

Environmental Assessment

Arkansas Post National Memorial

Fire Management Plan

December, 2004

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Chapter 1 -- Introduction

Site Description

Located in the Mississippi Delta region of Arkansas, Arkansas Post National Memorial (Post) lies on a peninsula surrounded by the Arkansas River and two backwaters. The Post was established in 1960 to preserve and commemorate the Quapaw, French, Spanish, English, and American history of this site. This part of southeastern Arkansas (Fig. 1) has been influenced by the interactions of the Mississippi and Arkansas Rivers, whose channels have shifted over time to leave a system of rivers, bayous, and oxbow lakes.

The land-based portion of the Post is characterized by terrace landscapes, flat terrain, and various stands of upland and lowland hardwoods (Table 2). Bayous and swamps are interspersed throughout the area (Fig. 2). Manicured lawns, prairie, and tall-grass areas also exist within the Memorial (Fig. 3). An abundance of flora and fauna resides both on land and in water (Tables 3 – 6).

The Post consists of two distinct and physically separated units, the Memorial Unit and the Osotouy Unit. The Memorial Unit (Memorial) contains 389.18 acres, 100 acres of which are water, leaving a land-based portion of approximately 289 acres (117 ha). Approximately 50 acres are mowed parkland with the remaining area covered by woods and a small prairie (Fig 3). The Post provides a visitor center, picnic grounds, and other services at the Memorial. Over 300 years of European history have occurred within the Memorial, creating a disturbed landscape. The Osotouy Unit (Osotouy) includes a National Historic Landmark known as the Menard/Hodges site. The 360-acre Osotouy lies about five miles southeast of the Memorial, but about 25 miles by roadway. Land cover consists of mixed hardwoods and abandoned fields. The original Quapaw village of Osotouy, contains the Menard/Hodges archeological site, a national historic landmark. Both units are similar in their rural setting with farmland and waterways around them.

The Arkansas River has long served as an important transportation corridor into the interior of North America; first for American Indians and later for European explorers and trappers. Today, the Arkansas River is managed by the Army Corps of Engineers (COE). The locks and dams on the river have raised the river substantially over its historic level, resulting in the inundation of lowlands, including over 80 acres within the park's authorized boundary. These water levels maintain the McClellan-Kerr navigation system built in the 1960s. It also created the peninsula on which the Memorial lies. Private land lies on the north boundary. Post and Moore Bayous bound the Memorial on the west, Post Bend Lake to the east, and the Arkansas River to the south. Park Lake sits near the southern projection of the Memorial, along side the visitor center and Old Townsite (Fig. 2).

Both the Memorial and Osotouy Units are designated as National Historic Landmarks. The Memorial represents European and American exploration and settlement that contributed greatly to the social, economic, and cultural development of the Lower Mississippi Valley. Despite the relatively small size, the Memorial retains significant and complex layers of cultural resources. Much of the land has been disturbed during the

historic period up to present with cultivation of the land as late as the 1950s, but a natural-appearing landscape has reclaimed areas of the park. Still, the landscape must be considered part of the cultural landscape without a significant division between cultural and natural sections, because it supports cultural values and the GMP recommends management for the interpretation of the cultural resources. The park is currently in the process of completing a Cultural Landscape Report (CLR), which will delineate those segments of land or areas that have any aspects of extant cultural significance. The CLR will include a conceptual treatment plan for all areas of the Memorial.

The Memorial has visitor use areas, areas of interpretable cultural landscape, and supporting landscape with a natural appearance. The visitor center is slightly removed from the historic resources, but provides an overview of the Post. This developed area provides parking and indoor exhibits. From the visitor center, a 2-mile scenic drive with waysides connects to the picnic area. A one-mile paved walkway with waysides, accessible from the visitor center, meanders through the Old Townsite. A short spur walkway provides access to the Civil War Rifle Pits trail. Nearly a mile of unpaved nature trail loops to Alligator Slough and ends at the Civil War Rifle Pits.

Mission Statement

The Arkansas Post National Memorial mission is to:

Commemorate human settlement near the confluence of the Arkansas and Mississippi Rivers and the events associated with the first European settlement in the Lower Mississippi fostering an appreciation of the interaction of the cultural groups, their histories, and their significance to the region; preserving the cultural and natural resources; and promoting resource stewardship through education.

The Government Performance and Results Act of 1993 (GPRA) Mission Goal Ia states that natural and cultural resources and associated values of Arkansas Post are protected, restored, and maintained in good condition and managed within their broader ecosystem and cultural context.

Historical Significance

The complex story of Arkansas Post involves historic events brought about by power struggles among the diverse cultures that lived on the first high ground above the confluence of the Arkansas and Mississippi Rivers. Control of this area, rich in natural resources, was the subject of conflicts, alliances, and interactions among various groups in historic times -- the Quapaw, French, Spanish, English, and American in particular. The entire Post is registered as a National Historic Landmark.

The Post preserves the evidence of early contact and continued interaction among the French, Spanish, and British and the American Indians and U.S. settlers in the Lower Mississippi River Valley for scientific study, public appreciation and benefit, and access by traditionally associated groups. It will commemorate and interpret the peoples and cultures that inhabited the successive Arkansas Posts. The Post will interpret and

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commemorate the American Indian communities and later European interaction with American Indians at Osotouy.

Significance Statement

The following describe the Post's significance and provide the basis for interpretive themes and desirable visitor experiences.

- Geographic and natural resources combine with the forces of global economy, politics, and society at Arkansas Post to create a rich heritage and lasting living legacy for the nation.
- Arkansas Post was the first permanent European settlement in the Lower Mississippi River Valley.
- Arkansas Post represents in a tangible way the struggle by European powers for dominance in the Lower Mississippi River Valley.
- Arkansas Post reflects where the United States gained control of the Arkansas River Basin by establishing Fort Madison.
- Arkansas Post served as a major temporary internment point along the water route of the Trail of Tears
- The Civil War battle at Arkansas Post helped the Union forces to reestablish control of the Lower Arkansas and Mississippi River systems.

Purpose

The Post maintains lands that are capable of burning and therefore must develop a fire management plan (NPS, Director's Order #18, Wildland Fire Management). This environmental assessment is necessary to assess the appropriate tools to manage hazard fuels and meet management objectives. Impacts of several management techniques will be evaluated in this document based on data available and the expertise of local and National Park Service (NPS) specialists in cultural and natural resources.

Managers wish to maintain an aesthetically pleasing and safe environment that contributes to the interpretation and protection of the Post, such as the trading post, the Revolutionary War engagement area, the Confederate fortification, and a civic-ceremonial center associated with Mississippian culture. The preferred alternative for management of resources, as presented in the Draft General Management Plan of 2004 (GMP) and Environmental Impact Statement of 2004 (EIS), emphasizes interpretation of cultural heritage that flourished over the centuries at Arkansas Post and provides innovative ways to celebrate the area's cultural diversity, while maintaining the natural and cultural resources. The Post also seeks to preserve these resources for scientific study, public appreciation and benefit, and access by traditionally associated groups (Strategic Plan 2001-2005). As part of the preservation of these resources and protection of visitor safety, the Post wishes to minimize the impact of wildland fire by managing hazard fuel conditions in the deciduous woodlots.

Need for Fire Management Plan and Environmental Assessment

National Park Service's Director's Order #18 requires that

"All NPS units with vegetation that can sustain fire must have a Fire Management Plan."

It further states that,

"The overall resource management objectives for an NPS unit must guide Fire Management Plans. The resource management objectives will determine whether and how fire will be managed."

To ensure that protocols described in the Fire Management Plan (FMP) will not have adverse effects on natural and cultural resources, Director's Order #18 requires that the FMP be compliant with the National Environmental Policy Act (NEPA). This environmental assessment (EA) functions as the NEPA documentation for analysis of a range of reasonable, short-term management alternatives and their direct, indirect, and cumulative impacts.

Impacts of several management techniques are evaluated in this document based on data available and the expertise of resource specialists familiar with the site. Some evaluations come from the recently written draft EIS for the GMP, which accounted for impacts to all pertinent resources on site. The GMP provides the basis for actions taken in subsidiary plans, such as the Resource Management Plan (RMP) and FMP.

Special consideration must be afforded the uniqueness of the two Post units, 389-acre Memorial and 360+acre Osotouy. The entire Post is listed on the National Register of Historic places, and Section 106 of the National Historic Preservation Act requires that any proposal for restoration, demolition, reconstruction, landscaping, or land acquisition must be reviewed and commented upon by the Advisory Council on Historic Preservation and the Arkansas Historic Preservation Officer. Fire management must consider the impact of hazard fuel mitigation and a no action alternative on the historic resources, including the cultural landscape.

Fire Management Objectives

Historically, fire occurred within the Arkansas River Valley, but natural fire was not as common in the bottomland of the Delta Region as in the uplands of Arkansas. Indigenous people set fires to clear areas and stimulate vegetative growth, to improve wildlife availability, to use tactically in warfare, and to promote other resources useful to indigenous people (Cooper 1981, Williams 2000). In much of Arkansas, indigenous people set fires year round, but the majority of fires occurred between September and December (Cooper 1981). Wildland species became adapted to the anthropogenic fire as well as the occasional natural fire. Frequent fire has less intensity than infrequent wildland fire and does not damage fire-dependent species as a whole. Prescribed fire may be useful in mixed bottomland hardwoods to control under story vegetation and to reduce fire hazard conditions in this region (Forest Service 1981).

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Fire management objectives reflect support for the principle mission of the Post and its emphasis on interpretation of the periods of significance. The Post wishes to consider techniques that will:

- Make firefighter and public safety the highest priority of every fire management activity.

Protection of human life is reaffirmed as the first priority in wildland fire management. Property and natural/cultural resources jointly become the second priority, with protection decisions based on values to be protected and other considerations.

- Manage prescribed and wildland fires in concert with federal, state, and local air quality regulations.
- Suppress all wildland fires regardless of ignition source to protect the public; check fire spread onto private property.
- Manage wildland fires so that Post resources (natural, cultural, and improvements) are protected from damage by suppression actions and fire.
- Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities.
- Use prescribed fire where and when appropriate as a tool to meet resource management objectives consistent with NPS policies.
- Integrate fire management with all other aspects of Post management.
- Reduce wildland fire hazard around developed areas, along interface boundary areas and adjacent to cultural and historic sites.

Scoping Issues and Impact Topics

Issues describe the relationships between proposed actions and environmental resources. They lead to the development of impact topics that receive attention in the environmental consequences portion of analysis. Impacts are predictable results of the action on the impact topics and they are quantified as much as possible. Internal and external scoping for the range of potential issues for the Post occurred on February 7, 2003. Principle issues identified in scoping included:

Air Quality

- Emissions from fires may degrade air quality below federal, state, or local air quality regulations.
- Farm fields are burned annually around the Post. This should allow neighbors to accept prescribed fire on the Post as an acceptable technique.

Geology and Soils

- Fires of varying intensities may alter the physical, chemical, and biological properties of the soil as a result of vegetation removal, consumption of organics, and increased temperatures.
- The lack of fire may alter the physical, chemical, and biological properties of the soil as a result of no nutrient cycling in fire maintained habitat types.
- Microorganism populations in soils are directly influenced by temperature increases that kill the organisms, which indirectly affects the aeration, nutrients, and moisture content of the soil environment. Fire use can result in furthering the nitrogen process, nutrient cycling, vegetation flushes, and composition diversity.

Vegetation

- Fire affects the productivity and composition of vegetation over different temporal and spatial cycles.
- An increase in exotic vegetation occurred following the last prescribed fire. The Post staff suggested that the fire may have been too intense and resulted in mortality of over story trees. The canopy openings and cover disturbance caused by fire could have allowed the intrusion of exotic plant species. Undesirable results from the 1995 fire caused the Post to reconsider the future use of prescribed fire in the wooded areas. Fire has not been used in the prairie since the mid-1990s, either, although no adverse impacts were reported for that location.

Wetlands

- Fire can result in a loss of riparian or wetland vegetation, decrease stream shading, and may result in chemical changes for macro invertebrates.

Wildlife

- Fire may remove or alter habitat for wildlife and fisheries.
- Fire may result in direct mortality of wildlife species.
- Fire may result in the growth of new fire-dependent species that would create new habitat for existing species and potentially new species that are attracted to the change of habitat.
- Fire frequency needed to control tick populations may be much greater than the fire rotation permits. Reestablishment of the tick population would probably occur within a month of fire.

Rare, Threatened and Endangered Species

- Fire may remove or alter habitat for threatened and endangered species.

Cultural Resources

- Fire or fire-related activities may damage, destroy, or reveal cultural resources: ethnographic resources are still relatively unknown on Osotouy. Fire suppression could damage unknown archaeological features in the soil.

Public Health and Safety

- Fire may be dangerous or present risks to the health, safety, life, or property of firefighters, USFS and NPS employees, and the general public.

Visitor Use and Experience

- Fires may prevent visitors from experiencing/enjoying all or part of the Park.
- Fire-related activities and equipment may increase the level of sound in the Park and surrounding areas, which may affect visitor experience.
- Treatments may affect recreation in areas surrounding Post, particularly the Army Corps of Engineers (COE), Pine Bluff Project.

From these issues, impact topics were derived, based on the potential for impacts by the alternatives. Impact topics cover natural resources, cultural resources and visitor experience. Natural resource topics include geology and soils; air quality; fauna and habitat; and rare, threatened, and endangered species. Vegetation specifically as a natural resource is absent from the discussion. Hazard fuel mitigation manipulates vegetation for fire management, but also, it is intended to support management objectives. Within a small park with cultural values distributed broadly, management of vegetative cover falls within cultural landscape parameters, rather than into ecosystem management. Therefore, vegetation impacts are considered under cultural landscape and the role of vegetation in a wildland setting is analyzed as a factor in habitat. No unique natural resources or ecologically critical areas are identified for the Post.

Cultural resource topics address archaeology and cultural landscape. The proposed alternatives are intended to meet the cultural landscape management objective to clear the under story, providing an open feeling similar to what would have existed at the Confederate Trench and Civil War Rifle Pits and near the town site. Therefore, this objective becomes an issue topic for further discussion under cultural landscape.

Visitor experience is included as an impact topic, as it may be temporarily impacted during the few hours of treatment, or aesthetic appeal of the area may be different after treatment. Some visitors use the site as a stopping place while fishing. These visitors may be temporarily inconvenienced by not being able to use a preferred access point. Impacts of alternatives on effective interpretation of resources fall under this topic.

Human health and safety constitute the overlying reason for developing a fire management strategy. This assessment takes into consideration all aspects of human health and safety, but will address them implicitly as they relate to other aspects of the human environment and hazard fuel management. Hazard fuel treatment directly relates to human health and safety, while impacts to natural resources indirectly affect health and

safety. Therefore, the objective of effective hazard fuel mitigation has been heavily weighted in the decision process. Human health and safety becomes an important component of air quality impact analysis as well.

Issues and Impact Topics Considered but Not Addressed in this EA

Several impact issues will not be discussed within the alternatives, because they are not impacted by the proposed alternatives. These impact issues will be discussed briefly below.

Tick control

The Post expressed a desire to use fire to control populations of deer ticks. Further investigation into this objective resulted in elimination of it, because reduction in tick population could not be achieved with the type of prescribed fire being proposed in this document.

Water Resources, including wetlands and floodplains

Although extensive water quality monitoring has not been conducted at the Post, managers suspect that the waters surrounding the Memorial contain agricultural chemicals, high sediment loads, and bacterial concentrations attributable to local land use. Sloughs, bayous, and other riparian and floodplain features create the principle wetland habitats that exist on site. Only minor wetland habitats persist outside these features and consist of seeps and small drainages. Some low-lying areas along the water in the Memorial are within the 100-year floodplain.

Any impact on water resources would result from soil erosion causing turbidity and sedimentation. Soil erosion is discussed for each alternative within the soils and geology section of environmental consequences. None of the alternatives will impact wetlands through filling, elevation changes, substantive changes to vegetation composition, or hydrologic and soil alterations (Joel Wagner, NPS-Water Resource Division, personal communication) and so there is no need for further discussion. Similarly, there will be no impacts to floodplains, since none of the alternatives would change elevations or current velocities on the floodplain (Mike Martin, hydrologist, NPS-Water Resource Division, personal communication). Proposed treatment areas in the Memorial lie above the 100-year floodplain and Osotouy, which lies within the 100-year floodplain, has been removed from treatment consideration at this time. The principle native vegetation types that currently exist on the floodplain and in wetlands of the Memorial are not expected to change because of treatment.

Ethnographic Resources

An ethnographic study has been initiated to document the dynamic relationship between the Quapaw and Arkansas Post including land use patterns, demography, and ceremonial life. Although the Memorial has a history relevant to indigenous people, the land itself does not appear to have major ethnographic significance. This is not the case in Osotouy, which served as the center of the Quapaw culture, based around a ceremonial mound of

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Mississippian culture. The Quapaw consider it sacred land and many burials exist around the mound.

In recent years, members of the Quapaw Tribe of Oklahoma whose ancestors occupied Osotouy when the French arrived in 1686 have expressed interest in Post actions involving Osotouy. They are committed to participating in planning, interpretation, and resource management issues that affect the tangible and intangible resources of their culture for which the NPS may have management responsibilities. These include ethnographic resources such as bodies of water, vegetation types, and landforms in addition to the archaeological resources.

Several areas within the 360+acre Osotouy Unit were the subjects of the archaeological field school conducted by the Arkansas Archeological Society and the Arkansas Archeological Survey during the summers of 1997 and 1998. Continuing archaeological work will help define parameters for appropriate site use and development. Scientific study has resulted in the discovery of human remains and materials specified in the Native American Graves Protection and Repatriation Act (NAGPRA). The GMP suggests that the NPS will honor the request of Quapaw to establish an area for reburial of repatriated human remains on the site, but away from any proposed visitor use areas. This ensures that Osotouy will retain its ethnographic importance and special consideration by the Post and NPS.

None of the alternatives include fire management activities in Osotouy, with the exception of the suppression of wildland fires. In deference to the Quapaw, and for the preservation of ethnographic values, consideration for fire planning will be made once a preservation and protection plan is in place for this unit.

No other traditional group has claimed interest in the Post holdings and so the Post does not expect alternatives to affect ethnographic resources. Therefore, with the elimination of Osotouy from treatment proposals, ethnographic resources will not be further discussed in this document.

Socioeconomics

Socioeconomic issues address economic impacts on surrounding private holdings. The surrounding land is predominantly farmland and the Pine Bluff Project, COE, is located nearby. The Pine Bluff Project offers camping, fishing, and hunting opportunities for visitors, making this area important to hunters and anglers.

All of the alternatives focus on managing hazard fuels and thinning under story in the Post. None of the alternatives will differentially impact neighboring recreational activities or farming, and thus indirectly impact economics. The alternatives have no substantive effect on socioeconomic issues. Impacts to adjacent land were considered but further discussion would only involve air quality, which is already addressed in natural resources. Therefore, this topic was dropped from further consideration.

Environmental Justice and Protection of Children

Socioeconomic issues include environmental justice (Executive Order 12898) and impacts on surrounding private holdings. The alternatives have no substantive effect on

environmental justice. No disproportionately high and adverse human health or environmental effects will exist for minorities and low-income populations. The alternatives have no substantive effect on the protection of children. Therefore, these topics were dropped from further discussion.

Costs

Although costs will not be addressed as a separate topic, it is included for consideration in the objectives and cumulative impacts. Labor is the principle cost associated with each alternative. Therefore, costs are discussed within the context of labor needed to reach objectives.

Chapter 2 -- Alternatives

This chapter describes the range of alternatives, including the No Action alternative, to be used at the Post. No other alternatives were considered and not further discussed in this document. Alternatives were selected based on their reasonableness and feasibility in meeting the Post objectives for management of hazard fuels and landscape.

The responsibility of the Post to preserve and protect cultural resources necessitates immediate suppression of all wildland fire in both management units. This is clearly indicated in the interpretation of planning and guidance documents cited previously. During fire suppression, fire crews would employ MIST at all times. The Gillett, Arkansas, Volunteer Fire Department provides emergency fire suppression on the Post. The Post does not have its own emergency fire suppression equipment or crew, although several staff members have been certified for fire fighting. Fire suppression is common to all alternatives and therefore is described separately from the specific alternatives and discussed in the environmental consequences in conclusion of each scoping topic.

Because Osotouy is new to the Post and plans have not been finalized for the preservation of the site and its artifacts, no treatments have been proposed for this unit. Once decisions are made as to the repatriation of human remains and issues, including elements under the Native American Graves Protection and Repatriation Act (Public Law 102-601, 25 U.S.C. 3001-13, 104 Stat. 3042), fuels treatments would be considered for Osotouy. Until a fire management plan is designed for the unique needs of Osotouy, wildland fire would be suppressed with consideration for the fragility of the artifacts and wishes of the traditional people associated with the site. Fire suppression for Osotouy may be necessary to protect resources on site and neighboring properties. Fire fighters would use MIST and would avoid vehicular travel off of roadways at all times. All possible consideration and care would be given to this unit during fire fighting activities.

Alternative A: No Action

This alternative represents the status quo for vegetation and hazard fuel management. The current management of hazard fuel consists of labor intensive manual removal of down and dead wood. Chainsaws and hand tools would be used to cut wood which could be hauled to vehicles for removal. Vehicles would occasionally need to go off of established pathways to safely access debris.

Under story vegetation control would be secondary to the hazard fuel mitigation. Under story management involves the use of mowers and "weed-whackers" in some locations. Mechanical mowing controls the height of grasses and other herbaceous plants in all turf around visitor use areas (Fig. 2). Leaves would be swept from turf and pathways and disposed of in compost piles. Where tree density excludes mechanical devices, infrequent under story and ground cover treatment would occur. Mowers have managed the trails through the wooded areas, but most of the surface has become compacted from use and does not require frequent mowing. Weed whackers would cut herbaceous and small woody plants in the forest and trim around obstacles.

The current treatment was instituted after fire had been used in the 1990s to thin the understory and reduce hazard fuels. The Post has not used prescribed fire since 1996 and does not consider it part of their current techniques. Burn piles are ignited under the 1993 Fire Management Plan and would continue to be an option for the disposal of debris.

Planning for the occurrence of wildland fire and long-term management of natural resources are basic protection goals established in the Government Performance and Results Act of 1993 (GPRA), Director's Order #18, and the Organic Act. An FMP using the no action alternative would focus on fire suppression. All wildland fire would be immediately suppressed. Crews responding to wildland fire would use MIST at all times to minimize the impacts to cultural and natural resources.

Alternative B: Prescribed Fire (No Mechanical or Manual Cutting Outside of Turf)

Prescribed fire would be used in wooded under story and tallgrass prairie to control under story and manage hazard fuels (Fig. 2). Fire staff from Buffalo National River would ignite and manage prescribed fires. Less than half of the available fire management area would be ignited in any given year. Fires would be ignited in small burn units that coincide with the type of vegetation, fire objectives, fire behavior, and prescription.

Literature review (Gill 1981, Huff and Smith 2000, Lyons, et al. 2000, Russel, et al. 1999), recommendations from fire management experts, and consideration of impacts suggests that the Post could use prescribed fire in maintenance of historic sites and the prairie immediately prior to greening of native species in early spring and occasionally in late summer and early fall during the growing season. This would be fairly consistent with past practices. Burn piles would not occur under this alternative. Prescribed fires could be planned for March or April and again in September through early November.

Mild to intense natural fire probably occurred every 4 – 20 years, with intensity increasing with length of time between fires, fuel moisture, weather topography and other factors. Prescribed fire could be used at the Memorial on a three- to 15-year rotation to approximate natural fire regimes (Scott Simon, written communication). The prairie would receive a fire return interval of three to five year, while the forests would receive a fire return interval of approximately 15 years.

It is probable that natural decomposition in the moist bottomlands would result in slow development of hazard fuel conditions with the greatest problem being in large, coarse fuels. Monitoring of fire effects would include monitoring the rate of hazard fuel condition development over the years when fire would not be used. Fire would occur frequently enough to meet both objectives of fuel mitigation and under story management. A five to ten year periodicity has been recommended for other sites in the region (Scott Simon, written communication), but has not been tested at the Post. Fire effects monitoring would help to determine the correct fire frequency to meet objectives without impacting community structure in the under story.

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Generally, fire would be used more frequently in tallgrass prairie than in woods. A fire rotation of three to five years would be appropriate for management of tallgrass species and reduction of fine fuels. Fire crews would use ATVs in prescribed fire and in fire suppression, particularly in the open areas, such as the prairie. Care would be taken to keep ATVs and other vehicles out of known archaeologically sensitive areas and wetlands.

Burning of landscape debris need not be considered under this alternative, because the assumption is that prescribed fire would be the only treatment used outside of turf areas. Brush piles result from manual cutting and removal of debris to localized sites, which would not occur under this alternative.

Hazard fuel treatment would reduce the potential for wildland fire in the treatment areas. If wildland fire occurs, it would be met with immediate suppression. Firefighters would apply MIST measures at all times and disturbance to soils would be minimized.

Alternative C: Manual Cutting of Hazard Fuels (No Prescribed Fire, No Herbicide)

Under this alternative, frequent brushing and hauling of woody debris could be conducted primarily by hand, using chainsaws, “weed whackers,” and hand tools. Vehicles could be placed on nearby access points to bring workers to the site and remove debris from the site. On occasion, when debris is heavy or safety is a concern, vehicles could be taken off of established paths to access work areas. Care would be taken to avoid sensitive archaeological areas and wetlands. Debris could be disposed of by chipping and composting or hauling off site. Fire is not proposed for the disposal of debris.

The Post proposes to continue mowing turf and herbaceous vegetation where mowers can safely access areas. Mowing maintains a low profile of about four inches on turf, but other herbaceous areas may grow higher than four inches before receiving treatment. Laborers could use weed whackers in herbaceous growth inaccessible to mowers. The prairie would be mowed to a height of 14 inches early in the season to discourage invasive trees and shrubs, before native grasses emerge. Mowing may be conducted as needed on herbaceous plants outside of turf areas, including pathways. Mowed grasses and herbaceous material would not be removed for disposal.

Undesirable understory plants could be cut as needed to meet the desired conditions for the historic landscape. Small understory vegetation could be removed from site or left to decompose at the managers’ discretion. Cutting may require the use of hand tools, chainsaws for large materials, and “weed whackers” in places where the equipment can be safely used in small diameter vegetation.

If wildland fire occurs, rural fire fighters would meet it with immediate suppression. Firefighters would apply MIST measures and minimize disturbance to soils and other resources as much as practicable.

Alternative D: Prescribed Fire and Manual Cutting (Preferred Alternative)

This alternative would be an eclectic approach with flexibility in methods of hazard fuel management and understory control that could be adjusted for the existing conditions. The Post has effectively combined cutting and/or removal of hazard fuels with prescribed fire and brush pile burning in the past. Cutting could be conducted either as a precursor to prescribed fire to reduce or redistribute fuels and control fire intensity, or after prescribed fire as a secondary treatment and cleanup. Fuels could be removed from the bases of trees with exposed or shallow roots. This process also allows moving fuels to brush piles for burning. Brush piles would be rotated to different safe locations to avoid repeated burning at one location. When fine materials would be cut to control understory vegetation, they could be left to decompose or burn in the next prescribed fire. Fire could occur once every fifteen years in the wooded areas and more frequently (every three to five years) in the prairie, unless fire effects monitoring and hazard fuel conditions suggests that timing should differ.

The Post could rely on manual hazard fuel treatment and understory management annually with prescribed fire used cyclically. Manual cutting could predominate as the principle treatment for understory management, but would also serve as a hazard fuel mitigation technique in the aftermath of a catastrophic event, such as a severe storm. The alternative would also support the use of fire to dispose of landscape debris, which could be helpful after catastrophic events also.

Prescribed fire could allow cleanup crews access to areas where understory is usually dense, locate stems that remain after a burn, and remove those stems by hand as a secondary treatment. Herbicide stump treatment would not be excluded from this alternative, but its use would be restricted to stump treatment of shrubs under an approved Integrated Pest Management Plan. Manually cut material could be left to decompose on the soil or large debris could be removed to brush piles, depending on local hazard fuel conditions and decomposition rates. Judgment would be made on-the-ground and adaptive management employed. Fire could be the principle treatment in the prairie, where fire frequency could be at three to five years. Mowing could be avoided in the prairie, but allowable early in the season at a height greater than the native grass height.

Prescribed fire may be employed during late summer and fall in some years. This may allow crews to cut vegetation during summer months and leave it or redistribute it to control fire intensity and enhance the probability of achieving desired results in prescribed fire. Again, crews on-the-ground would interpret the best means of achieving desired conditions by employing various options available under this alternative.

Having this broad base of tools to manage hazard fuels would result in the best and most effective management of hazard fuels. Methods of treatment can be selected and adapted to meet the current conditions and achieve desired conditions. Effectively managing hazard fuels would greatly reduce the potential for wildland fire. Should wildland fire occur, it would be met with immediate suppression, as in the other alternatives, and

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MIST would be used whenever practicable. Disturbance to soils and potential archaeological features would be minimized.

The Environmentally Preferred Alternative

The Council on Environmental Quality (CEQ) regulation (40CFR 1500-1508) and ID-12 require NPS to identify the alternative that best promotes the goals of section 101 of the NEPA. The CEQ defines the environmentally preferred alternative as

“ . . . the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources” (1981)

The environmentally preferred alternative is the combined use of prescribed fire and manual cutting, Alternative D. This alternative best meets the Post objectives with the least disturbance to the environment. It uses fire on a cycle that may best represent the pre-settlement regime. Perhaps most importantly, it allows the Post more options for adaptive management based on current conditions and desired future conditions.

The No Action plan and Alternative C (manual cutting) would be labor intensive and do not support the use of natural processes. Alternative B (prescribed fire) would not completely meet the desired conditions for understory management. None of the alternatives would directly, indirectly, or by cumulative impacts impair resources or values on the Memorial or those neighboring the Memorial.

There is not enough known at this time of the impacts of treatment on the archaeological and ethnographical resources of Osotouy. A conservative approach would best preserve the resources. Therefore, this unit will not be considered for any treatment except fire suppression using MIST. Without visitor services available at this site, the chances of wildland fire would be less than in the Memorial. The location in the relatively moist 100-year floodplain suggests that natural decomposition in the wooded area may retard development of hazard fuel conditions. This area would be considered for fire planning once plans for repatriation, resource protection, and visitor access are initiated and the extent and nature of the resource is better understood. Fire suppression with the use of MIST is not expected to have significant impacts at either the Memorial or Osotouy, and would result in less impact than allowing wildland fire to burn without suppression.

Chapter 3 -- Affected Environment

This chapter describes the conditions that exist at the Post. It describes the portion of the environment that may be affected by the proposed action and alternative actions. It does not describe aspects of the Post that are not affected by the actions. Therefore, Osotouy is only briefly described, relative to what is known of those resources potentially impacted by fire suppression.

Natural Resources

The Post is in the Lower Mississippi Riverine Forest ecoregion in the Delta Region of Arkansas. Currently 54 acres of the Memorial are mowed to produce a park-like landscape with sparse tree cover. The remaining 255 acres includes a small prairie and forests (Fig. 2).

Average high and low yearly temperatures range from 31°F to 91°F. Rain falls throughout the year with an average annual precipitation of 52 inches. Winter and spring are the wettest seasons with the driest period in autumn.

Air Quality

The Arkansas Department of Environmental Quality does not maintain an air quality monitoring station in the vicinity of the Post. Arkansas County is designated as a Class II air quality area under the 1963 Clean Air Act, as amended (42 U.S.C. 7401 et seq.). The air quality is considered generally good without major sources of point and non-point emissions. Particulate matter is the principle source of pollution, originating from primarily from mobile sources (www.scorecard.org).

State regulations exempt prescribed fire from general state prohibitions for open burning (Air Quality Regulations, State of Arkansas, Section 18.603[C] and [G] – attached), provided a “public official” has authorized the fire. Burning may only occur when winds prevent smoke from entering populated areas (Section 18.603). This is not a concern at the Post, since the park lies well away from populated areas. Farms occur on the land adjacent to the Post and these farms use fire to clear stubble. The Post is not a primary source of particulates in the air.

Geology and Soils

The Delta Region consists of a flat to gently sloping broad floodplain and low terraces made up of deep alluvium (water transported sediment) and loess (windblown and deposited sediment) overlying sedimentary bedrock. Most of the region is flat, with an average southward slope of less than 8 inches per mile. The only noticeable slopes are sharp terrace scarps and natural levees that rise sharply to several meters above adjacent bottomlands or river channels. The geology of the Delta does not appear at the land surface and will not be further described. The regional landscape contains oxbow lakes and cutoff meanders.

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Two soils dominate the Post: Immanuel silt loam and Stuttgart silt loam (Natural Resources Conservation Service, soil maps as interpreted by Marshall Handcock, Arkansas County District Conservationist). A small area of Ethel Silt Loam makes the substrate of the center of the Memorial and Crevasse Loamy Fine Sand, DeWitt Silt Loam, Keo Loam, and Muskogee Silt Loam are all represented to a lesser degree. Immanuel series soils are deep, moderately drained soils that formed in alluvium. Runoff can be negligible to very high depending on slope, and presents erosion problems at slopes greater than 3 to 8 percent. Stuttgart soils are very deep and moderately well to poorly drained. These alluvial soils have slow permeability because of the silt and clay constituents with moderate tendency to erode on slopes greater than those in the Memorial. They support similar vegetation as Immanuel series soils. Ethel soils occur on level to depressional landscapes with the water table lying within 12 inches of the surface. The soils are fine-silt and poorly drained. They support water oak (*Quercus nigra*), willow oak (*Q. phellos*), sweetgum (*Liquidambar styraciflua*) and other water tolerant bottomland species.

Vegetation and Wildlife

On the edge of the Arkansas River within the Delta Region, Arkansas Post is home to a diverse animal population. Throughout the 18th and early 19th centuries, the settlement at Arkansas Post was the base for fur-trapping activities along the Arkansas, White, and St. Francis rivers. The animal population in the Post today serves as a reminder of the seemingly unlimited animal populations that attracted hunters over 150 years ago.

The Post is located in a major migratory bird area. Ducks and geese frequent marshes while migrating. Commonly sighted bird species include cardinals, egrets, and herons. Bald eagles nest in Post Bayou, along the western edge of the Post. Among the passerine bird species found here are the Prothonotary Warbler, White-eyed Vireo, Yellow-billed Cuckoo, Louisiana Water Thrush, and species typically found in the Southeastern Mixed Forest Province. American Wood Duck and other waterfowl can be seen on the river and bayous. Game species occurring and managed on the neighboring Pine Bluff Project, COE, include waterfowl, deer, turkey, squirrel, rabbit, dove, and quail. Whitetail deer frequent the Post, while other species are not as easily seen. Raccoons and opossums reside in the wooded sections. (See Tables 3 – 6).

Nutria (*Myocastor coypus*) and alligators (*Alligator mississippiensis*) are found in the waterways in and around the park. The nutria, an aquatic mammal similar to beaver, is not native to North America. Introduced in the early 20th century, the nutria quickly spread into Arkansas rivers. Nutria are basically herbivorous and marsh loss has coincided with the expansion of the population on the Atlantic coast (USGS 1999). The ability of this large mammal to excavate root matt in marshes makes it instrumental in marsh loss (Haramis 1999).

An inventory of herpetofauna from 2002 (McCallum, et al. 2002) showed that overall species richness and abundance were highest in the vicinity of Alligator Slough (Fig. 2). This area supports 57% of the observed total richness broken into 50% of amphibian

species richness and 88% of the reptilian species richness. The largest forested tracts seemed to support high species richness, as well.

Humans have influenced natural processes in the Arkansas Post region, resulting in drastic ecological changes, including alterations in species composition and numbers (GMP). The influx of European trappers and merchants and the demand for resources started changes in resource conditions by the mid-1700s (Coleman 1987). Further alteration occurred in the natural environment with the building of forts, the development of the Village and Post of Arkansas, the advent of cotton production, a succession of floods and river migration, and the McClellan-Kerr navigation system. Today, different perspectives place different importance on the appropriate use of natural resources with occasional clashes between agricultural, economic, cultural, and spiritual values. Habitat and faunal species composition have been altered from pre-settlement.

Rare, Threatened, and Endangered Species

The GPRA goals for the Post include the following statements that address rare or federally listed species.

- By September 30, 2005, 100% populations of plant and animal species of special concern (e.g., state-listed threatened or endangered species, endemic or indicator species or native species classified as pests) are at scientifically acceptable levels.
- By September 30, 2005, the population of alligators (state-listed and threatened and endangered species) is at scientifically acceptable levels.

The American alligator is fully protected as a threatened species with populations increasing in Arkansas. They play a vital role in wetland communities as an important predator and their physical structures (deep holes, nest hummocks) create a diversity of wetland microhabitats. This resource at Post requires special consideration and monitoring. Alligators are seen in Post Bayou, Post Bend, and Park Lake. Nests are found on the Post, and young alligators are observed seasonally; recruitment appears to occur.

The American Bald Eagle (*Haliaeetus leucocephalus*) uses the waters and habitat of the Post, but does not nest within the park lands. The endangered pink mucket pearly mussel (*Lampsilis abrupta*) may occur in Arkansas County, but there are no known mussel beds containing this species immediately surrounding the Post. Many state listed animal species occur in Arkansas County, but populations have not been identified within the treatment areas on the Post. Consultation for Section 7 of the Endangered Species Act of 1973 (public Law 93-205) with the U.S. Fish and Wildlife Service is included with the FMP.

Cultural Resources

The Post is listed as a National Historic Landmark with several contributing historic resources. Many of the original features of the site are under water, but features remain to reveal many layers of cultural history associated with early settlement of the area.

Archaeology

In 1686, Henri de Tonti established a trading post known as "Poste de Arkanssea" at the Quapaw village of Osotouy. Over the years, the Post relocated as necessary due to flooding from the Arkansas River. Arkansas Post served as the Arkansas Territorial capital from 1819 to 1821. During the Civil War, Confederate troops tried to maintain tactical control of the confluence of the two rivers, and in 1862 they constructed a massive earthen fortification known as Fort Hindman. In January 1863 Union troops destroyed the fort and the adjacent river port town.

Artifacts and features of these periods and of the Quapaw and European influence reside in the Memorial. Some of these features may be under water. The Memorial acreage includes archaeological remnants from periods starting with the mid-18th century (Old Townsite) and going through Civil War (earthworks), which provide a tangible link to the cultures of past centuries. Although a systematic survey has not been done, archaeological research activities have recovered more than 90,000 objects. The only historic structures that remain from the settlement period are wells and cisterns. An archaeological base map is currently available.

The Osotouy Unit (Osotouy) includes a National Historic Landmark known as the Menard/Hodges site. The original Quapaw village of Osotouy was located here and subsequent European settlements occurred nearby. Osotouy served as the center of the Quapaw culture, based around a ceremonial mound of the Mississippian culture. The Quapaw consider it sacred land and many burials are believed to exist around the mound. Scientific study has resulted in the discovery of human remains and materials specified in the Native American Graves Protection and Repatriation Act (NAGPRA).

Cultural Landscape

The Post is an enormous archaeological site with vestiges of landscapes from several periods. Very little documentation exists concerning the landscape at the time of European arrival in the late 1600s. The current landscape is in various stages of succession after reclamation from agricultural uses in the 1950s. The park is viewed as a layered landscape archaeological site that retains features from several historic periods. There is no intact cultural landscape.

The GPRA goals relative to cultural landscape asserts that

"By September 30, 2005, 41% of the cultural landscapes on the 1999 Cultural Landscapes Inventory with condition information are in good condition [98 of the 239]."

Desired future conditions for the cultural landscape will be articulated in the CLR currently under development. The draft objectives for vegetation management on the site include

- to promote a spatial arrangement that assists with the interpretation of the town site,
- to reduce the acreage requiring frequent mowing while maintaining an open landscape,

- to retain an openness in the area around the Civil War fortifications, and
- to maintain woodland bird habitat.

The cultural landscape focuses on the areas in and around the principal archaeological features, but it also includes the vegetation throughout the site. An Osage orange (*Maclura pomifera*) tree located in the mowed area of the Memorial was recently awarded Champion Tree designation by the Arkansas Forestry Commission, as the largest Osage orange tree in Arkansas. This tree is one of a number in the park that date to the historic time period; other trees date to the early 1930s and the site's initial development as a state park.

Arkansas Post is the site of over 300 years of European occupation. Consequently, the land-based portion presents a mosaic of woody stands at different stages of succession. Exotic plants have, over time, become established through deliberate ornamental plantings or incidental intrusion. Many of the stands have succeeded from fields lying fallow since the 1920s. Some of these are overgrown with cedar (Fig. 2).

Thirteen vegetation types have been identified (Eads 2002) with five (excluding mowed areas) occurring in designated high visitor use areas (Table 2, Fig. 3). They are the oak/pine, oak/hickory, oak/mixed, sweetgum, and tallgrass types. The tallgrass prairie exists near the picnic area. This area has sweetgum and blackberry (*Rubus spp.*) encroaching on its borders.

Vegetative communities include terrace and bottomland hardwoods, open prairie, former agricultural land, and aquatic vegetation. Before cultivation, this area was covered by bottomland deciduous forest with an abundance of green ash (*Fraxinus pennsylvanica*) and Carolina ash (*F. caroliniana*), elms (*Ulmus spp.*), cottonwood (*Populus deltoides*), hackberry (*Celtis occidentalis*), sweetgum, and water tupelo (*Nyssa aquatica*), as well as oaks (*Quercus spp.*), bald cypress (*Taxodium distichum*), pecan (*Carya illinoensis*), eastern sycamore (*Platanus occidentalis*), and roughleaf dogwood (*Cornus drummondii*). Vines proliferate along water courses.

Exotic vegetation receives constant attention from managers. The Post identified exotic species consisted of trifoliate orange (*Poncirus trifoliata*), common privet (*Ligustrum vulgare L.*), Chinese privet (*L. sinense*), Japanese honeysuckle (*Lonicera japonica*), and Canada thistle (*Cirsium arvense*) (Eads 2002).

Visitor Use and Experience

The Post wishes to emphasize the interpretation of the rich cultural heritage that flourished over the centuries in the area of Arkansas Post. This is achieved, in part, by suggesting the cultural setting through landscape management. Tangible connections to history are established through the interpreted Old Townsite with its open vistas and waysides on the Village Tour Trail, and the earthen fortifications associated with the Civil War period on the Civil War Rifle Pits trail. The unpaved Post Bayou Nature Trail takes visitors through oak/pine forest, sweetgum woods, and tallgrass prairie. The Civil

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War overlook and Rifle Pits areas necessitate open views that allow vistas and sight lines. The Post maintains the Arkansas River overlook south of the visitor center as an area for quiet contemplation.

The Memorial provides accessible wildlife viewing opportunities. Visitors observe deer, alligators, and bald eagles throughout the year. Fishing has become a popular recreational use of the site. About 40% of the 43,000 visitors, annually, come for recreational activities, rather than the interpretive experience. In the winter, visitors drive through the park for wildlife viewing, and local residents use walkways for exercise. School groups visit the site, particularly in May. Destination visitation occurs throughout the summer, but slacks during hot weather. Anglers become frequent visitors to the Memorial during summer..

Table 1: Matrix of effectiveness and impacts of each alternative

	Alternative A No Action	Alternative B Prescribed Fire	Alternative C Manual Cutting	Alternative D Combined
Objectives				
Air quality	Negligible	Minor, temporary, local	Negligible	Minor, temporary, local
Geology and Soils	Minor, long-term, localized	Minor, long-term, local	Negligible	Minor, local, long-term.
Vegetation & Wildlife	Minor, short-term, local	Negative, minor, short-term, local negative; and positive, minor, long-term, local	Minor, short-term, local	Negative, minor, short-term, local negative; and positive, minor, long-term, local
Rare, Threatened or Endangered Species	No impact	No impact	No impact	No impact
Cultural Resources	Minor, moderate-term, local, positive	Minor, long-term, local, positive	Negligible	Minor, long-term, local, positive
Archaeology	No impact	No adverse impact, benefits	No impact	No adverse impact, benefits
Cultural landscape	Somewhat effective, labor intensive	Somewhat effective, fire cycle may be too long	Somewhat effective, labor intensive and debris disposal	Effective, reduces problem of debris disposal
Visitor Use & Experience	Minor, temporary, local	Minor, short-term, local	Minor, temporary, local	Negative, minor, short-term, local; and positive, minor, long-term local
Hazard fuel mitigation	Somewhat effective, if debris removed, labor intensive	Effective, decomposition is expected to assist	Effective, labor intensive, creates debris	Effective, allows for on-the-ground decisions

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Cultural Resources	No Action	Prescribed Fire	Manual Cutting	Combined
Cumulative impacts	No impact	No impact	No impact	No impact
Conclusions	Minor, local, labor intensive; somewhat effective	Minor, short-term, local, positive and negative; mostly effective	Minor, short-term, local; effective, labor intensive, debris disposal	Minor, local, positive and negative; overall most effective, cost efficient

Impact Intensity Threshold Criteria:

Negligible	Effects to the resource would be below or at the lower levels of detection. Any effects would be slight and no long-term effects to the resource would occur.
Minor	The effects to the resource would be detectable, but generally of limited area and localized. Effects to productivity or fertility of the resource would be small.
Moderate	The effects to the resource would be readily apparent and result in a change over a relatively wide area.
Major	The effect would have a substantial and possibly permanent consequence. Effects to the resource would be readily apparent, long-term, and substantially change the character of the resource over a large area.

Impact Duration Definitions:

Short-term	Recovers in less than three years from fire or other action.
Long-term	Takes more than three years to recover from fire or other action.

Chapter 4 -- Environmental Consequences

Analyses of impacts examine the predicted direct, indirect and cumulative impacts each alternative would have on Post resources and surrounding environment. Analysis takes into account human health and safety issues as being of paramount importance. It will identify both negative and positive impacts of the alternatives to the resources and to factors not specifically addressed in the management goals. Fire and ecology research on terrace and bottomland woodlands provides the basis for evaluation of impacts (Smith 2001; Forest Service 1981; U.S.D.A. 2003; Russel, et al. 1999; Lyons, et al. 2000; Kucera and Ehrenreich 1962; Huff and Smith 2000; Gill 1981; Cooper 1981; Adams et al. 1982; and others). The NPS and other agency/organization experts in fire effects or resource issues for this region were consulted whenever possible, so as to make discussions of possible impacts relevant to the Post. Impacts are judged in terms of their intensity, duration, and overall extent. Intensity, duration and extent are defined in the preceding table.

The NPS Management Policies 2001, section 1.4, stipulates that managers must determine whether the proposed actions would impair Post resources. Impairment occurs when in the professional judgment of a resource manager the integrity of resources and values will be harmed. This could happen if (1) a value specific to the enabling legislation, (2) the natural or cultural integrity, (3) opportunities to enjoy resources or values, or (4) a goal in park management plans is compromised. Management has the discretion to allow impacts to park resources in the fulfillment of the facility's purpose as long as the impact does not constitute impairment of affected resources and values. Impairment has been considered in the discussion of environmental consequences and will be summarized at the end.

Natural Resources

Air Quality

Alternative A -- No Action

The no action alternative allows the use of internal combustion driven tools for cutting fuels and understory. The alternative also allows for the burning of burn piles. Exhaust from tools and vehicles and smoke from the burn piles would be negligible

Alternative B -- Prescribed Fire

Impacts to air quality from prescribed fire would be minor, short-term and temporary, dissipating within hours of extinguishing a fire. No population centers occur near the Post, nor are there hazards associated with temporary limited visibility, except on park roads. No highways carry substantial traffic through the treatment areas. The Post location, surrounded on three sides by water, ensures that prescribed fire would not adversely impact neighbors in the vicinity. The State of Arkansas does not require a permit for prescribed fire and there are no local ordinances that apply. Mitigation would include minimal smoke ignition techniques. Smoke from prescribed fire creates a temporary decrease in air quality and visibility in the vicinity of the fire.

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The Environmental Protection Agency (EPA) Air Quality Policy on Wildland and Prescribed Burn (1998) integrates two goals: “(1) to allow fire to function, as nearly as possible, in its natural role in maintaining healthy wildland ecosystems, and (2) to protect public health and welfare by mitigating the impacts of air pollutant emissions on air quality and visibility.” Local land owners would be notified of prescribed fires well in advance of the date planned. Planning would take into account citizen concerns and possible incompatibility with activities in the Post at the time of a proposed fire.

The total addition of particulate load to the air is expected to be negligible. The local air quality has particulate loading attributed to agricultural activities and commercial activities. No substantive long-term or cumulative impacts from prescribed fire are predicted.

Alternative C -- Manual Cutting of Hazard Fuels

Manual cutting of hazard fuels and understory would have negligible, temporary impacts on air quality when chainsaws and weed whackers are used. Internal combustion engines release exhaust fumes that add both particulates and chemicals to the air.

Improper disposal of debris could result in hazard fuel conditions. Should wildland fire occur, hazard fuels could result in longer duration fires that would put smoke into the air for a somewhat longer period than if hazard fuels were regularly removed from the Post. The impacts from this alternative would be negligible.

Alternative D -- Prescribed Fire and Cutting of Hazard Fuels (Preferred Alternative)

Cut hazard fuels could be distributed in places where smoke would negligibly impact air quality over a very short time. Smoke poses a health and safety risk, but with the proposed use of minimal smoke ignition techniques, the openness of the woods, and following prescription, impacts would be minimized. Burn piles could be located with similar concern for health and safety. The ability to redistribute fuels would serve to minimize the temporary effects of a prescribed fire. The Post location, surrounded on three sides by water, ensures that prescribed fire would not adversely impact neighbors in the vicinity. Hazard fuels would always be properly disposed, reducing the chances of wildland fire. Wildland fire could result in greater impacts on air quality than any treatment, although those impacts would be of short duration and occur in the vicinity of the fire. The impacts from this alternative would be minor, temporary and regional.

Summary of Impacts

None of the alternatives would have a substantive impact on air quality. Any use of fire would be accompanied by minimum smoke ignition techniques and would consider the path smoke would take during the fire. The Post location, surrounded on three sides by water, ensures that prescribed fire would not adversely impact neighbors in the vicinity. Cutting of hazard fuels and redistributing them seems the most effective way to minimize impacts to the visitor center and picnic area. Alternative D allows for this extra care in protecting health and safety. Small stands would be ignited at different times resulting in prescribed fires that last for a short time. Any reduction in air quality would be temporary, since the small amount of smoke would disperse quickly. In contrast, wildland fire could result in long duration fires of high intensity, resulting in substantial smoke. The best control of hazard fuel conditions does the most to protect air quality.

Hazard fuel reduction treatments, particularly in Alternative D, would reduce the impacts associated with wildland fire.

No impairment would occur under any proposed alternative or wildland fire suppression

Geology and Soils

Alternative A – No Action

The current methods of management would not appreciably impact the condition or quality of soils or natural soil genesis. Vegetation removal can reduce the amount of organic material available to soils, but the negative impacts would be minor and localized. Burn piles would be kept small and rotated between several locations so as to minimize scorching and damage to soils.

Fire suppression could result in minor soil movement and compaction in localized areas, but the soils would recover. Creation of fire lines would disturb the soil horizons. The use of MIST would minimize the impacts of suppression and ensure that suppression affects resources less than wildland fire affects resources. The area of potential wildland fire is surrounded by obstructions that would limit the extent of fire. Hard surface, mowed grass, and water help to form fire barriers and reduce the need for fire lines. There would be no impact to geology during treatment or fire suppression, since no geological formations are exposed or near the soil surface.

Alternative B – Prescribed Fire

Fire would remove both litter and understory cover from soils, leaving them bare and open to the elements, except in areas of native grass cover. Native grasses would hold soil within their root structure, preventing erosion (Wright and Bailey 1982). Negligible erosion could occur in areas that are not grass covered although movement of soil on such flat terrain would be minimal. Timing for prescribed fire would be critical for encouraging cover to reestablish quickly (Mark Handcock, District Conservationist, Arkansas County, NRCS, personal communication). As long as fire occurs during or immediately preceding the growing season, soils would be exposed for only a short time period and fire would not adversely affect the soils or water quality in the vicinity of the few potentially erodible areas.

Prescribed fire allows nutrients to cycle quickly, making them available for plant growth (Kucera and Ehrenreich 1962, Wright and Bailey 1982). This would be less important in the Delta Region, where moisture is available to facilitate decomposition, but fire would encourage quick greening in spring. Frequency and timing of fires can impact nutrient cycling. Burning annually for many years can result in nitrogen deficiency (Kucera and Ehrenreich 1962, Kern 1995). Fire would be used cyclically, closely matching the natural fire regime and so nutrients would be effectively returned to the soil. Since impacts would be mitigated by timing and fire cycle, negative impacts from this alternative would be minor, long-term, and local.

Effective hazard fuel management would lessen the likelihood of wildland fire. In the event of wildland fire, suppression efforts could have a short-term impact on soils. Fire crews could contribute to disturbance and compaction of soil, and fire line creation would disturb soil horizons. The greatest concern for damage from fire suppression would be in the area of the

Civil War Rifle Pits. Although these are earthworks, they will be further discussed in the archaeology section. Intense wildfire could also damage soil matrix.

Alternative C -- Manual Cutting of Hazard Fuels

Manual removal of hazard fuels would take biomass and nutrients away from the soils, similarly to Alternative A. This could result in reduced nutrient availability, particularly at the soil surface, if areas were swept clean of debris. Surface sterility would affect vegetative cover and make soils susceptible to erosion. Leaf litter and small debris would remain and contribute to surface fertility, making impacts of debris removal negligible.

Cutting understory and leaving debris to naturally decompose at the soil surface could result in hazard fuel conditions. Actual rates of decomposition are unknown in the Post, but could be sufficient to reduce small twigs and herbaceous material. Decomposition would leave a protective duff on the soil surface, trapping moisture and nutrients at the soil interface.

The turf could be mowed regularly and unpaved paths mowed as needed. The infrequency of mowing outside of turf areas would make compaction negligible. Trucks used for hauling debris would remain on pathways and roads when possible. Occasional driving off road would have negligible impact on soils. Vehicles would avoid wet areas for environmental and practical reasons.

Removing hazard fuels would reduce the likelihood of wildland fire and so protect the soils from the impacts of wildland fire suppression. Debris would be removed from the Post to attain desired hazard fuel conditions. Debris removal may result in negligible impacts to soil fertility. The impacts of fire suppression and wildland fire have been state in the previous alternatives and would be similar under this alternative. The impacts to soils and geology from this alternative would be negligible.

Alternative D -- Prescribed Fire and Cutting of Hazard Fuels (Preferred Alternative)

This alternative would allow nutrient cycling by returning nutrients to the soil. Organic matter would be added to the soil at times when unburned materials would be left to decompose. This alternative, combining techniques, may satisfy the concerns raised when alternatives B and C would be used separately. It allows the Post to manage fuels while monitoring rates of decomposition and hazard fuel conditions to determine the best prescribed fire cycle. As with Alternative B, timing and length of cycle would be considered in management of soils.

Mitigation measures for burn piles are needed to minimize scorching of soil and causing soil sterility. Burn piles would be kept small and would be rotated to different locations with each fire. Taking the precautions described would result in minor, local, long-term impacts to soils and geology.

Summary of Impacts

Although none of the alternatives would substantively impact soils, provided timing to minimize potential erosion were taken into account, a combined management technique (Alternative D) would best meet objectives while best protecting soils. Under Alternative D, care would be taken that burn piles do not burn too hot and scorch soil. Timing of prescribed fire would be precise to ensure quick rebound of cover and/or the existence of canopy to protect soils from splash erosion during precipitation. This would mitigate the potential for negligible erosion over very short

duration. Being able to follow fire with manual cutting of understory would constitute a second treatment that would add small amounts of litter to the soil surface and protect soil-moisture. Hazard fuel reduction treatments, particularly in Alternative D, would reduce the impacts associated with wildland fire.

Both fire suppression and use of vehicles can cause soil compaction and disturbance. Creating fire line results in disturbance to soil horizons. Vehicles would be kept to established paths or turf when possible. The impacts of wildland fire suppression would be localized, minor, and of short duration. The impacts from suppression would be fewer and less severe than the impacts of wildland fire.

No impairment would occur under any proposed alternative or wildland fire suppression..

Vegetation and Wildlife

Alternative A -- No Action

Currently, the seasonal brush cutting and fuel mitigation in the treatment area could cause negligible and temporary disturbance to fauna, particularly nesting birds. Repeated disturbance could result in some birds failing to reproduce. Debris disposal may result in the temporary existence of slash piles that attract some animals seeking shelter. Once these piles are ignited, animals using them would evacuate the piles, but some may become trapped. Piles would not be burned during the reproductive season for birds, reptiles, and small mammals.

One of the goals of management is to manipulate understory. This would result in a negligible loss of shelter and food sources for some species, but would create better habitat for species requiring more open habitat. Burning of brush piles removes shelter areas for some species. Impacts would be minor, short-term, and local.

Alternative B -- Prescribed Fire

Fire affects animals largely through effects on habitat. Fires often cause short-term increases in wildlife foods that are moderated by the animals' ability to exist in the altered environment (Smith 2000). Because prescribed fire at the Post would be intended to maintain the desired understory characteristics and remove hazard fuels, habitat structure and species composition would not be impacted. Within forests, understory fires, the type that this alternative proposes, do not generally have a dramatic effect on species (Smith 2000; U.S.D.A. 2003). Animal species are adapted to survive the natural patterns of fire as it would have occurred in their habitat. Therefore, a pre-settlement fire regime would minimize impacts to fauna habitat. Most ground nesting birds rebound in years subsequent to the burn and ideally, habitat would be improved by the control of exotic vegetation, thus benefiting birds in the overall (Bockenstedt 1995).

Dead wood on the ground, which contributes fuel, provides habitat for small mammals and herpetofauna. Herpetofauna were rich and abundant in the Alligator Slough area of the Memorial (McCallum et al. 2002). Frequent fire in this area could reduce species richness and abundance by removing habitat. Common perception is that fire kills numerous animals, but in fact only a small percentage of animals are killed in fire (Lyons, et al. 2000). The exception to this is during nesting season for birds and small mammals. This also coincides with the active season for

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herpetofauna. Herpetofauna move ahead of fire, but are less successful escaping fire than mammals (Russel et al. 1999).

Understory fire occurring occasionally in the Memorial would not substantively impact the availability of habitat. Fire could only be used on a portion of the Post in any year, so as to allow animals refuge in other areas. Timing could avoid nesting season for birds and alligators, and the active season for herpetofauna. Fire in late winter and early spring meets these criteria.

Cover would begin to reestablish in the treatment areas shortly after prescribed fire, although its density would be suppressed under tree canopy. Prescribed fire in southeast Arkansas has had good results with a reduction in light-germinating species, increased herbaceous layer diversity, and increased oak recruitment. These benefits provide improved habitat for fauna. Therefore, overall, this alternative would cause minor, short-term, local, negative impacts from direct mortality from the fire, but would also cause minor, long-term, local positive impacts from indirect habitat improvement.

Alternative C -- Manual Cutting of Hazard Fuels

Manual cutting of hazard fuels would result in thinning of cover and may reduce the available habitat for wildlife on the Post. Cutting during the growing season would result in some rebound of understory growth, but managers expect the density to be less than before treatment, because tree canopy would reduce the availability of light for sprouts. Repeated cutting within a season would make the treatment area less attractive to wildlife, because of the constant disruption.

As with fire, most species of wildlife successfully avoid direct physical impacts of vegetation cutting. The exceptions to this include herpetofauna, which do not always evade mechanical devices, and nestling birds that cannot evade manual cutting. The operator or laborer removing brush may see and avoid vulnerable wildlife, but nests and individuals are usually well camouflaged and hard to discern. Repeated disruption of nesting birds may cause them to abandon attempts to breed in the treatment areas. Hand cutting would be timed to reduce disturbance to nesting animals, alligators, and understory birds. Since field season for laborers coincides with nesting season, the Post predicts that negligible impacts to these animals would be unavoidable. This alternative would result in a negligible loss of shelter and food sources for some species, but would create better habitat for species requiring more open habitat. The impacts would be minor, short-term and local.

Alternative D -- Prescribed Fire and Cutting of Hazard Fuels (Preferred Alternative)

The impacts associated with fire and manual cutting apply to the combined use of these techniques. A difference may be that the combined treatments could be more effective than either treatment alone and so require fewer treatments during the growing season. The fewer times the area is disrupted, the more use wildlife would make of the area. Therefore, impacts would be negligible and localized, and of less magnitude than in Alternative A or C. The same mitigations used for Alternative B would be applied to prescribed fire in this alternative. Care would be taken, such that burn piles would not become sinks for breeding animals or animals seeking shelter. Ignite piles outside of the reproductive season and disturb piles that have existed for several days prior to ignition. This may encourage resident animals to leave the pile. This alternative would cause minor, short-term, local, negative impacts from direct mortality from the

fire, but would also cause minor, long-term, local positive impacts from indirect habitat improvement.

Summary of Impacts

All of the alternatives would reduce safe cover for some small mammals, ground-nesting birds, and reptiles. The loss of shelter would be of short duration, since vegetation would rebound to some degree. All of the treatments would result in this temporary loss of understory and would change the structure of the understory slightly. Techniques that use fire are shown to improve the quality of the understory and its structure, thus resulting in a benefit to wildlife by improving habitat.

None of the treatment alternatives present a measurable impact directly on wildlife species. Breeding birds and herpetofauna would be similarly affected by each of the alternatives with mitigation measures taken for the use of fire. The best treatment would be one that requires the least repetition to achieve desired results. Timing of treatment can also minimize impacts. Treatment that occurs prior to nesting by song birds would not only spare eggs and nestling birds, but would also avoid impacts to herpetofauna that remain inactive until air temperatures warm. Infrequent use of fire allows populations to rebound between fires. Most ground nesting birds rebound in years subsequent to the burn and ideally, habitat would be improved by the control of exotic vegetation, thus benefiting birds in the overall (Bockenstedt 1995). Since the Post has identified maintaining woodland bird habitat in vegetation management plans, fire could be an important treatment in the strategy. Care would be taken in igniting burn piles to minimize impacts on breeding animals and animals taking refuge.

Treatment that prevents wildland fire would be the best choice, since wildland fire can damage habitat. Wildland fire suppression would have negligible impact on wildlife and habitat, relative to the impact of the wildland fire itself. Impacts from suppression would be short-term. Hazard fuel reduction treatments, particularly in Alternative D, would reduce the impacts associated with wildland fire.

No impairment would occur under any proposed alternative or wildland fire suppression.

Rare, Threatened, and Endangered Species

Alternative A -- No Action

This alternative would have no foreseeable impact on federally listed threatened or endangered species or candidates. Disturbance to alligators and their nests would be unlikely from laborers, since nesting females would aggressively defend their nests. Vehicle operators would take practical precautions in driving through areas where alligators may be present.

Alternative B -- Prescribed Fire -- Alternative A

While alligator nests could be susceptible to mortality by fire, alligators nest in June and July and incubate for 65 days (Gibbons 2001). Fire that occurs outside of the summer nesting season would not impact alligator survival or recruitment. This can be ensured by burning outside of the nesting season, June into September. Adult and young alligators are very mobile and spend much

*Fire Management Plan, Environmental Assessment
Arkansas Post National Memorial*

of their time in the water. Alligators on land are usually not far from water and can move very quickly when provoked. They would successfully evade fire or be conspicuous in their presence. Fires would not be ignited in the vicinity of an alligator. Therefore, fire would have no direct, indirect, or cumulative impacts on this species.

Alternative C -- Manual Cutting of Hazard Fuels -- Alternative B

No direct, indirect, or cumulative impacts would result from manual cutting. For the safety of laborers and alligators, nests and individuals would be avoided during treatments.

Alternative D -- Prescribed Fire and Cutting of Hazard Fuels (Preferred Alternative)

Using the same precautions listed for Alternatives B and C, this alternative would have no direct, indirect, or cumulative impact on alligators, nests, young, or adults.

Summary of Impacts

None of the alternatives would have a direct, indirect, or cumulative impact on species of concern. Wildland fire could pose a greater risk to rare, threatened, or endangered species, particularly alligators. Alligator nests are usually along side water, but they are on land and therefore, could be damaged in an intense wildland fire. No treatment would be done in the vicinity of active nests or individuals. Treatment would be done at a time when activity was not present at the location.

Hazard fuel treatments that prevent wildland fire would have the least potential impact, since wildland fire can damage alligator nests. Wildland fire suppression would have negligible impact on alligators, relative to the impact of the wildland fire itself. Impacts from suppression would be short-term.

No impairment would occur under any proposed alternative or wildland fire suppression.

Cultural resources

Archaeology

Alternative A -- No Action

Current management has no effect on archaeological resources. Care would be taken to not impact earthworks, such as the Rifle Pits, by walking or driving vehicles over these features. Intact artifacts would be located subsurface and would not be damaged by light traffic from laborers. Burn piles would be located in areas of low sensitivity, since burn piles support intense fires that have potential for heating soil and damaging artifacts.

Using the mitigating measures, no impacts are predicted from this alternative.

Alternative B -- Prescribed Fire

Prescribed fire could be used by archaeologists to uncover unknown archaeological features at the Post (Virgil Noble, personal communication). Vegetation often obscures subsurface components and its removal allows archaeologists to see traces of material cultural. Any artifacts that are yet undiscovered would be subsurface. They would not be damaged by the typical low to moderate intensity prescribed fire. Prescribed fire would not affect the Rifle Pits located at the

interface of two vegetation types that respond well to fire treatment. Therefore, no direct, indirect, or cumulative adverse impacts are expected from this alternative, but benefits could occur.

Alternative C -- Manual Cutting of Hazard Fuels -- Alternative B

Since unknown artifacts and features would lie beneath the soil surface, manual cutting of hazard fuels would not affect them. Vehicles would remain outside of sensitive areas and special attention would be given known features, such as the Rifle Pits. Provided these precautions are taken, this alternative would not affect archaeological resources.

Alternative D -- Prescribed Fire and Cutting of Hazard Fuels (Preferred Alternative)

This combined treatment would have the benefits suggested in Alternative B. No direct, indirect, or cumulative adverse impacts are predicted from this alternative, provided that the same precautions listed in Alternatives A and C are applied. Vehicles would remain out of sensitive areas. Burn piles would be ignited outside of sensitive areas as well.

Summary of Impacts

None of the proposed alternatives would adversely impact archaeological features or artifacts, given the precautions cited. Prescribed fire may assist archaeologists in discovering as yet unknown features on the terrace. The alternative that best reduces the probability of wildland fire is preferred, since wildland fires and their suppression have greater potential for affecting archaeological resources than prescribed fire.

Wildland fires have the potential to directly and indirectly impact archeological resources. Direct impacts would include damage to clay and stone artifacts, through heating on the ground surface and to a lesser degree within the top 5 cm of the soil profile. Indirect impacts occur through soil disturbance associated with fire suppression. This would be mitigated through the use of MIST. There would be a slight potential for compacting soil around artifacts and features, if fire fighting equipment strays from established pathways. Building a fire line could result in damage to artifacts or features. The alternative that best reduces hazard fuel conditions would be the preferred alternative in preserving archaeological artifacts and features.

No impairment would occur under any proposed alternative. Wildland fire suppression has a potential to impact unknown archaeological features and artifacts, but allowing wildland fire to continue unsuppressed has potential for impairing archaeological values and resources. Upon completion of the archaeological base map and as research and surveys are completed, the FMP would be reviewed to ensure protection of archaeologically sensitive areas.

Cultural Landscape (including meeting management objectives)

Alternative A -- No Action

This alternative would have no adverse impact on the cultural landscape. It can be used to selectively remove unwanted understory plants and retain desirable ones. This alternative allows for disposal of debris in burn piles. The alternative probably does not allow for the best management of the oak/sweetgum, oak/pine, or oak/hickory woods, or the tallgrass prairie.

Fire Management Plan, Environmental Assessment
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Mechanical treatment alone does not maintain the open landscape character or diversity, and would be much more costly than fire (Scott Simon, written communication).

Sweetgum encroaches in the prairie as well as intrudes as stands within the oak woods. Mowing or cutting would help to control invasion. Unfortunately for the prairie, most native warm season grasses are bunch-type and do not survive repeated mowing. Although mowing at 14 inches height early in the growing season can control some weedy species, it would not be as effective as fire in the tallgrass prairie. Manual cutting of woody intruders into the prairie would be labor intensive. Cutting some species of weedy plants in the prairie can stimulate their growth or spread, as with turf grasses, shrubs (privet and exotic honeysuckles), and herbaceous plants (Canada thistle), particularly at certain times of the growing season. The best management of trifoliate orange is poorly documented, since the plant is an escaped ornamental that does not have broad distribution as an invasive, feral species. This alternative would have minor, moderate-term, local, positive impact. This treatment would not adversely impact the cultural landscape, but it may not be the most effective treatment to satisfy cultural landscape objectives.

Alternative B – Prescribed Fire

Prescribed fire generally removes or suppresses some woody plant species, while not impacting healthy trees greater than 10 cm diameter breast height (DBH) if the roots are protected. Fire effectively reduces hazard fuel conditions in hardwoods and along riparian areas (Williams 2000a). Fire maintains oak and oak-pine woodland communities as well as grasslands and savannas (Pyne 1982) by maintaining the community and suppressing exotic intrusion. Studies have demonstrated that frequency, intensity, and seasonality of fire can benefit some woody species (Adams, et al. 1982). Therefore, fire may benefit native, fire-dependent species.

Fire is critical to maintaining the upland oak and prairie systems in this region (Scott Simon, written communication). Fire is somewhat effective in controlling sweetgum and very helpful in maintaining prairie. Upland oaks are well adapted to fire and frequent fire (five to 10 year cycle) would suppress mid-height woody plants that are targeted for removal from the cultural landscape. Frequency of fire would be the important consideration as to whether fire alone can maintain the desired cultural landscape. Young saplings, shrubs, and herbaceous plants can reestablish on the forest floor within a year of prescribed fire. Although it may take five or more years for woody species to reach heights that detract from the cultural landscape, herbaceous plants grow more quickly, occasionally reaching the heights greater than four feet in one growing season. Fire would be marginally effective in killing shrubby growth, because many shrub species have a propensity to sucker from stump or root. A natural fire regime would not effectively control mid-story vegetation without further intervention.

A solid and deep canopy can prevent light germinated species and shade intolerant species from reestablishing in the forest. Upland oak stands in good condition generally provide the depth of canopy to suppress shade intolerant species, but openings in the canopy can lead to opportunist species, particularly exotic species found in the Post, to gain ground in the forest. This occurred after the 1995 prescribed fire. Experts have discussed why the prescribed fire of 1995 resulted in damage to the canopy and subsequent increases in weedy and exotic species in the oak forest. Experts from several agencies and the University of Arkansas, Monticello, examined the incident and determined that the prescribed fire had burned according to prescription and that the prescription had been correct (Kevin Eads, personal communication; J. P. Mattingly, personal

communication). A secondary result of that same meeting was the recommendation that the forested areas of the Post be burned once every 15 years.

Not all native species are fire-dependent and not all exotics are controlled by fire (Kern 1995). Woody species of the bottomlands, such as cottonwood, are not fire-dependent. These trees have shallow root structure and could be damaged by fire. Similarly, trees growing in areas with high water table tend to have shallower root structures than they would in uplands. This is true even for fire-dependent species. Individual, susceptible trees could be foamed to protect them during prescribed fire and fire need not be used in areas with saturated soils, where root systems are shallow.

Woody species occurring above the bottomlands include several fire-dependent oaks (*Quercus falcata*, *Q. stellata*), somewhat fire-tolerant oaks (*Q. pagoda*, *Q. phellos*, *Q. nigra*) and pecan. These species survive mild intensity fire, provided they are well established with a DBH of 10 centimeters or larger. Trees smaller than 10 centimeters DBH can be protected by foaming.

Fire clears vegetation from the soil surface, thus permitting opportunistic species to emerge. Careful timing of fire can overcome this problem by burning after weed emergence has begun and immediately before native plant emergence and flushing of woody canopy. Most opportunistic weeds are not shade tolerant, since they have adapted to disturbed sites.

Prescribed fire use in the prairie could follow a three to five year cycle. This cycle would be adequate to meet hazard fuel conditions. This cycle may not be adequate to fully meet cultural landscape objectives if privet and honeysuckle are to be kept out of the prairie. Fire kills the above ground portion of these shrubs, but they generally sprout from remaining roots, requiring a second treatment. Fire would not adversely impact the prairie landscape, and are expected to enhance native grass cover, but may not be adequate to control exotics.

Taking the precautions outlined above, prescribed fire would not adversely impact the cultural landscape when it is used to manage hazard fuels and open understory. It would manage hazard fuels in both prairie and forest, but the Post would use different fire cycles for the two landscapes. Fire alone may not meet the cultural landscape objective without secondary treatment. This alternative would have minor, moderate-term, local, positive impact.

Alternative C -- Manual Cutting of Hazard Fuels -- Alternative B

Manual mitigation of hazard fuel allows selectivity in cutting and removing woody vegetation. Cutting of vegetation can weed out undesirable species while preserving desirable species and even individual specimens. Stump and root suckering is common among various shrub species, particularly persistent and invasive species, when no herbicide treatment is done. Without herbicide treatment stumps can produce large clones. Persistent and frequent cutting would eventually kill shrubs by robbing the plants of their reserves needed for sprouting. This would entail several cuttings during a season and would be labor intensive. This alternative would not adversely impact the cultural landscape, but it may not meet management objectives. This alternative would have negligible impact.

Alternative D -- Prescribed Fire and Cutting of Hazard Fuels (Preferred Alternative)

Fire would reduce the amount of manual cutting and removal necessary compared to Alternative C. Some plants that are resistant to one treatment could succumb to the other treatment or the synergy of both treatments used within one season. Combined methods work very well for exotic vegetation control (Kern 1995). Cutting and stump treating shrubs would be the most effective way to kill woody plants in the mid-story. Combining this treatment with prescribed fire could produce excellent results.

Removing hazard fuels or redistributing fuels that have been manually cut before prescribed fire allows the rate and intensity of the burn to be controlled. Fuels removed from around desirable, sensitive vegetation and redistributed in areas with damp conditions or low fuel density could protect the valued vegetation. Removing fuels from under trees to be protected would reduce the possibility of damage to those values during prescribed fire. Cutting of hazard fuels prior to fire can prevent a ladder effect and keep the fire intensity in the understory, protecting the crowns of mature trees. This would help to control fire effects in areas where values should be protected.

Prescribed fire opens the understory so that crews can enter and manually cut and stump treat shrubs after they have suckered. Without fire, undergrowth can become impenetrable and targeted spot treatment prohibitive. A double treatment of fire and cutting can suppress shrub regeneration without herbicide better than one treatment or the other alone. Persistent and frequent physical treatment would kill shrubs without the use of herbicide. Since herbicide use for stump treatment has not been excluded from this treatment, this treatment would be very versatile would effectively control privet, trifoliate orange, and exotic honeysuckle in the understory.

This alternative would have no adverse impact on the cultural landscape and could provide the best means of meeting the management objective. This alternative would have minor, long-term, local, positive impact.

Summary of Impacts

Although none of the alternatives would cause direct, indirect, or cumulative impacts on cultural landscape, prescribed fire used with manual cutting would best achieve the desired condition in the understory. Prescribed fire or cutting used singly would not effectively manage the understory to produce the desired result.

Hazard fuel treatment would be consistent with achieving the desired landscape results. Mid-height plants in the understory, those plants that obstruct views, can also act as fire ladders, taking understory wildland fire into the canopy. Damage to the canopy would impact the cultural landscape and so the best method of controlling hazard fuel conditions would be the preferred treatment.

None of the alternatives would result in measurable impact on cultural landscape values, but combined treatment using fire and manual cutting would be the most effective method of achieving desired results. Choosing the most effective treatment lessens the likelihood of wanted wildland fire and so would be preferred. Wildland fire or its suppression can impact vegetation, even when MIST procedures are followed. Wildland fires often burn hotter than prescribed fire and can damage trees, even those of considerable size by scorching the inner bark, damaging roots, or reaching into the crown. Fire suppression can result in the loss of desirable vegetation

through disturbance to the plants, but this impact would be short-term and localized and far less than impacts from wildland fire. Hazard fuel reduction treatments, particularly in Alternative D, would reduce the impacts associated with wildland fire.

No impairment would occur under any proposed alternative or wildland fire suppression. Upon completion of the CLR, the FMP would be reviewed with consideration of the desired conditions recommended by the CLR.

Visitor Use & Experience

Alternative A -- No Action

The effectiveness of this treatment would be acceptable in producing vistas associated with interpretive messages. This treatment requires the presence of crews with chainsaws and weed whackers within the areas targeted for interpretation. This may detract from the visitor experience where the crews would be working during the growing season. Visitors would be kept out of work areas, also. The growing season coincides with the time of highest visitation. Therefore, this alternative could result in a minor, temporary, local impact on visitation and visitor experience.

Alternative B -- Prescribed Fire

Prescribed fire would blacken the soils and may leave some blackened shrubs standing. This would have a temporary impact on aesthetics. The need to time fire such that cover would quickly rebound has been discussed in previous sections. This emphasis on timing would also minimize the aesthetic impact of fire. If properly timed, greenery would cover the blackened effects of fire within two weeks (Philip Grove, personal communication). Visitors would be excluded from treatment areas during prescribed fire. The effectiveness of this treatment may maintain the desired vistas for a year or two after use, but it would not maintain the vista throughout the proposed 15-year fire rotation in the forest. This would impact the quality of interpretation. Therefore, negligible impacts on visitor experience would occur during the fire and for two weeks after fire. Interpretation could suffer in the long-term if cultural landscape objectives are not met. This alternative would result in minor, short-term, local impact on visitor experience.

Alternative C -- Manual Cutting of Hazard Fuels

Manual cutting of hazard fuels can leave visible stumpage, and materials that would not be removed may look untidy. This would be a short-term problem if the cutting is done during the growing season and low growing vegetation is permitted to rebound in the absence of competition. The work would be labor intensive and necessitates the frequent intrusion of chainsaws, chippers, and crews in the midst of the cultural landscape. This could detract from the visitor experience on the occasions when crews would be present. The method would maintain the desired appearances, but removal and disposal of debris may be temporarily unsightly. The frequency of treatment, noise, and exclusion of visitors from treatment areas could affect the visitor experience temporarily. This alternative could result in a minor, temporary, local impact on visitation and visitor experience.

Alternative D -- Prescribed Fire and Cutting of Hazard Fuels

The combined technique would serve to reduce the potential impact to aesthetics that could result from Alternative B or C used alone. Safety concerns during prescribed fire would necessitate excluding visitors from the treatment area for one day during the fire rotation. Fire preceding cutting would make cutting easier for laborers by making the area accessible, resulting in a thorough job. Fire would result in some blackened stems that cutting would then eliminate.

A reverse approach to treatment could have desired effects, also. Cutting and hauling brush to appropriate locations where it would be burned in prescribed fire would spread fuels in areas of least impact. Burning gathered debris would allow easy disposal of vegetation. Either approach would facilitate "tidying" the area of treatment and returning the area to an attractive appearance. Therefore, negative impacts would be minor, short-term, and local but may be balanced by the effectiveness of treatment in shaping a cultural landscape that supports the interpretive themes, which would be minor, long-term and local positive impacts.

Summary of Impacts

The desired condition of the understory would be an aesthetically appealing landscape that supports the interpretive message. Removing excess brush and vegetation would open views to interpretable resources. None of the proposed alternatives have long-term impacts on aesthetics, although a combined use of fire and cutting could minimize short-term effects on the neat appearance. The method that effectively manages the cultural landscape would best support the interpretive message and visitor experience.

Wildland fire could damage the aesthetics of the area by scorching trees and removing more vegetation than any of the treatments, thus affecting the cultural landscape and detracting from the visitor experience. An intense wildland fire would result in aggressive suppression activities, which would also detract from the aesthetics. These impacts would be contained to areas of fire and would be temporal, although they may last for months. Visitors would be excluded from areas in which there was wildland fire until crews removed hazards caused by the fire. Choosing the alternative that best manages hazard fuels, while protecting resources, would be the best way to preserve visitor experience.

Impacts would be negligible and short-term for the alternatives with overall results of good management supporting the interpretive message. No impairment would occur under any proposed alternative or wildland fire suppression.

Cumulative Impacts

At this time, pending the completion of the Cultural Landscape Report, no plans stipulated in other Post planning documents impact the treatment area substantively. Alternatives in this document provide the tools to implement management of hazard fuels and the desired cultural landscape. Treatment of the understory, as described in this document, would be consistent with the GMP. The FMP is associated with the resource management sections of the GMP and would be considered during revisions of the encompassing plans. Any subsequent plans would include NEPA compliance, consideration of cumulative impacts, and public input and review, but no cumulative impacts are expected at this time. The FMP would undergo annual review and managers would amend it through the appropriate process as necessary.

No known plans or actions of neighboring organizations or individuals would have a cumulative impact if any of the actions are taken. Local farmers use fire to clear fields. The Post will avoid burning during the most active field clearing periods, so as to not create cumulative impacts on air quality. Neighboring land owners will be contacted prior to use of fire as a courtesy, and to ascertain whether other fires are planned.

Alternative A – No action

The current treatment cannot be expected to have substantive adverse cumulative impacts. To date, the No Action alternative has served to meet management objectives without substantive direct, indirect, or cumulative impacts to resources. The treatment would be labor intensive and so has an appreciable cost associated with it. Should park budget not be able to maintain this treatment, there would be no method of managing hazard fuels in the Post. Fuels accumulating for more than 15 years could result in hazard fuel conditions. No substantive cumulative impacts are expected from this alternative.

Alternative B – Prescribed Fire

Prescribed fire would cause few, negligible short-term impacts to Post resources and adjacent areas. These impacts would not be cumulative, because they would be short-term and would not recur within the affective period. A prescribed fire program at the Post would use fire once every 15 years in the forest and once every three to five years in the prairie to reduce hazard fuel conditions. Prescribed fire used on the stated rotation would be relatively inexpensive as a management technique. Hazard fuel conditions may develop after 15 years without fire in the forest and after five years in the prairie, but expectations are that budgets would permit the use of this treatment on a rotational basis. No substantive cumulative impacts are expected.

Alternative C – Manual Cutting of Hazard Fuels

Manual cutting of vegetation could result in hazard fuel conditions, unless the vegetation is removed from the treatment area and disposed of by removal from site or grinding and using on the landscape. This treatment would be labor intensive and therefore costly. It also requires the disposal of debris removed from the woods, which adds further to costs. If park budget does not allow for cutting and removing fuels for several years, there is no back up plan for fuel management. No substantive impacts are expected from this alternative.

Alternative D – Prescribed Fire and Cutting of Hazard Fuels

No substantive cumulative impacts are predicted at this time and the potential negligible impacts are mitigated or are short-term and so not cumulative. The flexibility of this treatment keeps costs within park budget, allows for effect disposal of debris, and permits the Post to make on-the-ground decisions about the best treatment to use at any given time. This adaptive management ensures that potential impacts would be avoided and eliminates concerns about cumulative impacts. The alternative would be cost effective and the variety of techniques available allows for alternative treatments to match funding available.

Summary of Impacts

No substantive cumulative impacts are expected from any alternative. No impairment would occur under any proposed alternative or wildland fire suppression. Cumulative impacts are not expected from wildfire or its suppression, because wildland fire would be unlikely to repeat frequently enough to cause cumulative effects. Wildland fire occurring on either the Memorial or Osotouy would result in a reassessment of fire management techniques with the intention to prevent another occurrence. Wildland fire in Osotouy would focus attention on planning and protection on that unit to prevent future incidents.

Impairment

None of the proposed alternatives would have significant impacts on any resources on or off the Memorial, directly, indirectly, or cumulatively. There would be no impairment of any resource on the Memorial and all of the alternatives would contribute to the preservation and protection of resources and mission of the site.

Fire suppression would not be expected to substantively impact resources on the Memorial or Osotouy. Firefighters would employ MIST and minimize fire line creation at both units. Wildland fire would have greater impact than fire suppression at both sites.

Conclusions

A combined approach of using manual cutting of vegetation with occasional prescribed fire (Alternative D) would best meet the goals for management of hazard fuel conditions and control of the understory in the Memorial. Using two treatments together would have a synergistic effect and in some cases would help to mitigate negligible impacts from using only one treatment exclusively. No measurable impacts in any of the topics considered would occur with this alternative. Wildland fire must be prevented to ensure the best protection of all resources in the Post. The best management of hazard fuel conditions plays an important role in determining the environmentally preferred alternative.

All the alternatives do not propose any fire management activities in Osotouy, with the exception of the suppression of wildland fires. At this time, only the archaeological features are known. Scientific study could result in the discovery of human remains, funerary objects, sacred objects, and objects of cultural patrimony. These items must be preserved as a significant contribution to a cultural history and as ethnographic artifacts.

Osotouy archaeological resources are sub-surface and at the soil surface. They are fragile and easily damaged by fire, particularly high intensity fire, compression from foot or vehicular traffic, and physical disturbance. Plans would include MIST, to minimize impacts on resources during fire suppression. Fire suppression will adversely impact these features, even when MIST is used. This impact will be moderate, long-term, and localized to areas where fire-fighting activity occurs. Impacts to natural resources are expected to be similar to those in the Memorial and no cultural landscape or visitation exists.

In contrast, the impacts of allowing wildland fire to burn in Osotouy could result in impairment of the archaeological resources. Impacts to resources would be major, long-term, and possibly regional. Wildland fire could continue onto private property, extending the scope of impact beyond the park. It would then threaten human health and safety outside of the park. Therefore,

fire suppression will result in less damage to resources within Osotouy and neighboring properties than wildland fire. Full suppression of wildland fire will be employed in Osotouy with respect for the important archaeological resources located there.

In conclusion:

Therefore, Alternative D, Prescribed Fire and Cutting of Hazard Fuels, is the preferred alternative and the environmentally preferred alternative. Full suppression of wildland fire, using MIST, is the environmentally preferred response.

Chapter 5 -- Coordination and Consultation

NPS team

Philip Grove, maintenance, Arkansas Post National Memorial

James P. Mattingly, fire management officer, Buffalo River National River

Sherry Middlemis-Brown, biologist, Herbert Hoover National Historic Site

Ed Wood, superintendent, Arkansas Post National Memorial

NPS consultants

Jim DeCoster, fire ecologist, Midwest Region

Kevin Eads, resource manager, formerly Arkansas Post National Memorial

Virgil Nobel, archaeologist, Midwest Archaeological Center

Mike Martin, hydrologist, Water Resource Division

Joel Wagner, Water Resource Division

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List of individuals involved in scoping or consultation from outside NPS

Martin Handcock, Arkansas County District Conservationist, Natural Resources Conservation Services, USDA

Daren Olson, Army Corps of Engineers

Scott Simon, Director of Stewardship, The Nature Conservancy, Arkansas Field Office

Agencies and Groups that were sent review copies of this document

Arkansas Archeological Survey

*Arkansas Department of Heritage, Office of Historic Preservation

Army Corps of Engineers, Arkansas Post Field Office

*City of Gillett (Fire Department)

Quapaw Tribe

Tichnor Fire Department

U. S. Fish and Wildlife Service, White River National Wildlife Refuge

* comments received and included in this section



The Department of
**Arkansas
Heritage**

Mike Huckabee, Governor
Cathie Matthews, Director

Arkansas Arts Council

Arkansas Natural Heritage
Commission

Historic Arkansas Museum

Delta Cultural Center

Old State House Museum



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February 11, 2005

Mr. Edward E. Wood Jr.
Superintendent
National Park Service
Arkansas Post National Memorial
1741 Old Post Road
Gillett, Arkansas 72055

RE: Arkansas County - General
Section 106 Review - NPS
Arkansas Post National Memorial, Fire Management Plan and Environmental
Assessment
AHPP Tracking No: 55693

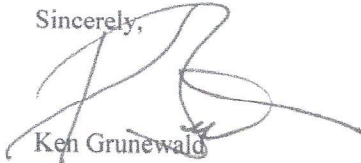
Dear Mr. Wood:

My staff has reviewed the Fire Management Plan & Environmental Assessment for Arkansas Post National Memorial. The National Park Service is obviously aware of the extraordinary importance of Arkansas Post and the associated site of Osotouy in the history of the nation and of Arkansas. We generally agree that the preferred alternative of managing vegetation through a combination of prescribed fire and mechanical means is the best alternative and should have no adverse effect on the historic and archeological resources at Arkansas Post. We have the following suggested changes to the Fire Management Plan:

1. Volunteer fire personnel from Gillette and Tichnor should be given sensitivity training so that they too will fully understand the importance of Arkansas Post. It is particularly important that they understand where vehicle traffic and ground disturbance should be avoided and why that is so.
2. The sites where brush is piled and burned should be restricted to areas that have been previously surveyed for cultural resources.
3. The Coose and Menard cemeteries should be excluded from prescribed burns to avoid damaging headstones and ornamental plantings.

Thank you for the opportunity to comment on this undertaking. If you have any questions, please contact Steve Imhoff of my staff at (501) 324-9880.

Sincerely,

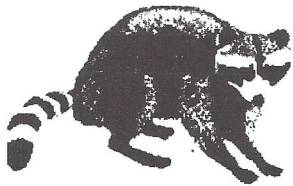

Ken Grunewald

Deputy State Historic Preservation Officer

cc: Dr. Ann M. Early, Arkansas Archeological Survey
Ms. Carrie V. Wilson, Quapaw Tribe of Oklahoma

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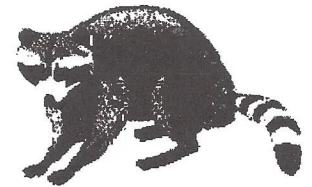




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"Home of Friendly People and the Coon Supper"

March 21, 2005

Mr. Edward E. Wood, Superintendent
Arkansas Post National Memorial
1741 Old Post Road
Gillett, Arkansas 72055

Dear Mr. Wood,

The City of Gillett Volunteer Fire Department has reviewed the current Fire Management Plan submitted by Arkansas Post National Memorial.

In reference to Agreement # MU 7110-001, the memorandum of understanding between the National Park Service and the Gillett Volunteer Fire Department will remain valid until changes are deemed necessary by either interested parties.

Sincerely,

Layton Mattmiller
Mayor of Gillett, Arkansas

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List of Acronyms

CEQ	Council on Environmental Quality, council that develops guidance followed by EPA and other agencies in implementing NEPA and other environmental regulations
CLR	Cultural Landscape Report, document discussing vegetation and desired future conditions (in development)
COE	Army Corps of Engineers, control of navigable waters and water levels
DBH	Diameter Breast Height, standard forestry measurement of tree diameter at 48 inches height
EA	Environmental Assessment, this document, assessment of impacts from an action
EIS	Environmental Impact Statement, assessment of impacts, when impacts may be controversial or of greater magnitude, using data and information collected for the decision making process
EPA	Environmental Protection Agency, lead agency in environmental compliance in air quality, water quality, NEPA, and several other issues
FMP	Fire Management Plan, document that describes the use of fire in management and protection of resources, also includes information on fire suppression
GMP	General Management Plan, planning document that sets NPS facility themes and desired future conditions, while recommending general means of achieving desired future conditions
GPRA	Government Performance Results Act of 1993, legislation intended to make federal agencies accountable for results based on mission; results in a multi-year Strategic Plan and annual Work Plan
Memorial	Memorial Unit of Arkansas Post National Memorial
MIST	Minimum Impact Suppression Tactics, documented in NPS Reference Manual 18, minimize impacts on resources during fire suppression
Post	Arkansas Post National Memorial
Osotouy	Osotouy Unit of Arkansas Post National Memorial
NEPA	National Environmental Policy Act of 1969 (as amended in 1975), federal regulation guiding consideration of the human environment in planning and actions
NPS	National Park Service, U.S. Department of Interior
RMP	Resource Management Plan, NPS planning document nested within the GMP and addressing issues of cultural and natural resource management and protection

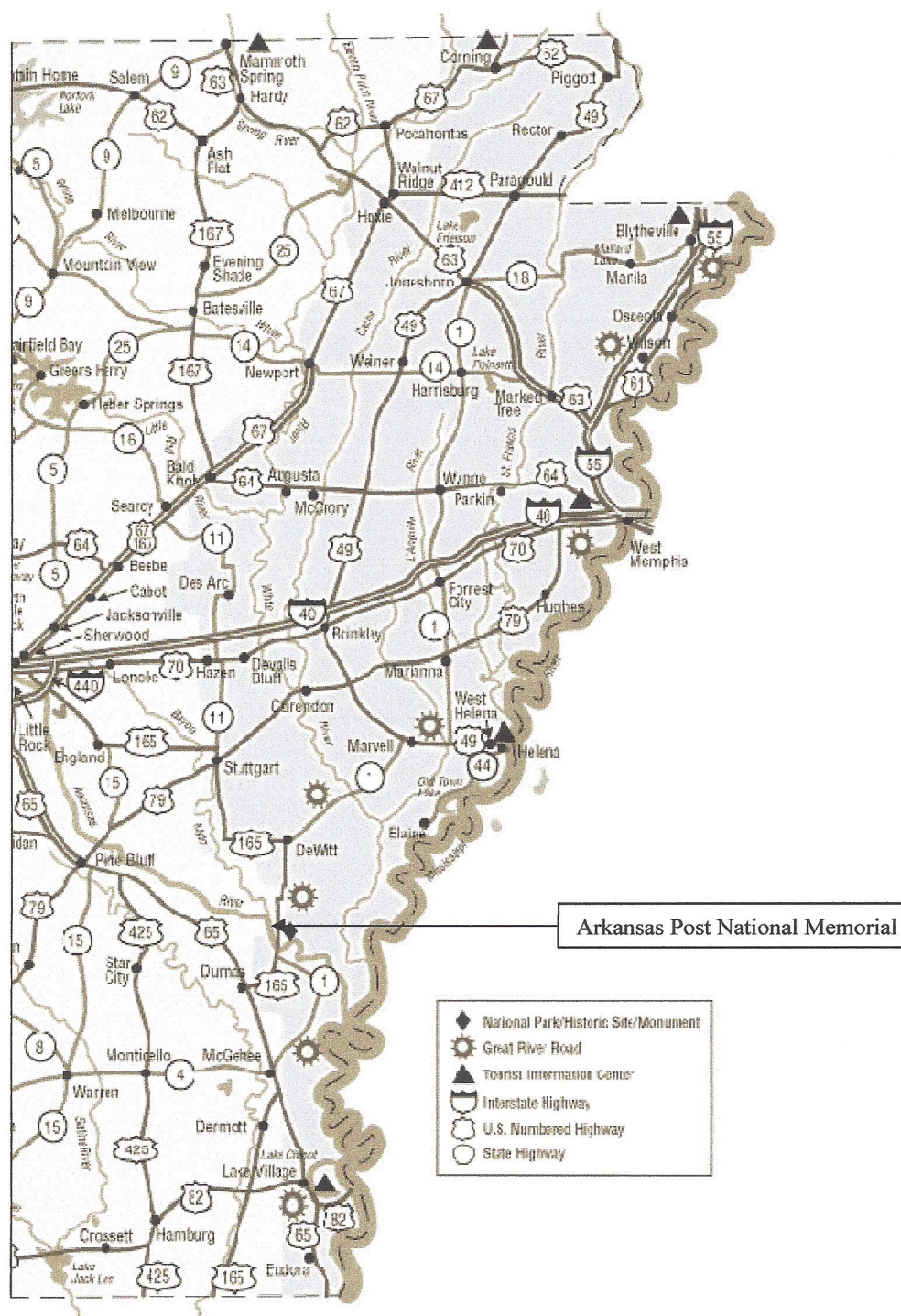


Figure 1: Location of Arkansas Post NM

Figure 2: Memorial Unit

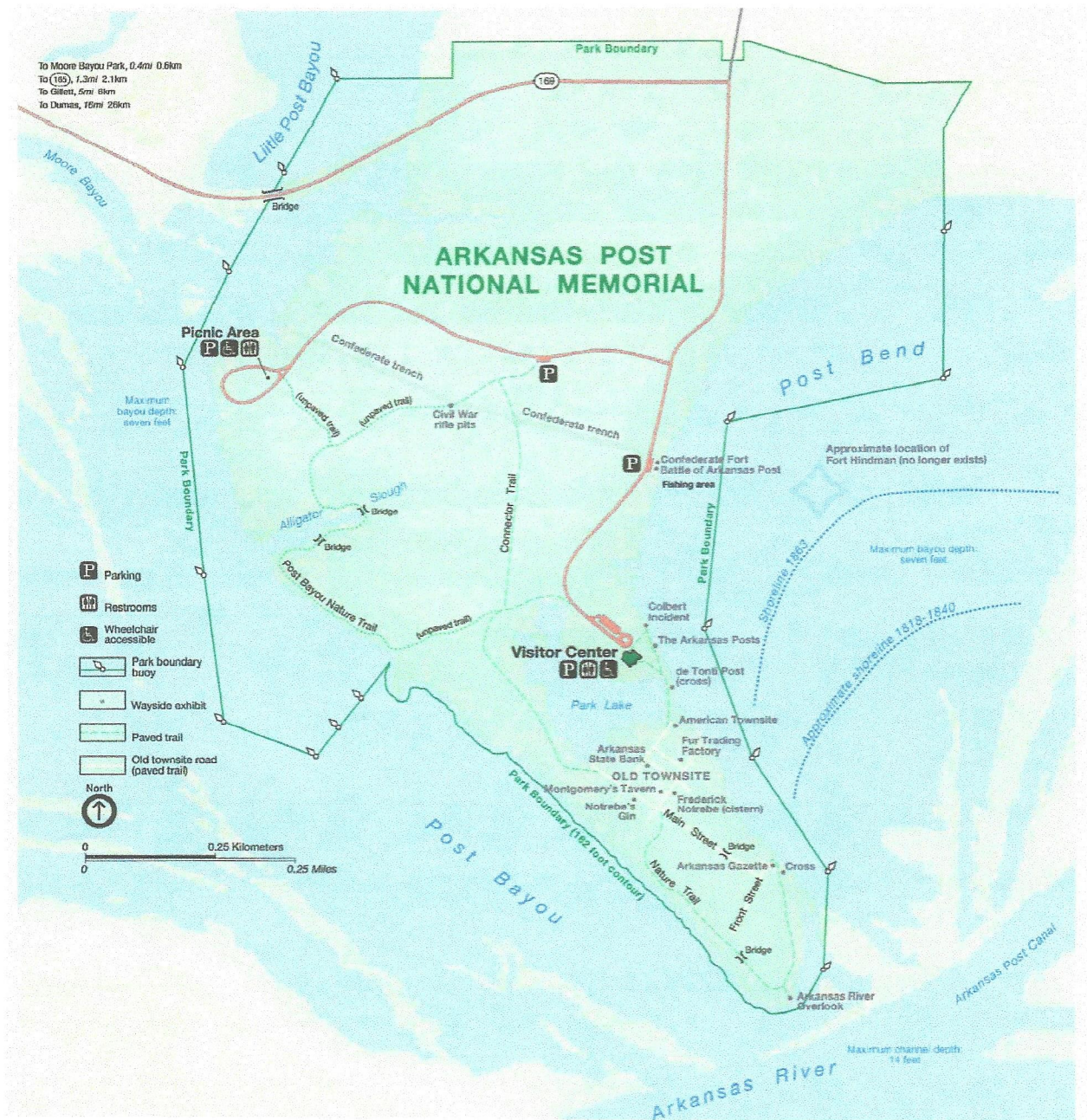


Figure 3: Vegetation types within the Memorial Unit

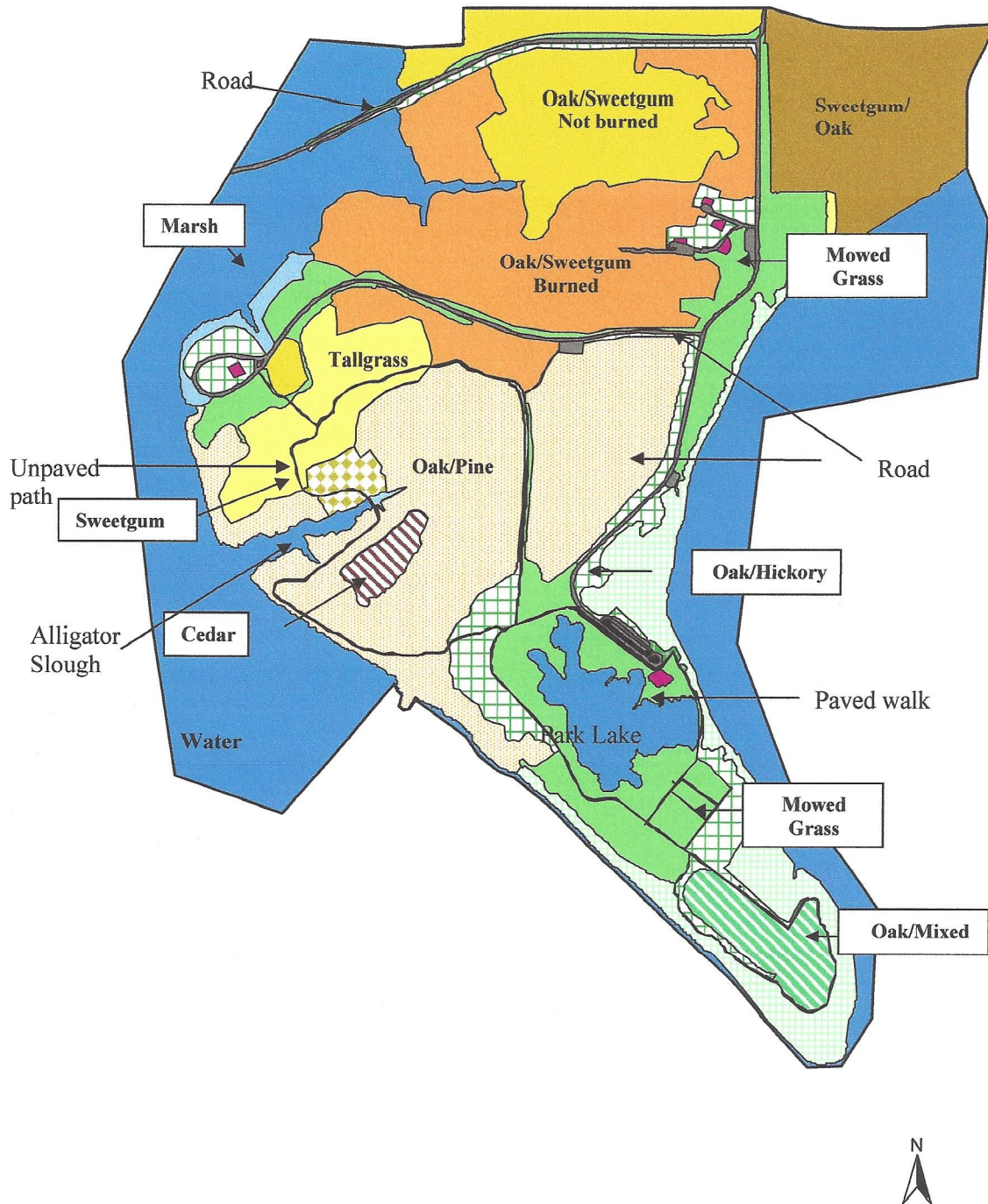


Table 2: Description of General Vegetation Types

Vegetation type	Description
Mixed A – Cherry Bark Oak (<i>Quercus pagoda</i>) & Water Oak (<i>Q. nigra</i>)	Average basal area = 100 ft ² standard deviation = 29.1043 Dominant species include: Cherry bark Oak (21%), Water Oak (28%), Sweet Gum (17%), Eastern Red Cedar (7%), and Post Oak (7%).
Hardwood B – Willow Oak (<i>Q. phellos</i>) & Water Oak (<i>Q. nigra</i>)	Average basal area = 56.67 ft ² standard deviation = 20.6155 Dominant species include: Willow Oak (24%), Cherry Bark Oak (14%), Water Oak (19%), and Southern Red Oak (17%).
Mixed C - Water Oak (<i>Q. nigra</i>) , Cherry Bark Oak (<i>Q. pagoda</i>), & Red Cedar (<i>Juniperus virginiana</i>)	Average basal area = 131.25 ft ² standard deviation = 18 Dominant species: Water Oak (26%), Cherry Bark Oak (25%), Pecan Hickory (9%), and Cedar (13%).
Mixed D – Water Oak (<i>Q. nigra</i>), Cherry Bark Oak (<i>Q. pagoda</i>), Southern Red Oak (<i>Q. falcata</i>), Willow Oak (<i>Q. phellos</i>). & Red Cedar (<i>J. virginiana</i>)	Average basal area = 53.33 ft ² standard deviation = 10 Dominant species: Water Oak (23%), Cherry Bark Oak (19%), Southern Red Oak (13%), Willow Oak (13%), Winged Elm (4%), Sweet Gum (8%), Post Oak (6%), and Cedar (4%).
Hardwood E – Pecan Hickory (<i>Carya illinoensis</i>), Water Oak (<i>Q. nigra</i>), & Cottonwood (<i>Populus deltoides</i>)	Average basal area = 45 ft ² standard deviation = 11.9523 Dominant species: Pecan Hickory (31%), Water Oak (27%), and cottonwood (14%). Other species present include Post Oak, Willow Oak, Sycamore, Cherry Bark Oak, Green Ash, Osage Orange, and Box Elder.

Table 2 (Continued) Description of General Vegetation Types

Vegetation type	Description
Mixed F – Sweetgum (<i>Liquidambar styraciflua</i>), Cherry bark (<i>Q. pagoda</i>) & Cedar	<p>Average basal area = 72.22 ft² standard deviation = 24.8886</p> <p>Dominant species: Sweet Gum (31%), Cherry Bark Oak (17%), Winged Elm (11%), Water Oak (15%), and Eastern Red Cedar (17%)</p> <p>Average basal area = 61 ft² standard deviation = 21.4735</p> <p>Dominant species: Sweetgum (83%), Cherry Bark Oak, Winged Elm and Water Oak (12% collectively)</p> <p>Average basal area = 160 ft² standard deviation = 14.1421</p> <p>Sweetgum is the dominant species making up 100% of this vegetation type.</p> <p>Average basal area = 38 ft² standard deviation = 13.1656</p> <p>Dominant species: Sweet Gum (89%) and Pecan Hickory (10%).</p> <p>Average basal area = 57.5 ft² standard deviation = 10.3509</p> <p>Dominant species: Post Oak (52%), and Willow Oak (15%). Other species present include Cherry Bark Oak, Water Oak, American Elm, Pecan Hickory, and Sugar Berry</p> <p>Average basal area = 96 ft² standard deviation = 25.0998</p> <p>Dominant species: Cedar (89%), Sweetgum (8%) and Water Oak (2%)</p> <p>Average basal area = 0 Bermuda is the dominant specie (100%)</p>
Hardwood G – Sweetgum (<i>L. styraciflua</i>)	
Hardwood J – Sweetgum (<i>L. styraciflua</i>)	
Hardwood L – Sweetgum (<i>L. styraciflua</i>)	
Hardwood M – Post Oak (<i>Q. stellata</i>)	
Conifer O – Red Cedar (<i>J. virginiana</i>)	
Mown Parkland – Bermuda (<i>Cynodon sp.</i>)	

Table 3: List of principle mammal species that may occur in Post, as taken from the nearby White River National Wildlife Refuge

Insectivores

Least Shrew	(<i>Cryptotis parva</i>)
Eastern Mole	(<i>Scalopus aquaticus</i>)
Short-tail Shrew	(<i>Blarina brevicauda</i>)

Rodents

Cotton Mouse	(<i>Peromyscus gossypinus</i>)
Deer Mouse	(<i>Peromyscus maniculatus</i>)
White-footed Mouse	(<i>Peromyscus leucopus</i>)
Golden Mouse	(<i>Peromyscus nuttalli</i>)
Fulvous Harvest Mouse	(<i>Reithrodontomys fulvescens</i>)
Eastern Woodrat	(<i>Neotoma floridana</i>)
Hispid Cotton Rat	(<i>Sigmodon hispidus</i>)
Pine Vole	(<i>Pitymys pinetorum</i>)
Plains Pocket Gopher	(<i>Geomys bursarius</i>)
Muskrat	(<i>Ondatra zibethicus</i>)
Eastern Fox Squirrel	(<i>Sciurus niger</i>)
Eastern Gray Squirrel	(<i>Sciurus carolinensis</i>)
Southern Flying Squirrel	(<i>Glaucomys volans</i>)
American Beaver	(<i>Castor canadensis</i>)
Nutria	(<i>Myocastor coypus</i>)

Bats

Big Brown Bat	(<i>Eptesicus fuscus</i>)
Southeastern Bat	(<i>Myotis austroriparius</i>)
Eastern Pipistrel	(<i>Pipistrellus subflavus</i>)*
Evening Bat	(<i>Nycticeius humeralis</i>)
Hoary Bat	(<i>Lasiurus cinereus</i>)
Keen Myotis	(<i>Myotis keeni</i>)
Little Brown Myotis	(<i>Myotis lucifugus</i>)
Red Bat	(<i>Lasiurus borealis</i>)
Silver-haired Bat	(<i>Lasionycteris noctivagans</i>)
Rafineque's big-eared bat	(<i>Corynorhinus rafinesquii</i>)

Opossum Family

Virginia opossum	(<i>Didelphis marsupialis</i>)
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Raccoon Family

Common Raccoon *(Procyon lotor)*

Armadillo Family

Nine-banded Armadillo *(Dasypus novemcinctus)*

Rabbit Hare Family

Eastern Cottontail *(Sylvilagus floridanus)*
Swamp Rabbit *(Sylvilagus aquaticus)*

Weasel Family

Long-tail Weasel *(Mustela frenata)*
Mink *(Mustela vison)*
Spotted Skunk *(Spilogale putorius)*
Striped Skunk *(Mephitis mephitis)*
River Otter *(Lutra canadensis)*

Hoofed Mammals

Whitetail Deer *(Odocoileus virginianus)*
Feral Hog *(Sus scrofa)*

Bear Family

Black Bear *(Ursus americanus)*

Feline Family

Bobcat *(Lynx rufus)*
Mountain Lion * *(Felis concolor)*

Canine Family

Coyote *(Canis latrans)*
Gray Fox *(Urocyon cinereoargenteus)*
Red Fox *(Vulpes fulva)*

Table 4: Amphibians of Arkansas Post National Memorial (from Herpetofaunal Inventory of Arkansas Post National Memorial 2002)

Key: (+++++) = Commonly encountered, (+) = Rare, (?) = unverified observation

Anura	Relative Abundance
Bufonidae	
American Toad (<i>Bufo americanus</i>)	+++
Fowler's Toad (<i>Bufo fowleri</i>)	+++++
Northern Cricket Frog (<i>Acris crepitans</i>)	+++++
Spring Peeper (<i>Pseudacris crucifer</i>)	+++
Cope's Gray Treefrog (<i>Hyla chrysoscelis</i>)	+
Green Treefrog (<i>Hyla cinerea</i>)	++++
Microhylidae	
Eastern Narrowmouth Toad (<i>Gastrophryne carolinensis</i>)	+++
Ranidae	
Bullfrog (<i>Rana catesbeiana</i>)	+++
Bronze Frog (<i>Rana clamitans</i>)	++++
Southern Leopard Frog (<i>Rana sphenoccephala</i>)	+++++
Caudata Ambystomatidae	
Marbled Salamander (<i>Ambystoma opacum</i>)	+
Plethodontidae	
Western Slimy Salamander (<i>Plethodon albagula</i>)	?

Table 5: Reptiles of Arkansas Post National Memorial (from Herpetofaunal Inventory of Arkansas Post National Memorial 2002)

Key: (+++++) = Commonly encountered, (+) = Rare, (?) = unverified observation

Squamata Phrynosomatidae		Relative Abundance
	Northern Fence Lizard (<i>Sceloporus undulatus hyacinthinus</i>)	+++
Scincidae		
	Five-lined Skink (<i>Eumeces fasciatus</i>)	+++++
	Broadhead Skink (<i>Eumeces laticeps</i>)	+++
	Ground Skink (<i>Scincella lateralis</i>)	+++++
Colubridae		
	Southern Black and Blackmask Racer (<i>Coluber constrictor</i>)	+++
	Speckled King Snake (<i>Lampropeltis getula</i>)	+++
	Red Milk Snake (<i>Lampropeltis triangulum</i>)	+
	Green Water Snake (<i>Nerodia cyclopion</i>)	+++++
	Yellowbelly Water Snake (<i>Nerodia erythrogaster</i>)	++++
	Broad-banded Water Snake (<i>Nerodia fasciatus</i>)	++++
	Diamondback Water Snake (<i>Nerodia rhombifer</i>)	++++
	Rough Green Snake (<i>Opheodrys aestivus</i>)	+
	Graham's Crayfish Snake (<i>Regina grahami</i>)	+++
	Western Ribbon Snake (<i>Thamnophis proximus</i>)	++

Reptiles continued

Viperidae

Western Cottonmouth (*Agkistrodon piscivorus*) +++++

Testudines Chelydridae

Common Snapping Turtle (*Chelydra serpentina*) +++++

Emydidae

Common Map Turtle (*Graptemys geographica*) ++

River Cooter (*Pseudemys concinna*) +++++

Three-toed Box Turtle (*Terrapene carolina triunguis*) +++++

Red-eared Slider (*Trachemys scripta*) +++++

Kinosternidae

Common Musk Turtle (*Sternotherus odoratus*) ++

Razorback Musk Turtle (*Sternotherus carinatus*) +++++

Crocodylia Alligatoridae

American Alligator (*Alligator mississippiensis*) ++

Table 6: Fishes that may occur, based on White River National Wildlife Refuge lists

Sturgeons	
Pallid Sturgeon*	(<i>Scaphirhynchus albus</i>)
Shovelnose Sturgeon	(<i>Scaphirhynchus platorynchus</i>)
Paddlefishes	
Paddlefish	(<i>Polyodon spathula</i>)
Gars	
Alligator Gar	(<i>Atractosteus spatula</i>)
Spotted Gar	(<i>Lepisosteus oculatus</i>)
Longnose Gar	(<i>Lepisosteus osseus</i>)
Shortnose Gar	(<i>Lepisosteus platostomus</i>)
Bowfins	
Bowfin	(<i>Amia calva</i>)
Freshwater Eels	
American Eel	(<i>Anguilla rostrata</i>)
Herrings	
Skipjack Herring	(<i>Alosa chrysochloris</i>)
Gizzard Shad	(<i>Dorosoma cepedianum</i>)
Threadfin Shad	(<i>Dorosoma petenense</i>)
Mooneyes	
Goldeye	(<i>Hiodon alosoides</i>)
Mooneye	(<i>Hiodon tergisus</i>)
Pikes	
Grass Pickerel	(<i>Esox americanus</i>)
Chain Pickerel	(<i>Esox niger</i>)

Minnows and Carps

Goldfish	(<i>Carassius auratus</i>)
Grass Carp	(<i>Ctenopharyngodon idella</i>)
Common Carp	(<i>Cyprinus carpio</i>)
Cypress Minnow	(<i>Hybognathus hayi</i>)
Mississippi Silvery Minnow	(<i>Hybognathus nuchalis</i>)
Speckled Chub	(<i>Hybopsis aestivalis</i>)
Silver Chub	(<i>Hybopsis storeriana</i>)
Silver Carp	(<i>Hypophthalmichthys molitrix</i>)
Golden Shiner	(<i>Notemigonus crysoleucas</i>)
Pallid Shiner	(<i>Notropis amnis</i>)
River Shiner	(<i>Notropis blennius</i>)
Ghost Shiner	(<i>Notropis buchanani</i>)
Ironcolor Shiner	(<i>Notropis chalybaeus</i>)
Pugnose Minnow	(<i>Notropis emiliae</i>)
Ribbon Shiner	(<i>Notropis fumeus</i>)
Red Shiner	(<i>Notropis lutrensis</i>)
Weed Shiner	(<i>Notropis texanus</i>)
Redfin Shiner	(<i>Notropis umbratilis</i>)
Blacktail Shiner	(<i>Notropis venustus</i>)
Mimic Shiner	(<i>Notropis volucellus</i>)
Bluntnose Minnow	(<i>Pimephales notatus</i>)
Bullhead Minnow	(<i>Pimephales vigilax</i>)

Suckers

River Carpsucker	(<i>Carpiodes carpio</i>)
Quillback	(<i>Carpiodes cyprinus</i>)
Highfin Carpsucker	(<i>Carpiodes velifer</i>)
Bluesucker	(<i>Cycleptus elongates</i>)
Lake Chubsucker	(<i>Erimyzon sucetta</i>)
Smallmouth Buffalo	(<i>Ictiobus bubalus</i>)
Bigmouth Buffalo	(<i>Ictiobus cyprinellus</i>)
Black Buffalo	(<i>Ictiobus niger</i>)
Spotted Sucker	(<i>Minytrema melanops</i>)
Shorthead Redhorse	(<i>Moxostoma macrolepidotum</i>)

Bullhead Catfishes

White Catfish	(<i>Ictalurus catus</i>)
Blue Catfish	(<i>Ictalurus furcatus</i>)
Black Bullhead	(<i>Ictalurus melas</i>)
Yellow Bullhead	(<i>Ictalurus natalis</i>)
Channel Catfish	(<i>Ictalurus punctatus</i>)
Tadpole Madtom	(<i>Noturus gyrinus</i>)
Freckled Madtom	(<i>Noturus nocturnus</i>)

Pirate Perches

Pirate Perch	(<i>Aphredoderus sayanus</i>)
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Killifishes

Golden Topminnow	(<i>Fundulus chrysotus</i>)
Northern Starhead Topminnow	(<i>Fundulus dispar</i>)
Blackstripe Topminnow	(<i>Fundulus notatus</i>)
Blackspotted Topminnow	(<i>Fundulus olivaceus</i>)

Livebearers

Mosquitofish	(<i>Gambusia affinis</i>)
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Silversides

Brook Silverside	(<i>Labidesthes sicculus</i>)
Inland Silverside	(<i>Menidia beryllina</i>)

Temperate Basses

White Bass	(<i>Morone chrysops</i>)
Yellow Bass	(<i>Morone mississippiensis</i>)
Stripped Bass	(<i>Morone saxatilis</i>)

Sunfishes

Flier	(<i>Centrarchus macropterus</i>)
Green Sunfish	(<i>Lepomis cyanellus</i>)
Warmouth	(<i>Lepomis gulosus</i>)
Orangespotted Sunfish	(<i>Lepomis humilis</i>)
Bluegill	(<i>Lepomis macrochirus</i>)
Longear Sunfish	(<i>Lepomis megalotis</i>)
Redear Sunfish	(<i>Lepomis microlophus</i>)
Spotted Sunfish	(<i>Lepomis punctatus</i>)
Bantam Sunfish	(<i>Lepomis symmetricus</i>)
Spotted Bass	(<i>Micropterus punctulatus</i>)
Largemouth Bass	(<i>Micropterus salmoides</i>)
White Crappie	(<i>Pomoxis annularis</i>)
Black Crappie	(<i>Pomoxis nigromaculatus</i>)

Pygmy Sunfishes

Banded Pygmy Sunfish	(<i>Elassoma zonatum</i>)
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Perches

Crystal Darter	(<i>Ammocrypta asprella</i>)
Western Sand Darter	(<i>Ammocrypta clara</i>)
Mud Darter	(<i>Etheostoma asprigene</i>)
Bluntnose Darter	(<i>Etheostoma chlorosomum</i>)
Swamp Darter**	(<i>Etheostoma fusiforme</i>)
Slough Darter	(<i>Etheostoma gracile</i>)
Harlequin Darter	(<i>Etheostoma histrio</i>)
Cypress Darter	(<i>Etheostoma proeliare</i>)
Speckled Darter	(<i>Etheostoma stigmaeum</i>)
Logperch	(<i>Percina caprodes</i>)
Blackside Darter	(<i>Percina maculata</i>)
Dusky Darter	(<i>Percina sciera</i>)
River Darter	(<i>Percina shumardi</i>)
Sauger	(<i>Stizostedion canadense</i>)

Drums

Freshwater Drum	(<i>Aplodinotus grunniens</i>)
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Mulletts

Striped Mullet	(<i>Mugil cephalus</i>)
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Air Quality Standards, State of Arkansas

CHAPTER 6: EMISSIONS FROM OPEN BURNING

Section 18.601 Intent

In order to avoid conflicting and overlapping jurisdiction, it is the intention of this chapter to clarify the position that the Department occupies the field of control and abatement of air pollution and contamination; and no political subdivision of this state shall enact or enforce laws, ordinances, resolutions, rules or regulation in this field, unless such laws, ordinances, resolutions, rules or regulations are for the purpose of prohibiting burning in the open or in a receptacle having no means for significantly controlling the fuel/air ratio.

Section 18.602 General Prohibition

No person shall cause or permit the open burning of refuse, garbage, trade waste, or other waste material, or shall conduct a salvage operation by open burning.

Section 18.603 Exemptions

The provisions of §18.602 herein shall not apply to the following activities:

(A) Fires used for the non-commercial cooking of food or for ceremonial or recreational purposes, including barbecues and outdoor fireplaces used in connection with any residence;

(B) Open burning related to agricultural activities including, but not limited to, clearing previously uncultivated lands and burning of stubble and other debris on previously harvested fields; provided however, that this exemption shall not be extended to the disposal, by open burning, of waste products generated by cotton gins, or similar equipment used in a manufacturing process or to the disposal by open burning of fowls or animals;

(C) Controlled fires used for purposes of forest and wildlife management, provided that such fires are used and burned when winds are blowing away from populated areas which might be affected;

(D) Controlled fires used only for purposes of on-site land clearing operations;

(E) Smokeless flares or safety flares from the combustion of waste gases, provided that all other applicable provisions of this Code are complied with;

(F) Open burning of the site or origin of waste hydrocarbon products from oil exploration, development, or production, or from natural gas processing plants, or from materials spilled or lost from pipeline breaks, where, because of the isolated location, such waste products cannot be reclaimed, recovered, or disposed of lawfully in any other manner;

(G) Fires set or authorized by any public officer, board, council, or commission when the fire is set or permission to burn is given in the performance of the duty of the officer for the purpose of weed abatement, or the prevention or elimination of a fire hazard; or fires set for the purposes of the instruction in methods of firefighting or for civil defense instructions;

(H) Open burning incident to on-site clean-up operations resulting from transportation accidents where, because of the isolated location, the material to be burned cannot be reclaimed or recovered, or where there is no other practical, safe, or lawful method of disposal; provided, however, that the Director shall be notified of the exact location, and the nature and quantities of materials to be burned prior to ignition; and provided, further, that such burning shall be conducted in accordance with the written approval of the Director. At his election, the Director's approval may be delivered by telephone, and confirmed, thereafter, in writing, in the case of an emergency; and

(I) Open burning of any material not elsewhere specifically prohibited or exempted in this chapter and for which there is no practical, safe, or lawful means of disposal; except that no person shall cause or permit such open burning without first obtaining a letter of authorization for open burning from the Director in accordance with the provisions as set forth in §18.605.

FINDING OF NO SIGNIFICANT IMPACT

Fire Management Plan Arkansas Post National Memorial

The Post was established July 6, 1960 by Public Law 74 Stat. 333 to include the initial 389-acre Arkansas Post State Park, referred to as the Memorial Unit. A boundary revision that appended the non-contiguous 360-acre Osotouy Unit was made through Public Law 105-83, 111 Stat. 25, on November 14, 1997. It is the mission of Arkansas Post National Memorial (ARPO) to commemorate human settlement near the confluence of the Arkansas and Mississippi Rivers and the events associated with the first European settlement in the Lower Mississippi fostering an appreciation of the interaction of the cultural groups, their histories, and their significance to the region; preserving the cultural and natural resources; and promoting resource stewardship through education.

The Fire Management Plan (FMP) and Environmental Assessment (EA) are developed to support and implement management goals and objectives outlined in the ARPO General Management Plan, 2004 (GMP) and Resource Management Plan. The plans require the development of a Cultural Landscape Plan (CLR) and determination of the appropriate landscape to be maintained in the park environ. Since the historic period covers the years before 1500 up to mid-1863 (Civil War Battle of Arkansas Post), the landscape has changed dramatically. While the CLR is still under development, the park lands will be maintained as a memorial landscape while maintaining the natural landscape (conservation area) as a forested area to support native wildlife and vegetation. The FMP will allow the park staff to manage natural resources effectively and use prescribed fire as appropriate. National Park Service policy requires any NPS area with vegetation capable of burning to prepare a FMP.

The environmental assessment evaluated the environmental impacts associated with different approaches to implement management goals outlined in the GMP and RMP. The park is divided into three fire management units. The first fire management unit (FMU-1) consists of approximately 130 acres that includes primarily forested lands with limited development including trails and underground utilities. The second fire management unit (FMU-2) is an intensely managed, park-like Bermuda lawn with scattered trees and park facilities which totals approximately 150 acres. The third fire management unit (FMU-3) is the entire Osotouy Unit which consists of approximately 360+ acres of relatively natural woodlands and recovering fields (plus a portion of Menard Bayou and Lake Dumond). Alternatives evaluated included the use of prescribed fire, mechanical and herbicide treatments to eliminate non-native species of plants, and mechanical treatment to reduce hazard fuels. The assessment evaluated the environmental consequences to cultural resources, vegetation and wildlife, geology and soils, rare, threatened, and endangered species and air quality. In addition, the impact of alternatives on park operations and staff workload was analyzed.

Preferred Alternative

The agency's preferred alternative (Alternative D described below) relies on vegetation management tools, augmented by prescribed fire, to meet park goals and objectives for the managed lands. All unscheduled ignitions will be suppressed in all the fire management units.

Environmentally Preferred Alternative

The Council on Environmental Quality (CEQ) regulation (40CFR 1500-1508) and DO-12 require NPS to identify the alternative that best promotes the goals of section 101 of the NEPA. The CEQ defines the environmentally preferred alternative as

"... the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources" (1981)

The environmentally preferred alternative is the combined use of prescribed fire and manual cutting, Alternative D. This alternative best meets the Post objectives with the least disturbance to the environment. It uses fire on a cycle that may best represent the pre-settlement regime. Perhaps most importantly, it allows the Post more options for adaptive management based on current conditions and desired future conditions.

The No Action plan and Alternative C (manual cutting) would be labor intensive and do not support the use of natural processes. Alternative B (prescribed fire) would not completely meet the desired conditions for understory management. None of the alternatives would directly, indirectly, or by cumulative impacts impair resources or values on the Memorial or those neighboring the Memorial.

There is not enough known at this time of the impacts of treatment on the archaeological and ethnographical resources of Osotouy. A conservative approach would best preserve the resources. Therefore, this unit will not be considered for any treatment except fire suppression using MIST. Without visitor services available at this site, the chances of wildland fire would be less than in the Memorial. The location in the relatively moist 100-year floodplain suggests that natural decomposition in the wooded area may retard development of hazard fuel conditions. This area would be considered for fire planning once plans for repatriation, resource protection, and visitor access are initiated and the extent and nature of the resource is better understood. Fire suppression with the use of MIST is not expected to have significant impacts at either the Memorial or Osotouy, and would result in less impact than allowing wildland fire to burn without suppression.

Alternatives Considered

Four alternatives were considered for the ARPO fire management plan. The alternatives are:

Alternative A – No Action This alternative represents the status quo for vegetation and hazard fuel management. The current management of hazard fuel consists of labor intensive manual removal of down and dead wood. Chainsaws and hand tools would be used to cut wood which could be hauled to vehicles for removal. Vehicles would occasionally need to go off of established pathways to safely access debris.

Understory vegetation control would be secondary to the hazard fuel mitigation. Understory management involves the use of mowers and “weed-whackers” in some locations. Mechanical mowing controls the height of grasses and other herbaceous plants in all turf around visitor use areas. Leaves would be swept from turf and pathways and disposed of in compost piles. Where tree density excludes mechanical devices, infrequent understory and ground cover treatment would occur. Mowers have managed the trails through the wooded areas, but most of the surface has become compacted from use and does not require frequent mowing. Weed whackers would cut herbaceous and small woody plants in the forest and trim around obstacles.

The current treatment was instituted after fire had been used in the 1990s to thin the understory and reduce hazard fuels. The Post has not used prescribed fire since 1996 and does not consider it part of their current techniques. Burn piles are ignited under the 1993 Fire Management Plan and would continue to be an option for the disposal of debris.

Planning for the occurrence of wildland fire and long-term management of natural resources are basic protection goals established in the Government Performance and Results Act of 1993 (GPRA), Director’s Order #18, and the Organic Act. An FMP using the no action alternative would focus on fire suppression. All wildland fire would be immediately suppressed. Crews responding to wildland fire would use Minimum Impact Suppression Tactics (MIST) at all times to minimize the impacts to cultural and natural resources.

Alternative B – Prescribed Fire Prescribed fire would be used in wooded understory and tallgrass prairie to control understory and manage hazard fuels. Fire staff from Buffalo National River would ignite and manage prescribed fires. Less than half of the available fire management area would be ignited in any given year. Fires would be ignited in small burn units that coincide with the type of vegetation, fire objectives, fire behavior, and prescription.

Literature review (Gill 1981, Huff and Smith 2000, Lyons, et al. 2000, Russel, et al. 1999), recommendations from fire management experts, and consideration of impacts suggests that the Post could use prescribed fire in maintenance of historic sites and the prairie immediately prior to greening of native species in early spring and occasionally in late summer and early fall during the growing season. This would be fairly consistent with past

practices. Burn piles would not occur under this alternative. Prescribed fires could be planned for March or April and again in September through early November.

Mild to intense natural fire probably occurred every 4 – 20 years, with intensity increasing with length of time between fires, fuel moisture, weather topography and other factors. Prescribed fire could be used at the Memorial on a three- to 15-year rotation to approximate natural fire regimes (Scott Simon, written communication). The prairie would receive a fire return interval of three to five year, while the forests would receive a fire return interval of approximately 15 years.

It is probable that natural decomposition in the moist bottomlands would result in slow development of hazard fuel conditions with the greatest problem being in large, coarse fuels. Monitoring of fire effects would include monitoring the rate of hazard fuel condition development over the years when fire would not be used. Fire would occur frequently enough to meet both objectives of fuel mitigation and understory management. A five to ten year periodicity has been recommended for other sites in the region (Scott Simon, written communication), but has not been tested at the Post. Fire effects monitoring would help to determine the correct fire frequency to meet objectives without impacting community structure in the understory.

Generally, fire would be used more frequently in tallgrass prairie than in woods. A fire rotation of three to five years would be appropriate for management of tallgrass species and reduction of fine fuels. Fire crews would use ATVs in prescribed fire and in fire suppression, particularly in the open areas, such as the prairie. Care would be taken to keep ATVs and other vehicles out of known archaeologically sensitive areas and wetlands.

Burning of landscape debris need not be considered under this alternative, because the assumption is that prescribed fire would be the only treatment used outside of turf areas. Brush piles result from manual cutting and removal of debris to localized sites, which would not occur under this alternative.

Hazard fuel treatment would reduce the potential for wildland fire in the treatment areas. If wildland fire occurs, it would be met with immediate suppression. Firefighters would apply MIST measures at all times and disturbance to soils would be minimized.

Alternative C – Manual Cutting (no prescribed fire or herbicides) Under this alternative, frequent brushing and hauling of woody debris could be conducted primarily by hand, using chainsaws, “weed whackers,” and hand tools. Vehicles could be placed on nearby access points to bring workers to the site and remove debris from the site. On occasion, when debris is heavy or safety is a concern, vehicles could be taken off of established paths to access work areas. Care would be taken to avoid sensitive archaeological areas and wetlands. Debris could be disposed of by chipping and composting or hauling off site. Fire is not proposed for the disposal of debris.

The Post proposes to continue mowing turf and herbaceous vegetation where mowers can safely access areas. Mowing maintains a low profile of about four inches on turf, but other herbaceous areas may grow higher than four inches before receiving treatment. Laborers

could use weed whackers in herbaceous growth inaccessible to mowers. The prairie would be mowed to a height of 14 inches early in the season to discourage invasive trees and shrubs, before native grasses emerge. Mowing may be conducted as needed on herbaceous plants outside of turf areas, including pathways. Mowed grasses and herbaceous material would not be removed for disposal.

Undesirable understory plants could be cut as needed to meet the desired conditions for the historic landscape. Small understory vegetation could be removed from site or left to decompose at the managers' discretion. Cutting may require the use of hand tools, chainsaws for large materials, and "weed whackers" in places where the equipment can be safely used in small diameter vegetation.

If wildland fire occurs, rural fire fighters would meet it with immediate suppression. Firefighters would apply MIST measures and minimize disturbance to soils and other resources as much as practicable.

Alternative D – Prescribed fire and manual cutting (Preferred Alternative) This alternative would be an eclectic approach with flexibility in methods of hazard fuel management and understory control that could be adjusted for the existing conditions. The Post has effectively combined cutting and/or removal of hazard fuels with prescribed fire and brush pile burning in the past. Cutting could be conducted either as a precursor to prescribed fire to reduce or redistribute fuels and control fire intensity, or after prescribed fire as a secondary treatment and cleanup. Fuels could be removed from the bases of trees with exposed or shallow roots. This process also allows moving fuels to brush piles for burning. Brush piles would be rotated to different safe locations to avoid repeated burning at one location. When fine materials would be cut to control understory vegetation, they could be left to decompose or burn in the next prescribed fire. Fire could occur once every fifteen years in the wooded areas and more frequently (every three to five years) in the prairie, unless fire effects monitoring and hazard fuel conditions suggests that timing should differ.

The Post could rely on manual hazard fuel treatment and understory management annually with prescribed fire used cyclically. Manual cutting could predominate as the principle treatment for understory management, but would also serve as a hazard fuel mitigation technique in the aftermath of a catastrophic event, such as a severe storm. The alternative would also support the use of fire to dispose of landscape debris, which could be helpful after catastrophic events also.

Prescribed fire could allow cleanup crews access to areas where understory is usually dense, spot stems that remain after a burn, and remove those stems as a secondary treatment. Herbicide stump treatment would not be excluded from this alternative, but its use would be restricted to stump treatment of shrubs under an approved Integrated Pest Management Plan. Manually cut material could be left to decompose on the soil or large debris could be removed to brush piles, depending on local hazard fuel conditions and decomposition rates. Judgment would be made on-the-ground and adaptive management employed. Fire could be the principle treatment in the prairie, where fire frequency could be at three to five years.

Mowing could be avoided in the prairie, but allowable early in the season at a height greater than the native grass height.

Prescribed fire may be employed during late summer and fall in some years. This may allow crews to cut vegetation during summer months and leave it or redistribute it to control fire intensity and enhance the probability of achieving desired results in prescribed fire. Again, crews on-the-ground would interpret the best means of achieving desired conditions by employing various options available under this alternative.

Having this broad base of tools to manage hazard fuels would result in the best and most effective management of hazard fuels. Methods of treatment can be selected and adapted to meet the current conditions and achieve desired conditions. Effectively managing hazard fuels would greatly reduce the potential for wildland fire. Should wildland fire occur, it would be met with immediate suppression, as in the other alternatives, and MIST would be used whenever practicable. Disturbance to soils and potential archaeological features would be minimized.

The Preferred Alternative and Significance Criteria

Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.

Minor to moderate negative impacts to air quality could result from the use of prescribed fire, but would be local and temporary. The use of prescribed fire is expected to be infrequent and the effects are generally beneficial. Minor negative impacts could occur to trees. There would negligible effects on archeological or historic resources; the use of prescribed fire to reduce fuel hazards would reduce risks posed by an unscheduled ignition to historic resources.

The degree to which the proposed action affects public health or safety.

The preferred action provides the best plan for safety. Suppressing fires using the most appropriate suppression response allows managers to select strategies that maximize safety for wildland firefighters, the public and adjacent landowners. Prescribed fire plans will be developed using criteria from RM-18 which provides for firefighter safety; and prescribed fires will be planned to protect firefighters and any other employees in the area.

The direction provided by the GMP and RMP provides for using prescribed fire, and mechanical and chemical treatments for hazardous fuels reduction, control or elimination of non-native vegetation, and cultivation of native species. Reduction of hazardous fuels will reduce the threat of wildland fire for visitors, developed areas within the park, and firefighters.

Smoke generated by prescribed fires could reduce visibility in the areas adjacent to the park. The EA specifies actions to be adopted in the prescribed fire plan to reduce risks associated with the visual impacts of smoke.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

Arkansas Post National Memorial is listed on the National Register of Historic Places and is a designated National Historic Landmark. The park GMP promotes the reestablishment of the historic landscape for interpretive purposes as well as maintaining a viable natural environment. Prescribed fire will only be used under carefully planned and supervised situations. Suppression of all wildland fires in the park is intended to provide for public and employee safety and protect historic structures on the site.

The degree to which the effects on the quality of the human environment are likely to be controversial.

None of the identified impacts on the quality of the human environment are controversial.

The degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks.

There are no identified risks associated with the preferred alternative that are unique or unknown, and there are no effects associated with the preferred alternative that are highly uncertain identified during the analysis for the EA.

The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The preferred alternative does not establish a precedent for any future actions that may have significant effects, nor does it represent decisions about future considerations.

Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

The analysis identified no long-term adverse impacts on vegetation or wildlife populations. Some beneficial impacts were identified, particularly the control of non-native species and the establishment of native vegetation. Modification of vegetation will also help protect existing cultural resources from unscheduled ignitions and may provide protection during prescribed fires. There will be short-term, minor impacts to air quality if prescribed fire is employed.

The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.

ARPO is listed on The National Register of Historic Places. Prescribed fire planning will be sensitive to the designation and all necessary compliance will be completed prior to project implementation. Firebreaks will be created with mown areas reinforced by engines and hose to establish control lines. No ground disturbance to create fire lines is anticipated or authorized by the fire management plan.

In accordance with Section 106 of the National Historic Preservation Act, ARPO contacted the Arkansas State Historic Preservation Office (SHPO) during development of the draft Wildland Fire Management Plan and environmental assessment. The SHPO also received a copy of the draft Fire Management Plan and environmental assessment.

In a letter dated February 11, 2005, the SHPO determined that the project would not adversely affect any property listed or eligible for listing on the National Register of Historic Places. Suggested changes were made that included training volunteer fire personnel from Gillett and Tichnor in the importance of Arkansas Post and that vehicular traffic can have a lasting impact on the significant historical resources of the park. They also suggested that burn piles should be restricted to areas that have been surveyed for cultural resources. Finally, Coose and Menard cemeteries should be excluded from prescribed burns. All these suggestions have been included in the final FMP. In a letter from the City of Gillett, dated March 21, 2005, the city confirmed the validity of the existing MOU with the park to participate in prescribed fire and suppression activities as indicated in the FMP.

The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

No endangered plants or animals have been identified in the park except the Arkansas threatened alligator population. Since alligators are primarily aquatic animals, the major concerns would be limited to their nesting areas and no prescribed fires are permitted in these nesting areas.

Whether the action threatens a violation of Federal, state, or local law or requirements imposed for the protection of the environment.

The action violates no federal, state, or local environmental protection laws.

Impairment

Through the development of the EA, a determination has been made that none of the proposed projects will constitute impairment. Based upon National Park Service policy (*NPS Management Policies*, 2001) an impact would be more likely to constitute impairment to the extent that it has a moderate or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- identified as a goal in the park's general management plan or other relevant National Park Service planning documents.

None of the impacts discussed for the preferred alternative meet this criteria. Overall, the plan results in benefits to park resources and values, opportunities for their enjoyment, and it does not result in their impairment.

Public Involvement

Scoping is the effort to involve agencies and the general public in determining the issues to be addressed in the environmental document. Among other tasks, scoping determines important issues and eliminates issues not important; allocates assignments among the interdisciplinary team members and other participating agencies; identifies related projects and associated documents; identifies other permits, surveys, consultations required by other agencies; and creates a schedule which allows adequate time to prepare and distribute the environmental document for public review and comment before a final decision is made. Scoping included any interested agency or any agency with jurisdiction by law or expertise.

The park released the draft fire management plan and environmental assessment for public review and comment on January 27, 2005. The 30 day comment period ended on February 28, 2005. Copies of the EA were mailed to governmental agencies (Army Corps of Engineers, Arkansas Archeological Survey), the USFWS (White River NWR), the Quapaw Nation of Oklahoma, and volunteer fire departments of Gillett and Tichnor. The park received two letters, one each from the following organizations:

Arkansas State Historic Preservation Office

The City of Gillett

The comments from the SHPO and City of Gillett are summarized in the previous section titled the Preferred Alternative and Significance Criteria.

Conclusion

The preferred alternative does not constitute an action that normally requires preparation of an environmental impact statement (EIS). The preferred alternative will not have a significant effect on the human environment. Negative environmental impacts that could occur are negligible or minor in intensity. There are no significant impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, significant cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Based on the foregoing, I have determined that an EIS is not required for this project and thus will not be prepared.

Recommended:



Superintendent

4-8-05
Date

Approved:



Midwest Regional Director

4-15-05
Date