban interface. Aztec Ruins National Monument does not contain wilderness. Additionally, the fire management program will not include the use of herbicides or pesticides or the construction of new permanent roads or any other new permanent infrastructure. There will be no sale of vegetative material. The proposed action was designed to conform to all National Park Service standards, and it incorporates the appropriate guides for the required and desired conditions relevant to the project activities. Suppression activities, if needed, would be considered emergency actions and not subject to NEPA requirements.

F. Land Base

The Park presently administers 257 acres within the authorized boundaries of approximately 320 acres. Annexations to the City of Aztec have resulted in the the lands now administered by the park as falling within the Aztec City limits. Although the Park itself is open and rural, the area is becoming more urban with an existing trailer park and subdivision south of the Park and a new subdivision being developed north and west of the Park. (Figures 1 & 2)

Figure 1 Regional Map showing location of Aztec Ruin National Monument

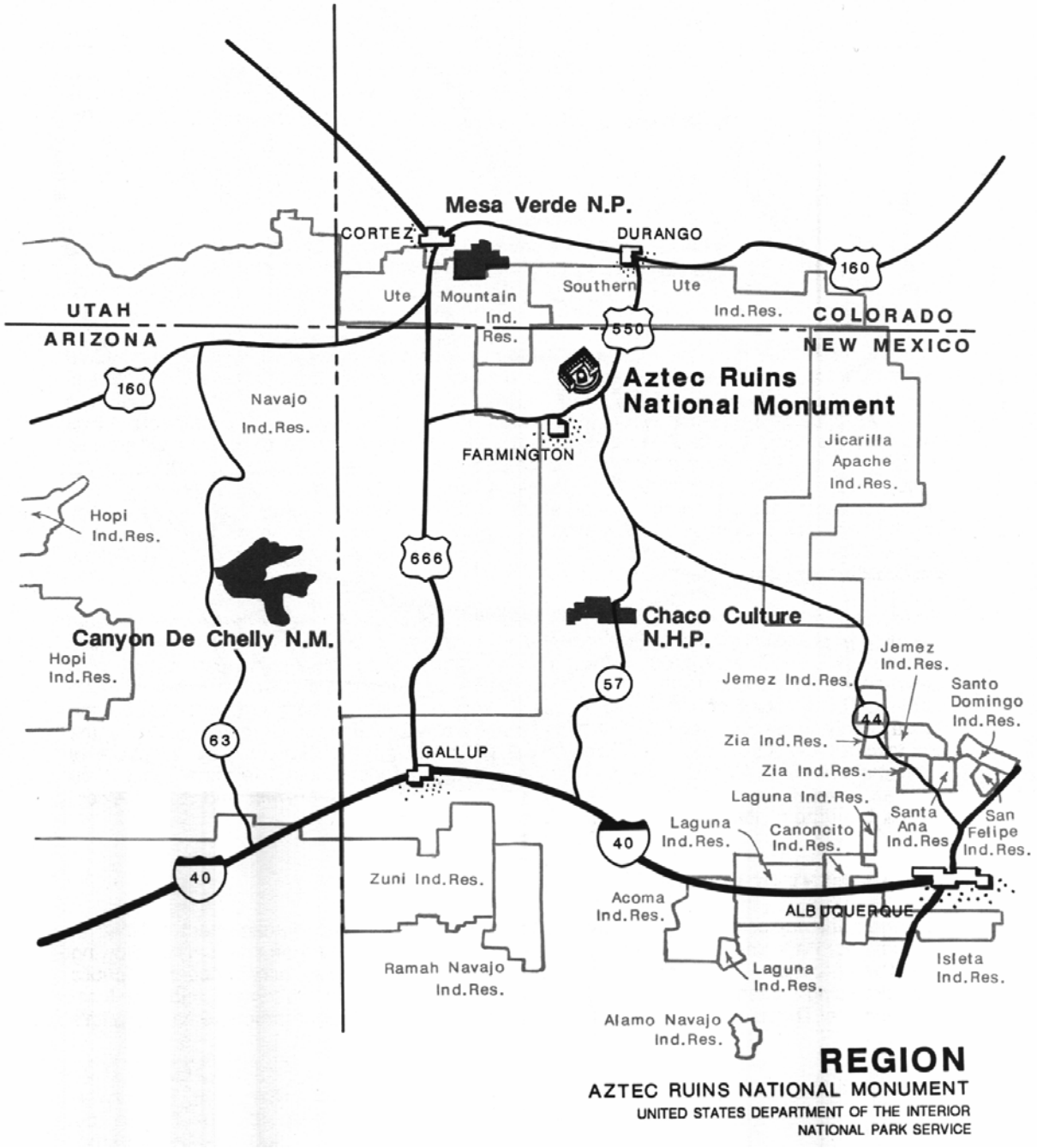

Figure 2 Aerial photo showing exterior authorized boundaries of Aztec Ruins, existing nearby housing, and location of future development.

Exterior Authorized Boundaries Of Aztec Ruins National Monument

G. Park Mission

Aztec Ruins National Monument is the site of a remarkable community of ruins along the Animas River in northwest New Mexico. These ancient structures of the early Pueblo people are preserved and protected to tell their stories, so that the people of today and future generations can understand and appreciate that multi-faceted culture. We work toward that goal in cooperation with park neighbors, partners, tribes, and others, moving forward together to shape our future.

H. Park Statements of Significance

The community that took shape at the Aztec Ruins site from the late 1000s to 1280 A.D. contains a unique complex of architectural features that include rare tri-walled structures, multi-story great houses, road alignments, earthworks, and ceremonial buildings that together contribute to a highly modified, ritual landscape exhibiting symmetry and careful planning.

Because of the nature and extent of the resources, Aztec Ruins National Monument provides outstanding opportunities for continued archeological research and discovery. Aztec Ruins contains some of the most remarkably well-preserved and visible indigenous architecture in the Southwest. The designed landscape and many of the individual structures are monumental in scale. Masonry, wood elements, earthwork features, and artifacts are unusually well-preserved. Aztec Ruins is the best tree-ring-dated site in the Southwest.

Aztec Ruins is a prominent expression of a much longer human history in the larger Four Corners region. The site played a significant role in the widespread Chacoan system, and offers insights into that system's nature, extent, and chronology. Its physical integrity and ability to contribute to understanding that system were recognized in 1987 when Aztec Ruins National Monument was included in the designation of Chaco Culture National Historical Park as a World Heritage Site.

Aztec Ruins is sacred for many American Indians who maintain strong spiritual connections to the site.

The pioneering excavations of the American Museum of Natural History provided archeological data and explanations that influenced interpretations of cultural history in the San Juan Basin for half a century, and the profession as a whole. The reconstruction of the Great Kiva was an unparalleled effort in the history of southwestern archeology, and offers visitors an exceptional opportunity to connect with the people who built this ceremonial structure.

II.RELATIONSHIP TO LAND MANAGEMENT PLANNING AND FIRE POLICY

A. Establishment and Legislative History

The Park was established on 4.62 acres in 1923 by Presidential Proclamation (January 24, 1923, 42 Stat. 2295, appended). In recognition of a "…ruin of great antiquity and historical interest," President Warren G. Harding established the national monument "…with a view to the preservation of said ruin for the enlightenment and culture of the Nation." Executive Orders 1840 (July 1, 1928, 45 Stat. 2954) and 1928 (December 19, 1930, 46 Stat. 3040) added 14.4 more acres, including the East Ruin, the museum's field headquarters, and Earl Morris's home in the southwest corner of the monument. Executive Order 1928 also included an additional 6.87 acres purchased from the heirs of H.D. Abrams, the original owner of the entire site. A 1948 donation of the 1.25 acre Hubbard site from the Southwestern Monuments Association (Presidential Proclamation No. 2787, May 27, 1948, 62 Stat. 1513) brought the monument to 27.14 acres. Public Law 100-559 (October 28, 1988, title IV,) authorized an expanded monument boundary of nearly 320 acres.

B. NPS Management Policies as Related to Fire Management

The *National Park Service Management Policies (2001)* is the basic Service-wide policy document of the National Park Service. It is the highest of three levels of guidance documents in the NPS Directives System. *National Park Service Management Policies* is designed to provide NPS management and staff with clear information on NPS policy, required and/or recommended actions, and other information to help them manage parks and programs effectively. Appendix B contains a summary of elements relating to compliance with the 2001 Federal Wildland Management Policy.

National Park Service Management Policies include the following guidance related to the preparation of fire management plans and the management of fire on national park sites:

- *Park fire management programs will be designed to meet park resource management objectives while ensuring that firefighter and public safety are not compromised. (NPS Management Policies, Chapter 4.5).*

Each park with vegetation capable of burning will prepare a fire management plan and will address the need for adequate funding and staffing to support its fire management program. The plan will be

designed to guide a program that responds to the park's natural and cultural resource objectives; provides for safety considerations for park visitors, employees, neighbors, and developed facilities; and addresses potential impacts to public and private property adjacent to the park. Preparation of the plan will include collaboration with adjacent communities, interest groups, state and federal agencies, and tribal governments. (*NPS Management Policies, Chapter 4.5*).

All fires burning in natural or landscaped vegetation in parks will be classified as either wildland fires or prescribed fires. All wildland fires will be effectively managed through application of the appropriate strategic and tactical management options. These options will be selected after comprehensive consideration of the resource values to be protected, firefighter and public safety, and costs. Prescribed fires are those fires ignited by park managers to achieve resource management and fuel treatment objectives. Prescribed fire activities will include monitoring programs that record fire behavior, smoke behavior, fire decisions, and fire effects to provide information on whether specific objectives are met. All parks will use a systematic decision-making process to determine the most appropriate management strategies for all unplanned ignitions, and for any prescribed fires that are no longer meeting resource management objectives. (*NPS Management Policies, Chapter 4.5*)

There may be situations in which an area may be closed to visitor use to protect the natural resources (for example, during an animal breeding season) or for reasons of public safety (for example, during a wildland fire). Such closures may be accomplished under the superintendent's discretionary authority, and will comply with applicable regulations (36 CFR 1.5 and 1.7). (*NPS Management Policies, Chapter 4.1*)

The second level of NPS guidance documents (under *NPS Management Policies*) are Director's Orders. Director's Orders provide operational policies and procedures that support and supplement Management Policies. Director's Orders are often further supported with a third level of guidance consisting of reference manuals or handbooks. Specific guidance to the NPS on wildland fire is contained in Directors Orders (DO-18) and attendant Reference Manual (RM-18), and "The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide" (1998).

Director's Order 18 – Wildland Fire Management and *Reference Manual 18 – Wildland Fire Management* are the documents that provide National Park Service units with specific guidance on the preparation of wildland fire management plans and on wildland fire and prescribed fire management. DO-18 states:

> *Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet resource management objectives prescribed for the various areas of the park and to ensure that firefighter and public safety are not compromised. Each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the park's natural and cultural resource objectives and to safety considerations for park visitors, employees, and developed facilities.*
>
> *The NPS is committed to protecting park resources and natural ecological processes; but firefighter and public safety must be first priority in all fire management activities.*

RM-18 states that the paramount considerations of each park fire management program will be:

1. Protection of life, both employee and public
2. Protection of facilities and cultural resources
3. Perpetuation of natural resources and their associated processes
4. Perpetuation of cultural and historic scenes.

These priorities are further emphasized in RM-18 (chapter 3, page 1) with the following language:

> *Safety is the responsibility of everyone assigned to a wildland or prescribed fire incident. The safety of employees and visitors alike must be of prime concern during fires. Agency administrators at all levels need to stress that firefighter and visitor safety always takes precedence over property and resource loss*.

C. Management Documents

Ideally this Plan would be developed with direction from a current overall planning document such as a General Management Plan (GMP). The present GMP was approved in 1989, but a new GMP is currently underway. Other relevant documents include the1996 Resource Management Plan and a 1997 Hazard Fuels Assessment. These three documents address hazard fuels issues and recommend treatment to reduce hazardous fuels in some parts of the Park. They do not address other areas of wildland fire management. Other fire related policies and mandates are discussed in the next section.

III. WILDLAND FIRE MANAGEMENT STRATEGIES

Wildland fires are those fires that have not been ignited for a specific Park goal or goals. Wildland fires will be managed primarily with the goal of immediate suppression. The choice of a particular method of suppression will take into account the safety of firefighters and the public, the values to be protected, the weather, current and predicted fire behavior, topography, and fuels. These suppression methods are thought of as a list of choices or "appropriate management responses."

A. General Management Considerations

The wildland fire management program at the Park has specific goals to protect human health and safety, protect property, reduce wildland fire risk, and protect cultural and natural resource values.

All wildland fires will be suppressed using the appropriate management response in a safe and cost-effective manner with minimum damage to resources. Aztec Volunteer Fire Department (AVFD) will serve as the first response for fires that occur in the Park. The Park does not currently have staff that are qualified to perform initial attack on wildland fires, nor does it have the equipment and tools. This lack of firefighters, tools, and equipment is expected to continue, so that reliance on AVFD is necessary.

Staff at the Park recognizes that collaboration with other agencies is essential to effectively and efficiently manage wildland fire. The NPS is a signatory of the Annual Operating Plan for Fire Management between the U.S. Forest Service, Bureau of Land Management, NPS, Bureau of Indian Affairs, and the State of New Mexico for fire management activities in northwestern New Mexico. This plan documents the agencies' agreement and commitment to fire protection assistance and cooperation.

The Park is also a signatory in an intra-Service agreement with Mesa Verde National Park. In the agreement, Mesa Verde assumes a leadership role and provides management support for fire-related issues. The above partners, interested and affected groups and agencies, and the public have been involved in the collaborative process used to develop this Plan.

B. Wildland Fire Management Goals

The NPS is committed to protecting park resources and natural ecological processes, but firefighter and public safety must be the first priority in all fire management activities. The overall goals for wildland fire management are to promote a fire prevention program and to ensure a suppression response that is capable of meeting expected wildland fire complexity. Specific park fire management goals are:

1. **Make firefighter and public safety the highest priority of every fire management activity.**
   Objective: 100 percent of wildland fire operations are conducted so that they cause no injuries to the public and no serious injuries to firefighters.

2. **Manage wildland fires so that resources (natural, cultural, and improvements) are protected from damage by suppression actions and fire.**
   Objective: Protection of park resources is actively considered in 100 percent of all wildland fire planning and fire management activities.

3. **Prevent wildland fires from spreading onto neighboring private land.**

   Objective: Incidents will be managed so that 100% of fires on the monument will be prevented from spreading to neighboring land.

4. **Maintain an active fire prevention program to reduce the incidence and threat of wildfire.**
   Objective: Prevention programs will reduce human caused fires by 80% and keep all fires less than one acre.

5. **Rehabilitate areas disturbed by wildland fire and suppression actions.**
   Objective: 100% of fires will involve assessment and rehabilitation of damage due to suppression. Further, all fires will be evaluated for rehabilitation due to fire damage.

6. **Maintain fire management agreements with adjacent land management agencies and local fire departments.**
   Objective: AZRU will maintain annual agreements with Federal, state and municipal firefighting agencies.

7. **Reduce fuel hazards around cultural and historic sites as well as along the unit boundary.**
   Objective: A ten year plan plan will be developed that identifies fuel hazards and plans for treatments of those areas.

C. Wildland Fire Management Options

The following wildland fire management options are available for use at the Park:

1. Wildland Fire Suppression:
Historically, all wildland fires have been suppressed at Aztec Ruins. Under this plan, the Park will continue to suppress all wildland fires using the most appropriate management action. Determination of the most appropriate management action will consider human safety, threat and potential damage to property, resources, and cost effectiveness. Suppression will not be used to accomplish resource objectives.

2. Prescribed Fire:
A program of using traditional prescribed fire (i.e. broadcast burning) at the Park is not considered in this Plan. There is an option for pile burning from mechanical removal for the protection of cultural resources, hazard fuel reduction, and natural resource objectives. Fire may also be used to dispose of debris in a non-wildland environment. Pile and debris burning is further discussed in the Prescribed Fire section under Preparedness Actions. If a determination is made that a specific prescribed fire is required, that prescribed fire will be subject to the requirements of NEPA, the NHPA and other applicable regulations.

3. Wildland Fire Use: Wildland fire use will not be used at Aztec Ruins. This option was rejected due to the small size of the Park, the significant degree of wildland urban interface along the Park boundary, and the lack of available qualified fire personnel required to manage these fires.

4. Non-Fire Applications: The reduction or removal of fuels by mechanical means is an option that may be used for objectives such as protection of resources, protection of private property located in the wildland/urban interface, invasive species control, or other natural resource objectives.

D. Description of Fire Management Units (FMU)

Due to the small size of the Park and relatively uniform fuels, there is no need to develop separate Fire Management Units. A management strategy of suppression will be discussed further in other sections of this plan. The following is a discussion of biotic and abiotic conditions within the Fire Management Unit.

1. Wildlife

Despite the park's small size, a variety of habitats support a remarkable diversity of plant and animal species. A two year survey of wildlife conducted over 2001 and 2002 provided data regarding the variety and distribution of animals within the park.

Mammals: Biologists found that the pinon-juniper woodland on the mesa top provided the highest species richness for terrestrial mammals.

The most common mammals captured were the western harvest mouse and the non-native house mouse. Acoustic surveys and capture through mistnetting identified at least seven species of bats. Species richness for bats was highest

at the irrigation ditch and Great Kiva, where five species were documented. Several bat species are New Mexico species of concern: Spotted Bat *Euderma maculatum;* Western Small-footed Myotis Bat *Myotis ciliolabrum melanorhinus;* Yuma Myotis Bat *Myotis yumanensis yumanensis;* and Big Free-tailed Bat *Nyctinomops macrotis.* The spotted bat is also a federally listed species of concern. A nesting colony of the pallid bat is present in the supporting roof beams of the reconstructed Great Kiva.

During the inventory season in 2001, biologists captured, observed, or documented previous sightings of the following 19 species of mammals: Western small-footed myotis, Yuma myotis, big brown bat, spotted bat, pallid bat, Brazilian free-tailed bat, big free-tailed bat, desert cottontail, black-tailed jack rabbit, silky pocket mouse, western harvest mouse, brush mouse, deer mouse, pinon mouse,northern grasshopper mouse, house mouse, white footed mouse, western spotted skunk, and mule deer. Additional species identified by park staff or biologists include: rock squirrel, Gunnison's prairie dog, Botta's pocket gopher, muskrat, porcupine, coyote, red fox, bobcat, American black bear (an accidental sighting.)

Birds: The riparian and pinon-juniper woodland areas, along with patches of once-cultivated grassy fields, orchards, and desert scrub all provide diverse habitats for birdlife in the park.

As part of the National Park Service's Natural Resources Initiative, ornithologists conducted bird inventories in the park in 2001 and 2002. In addition, a multi-park grant from the National Park Foundation and Hawks Aloft provided for a survey in 2002 of neotropical migrant breeding birds. Prior to these recent inventories, volunteers from the local Audobon Society had compiled a bird checklist for the park that listed 74 species.

During the 2001 field season, a total of 53 species were detected. Of these species, 40 were in riparian habitats, and 14 of those were detected only in riparian zones. Thirty-seven species were detected in upland habitat (the location of the Fee 4-A well), 12 of which were only found in uplands. Although no federally listed species of concern were detected, one State of New Mexico species of concern was detected, the yellow-billed cuckoo.

During the 2002 breeding season, a total of 58 species were detected, including six species previously undetected in the park. The yellow-billed cuckoo was not detected during this season. The two years of inventory yielded a detection of 63 species within the park.

Reptiles and Amphibians: Reptile and amphibian inventories were conducted in 2001 and 2002. Reptile and amphibian species documented at Aztec Ruins were: Woodhouse's toad, striped chorus frog, common collared lizard, sagebrush

lizard, eastern fence lizard, western whiptail, plateau striped whiptail, striped whipsnake, gopher snake, western terrestrial garter snake, western rattlesnake.

Aztec Ruins was expected to have a fairly diverse community of reptile and amphibian species for a park of its size, largely due to the diversity of habitats found here. Severe drought conditions likely affected the survey results. Many common amphibian species may not have been found due to dry conditions. Expanded park boundaries to the north of the Farmers' Ditch may contain a number of snake species (e.g. Night Snake, Hognose Snake, Common Kingsnake, Glossy Snake) that have not yet been found. Some species, such as the Side-Blotched Lizard and the Tree Lizard that were originally thought to be present were not spotted. Their possible presence has been downgraded, since it is highly unlikely these conspicuous, diurnal species would have been missed by the surveyors.

2. Soils and Geology

A portion of the Park lies on the alluvial fill of the Animas River. The alluvium consists of clay, silt, sand, and gravel and is derived from the San Juan Mountains in southern Colorado. It is approximately 77 feet thick, and capped by a yellowish-brown loamy soil. It is about 60 inches or less and consists of weakly stratified clay loams, silty clay loams, and loams. The Fee 9Y well is located on the alluvial fill. Pleistocene outwash terraces also occur in the Animas River Valley. The terraces were derived from late Pleistocene glacial moraines in the San Juan Mountains. They are composed of coarse rounded gravels and sands, and are found along the sides of the valley and mark former Pleistocene river levels and channels. The Animas River has since eroded through these gravel deposits, so that only remnants remain. One of these terraces, commonly referred to as the "north mesa," is in the northern part of the Park upon which the Fee 4-A well is located. The alluvium in the park is underlain by the Nacimiento Formation, composed of shales which grade into sandstone near the top of the unit (Christiansen).

The soils have already been impacted by grazing, agricultural activities, residential development, road building, irrigation, and visitor activities within most of the park.

3. Vegetation

Located along the Animas River, the boundaries of Aztec Ruins encompass 11 vegetation types including riparian, piñon-juniper woodlands, native grasslands, old fields, and restoration areas. Nearly 300 plant species have been documented at the monument. Aztec Ruins and vicinity lie within the Upper Sonoran Life Zone. Vegetation in the monument includes big sagebrush (*Artemisia tridentata* Nutt.), rabbitbrush *(*Chrysothamnus nauseosus (Pall.) Britt*.),* yucca (*Yucca spp.*), Utah juniper (*Juniper osteosperma* (Torr.) Little , pinyon

(*Pinus edulis* Engelm.), and a variety of grasses such as blue grama (*Bouteloua gracilis* (H.B.K.) lag.ex Steud.), galleta grass *(Hilaria jamesii* (Torr.) Benth*.,* alkali sacaton (*Sporobolus airoides* (Torr.) Torr.), and Indian ricegrass (*Oryzopsis hyminoides* (R. & S.) Ricker) (Stein and McKenna, 1988; Cully, personal communication, 2004).

Along the Animas River, at the lowest elevation in the park of 5630 feet, riparian vegetation of cottonwoods (*Populus fremontii* Wats.), willows (*Salix exigua* Nutt.; *S. goodiingii* Ball), box elder (*Acer negundo* L. var. *interius* (Britt.) Sarg., and exotic Russian olive (*Eleagnus angustifolia* L.) and tamarisk (*Tamarix* sp.) trees are home to a variety of birds and other animals. As the topography rises away from the river, lands historically irrigated for pasture and fruit trees surround the core area that preserves most of the large prehistoric structures. Since acquiring these previously cultivated lands in the late 1990's, the park has discontinued irrigation according to a long range plan of converting them to Upper Sonoran desertscrub native vegetation. Within the core historic area, native vegetation already dominates the scene.

On the north terrace there is a dominance of native grass species, especially of Galleta (*Hilaria jamesii* (Torr.) Benth.) and alkali sacaton. Broom snakeweed (*Gutierrezia sarothae* (Pursh) Britt. & Rusby) also dominates the mesa slopes and tops providing evidence of historic degradation as a result of grazing and fire suppression. Less frequent species include Indian rice grass, prairie three-awn (*Aristida sp*.), big sagebrush, four-winged saltbrush (*Atriplex caescens* (Pursh) Nutt.), wavy-leaf thistle, and prickly pear cactus (*Opuntia fragilis* Nutt., *O. polyacantha* Haw.). Individuals of several non-native species also occur, including russian thistle (*Salsola iberica* Sennen & Pau), ox-eye daisy (*Chrysantheum leucanthemum*), and cheatgrass (*Bromus tectorum* L.).

North and west of the developed area is an abandoned field pasture which is almost completely dominated by non-native grass and tree species. Most dominant is tall fescue (*Festuca arundinacea* Schreb.). Less dominant exotic grass species include Grass #7, timothy (*Phleum pratense* L.), foxtail barley (*Hordeum jubatum* L.), and smooth brome (*Bromus inermis* L.). A minimal amount of the native western wheatgrass (*Agropyron smithii* Rydb.) is present. Chinese elms (*Ulmus pumila* L.) and Russian olives grow along an old roadbed.

4. Air Quality

Aztec Ruins National Monument is designated as a Class II air shed under the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act. Air quality may be impacted by the burning of fuels should fires arise. This would be short lived and add to the numerous impacts on air quality from other sources outside park boundaries.

5. Ethnographic Resources

Ethnographic resources include traditional cultural properties and items defined by the Native American Graves Protection and Repatriation Act (human remains, funerary objects, sacred items, items of cultural patrimony.) The Park has not conducted formal research to identify possible traditional cultural properties within the park. However, the Park consulted with associated tribes through correspondence regarding their concerns for this project. Through previous consultation with tribes, the Park has determined that in general, all of the tribes associated with the area consider Aztec Ruins to be a sacred ancestral place.

6. Archeological Resources

Aztec Ruins contains 41 archeological sites that are listed in the National Park Service's FY2000 Archeological Sites Management Information System. The core area focuses on acreage included within park boundaries up until 1988, and consists of archeological sites covering 27.14 acres. Included are three large "great houses" (excavated and stabilized West Ruin, partially excavated East Ruin, and the unexcavated Earl Morris Ruin); the reconstructed Great Kiva; two unexcavated great kivas; three triwall structures (Hubbard Site, Mounds A and F); an unexcavated small pueblo (Mounds C and D); two trash mounds (Mounds E and H); Mound B; and a cluster of seven houseblocks identified as the West Ruin Annex. The sites within the core area are all included in the listing that designates Aztec Ruins as a UNESCO World Heritage Site.

Additional archeological sites were added to the park in acreage included within the expanded park boundaries of 1988. The 24 sites so far identified in the additional acreage comprise two site clusters in the designated Aztec North Mesa Archeological District, Aztec North and Residence West. The sites include the prominent North Ruin and other single-room and multi-story structures with associated archeological middens, kivas, berms, ramps, linear alignments (roads), platforms, and other features.

7. Cultural Landscapes

Three cultural landscapes have been identified at the Park, a prehistoric designed landscape, a historic designed landscape, and a historic vernacular landscape. An initial cultural landscape inventory indicates that the prehistoric designed landscape is eligible to be listed on the National Register, but the Park has not completed consultations with the New Mexico State Historic Preservation Officer (SHPO) regarding its eligibility. The SHPO has concurred that the historic designed landscape is eligible to be listed in the National Register. Both cultural landscapes would be treated as potentially eligible for listing on the National Register. According to an initial cultural landscape inventory, the historic

vernacular landscape has lost integrity in a number of ways and is not eligible for National Register listing.

The prehistoric designed cultural landscape is about 320 acres in size and includes all lands within the currently authorized boundary of Aztec Ruins NM, including the West Ruin, Hubbard Tri-Wall site, Earl Morris Ruin, East Ruin, and the North Ruin and north mesa terrace sites. The vegetation in this landscape is not identified as a contributing feature.

Because natural landforms apparently played an important role in the layout and use of the prehistoric landscape, the true limits of the prehistoric landscape associated with the Park have not been and likely will not be determined. It is probable that the boundaries of the prehistoric designed landscape may extend beyond the authorized boundaries of the Park. It is reasonable to consider the Estes Arroyo as a western boundary, the terrace above Farmer Arroyo to the north as a northeastern boundary, and the Animas River as a southeastern boundary of the larger prehistoric designed landscape.

The historic designed landscape is 7 acres in size. The boundary of the historic designed landscape, known as the visitor center complex, includes the lawns and grounds surrounding the historic Earl Morris house, which serves as the visitor center, the parking area for the visitor center, the monument entrance and parking lot, and the picnic area to the east of the visitor center.

The historic vernacular landscape includes the agricultural lands within the monument's authorized boundaries. Prior to the establishment of the park, the majority of the land in and around the prehistoric ruins was under cultivation. Over the years, the cultivated acreage was reduced due to development of the national monument and the growing town of Aztec. The boundaries of the historic vernacular landscape are the Farmer's Ditch on the north, the Animas River on the east, and the trailer park and residential development on the south. Landscape features associated with the historic vernacular landscape include irrigation features associated with Farmers Ditch, waters of the Animas River, irrigated hay fields and pasture, and the orchard located west of the Hubbard site. Lands within this landscape retain a rural character and hold remnants of agricultural elements and features. However, the historic vernacular landscape has lost integrity such as patterns of spatial organization, historic vegetation, associated buildings and structures, land use activities, and cluster arrangements.

8. Visitor Use

Visitor use is currently focused on the self-guided interpretive trail through the West Ruin, located just north of the visitor center. One of the stops on the trail give visitors a view of the East Ruin off to the east. A portion of the trail travels to an outlying site, the Hubbard Site, just north of the West Ruin. From this vantage

visitors have a view of the former agricultural fields to the north, and the north mesa.

Other areas of the Park are closed to visitor access unless accompanied by park staff. Occasionally park staff conduct guided tours to the East Ruin and north mesa. From the north mesa visitors experience a sweeping view of the Animas River Valley, the cultural mounds and ruins in the core area of the park, and an impressive view north toward the San Juan Mountains. They are able to appreciate a more comprehensive perspective of the ancestral Pueblo people, and explore the park themes related to the expanded community, cultural landscapes, human interaction with the environment, and changing perspectives and interpretations of the people.

IV Wildland Fire Management Program Components

A. General Implementation Procedures

Implementation of the components of the wildland fire management plan is consistent with the park's fire management capabilities and will consider the current and predicted conditions affecting fire behavior. The Initial Fire Assessment documents the current and predicted situation, documents all appropriate administrative information, and aids managers by serving as a fire size-up form. This action will allow the incident commander to select an appropriate management response.

B. Wildland Fire Suppression

1. Range of Potential Fire Behavior

Fire behavior varies by time of season and current weather conditions. Fuels at the Park are mostly characterized by brush/grass models. Under hot and dry conditions, these fuels can result in flashy, fast moving fires. This is a concern for the safety of initial attack forces and all tactics must consider this potential behavior. For the most part these fires are short lived and generally result in total consumption of all vegetation. Because of this behavior, there are a number of issues related to rehabilitation and resource impacts.

2. Historical weather analysis

Annual precipitation is 9.89 inches. Average daytime highs during the summer months range from the 70s to the 90s. It is not uncommon to have several days above 100 degrees.

3. Fire season

Fire season runs generally from March through October in this part of New Mexico.

4. Historical Fire Regimes and Current Condition Classes

Fire regime is used to characterize the traits of a fire in a given vegetation type; namely how often it recurs on the landscape, the type of pattern created, and the ecological effects. The Park can best be described in fire regime type II, 0-35+ years fire frequency, surface fire, and high severity. Due to its past history as a farm, the fuels have been altered from the original fuel type. In addition the introduction of exotic species such as Russian olive and tamarisk has greatly changed the fire regime. The condition class is described best as a Condition Class 3, where the fire regime has been altered from the historical range. The risk of losing key ecosystem components is moderate. Fire frequencies have departed from historical frequencies by one or more return intervals. This results in moderate changes to one or more of the following; fire size, intensity, severity, and landscape patterns. Vegetation attributes have been moderately altered from their historical range.

5. Resource Protection Guidelines

All fire management tactics will have a minimum impact to resources while maintaining the safety of firefighters, personnel, and the public as the highest priority. These tactics are discussed in the Minimum Impact Tactics section.

All firelines, spike camps, and other disturbed areas will be rehabilitated to return the site to the way it appeared before the incident. If fire facilities are located on private land or if private lands or other resources are planned to be used, a land use agreement will be completed between the land owner and the Park. Agreements must be negotiated by a contracting officer.

C. Preparedness Actions

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

Departmental policy requires that all personnel engaged in wildland fire suppression and prescribed fire duties meet the standards set by the National Wildfire Coordinating Group (NWCG, *PMS-310-1*). The Park will conform strictly

to the requirements of the NPS wildland fire management qualification and certification system.

Although the Park has no specific wildland firefighter positions, employees may become qualified as wildland firefighters in order to support the Park's fire management program. The Park's Fire Coordinator will coordinate with the Mesa Verde Fire Management Officer and other qualified individuals to obtain funding, equipment, and advice as appropriate to conduct the Park's fire management program.

1. Planning with Aztec Volunteer Fire Department and Neighboring Land Owners

Prior to the wildland fire season, Park and Mesa Verde staff will meet with AVFD staff and neighboring land owners to discuss planning and actions for the upcoming fire season. Safety, staffing, training, equipment and communications and notification will be an essential part of this meeting. A review of weather, fuels and fire danger for the fire season will predicate much of the seasonal planning. Training will include a review of the Park's unique resources and the preferred methods of protecting these resources in fire suppression actions. Fire detection and reporting procedures will be reviewed with an updated phone and radio frequency list.

2. Planning with Four Corners Interagency Fire Zone

An NPS staff member from the Park will take part in annual planning meetings with other Interagency Partners through the Four Corners Zone as appropriate. These partners include local representatives of the US Forest Service, Bureau of Land Management, Bureau of Indian Affairs, the State of New Mexico and San Juan County. A key element of this planning is reviewing, updating and approval of the Annual Operating Plan. This Operating Plan details fire suppression activities for Northwest New Mexico.

3. Fire Prevention, Education, and Community Assistance

Fire prevention and education program may be implemented in conjunction with other fire management and public safety agencies to increase awareness of fire prevention, develop understanding of the dangers and benefits of fire, protect human life and property, and prevent damage to cultural resources, real property, and natural resources. Public education is described further in the section on Information and Education.

4. Fire Danger

A specific daily fire danger rating is not generated for AZRU. The monument's actual adjective fire danger rating (i.e. Extreme, Very High, High, Moderate, Low)

will utilize the fire danger rating generated by the Farmington BLM Field Office/Four Corners Interagency Dispatch. Communicating specific fire danger to the public is accomplished as needed through existing programs. Daily fire planning is divided into five staffing classes according to the intensity of danger factors indicated by the Energy Release Component, Burning Index and/or other indices. Daily indices are available from the BLM/Four corners. The greatest value of this system is to alert staff, visitors and neighboring landowners to fire potential and address cautions needed in fire prevention.

5. Fire Weather

The Park does not maintain a fire weather station. The BLM maintains the Albino RAWS station which is approximately 20 miles northeast of Aztec. Due to the difference in elevation and fuel types, this station is not an ideal site for NFDRS data for the monument. However, since the fire load at the Park is very light, this is not an issue. By looking at other nearby RAWS stations in Colorado and New Mexico, judgments on fire danger can be estimated for the Park.

6. Step-Up Staffing Plan

Fire preparedness levels are established nationally by the National Interagency Fire Center, Boise, Idaho and in the Northwest New Mexico by the Four Corners Interagency Fire Zone. These various levels identify the level of wildland fire activity, severity, and resource commitment area wide. The Park Step-Up Plan is linked to both the national and regional levels and identifies actions to be taken by personnel to ensure that an appropriate level of preparedness/readiness is obtained for the existing or potential situation. Note that each action in the five levels adds progressively to the actions taken in the lower preparedness level. Burning Index is the NFDRS Index that will be followed using fuel model L western perennial grasses.

Staffing Class I and II
Conditions:
Burning Index 0-20 Fire would present a low to moderate level of control difficulty. Fires occurring at this level could be controlled with onsite forces. Wind speed and direction would determine severity of fire spread. Fine fuels would be drying.
Preparedness Actions:

Fire weather reviewed daily;
Hand tools and portable equipment kept ready;
Initial attack will be conducted by the Aztec Volunteer Fire Department, BLM or Forest Service and the Park will provide an agency representative. Additional attack forces will be dispatched after size-up and upon request of the first firefighter to arrive.

Staffing Class III

Conditions:
Burning Index 21-39
Fires would present a moderate level of control difficulty. Light and heavy fuels would be drying. Mop-up would be more difficult and time-consuming.

Preparedness Actions:

All actions specified for staffing class I - II days will also be implemented at this level; and,
Initial attack will be conducted by the Aztec Volunteer Fire Department, BLM or Forest Service and the Monument will provide an agency representative.

Staffing Class IV and V
Burning Index: 40 – 46+
Conditions:

Fire would present a moderate to high level of control difficulty. Initial attack and reinforcing crews could have difficulty controlling a fire at this level. All fuels would be dry. Air temperature would be high and humidity low. Strong gusty winds would be possible. Spotting would be likely.

Preparedness Actions:

All actions specified for staffing Class III days will also be implemented at this level;
Initial attack will be conducted by the Aztec Volunteer Fire Department, BLM or Forest Service and the Park will provide an agency representative;
Request additional resources through the Four Corners Interagency Dispatch.
Visitor center personnel will alert the public to fire conditions and hazards;
Interpretive activities will include a fire safety message;
Fire danger notices will be posted; and,
Temporary closures may be placed in critical areas when fire, or the threat of fire, could compromise life safety.

7. Pre-Attack Plan

The pre-attack plan is a compilation of essential fire management information which must be available in the park's resource management office. The plan includes important information on areas of high risk, natural firebreaks, water sources, cultural resource locations, endangered species critical habitat, structures, utilities, gas wells criteria and procedures for evacuations and closures, park base maps, vegetation/fuel maps and fire fighting resources available near the Park. Advance preparation of this critical document will save fire managers considerable time during fire suppression operations. (For further information, please see RM-18, Chapter 7, Exhibit 3.)

The pre-attack plan will be reviewed and revised annually by the Fire Management Officer, Natural and Cultural Resource Management Specialists, Facility Manager and other pertinent staff. The pre- attack plan is not included with the FMP due to the sensitive nature of some information.

8. Initial Attack

a. Reporting

Visitors, neighbors, and employees will report most fires. Any park employee to whom a fire is reported must obtain complete information regarding the fire; and the name, address, and phone number of the reporting party. The Chief of Resources Management will assure that all fire reports are promptly investigated. Initial attack on wildfires is the primary responsibility of the on-scene Incident Commander with support from the park staff. The Mesa Verde FMO and the Chief of Resources Management will be notified of a wildland fire as soon as possible. The Archeologist will supply information on any cultural sites in the area.

b. Size-up

The Incident Commander will perform or designate an individual to size-up the fire. This will include:

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

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

c. WFSA

Once a fire is located and a size-up conducted the Incident Commander will determine the most appropriate management strategy to suppress the fire. The Incident Commander will also complete a Wildland Fire Situation Analysis if the fire escapes initial attack.

d. Cause of Fire
The point of origin will be established and protected so that an investigation can determine or confirm the cause of the fire. That area should be treated as a crime scene and left undisturbed for future investigation. Vehicles observed while in route to the fire should be noted (license number, make, color, etc.) and the information given to the investigation officer. All evidence which may indicate arson as the cause shall be protected and the investigation officer informed. The Incident Commander may request a fire investigator on all suspected arson fires.

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

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

f. Control
After the fire has been controlled, the Incident Commander or his/her representative will map the fire. Fires will be patrolled until pronounced controlled by the Incident Commander. No fires will be left until the Incident Commander is certain that the fire will not escape existing control lines. The FMO will ensure all controlled fires are checked by 11:00 a.m. on subsequent days until he/she is comfortable that the fire is declared out.

g. Priority Setting Resources During Multiple Fire Occurrences
In order to set priorities the following information will be useful for decision making:

- Cultural site map.
- Map displaying private structures near park boundary.
- Wildlife habitat and vegetation maps.
- Key members of monument staff.

h. Appropriate Management Response
The federal fire policy allows managers to select the most appropriate suppression strategy. Firefighter safety should be the primary consideration when selecting the most appropriate strategy. Values at risk, probability of success, consequences of failure, cost, and management objectives, public and

adjacent landowner concerns are some additional considerations in selecting the most appropriate strategy. The preferred strategy should be implemented as quickly, safely and efficiently as possible.

Confinement may be determined to be the most appropriate strategy, because it is the safest, most expedient way to control the fire. Confinement may also be used through the Wildland Fire Situation Analysis when the fire is expected to exceed initial attack capability or planned management capability.

i. Typical Fire Response Times

Fire response time at the park will vary depending on staffing, fire management activity in the area, day of the week and the time of day. During the period of highest activity in the fire season, when no other fires are burning and staff is available, the local fire department can respond to most fires within 15 minutes or less. Reinforcements from local agencies can respond to a fire at the park within 1 hour. Air tanker and helicopter attack can typically reach a fire within 2 hours. Reinforcements from outside the immediate vicinity may not arrive until about 8 hours, or more, after a request is made for them. All response times are subject to availability of firefighting resources.

j. Restrictions and Special Concerns

- The Superintendent must authorize the use of any off-road mechanized equipment including bulldozers and other heavy equipment.
- Retardant is used only when a fire threatens to leave NPS lands.
- Minimum impact suppression tactics will be used when possible.
- The Park will identify appropriate access routes for ground equipment to use when at all possible to approach the fire locations. (Figure 3)

Figure 3 Access routes for ground equipment.

9. Extended attack and large fire suppression

If an extended attack or large fire suppression situation were to involve the park, the fire would have to be managed in cooperation with other jurisdictions because of the size, location of the Park and the predominant fuel type. The Park is surrounded by private land, so coordination with private land owners is critical. The following information should be used in determining management actions and decisions:

- Threats to life, property and park resources;
- Availability of suppression forces;
- Current and expected fire behavior; and,
- Wildland Fire Situation Analysis.

a. Extended Attack Needs

All agencies that will be affected in an extended attack, either by land ownership or resources committed, will be involved in determining what resources will be needed in order to safely suppress the fire as quickly as possible. The number and type of resources needed, and their availability and estimated time of arrival are factors that should be considered in determining extended attack needs.

b. Implementation Plan Requirements

A Wildland Fire Situation Analysis will be initiated for all wildland fires escaping initial attack. The Area FMO will coordinate with the U.S. Forest Service to complete this analysis. An example of the Wildland Fire Situation Analysis can be found in Reference Manual 18, Appendix A.

c. Complexity Decision Process

See Reference Manual 18, Chapter 9, Exhibit 2 for a complexity decision chart.

d. “Delegation of Authority” for Incident Commander

Whenever an Incident Commander from a cooperating agency manages a fire within the park’s boundaries the Superintendent must provide a written limited delegation of authority and a briefing package.

10. Exceeding WFIP and New Strategy Selection

A WFIP has been exceeded when a fire cannot be suppressed during initial attack suppression actions, or when a prescribed fire becomes an escaped fire. 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.

11. Minimum Impact Suppression Tactics

The following is a list of minimum impact tactics that should guide suppression forces:

- Keep firelines to the minimum width necessary to contain fires. Use natural and existing human-made barriers whenever possible.
- Use of dozers and other heavy equipment is limited to specific approval by the superintendent.
- Limbing along the fireline will be done only if it is essential for the suppression effort and safety.
- Under appropriate conditions, unburned material may be left within the final line.
- Clearing and scraping will be minimized.
- Fell snags or trees only when essential for fire control or for safety and ensure containment measures are in place.
- Cold trail the fire edge when practical.
- Use water instead of foam or retardants. If these are needed, avoid the wetlands. Avoid using on or near identified cultural sites.
- If water and pumps are available, use wetlines or natural fuel breaks wherever possible in lieu of handline construction.
- Use fog spray in mop-up. Avoid boring and hydraulic action.
- Decisions on suppression actions will be made by the Incident Commander within the scope of the delegation of authority.

As much as possible, archeological sites and sensitive species will be identified during suppression actions and protected and avoided wherever possible. Minimizing ground disturbance is a goal. Fireline qualified archeologists will accompany crews to assist in these activities.

12. Rehabilitation Guidelines

When a suppression action is taken, rehabilitation may be necessary. The most effective rehabilitation measure is prevention of impacts through careful planning and the use of minimum impact suppression tactics. The Incident Commander will initiate immediate rehabilitation actions. Rehabilitation will be directed toward minimizing or eliminating the effects of the suppression effort and reducing the potential damage and hazards caused by the fire.

These actions may include:

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

If re-vegetation or seeding is necessary, only native plant species will be utilized, and the Chief of Resources Management will be consulted for approval of the species chosen. Special attention will be given to the preservation of cultural resources. Rehabilitation efforts should be initiated as soon as they can be safely implemented, which may be before the fire is declared controlled.

If extensive emergency rehabilitation is needed or if rehabilitation is needed to reduce the effects of a wildland fire then the Park can request appropriate funding through the Burned Area Emergency Rehabilitation (BAER) fund. The BAER fund is administered through the NPS Branch of Fire and Aviation Management at the National Interagency Fire Center. The specifics of the policy can be found in 620 DM 3 DOI BAER Policy (2004). BAER project requests totaling $300,000 or less can be approved by the Regional BAER Coordinator. Submissions over this amount are reviewed at the regional level, and forwarded to the Fire Management Program Center for approval. Requests for BAER funding must be made to the Area Fire Management Officer within 72 hours of control of the fire.

13. 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.

14. Wildland Fire Use (WFU)

This option has been rejected by the Park for several reasons. The size of monument is too small to realistically have a wildland fire use program. Not

enough is known about the natural role of fire in the ecosystems at the Park to develop a WFU program at this time. There are also no qualified individuals at the Park to initiate wildland fire use.

15. Gas Wells

There are three active natural gas wells located within the Park boundaries. The National Park Service Geologic Resources Division has rated the fire and explosion hazard as low probability and relatively low to moderate intensity. The well operators are responsible for assuring that the well locations are monitored and cleared of vegetation, debris, and materials deemed to be fire hazards. (Figure 4).

D. Prescribed Fire

A program of using broadcast prescribed fire at AZRU is not considered in this Plan. Pile burning may be used for disposal of fuels accumulated from fuels reduction projects. These burn piles are treated and planned for all prescribed fires and are subject to the requirements of NEPA, the NHPA and other applicable regulations. All prescribed fire operations will adhere to NPS prescribed fire policies and procedures found in RM-18.

1. Planning and Documentation

a. An approved burn plan will identify need resources, individual responsibilities, and timelines. These activities include scheduling of resources, coordination with neighboring agencies and communities, and obtaining necessary permits.

b. Long-Term Prescribed Fire Strategy

Planning for pile burning will be a part of long term fuel planning.

2. Needed Personnel

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

3. Fire Weather, Effects, and Behavior Monitoring

Monitoring for pile burning 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.

Figure 4 Locations of active natural gas wells.

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

The Park will use the fire monitoring protocols with adaptations described in NPS Fire Effects Monitoring. Fire monitoring support will be coordinated with the MEVE Fire Management Officer.

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

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

4. Exceeding Prescribed Fire Burn Plan

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

5. Air Quality and Smoke Management

a. Air Quality Issues:
All prescribed fires will be performed in accordance with all federal and state laws. Burns will be coordinated with and permitted through the state of New Mexico. It may be necessary to aggressively control fires when smoke affects a sensitive area or creates a significant public response. All fire activities may have to be curtailed when an extended inversion or air pollution episode is in effect. Traffic control measures will be undertaken in conjunction with local law

enforcement agencies when such episodes occur. Complaints regarding smoke will be documented and communicated to the Superintendent.

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

6. Debris Burning

Fire is occasionally used to dispose of natural vegetative debris deemed infeasible or impractical to remove mechanically in a non-wildland fuel environment (parking lot, storage yard, gravel pit, etc.). The debris may be generated from routine maintenance activities, piled debris generated from construction activities, removal of hazard trees, discarded building and administrative materials. Any material being burned for debris disposal must be classified as permissible to burn under applicable federal, state, and local regulations.

Debris burned in non-wildland environments do not require a prescribed burn plan. Debris burned in a wildland environment, including snow-covered ground, requires a prescribed fire plan.

7. Non-Fire Fuel Treatment Applications

This plan includes goals that provide for human life and safety as well as protection of resources, improvements and neighboring land from fire risk. These goals can be attained by treating fuels prior to a wildland fire event. Priorities for the Park will be the protection of structures, developed areas and heavily visited areas. Other fuel management activities may include protection of cultural and historic resources, protection of unique features, control of exotic plants or other biological goals. The following are specific actions that will be taken to lessen the wildland fire risk:

East Ruin Area Brush removal: The 1997 Archeological Sites Hazardous Fuels Assessment Program recommended that several areas in the Park should receive fuel reduction treatments to lessen the risk of wildland fire to cultural resources. In that assessment, three sites in an approximate 10 acre area on the east side of the Park were identified as being priorities for fuel treatments. These include East Ruin, Earl Morris Ruin and Mound F. These sites are covered with greasewood, sagebrush, cheatgrass and other vegetation. These sites and immediate surroundings will be targeted for selective treatment under this Plan. (Figure 5)

Workers will mechanically remove shrubs in a mosaic pattern from the mound sites and surrounding areas as appropriate. Not all vegetation would be removed. Rather, the area will be selectively treated to work in conjunction with identified fire breaks and likely ignition sources to lessen the risk of wildland fire to cultural resources. Exact bushes to be removed will be determined in the field by a person qualified in fuels management in consultation with cultural resources staff. The fuels will be cut using chainsaws, hand loppers or brushcutters. Only one or two individuals will work on top of the sites in order to lessen the impacts, and they will be monitored by an archeologist. Brush on the slopes of ruin mounds will be selectively removed to assure that erosion will not be a future impact. Material that is removed can be further treated by removal to a landfill, chipping or burning in piles in road beds or other appropriate areas. Future monitoring and cutting of the vegetation will deter regrowth and is essential to the success of fuels reduction. This fuels reduction effort will also provide a fire buffer for the visitor center. By linking the brush removal project with an existing road, an effective fuel break will be created for the Visitor Center/headquarters area.

Cleared areas will be seeded with native grass species to discourage introduction of non-native species and future growth of brush. Work may be scheduled during winter months when activities can take advantage of frozen ground to reduce impacts on soils and other features.

Grass Mowing, Fire Breaks: Maintenance of roads and other targeted areas through mowing and clearing of vegetation as appropriate can provide effective fuel breaks. The breaks will help confine fires and keep them from spreading throughout the park or on to neighboring land. Keeping these areas free of vegetation assures firefighter safety and provides defensible space. The following are fuel breaks that will be maintained as appropriate: (Figure 6)

- Mowing as appropriate along the East Ruin access road can create a break that links the East Ruin Area Brush Removal project area with the Ruins Road. This can help confine any fires that start along the Ruins Road.
- The field adjacent to the mobile home park in the southern part of the Park can be mowed to create a fire break that can confine fires to the Park. This will also help keep fires from the private land from spreading into the park.
- Mowing along the southwest boundary road will similarly create a fuel break for the adjacent subdivision.
- The access road to the Fee 4-A and Bobbie Herrera wells in the northwest area of the Park will also serve as a fuel break.

Figure 5 Areas targeted for selective brush removal.

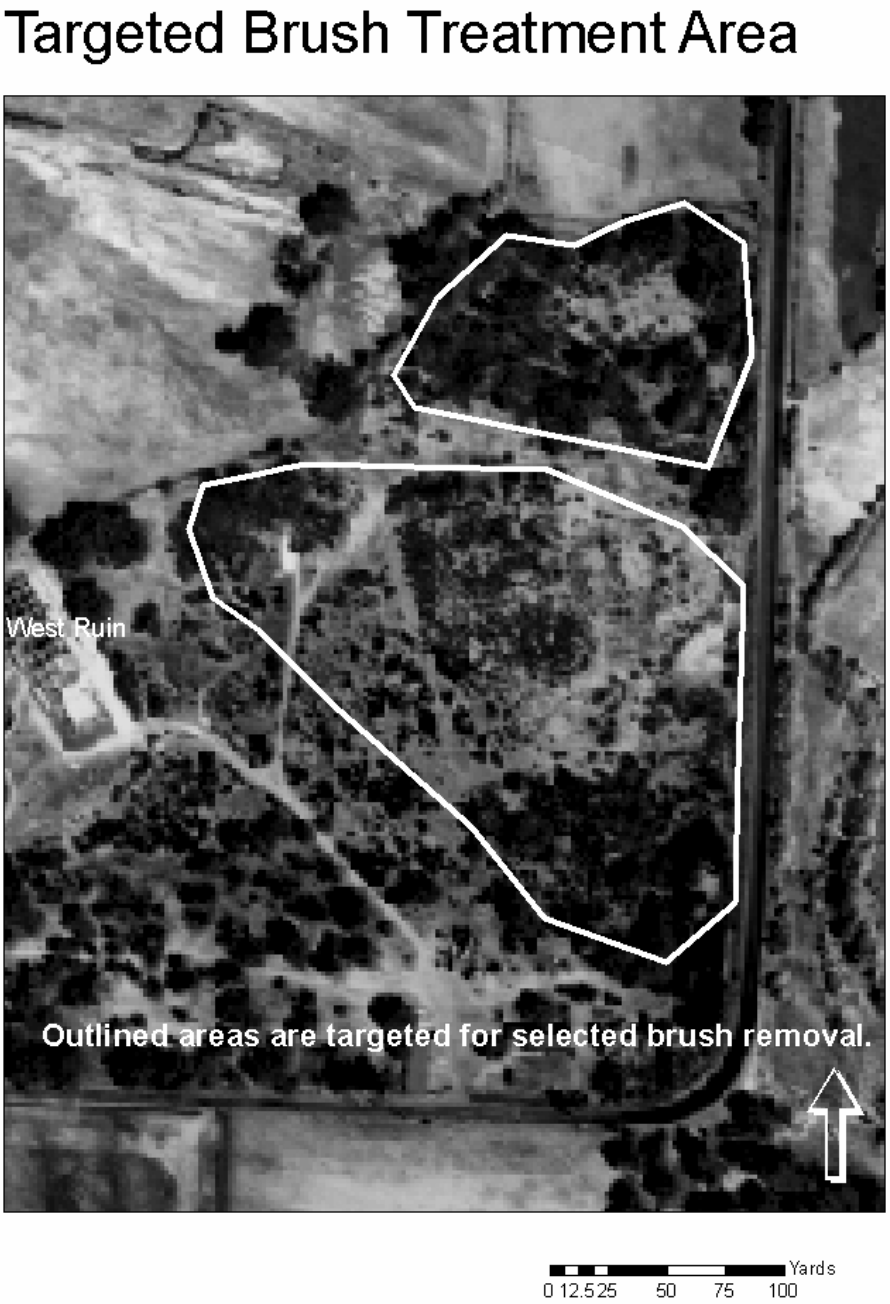

Figure 6 Fire break areas to be maintained.

8. Emergency Rehabilitation and Restoration

On January 19, 2001, the Department of the Interior issued a 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 Chief of Natural Resources, subject to review by the Park Fire Committee, will jointly formulate a rehabilitation plan for each fire. The BAER plan will be submitted to the Regional BAER Coordinator (Regional Prescribed Fire Specialist) through the Area Fire Management Officer for approval within 72 hours of the date the fire is declared controlled. BAER project requests totaling $300,000 or less can be approved by the Regional Baer Coordinator. Submissions over this amount are reviewed at the regional level and forwarded to the NPS Fire Management Program Center for approval.

V. Organizational and Budgetary Parameters

A. Organizational Structure of Site's Fire Management Program

The Park does not have a formal fire management organization. The Area FMO based at Mesa Verde reports to the Superintendent, and provides oversight and assistance as described in this plan. The FMO coordinates with the Intermountain Region Fire Management Office and Fire Management Program Center. The Superintendent will designate a Park staff member as Fire Coordinator. The Fire Coordinator is the primary on-the-ground contact for the Area FMO.

This section outlines responsibility for implementation of the fire management program by specific positions at the Park.

1. Superintendent

a. The Superintendent is responsible for the overall operation and management of the Park, as well as for visitor's safety. Fire management duties and accompanying responsibilities are delegated to staff members.

b. Manages the program within Departmental and Park Service policy, Fire Management Guidelines (NPS-18) and all relevant laws and regulations.

c. Ensures that the fire management program is adequately planned, staffed and implemented and that the Plan is reviewed annually and revised as necessary.

d. Maintains and facilitates public and media relations pertaining to both suppression and prescribed fire.

e. Approves the Wildland Fire Situation Analysis (WFSA) and Line Officers Briefing Statement.

f. Approves prescribed fire, and non-fire application plans.

2. Chief of Resources Management and Fire Coordinator

a. Responsible for all aspects of the fire management program.

b. Responsible for overall coordination, direction and supervision of wildland fire prevention, presuppression, and suppression activities.

c. Assists the FMO in all serious wildland fire emergencies.

d. Briefs the Superintendent on current and predicted fire management activity.

e. Recommends approval of the Plan to the Superintendent.

f. Ensures that a briefing statement and delegation of authority are prepared for incoming Incident Management Teams.

3. Fire Management Officer (FMO)

a. Responsible for all fire management program activities. Prepares the Fire Management Plan, Hazard Fuel Reduction and Fire Prevention Plans and the annual budget. Reviews and updates the Fire Management, Hazard Fuel Reduction and Fire Prevention Plans on an annual basis.

b. Communicates with the Chief Ranger on fire activity.

c. Maintains at a minimum the IFPM program complexity requirements and stated qualifications for the FMO position.

d. Responsible for monument wide initial attack and implementation of the appropriate suppression response.

e. Responsible for safety during wildland fire suppression and the demobilization and rehabilitation of initial attack area fires.

f. Responsible for providing fire training opportunities to monument personnel to maintain predetermined fire qualification skills in critical positions.

g. Ensures that equipment and supplies are well maintained with an adequate inventory to implement the fire management program.

h. Ensures implementation of the approved hazard fuel reduction and fire prevention plans.

i. Maintains regular contact with the Regional Fire Management Officer and the Four Corners Dispatch during fire season.

j. Prepares, reviews and revises interagency cooperative agreements with cooperators. Maintains liaison with interagency cooperators through annual meetings to review agreements.

k. Responsible for completion of all fire reports (DI-1202) and timely entry into the SACCS System.

4. Monument Information Officer

a. Prepares and releases information about the fire management program and current fire activity.

b. Serves as liaison between news media and monument staff, providing timely and accurate fire information updates.

5. Chief of Resources Management

a. Serves as liaison between the Superintendent and the Incident Commander.

b. Supervises employees who act as advisors on cultural and natural resources in all areas of fire management

c. Reviews WFSAs, project plans and prescribed fire plans to ensure resource management objectives are met.

d. Leads efforts in fire rehabilitation.

6. Resource Advisors

a. Advises the Incident Commander on resource constraints and problems.

b. Knowledgeable in natural and cultural resources.

c. Assists suppression personnel in identification of archeological sites preparatory to line location and construction.

d. Provides training in cultural site identification and the significance natural resources to fireline personnel.

B. FIREPRO Funding

FIREPRO is the mechanism for funding requests and resource allocations for the NPS fire management program. The FMO manages all FIREPRO funding for the park. Funding is available for personal protective equipment and training on an as-needed and available basis. Fire Program Analysis is a new interagency fire budgeting tool that will be established during the life of this plan. This will involve fire planning with other federal agencies.

C. Interagency Coordination

Interagency coordination and cooperation with Carson National Forest, the Farmington Field Office of the Bureau of Land Management, San Juan County and the Aztec Volunteer Fire Department are integral to successful implementation of the fire management program at the park. All wildland and prescribed fires will require external support by interagency cooperators and/or other NPS units.

Cooperative agreements will be written to formalize this arrangement. Neighboring agencies, upon request, will provide assistance with emergency fire suppression while adhering to the suppression and mop-up standards outlined in the agreement. Dispatch and coordination will be through Four Corners Interagency Dispatch and San Juan County Central Dispatch.

VI. Monitoring and Evaluation

A. Monitoring Program

The Park will implement long and short term monitoring to assess accomplishments of fuels management goals as well as determine the effects of fire management activities on cultural and natural resources. Monitoring will be designed to track the goals of individual projects over time.

The Park will work closely with Mesa Verde and Regional staff in developing and implementing this monitoring program. Assistance in conducting fire monitoring activities, including the establishment and sampling of monitoring plots, will be coordinated through the Mesa Verde FMO.

B. NPS Fire Monitoring Handbook

This handbook will serve as the source document providing monitoring needs with minor adaptations made for local situations and conditions. An electronic copy can be found at http://www.nps.gov/fire/fmh/FEMHandbook.pdf

C. Fire Monitoring Plan

A Fire Monitoring Plan, based upon the protocols found in the NPS Fire Monitoring Handbook will be developed as part of the implementation of this Fire Management Plan.

VII. Fire Research

A large body of scientific information on the effects of fire and fire exclusion in areas similar to the park already exists. There is limited funding available for fire research. The FMO may submit requests through the annual FIREPRO budget call if a determination is made that more data is needed. Additionally, requests for research funding may be made through the Interagency Joint Fire Science Group.

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 monument boundary with regards to its fire management program. The Superintendent may close all or a portion of the Park (including roads and trails) when elevated fire danger, wildland fire or a prescribed fire pose an imminent threat to public safety.

B. Mitigation Safety Procedures

The Park will implement a notification system to inform visitors, neighbors, and the Aztec community of all fire activity through normal communication channels. A fire activity report will be updated, as significant changes occur to inform Monument personnel of potential fire threats. Areas of fire activity will be clearly signed at the visitor center. Residents adjacent to the Park will be notified in advance of any prescribed fire. If any fire poses a threat outside the Park's boundaries, law enforcement agencies will be notified.

IX. Public Information and Education

Information and education are important processes in public acceptance of the managed fire program at the Park. The Fire Coordinator will provide the Superintendent with accurate information regarding current fire situations and management activities. The public information program will be developed as follows:

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

- 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.

- The public information outlets of neighboring and cooperating agencies, the area fire management office 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, contractors, volunteers, residents, and Park neighbors.

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

X. Protection of Sensitive Resources

The Park contains sensitive cultural and natural resources. Within the limits of firefighter and public safety, every effort should be made to minimize disturbances from suppression actions. Where possible, MIST tactics will be employed to avoid or mitigate these impacts.

A. Cultural Resources

The greatest resource concern are the structures and artifacts of the ancestral Puebloan people. Protection of these resources is focused on prohibiting any activity that causes damage to the structures or to the artifacts that are housed by these structures. Damage from fire can include burning of wooden features, spalling of sandstone, smoke damage, damage to artifacts, and burning of features rendering them useless for future dating techniques. Other possible problems include erosion of surrounding soils due to loss of ground cover and damage from suppression operations. An historic orchard near the river is at moderate risk from fire and should be protected.

B. Natural Resources

The Gunnison's prairie dog is state listed as a species of concern. Colonies are located in the open fields with low vegetation cover and are not expected to be adversely affected by fire should it occur. Other sensitive animal species and their habitat such as various bats will be affected minimally by fire. Possible habitat for Southwestern willow flycatcher and yellow-billed cuckoo along the

river could be affected by fire. There are no known threatened or endangered plant species within the Park.

The riparian environment along the river and farmer's irrigation ditch support a variety of plant and animal life. Fire retardants will not be used in these areas if at all possible.

C. Developments, Infrastructure, and Improvements

As funding allows, defensible space will be maintained around buildings, structures, and other improvements in the Park.

XI. Fire Critiques and Annual Plan Review

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

On smaller incidents, an informal After Action Review will take place with the resources on the fire. On larger, more complex fires review and critique will be performed by the Fire Management Officer, the Incident Commander/Burn Boss and a representative of the Park (i.e. Superintendent, Chief of Resources Management, Park Ranger, Resource Specialist). Prescribed or wildland fires involving an Incident Management Team or significant political, safety, or public issues should be reviewed by the Area Fire Management Officer. If a fire generates a major political or public concern, involves multiple serious injuries or a fatality, the Regional Fire Management Officer and the NPS Fire Management Program Center should participate in the review. The Fire Management Officer will review the Fire Management Plan annually for currency and incorporate changes into the appendix. The fire management plan is subject to formal review every five years.

XII. Consultation and Coordination

Wildland Fire Management Plan, Agencies consulted

Intermountain Regional Office, National Park Service
Mesa Verde National Park
Carson National Forest, Jicarilla Ranger District
Bureau of Land Management, Farmington District
Four Corners Interagency Dispatch Center
New Mexico State Forestry
New Mexico State Historic Preservation Office
San Juan County Fire Department
US Fish and Wildlife Service

XIII. Appendices

Appendix A: Hazardous Fuels Assessment Report for Aztec Ruins National Monument

August 19, 1997

Memorandum

To: **Superintendent, Aztec Ruins National Monument**

From: **Archeological Sites Hazardous Fuels Assessment Program (ASHFAP)**

Subject: **Hazardous Fuels Assessment Report for Aztec Ruins National Monument**

Enclosed are recommendations for the protection of archeological sites in preparation of a wildfire event at Aztec Ruins National Monument prepared by the ASHFAP team. The recommendations found in the report are explicitly concerned with the threat of wildfire to four prehistoric sites and have not taken into consideration related administrative topics such as threatened and endangered species, site visibility, esthetics, popular public opinion and other managerial objectives.

At this time the ASHFAP team would like to express its gratitude to Theresa Nichols for the well planned and executed arrangements made to assist us in the completion of our task.

Edward Maloney, Archeologist

Brenda I. Zimpel, Fuel Technician

Objectives:

The ultimate objective of the Archeological Site Hazardous Fuels Assessment Program (ASHFAP) is to offer suggestions that might protect, or at least minimize damage to, archeological resources from potential catastrophic wildfire events. A secondary objective of the ASHFAP team is to construct a precise photographic series that can be used by Park managers as a comparative baseline for application of assessment criteria on the many other sites at National Park Service properties that are suspected of having dangerously heavy fuel loads. A third objective of the team is to produce a set of hard data that is at once measurable, replicable, flexible, and applicable to a wide array of archeological sites and hazardous fuel types. A fourth objective of the ASHFAP team is to attempt to coalesce two widely disparate areas of expertise, cultural resource and fire management.

Background:

The call for this program (see Appendix A) is the result of several recent wildland fires that have irreversibly damaged cultural remains in national parks. A century of fire suppression has led to a high accumulation of combustible fuels on and around irreplaceable archeological remains. This problem of fuel loads around cultural remains will only worsen with time. The Intermountain Region (IMR) has decided to take a proactive stance in terms of managing high fuel loads on cultural resources without delay. The ASHFAP team represents the first attempt by IMR to address this problem.

The ASHFAP team is composed of two people: an archeologist, with degrees in anthropology, geology, and English, with a total of 19 years of professional experience, and a fuels technician with a degree in biology and a total of eight years of field experience.

Aztec Ruins National Monument Fire History:

The Monument had a fire in 1991 that was started by fireworks. The fire was immediately suppressed and was less than 1/10 acre in size. Due to the close proximity to local roads and housing areas, the probability of human-caused ignition is much greater than a lightning strike fire.

> “Fire managers have long realized that all risks can not be eliminated. Rather risks need to be acknowledged and managed commensurable with fuel hazard levels and values-at-risk (Omi, 1997).”

Introduction:

During the month of August 1997 the ASHFAP team completed fuel load assessments on the east portion of the monument as requested by Aztec staff (Appendix B & C). Results of these assessments, the Team’s recommended mitigation procedures, and labor estimates for initial fuel adjustments follow.

East Ruin is a large Chaco Culture Greathouse that remains mostly unexcavated in a formal sense; however, East Ruin probably

retains most of its data potential. The site contains numerous exposed prehistoric roof beams, has several modern door covers made of wood, and 2 small modern roof structures, also made of wood. Topography on the site is basically flat. Fuels on the site include abundant greasewood, cheatgrass, and ragweed, in spite of the fact that all were mechanically removed only 5 years ago. Overall, the ASHFAP team considers this fuel load as light; however, the presence of numerous prehistoric and modern flammable materials places the site in the medium category for fuels adjustment.

East Ruin Annex is a smaller Chaco Culture Greathouse located immediately adjacent to the main East Ruin building. The site is not formally excavated and retains most of its data potential. There are a few exposed prehistoric roof beams present, several small modern door covers made of wood, and at least 2 areas have been covered with flammable mulching material to stimulate plant growth. Topography on the site is basically flat. There is a paved road located just east of the site. Although the site had its fuels mechanically removed only 5 years ago, it is now overgrown with greasewood, cheatgrass, and ragweed. The ASHFAP team considers this a light fuel load, and this site to be in the “low” category for site vulnerability. Overall, the East Ruin Annex is deemed low priority for fuels adjustment.

Earl Morris Ruin is a large multi-room pueblo that is almost completely buried and remains unexcavated. The site retains full data potential. There are no obvious flammable materials exposed on the site. Topography on the site is flat. There is a large pond area just west of the site, and a paved road adjacent to the east. This ruin has the lowest fuel load observed within the Monument’s boundaries. These fuels consist of a few large rabbitbrush and greasewood plants, cheatgrass, and ragweed. Overall, the ASHFAP team considers this site very low risk and low priority for fuels adjustment.

Mound H is a probable tri-wall structure located adjacent to the large pond north of the Monument boundary. The structure is unexcavated and retains full data potential. The fence line marking the Monument’s north boundary runs over the top of the mound. The large pond just outside and north of the Monument is located very close to the site and cottonwood trees located on the mound have grown very large as a result of this constant water supply. In addition, the pond probably keeps live fuel moistures high, even during extended drought periods. Thus, the ASHFAP team considers this site low risk and low priority for fuels adjustment.

Mound F is a large round rubble mound, probably a great kiva, located just east of the main Aztec Ruin. The site was not originally

intended for observation by the ASHFAP team; however, casual observation by the Team revealed that this site has the highest fuel load within the Monument. Thus, the Team determined to submit recommendations for Mound F. The site is so completely overgrown with very large sage and greasewood that no architecture can be seen. The site apparently did not receive fuels reduction in 1992. Although the presence of these abundant fuels limits the Team's estimation of the site vulnerability, the site type in this case suggests that risks are low. Overall, the ASHFAP team considers this site low priority for fuels adjustment.

There are two other areas within the Monument that have not been given formal site designation, but that were taken into consideration by the ASHFAP team. The first of these is the great kiva depression located immediately south of the East Ruin. This structure is completely buried and in no danger from wildfire. The second area is the large midden located south of the great kiva. This midden was extensively looted early in the 20th Century. No flammable materials were located during the assessment. Both of these areas show abundant sage, greasewood, and cheatgrass; however, both areas are considered low risk and low priority for fuels adjustment.

Recommendations:

Plan A: Mechanically remove all shrubs from the ten acre area on the east portion of the Monument including Mound F. Remove all dead and down 100 and 1000 hour fuels; including the compost pile and slash piles located on the south end of the treatment area. The fuels can be cut using chainsaws, limb-loppers and brush cutters. Chip the debris into a wheelbarrow, which then can be loaded into a truck for removal. Immediately after thinning apply *Roundup* to prevent the shrubs from returning. Cyclical removal of the fuels is required to keep live fuel loads low.

Plan B: Initial mechanical thinning as described in Plan A. Cyclically burn the vegetation as it returns to the treatment area. Introducing fire to this area will slow regeneration of shrubs and propagate regeneration of grasses except for non-native cheatgrass. This plan does not include the East Ruin or the East Ruin Annex, which are too vulnerable to the presence of any fire. The Team prefers Plan B because the overall long-term costs of the fuel reduction would be lower.

Labor for the mechanical removal project will take approximately 40 hours/acre including the onsite archeologist's time. Total labor for the project is 400 hours for the initial fuel removal. Subsequent cyclical fuel

maintenance will be less depending on which Plan the Monument's managers administer.

General Comments on Recommendations:

- **A qualified archeologist should be present to monitor work during implementation of recommendations to insure maximum preservation of site.**
- **Brush cutters can be obtained from Stihl. The recommended model for this project is the FS360, which can be obtained through Four Corner's Saw, 1010 N Broadway, Cortez, CO, (970) 565-8311.**

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Glossary

Control Line: A comprehensive term for all the constructed and natural fire barriers and treated fire edges used to control a fire.

Direct Method: A method of suppression that treats the fire as a whole, or all its burning edges, by wetting, cooling, smothering, or chemically quenching the fire, or by mechanically separating the fire from unburned fuel.

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

Fire Management Plan: A strategic plan that defines a program to manage wildland fires. This plan is supplemented by operational procedures such as preparedness, preplanned dispatch burn plans and prevention.

Flame Length (FL): The length of a flame measured from the base of the flame to it's tip and parallel to the length of the flame. Flame length is measured on a slant when the flame is tilted due to the effects of wind and slope.

Fuel Model: A simulated fuel complex for which all fuel descriptions required by the mathematical fire spread model have been specified.

Fuel Type: An identifiable vegetative association of fuel elements of distinctive species, form, size, arrangement, or other characteristics.

Hazard Fuels: Fuels that, if ignited, have significant potential to threaten human life and safety, real property, park resources, or carry fire across park boundaries.

Indirect Attack: A method of suppression in which the control line is located along natural firebreaks, favorable breaks in topography, or at considerable distance from the fire.

Initial Action: Action taken by the first resources to arrive at a wildland fire to meet protection and fire use objectives.

Minimum Impact Suppression Tactics (MIST): The application of techniques that effectively accomplish wildland fire management objectives while minimizing the impacts to cultural and natural resources commensurate with ensuring public and firefighter safety and effective wildland fire control.

National Fire Danger Rating System (NFDRS): A multiple index scheme designed to provide fire control and land management personnel with a systematic means of assessing various aspects of fire danger on a day-to-day basis.

Planned Ignition: A fire ignited by management actions to meet specific objectives.

Preparedness: Activities that help to provide a safe, efficient and cost effective fire management program in support of land and resource management objectives through appropriate planning and coordination.

Prescribed Fire: A fire ignited by park managers under known conditions of fuel, weather, and topography to achieve specific objectives. An approved prescribed fire plan must be completed and NEPA requirements must be met prior to ignition.

Prescription: Measurable criteria that guide selection of appropriate management strategies and actions. Prescription criteria may include economic, public health, environmental, geographic, administrative, social or legal considerations.

Rate of Spread (ROS): The time it takes the leading edge of a flaming fire front to travel a known distance. Rate of spread is commonly measured in chains/hour and meters/second.

Suppression: management actions intended to protect identified values from a fire, extinguish a fire, or alter a fire's direction of spread.

Unplanned Ignition: A wildland fire not ignited by management actions.

Wildland: Any area under fire management jurisdiction of a land management agency.

Wildland Fire: Any fire, other than prescribed fire that occurs in the wildland.

Wildland Fire Situation Analysis (WFSA): A decision-making process that evaluates alternative management strategies against selected environmental, social, political, and economic criteria.
Wildland Fire Use: A natural (lightning) ignited fire that is managed to meet resource benefits.

Weather Information Management System (WIMS): An interactive computer system designed to accommodate the weather information needs of all federal and state natural resource agencies.