
**LYNDON B. JOHNSON NATIONAL HISTORICAL PARK
FIRE MANAGEMENT PLAN**



**DRAFT ENVIRONMENTAL ASSESSMENT
SEPTEMBER 2004**

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Lyndon B. Johnson National Historical Park

Fire Management Plan – Environmental Assessment

National Park Service

U.S. Department of the Interior

Lyndon B. Johnson National Historical Park

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Johnson City, TX 78636

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United States Department of the Interior

NATIONAL PARK SERVICE
Lyndon B. Johnson National Historical Park
P.O. Box 329
Johnson City, Texas 78636

IN REPLY REFER TO:

November 8, 2004

Dear Interested Party,

Enclosed is a copy of the **Lyndon B. Johnson National Historical Park Fire Management Plan Environmental Assessment** for your review and comment. This Environmental Assessment was prepared pursuant to the National Environmental Policy Act (NEPA). Our records indicate that you have participated in the planning process or have requested to receive copies of the park's planning documents.

National Park Service Wildland Fire Management Guidelines (DO-18) mandates, "All parks with vegetation that can sustain fire must have a fire management plan." The purpose of this Federal action is to develop a Fire Management Plan and program that utilizes the benefits of fire to achieve desired natural and cultural resource conditions while minimizing the fire danger to park resources and adjacent lands from hazardous fuel accumulations. We seek to manage and enhance native plant communities, such as tallgrass prairie, and restore and protect the historic landscape while protecting visitors, facilities, and resources on and adjacent to the park.

As a result of our analysis, we consider Alternative 2 to be the preferred alternative for best accomplishing the purpose and interest for this Proposed Action. Under this alternative, all wildland fires in the park would be suppressed in a manner that minimizes the negative environmental impacts of suppression activities. There would be an enhanced program of hazard fuels reduction to include mowing of vegetation in areas adjacent to park structures, grazing of pastures, and the occasional selective thinning of woody vegetation using mechanical methods. A 12 foot wide mowed buffer along critical areas of the park's boundary would be maintained. The park would work with neighboring landowners to reduce fuels on adjacent non-federal land. Prescribed fire would be conducted on a two to five year rotation in a small prairie restoration project area and on pastureland. This alternative best protects and helps preserve the historic, cultural, and natural resources in the park for current and future generations.

Additional information concerning the Lyndon B. Johnson National Historical Park Fire Management Plan can be obtained from the Texas State Coordinator/Superintendent, Lyndon B. Johnson National Historical Park, P.O. Box 329, Johnson City, TX 78636. Written comments will be accepted until December 23, 2004, 30 days after the publication of the Environmental Assessment Notice of Availability in the Johnson City Record Courier, which will be on or about November 23, 2004.

Please include the following information when submitting comments:

1. Name, address, and (if possible) telephone number.
2. Title of the document on which the comments are being submitted.
3. Specific comments along with the supporting reasons that the Superintendent should consider in reaching a final decision.

Comments received in response to this solicitation, including names and addresses, will become part of the public record and available for public inspection.

Comments involving the Environmental Assessment can be provided by e-mail to lyjo_superintendent@nps.gov, by fax (830) 868-0810, or by mail to: David Vela, Texas State Coordinator/Superintendent, Lyndon B. Johnson National Historical Park, P.O. Box 329, Johnson City, TX. 78636.

Sincerely,



David Vela
Texas State Coordinator/Superintendent

Enclosure

Executive Summary

National Park Service Wildland Fire Management Guidelines (DO-18) state, “All parks with vegetation that can sustain fire must have a fire management plan.” This Environmental Assessment (EA) examines possible environmental impacts of implementing the proposed Lyndon B. Johnson National Historical Park Fire Management Plan (FMP). The purpose of developing this fire management plan and program is to utilize the benefits of fire to achieve desired natural and cultural resource conditions, while minimizing the fire danger to park resources and adjacent lands from hazard fuel accumulations. The EA considers two alternative ways of meeting the park’s fire management goals, in addition to the proposed action.

For every National Park Service FMP, public and firefighter safety in the event of wildland fire is of primary importance. A key component in meeting the issue of human health and safety with regard to fire management is the protection and treatment of the wildland urban interface. The wildland urban interface refers to areas where wildland vegetated areas meet or lead up to urban developments. The Johnson City and LBJ Ranch Districts that comprise the park are urban interface areas with numerous high value high-risk structures adjacent to the boundary. Therefore, protecting the wildland-urban interface is an important issue in the FMP and EA.

Depending on the circumstances of a particular park, prescribed fire may be used under carefully controlled conditions to promote natural and cultural resources, for example, to control exotic (weedy) species, reduce dangerous fuel loads, or to maintain the appearance of an historic landscape. In central Texas, fire is a natural and integral part of the landscape. Prior to the introduction of livestock, the general consensus is that fire was the most important natural disturbance that occurred in the area. Historically, large areas of prairie and woodland periodically burned. In the past, Lyndon B. Johnson NHP has used prescribed fire on a two-three year rotation, and use of prescribed fire is a component of the proposed action.

For all of the alternatives considered in this EA, Lyndon B. Johnson National Historical Park will be managed using two separate fire management units (FMUs): the LBJ Ranch FMU (594 acres) and the Johnson City FMU (81 acres). The three alternatives considered in this EA are as follows:

2.2.2 Alternative 1 (No Action Alternative) - Fire Management Plan to Include Wildland Fire Suppression, Hazard Fuels Reduction Treatments, and Prescribed Fire Use.

Under this alternative, all wildland fires in the park would be suppressed in a manner that minimizes the negative environmental impacts of suppression activities. Hazard fuels reduction would involve the mowing of vegetation in areas adjacent to park structures, the grazing of pastures and the occasional selective thinning of woody vegetation as well as any hazard trees using mechanical methods. Prescribed fire would be conducted on a two to five year rotation in a small prairie restoration project area and on pastureland.

2.2.3 Alternative 2 (Preferred Alternative) - Fire Management Plan to Include Wildland Fire Suppression, Expanded Hazard Fuels Reductions Around Park Structures and Along Park Boundaries, and Prescribed Fire Use.

Under this alternative, wildland fire suppression would be conducted as under the No Action. In addition, the LBJ Ranch and Johnson City fire management units would be reorganized into several different management compartments: Pasturelands, Developed Areas, Cedar/Oak Thicket and Prairie Restoration Area.

While wildland fire suppression and prescribed fire use would be conducted in the same manner as in the “No Action” Alternative, hazard fuels reduction would be expanded in the Developed Areas, Prairie Restoration Area and Cedar/Oak Thicket in order to protect all park structures and certain areas along the park’s boundary. Along critical portions of the park’s boundary a 12-ft wide mowed buffer will be maintained, especially during the driest times of the year and during prescribed burns, in order to help prevent the spread of wildland fire to and from adjacent non-agency land. The park would work with neighboring landowners to reduce fuels on adjacent non-federal land. Mowed buffers around all park structures would be expanded to new park specifications.

2.2.4 Alternative 3 – Fire Management Plan to Include Wildland Fire Suppression and Expanded Hazard Fuels Reduction around Park Structures and Along Park Boundaries.

Under this alternative wildland fire suppression and hazard fuels reduction would be conducted in the same manner as in the “Preferred” Alternative, however prescribed fire would not be utilized anywhere in the park to reduce hazard fuel loads or to combat invasive plant species. Within the Prairie Restoration Area Compartment, the area would be mowed and baled to meet management objectives, while in the Pasturelands Compartment, grazing would continue (see Figure 2-2).

This EA analyzes impacts to important environmental resources from each of the alternatives. Each of the alternatives had common elements of suppressing wildland fire and reducing hazard fuels. Impacts of all alternatives were generally either minor or beneficial. The lack of prescribed fire under Alternative 3 provided fewer benefits than the other two alternatives in terms of enhancing native vegetation, reducing exotic species, and other benefits. The No Action had the benefit of prescribed fire. However, the Proposed Action had the additional benefit of an enhanced hazard fuels management program.

Therefore, the Proposed Action is not only the park’s preferred alternative, but the environmentally preferred alternative under National Environmental Policy Act (NEPA), since it best meets the national environmental policy expressed in NEPA. Under this alternative, fire management activities would help restore and maintain native plant communities in the park’s native vegetation (prairie) restoration project, mimic natural ecological processes, and help protect park resources and adjacent lands from the threat of wildland fires. Finally, the alternative best protects and helps preserve the historic, cultural, and natural resources in the park for current and future generations.

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Chapter 1 - Purpose and Need

1.1 INTRODUCTION

This Environmental Assessment (EA) documents the results of a study of the potential environmental impacts of an action proposed by the National Park Service to develop the Lyndon B. Johnson National Historical Park Fire Management Plan.

This EA has been prepared in compliance with:

- The National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321 et seq.), which requires an environmental analysis for major Federal Actions having the potential to impact the quality of the environment;
- Council of Environmental Quality Regulations at 40 Code of Federal Regulations (CFR) 1500-1508, which implement the requirements of NEPA;
- National Park Service Conservation Planning, Environmental Impact Analysis, and Decision Making; Director's Order (DO) #12 and Handbook.

The Purpose of an Environmental Assessment (EA)

There are three primary purposes of an EA:

- To help determine whether the impact of a proposed action or alternative could be significant, thus indicating that an environmental impact statement (EIS) is needed;
- To aid in compliance with NEPA when no EIS is necessary by evaluating a proposal that will have no significant impacts, but that may have measurable adverse impacts; and
- To facilitate preparation of an EIS if one is necessary.

Key goals of NEPA are to help Federal agency officials make well-informed decisions about agency actions and to provide a role for the general public in the decision-making process. The study and documentation mechanisms associated with NEPA seek to provide decision-makers with sound knowledge of the comparative environmental consequences of the several courses of action available to them. NEPA studies, and the documents recording their results, such as this EA, focus on providing input to the particular decisions faced by the relevant officials. In this case, the Superintendent of Lyndon B. Johnson National Historical Park is faced with a decision to develop the park's Fire Management Plan as described below. This decision will be made within the overall management framework already established in the Lyndon B. Johnson National Historical Park 1999 General Management Plan and is consistent with 2001 federal wildland fire management policy and guidelines. The alternative courses of action to be considered at this time are, unless otherwise noted, crafted to be consistent with the concepts established in the General Management Plan (copies of the 1999 General Management Plan can be obtained by contacting NPS personnel at the park) and the 2001 federal wildland fire management policy and guidelines.

In making decisions about National Park Service administered resources, the Park Service is guided by the requirements of the 1916 Organic Act and other laws, such as the Clean Air Act,

Clean Water Act, and Endangered Species Act. The authority for the conservation and management of the National Park Service is clearly stated in the Organic Act, which states the agency's purpose: "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." This authority was further clarified in the National Parks and Recreation Act of 1978: "Congress declares that...these areas, though distinct in character, are united...into one national park system.... The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress."

Lyndon B. Johnson National Historical Park was originally established by Public Law 91-134 on December 2, 1969, as a national historic site in order "...to preserve in public ownership historically significant properties associated with the life of Lyndon B. Johnson." Senate 2363-1980, Park Omnibus Bill, Title VI, Lyndon B. Johnson National Historical Park, December 28, 1980, amended Public Law 91-134 by changing "national historic site" to "national historical park, "raising the development ceiling and authorizing the acquisition of additional lands.

The requirements placed on the National Park Service by these laws, especially the Organic Act, mandate that resources are passed on to future generations "unimpaired" (DOI, 2001a). An impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including opportunities that otherwise would be present for the enjoyment of those resources or values. An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result from an action necessary to preserve or restore the integrity of park resources or values (DOI, 2001b). This EA addresses whether the actions of the various alternatives proposed by Lyndon B. Johnson National Historical Park impair resources or values that are (1) necessary to fulfill specific purposes identified in the enabling legislation of the park, (2) key to the natural or cultural integrity of the park or opportunities for enjoyment of the park, and (3) identified as a goal in the park's general management plan or other Park Service planning documents (see *Chapter 3 – Environmental Consequences*).

1.2 PURPOSE AND NEED

National Park Service Wildland Fire Management Guidelines (DO-18) states, "All parks with vegetation that can sustain fire must have a fire management plan." The purpose of this federal action is to provide a long-range fire management plan and program utilizing the benefits of fire to achieve desired natural and cultural resource conditions while protecting from fire the resources preserved within the park and on the surrounding lands and properties.

This action is needed for the following reasons:

- The park is surrounded in both districts by agricultural or developed land, and fires that start on park property could easily move onto neighboring lands.
- Almost the entire park is listed on the National Register of Historic Places as an historic district of national significance. The cultural landscapes preserved at the park are vital components of the park's significance.
- Burning of agricultural pastures is an accepted agricultural method used to maintain a forage crop.
- Prescribed burning has been conducted at the Johnson Settlement in order to reestablish a native tall-grass prairie and to control exotic or invasive plants.
- The current Fire Management Plan is in need of revision in order to bring the park into compliance with current guidelines and policies.

1.3 BACKGROUND

1.3.1 *Fire Ecology*

According to fire ecologist Dr. Cecil Frost (1998), "... fire once played a role in shaping all but the wettest, the most arid, or the most fire-sheltered plant communities of the United States. (USDA, 2002a)" Lightning caused fires were a major environmental force shaping the vegetation of North America for millions of years prior to human settlement. Fire-dependent ecosystems developed, as did individual plant species dependent upon or adapted to wildland fire.

In central Texas, fire is a natural and integral part of the landscape. Prior to the introduction of livestock, the general consensus is that fire was the most important natural disturbance that occurred in the area. Historically, large areas of prairie and woodland periodically burned. While there is little data available on fire frequencies within this area of Texas, it is estimated that fire frequencies ranged from less than 10 years to 35 years, depending upon the amount of understory fuels available (USDA, 2000b). Fires occur most frequently during February and March when most grasses are dormant and lightning strikes occur commonly and from July to September when grasses are dry. Both winter and summer fires with ample fuel loading in the grass understory can topkill trees resulting in major alteration of the existing vegetative communities. However, woody plant mortality and stand-replacements are rare. Winter fires that occur with low understory fuel loadings can result in partial removal of the overstory. Species such as live oak sprout if topkilled by fire and are rarely removed from the vegetation complex by fire. However, Ashe juniper can be killed by fire and replaced by herbaceous vegetation (USDA, 2000b).

Lyndon B. Johnson National Historical Park, located in Johnson City, is in the "Hill Country" of south-central Texas, a landscape of forested hills, deep canyons, and secluded valleys. The park is made up of the Johnson City District, and the LBJ Ranch District near Stonewall. The Johnson City District lies 47 miles west of Austin and 63 miles north of San Antonio, while the LBJ Ranch district lies 14 miles west of Johnson City (see Figure 1-1). The general area is drained by the Pedernales River, a tributary of the Colorado River.

- **The Johnson City District (81 acres):** The Johnson City District focuses on the ancestry of the president; it includes the Park Headquarters and Visitor Center, Boyhood Home, Johnson Settlement, and Education Center.
- **The LBJ Ranch District (594 acres):** The LBJ Ranch District focuses primarily on Lyndon Johnson the rancher and president; it includes the Junction School, Reconstructed Birthplace, Texas White House, Show Barn, ranch lands and cattle, and other structures related to President Johnson's life in the Texas Hill Country.

Closely associated with the national historical park is the LBJ State Park and Historic Site, which is operated by the Texas Parks and Wildlife and was also initiated by President Johnson. Interpretation at the state park concentrates on the natural and cultural resources of the Texas Hill Country and the environment that greatly influenced the future president. This state park provides exhibits, orientation films, and an educational sales area in the visitor center. Other activities, including visiting the Sauer-Beckman Living History Farm, viewing wild animals, swimming, and baseball are also available. The NPS tour of the LBJ Ranch begins at the state park.

There are no indications in the historic record as to the extent or frequency of fire activity (either natural or prescribed) in the specific park vicinity. President Johnson periodically burned areas of the Ranch Unit. Historically fire has been used and continues to be used by local landowners to remove undesirable species and promote the growth of desirable species. Since its inception, the park has attempted to conduct one prescribed burn every two to three years.

Since Lyndon B. Johnson National Historical Park entered National Park Service administration in 1969, all wildland fires have been suppressed. On average, the occurrence of wildland fires at the park has been low; since 1980 there has been only four known wildland fires, two caused by lightning and two human related.

1.3.2 *Human Health & Safety*

A key component in meeting the underlying need of human health and safety with fire management is the protection and treatment of the wildland urban interface. The wildland urban interface refers to areas where wildland forests meet urban developments, or where forest fuels meet urban fuels (such as houses). These areas encompass not only the interface (areas immediately adjacent to urban development), but also the continuous slopes and fuels that lead directly to the urban developments. The Johnson City and LBJ Ranch Districts are urban interface areas with numerous high value high-risk structures adjacent to the boundary. The Johnson City District has grassy fuels that can carry a fast moving fire from a major highway onto the park, and threaten visitors and historic structures within minutes. Conversely, an accidental ignition by a visitor or park employee can threaten adjacent homes before a phone call could be made. The LBJ Ranch District has significantly more grazing that reduces hazard fuels accumulation, and visitors are confined to bus tours with brief stops at specific locations. It is also on a hilltop with wind exposure, and grassy fuels along the Pedernales River.

Reducing the fire hazard in the wildland urban interface requires the efforts of federal, state, and local agencies, Tribes, and private individuals. "The role of [most] federal agencies in the

wildland urban interface includes wildland fire fighting, hazard fuels reduction, cooperative prevention and education and technical experience. Structural fire protection [during a wildland fire] in the wildland urban interface is [largely] the responsibility of Tribal, state, and local governments” (USDA, 2003). Property owners share a responsibility to protect their residences and businesses and minimize fire danger by creating defensible areas around them and taking other measures to minimize the fire risks to their structures (USDA, 2003). With treatment, a wildland urban interface can provide firefighters a defensible area from which to suppress wildland fires or defend structures and/or communities. In addition, a wildland urban interface that is properly managed will be less likely to sustain a crown fire that enters or originates within it.

1.4 FIRE MANAGEMENT OBJECTIVES

National Park Service Wildland Fire Management Guidelines (DO-18) requires that all parks with vegetation capable of sustaining fire develop a wildland fire management plan that will meet the specific resource management objectives for that park, and to ensure that firefighter and public safety are not compromised. This guideline identifies fire as the most aggressive natural resource management tool employed by the National Park Service. The guideline further states that all wildland fires are either classified as wildland fires or prescribed fires. Prescribed fires (including wildland fire use) may be authorized by an approved wildland fire management plan and contribute to a park’s resource management objectives. Human-caused wildland fires are unplanned events and may not be used to achieve resource management objectives.

Wildland Fires are any non-structure fires, other than prescribed fires, that occur in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Prescribed Fires are any fires ignited by management actions in defined areas under predetermined weather and fuel conditions to meet specific objectives.

Wildland Fire Use is the management of naturally ignited (e.g. lightning) wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in Fire Management Plans.

DO-18 identifies three paramount considerations for each park’s fire management program. They are:

- Protect human life and property both within and adjacent to park areas;
- Perpetuate, restore, replace, or replicate natural processes to the greatest extent practicable; and
- Protect natural and cultural resources and intrinsic values from unacceptable impacts attributable to fire and fire management activities

The overall objectives of the Lyndon B. Johnson National Historical Park Fire Management Plan are the following:

- Suppress all wildland fire in a cost-effective manner, consistent with resource objectives, considering firefighter and public safety (always the highest priority), and values to be protected (including adjacent non-agency land).
- Reduce hazard fuels accumulations, which in turn:
 - Reduces the threat of catastrophic wildland fire, and reduces the risk of negative impacts to park resources in the event of a wildland fire.
 - Improves conditions for firefighter and public safety, and reduces suppression costs in the event of a wildland fire.
- Manage all wildland fire incidents in accordance with accepted interagency standards, using appropriate management strategies and tactics, and maximizing efficiency via interagency coordination and cooperation.
- Maintain existing cooperative agreements with state and local agencies in order to facilitate close working relationships and mutual cooperation regarding fire management activities.
- Develop and conduct a monitoring program with recommended standard monitoring levels commensurate with the scope of the fire management program, and use the information gained to continually evaluate and improve the fire management program.
- Integrate knowledge gained through natural resource research into future fire management decisions and actions.
- Maintain the highest standards of professional and technical expertise in planning and safely implementing an effective fire management program.
- Plan and conduct all fire management activities in accordance with all applicable laws, policies and regulations.
- Incorporate the minimum impact suppression tactics policy into all suppression activities, to the greatest extent feasible and appropriate.

The park's 1999 General Management Plan Mission Goals of the park include:

- The natural environment and cultural heritage of the Texas Hill Country are protected and maintained through a regional network of private and public stewardship. Lyndon B. Johnson National Historical Park is a full partner in the research, resource preservations, and technical assistance integral to sustaining public awareness of the connection between influences of place and the programs of the Johnson administration.

- The public, provided with a variety of options for direct and indirect access, can identify and value the significance of President Johnson, and the policies and programs of his administration, in the context of his ancestry, full life span, and continuing legacy.
- Lyndon B. Johnson National Historical Park partners internally, within divisions and across division lines, and across park boundaries with other National Park Service, private, public, and governmental entities to maximize our strengths and minimize our deficiencies. Park employees have a comprehensive knowledge of and practice a strong conservation and preservation ethic.

1.5 SCOPING ISSUES AND IMPACT TOPICS

On November 26, 2003, the Superintendent of the Lyndon B. Johnson National Historical Park sent out scoping letters to everyone on the park's mailing list (841 individuals and organizations) inviting public input on the proposed Fire Management Plan. The letter invited the public to an open house and stated that comments on the proposed plan would be accepted from November 28 through December 26 via e-mail, fax, mailed letter, or over the phone. On December 11, the open house was held at the park; three people signed the attendance list and no comments were made. No comments were received during the comment period; one comment in favor of the proposed actions was received shortly after the comment period ended. Issues determined to be important were those discussed during internal scoping meetings held November 13 and 14, and were those that related to the effects of the proposed action, and those not already adequately addressed by laws, regulations, and policies. These important issues were considered in developing and evaluating the alternatives to the Proposed Action discussed in this EA.

1.5.1 *Impact Topics Considered in this EA*

Impact topics are derived from issues raised during internal and external scoping. Not every conceivable impact of a proposed action is substantive enough to warrant analysis. The following topics, however, do merit consideration in this EA:

Soils: Low and moderate-severity fires can benefit soils through a fertilization effect, while high-intensity fires can damage soils. In addition, fire management activities such as hazard fuels reduction and the digging of firelines can also damage soils; therefore, impacts to soils are analyzed in this EA.

Water Resources (including Floodplains): NPS policies require protection of water resources consistent with the Federal Clean Water Act. Thinning treatments and fire suppression efforts can adversely impact water quality (sedimentation, turbidity, chemicals); therefore, impacts to water resources are analyzed in this EA.

Vegetation: A variety of rangeland trees and shrubs and a mixture of grasses and forbs characterize vegetation of the park, along with a pecan orchard and working pastureland. Thinning, prescribed fire use and fire suppression efforts can affect vegetation communities and rare plant species; therefore, impacts to vegetation are analyzed in this EA.

Wildlife: There are resident populations of various species of reptiles, amphibians, birds, mammals, fish, and invertebrates that can be adversely and/or beneficially impacted by thinning treatments and prescribed fires; therefore, impacts to wildlife are evaluated in this EA.

Threatened and Endangered Species: The Federal Endangered Species Act prohibits harm to any species of fauna or flora listed by the U. S. Fish and Wildlife Service (USFWS) as being either threatened or endangered. Such harm includes not only direct injury or mortality, but also disrupting the habitat on which these species depend. While there are no federally listed species or habitat within the park, coordination with the USFWS revealed that the Golden-cheeked Warbler (*Dendroica chrysoparia*) and Black-capped Vireo (*Vireo atricapillus*) could utilize habitat in areas around that park. Therefore, impacts to T&E species are analyzed in this EA.

Air Quality: The Federal 1970 Clean Air Act stipulates that Federal agencies have an affirmative responsibility to protect a park's air quality from adverse air pollution impacts. All types of fires generate smoke and particulate matter, which can impact air quality within the park and surrounding region. In light of these considerations, air quality impacts are analyzed in this EA.

Visitor Use and Experience: The 1916 NPS Organic Act directs the Service to provide for public enjoyment of the scenery, wildlife and natural and historic resources of national parks "in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations." Fire management activities can result in the temporary closure of certain areas and/or result in visual impacts that may affect the visitor use and experience of the park; therefore, potential impacts of the proposed FMP on visitor use and experience are addressed in this EA.

Human Health and Safety: Wildland fires can be extremely hazardous, even life-threatening, to humans, and current federal fire management policies emphasize that firefighter and public safety is the first priority. All Fire Management Plans must reflect this commitment (NIFC, 1998); therefore, impacts to human health and safety are addressed in this EA.

Cultural Resources: Section 106 of the National Historic Preservation Act of 1966 provides the framework for Federal review and protection of cultural resources, and ensures that they are considered during Federal project planning and execution. Lyndon B. Johnson National Historical Park in its entirety is listed in the National Register of Historic Places. As per the Lyndon B. Johnson National Historical Park Cultural Landscape Inventory, there is one identified cultural landscape at the LBJ Ranch containing three component landscapes (the Texas White House, the Agricultural Complex and the Johnson Family Farm Historic Area). The park has documented 120 structures on the List of Classified Structures (LCS). While the use of fire management activities within the park are consistent with the GMP with regards to maintaining and protecting the Park's historic landscape, cultural resources can be affected by fire itself and fire suppression activities. Thus, potential impacts to cultural resources are addressed in this EA.

Park Operations: Severe fires can potentially affect operations at national parks, especially in more developed sites like visitor centers, campgrounds, administrative and maintenance

facilities. These impacts can occur directly from the threat to facilities of an approaching fire, and more indirectly from smoke and the diversion of personnel to firefighting. Fires have caused closures of facilities in parks around the country. Thus, the potential effects of the FMP alternatives on park operations will be considered in this EA.

1.5.2 Impact Topics Considered but dropped from Further Analysis

NEPA and the CEQ Regulations direct agencies to “avoid useless bulk...and concentrate effort and attention on important issues” (40 CFR 1502.15). Certain impact topics that are sometimes addressed in NEPA documents on other kinds of proposed actions or projects have been judged to not be substantively affected by any of the FMP alternatives considered in this EA. These topics are listed and briefly described below, along with the rationale for considering them, but dropping them from further analysis.

Noise: Noise is defined as unwanted sound. Fuels reduction and fire suppression efforts can all involve the use of noise-generating mechanical tools and devices with engines, such as chain saws and trucks. Chain saws, at close range, are quite loud (in excess of 100 decibels). The use of machines, such as chainsaws, would be infrequent in light of the limited thinning to be conducted on the park (on the order of hours, days, or at most weeks per year). This is not frequent enough to substantially interfere with human activities in the area or with wildlife behavior. Nor will such infrequent bursts of noise chronically impair the solitude and tranquility associated with park. Therefore, this impact topic is eliminated from further analysis in this EA.

Waste Management: None of the FMP alternatives would generate noteworthy quantities of either hazardous or solid wastes that need to be disposed of in hazardous waste or general sanitary landfills. Therefore, this impact topic is dropped from additional consideration.

Utilities: Generally speaking, some kinds of projects, especially those involving construction, may temporarily impact above and below-ground telephone, electrical, natural gas, water, and sewer lines and cables, potentially disrupting service to customers. Other proposed actions may exert a substantial, long-term demand on telephone, electrical, natural gas, water, and sewage infrastructure, sources, and service, thereby compromising existing service levels or causing a need for new facilities to be constructed. None of the FMP alternatives will cause any of these effects to any extent, and therefore utilities are eliminated from any additional analysis.

Land Use: Visitor and administrative facilities occur within the park. Fire management activities would not affect land uses within the park or in areas adjacent to it; therefore, land use is not included for further analysis in this EA.

Socio-economics: NEPA requires an analysis of impacts to the “human environment” which includes economic, social and demographic elements in the affected area. Fire management activities may bring a short-term need for additional personnel in the park, but this addition would be minimal and would not affect the neighboring community’s overall population, income and employment base. Therefore, this impact topic is not included for further analysis in this EA.

Transportation: None of the FMP alternatives would substantively affect road, railroad, water-based, or aerial transportation in and around the park. One exception to this general rule would be the temporary closure of nearby roads during fire suppression activities or from heavy smoke emanating from wildland fires. Over the long term, such closures would not significantly impinge local traffic since they would be both very infrequent, and, in the case of prescribed fire, of short duration (on the magnitude of 1-2 hours). Therefore, this topic is dismissed from any further analysis.

Environmental Justice / Protection of Children: Presidential Executive Order 12898 requires Federal agencies to identify and address disproportionate impacts of their programs, policies and activities on minority and low-income populations. Executive Order 13045 requires Federal actions and policies to identify and address disproportionately adverse risks to the health and safety of children. None of the alternatives would have disproportionate health or environmental effects on minorities or low-income populations as defined in the Environmental Protection Agency's Environmental Justice Guidance; therefore, these topics are not further addressed in this EA.

Indian Trust Resources: Indian trust assets are owned by Native Americans but held in trust by the United States. Indian trust assets do not occur in Lyndon B. Johnson National Historical Park and are not affected by this Fire Management Plan. Accordingly, they are not evaluated further in this EA.

Prime and Unique Agricultural Lands: Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that the land is available for farming uses. Fire management activities, however, would not prevent these lands from being farmed under special use permit. Therefore, this impact topic is not evaluated further in this EA.

Wilderness: According to National Park Service Management Policies (DOI, 2001b), proposals having the potential to impact wilderness resources must be evaluated in accordance with National Park Service procedures for implementing the National Environmental Policy Act. Since there are no proposed or designated wilderness areas within or adjacent to the park, wilderness impacts are not further evaluated in this EA.

Resource Conservation, including Energy, and Pollution Prevention: The National Park Service's *Guiding Principles of Sustainable Design* provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used such as resource conservation and recycling. Proposed project actions would not minimize or add to resource conservation or pollution prevention on the park; therefore, this impact topic is not evaluated further in this EA.

Table 1-1 Impact Topics for Lyndon B. Johnson National Historical Park Fire Management Plan EA

Impact Topic	Retained or Dismissed from Further Evaluation	Relevant Regulations or Policies
Soils	Retained	<i>NPS Management Policies 2001</i>
Water Resources	Retained	Clean Water Act; Executive Order 12088; <i>NPS Management Policies</i>
Floodplains and Wetlands	Retained	Executive Order 11988; Executive Order 11990; Rivers and Harbors Act; Clean Water Act; <i>NPS Management Policies</i>
Vegetation	Retained	<i>NPS Management Policies</i>
Wildlife	Retained	<i>NPS Management Policies</i>
Air Quality	Retained	Federal Clean Air Act (CAA); CAA Amendments of 1990; <i>NPS Management Policies</i>
Visitor Use and Experience	Retained	<i>NPS Management Policies</i>
Human Health & Safety	Retained	<i>NPS Management Policies</i>
Cultural Resources	Retained	Section 106; National Historic Preservation Act; 36 CFR 800; NEPA; Executive Order 13007; Director's Order #28; <i>NPS Management Policies</i>
Park Operations	Retained	<i>NPS Management Policies</i>
Noise	Dismissed	<i>NPS Management Policies</i>
Waste Management	Dismissed	<i>NPS Management Policies</i>
Utilities	Dismissed	<i>NPS Management Policies</i>
Land Use	Dismissed	<i>NPS Management Policies</i>
Socioeconomics	Dismissed	40 CFR Regulations for Implementing NEPA; <i>NPS Management Policies</i>
Threatened and Endangered Species and their Habitats	Dismissed	Endangered Species Act; <i>NPS Management Policies</i>
Transportation	Dismissed	<i>NPS Management Policies</i>
Environmental Justice	Dismissed	Executive Order 12898
Indian Trust Resources	Dismissed	Department of the Interior Secretarial Orders No. 3206 and No. 3175
Prime and Unique Agricultural Lands	Dismissed	Council on Environmental Quality 1980 memorandum on prime and unique farmlands
Wilderness	Dismissed	The Wilderness Act; Director's Order #41; <i>NPS Management Policies</i>
Resource Conservation, Including Energy, and Pollution Prevention	Dismissed	NEPA; <i>NPS Guiding Principles of Sustainable Design</i> ; <i>NPS Management Policies</i>

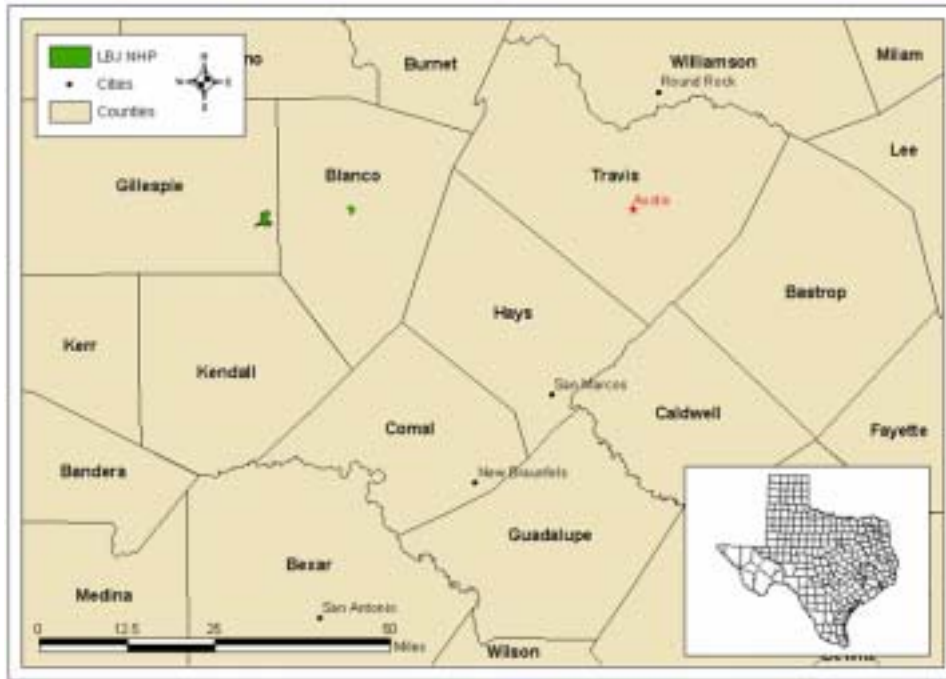


Figure 1-1 Lyndon B. Johnson National Historical Park Vicinity

Chapter 2 - Alternatives

This chapter describes the range of alternatives, including the Proposed Action and “No Action” Alternatives, formulated to address the purpose of and need for the proposed project. These alternatives were developed through evaluation of the comments provided by individuals, organizations, governmental agencies, and the Interdisciplinary Team (IDT).

2.1 ALTERNATIVES CONSIDERED BUT NOT ANALYZED FURTHER IN THIS EA

2.1.1 *Fire Management Plan to include Wildland Fire Use*

Wildland fire use involves the management of fires ignited by natural means (usually lightning) that are permitted to burn under specific environmental conditions for natural resource benefits. In many cases, national parks and forests employ wildland fire use as a part of their fire management program to obtain natural resource benefits from wildland fire. These parks and forests typically have large acreages and the areas identified for its use contain few if any private residences and structures nearby (wildland urban interface). In such cases, wildland fire use is a critical component in meeting fire management objectives of federal agencies. This alternative was considered but not analyzed further in this EA because the authorized boundary of the park (~1,500 acres) is too small to ensure fire containment within park boundaries, considering the staffing limitations at the park and the close proximity of urban development near the park. Park staff concluded that the potential risks to human health and safety and natural/cultural resources under this alternative outweigh any potential resource benefits that would be obtained from including wildland fire use in the Fire Management Plan.

2.2 ALTERNATIVES CONSIDERED AND ANALYZED IN THIS EA

2.2.1 *Fire Management Units*

For all of the alternatives considered in this EA, Lyndon B. Johnson National Historical Park will be managed using two separate fire management units (FMU): the LBJ Ranch FMU (594 acres) and the Johnson City FMU (81 acres). The LBJ Ranch FMU, which is 14 miles west of the Johnson City District, is located within the historic confines of the LBJ Ranch. The park’s primary historic resource, the Texas White House, is located there, as are the Johnson Family Cemetery, Junction School, Reconstructed Birthplace, Show Barn and numerous other historic and administrative structures. The LBJ Ranch FMU is made up predominately of managed pastureland; the entire area is either grazed

Fire Management Unit (FMU)

A FMU is any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that sets it apart from management characteristics of an adjacent unit. FMUs are delineated in Fire Management Plans (FMP). These units may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives (NPS, 1999).

or hayed which keeps the fuels relatively short. The topography is flat to slightly sloping. The vegetation consists predominately of coastal Bermuda grass, a small pasture containing native grasses and a pecan orchard. Ornamental trees and shrubs are located in formal landscaping around some structures.

The Johnson City FMU is located within the boundary of the city of Johnson City. It contains the Park Headquarters and Visitor Center, Johnson Settlement, LBJ's Boyhood Home, Exhibit Center and associated structures. The unit contains several pastures that are actively grazed, and a 12-acre prairie restoration area with native and invasive non-native grasses, riparian woodlands and the remnants of a pecan orchard. The prairie restoration is being undertaken to interpret what the area looked like prior to Euroamerican settlement. The topography is flat with roads and trails dividing the area into burn blocks.

2.2.2 Alternative 1 (No Action Alternative) - Fire Management Plan to Include Wildland Fire Suppression, Hazard Fuels Reduction Treatments, and Prescribed Fire Use.

Under this alternative, the Fire Management Plan would include the suppression of all wildland fires, allow for hazard fuels reduction, and prescribed fire use. All wildland fires in the park, including human-caused fires and naturally ignited fires, e.g. lightning fires, would be declared wildland fires and suppressed in a manner that minimizes the negative environmental impacts of suppression activities. All wildland fire suppression activities would adhere to Minimum Impact Suppression Tactics (MIST) guidelines as outlined in Section 2.3, Mitigation Measures and Monitoring.

Fuels on the Lyndon B. Johnson National Historical Park principally consist of rangeland or pasture with areas of numerous live oaks, pecan orchards and stands of Ashe juniper (cedar). Hazard fuels reduction would involve the mowing of vegetation in areas adjacent to park structures, the grazing of pastures and the occasional selective thinning of woody vegetation as well as any hazard trees using mechanical methods.

Prescribed fire would be conducted on a two to five year rotation in the prairie restoration area. Prescribed fire would be utilized on the 12-acre native prairie restoration project in the Johnson City FMU in order to mimic a more natural fire regime, and to also benefit this fire adapted ecosystem and to help combat invasive exotic plants species. On the pastureland of both FMUs, prescribed fire would be used to help remove invasive weedy plant species, promote the growth of coastal Bermuda grass and other pasture grasses, and to recycle nutrients into the soil (see Figure 2-1 and Figure 2-2).

2.2.3 Alternative 2 (Preferred Alternative) - Fire Management Plan to Include Wildland Fire Suppression, Expanded Hazard Fuels Reductions Around Park Structures and Along Park Boundaries, and Prescribed Fire Use.

Under this alternative, the LBJ Ranch and Johnson City FMUs would be reorganized into several different management compartments: Pasturelands, Developed Areas, Cedar/Oak Thicket and Prairie Restoration Area.

While wildland fire suppression and prescribed fire use would be conducted in the same manner as in the “No Action” Alternative, hazard fuels reduction would be expanded in the Developed Areas, Prairie Restoration Area and Cedar/Oak Thicket in order to protect all park structures and certain areas along the park’s boundary. Along critical portions of the park’s boundary a 12-ft wide mowed buffer will be maintained, especially during the driest times of the year and during prescribed burns, in order to help prevent the spread of wildland fire to and from adjacent non-agency land. The park would work with neighboring landowners to reduce fuels on adjacent non-federal land.

Mowed buffers around all park structures would be expanded to new park specifications. Structures will have defensible space meeting the following specifications (see also Figure 2-1 and Figure 2-2):

- Remove brush from around the structures for a distance equal to 1 1/2 times the height of the structure plus 30 feet
- Limb remaining trees within this buffer to 2 times the height of expected flame length in surface fuels (i.e. 6'), and thin or prune trees so that the widest portion of the crowns are at least 15 feet apart
- Grassy fuels adjacent to all structures will be mowed to maintain a 6-foot swath with 4-inch stubble. If wooden portions of a structure are within 9-inches of the ground, then surface fuels will be removed, to mineral soil, in a 9-inch swath.
- Fuel accumulation on roofs and gutters will be removed as needed

The Cedar/Oak Thicket Compartment lies adjacent to the Farm Equipment Storage Building. This structure contains museum collections, and has walls of metal sheeting. Structure protection for this facility would entail the creation of a defensible space by the following actions (see Figure 2-1):

- Clear all fuels to mineral soil to a distance of 3 feet around the structure
- Mow grass within 12 feet of the structure to a height of 6" or less
- Clear all juniper within 30 feet of the structure
- Limb remaining trees and juniper within this buffer plus an additional 15 feet (i.e. 45 feet from the structure) to a height of 8 feet, and thin or prune trees so that the widest portion of the crowns are at least 15 feet apart
- Limb trees and juniper to a height of 8 feet at a distance of 60 feet from the structure.

2.2.4 Alternative 3 – *Fire Management Plan to Include Wildland Fire Suppression and Expanded Hazard Fuels Reduction around Park Structures and Along Park Boundaries.*

Under this alternative wildland fire suppression and hazard fuels reduction would be conducted in the same manner as in the “Preferred” Alternative, however prescribed fire would not be utilized anywhere in the park to reduce hazard fuel loads or to combat invasive plant species. Within the Prairie Restoration Area Compartment, the area would be mowed and baled to meet management objectives, while in the Pasturelands Compartment, grazing would continue (see Figure 2-2).

2.2.5 *Environmentally Preferred Alternative*

The National Park Service is required to identify the environmentally preferred alternative(s) for any of its proposed projects. That alternative is the alternative that will promote the national environmental policy expressed in NEPA (Section 101 (b)). This includes alternatives that:

- 1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- 2) ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- 3) attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- 4) preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- 5) achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities; and
- 6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

In essence, the environmentally preferred alternative would be the one(s) 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” (DOI, 2001a).

In this case, Alternative 2 is the environmentally preferred alternative for Lyndon B. Johnson National Historical Park since it best meets goals 1, 2, 3, and 4 described above. Under this alternative, fire management activities would help restore and maintain native plant communities in the park’s native vegetation (prairie) restoration project, mimic natural ecological processes, and help protect park resources and adjacent lands from the threat of wildland fires. Finally, the preferred alternative best protects and helps preserve the historic, cultural, and natural resources in the park for current and future generations.

2.3 MITIGATION MEASURES AND MONITORING

Monitoring

Lyndon B. Johnson National Historical Park will collect information on fuel reduction efforts, vegetative resources, and other objective dependant variables after a wildland fire. During fire events, data will be collected regarding the current fire conditions, such as fuel and vegetation type, anticipated fire behavior and fire spread, current and forecasted weather, smoke volume and dispersal.

Upon implementation of a prescribed fire program, a fire-monitoring program would be established in order to measure the effectiveness of prescribed fire in accomplishing the goals set out by the Fire Management Plan. Specifically, fire monitoring in the Prairie Restoration Area Compartment would be helpful in evaluating the effects of fire on the progress of prairie restoration. Vegetative measurements such as species occurrence, species abundance, and species distribution are needed to evaluate efforts to restore native species of grasses and forbs and to eliminate non-native species of grasses and forbs. Monitoring of changes in the thickness of thatch and/or leaf litter will aid in measuring the effectiveness of prescribed fire in reducing biomass accumulation, which is essential for successful prairie restoration. In addition, the information gathered will be used as feedback to make any necessary refinements or changes to the prescribed fire objectives and prescriptions in place at the park. The monitoring program will continue to be refined as more intelligence is gathered through research regarding the role of fire in the various park vegetation communities.

This data would be gathered by establishing monitoring plots in select locations within the park. The plot design will follow the protocol from the NPS Fire Monitoring Handbook. Selection of plot locations will be random utilizing the grid method for origin point selection. Due to the small size of the monitoring area, this method will be used as an initial guide and then adjusted until a suitable site is found. Plot rejection criteria will be developed to exclude external impacts from park roads, trails, and improvements.

The fire monitoring plan would be established and implemented by the Big Thicket National Preserve Fire Effects Monitoring Crew (Big Thicket). Vegetation data would be collected on NPS Fire Monitoring Handbook-16 forms and photo documentation would be integrated into the monitoring. Analysis and electronic storage would be accomplished utilizing the NPS Fire Ecology Assessment Tool (FEAT) software. Analysis and reports would be completed by the Big Thicket Fire Ecologist and turned over to Lyndon B. Johnson National Historical Park resource management staff. All monitoring plots would be established and measured by Big Thicket. When available, Lyndon B. Johnson National Historical Park resource management staff will provide a person familiar with local vegetation to assist Big Thicket with plant identification.

Mitigation Measures

2.3.1 Appropriate Management Response

- The Appropriate Management Response will be determined by the Incident Commander, by balancing the increasing level of response with fire potential and values to be protected.
 1. Suppress with fire engines using direct attack.
 2. Suppress with a combination of direct and indirect attack utilizing engines and burn-out from existing control features
 3. Suppress with a combination of direct and indirect attack utilizing ground forces, engines, and burn-out from existing and constructed control features.
 4. Incorporate heavy equipment (tractors, dozers, graders, etc.) into the suppression effort.
 5. The use of fire line explosives is prohibited.
- *Minimum Impact Suppression Tactics (MIST):*

Mitigation measures (RM-18, chapter 9) will be used to prevent and/or mitigate adverse environmental impacts that may occur from fire management activities, and are common to all alternatives. These include:

- Keep fire engine on roads when possible; utilize ‘brush trucks’ for cross-country direct attack.
- Use existing natural fuel breaks, ‘wet lines’, or cold trailing the fire edge in lieu of handline construction whenever possible;
- Keep fire line widths as narrow as possible when they must be constructed.
- Avoid ground disturbance within known natural and archeological/cultural/historic resource locations. When fire line construction is necessary in proximity to these resource locations, it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible
- A tractor with box blade or disc may be used when high value resources are at risk. The use of heavy equipment (bulldozers/plows or graders) may be used along the boundary with the authorization of the superintendent or designee.
- When mopping-up duff or soil fires, avoid boring and hydraulic action.

2.3.2 Air and Water Resources including Floodplains

- The park will comply with the Clean Air Act, the Clean Water Act, and all other applicable federal, state, and local laws and requirements. Additionally:
 - The suppression response selected to manage a wildland fire will consider air quality standards.

- During fire suppression, water will be used in lieu of fire retardant whenever possible. If retardant must be used, a non-fugitive type will be chosen, and bodies of water avoided.
- There will be some involvement of floodplains and wetlands with the use of prescribed fire. The LBJ Ranch FMU has river bottom pastures that reside in the 100 to 500 year flood plains. Burning in these areas will be scheduled to avoid periods of heavy rainfall and flood events in an effort to avoid soil erosion and silting. This policy will also apply to Johnson City areas along Town Creek, which are located in the flood plain, and around the wetlands.

2.3.3 Property

- To the greatest extent feasible and appropriate, park infrastructure, any other development, and adjacent non-agency land will be protected during all fire management activities.

2.3.4 Human Health and Safety

- Only fully qualified (i.e. meeting NPS qualifications and accepted interagency knowledge, skills and abilities for the assigned fire job), red-carded employees will be assigned fire management duties (unless assigned as trainees, in which case they will be closely supervised by an individual fully qualified for the given position).
- No fire management operation will be initiated until all personnel involved have received a safety briefing describing known hazards and mitigating actions [Lookouts – Communications – Escape Routes – and Safety Zones (LCES)], current fire season conditions, and current and predicted fire weather and behavior. Hazards specific to the park include:
 - Snags and dead trees with weak root systems.
 - Stinging/biting insects, ticks, and poisonous snakes.
 - Dehydration, heat exhaustion and heat stroke.
- Wildland fire incident commanders will minimize firefighter exposure to heavy smoke by incorporating the recommendations outlined in the publication *Health Hazards of Smoke* (Sharkey 1997), available from the Missoula Technology and Development Center.
- Park neighbors, visitors and local residents will be notified of all planned fire management events that have the potential to impact them.
- The Park Superintendent or designee may, as a safety precaution, temporarily close all or part of the park to the visiting public.
- Smoke on roadways will be monitored and traffic control provisions taken to ensure motorist safety during fire events at the park. The following procedures will be taken to

compensate for reduced visibility when a paved road is affected by smoke (the incident commander on a particular event will determine visibility levels):

- Posting of “Smoke on Road” signs on either side of the affected area.
- Work with the local law enforcement jurisdiction to reduce the posted speed limit when visibility is significantly reduced, and to escort vehicles as necessary.
- Recommend to the local law enforcement jurisdiction to close the road to traffic when visibility is severely reduced.

2.3.5 *Cultural and Natural Resources*

- Natural and cultural resources will be protected from the adverse effects of unwanted fire as well as the adverse effects of fire management activities. During all suppression activities, the minimum impact suppression tactics policy will be incorporated to the greatest extent feasible and appropriate, employing methods least damaging to park resources for the given situation.
- The park Integrated Resources Program Managers will coordinate with Intermountain Region Cultural Resource Program to ensure that Lyndon B. Johnson National Historical Park has the most current data regarding archeological resources within its boundaries. Recommendations will be provided on how to mitigate adverse affects (including the effects of smoke) to these resources during fire management activities, and the park will coordinate compliance with Section 106 of the National Historic Preservation Act, as appropriate.
- Historic structures will be protected from wildland fire via defensible space around each (minimum of 50 feet around buildings), which may consist of nonflammable material (asphalt, concrete), or a lack of fuel resulting from non-fire fuels treatments.

2.4 IMPACT DEFINITIONS

Table 2-1 depicts the impact definitions used in this Environmental Assessment. Significant impact thresholds for the various key resources were determined in light of compliance with existing state and federal laws, and compliance with existing Lyndon B. Johnson National Historical Park planning documents.

Table 2-1 Impact Definitions

Key Resources	“Negligible” Impact	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
Soils	Soils would not be affected or the effects to soils would be below or at the lower levels of detection. Any effects to soil productivity or fertility would be slight and no long-term effects to soils would occur.	The effects to soils would be detectable, but likely short-term. Damage to or loss of the litter/humus layers that causes slight localized increases in soil loss from erosion; effects to soil productivity or fertility would be small, as would the area affected; short-term and localized compaction of soils that does not prohibit re-vegetation; If mitigation were needed to offset adverse effects, it would be relatively simple to implement and likely successful.	The effect on soil productivity or fertility would be readily apparent, long term, and result in a change to the soil character over a relatively wide area; fire severe enough to cause a noticeable change in soil community; intermittent areas of surface sterilization of soils that may cause some long term loss of soil productivity that may alter a portion of the vegetation community; short-to long-term and localized compaction of soils that may prohibit some re-vegetation; Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.	The effect on soil productivity or fertility would be readily apparent, long-term, and substantially change the character of the soils over a large area in and out of the park. Damage to or loss of the litter/ humus layers that would increase soil loss from erosion on a substantial portion of the burn area; fire severe enough to cause substantial damage to the soil community; substantial surface sterilization of soils that may cause long term loss of soil productivity and that may alter or destroy the vegetation community over most of the burned area; long-term and widespread soil compaction that affects a large number of acres and prohibits re-vegetation; Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.	<p>Short Term Recovers in less than 3 years</p> <p>Long Term Takes more than 3 years to recover</p>

Key Resources	“Negligible” Impact	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
Water Resources (Including Wetlands and Floodplains)	Neither water quality nor hydrology would be affected, or changes would be either non- detectable or if detected, would have effects that would be considered slight, local, and short- term.	Changes in water quality would be measurable, although small, likely short-term, and localized; localized and indirect riparian impacts that do not substantively increase stream temperatures or affect stream habitats; no alteration of natural hydrology of wetlands; A U.S. Army Corps of Engineers 404 permit would not be required; no filling or disconnecting of the floodplain; short-term impacts that do not affect the functionality of the floodplain No mitigation measure associated with water quality would be necessary	Changes in water quality would be measurable and long-term but would be relatively local; localized and indirect riparian impacts that may slightly increase stream temperatures or affect stream habitats; alteration of natural hydrology of wetlands would be apparent such that an U.S. Army Corps of Engineers 404 permit could be required; alteration of the floodplain apparent; Wetland or floodplain functions would not be affected in the long-term; Mitigation measures associated with water quality or hydrology would be necessary and the measures would likely succeed	Changes in water quality would be readily measurable, would have substantial consequences, and would be noticed on a regional scale; localized and indirect riparian impact that may substantively increase stream temperatures or affect stream habitats; effects to wetlands or floodplains would be observable over a relatively large area and would be long-term, and would require a U.S. Army Corps of Engineers 404 permit; filling or disconnecting of the floodplain; long-term impacts that affect the functionality of the floodplain; Mitigation measures would be necessary and their success would not be guaranteed	<p><u>Short Term</u> Recovers in less than 1 year</p> <p><u>Long Term</u> Takes more than 1 year to recover</p>
Vegetation	No native vegetation would be affected or some individual native plants could be affected as a result of the alternative, but there would be no effect on native species populations. The effects would be short- term, on a small scale, and no species of special concern would be affected.	Temporarily affect some individual native plants and would also affect a relatively small portion of that species’ population; short-term changes in plant species composition and/or structure, consistent with expected successional pathways of a given plant community from a natural disturbance event; increase in invasive non-native species in limited locations; occasional death of a canopy tree; mitigation to offset adverse effects, including special measures to avoid affecting species of special concern, could be required and would be effective	The effect on some individual native plants along with a sizeable segment of the species’ population in the long-term and over a relatively large area; long-term changes in plant species composition and/or structure, consistent with expected successional pathways of a given plant community from a natural disturbance event; widespread increase in invasive non-native species that does not jeopardize native plant communities; repeated death of a canopy tree; mitigation to offset adverse effects could be extensive, but would likely be successful; some species of special concern could also be affected	Considerable long-term effect on native plant populations, including species of special concern, and affect a relatively large area in and out of the park; violation of the Endangered Species Act of 1973; widespread increase in invasive non-native species that jeopardizes native plant communities; mitigation measures to offset the adverse effects would be required, extensive, and success of the mitigation measures would not be guaranteed	<p><u>Short Term</u> Recovers in less than 3 years</p> <p><u>Long Term</u> Takes more than 3 years to recover</p>

Key Resources	“Negligible” Impact	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
Wildlife	There would be no observable or measurable impacts to native fish and wildlife species, their habitats, or the natural processes sustaining them. Impacts would be of short duration and well within the range of natural fluctuations. No federally listed species would be affected or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected Individual or its population. Negligible effect would equate with a “no effect” determination in U.S. Fish and Wildlife Service terms.	Temporary displacement of a few localized individuals or groups of animals; mortality of individuals of species not afforded special protection by state and/or federal law; mortality of individuals that would not impact population trends; mitigation measures, if needed to offset adverse effects, would be simple and successful	Effects to wildlife would be readily detectable, long-term and localized, with consequences affecting the population level(s) of specie(s); mitigation measures, if needed to offset adverse effects, would be extensive and likely successful	Effects to wildlife would be obvious, long-term, and would have substantial consequences to wildlife populations in the region; violation of the Endangered Species Act of 1973; mortality of a number of individuals that subsequently jeopardizes the viability of the resident population; extensive mitigation measures would be needed to offset any adverse effects and their success would not be guaranteed	<p><u>Short Term</u> Recovers in less than 1 year</p> <p><u>Long Term</u> Takes more than 1 year to recover</p>
Air Quality	No changes would occur or changes in air quality would be below or at the level of detection, and if detected, would have effects that would be considered slight and short-term.	Changes in air quality would be measurable, although the changes would be small, short-term, and the effects would be localized; temporary and limited smoke exposure to sensitive resources; No air quality mitigation measures would be necessary	Changes in air quality would be measurable, would have consequences, although the effect would be relatively local; all air quality standards still met; short-term exposure to sensitive resources; Air quality mitigation measures would be necessary and the measures would likely be successful	Changes in air quality would be measurable, would have substantial consequences, and be noticed regionally; violation of state and federal air quality standards; violation of Class II air quality standards; prolonged smoke exposure to sensitive receptors; Air quality mitigation measures would be necessary and the success of the measures could not be guaranteed	<p><u>Short Term</u> Recovers in 7 days or less</p> <p><u>Long Term</u> Takes more than 7 days to recover</p>

Key Resources	“Negligible” Impact	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
Visitor Use & Experience	Visitors would be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would short-term. The visitor would not likely be aware of the effects associated with the alternative.	Temporary displacement of recreationists or closure of trails, and recreation areas during off-peak recreation use; temporary or short-term alteration of the vista, or temporary presence of equipment in localized area; smoke accumulation during off-peak recreation use; The visitor would be aware of the effects associated with the alternative, but the effects would be slight	Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes	Permanent closure of trails and recreation areas; conflict with peak recreation use; long-term change in scenic integrity of the vista; substantive smoke accumulation during peak recreation use; The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes	<u>Short Term</u> Occurs only during the treatment effect <u>Long Term</u> Occurs after the treatment effect
Human Health & Safety	Human health and safety would not be affected, or the effects would be at low levels of detection and would have an appreciable effect on human health and safety.	The effect would be detectable and short-term, but would not have an appreciable effect on public health and safety; potential for small injuries to any worker or visitor (e.g. scrapes or bruises); limited exposure to hazard compounds or smoke particulates at concentrations below health-based levels; If mitigation were needed, it would be relatively simple and likely successful	The effects would be readily apparent and long-term, and would result in substantial, noticeable effects to public health and safety on a local scale; non-life threatening injuries to any worker or visitor; limited exposure to hazard compounds or smoke particulates at concentrations at or slightly above health-based levels; Mitigation measures would probably be necessary and would likely be successful	The effects would be readily apparent and long-term, and would result in substantial noticeable effects to public health and safety on a regional scale; Serious life-threatening injuries to any worker or member of the public; limited or prolonged exposure to hazard compounds or smoke particulates at concentrations well above health-based levels; Extensive mitigation measures would be needed, and their success would not be guaranteed	<u>Short Term</u> Occurs only during the treatment effect <u>Long Term</u> Occurs after the treatment effect
Cultural Resources	Impact is at the lowest levels of detection - barely measurable with any perceptible consequences, either adverse or beneficial, to archeological resources. For purposes of 106, the determination of effect would be no adverse effect.	For archeological resources, the impact affects an archeological site(s) with modest data potential and no significant ties to a living community’s cultural identity; temporary, non-adverse effects to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties; no affect to the character defining features	For archeological resources, the impact affects an archeological site(s) with high data potential and no significant ties to a living community’s cultural identity; temporary adverse effects to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties, but would not diminish the integrity of the cultural resource to the extent that its National Register eligibility is jeopardized	For archeological resources, the impact affects an archeological site(s) with exceptional data potential or that has significant ties to a living community’s cultural identity; long-term adverse impacts to registered cultural resource sites, eligible cultural resource sites, sites with an undetermined eligibility, and traditional cultural properties that would diminish the integrity of the cultural resource to the extent that its National Register eligibility is jeopardized	<u>Short term</u> Treatment effects on the natural elements of a cultural landscape (e.g., 3 to 5 years until new vegetation returns) <u>Long term</u> Because most

Key Resources	“Negligible” Impact	“Minor” Impact	“Moderate” Impact	“Major” Impact	Duration
		of a National Register of Historic Places eligible or listed structure, district, or cultural landscape			cultural resources are non-renewable, any effects would be long term
Park Operations	Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.	The effect would be detectable and likely short-term, but would be of a magnitude that would not have an appreciable effect on park operations; short-term suspension of non-critical park operations; negligible impact to park buildings and structures. If mitigation were needed to offset adverse effects, it would be relatively simple and likely successful.	The effects would be readily apparent, be long-term, and would result in a substantial change in park operations in a manner noticeable to staff and the public; long term suspension of all park operations (1 to 2 days); detectable adverse impacts to park buildings and structures; mitigation measures would probably be necessary to offset adverse effects and would likely be successful	The effects would be readily apparent, long-term, would result in a substantial change in park operations in a manner noticeable to staff and the public and be markedly different from existing operations; prolonged suspension of all park operations; substantial adverse impacts to park buildings and structures; mitigation measures to offset adverse effects would be needed, would be extensive, and their success could not be guaranteed.	Short term- Effects lasting for the duration of the treatment action Long term- Effects lasting longer than the duration of the treatment action.

2.5 COMPARISON OF ALTERNATIVES

The following tables summarize the environmental effects of the various alternatives. Table 2-2 compares the alternatives in terms of the objectives of the Fire Management Plan. Table 2-3 compares the fire management treatments under each alternative. Table 2-4 provides a comparison of alternatives' impacts on resources. Chapter 3 discusses the environmental consequences of the alternatives in detail.

Table 2-2 Comparison of Alternatives by Stated Objectives of Fire Management Plan

	Alternative 1. No Action Alternative	Alternative 2. (Preferred Alternative) Suppress Wildland Fires, Prescribed Fire, Manual/Mechanical Thinning, and Hazard Fuels Reduction	Alternative 3. Suppress Wildland Fires, Manual/Mechanical Thinning, and Hazard Fuels Reduction
Objectives			
Suppress all wildland fire in a cost-effective manner consistent with resource objectives	Yes, wildland fire suppressed cost-effectively consistent with resource objectives	Yes, wildland fire suppressed cost-effectively consistent with resource objectives	Yes, wildland fire suppressed cost-effectively consistent with resource objectives
Use non-fire applications to reduce hazard fuels accumulations	Yes, hazard fuels reduced by non-fire applications	Yes, hazard fuels reduced by non-fire applications to a greater extent than under Alternative 1	Yes, hazard fuels reduced by non-fire applications to a greater extent than under Alternative 1
Manage all wildland fire incidents in accordance with accepted interagency standards, using appropriate management strategies and tactics, and maximizing efficiency via interagency coordination and cooperation	Yes, wildland fire incidents managed using accepted interagency standards and appropriate management strategies and tactics; efficiency maximized via interagency coordination and cooperation	Yes, wildland fire incidents managed using accepted interagency standards and appropriate management strategies and tactics; efficiency maximized via interagency coordination and cooperation	Yes, wildland fire incidents managed using accepted interagency standards and appropriate management strategies and tactics; efficiency maximized via interagency coordination and cooperation
Maintain existing cooperative agreements with state and local agencies	Yes, existing cooperative agreements maintained	Yes, existing cooperative agreements maintained	Yes, existing cooperative agreements maintained
Develop and conduct a monitoring program and use the information to continually evaluate and improve the fire management program	Yes, monitoring program used to continually evaluate and improve the fire management program	Yes, monitoring program used to continually evaluate and improve the fire management program	Yes, monitoring program used to continually evaluate and improve the fire management program
Integrate knowledge gained through natural resource research into future fire management decision and actions	Yes, knowledge gained through natural resource research integrated into future fire management decision and actions	Yes, knowledge gained through natural resource research integrated into future fire management decision and actions	Yes, knowledge gained through natural resource research integrated into future fire management decision and actions

Maintain the highest standards of professional and technical expertise in planning and safely implementing an effective fire management program	Yes, highest standards of professional and technical expertise in planning and safely implementing an effective fire management program maintained	Yes, highest standards of professional and technical expertise in planning and safely implementing an effective fire management program maintained	Yes, highest standards of professional and technical expertise in planning and safely implementing an effective fire management program maintained
Plan and conduct all fire management activities in accordance with all applicable laws, policies and regulations	Yes, all fire management activities planned and conducted in accordance with all applicable laws, policies and regulations	Yes, all fire management activities planned and conducted in accordance with all applicable laws, policies and regulations	Yes, all fire management activities planned and conducted in accordance with all applicable laws, policies and regulations
Incorporate the minimum impact suppression tactics policy into all suppression activities, policies and regulations.	Yes, minimum impact suppression tactics policy incorporated into all suppression activities, policies and regulations	Yes, minimum impact suppression tactics policy incorporated into all suppression activities, policies and regulations	Yes, minimum impact suppression tactics policy incorporated into all suppression activities, policies and regulations

Table 2-3 Fire Management Treatments By Alternative

	Suppress Wildland Fire	Prescribed Fire	Manual/Mechanical Thinning	Hazard Fuels Reduction	Wildland Fire Use
Alternatives					
Alternative 1 No Action Alternative	Yes, wildland fires suppressed using Minimum Impact Suppression Tactics	Yes, prescribed fire used for resource benefits and hazardous fuels reduction	Yes, manual/mechanical thinning used for resource benefits and hazardous fuels reduction	Yes, hazard fuels reduction achieved and maintained over time.	Not used
Alternative 2 (Preferred Alternative) Suppress Wildland Fires, Prescribed Fire, Manual/Mechanical Thinning, and Hazard Fuels Reduction	Yes, wildland fires suppressed using Minimum Impact Suppression Tactics	Yes, prescribed fire used for resource benefits and hazardous fuels reduction	Yes, more use of manual/mechanical thinning for resource benefits and hazardous fuels reduction than under Alternative 1	Yes, greater reduction of hazard fuels than under Alternative 1	Not used
Alternative 3 - Suppress Wildland Fires, Manual/Mechanical Thinning, and Hazard Fuels Reduction	Yes, wildland fires suppressed using Minimum Impact Suppression Tactics	Not used	Yes, more use of manual/mechanical thinning for resource benefits and hazardous fuels reduction than under Alternative 1	Yes, greater reduction of hazard fuels than under Alternative 1	Not used

Table 2-4 Comparison of Alternatives' Impacts on Resources

	Alternative 1 No Action Alternative	Alternative 2 (Preferred Alternative) Suppress Wildland Fires, Prescribed Fire, Manual/Mechanical Thinning, and Hazard Fuels Reduction	Alternative 3 - Suppress Wildland Fires, Manual/Mechanical Thinning, and Hazard Fuels Reduction
Impact Topics			
Geology and Soils	Minor short-term soil erosion impacts resulting from prescribed fire and thinning activities; benefits to soil development and soil nutrification	Minor short-term soil erosion impacts resulting from prescribed fire and thinning activities; benefits to soil development and soil nutrification	Very minor short-term soil erosion and compaction impacts resulting from thinning activities; benefits to soil development from prescribed fire use not realized
Water Resources	Very minor, short-term water resources impacts	Very minor, short-term water resources impacts	Very minor, short-term water resources impacts
Vegetation	Plant habitat and diversity improved with prescribed fire use (native grasses and forbs favored but prescribed fire use may increase or reduce invasive non-native species depending on fire seasonality, duration and other factors); weedy species reduced in pastures; fuel loadings reduced; fire management activities resulting in ground disturbance could result in the spread of invasive non-native species;	Plant habitat and diversity improved with prescribed fire use (native grasses and forbs favored but prescribed fire use may increase or reduce invasive non-native species depending on fire seasonality, duration and other factors); weedy species reduced in pastures; fuel loadings reduced; fire management activities resulting in ground disturbance could result in the spread of invasive non-native species;	Vegetative benefits resulting from historic fire regime not realized; fire management activities resulting in ground disturbance could result in the spread of invasive non-native species.

Table 2-4 Comparison of Alternatives' Impacts on Resources

	Alternative 1 No Action Alternative	Alternative 2 (Preferred Alternative) Suppress Wildland Fires, Prescribed Fire, Manual/Mechanical Thinning, and Hazard Fuels Reduction	Alternative 3 - Suppress Wildland Fires, Manual/Mechanical Thinning, and Hazard Fuels Reduction
Wildlife	Prescribed fire and thinning activities would temporarily displace some wildlife species; individual mortality within some species likely; overall wildlife habitat quality improved in the long-term with restoration of historic fire regime	Prescribed fire and thinning activities would temporarily displace some wildlife species; individual mortality within some species likely; overall wildlife habitat quality improved in the long-term with restoration of historic fire regime; not likely to adversely affect T&E or sensitive species	Benefits to wildlife habitat resulting from historic fire regime not realized
Air Quality	Minor and temporary effects on air quality and visibility resulting from prescribed fire; minor smoke impacts on sensitive receptors	Minor and temporary effects on air quality and visibility resulting from prescribed fire; minor smoke impacts on sensitive receptors	No air quality impacts
Visitor Use and Experience (including Park Operations)	Minor and short-term impacts during thinning, suppression and prescribed fire activities (e.g. trail or road closures, presence of work crews in the vista); no effect on park operations; long-term effect will be beneficial in that it will allow visitors to experience a more historically-accurate landscape (native prairie restoration)	Minor and short-term impacts during thinning, suppression and prescribed fire activities (e.g. trail or road closures, presence of work crews in the vista); no effect on park operations; long-term effect will be beneficial in that it will allow visitors to experience a more historically-accurate landscape (native prairie restoration)	Minor and short-term impacts during thinning and suppression activities (e.g. trail closures or limited access to certain areas, presence of work crews in the vista); potential for impacts on park operations in the event of high-severity fire; long-term adverse impact from denying visitors opportunity to experience and view more historically-accurate landscape
Human Health & Safety	Human health and safety improved by reducing fire danger to the park; potential for injury from thinning activities; very minor exposure to smoke by workers and the public during prescribed fire	Human health and safety improved by reducing fire danger to the park and adjacent communities; potential for injury from thinning activities; very minor exposure to smoke by workers and the public during prescribed fire	Human health and safety improved marginally with reduction of hazard fuels via thinning alone
Cultural Resources	No impact or minor impact to known cultural resources likely; small potential for impacts to un-recorded sites; beneficial effects on cultural / historic landscape	No impact or minor impact to known cultural resources likely; small potential for impacts to un-recorded sites; beneficial effects on cultural / historic landscape	No impact or minor impact to known cultural resources; potential for impacts to un-recorded sites; long-term adverse effect on cultural / historic landscape

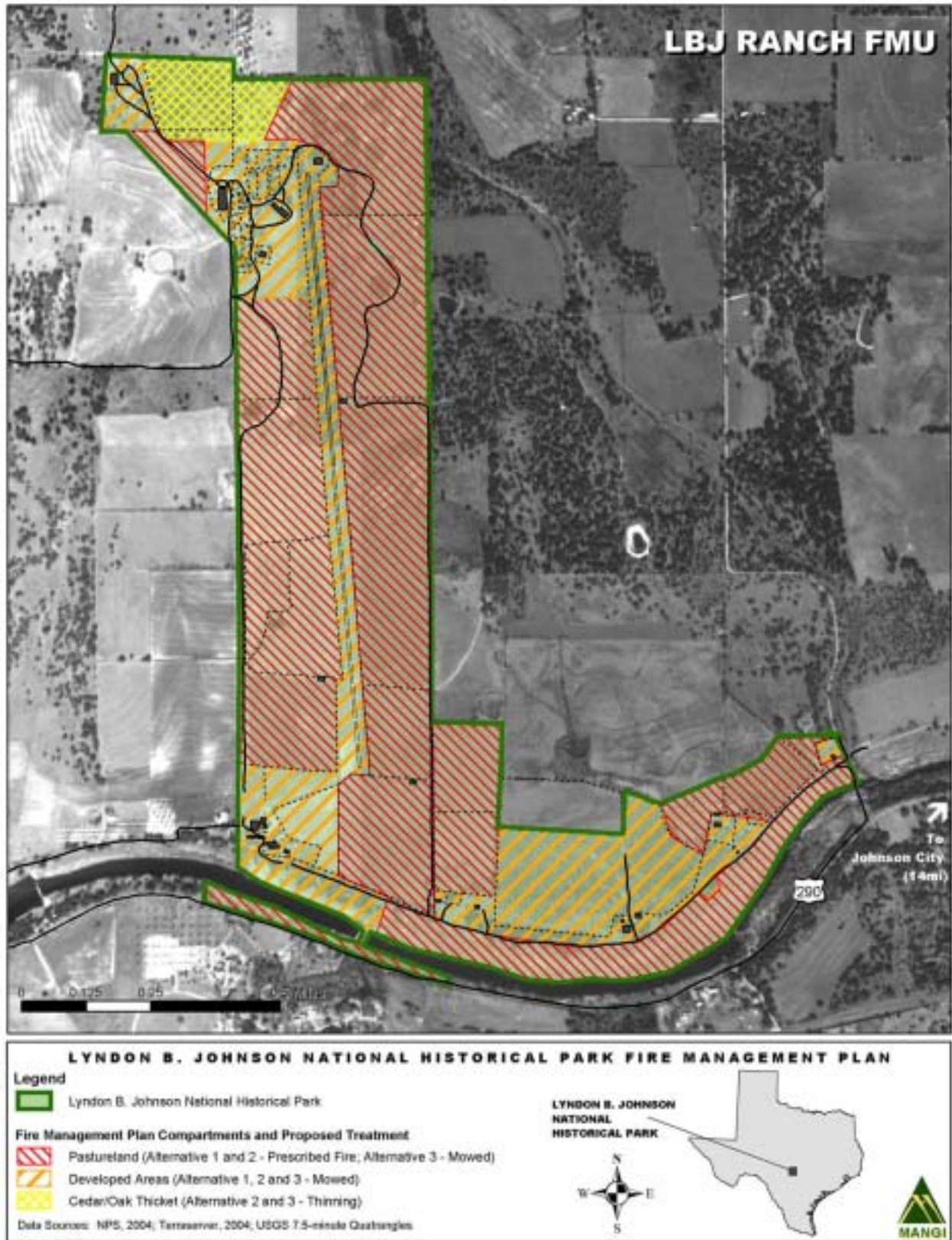


Figure 2-1 LBJ Ranch FMU - Alternatives 1,2 (Preferred), and 3



Figure 2-2 Johnson City FMU - Alternatives 1,2 (Preferred), and 3

Chapter 3 – Environmental Analysis

This chapter summarizes the existing environmental conditions and the probable environmental consequences (effects) of implementing the action and No Action alternatives. This chapter also provides the scientific and analytical basis for comparing the alternatives. The probable environmental effects are quantified where possible; where not possible, qualitative descriptions are provided.

The cumulative effects analysis for the Fire Management Plan environmental assessment considers the past, present, and reasonably foreseeable future actions on land uses that could add to (intensify) or offset (compensate for) the effects on the resources that may be also be affected by the Fire Management Plan alternatives. Cumulative effects vary by resource; the geographic areas considered are the park, and areas adjacent to the park. In some instances, activities may result in both negative and positive impacts when considering the short and long-terms. As a result, some resource categories in Table 3-3 show both positive and negative impacts resulting from a particular activity. The information provided in Table 3-3 is the basis for the cumulative effects described in Table 3-4.

3.1 SOILS

3.1.1 *Affected Environment*

The topography of the park and surrounding area consists of low rolling hills with occasional rock outcroppings. Soils of the Johnson City district area are shallow and underlain by limestone and marl, characterized as loamy, clayey, stony soils of the Brackett-Purves-Doss Association, on undulating and hilly uplands. These soils characteristics are moderately slow permeability, limitations on depth to rock, and shrink and swell potential with moisture. The soils of the LBJ Ranch district are sandy to loamy, gently sloping soils of the Luckenbach- Pedernales-Heatly Association on uplands and terraces. In general, these soils are moderately well drained, permeability is moderately slow, and runoff is moderate.

3.1.2 *Environmental Consequences*

Soil impacts were qualitatively assessed using professional judgment based on investigations of soil characteristics and information from the Park's 1999 General Management Plan.

3.1.2.1 Alternative 1 – No Action

Proposed activities with the potential to impact soils include building fire lines, thinning, and prescribed fire.

Minor and localized soil compaction would occur from thinning activities, and vehicle use would be restricted to existing roads. In the Johnson City FMU, soils in the pastures become extremely soft during times of rain and prone to rutting. This damage would be minimized by mowing only

during the drier parts of the year when the soil was less wet and more firm, and able to handle the weight of the mowers.

During suppression efforts, fire line construction would result in soil disturbance and could lead to increased erosion. However, due to the relatively flat topography erosion would be minor. In addition, fire lines would only have to be constructed in extreme situations, since currently; there are adequate roads and trails throughout the park that act as natural firebreaks. If fire lines were dug, they would be re-contoured and possibly seeded (with native plant species) after the suppression activities had taken place in order to minimize any damage that may have been done.

The use of prescribed fire would release nutrients into the soil and the fertilization effects of ash would provide an important source of nutrients for vegetation in the area. In addition to recycling nutrients back into the soils, raising pH, and increasing minerals and salt concentrations in the soil, the ash and charcoal residue resulting from incomplete combustion aids in soil buildup and soil enrichment by being added as organic matter to the soil profile. The added material works in combination with dead and dying root systems to make the soil more porous, better able to retain water, and less compact while increasing needed sites and surface areas for essential microorganisms, mycorrhizae, and roots (Vogl, 1979; Wright and Bailey, 1980).

With prescribed fire use, there is the possibility of increased wind soil erosion resulting from a loss of some vegetative cover. Problems with erosion would only result in minor, localized, and temporary impacts. In addition, impacts following a prescribed fire would be reduced and/or eliminated during the “green-up” as new herbaceous cover developed.

If a prescribed fire exceeded a burn prescription and burned “hot”, resulting in areas of high-burn severity, the organic layer of the soil could be consumed and soil layers could become water repellent. Fire management personnel would contain and/or suppress out-of-prescription fires, minimizing the potential for, and effects of, any high-burn severity prescribed fires.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 to affect park soils include:

- Past land acquisition protects soils within the park from development;
- Minor adverse soil impacts (soil erosion or loss) from past wildland fire suppression;
- On-going use of cattle on pastureland benefits soil by adding nutrients, but may also cause minor soil impacts (compaction, disturbance);
- Future removal of pecan trees would have minor negative impacts on soil;
- Complete archeological survey would result in temporary minor soil impacts throughout the park

The impacts of the above actions, in combination with the impacts of Alternative 1, would result in minor short-term adverse cumulative disturbance to soils. These effects would be distributed throughout the park, rather than being concentrated in one area or at one time, minimizing the

adverse cumulative effect. There would also be minor long-term cumulative benefits to park soils.

Conclusion

Alternative 1 would provide minor short-term benefits to the soils of the Prairie Restoration and Pasture Compartments through prescribed fire use. However, Alternative 1 would also result in some minor, temporary soil disturbance as a result of fire management activities.

Alternative 1 would not produce any major adverse impacts or impairment of soil resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.1.2.2 Alternative 2 – (Preferred Alternative)

Proposed activities with the potential to affect soils include building fire lines, thinning, and hazard fuels reduction activities.

General soil impacts, with regards to fire suppression and manual/mechanical thinning activities, would be similar to those described under the “No Action” Alternative.

Cumulative Impacts

Past, present, and future actions that could combine with the Proposed Action to affect park soils include:

- Past land acquisition protects soils within the park from development;
- Minor adverse soil impacts (soil erosion or loss) from past wildland fire suppression;
- On-going use of cattle on pastureland benefits soil by adding nutrients, but may also cause minor soil impacts (compaction, disturbance);
- Future removal of pecan trees would have minor negative impacts on soil;
- Complete archeological survey would result in temporary minor soil impacts throughout the park

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in minor short-term adverse cumulative disturbance to soils. These effects would be distributed throughout the park, rather than being concentrated in one area or at one time, minimizing the adverse cumulative effect. There would also be minor long-term cumulative benefits to park soils.

Conclusion

Alternative 2 (Preferred Alternative) would provide minor short-term benefits to the soils of the Prairie Restoration and Pasture Compartments through prescribed fire use. However, Alternative 2

would also result in some minor, temporary soil disturbance as a result of fire management activities.

Alternative 2 would not produce any major adverse impacts or impairment of soil resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.1.2.3 Alternative 3

Proposed activities with the potential to impact soils include wildland fire suppression activities, expanded mechanical thinning, and hazard fuels reduction.

The effects of wildland fire suppression activities, thinning, and hazard fuels reduction would be similar to those described under the “No Action” Alternative. However, those impacts would be felt over the entire area of the Prairie Restoration Area, as that area would be mowed and baled to meet management objective under this alternative. Strict attention to ground moisture is critical in this area to minimize the damage caused by the mowers. The Pasturelands would continue to be grazed. , In both the Prairie Restoration Area and the Pasturelands, the overall soil benefits resulting from prescribed fire use would not be realized.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 3 to affect park soils include:

- Past land acquisition protects soils within the park from development;
- Minor adverse soil impacts (soil erosion or loss) from past wildland fire suppression;
- On-going use of cattle on pastureland benefits soil by adding nutrients, but may also cause minor soil impacts (compaction, disturbance);
- Future removal of pecan trees would have minor negative impacts on soil;
- Complete archeological survey would result in temporary minor soil impacts throughout the park

The impacts of the above actions, in combination with the impacts of Alternative 3, would result in minor short-term adverse cumulative disturbance to soils. These effects would be distributed throughout the park, rather than being concentrated in one area or at one time, minimizing the adverse cumulative effect. Alternative 3 would not contribute to beneficial impacts from prescribed fire.

Conclusion

Alternative 3 would result in some very minor, temporary soil disturbance as a result of fire management activities.

Alternative 3 would not produce any major adverse impacts or impairment of soil resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.2 WATER RESOURCES (INCLUDING FLOODPLAINS)

3.2.1 *Affected Environment*

There are several surface water resources within the Lyndon B. Johnson National Historical Park, primarily in the LBJ Ranch District. These include the Pedernales River and several prominent impoundments (Jordan and Johnson dams). The Pedernales River watershed drains approximately 1,300 square miles. Numerous other surface waters in the LBJ Ranch District consist of earthen dams and ponds.

The water quality of the Pedernales River can be characterized as very good and supportive of all designated beneficial uses. Current concentrations of all major water quality constituents are generally below levels that would be cause for concern or result in the listing of this river segment as impaired. In addition, this data set indicates that the concentrations of the analyzed constituents at each monitoring site are relatively constant or improving (Barrett, 1998).

Surface water resources at the Johnson City district include Town Creek, a small pond, and a small spring-fed seep. Town Creek is an intermittent stream, which flows directly through the settlement areas of the district. The Johnson Pond is spring-fed and located in the Johnson Settlement, as is the small seep. Several other parental streams lie within this district.

Due to the local topography and hydrology of the Pedernales River, large portions of lands within both districts of the national historic park partially lie within the 100-year and 500-year floodplains.

3.2.2 *Environmental Consequences*

Water resource impacts were qualitatively assessed using professional judgment based on investigations of water resources, literature reviews, and information from the Park's 1999 General Management Plan.

3.2.2.1 Alternative 1 – No Action

Proposed activities with the potential to impact the water resources of the park include wildland fire suppression activities, thinning, and prescribed fire.

This alternative is unlikely to lead to any substantial change in the flow of streams draining the park; that is, it would not result in large pulses of water delivered to these streams during storm events from somewhat greater runoff on burned or disturbed ground surfaces.

The two principal impacts to water quality stem from: 1) erosion-induced suspended sediments, turbidity, and sedimentation, and 2) toxic effects from fire retardants and foam suppressants. In addition, intense fires may introduce large quantities of organic material (ash) into aquatic systems, blown in by wind or transported by runoff. The hazard fuels reduction and prescribed fire associated with this alternative should largely avoid large, intense fires.

Increased soil erosion could result from loss of vegetative cover during either a wildland or prescribed fire as well as from ground crew activities engaged in suppression activities. This could lead to turbidity and sedimentation of surface water resources in the park. Turbidity and sedimentation can alter the hydrologic regime of surface waters and adversely affect aquatic habitats, invertebrates and fish. The potential for an increase in turbidity and sediment delivery in the Pedernales River and other small streams within the park as a result of soil erosion following suppression activities exists; however, as described under Section 3.1.2.1, the degree of soil erosion would be minor and localized. Adherence to Minimum Impact Suppression Tactics would also reduce water quality problems from suppression efforts.

The use of fire retardants or foams could potentially cause short and long-term impacts to water resources if misapplied or mishandled. Retardants contain ammonia and phosphate or sulfate ions, which can change the chemistry of a water body, thus making it lethal to fish and other aquatic organisms. Foams contain detergents that can interfere with the ability of fish gills to absorb oxygen. The degree of impact would depend on the volume of retardant/foam dropped into the water body, the size of the water body, and the volume of flow in the stream or river. For example, if an 800-gallon drop is made into a fast flowing river, it is likely that the lethal effects to aquatic resources will be short-lived as dilution below the toxic level is quickly achieved. On the other hand, a 3,000-gallon drop in a stagnant pond would likely cause toxic levels to persist for some time (USDA, 2001). However, since mitigation measures limit the use, type, and proximity to water bodies of fire retardants, impacts to water quality will be minimal.

Manual and mechanical thinning and suppression activities would not affect the overall water quality of the rivers and streams associated with Lyndon B. Johnson National Historical Park. Thinning, suppression activities, and prescribed fire use would not affect the classified uses of the Pedernales River and would not jeopardize its current classification as “fully supporting.” Moreover, these activities would not involve the filling or disconnection of any floodplain, and would not affect its functionality.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 to affect water resources include:

- Commercial/residential development adjacent to the park would adversely impact water resources (turbidity, sediment delivery, pollution, water consumption);
- Past and future wildland fire suppression activities would have minor indirect impacts (turbidity and sediment delivery from soil erosion);
- Past, present, and future cattle use on pastureland could result in nonpoint source pollution in the form of fecal matter to the watershed.

The impacts of the above actions, in combination with the impacts of Alternative 1, would result in minor, short-term adverse cumulative impacts to water quality.

Conclusion

Alternative 1 would result in very minor, temporary impacts to water quality as a result of fire management activities.

Alternative 1 would not produce any major adverse impacts or impairment of water resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.2.2.2 Alternative 2 (Preferred Alternative)

General water resources impacts under Alternative 2 would be similar to those described under the “No Action” Alternative. Additional hazard fuels reduction would have no immediate impact on water resources in the park due to the locality of the hazard fuels reduction treatment areas, and mitigation measures aimed at minimizing impacts.

Cumulative Impacts

Past, present, and future actions that could combine with the Alternative 2 (Proposed Action) to affect water resources include:

- Commercial/residential development adjacent to the park would adversely impact water resources (turbidity, sediment delivery, pollution, water consumption);
- Past and future wildland fire suppression activities would have minor indirect impacts (turbidity and sediment delivery from soil erosion);
- Past, present, and future cattle use on pastureland could result in nonpoint source pollution in the form of fecal matter to the watershed.

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in minor, short-term adverse cumulative impacts to water quality.

Conclusion

Alternative 2 would result in very minor, temporary impacts to water quality as a result of fire management activities.

Alternative 2 would not produce any major adverse impacts or impairment of water resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.2.2.3 Alternative 3

Proposed activities with the potential to impact soils include wildland fire suppression activities, expanded mechanical thinning, and hazard fuels reduction.

General water resource impacts resulting from suppression and hazard fuels reduction activities would be similar to those described in the “No Action” Alternative. Since prescribed fire would not be utilized, there would be less of a potential to affect water quality from loss of vegetative cover and subsequent erosion, runoff, and turbidity.

Cumulative Impacts

Past, present, and future actions that could combine with the Proposed Action or alternatives to affect water resources include:

- Commercial/residential development adjacent to the park would adversely impact water resources (turbidity, sediment delivery, pollution, water consumption);
- Past and future wildland fire suppression activities would have minor indirect impacts (turbidity and sediment delivery from soil erosion);
- Past, present, and future cattle use on pastureland could result in nonpoint source pollution in the form of fecal matter to the watershed.

The impacts of the above actions, in combination with the impacts of Alternative 3, would result in very minor, short-term cumulative impacts to water quality.

Conclusion

Alternative 3 would result in very minor, temporary impacts to water quality as a result of fire management activities.

Alternative 3 would not produce any major adverse impacts or impairment of water resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.3 VEGETATION

3.3.1 *Affected Environment*

A variety of trees and shrubs and a mixture of grasses and forbs characterize vegetation of the park. The vegetation consists predominately of coastal Bermuda grass (*Cynodon dactylon*) within the LBJ Ranch FMU pastures, and native grasses within the 12-acre native prairie restoration in the Johnson City FMU. Common rangeland vegetation is Ashe juniper, agarita (*Berberis trifoliolata*), persimmon, (*Prosopis glandulosa*), and whitebrush (*Aloysia gratissima*). Native tree species on the site include hackberry (*Celtis occidentalis*), live oak (*Quercus virginiana*), mesquite (*Prosopis glandulosa*), cedar elm (*Ulmus crassifolia*), Ashe juniper

(*Juniperus ashei*), black willow (*Salix nigra*), and bald cypress (*Taxodium distichum*). There is a pecan orchard located in the LBJ Ranch FMU north of the Pedernales River and east of the Texas White House, and the remnants of a pecan orchard in the Johnson City FMU. Pecans (*Carya illinoensis*) are native to the area and were present near Hill Country streams and rivers during the 19th century. The existing pecan orchard at the LBJ Ranch was established using varietals during the 1940s and 1950s; it is being maintained as part of the cultural landscape. The scattered pecans in the Johnson Settlement are being gradually as part of the ongoing prairie restoration project.

Several invasive non-native species were identified in the Johnson Settlement, including Johnson grass (*Sorghum halapense*) King Ranch bluestem (*Bothriochloa ischaemum* var. *songarica*) and tall fescue (*Festuca arundinacea*), and Chinese tallow (*Sapium sebiferum*) which is a particularly invasive and persistent species.

Table 3-1 Common Invasive and Exotic Plant Species at the Lyndon B. Johnson National Historical Park

Common Name	Scientific Name	Habitat
King Ranch bluestem	<i>Bothriochloa ischaemum</i> var. <i>songarica</i>	It is adapted to a wide range of soils from well- drained good sandy soils to loam and clay loam soils, but not to deep sands. It prefers limestone soils, dry stony places, borders of fields and slopes (FAO, 2003).
Tall fescue	<i>Festuca arundinacea</i>	It occurs in grazed woods, along roads, ditches, and railroad tracks, in fallow and abandoned fields, meadows, and marshes. It is a weed of cultivated areas and is found in moist, disturbed places (USDA, 2002b).
Chinese tallow	<i>Sapium sebiferum</i>	Variety of disturbed sites and a wide range of soil conditions (alkaline, saline, or acid soils). It does best in alluvial forests, on low alluvial plains, and on rich leaf-molds, preferring well-drained clay-peat soils (IFAS, 2003).
Johnson Grass	<i>Sorghum halepense</i>	Johnson grass occurs in all major agricultural areas in the world
Musk Thistle	<i>Carduus nutans</i>	Musk thistle can be found on all types of land except deserts, dense forests, high mountains, coastal areas, and newly cultivated fields. Musk thistle is most often described as occurring on disturbed sites and waste areas, and along roads (USDA, 2002b).

3.3.2 Environmental Consequences

Vegetation impacts were qualitatively assessed using professional judgment based on the presence/absence of plant species, literature reviews, and by determining the number of acres impacted.

3.3.2.1 Alternative 1 – No Action

Proposed activities with the potential to affect vegetation include wildland fire suppression activities, hazard fuels reduction, and prescribed fire.

Thinning and any fire suppression activities that resulted in soil disturbance (fire lines) would make those disturbed areas more susceptible to invasive plant infestations, such as Chinese tallow and tall fescue. Disturbed areas may be seeded with native grasses and would be monitored to guard against such infestations. Coupled with mitigation measures aimed at reducing soil damage,

manual/mechanical-thinning activities would also help reduce the extent of existing invasive non-native infestations in the park. Through the removal of this vegetation in these areas, a competitive advantage would be given to native species.

Prescribed fire use under this alternative would benefit native fire-adapted and fire-dependant plant species found in the Prairie Restoration Area Compartment and encourage new growth by rejuvenating the soil with nutrients, and reducing dense undergrowth and matting of grasses (Hunter, 1990). Prescribed fire use would similarly encourage new growth in the Pasturelands Compartment and would reduce the occurrence of weedy species from the pastures, where Coastal Bermuda grass is the desired forage plant.

While fire may help control some invasive non-native plant species, many are disturbance-adapted and fire increases their vigor and encourages their spread. The species listed below can re-sprout vigorously from rhizomes, root crowns after fires, or colonize burned areas through prolific seed production (USDA, 2002b). Table 3-2 summarizes the fire effects on several of the more pernicious invasive plants found in the park.

Table 3-2 Effects of Fire on Invasive and Exotic Plants Common to Lyndon B. Johnson National Historical Park

Common Name	Fire Effects
King Ranch bluestem	Burning positively affected King ranch bluestem on sites previously seeded with King ranch bluestem, however those sites not previously seeded, King ranch bluestem was negatively affected (Windhager, 1999).
Tall fescue	Tall fescue probably sprouts from short rhizomes after above ground portions are burned. Tufts formed by the leaves may protect basal buds from fire damage. Burning during the plant's dormant seasons (late fall and winter) produced yields similar to those on unburned plots. Burning during active growth produced lower yields than burning on dormant plots (spring). Tall fescue seedstalk numbers are stimulated by mid-summer fire (USDA, 2002b).
Chinese Tallow	Tallow does not burn easily and, because they shade out native grasses that do burn, tallow stands act as natural fire suppressants (USGS, 2000).
Johnson Grass	Johnson grass survives fire by sprouting from deep rhizomes and is positively affected by fire (USDA, 2002b).
Musk thistle	Fire creates conditions that are favorable to the establishment of musk thistle (i.e. open canopy, reduced competition, areas of bare soil), so if musk thistle seeds are present and competition minimal, musk thistle may be favored in the postfire community. Response of musk thistle to fire appears to be primarily related to the abundance of competitors and their response to fire. It is unclear what effects fire has on musk thistle seeds in the soil, although incidents of rapid colonization after fire suggest that musk thistle seeds may have been present in the soil at the time of the fire and survived to germinate after the overstory was removed (USDA, 2002b).

Because these invasive non-native species are found in treatment units where prescribed fire is intended to maintain natural vegetation (e.g. the Prairie Restoration Area), the park will need to employ other treatments, such as additional manual/mechanical removal and/or reseedling with a weed-free seed mix after prescribed fire use in order to ensure that the growth of these invasive non-native plants would not be promoted under a prescribed fire regime. Prescribed fire use would only be one management tool to be employed in the restoration of native prairie and the management of invasive non-native species in these areas. A more comprehensive prairie restoration plan that included a full suite of management strategies is under development and will receive separate environmental analysis. An integrated pest management plan for the management of weedy species in park pastures already exists.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 to affect vegetation resources include:

- Past land acquisition preserves vegetation communities;
- Future removal of pecan trees as part of prairie restoration will help restore native vegetation.
- Past and future wildland fire suppression activities may have disturbed soils and made them susceptible to invasive non-native species;
- Past, current, and future development adjacent to the park alters native vegetation communities;
- Past conversion of native prairie to pastureland detrimental to native vegetation;

The impacts of the above actions, in combination with the impacts of Alternative 1, would result in moderate long-term beneficial cumulative impacts to vegetation through the return of a natural fire regime. However, there would also be the potential for past fire suppression and prairie conversion, in combination with ground-disturbing activities under Alternative 1, to result in long-term but minor adverse cumulative impacts to vegetation due to the spread of invasive species.

Conclusion

Alternative 1 would result in minor to moderate long-term vegetative benefits to the Prairie Restoration and Pasture Compartments found within the park. Alternative 1 could also result in minor long-term adverse impacts to vegetation from invasive species.

Alternative 1 would not produce any major adverse impacts or impairment of vegetation resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.3.2.2 Alternative 2 - (Preferred Alternative)

Proposed activities with the potential to affect vegetation would include wildland fire suppression activities, and thinning treatments and hazard fuels reduction.

Wildland fire suppression and manual and mechanical thinning would be conducted in the same manner under this alternative. General vegetation impacts resulting from manual/mechanical thinning would be similar to those described under the “No Action” Alternative. However, with the increased acreage being affected the potential for soil damage increases, which in turn, increases the amount of acres susceptible to invasive exotic plant infestations.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 2 to affect vegetation include:

- Past land acquisition preserves vegetation communities;
- Future removal of pecan trees as part of prairie restoration will help restore native vegetation.
- Past and future wildland fire suppression activities may have disturbed soils and made them susceptible to invasive non-native species;
- Past, current, and future development adjacent to the park alters native vegetation communities;
- Past conversion of native prairie to pastureland detrimental to native vegetation;

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in moderate long-term beneficial cumulative impacts to vegetation through the return of a natural fire regime. However, there would also be the potential for past fire suppression and prairie conversion, in combination with ground-disturbing activities under Alternative 2, to result in long-term but minor adverse cumulative impacts to vegetation due to the spread of invasive species.

Conclusion

Alternative 2 would result in minor to moderate long-term vegetative benefits to the Prairie Restoration and Pasture Compartments found within the park. Alternative 2 could also result in minor long-term adverse impacts to vegetation from invasive species.

Alternative 2 would not produce any major adverse impacts or impairment of vegetation resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.3.2.3 Alternative 3

Proposed activities with the potential to affect vegetation include wildland fire suppression activities, manual and mechanical thinning, and hazard fuels reduction.

Wildland fire suppression, manual and mechanical thinning, and hazard fuels reduction would be conducted in the same manner as Alternative 2, and the general vegetation impacts would be similar to those described under this alternative. Prescribed fire however, would not be utilized anywhere in the park to reduce hazard fuel loads, combat invasive plant species, or to restore a more natural fire regime to the park. In lieu of prescribed fire, within the Prairie Restoration Compartment, the area would be mowed and baled to meet management objectives, while in the pastures, grazing would continue.

Under this alternative, benefits accrued from prescribed fire would not be realized, and fire-adapted, native prairie species would suffer. Mowing and baling of grasses within the Prairie Restoration Compartment may help in the spread of some invasive species through soil damage potentially caused by the mowers and through seed dispersal. These impacts could be mitigated by mowing only during the drier parts of the year when the soil was less wet and more firm, and during times when invasive species were not in seed.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 3 to affect vegetation include:

- Past land acquisition preserves vegetation communities;
- Future removal of pecan trees as part of prairie restoration will help restore native vegetation.
- Past and future wildland fire suppression activities may have disturbed soils and made them susceptible to invasive non-native species;
- Past, current, and future development adjacent to the park alters native vegetation communities;
- Past conversion of native prairie to pastureland detrimental to native vegetation;

There would be the potential for past fire suppression and prairie conversion, in combination with ground-disturbing activities under Alternative 3, to result in long-term but minor adverse cumulative impacts to vegetation due to the spread of invasive species.

Conclusion

Alternative 3 could result in minor long-term adverse impacts to vegetation from invasive species. Unlike the other alternatives, this would not be counter-balanced by benefits of prescribed fire.

Alternative 3 would not produce any major adverse impacts or impairment of vegetation resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.4 WILDLIFE (INCLUDING THREATENED AND ENDANGERED SPECIES)

3.4.1 Affected Environment

A variety of wildlife resources inhabit the forested areas and grasslands of Lyndon B. Johnson National Historical Park including ungulates, small mammals, birds, reptiles, amphibians, and invertebrates. Some of the more commonly sighted Hill Country wildlife include wild turkey (*Meleagris gallopavo*), white-tailed deer (*Odocoileus virginianus*), fox squirrel (*Sciurus niger*), fence lizard (*Sceloporus undulates*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture

(*Cathartes aura*), mourning dove (*Zenaida macroura*), raccoon (*Procyon lotor*), ringtail (*Bassariscus astrius*), jack rabbit (*Lepus sp.*) and common slider (*Trachemys scripta*). The black buck antelope (*Antelope cervicapra L.*), which is native to the open plains of India, Pakistan, and Nepal, also has an established population within the park and general vicinity, as do the non-native nutria (*Myocastor coypus*) and the axis deer (*Axis axis*).

Consultation with the U.S. Fish and Wildlife Service has determined that Golden-cheeked Warbler (*Dendroica chrysoparia*) and Black-capped Vireo (*Vireo atricapillus*) habitat may occur around the park, however, no documented species or suitable habitat have been found within the park.

3.4.2 *Environmental Consequences*

The effects of the alternatives on wildlife were qualitatively assessed using professional judgment based on literature reviews, general knowledge, and research specific to the area.

3.4.2.1 Alternative 1 – No Action

Proposed activities with the potential to affect wildlife include wildland fire suppression activities, hazard fuels reduction, and prescribed fires.

All the fire management activities could result in the temporary displacement of wildlife or individual mortality of wildlife species; however, these impacts would be minor. The loss of individuals of a non-threatened or endangered species would not jeopardize the viability of the populations on and adjacent to the park. There would be some loss of migratory bird habitat as a result of thinning woody shrubs; however, the limited amount of thinning to be conducted would not adversely affect the viability of the nesting populations in the park.

Habitat conditions for wildlife species that inhabit Lyndon B. Johnson National Historical Park would likely improve somewhat with the continuation of the historic high frequency, low-intensity fire regime characteristic of this area prior to the twentieth century. Such a fire regime would help restore and enhance the variety and diversity of native plant and wildlife habitats within the Prairie restoration area. Nutrients released to plants through the fertilization effects of ash would provide an important source of nutrition for wildlife in the area and also for the cattle that utilize the pasturelands. Prescribed fire eliminates standing dead forage and provides livestock and wildlife with green forage of higher nutritive value. Fire releases nutrients from dormant standing forage (phosphorus and potassium) for a brief period of time resulting in somewhat increased nutritive value of subsequent forage. The blackened surface generally greens up earlier than non-burned areas, thus providing earlier grazing (Redmon and Bidwell, 2003).

Prescribed fire activities would not directly impact nesting migratory birds when the burns would occur during the winter months, prior to the breeding season (generally between May 15 - August 15). Prescribed fire in the 12-acre Prairie Restoration Area Compartment during the breeding season may cause mortality for a small number of unfledged young birds of ground

nesting species. The low frequency of scheduled burns (two to five years) would mitigate these impacts.

Aquatic species in the park would not be affected by fire line construction or fire retardant use since mitigation measures state that water will be used whenever possible, and, if retardant must be used, it will be a non-fugitive type, and all surface waters would be avoided.

Since the Golden-cheeked Warbler (*Dendroica chrysoparia*) and Black-capped Vireo (*Vireo atricapillus*) do not occur within the Park and no critical habitat exists within the park, implementing the Preferred Alternative would result in no effect to T&E species. In addition, if either of these species were to occur, there would likely be no impacts from fire management activities. As stated in the National Park System's 2001 Management Policies, if a Federally or state listed species were to be documented within the park boundaries, active management programs would be undertaken to inventory, monitor, restore, and maintain the listed species' habitats, control detrimental non-native species, control detrimental visitor access, and re-establish extirpated populations as necessary to maintain the species and habitats upon which they depend. The Park would also manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for the recovery of threatened and endangered species. Measures taken to protect those species, or their required habitat, would supersede any management activities outlined in the FMP in the event any of those management activities would negatively impact the listed species.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 to affect wildlife include:

- Past land acquisition preserves wildlife;
- Past, current, and future development adjacent to the park reduces wildlife habitat and fragments wildlife corridors and edge habitat

The impacts of the above actions, in combination with the impacts of Alternative 1, would result in minor short-term adverse cumulative impacts to wildlife from displacement and habitat fragmentation. Additionally, there would be minor to moderate beneficial cumulative impacts to wildlife from improved habitat resulting from prescribed fire.

Conclusion

Alternative 1 would provide minor short-term wildlife benefits to the park, as well as minor short-term adverse impacts.

Alternative 1 would not produce any major adverse impacts or impairment of wildlife resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.4.2.2 Alternative 2 – (Preferred Alternative)

General wildlife impacts under Alternative 2 would be similar to those described in the “No Action” Alternative.

Consultation was initiated on February 12, 2004 with the U.S. Fish and Wildlife Service (FWS) (See Appendix A). FWS requested a survey be conducted of habitat for Golden-cheeked Warbler and Black-Capped Vireo. This survey was conducted on March 30, 2004. Results were forwarded to FWS for concurrence that no T&E species would be impacted by the proposed fire management plan. On October 26, 2004, FWS stated in a phone communication that it no longer provides concurrence, and that the park’s determination via the survey that no T&E species would be impacted by the Proposed Action is sufficient (Milliken, 2004). Should conditions change regarding critical habitat or T&E species, the park would initiate consultation with FWS.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 2 to affect wildlife include:

- Past land acquisition preserves wildlife;
- Past, current, and future development adjacent to the park reduces wildlife habitat and fragments wildlife corridors and edge habitat

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in minor short-term adverse cumulative impacts to wildlife from displacement and habitat fragmentation. Additionally, there would be minor to moderate beneficial cumulative impacts to wildlife from improved habitat resulting from prescribed fire.

Conclusion

Alternative 2 would provide minor short-term wildlife benefits to the park, as well as minor short-term adverse impacts.

Alternative 2 would not produce any major adverse impacts or impairment of wildlife resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.4.2.3 Alternative 3

Proposed activities with the potential to impact wildlife include wildland fire suppression activities and hazard fuels reduction.

General impacts to wildlife resulting from wildland fire suppression activities, hazard fuels reduction would be the same as in the “No Action” Alternative. Benefits to wildlife from the use of prescribed fire not realized under this alternative.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 3 to affect wildlife include:

- Past land acquisition preserves wildlife;
- Past, current, and future development adjacent to the park reduces wildlife habitat and fragments wildlife corridors and edge habitat

The impacts of the above actions, in combination with the impacts of Alternative 3, would result in minor short-term adverse cumulative impacts to wildlife from displacement and habitat fragmentation. This alternative would not contribute to any beneficial cumulative impacts to wildlife from prescribed fire.

Conclusion

Alternative 3 would produce minor short-term wildlife adverse impacts to the park.

Alternative 3 would not produce any major adverse impacts or impairment of wildlife resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.5 AIR QUALITY

3.5.1 Affected Environment

National Ambient Air Quality Standards (NAAQS) for what are known as criteria pollutants are intended to protect human health and welfare. The criteria pollutants are sulfur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (as PM₁₀ and PM_{2.5}), lead, and carbon monoxide (CO).

Lyndon B. Johnson National Historical Park is designated as a Class II area under the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act. As such, the area’s air quality is protected by allowing only limited increases (i.e., allowable increments) over baseline concentrations of pollution for SO₂, nitrogen oxides (NO_x), and particulate matter (PM). The PSD permitting program is administered by the Texas Commission on Environmental Quality (TCEQ), and applies to defined categories of new or modified sources of air pollution with emissions greater than 100 tons per year and all other sources greater than 250 tons per year.

Ambient monitoring has not routinely been undertaken at Lyndon B. Johnson National Historical Park, such that the nearest criteria pollutant monitoring is in the Austin and San Antonio

metropolitan areas. Based on that monitoring, the Austin and San Antonio areas are considered to be in attainment for all NAAQS as of 2002, except for ozone.

The Austin and San Antonio areas each have at least one monitoring site for CO, O₃, PM₁₀, and PM-2.5. CO levels are well below the NAAQS. Ozone values from sites in the Austin and San Antonio areas that are located nearest Lyndon B. Johnson National Historical Park demonstrate the two areas' ongoing issues with that pollutant. Ozone levels in the park itself are unknown at this time, but could well be in compliance with the new 8-hour standard given its distance from Austin and San Antonio. It should be noted though that at levels well below the NAAQS that ozone can be phytotoxic, having damaging effects on sensitive vegetation.

Although apparently in attainment for PM-2.5, Lyndon B. Johnson National Historical Park experiences some of the same widespread visible haze that affects much of the eastern half of Texas on some days. This haze may be attributed to a variety of sources, including more regional ones some distance away.

3.5.2 Environmental Consequences

Air quality impacts were qualitatively assessed using literature reviews and professional judgment based on consideration of fuel levels and types, size of area that could burn, and knowledge of air chemistry.

3.5.2.1 Alternative 1 – No Action

The combustion of vegetation produces various chemical compounds. These compounds include NO_x, organic compounds, CO, and particulate matter. The pollutants that affect visibility that derive from vegetative burning are PM₁₀, PM_{2.5}, nitrates, ozone, organic carbon, and elemental carbon. Ozone, a measurable constituent of "smog" or haze, is not directly produced by fires, but as a byproduct of the chemical reaction of combustion products such as NO_x, and volatile organic compounds (VOCs). About 90 percent of smoke particles from wildland and prescribed fires are PM₁₀ and PM_{2.5} (EPA, 1998).

Smoke consists of dispersed airborne solids and liquid particles, called particulates, which could remain suspended in the atmosphere for a few days to several months. Particulates can reduce

"Criteria Pollutants" for which National Standards have been set under the Clean Air Act

Carbon Monoxide (CO) is a colorless odorless, toxic gas produced by the incomplete combustion of organic materials used as fuels. CO is emitted as a by-product of essentially all combustion

Ozone (O₃) is a photochemical oxidant and major constituent of smog. Ozone is formed when two precursor pollutants, hydrocarbons (VOCs) and nitrogen oxides, react chemically in the presence of sunlight

PM₁₀ are fine particles less than 10 micrometers in diameter. PM₁₀ includes solid and liquid material suspended in the atmosphere and formed as a result of incomplete combustion

PM_{2.5} are fine particles less than 2.5 micrometers in diameter. PM₁₀ includes solid and liquid material suspended in the atmosphere and formed as a result of incomplete combustion

Sulfur Dioxide (SO₂) is a corrosive and poisonous gas produced mainly from the burning of sulfur-containing fuel. It is also a precursor to acid precipitation

Nitrogen Oxides (NO_x) are poisonous and highly reactive gases produced when fuel is burned at high temperatures, causing some of the abundant nitrogen in the air to burn as well.

Lead (Pb) is a toxic heavy metal, the most significant emissions of which derive from gasoline additives, iron and steel production, and alkyl lead manufacturing.

visibility and contribute to respiratory problems. Very small particulates can travel great distances and add to regional haze problems. Regional haze can sometimes result from multiple burn days and/or multiple owners burning within an airshed over too short a period of time to allow for dispersion.

Prior to any prescribed fire, the park would notify the Texas Air Quality Board. The notification would identify the location and size of the proposed prescribed fire, as well as the fuel types to be burned.

Each prescribed fire plan will include smoke trajectory maps and identify smoke-sensitive areas. Fire weather forecasts will be used to correlate ignitions with periods of optimal combustion and smoke dispersal. Mitigation measures would be defined in the plan and arrangements made prior to ignition to ensure that designated resources are available if needed to implement the mitigation measures. Prescribed fire will not be implemented when atmospheric conditions exist that could permit degradation of air quality to a degree that negatively affects public health. (Federal and state air quality standards will be the basis for this decision.) Any smoke situation that arises and threatens any smoke-sensitive areas will entail immediate suppression action.

There are “sensitive receptors” (e.g. residents, schools, churches) in the vicinity of the park that may be susceptible to smoke impacts from a prescribed fire. Considering the relatively small number of acres that would be affected by prescribed fire in any given year, and considering the major fuel type to be burned (grasses do not generate large quantities of smoke), prescribed fires would not violate daily national or state emission standards and would cause very minor and temporary air quality impacts.

The immediate suppression of any wildland fires that may occur on the park would minimize any air quality impacts may occur from these fires.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 include:

- Commercial practices emit pollutants and particulate matter;
- Automobiles on and off the park contribute to some temporary deterioration in air quality and visibility;
- The future bypass of HWY 290 to the south of the park would result in minor air quality improvement as the volume of cars traveling near the park would be reduced

The impacts of the above actions, in combination with the impacts of Alternative 1, would result in minor to moderate temporary adverse cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from Alternative 1 would be negligible, as most air quality impacts are from other sources.

Conclusion

Alternative 1 would result in minor temporary impacts to air quality in and around the park.

Alternative 1 would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.5.2.2 Alternative 2 – (Preferred Alternative)

Air quality impacts under this alternative would be the same as the “No Action” Alternative.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 2 (Proposed Action) include:

- Commercial practices emit pollutants and particulate matter;
- Automobiles on and off the park contribute to some temporary deterioration in air quality and visibility;
- The future bypass of HWY 290 to the south of the park would result in minor air quality improvement as the volume of cars traveling near the park would be reduced

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in minor to moderate temporary adverse cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from Alternative 2 would be negligible, as most air quality impacts are from other sources.

Conclusion

Alternative 2 would result in minor temporary impacts to air quality in and around the park.

Alternative 2 would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.5.2.3 Alternative 3

There would be no impacts to air quality under this alternative.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 3 include:

- Commercial practices emit pollutants and particulate matter;

- Automobiles on and off the park contribute to some temporary deterioration in air quality and visibility;
- The future bypass of HWY 290 to the south of the park would result in minor air quality improvement as the volume of cars traveling near the park would be reduced

Alternative 3 would not contribute to cumulative air quality impacts.

Conclusion

Alternative 3 would not contribute any impacts to air quality in and around the park.

Alternative 3 would not produce any major adverse impacts or impairment of air quality resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.6 VISITOR USE AND EXPERIENCE (INCLUDING PARK OPERATIONS)

3.6.1 Affected Environment

The Visitor Center is the focal point of Lyndon B. Johnson National Historical Park. It contains exhibits interpreting President Johnson's presidency, a Western National Parks and Monuments sales outlet, two theaters and an information counter. From the Visitor Center, one can walk to Lyndon Johnson's Boyhood Home and to the nearby Johnson Settlement. Featured at the Johnson Settlement are structures that trace the evolution of the Texas Hill Country from the open range cattle kingdom days of Lyndon Johnson's grandfather Sam Ealy Johnson, Sr. to the local ranching and farming of more recent times. There is an unstaffed Exhibit Center in the Johnson Settlement.

LBJ Ranch bus tours begin at the LBJ State Park. Buses operated by the National Park Service provide regularly scheduled tours which include the Junction School, the Reconstructed Birthplace, the Johnson Family Cemetery and the LBJ Ranch with its registered Hereford herd and Show Barn.

Facilities at the adjacent LBJ State Park include restrooms without showers, picnic sites with and without shade shelters, refreshment vending machines located at the visitor's center, interpretive center, auditorium, amphitheater, swimming pool, playgrounds, and nature trails. At the Sauer-Beckmann Living History Farm, located east of the visitor center and off the nature trail, life on the farmstead is presented as it was in 1918. Park interpreters wear period clothing, do the farm and household chores as they were done at that time and also conduct tours for the visitors.

Visitors to both parks can enjoy historical study, picnicking, nature study and walks, fishing, biking, bird watching, hiking, and wildlife viewing.

In 2003, 85,338 recreation visits were recorded in the park. Visitation is highest during the period from March through May. This is a period of pleasant daytime temperatures and springtime color. As the summer heat grows, visitation drops off. There is a small spike in the fall month of October.

3.6.2 *Environmental Consequences*

Recreation impacts were qualitatively assessed in light of the intensity and duration of fire management activities as they related to visitor use and experience. Visual resource impacts in this environmental assessment were assessed in terms of scenic integrity, visual wholeness, and unity of the landscape.

3.6.2.1 Alternative 1 (No Action)

There would be some short-term reduction in scenic integrity and visitor use during and immediately following any thinning, prescribed fire, or wildland fire suppression activities due to the presence of engines and fire crews. Short-term reduction in scenic integrity, however, would be minor because 1) fire management activities would involve only short-term presence of vehicles and people, 2) stumps would be cut flush with the ground, 3) smoke accumulation would be temporary since prescribed fires would only be ignited under favorable conditions for smoke dispersion.

Any prescribed fires would likely produce short-term smoke accumulations that impact local visual quality. Minimizing smoke emissions through best management practices and prohibiting prescribed fires during times of peak recreation use would reduce any short-term impacts.

Visitor use would also be temporarily affected under this alternative since access to those locations where crews were conducting mechanical thinning or removal, prescribed fire, and suppression activities would be restricted. Since most prescribed fires would not be ignited during the months of peak park visitation, and since only a small portion of the park would be subjected to treatment at any one time, prescribed fire and mechanical thinning and removal activities on the surface of the park would not significantly impact the visitor use and experience.

Over the long term, the visitor experience would be enhanced under this alternative. This is because the program of prescribed fire would help to restore and maintain the integrity and appearance of the historic landscape, along with benefiting the native prairie restoration project.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 (No Action) include:

- Past land acquisition preserves areas for visitors to enjoy;
- An archeological survey of the park would provide educational benefits to the public;
- Future cattle use enhances the cultural landscape, which benefits visitor use and experience;
- Future removal of pecan trees as part of prairie restoration will result in an improved interpretive experience at the Johnson Settlement

- Development adjacent to the park degrades historical landscape impairing visitor experience; The impacts of the above actions, in combination with the impacts of Alternative 1, would result in minor temporary adverse cumulative impacts to visitor use and experience. However, there would also be moderate long-term cumulative beneficial impacts to visitor use and experience due to improvements in the cultural landscape.

Conclusion

Alternative 1 would result in minor temporary adverse impacts to visitor use and experience, but also would produce moderate long-term beneficial impacts.

3.6.2.2 Alternative 2 - (Preferred Alternative)

General impacts to visitor use and experience would be similar to those described under the “No Action” Alternative.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 2 (Proposed Action) include:

- Past land acquisition preserves areas for visitors to enjoy;
- An archeological survey of the park would provide educational benefits to the public;
- Future cattle use enhances the cultural landscape, which benefits visitor use and experience;
- Future removal of pecan trees as part of prairie restoration will result in an improved interpretive experience at the Johnson Settlement
- Development adjacent to the park degrades historical landscape impairing visitor experience;

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in minor temporary adverse cumulative impacts to visitor use and experience. However, there would also be moderate long-term cumulative beneficial impacts to visitor use and experience due to improvements in the cultural landscape.

Conclusion

Alternative 2 would result in minor temporary adverse impacts to visitor use and experience, but also would produce moderate long-term beneficial impacts.

3.6.2.3 Alternative 3

General impacts to visitor use and experience would be similar to those described under the No Action Alternative. However, in the short-term, the absence of prescribed fire would result in fewer temporary impacts to visitor use and experience.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 3 include:

- Past land acquisition preserves areas for visitors to enjoy;
- An archeological survey of the park would provide educational benefits to the public;
- Future cattle use enhances the cultural landscape, which benefits visitor use and experience;
- Future removal of pecan trees as part of prairie restoration will result in an improved interpretive experience at the Johnson Settlement
- Development adjacent to the park degrades historical landscape impairing visitor experience;

The impacts of the above actions, in combination with the impacts of Alternative 3, would result in minor temporary adverse cumulative impacts to visitor use and experience. However, there would also be moderate long-term cumulative beneficial impacts to visitor use and experience due to improvements in the cultural landscape.

Conclusion

Alternative 3 would result in negligible temporary adverse impacts to visitor use and experience, and would also would produce moderate long-term beneficial impacts.

3.7 HUMAN HEALTH AND SAFETY

3.7.1 Affected Environment

As hazards exist in both wildland and prescribed burns, safety is always the highest priority. Smoke on roads in and adjacent to the park is of concern. A growing amount of residential development is located near the park as well. Smoke from sources on and off the unit can be a safety issue to the visiting public. The flaming front of a fire can put unsuspecting members of the visiting public at risk. For this reason, areas affected by fire of any cause will be closed to the public. There is always a risk that curious park visitors will actually approach a fire rather than flee it. Adjacent and nearby landowners will be notified when fires are a threat to off-unit residential areas.

Prior to the ignition of any prescribed fire in the park, all the burn parameters of the approved prescribed fire burn plan must be met to ensure a safe and effective prescribed fire. Prescribed fire is a commonly used tool of the landowners in this area and not an uncommon sight. Visiting public will be informed and educated when prescribed burns take place. In the event of a potentially hazardous wildland fire within the park, the Park Superintendent and Public Information Officer would coordinate public notification efforts within and outside the park. The extent of public notice would depend on the specific fire situation. Assuring visitor and park staff safety would take priority over other activities.

3.7.2 *Environmental Consequences*

Human health & safety impacts were qualitatively assessed through determination of activities, equipment and conditions that could result in injury, literature review of type and extent of injury caused by equipment and conditions, and in light of mitigation measures and best management practices.

3.7.2.1 Alternative 1 – No Action

Factors most likely to adversely impact firefighter health and safety include activities associated with wildland fire suppression efforts (accidental spills, injuries from the use of fire-fighting equipment, smoke inhalation, and, in severe cases, injuries from wildland fires). Impacts to the public could include smoke inhalation, and in severe cases, injuries from wildland fires.

Accidental spills of fire retardants and foams are the most likely to adversely impact human health & safety. Fire retardants used in controlling or extinguishing fires contain about 85% water, 10% fertilizer, and 5% minor ingredients such as corrosion inhibitors and bactericides. Fire suppressant foams are more than 99% water. The remaining 1% contains surfactants, foaming agents, corrosion inhibitors, and dispersants. These qualified and approved wildland fire chemicals have been tested and meet specific requirements with regard to mammalian toxicity as determined by acute oral and dermal toxicity testing as well as skin and eye irritation tests (USDA, 2001). However, they are strong detergents, and can be extremely drying to skin. All currently approved foam concentrates are irritating to the eyes as well. Application of a topical cream or lotion can alleviate the effects of a retardant, and protective goggles can prevent any injury to the eyes when using foams.

Fuel break construction can pose safety threats to firefighters. Injuries can occur from the use of equipment as well as from traveling overland to targeted areas for firefighting efforts during suppression efforts. While each member of the crew is trained in the use of firefighting equipment, accidental injuries may occur from time to time. Strict adherence to guidelines concerning firefighter accreditation, and equipment and procedure safety guidelines would minimize accidents.

Smoke inhalation can also pose a threat to human health & safety. Smoke from wildland fires is composed of hundreds of chemicals in gaseous, liquid, and solid forms. The chief inhalation hazard appears to be carbon monoxide (CO), aldehydes, respirable particulate matter with a median diameter of 2.5 micrometers (PM_{2.5}), and total suspended particulate (TSP). Adverse health effects of smoke exposure begin with acute, instantaneous eye and respiratory irritation and shortness of breath, but can develop into headaches, dizziness, and nausea lasting up to several hours. Based on a recent study of firefighter smoke exposure, most smoke exposures were not considered hazardous, but a small percentage routinely exceeded recommended exposure limits for carbon monoxide and respiratory irritants (USDA, 2000a).

Use restrictions applied to areas of wildland fires would minimize or eliminate public human health & safety concerns resulting from smoke exposure and fire injuries. Elements of the prescribed fire plan that relate to ensuring a safe burn include such measures as fuel moisture,

wind speed, rate of fire spread, and estimated flame lengths. When using prescribed fire, mitigation measures, such as construction of fire lines, the presence of engines, and strict adherence to prescribed fire plans, would minimize the potential for an out-of-prescription burn or escape. While the potential for a fire escape will always exist when conducting prescribed fires, that potential is extremely small. Recent statistics summarized by the National Interagency Fire Center report that approximately 1% of prescribed fires on federal lands required suppression activities of some kind. In most cases, these prescribed fires jumped a control line and suppression tactics were successfully used to control them. Out of the 1% of prescribed fires that required suppression, 90% were controlled without incident. Statistically, this result leaves about 0.1% of prescribed fires that required major suppression actions (Stevens, 2000).

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 to affect human health and safety include:

- Past wildland fire suppression protects park staff, visitors, and neighbors;
- Past and current development improves human health and safety in areas outside the park boundaries, but also is associated with increased pollution.

The impacts of the above actions, in combination with the impacts of Alternative 1, would result in both minor beneficial long-term cumulative impacts to human health and safety, and minor short-term adverse cumulative impacts.

Conclusion

Most of the impacts to human health and safety would be minor, beneficial and long-term; there is the potential for short-term minor adverse impacts as well.

3.7.2.2 Alternative 2 – (Preferred Alternative)

The general impacts to human health & safety under Alternative 2 would be similar to those described under the “No Action” Alternative.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 2 to affect human health and safety include:

- Past wildland fire suppression protects park staff, visitors, and neighbors;
- Past and current development improves human health and safety in areas outside the park boundaries, but also is associated with increased pollution.

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in both minor beneficial long-term cumulative impacts to human health and safety, and minor short-term adverse cumulative impacts.

Conclusion

Most of the impacts to human health and safety would be minor, beneficial and long-term; there is the potential for short-term minor adverse impacts as well.

3.7.2.3 Alternative 3

In most years, the general impacts to human health and safety under Alternative 3 would be similar to those under the “No Action” Action. The exclusion of prescribed fire would eliminate the possibility of an out-of-prescription burn or fire escape.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 3 to affect human health and safety include:

- Past wildland fire suppression protects park staff, visitors, and neighbors;
- Past and current development improves human health and safety in areas outside the park boundaries, but also is associated with increased pollution.

The impacts of the above actions, in combination with the impacts of Alternative 3, would result in both minor beneficial long-term cumulative impacts to human health and safety, and minor short-term adverse cumulative impacts. Lack of prescribed fire under this alternative would make adverse impacts slightly less than under the other two alternatives.

Conclusion

Most of the impacts to human health and safety would be minor, beneficial and long-term; there is the potential for short-term minor adverse impacts as well.

3.8 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their proposals on historic properties, and to provide state historic preservation officers, tribal historic preservation officers, and, as necessary, the Advisory Council on Historic Preservation a reasonable opportunity to review and comment on these actions.

3.8.1 *Affected Environment*

Lyndon B. Johnson National Historical Park is listed in the National Register of Historic Places as an historic district with national significance in the area of politics/government for the period

of 1869-1973. As such, its 675 federally-owned acres are managed in compliance with the standards as outlined in Management Policies of the National Park Service (1988) and Director's Order 28, among other applicable documents. The Johnson Boyhood Home was designated a National Historic Landmark in 1966.

Major structures within the Johnson City District include the Park Headquarters and Visitor Center, Johnson's Boyhood Home (where he lived from 1913 to 1931), and the Johnson Settlement, which Johnson's grandfather, Samuel Ealy Johnson, Sr., used as headquarters for his open-range cattle business from 1867 to 1872. The original log house purchased and expanded by Sam E. Johnson, Sr. still stands, as do several stone buildings constructed by later property owners.

The focal point of the LBJ Ranch District is the LBJ Ranch House, which was acquired by the Senator and Mrs. Johnson in 1951. This was President Johnson's home and served as the Texas White House during his administration. The LBJ Ranch District also encompasses many auxiliary structures associated with presidential communications, transportation, and security, as well as the Reconstructed Birthplace, the Junction School, the Johnson Family Cemetery, an airstrip, and a 55-acre pecan grove.

The historic structures within the park are of varying ages and were constructed using a variety of techniques. The structures range in type from a log cabin to stone barns to wooden frame buildings. Many of the older wooden buildings have a high risk of damage from fire due to their age and construction, especially if the ignition were to occur during dry and/or windy conditions.

In addition to the 120 historic structures maintained by the National Park Service, historic objects are used to furnish or interpret the various sites. These historic resources document and communicate the heritage of the 36th President of the United States. The museum collection and archives of Lyndon B. Johnson National Historical Park includes original furnishings, farm and ranch equipment, LBJ memorabilia, automobiles, archeological artifacts, photographs, and archival materials. There are currently over 17,232 objects in the museum collection that are documented to the catalog-data level, including 1,290 archeological artifacts and 1,415 natural history specimens. Objects from the collection are exhibited at the Boyhood Home, in the Visitor Center in Johnson City, at the Reconstructed Birthplace and in the hangar carport enclosure at the ranch. The furnished historic structures contain household furniture, artwork, books, articles of clothing and other historic objects arranged to convey an historic scene. Many of these objects are susceptible to damage if exposed to high heat, direct flame or intense smoke. The Farm Equipment Storage Building contains historic farming equipment and vehicles that would be similarly susceptible to damage.

Cultural Landscape

A geographic area (including both cultural and natural resources and the wildlife or domestic animals therein), associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values.

Component Landscape

A discrete portion of the landscape that can be further subdivided into individual features. The landscape unit may contribute to the significance of a National Register property, such as a farmstead in a rural historic district. In some cases, the landscape unit may be individually eligible for the National Register of Historic Places, such as a rose garden in a large urban park.

(Source: NPS 2002)

At this time, one prehistoric archeological site in the park, the Taylor Site, is documented on state records. Field work performed during the 2003 season for a comprehensive archeological survey of Lyndon B. Johnson National Historical Park found evidence for several other buried and surface historic and prehistoric sites. The corridor along the Pedernales River is considered to be a high probability area for prehistoric sites. Artifacts at these sites consist of both historic and prehistoric objects. Historic objects are most commonly associated with historic dump sites, and consist of items such as discarded equipment, household refuse and fencing debris. Objects on the surface would be damaged if exposed to direct flame and/or high heat. Prehistoric objects can be found as surface scatter and also as buried deposits. The items most commonly found on the surface are stone flakes and points. These items may be damaged if exposed to high heat for prolonged periods.

The cultural landscape inventory identified prominent elements that contribute to the LBJ Ranch's primary period of significance - 1963 to 1973, the years of Johnson's presidency and later retirement - as:

- The gently rolling topography of the Texas Hill County
- The Pedernales River
- The LBJ Ranch House complex
- The Show Barn complex
- The 35-acre pecan orchard
- The herd of Herefords
- The Johnson Family Cemetery
- The Junction School
- The network of roads (Ranch Road 1, Park Road 49, Bailey Road, and Malechek Road), paths, and fences

The cultural landscape inventory has also identified three component landscapes in the LBJ Ranch district:

- The Texas White House - primarily consists of the LBJ Ranch House and surrounding gardens and landscaped areas; roads and paths; the poolhouse, Martin Barn, Secret Service Command Post, hangar, communications trailers and other outbuildings; east and west gates; the airstrip; and the Johnson Dam and Pedernales River.
- Agricultural Complex - consist primarily of the Show Barn complex, fields and pastures, water tanks, the pecan grove, and associated roads and paths.
- Johnson Family Farm Historic Area - include the Reconstructed Birthplace, Junction School, Sam E. Johnson, Sr. Farmhouse complex, all associated gardens and designed landscape areas, the Johnson family cemetery, the pecan grove, the Pedernales River, and Park Road 49.

Landscape features such as structures and fences are susceptible to damage from high heat and/or direct flame. Biotic elements such as landscaping features or pecan trees would be similarly susceptible

The park is not aware of any ethnographic resources or potential ethnographic resources that exist within park boundaries. Most of the ethnography associated with the Johnson history is directly associated with park structures and landscape features. Consultation with potentially affiliated tribes for a recently conducted archeological survey has not resulted in any tribe's affiliation being claimed or in any concerns about ethnographic resources being voiced.

3.8.2 *Environmental Consequences*

Cultural resource impacts were qualitatively assessed through a presence/absence determination of significant cultural resources and mitigation measures to be employed during wildland fire suppression, and hazard fuel reduction activities.

3.8.2.1 Alternative 1 – No Action

Under this alternative, the park would incorporate archeological/cultural/historic resources protection into fire management in a variety of ways. For example:

- Historic structures would be protected from wildland fire via mowing of the grass around them.
- During all suppression activities, the minimum impact suppression tactics policy (see section 2.3.1) will be incorporated to the greatest extent feasible and appropriate for the given situation. Tactics directly or indirectly facilitating the protection of archeological/cultural/historic resources include:
 - Keeping fire engines or slip-on units on existing roads.
 - Not using heavy equipment (e.g. bulldozers, plows) for constructing fireline.
 - Not using fireline explosives.
 - Using existing natural fuel breaks and human-made barriers, wet line, or cold trailing the fire edge in lieu of fireline construction whenever possible.
 - Keeping fireline width as narrow as possible when it must be constructed.
 - Avoiding ground disturbance within known archeological/cultural/historic resource locations. When fireline construction is necessary in proximity to these resource locations it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible.
 - Using soaker hose, sprinklers or foggers in mop-up; avoiding boring and hydraulic action.

Cultural site boundaries would be clearly marked for avoidance during any fire management activities, and sites would be monitored during and after completion of the activities. Because these sites would be avoided, there would be no effect to these cultural resource sites.

Under this alternative, prescribed fire would be used to restore and maintain the historic landscapes of the Prairie Restoration Area Compartment and to maintain pastures in the Pasturelands Compartment. While this would have positive impacts on the overall landscape, the effects of prescribed fire on potential unknown cultural resources are still not well understood or documented.

To date, much of the literature on the subject is anecdotal and qualitative (Gleeson and Jones, 2000), rather than based on controlled scientific studies. For example, post-fire observations are often unable to distinguish between damage to archaeological resources caused by the fire itself from damage that was pre-existing.

The vulnerability of subsurface archaeological resources and artifacts to fire depends not only on the nature of the materials themselves but also on the intensity of the fire. Hotter surface fires penetrate more deeply into the subsurface and can potentially cause more damage. Glass bottles can be cracked or broken for example. On the other hand, ceramics or objects carved or chipped from stone are likely to be more resistant to fire and heat. Since wildland and prescribed fire were common in the past, for a subsurface historic object or archaeological artifact to have survived into the 21st century, it must have already withstood at least several, and sometimes many, previous fires.

Mitigating measures aimed at protecting the park's cultural resources from the affects of prescribed fire includes the immediate suppression of any prescribed fire that burns out of prescription. Prescribed fires would be suppressed in the event of a weather shift during the burn that pushes the fire in a direction not intended, and if the prescribed fire begins to burn "hot." In addition, combustible structures (*e.g.* wooden structures, wooden shingles) that are located near prescribed fire areas, especially those in and around the prairie restoration compartment, would be protected by mowing and wetting firebreaks around the structures during prescribed burns. Wooden shake roofs would be sprayed with foam and openings covered to reduce the risk of ignition by flying embers. Roof sprinklers may also be used in specific situations. If needed, a fire line would be built around the perimeter of these sites. Fuels would be removed from the interior of the sites and from the area surrounding the site to maintain low burn temperatures. Back burning may also take place around the site to reduce fuel loading. Low-temperature burning over chipped stone scatters does not require additional protective measures. Low-temperature burning is considered to have no adverse effect on these cultural resource sites.

Overall, however, the "No Action" Alternative would only have minor adverse effects on archaeological and historic resources in the park. In addition the use of prescribed fire and manual fuel reduction would have long-term beneficial effects by helping to maintain the park's cultural / historic landscape.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 1 to affect cultural resources include:

- Past land acquisition preserves the cultural landscape of the park;
- Past and present use of pastureland for cattle production helps preserve the historical landscape of the ranch;
- Use of pastureland improves the cultural landscape;
- An archeological survey of the park would contribute to the historical knowledge of the park;
- Residential and commercial development degrade cultural landscapes adjacent to the park;

The impacts of the above actions, in combination with the impacts of Alternative 1, would result in long-term moderate beneficial cumulative impacts to cultural resources. There is also the potential for minor long-term cumulative impacts to undiscovered artifacts.

Conclusion

Under this alternative, there would be the potential to adversely impact unrecorded cultural resources through wildland fire suppression activities. However, most of the impacts of this alternative would be beneficial, minor to moderate, and long-term.

Alternative 1 would not produce any major adverse impacts or impairment of cultural resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.8.2.2 Alternative 2 – (Preferred Alternative)

General impacts to cultural resource sites under Alternative 2 would be similar to those described under the “No Action” Alternative. However, in addition to suppression and use of prescribed fire as described under the previous alternative, Alternative 2 includes the measures described below:

- Mowed buffers around all park structures would be expanded to new park specifications. Structures will have defensible space consisting of:
 - Remove brush from around the structures for a distance equal to 1 1/2 times the height of the structure plus 30 feet
 - Limb remaining trees within this buffer to 2 times the height of expected flame length in surface fuels (i.e. 6'), and thin or prune trees so that the widest portion of the crowns are at least 15 feet apart.
 - Grassy fuels adjacent to all structures will be mowed to maintain a 6-foot swath with 4-inch stubble. If wooden portions of a structure are within 9-inches of the ground, then surface fuels will be removed, to mineral soil, in a 9-inch swath.
 - Fuel accumulation on roofs and gutters will be removed during periods of very high or extreme fire danger.

It has been determined through consultation with the Texas State Historical Commission that there would be no negative effects to cultural impacts resulting from the use of prescribed fire in any of the prescribed burn units (see Appendix A).

The additional fuels breaks along the park’s boundary, the extended buffers around the park’s structures, and the additional hazard fuels reduction would help better protect the park’s cultural resources from wildland fire occurring from outside the park’s boundary.

The “Preferred Alternative” could have minor adverse effects on unknown archaeological and historic resources in the park. In addition, the use of prescribed fire would have long-term

beneficial effects on the park's cultural / historic landscape, and provide for greater protection of its cultural resources from wildland fires.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 2 (the Proposed Action) to affect cultural resources include:

- Past land acquisition preserves the cultural landscape of the park;
- Past and present use of pastureland for cattle production helps preserve the historical landscape of the ranch;
- Use of pastureland improves the cultural landscape;
- An archeological survey of the park would contribute to the historical knowledge of the park;
- Residential and commercial development degrade cultural landscapes adjacent to the park;

The impacts of the above actions, in combination with the impacts of Alternative 2, would result in long-term moderate beneficial cumulative impacts to cultural resources. There is also the potential for minor long-term adverse cumulative impacts to undiscovered artifacts.

Conclusion

Under this alternative, there would be the potential to adversely impact unrecorded cultural resources through wildland fire suppression activities. However, most of the impacts of this alternative would be beneficial, minor to moderate, and long-term.

Alternative 2 would not produce any major adverse impacts or impairment of cultural resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

3.8.2.3 Alternative 3

Impacts to cultural resource sites from these activities are similar to those described under the "No Action" Alternative; however, impacts resulting from prescribed fire would not occur. There is the possibility, as with the other alternatives, for the potential of fire management activities affecting unrecorded cultural resource sites.

Cumulative Impacts

Past, present, and future actions that could combine with Alternative 3 to affect cultural resources include:

- Past land acquisition preserves the cultural landscape of the park;
- Past and present use of pastureland for cattle production helps preserve the historical landscape of the ranch;
- Use of pastureland improves the cultural landscape;

- An archeological survey of the park would contribute to the historical knowledge of the park;
- Residential and commercial development degrade cultural landscapes adjacent to the park;

The impacts of the above actions, in combination with the impacts of Alternative 3, would result in long-term negligible adverse cumulative impacts to the cultural landscape. Lack of prescribed fire under this alternative would contribute minor adverse impacts, however, these would be largely offset by beneficial effects of other park activities. There is also the potential for minor long-term adverse cumulative impacts to undiscovered artifacts.

Conclusion

Under this alternative, there would be the potential for minor adverse long-term impacts to unrecorded cultural resources through wildland fire suppression activities. There would also be minor long-term adverse impacts through lack of prescribed fire.

Alternative 3 would not produce any major adverse impacts or impairment of cultural resources or values whose conservation is necessary to the purpose of the establishment of the park, that are key to the natural or cultural integrity of the park, or that are actions identified as management goals of the park.

Table 3-3 Cumulative Impacts of the Preferred Alternative

	Soils	Water Resources	Vegetation	Wildlife	Air Quality	Visitor Use & Experience	Human Health & Safety	Cultural Resources
Wildland fire suppression past, present, future	-	-	-		+		+	+
Past land acquisition in the park's authorized boundary			+	+		+		+
Past, present, and future use of pastureland to raise cattle.	+-	-	+			+		+
Future removal of pecan trees from the prairie restoration compartment	-		+			+		+
Past, Present, and Future commercial/residential development outside the park boundary		-		-	-	+-	+-	
Future measures aimed at increasing visitor use.						+		+
Future Bypass of Highway HWY 290						-		
Future archeological field surveys	-					+		+
Future water quality monitoring		+					+	

DIRECT/INDIRECT EFFECTS KEY: (+) Positive/beneficial; (-) Negative/detrimental; (Blank) Neutral/no effect

Table 3-4 Cumulative Effects

Resource	Impacts from Past and Present Activities/Land Uses	Impacts from Future Activities/Land Uses	Impacts from Proposed Actions (No Action, Alternatives 2 and 3)	Cumulative Impacts from Proposed Actions
Soils	Past land acquisition protects soils within the park from development; minor adverse soil impacts (soil erosion or loss) from past wildland fire suppression; use of cattle on pastureland adds nutrients to soil, however may cause minor soil impact (compaction, disturbance)	Future removal of pecan trees would have minor negative impacts on soil; complete archeological survey that would require the grid-style transects and shovel tests, which would result in temporary minor soil impacts throughout the park; minor adverse soil impacts (soil erosion or loss) from past wildland fire suppression; future use of cattle on pastureland adds nutrients to soil, however may cause minor soil impact (compaction, disturbance)	Prescribed fire would have temporary and minor adverse effects on soils (soil erosion, if soil is denuded), but beneficial effects as well over the short and long-terms (soil development and soil nitrification); wildland fire suppression, thinning, and hazard fuels reduction activities would result temporary minor adverse soil impacts	Fire Management Plan would not result in significant cumulative impacts; Soils inside of the park would improve over time with soil development and nitrification from prescribed fires; the “Preferred” and “No Action” Alternatives would contribute the most to positive soil cumulative impacts, while the Alternative 3 would contribute the least
Water Resources	Commercial/residential development adjacent to the park would adversely impact water resources (turbidity, sediment delivery, pollution, water consumption); wildland fire suppression activities would have minor indirect impacts (turbidity and sediment delivery from soil erosion); past and present cattle use on pastureland could result in nonpoint source pollution in the form of fecal matter to the watershed.	Increased development in areas adjacent to the park would directly and indirectly impact water resources (turbidity, sediment delivery, pollution, water consumption); Future water quality monitoring would provide data in protecting water quality; future cattle use on pastureland could result in nonpoint source pollution in the form of fecal matter to the watershed.	Prescribed fires, thinning, and wildland fire suppression activities would have no direct impacts on water resources, and minor indirect impacts (turbidity and sediment delivery from soil erosion)	Fire Management Plan would result in very minor cumulative effect on water resources; the “Preferred Alternative” would contribute the most to water resource cumulative impacts, while Alternative 3 would contribute the least
Vegetation	Past land acquisition preserves vegetation communities; past wildland fire suppression activities may have disturbed soils and made them susceptible to invasive non-native species; past and current development adjacent to the park alters native vegetation communities; past conversion of native prairie to pastureland detrimental to native vegetation.	Future wildland fire suppression activities may disturb soils and make them susceptible to invasive non-native species; future development adjacent to the park may alter native vegetation communities; future use of pastureland to raise cattle will maintain pasture vegetation; future removal of pecan trees as part of prairie restoration will help restore native vegetation.	Prescribed fire and thinning activities would promote native plant and pastureland species through the return of natural fire regime; any fire management activities that resulted in ground disturbance could result in the spread of invasive non-native species	Fire Management Plan would not result in significant cumulative impacts; the prairie restoration and pastureland compartments would continue to improve; invasive non-native plant species may decline; however, the “Preferred” and “No Action” Alternatives would contribute the most beneficial cumulative; no beneficial impacts resulting from prescribed fire use would be seen in Alternative 3

Table 3-4 Cumulative Effects

Resource	Impacts from Past and Present Activities/Land Uses	Impacts from Future Activities/Land Uses	Impacts from Proposed Actions (No Action, Alternatives 2 and 3)	Cumulative Impacts from Proposed Actions
Wildlife	Past land acquisition preserves wildlife; Past and current development adjacent to the park reduces wildlife habitat and fragments wildlife corridors and edge habitat	Continued commercial/residential development along park boundaries would disrupt and fragment wildlife habitat;	Prescribed fire and hazard fuels reduction and thinning activities would result in minor, short-term disturbance and displacement with minimal species loss; potential loss of individuals; prescribed fire would improved habitat and increased wildlife diversity	Fire Management Plan would not result in significant cumulative impacts; wildlife habitat quality and diversity increases; the “Preferred” and “No Action” Alternatives would contribute the most beneficial cumulative impacts to wildlife, while the “No Action” Alternative would contribute the least
Air Quality	Commercial practices emit pollutants and particulate matter; automobiles on and off the park contribute to some temporary deterioration in air quality and visibility	Similar effects as described in past and present activities/land uses; the future bypass of HWY 290 to the south of the park would result in minor air quality improvement as the volume of cars traveling near the park would be reduced	Prescribed fire emissions would result in very minor, short-term air quality and visibility impacts	Fire Management Plan would not result in significant cumulative impacts; Class II air quality standards would not be violated; the “Preferred” and “No Action” Alternatives would contribute the most to air quality cumulative negative impacts, while Alternative 3 would contribute the least
Visitor Use and Experience (including Park Operations)	Past land acquisition preserves areas for visitors to enjoy; development adjacent to the park degrades historical landscape impairing visitors to the park	Future efforts to entice visitors enhances visitor use and experience; future residential and commercial development near the park degrade the historical landscape and degrade visitor use and experience; an archeological survey of the park would provide educational benefits to the public; future cattle use enhances the cultural landscape, which benefits visitor use and experience; future bypass of HWY 290 may decrease the number of visitors, as interstate traffic is diverted farther to the south; future removal of pecan trees as part of prairie restoration will result in an improved interpretive experience at the Johnson Settlement	Prescribed fire, hazard fuels reduction and thinning activities, would result in minor and temporary visitor use and experience impacts; preservation of cultural landscapes in the park would enhance visitor use and experience; reduction of invasive non-native plant species allows for better interpretation of prairie restoration compartment	Fire Management Plan would not result in significant cumulative impacts; long-term enhancement of recreation resources and opportunities offsets short-term recreation inconveniences from fire management activities; the “Preferred” Alternative would contribute the most long-term positive with only short-term minor negative cumulative impacts to visitor use and experience, while Alternative 3 contribute the least
Human Health & Safety	Past wildland fire suppression protects park staff, visitors, and neighbors; Past and current development improves human health and safety in areas outside the park boundaries, but also has negative associated with increased pollution.	Similar effects as described in past and present activities/land uses; future water quality monitoring could potentially protect local residents from water quality issues, before problems become too severe	Prescribed fire, hazard fuels reduction and thinning activities may result in very minor impacts (cuts and bruises); overall potential for wildland fire decreases as hazard fuels are reduced	Fire Management Plan would not result in significant cumulative impacts; fire Management activities would improve human health and safety in the event of wildland fire; the “Preferred” Alternative and Alternative 3 would contribute the most to human health and safety cumulative impacts, while the “No Action” Alternative would contribute the least

Table 3-4 Cumulative Effects

Resource	Impacts from Past and Present Activities/Land Uses	Impacts from Future Activities/Land Uses	Impacts from Proposed Actions (No Action, Alternatives 2 and 3)	Cumulative Impacts from Proposed Actions
Cultural Resources	Past land acquisition preserves the cultural landscape of the park; past and present use of pastureland for cattle production helps preserve the historical landscape of the ranch; residential and commercial development degrade cultural landscapes adjacent to the park	Residential and commercial development degrade cultural landscapes adjacent to the park; use of pastureland improves the cultural landscape; an archeological survey of the park would contribute to the historical knowledge of the park	Prescribed fire, hazard fuels reduction and thinning activities preserve the prairie restoration and pastureland compartments; hazard fuels reduction protects historic park structures from wildland fires	Fire Management Plan would not result in significant cumulative impacts; cultural landscapes continue to be preserved and enhanced; the “Preferred” Alternative and “No Action” Alternative would contribute the most beneficial cumulative impacts to cultural resources, while Alternative 3 would contribute the least

Consultation and Coordination

List of Preparers

Joel Gorder, Project Manager, Mangi Environmental Group
Rachel Shaw, Environmental Analyst, Mangi Environmental Group
Andrea Pahlevanpour, Analyst, Mangi Environmental Group
Rebecca Whitney, Geographic Information Systems (GIS) Analyst, Mangi Environmental Group

Persons, Organizations, and Agencies Consulted

Brian Carey, Chief, Resources Management and Visitor Protection, Lyndon B. Johnson National Historical Park
Drew Gilmour, Park Ranger (Protection), Lyndon B. Johnson National Historical Park
Wendy Lott, Historian, Lyndon B. Johnson National Historical Park
Jason Lott, Integrated Resources Program Manager, Lyndon B. Johnson National Historical Park
Fulton Jeansonne, Fire Ecologist, Big Thicket National Preserve
Dave McHugh, Fire Management Officer, Big Thicket National Preserve

Scoping

Details of the scoping process and the issues that arose from it are described in Chapter 1, Section 1.5 – *Scoping Issues and Impact Topics*.

Persons, organizations, and agencies who were invited to comment – See Appendix B

Persons, Organizations, and Agencies Who Received this Environmental Assessment

Helen McDonald Admiral Nimitz SHP	The Honorable Mark Stroehrer Gillespie County Judge	Bill Granbury, Reg. Dir. TPW Region 7 Headquarters
Superintendent & Staff Amistad NRA	Superintendent & Staff Guadalupe Mountains NP	Mr. Sammy Segner
J. David Bamberger Bamberger Ranch	Kermit Roeder Johnson City Mayor	Superintendent & Staff San Antonio Missions NHP
Superintendent & Staff Big Bend NP	Librarian Johnson City Library	The Honorable Kay Bailey Hutchinson U.S. Senate
Superintendent & Staff Big Thicket NP	Todd Kneese, Chief Johnson City VFD	Mr. Steve Saxton
Ms. Elaine Lockhart Mr. Bill Arbon	Dr. Robert Bruenig Lady Bird Johnson Wildflower Ctr.	Stonewall Chamber of Commerce
Liz Waller, Mgr. Blanco Chamber of Commerce	Betty Sue Flowers, Dir. LBJ Library & Museum	Bradley Nielsen, Fire Chief Stonewall VFD
Stephen Zoeller, Extension Agent Blanco County Extension Office	Joe Beal - H-115 LCRA, Gen. Mgr.	U.S. House of Representatives The Honorable Lamar S. Smith
The Honorable Bill Guthrie Blanco County Judge	Mr. & Mrs. Alvin Weinheimer, Jr.	John Ahrns Westcave Preserve
Blanco Mayor	Mr. & Mrs. Roy Weinheimer	Mr. William B. Hodges
Terrance Rodgers, Supt. Blanco State Park	Mr. & Mrs. Lyndon Nugent	Rosie Kunkel, President Johnson City C of C
Superintendent & Staff Chamizal NM5	Mrs. Lynda Robb	Conservation District Pedernales Soil & Water
Mike Rush, Exec. Dir. Earth Share of Texas	LBJ Library & Museum Mrs. Lyndon B. Johnson	Ms. Evelyn Klein
Rob Trippet, Supt. Enchanted Rock SNA	Ms. Luci Johnson	C.A. Cowsert Natural Resource Conserv. Svc.
Attn.: Phyllis Burns Environmental Defense Fund	Superintendent & Staff NPS, Padre Island NS	Bill Botard, Extension Agent Gillespie County Extension Office
Superintendent & Staff Fort Davis NHS The Honorable Tim Crenwelge Fredericksburg Mayor	Superintendent & Staff NPS, Palo Alto Battlefield NHS	Robert L. Cook, Executive Dir. TPW
Fredericksburg VFD 124 W. Main St.	Benny R. Fuelberg, Jr. PEC, Inc.	Val & Shirley Smith Travel Mart Exxon
	Bill McDaniels, Supt. Pedernales Falls SP	The Honorable John Cornyn U.S. Senate
	Mary O'Boyle II Redstone Ranch	

Southwest Region National Parks & Conserv. Assoc.	Sierra Club Austin, TX
National Parks & Conserv. Assoc. Washington, DC	Travis Audubon Society
Superintendent & Staff NPS, Lake Meredith NRA	Botanical Research Inst. Of Texas
Review Coordinator U.S. EPA, Reg. Environmental	Conservation District Blanco-Pedernales Groundwater
Ecological Services Field Office U.S. Fish & Wildlife	Natural Resources Coordinator TPW, Wendy Connally
Executive Director Texas Comm on Environmental Quality	Conservation District Hill Country Underground Water
Exec. Administrator Texas Water Devp. Board	Tonkawa Tribe of Oklahoma President Carl Martin
Regional Office FRC 800 FEMA	Mescalero Apache Tribe President Sarah Misquez
Regulatory Branch, EV-R U.S. Army Corps of Engineers	Mr. William Roberts
Fredericksburg Field Office Natural Resource Conserv. Service	
FWS, Balcones NWR Attn.: Tom Ledbetter, Fire Mgmt. Nature Conservancy of Texas	
National Weather Service	
Len Deems, FMO NPS, IMR	
Regional Fire Coordinator Texas Forest Service	
Forest Res. Protection - Weather Texas Forest Service	
Valerie Schafer, Reg. Mgr. Texas Western National Parks Assoc.	
Ms. Freda Williams	
Communications Director Save Our Springs Alliance	

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APPENDIX A

CONSULTATIONS WITH TEXAS STATE HISTORICAL COMMISSION AND THE U.S. FISH AND WILDLIFE SERVICE

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THE MANGI ENVIRONMENTAL GROUP, INC.
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February 12, 2004

F. Lawrence Oaks, Executive Director
Texas State Historical Commission
P.O. Box 12276
Austin, Texas 78711

RECEIVED

FEB 17 2004

TEXAS HISTORICAL COMMISSION

Dear Mr. Oaks:

This letter initiates consultation with the Texas State Historical Commission on behalf of the National Park Service (NPS) in compliance with Section 106 of the National Historic Preservation Act (NHPA). The Mangi Environmental Group is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) for the Lyndon B. Johnson National Historical Park Fire Management Plan, Johnson City, Texas. The plan is guided by Director's Order-18 (DO-18) which requires that all park units with vegetation capable of sustaining fire develop a Fire Management Plan (FMP). Based on the results of scoping, alternatives for restoring native plant communities, combating invasive species, and protecting historic landscapes will be formulated and analyzed in detail.

The draft Fire Management Plan recognizes and reflects current federal fire policy guidance, which states that firefighter and public safety is the first and highest priority during any fire management activity. In the plan, the park proposes to suppress all wildland fires in a manner that minimizes negative environmental impacts from suppression activities, employ prescribed fire as a tool to meet management objectives, reduce hazardous fuels, and expand and create buffers around park structures and along certain areas along the park's boundary.

Under the proposed plan, all wildland fires in the park, human-caused fires and naturally ignited fires, e.g. lightning fires, would be declared wildland fires and suppressed in a manner that minimizes the negative environmental impacts of suppression activities. All wildfire suppression activities would adhere to Minimum Impact Suppression Tactics (MIST) guidelines.

The Park would employ prescribed fire on an approximately 19-acre prairie restoration area along with all of the park's pastureland over the next 5 years. Prescribed fires would occur primarily in the late fall or winter. The use of prescribed fire on the prairie restoration area would benefit this fire-adapted ecosystem and to help combat invasive exotic plants species. On the pastureland, prescribed fire would be used to help remove undesirable plant species, promote the growth of coastal Bermuda grass and other pasture grasses, and to recycle nutrients into the soil.

Protecting the historic/cultural landscapes and park buildings from wildland fires would be done by reducing hazardous fuels around all park structures and certain areas along the park's boundary. Mowed buffers around all park structures would be expanded to new park specifications. Structures will have defensible space consisting of:

- Removing brush from around the structures for a distance equal to 1 1/2 times the height of the structure plus 30 feet
- Limbing remaining trees within this buffer to 2 times the height of expected flame length in surface fuels (i.e. 6'), and thin or prune trees so that the widest portion of the crowns are at least 15 feet apart
- Mowing grassy fuels adjacent to all structures to maintain a 6-foot swath with 4-inch stubble. If wooden portions of a structure are within 9-inches of the ground, then surface fuels will be removed, to mineral soil, in a 9-inch swath.
- Removing fuel accumulation on roofs and gutters during periods of very high or extreme fire danger.

The Cedar/Oak Thicket Compartment lies adjacent to the Farm Equipment Storage Building. Structure protection for this facility would entail the creation of a defensible space by the following actions:

- Clearing all fuels to mineral soil to a distance of 3 feet around the structure
- Mowing grass within 12 feet of the structure to a height of 6" or less
- Clearing all juniper within 30 feet of the structure
- Limbing remaining trees and juniper within this buffer plus an additional 15 feet (i.e. 45 feet from the structure) to a height of 8 feet, and thin or prune trees so that the widest portion of the crowns are at least 15 feet apart
- Limbing trees and juniper to a height of 8 feet at a distance of 60 feet from the structure.

In addition, along critical portions of the park's boundary a 12-ft wide mowed buffer would be maintained, especially during the driest times of the year and during prescribed burns, in order to help prevent the spread of wildland fire to and from adjacent non-agency land. The park would work with neighboring landowners to reduce fuels on adjacent non-federal land.

Lyndon B. Johnson National Historical Park is listed on the National Register of Historic Places, and as such, its 544 Federally-owned acres are classified as a historic zone, and are managed in compliance with the standards as outlined in Management Policies of the National Park Service (1988), which limit physical development to the minimum

needed to preserve, protect, and interpret the historical, cultural, and archeological values, and which limit activities therein to sightseeing, interpretive presentations, and the study of the cultural features.

Major structures within the Johnson City District include the park headquarters/visitor center, Johnson's boyhood home (where he lived from 1913 to 1931), and the Johnson settlement area, which Johnson's grandfather, Samuel Ealy Johnson, Sr., used as headquarters for his open-range cattle business from 1867 to 1872. The original log house purchased and expanded by Sam Johnson still stands in the settlement area, as do several stone buildings constructed by later property owners.

The focal point of the LBJ Ranch District is the ranch house, which was purchased by the Senator and Mrs. Johnson in 1951. This was President Johnson's home and served as the Texas White House during his administration. The LBJ Ranch district also encompasses many auxiliary structures associated with presidential communications, transportation, and security, as well as the reconstructed birthplace house, the Junction School, the Johnson family cemetery, an airstrip, and a 3.5-acre pecan grove.

In addition to the 96 historic structures maintained by the National Park Service, some 10,430 historic objects are used to furnish or interpret the various sites. From the 1860s to the 1970s, the historic resources at the Lyndon B. Johnson National Historic Park document and communicate the heritage of the 36th President of the United States.

The cultural landscape inventory identified the following as among the more prominent elements that contribute to the ranch's primary period of significance, 1963-1973 (the years of Johnson's presidency and later retirement):

- The gently rolling topography of the Texas Hill Country
- The Pedernales River
- The ranch house complex
- The show barn complex
- The 35-acre pecan orchard
- The herd of Herefords
- The Johnson family cemetery
- The Junction School
- The network of roads (Ranch Road 1, Park Road 49, Bailey Road, and Malechek Road), paths, and fences

The cultural landscape inventory has also identified three potential component landscapes in the LBJ Ranch district:

- The Texas White House Complex - primarily consists of the ranch house and surrounding gardens and landscaped areas; roads and paths; the poolhouse, Martin barn, Secret Service command post, hangar, communications trailers and other outbuildings; east and west gates; the airstrip; and the Pedernales River.

- Agricultural Areas - consist primarily of the show barn complex, fields and pastures, water tanks, the pecan grove, and associated roads and paths.
- Historic areas - include the birthplace house, Junction School, Sam E. Johnson ranch house complex, all associated gardens and designed landscape areas, the Johnson family cemetery, the pecan grove between the birthplace house and Sam E. Johnson ranch house, the area between the Junction School and the birthplace house, the Pedernales River, and Park Road 49.

The museum collection and archives of Lyndon B. Johnson National Historical Park includes original furnishings, farm and ranch equipment, LBJ memorabilia, automobiles, archeological artifacts, photographs, and archival materials. There are currently over 7,400 objects in the museum collection that are documented to the catalog-data level, as well as over 2,800 archeological artifacts and approximately 150 natural history specimens. Objects from the collection are exhibited at the boyhood home, in the visitor center in Johnson City, and at the birthplace and the hangar carport at the ranch.

While the proposed FMP calls for the use of suppression tactics that minimize impacts to natural and cultural resources, when dealing with wildland fires, there is always a degree of uncertainty when trying to predict the potential impacts on cultural resources. The effects of fire on cultural resources are still not well understood or documented. For example, post-fire observations are often unable to distinguish between damage to archaeological resources caused by the fire itself from damage that was pre-existing. Thus, the following discussion of potential impacts of fire and fire management on cultural resources is of necessity general and somewhat speculative.

Both wildland fires and wildland fire suppression can affect cultural resources and historic properties. Fires themselves can and often do destroy historic structures or properties, especially those constructed of wood or other flammable material. Historic districts and cultural landscapes are also somewhat vulnerable to adverse impacts or destruction from wildfires.

The archaeological and cultural resources of the LBJ are limited and nonrenewable. When disturbed or removed from their context, the scientific information or cultural significance could be lost forever. Precautions will be taken during wildland fire suppression so important archeological and cultural resources are not destroyed.

Under the proposed FMP, Lyndon B. Johnson National Historical Park Office management would work with local agencies to aggressively suppress all wildland fires, taking into account the safety of firefighting personnel, the visiting public and protection of all resources at risk on the unit. All wildfires would be suppressed in a manner that minimizes negative environmental and cultural impacts from suppression activities. As outlined in the FMP, the preferred suppression tactics that would be used to minimize impacts to cultural resources along the Trail include:

- Keeping fire engines or slip-on units on existing roads.
- Using existing natural fuel breaks and human-made barriers, wet line, leaf blown lines, mowed lines or cold trailing the fire edge in lieu of fireline construction whenever possible.
- In rare circumstances when less disturbing techniques cannot be used, the use of bulldozers or heavy equipment in suppression may be authorized by the Park Manager or designee. Engines and other vehicles would be restricted from areas identified as potentially affected by vehicle traffic where rutting, soil compaction or other habitat damage could occur if at all possible;
- Handlines would be constructed only in areas where damage to known archeological and/or historic resources is not likely to occur.
- Keeping fireline width as narrow as possible when it must be constructed.
- Avoiding ground disturbance within known archeological/cultural/historic resource locations. When fireline construction is necessary in proximity to these resource locations it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible.
- Using soaker hose, sprinklers or foggers in mop-up; avoiding boring and hydraulic action.
- Avoiding sensitive areas identified in Natural Resource Inventories to the greatest extent possible.

In brief, while both wildland fire and wildland fire suppression can potentially have adverse affects on cultural resources within the areas bounded by the park, mitigations measures included as part of the minimum impact suppression tactics, outlined within the proposed FMP, have prioritized cultural resources during its formulation.

Impacts to cultural resources resulting from other proposed actions outlined in the proposed FMP would be minimal. Known cultural sites that could be potentially affected during mechanical thinning of hazardous fuels and prescribed fire use would be avoided to eliminate potential damage. Site boundaries would be clearly marked for avoidance, and sites would be monitored during and after completion of the activities. Because these sites would be avoided, there would be no effect to these cultural resource sites. With the creation/expansion of buffers around park structures and areas along the boundary, the cultural resources of the park would be protected to a greater extent from the potential of wildland fire.

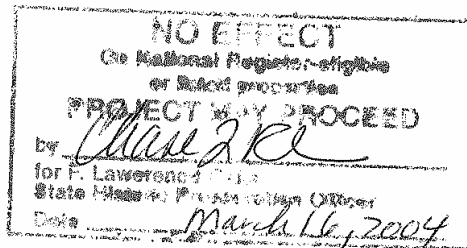
We are requesting your concurrence in this determination in accordance with Section 106 of the National Historic Preservation Act and the regulations (36 CFR part 800 of the Advisory Council on Historic Preservation regulations). We would appreciate receiving any comments you might have within the next 30 days. After evaluation of any comments that are received, the National Park Service would make a final determination regarding this project.

If you have any questions or comments regarding these proposed actions, please feel free to contact me at (703) 760-4801 x 231. Thank you very much.

Sincerely,



Joel Gorder
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*Viet Nam
Veteran
Owned*

February 12, 2004

Dawn Whitehead
Fish and Wildlife Service
Ecological Services Field Office
10711 Burnet Rd, Suite 200
Austin, TX 78758

Re: Federally Threatened and Endangered Species and Candidate Species at Lyndon B. Johnson National Historical Park, Johnson City, Texas.

Dear Ms. Whitehead,

On behalf of the National Park Service (NPS), the Mangi Environmental Group is preparing an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA) for the Lyndon B. Johnson National Historical Park Fire Management Plan. The NPS is currently in the early planning stages of this draft Fire Management Plan. Based on the results of scoping, alternatives for restoring native plant communities, managing the park's pastures, combating undesirable plant species, and protecting historic/cultural landscapes and park structures from wildland fire will be formulated and analyzed in detail.

The draft Fire Management Plan recognizes and reflects current federal fire policy guidance, which states that firefighter and public safety is the first and highest priority during any fire management activity. In the plan, the park proposes to suppress all wildland fires in a manner that minimizes negative environmental impacts from suppression activities, employ prescribed fire as a tool to meet fire management objectives, reduce hazardous fuels, and to expand/create buffers around park structures and along certain areas along the park's boundary to protect the park and its structures from the risk of wildland fire.

Under the proposed plan, all wildland fires in the park, human-caused fires and naturally ignited fires, e.g. lightning fires, would be declared wildland fires and suppressed in a manner that minimizes the negative environmental impacts of suppression activities. All wildfire suppression activities would adhere to Minimum Impact Suppression Tactics (MIST) guidelines.

The Park would employ prescribed fire on an approximately 19-acre prairie restoration area along with all of the park's pastureland over the next 5 years. Prescribed fires would occur primarily in the late fall or winter. The use of prescribed fire on the prairie restoration area would benefit this fire-adapted ecosystem and to help combat invasive exotic plants species. On the pastureland, prescribed fire would be

used to help remove undesirable plant species, promote the growth of coastal Bermuda grass and other pasture grasses, and to recycle nutrients into the soil.

Protecting the historic/cultural landscapes and park buildings from wildland fires would be done by reducing hazardous fuels around all park structures and certain areas along the park's boundary. Mowed buffers around all park structures would be expanded to new park specifications. Structures will have defensible space consisting of:

- Removing brush from around the structures for a distance equal to 1 1/2 times the height of the structure plus 30 feet
- Limbing remaining trees within this buffer to 2 times the height of expected flame length in surface fuels (i.e. 6'), and thin or prune trees so that the widest portion of the crowns are at least 15 feet apart
- Mowing grassy fuels adjacent to all structures to maintain a 6-foot swath with 4-inch stubble. If wooden portions of a structure are within 9-inches of the ground, then surface fuels will be removed, to mineral soil, in a 9-inch swath.
- Removing fuel accumulation on roofs and gutters during periods of very high or extreme fire danger.

The Cedar/Oak Thicket Compartment lies adjacent to the Farm Equipment Storage Building. Structure protection for this facility would entail the creation of a defensible space by the following actions:

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- Clearing all juniper within 30 feet of the structure
- Limbing remaining trees and juniper within this buffer plus an additional 15 feet (i.e. 45 feet from the structure) to a height of 8 feet, and thin or prune trees so that the widest portion of the crowns are at least 15 feet apart
- Limbing trees and juniper to a height of 8 feet at a distance of 60 feet from the structure.

In addition, along critical portions of the park's boundary a 12-ft wide mowed buffer would be maintained, especially during the driest times of the year and during prescribed burns, in order to help prevent the spread of wildland fire to and from adjacent non-agency land. The park would work with neighboring landowners to reduce fuels on adjacent non-federal land. The attached GIS map illustrates the locations and acreage for each of the prescribed fire units contemplated in the Park's draft Fire Management Plan.

While there are no federally listed threatened or endangered species documented within the park, the following federally listed and candidate species known to occur in Blanco and Gillespie County, Texas,

as per the U.S. Fish and Wildlife Service, Region 7 website:
(<http://ifw2es.fws.gov/endangeredspecies/lists/ListSpecies.cfm>):

Blanco County:

- black-capped Vireo (*Vireo atricapilla*) - Endangered
- Black-tailed prairie dog (*Cynomys ludovicianus*) – Species of Concern
- golden-cheeked warbler (*Dendroica chrysoparia*) – Endangered

Gillespie County:

- bald eagle (*Haliaeetus leucocephalus*) - Proposed Delisting
- black-capped Vireo (*Vireo atricapilla*) - Endangered
- black-tailed prairie dog (*Cynomys ludovicianus*) - Candidate Species
- golden-cheeked warbler (=wood) (*Dendroica chrysoparia*) - Endangered
- whooping crane (*Grus Americana*) - Endangered

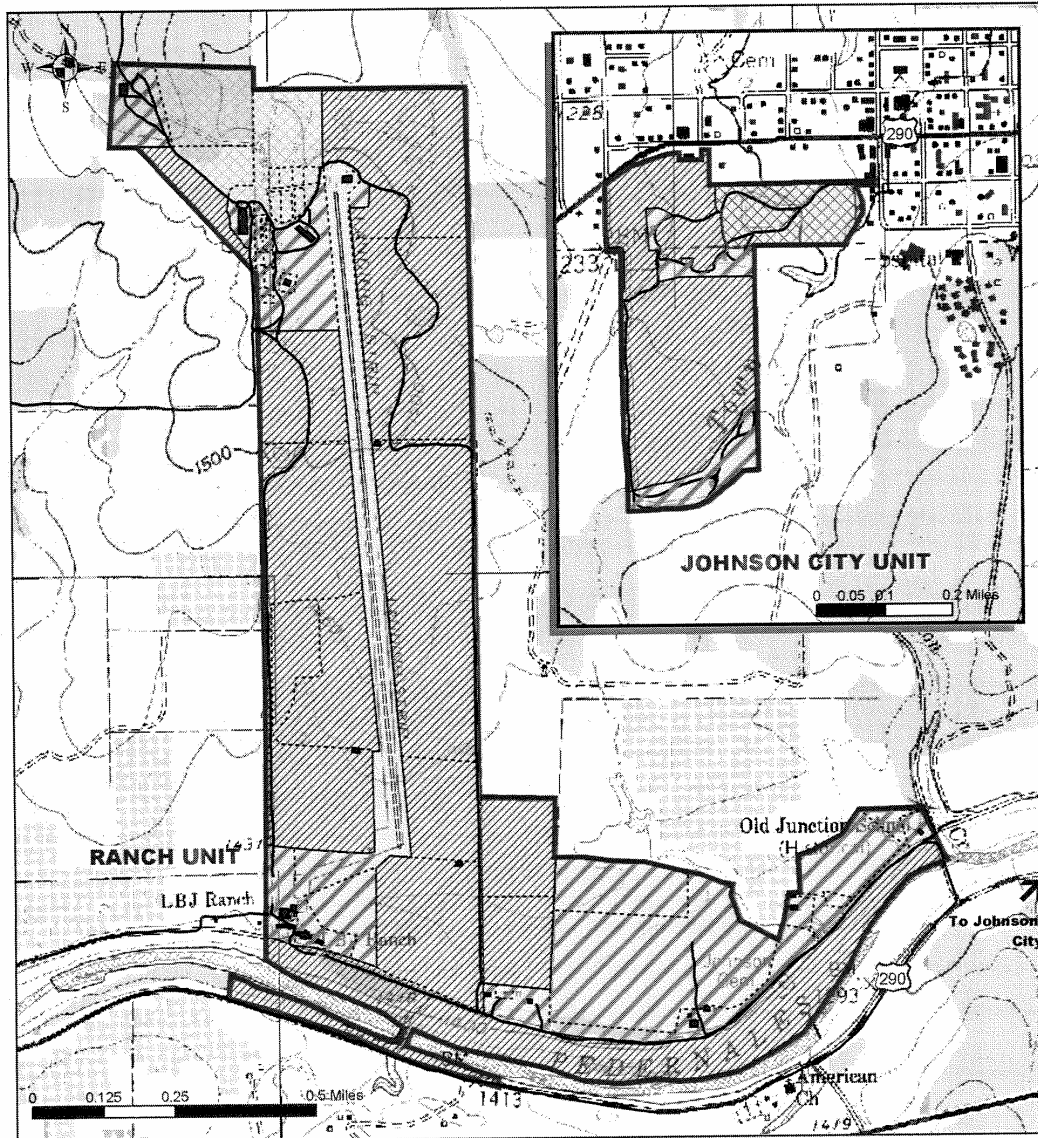
Please identify any additional resources within your purview that may experience potential impacts from this project and provide any comments or information within 15 days of receipt of this letter. Please send responses to:

Joel Gorder
7915 Jones Branch Drive, Suite 2300
McLean, VA, 22102

Should you require additional information or have questions concerning the proposed action, please contact me at 703-760-4801 ext. 231, fax 703-760-4899.

Sincerely,

Joel Gorder
Mangi Environmental Group, Inc.
7915 Jones Branch Drive
McLean, VA 22102
Phone - (703) 760-4801 Ext. 231
Fax - (703) 760-4899
jgorder@mangi.com
www.mangi.com



LYNDON B. JOHNSON NATIONAL HISTORICAL PARK FIRE MANAGEMENT PLAN

<p>Legend</p> <p> Lyndon B. Johnson National Historical Park</p>	<p>LYNDON B. JOHNSON NATIONAL HISTORICAL PARK</p>
<p>Fire Management Plan Compartments and Proposed Treatment</p> <p> Pastureland (Prescribed Burn)</p> <p> Developed Areas (Mowed)</p> <p> Cedar Oak Thicket (Thinning)</p> <p> Prairie Restoration Area (Prescribed Fire)</p>	<p>Notes:</p> <p>* Ranch Unit Data Sources - NPS, 2004; USGS 7.5-minute Quatrangles (Cave Creek School, TX; Stonewall, TX; Hye, TX; Rocky Creek, TX)</p> <p>** Johnson City Unit Data Sources - NPS, 2004; USGS 7.5-minute Quatrangle (Johnson City, TX)</p> <p align="right">MANGI</p>



United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974



MAR 10 2004

Joel Gorder
Mangi Environmental Group, Inc.
7915 Jones Branch Drive
McLean, Virginia 22102

Consultation # 2-15-04-I-0156

Dear Mr. Gorder:

This responds to your February 12, 2004, letter requesting comments from the U.S. Fish and Wildlife Service on the proposed prescribed fire plan at the Lyndon B. Johnson National Historical Park near Johnson City in Blanco and Gillespie counties, Texas. We understand the approximately 19-acre (7.7-hectare) prairie restoration project is designed to reduce hazardous fuels, combat invasive plants, and recycle soil nutrients and will involve clearing and limbing of Ashe juniper (*Juniperus ashei*) and other trees species.

Federally listed species

A list of federally listed species that may occur in Blanco and Gillespie counties is enclosed for your reference. Note the corrections to your list for the bald eagle (*Haliaeetus leucocephalus*) and the black-tailed prairie dog (*Cynomys ludovicianus*). Information about each of these species may be found by visiting the website: <http://endangered.fws.gov/wildlife.html>.

Handouts describing habitat for the black-capped vireo (*Vireo atricapilla*) and the golden-cheeked warbler (*Dendroica chrysoparia*) are enclosed for your reference. We are concerned that clearing or otherwise modifying vegetation, primarily Ashe juniper, may result in impacts to the golden-cheeked warbler. We recommend you assess the potential for habitat for this species to occur on or near the project area.

Generally, the Service believes that the best evaluation and determination of endangered species impacts result when surveys are conducted within the project area by persons with appropriate biological expertise. Often, the absence of endangered species can be determined and the project can then proceed without further concern. If assessments indicate that suitable habitat is likely to be affected either directly or indirectly, we recommend that you consult with us further. If any endangered species or their habitat are present, the project can often be modified to avoid all impacts. Please send any completed surveys or habitat assessments to our office for concurrence that no impacts will occur or for assistance in evaluating potential impacts.



Joel Gorder

2

Section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act), requires that all federal agencies consult with the Service to ensure that the actions authorized, funded, or carried out by such agencies do not jeopardize the continued existence of any threatened or endangered species or adversely modify or destroy critical habitat of such species. It is the primary responsibility of the National Park Service, as the federal action agency, to determine whether any action it authorizes, funds, or carries out may affect a federally listed or proposed species.

Candidate Species

We also recommend that you review the potential for your project to affect candidates such as black-tailed prairie dog. Candidate species are those that are being considered for possible addition to the threatened and endangered species list. There is sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but higher priority listings currently preclude issuance of a proposed rule for those species. Candidate species currently have no legal protection. If you find your project may potentially impact these species, the Service would like to provide technical assistance to help avoid or minimize adverse effects. Addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.

State-listed species

The State of Texas also protects certain species of plants and animals. Contact the Texas Parks and Wildlife Department (Endangered Resources Branch), Fountain Park Plaza Building, Suite 100, 3000 South IH-35, Austin, Texas 78704 (512-912-7011) for information concerning fish, wildlife, and plants of State concern.

Wetlands and Native Habitats

If your project will involve filling, dredging, or trenching of a wetland or riparian area it may require a Section 404 permit from the U.S. Army Corps of Engineers. For permitting requirements under Section 404 of the Clean Water Act, please contact the Fort Worth District, Permits Section, CESWF-EV-0, P.O. Box 17300, Fort Worth, Texas, 76102-0300, 817-978-2681.

Wetlands and riparian zones provide valuable fish and wildlife habitat as well as contribute to flood control, water quality enhancement, and groundwater recharge. Wetland and riparian vegetation provide food and cover for wildlife, stabilize banks, and decrease soil erosion. These areas are inherently dynamic and very sensitive to changes caused by such activities as overgrazing, logging, major construction, or earth disturbance. Construction activities near such areas should be carefully designed to minimize impacts. If vegetation clearing is needed in riparian areas, these areas should be revegetated with native wetland and riparian vegetation to prevent erosion or loss of habitat. We recommend minimizing the area of soil scarification and initiating incremental reestablishment of herbaceous vegetation at the proposed work sites. Denuded and/or disturbed areas should be revegetated with a mixture of native legumes and grasses. Species commonly used for soil stabilization are listed in the Texas Department of

Joel Gorder

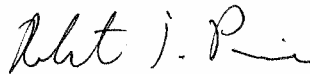
3

Agriculture's (TDA) Native Tree and Plant Directory, available from TDA at P.O. Box 12847, Austin, Texas, 78711.

We also urge you to take all precautions to ensure sediment loading does not occur to receiving streams in the project area. To prevent and/or minimize soil erosion and compaction associated with construction activities, avoid any unnecessary clearing of vegetation, and follow established rights-of-way whenever possible. All machinery and petroleum products should be stored outside the floodplain and/or wetland area during construction to prevent possible contamination of water and soils. No permanent structures should be placed in the 100-year floodplain.

Thank you for your concern for endangered and threatened species and other natural resources, and we appreciate the opportunity to comment on the proposed project. If we can be of further assistance or if you have any questions about these comments, please contact Jana Milliken at 512-490-0057, extension 243. Please refer to the Service Consultation number listed above in any future correspondence regarding this project.

Sincerely,



Robert T. Pine
Supervisor

Enclosures

Federally Listed as Threatened and Endangered Species of Blanco and Gillespie Counties

DISCLAIMER

This list is based on information available as of on September 12, 2003. This list is subject to change as new biological information is gathered and should not be used as the sole source for identifying species that may be impacted by a project.

Migratory Species Common to many or all Counties: Species listed specifically in a county have confirmed sightings. If a species is not listed they may occur as migrants in those counties.

Least tern	(E ~)	<i>Sterna antillarum</i>
Whooping crane	(E w/CH)	<i>Grus americana</i>
Bald eagle	(T)	<i>Haliaeetus leucocephalus</i>
Piping plover	(T w/CH)	<i>Charadrius melodus</i>

Blanco County

Black-capped vireo	(E)	<i>Vireo atricapilla</i>
Golden-cheeked warbler	(E)	<i>Dendroica chrysoparia</i>
Black-tailed prairie dog	(C)	<i>Cynomys ludovicianus</i>

Gillespie County

Black-capped vireo	(E)	<i>Vireo atricapilla</i>
Golden-cheeked warbler	(E)	<i>Dendroica chrysoparia</i>
Whooping crane	(E w/CH)	<i>Grus americana</i>
Bald eagle	(T)	<i>Haliaeetus leucocephalus</i>
Black-tailed prairie dog	(C)	<i>Cynomys ludovicianus</i>

INDEX

Statewide or areawide migrants are not included by county, except where they breed or occur in concentrations. The whooping crane is an exception; an attempt is made to include all confirmed sightings on this list.

- E = Species in danger of extinction throughout all or a significant portion of its range.
- T = Species which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.
- C = Species for which the Service has on file enough substantial information to warrant listing as threatened or endangered. These species currently have no legal protection. However, addressing these species at this stage could better provide for overall ecosystem health in the local area and may avert potential future listing.
- CH = Critical Habitat (in Texas unless annotated ‡)
- ~ = protection restricted to populations found in the “interior” of the United States. In Texas, the least tern receives full protection, except within 50 miles (80 km) of the Gulf Coast.



THE MANGI ENVIRONMENTAL GROUP, INC.
7915 Jones Branch Dr. McLean VA 22102
703 760 4801 Fax 703 760 4899
www.mangi.com



*Viet Nam
Veteran
Owned*

October 15, 2004

Dawn Whitehead
Fish and Wildlife Service
Ecological Services Field Office
10711 Burnet Rd, Suite 200
Austin, TX 78758

Re: Survey for habitat for golden-cheeked warbler (*Dendroica chrysoparia*) and black-capped vireo (*Vireo atricapillus*) at Lyndon B. Johnson National Historical Park, Johnson City, Texas.

Dear Ms. Whitehead,

This is in response to your letter of March 10, 2004 to Joel Gorder of our office. Mr. Gorder had asked for your comments on the National Park Service's draft Fire Management Plan at Lyndon B. Johnson National Historical Park. You recommended that the park survey for habitat suitable for the above species.

Attached is a letter documenting the results of that survey. Based on the findings, we ask for your concurrence that no impacts to these species would occur as a result of the park's proposed fire management activities.

Please send your response to:

Rachel Shaw
Mangi Environmental Group
7915 Jones Branch Drive, Suite 2300
McLean, VA, 22102

If you need to contact me, you can reach me at 703-760-4801 ext. 235, fax 703-760-4899.

Sincerely,

Rachel Shaw
Environmental Analyst



United States Department of the Interior

NATIONAL PARK SERVICE
Southern Plains Inventory and Monitoring Network
P.O. Box 329
Johnson City, Texas 78636

N1621

April 1, 2004

Brian Carey
Lyndon B. Johnson National Historical Park
P.O. Box 329
Johnson City, TX 78636

Dear Mr. Carey:

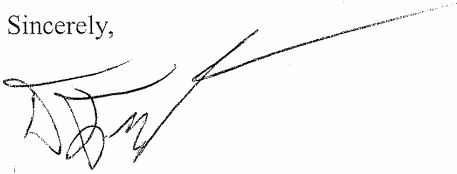
On March 30, 2004, I visited Lyndon B. Johnson National Historical Park (LBJ) to evaluate the park for golden-cheeked warbler (*Dendroica chrysoparia*) and black-capped vireo (*Vireo atricapillus*) habitat. Also on the site visit were yourself, Jason Lott (Lyndon B. Johnson NHP) and Heidi Sosinski (Southern Plains Inventory and Monitoring Network).

The first area we visited was in the vicinity of the hay barn at the LBJ Ranch District. This area was approximately 5 acres in size and dominated by ashe juniper (*Juniperus ashei*), live oaks (*Quercus fusiformis*) and Texas red oaks (*Quercus buckleyi*). The juniper were young (no trees with shredding bark) and invading the area. There were no large mature junipers in the area. The area was surrounded by grazed savannah with little to no ashe juniper. This area is not habitat for either species due to the young age of the juniper, the small size of the area, and being surrounded by grazed savannah.

The second area we visited was at the south end of the LBJ Johnson City District near the volunteer-in-parks camping area. This forested area was along Town Creek, which is a flat meandering creek that was dry at the time of the visit. The forested area is linear, only 1-2 acres in size and dominated by ashe juniper and cedar elm (*Ulmus crassifolia*). There were a few scattered mature juniper with peeling bark (5-10 trees). The area is surrounded by grazed pasture with very few trees to the north and west, grazed pasture with invading young juniper to the east, and a developed area used for camping, storage and fuel to the south. This area is also not suitable habitat for either bird species due to its small size, the low number of mature juniper trees, and because it is surrounded by pasture and development with few or no trees.

Based on the visits to these two areas, Lyndon B. Johnson does not have any suitable habitat for either golden-cheeked warblers or black-capped vireos. Please let me know if you have any further questions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Dustin Perkins', with a long horizontal stroke extending to the right.

Dustin Perkins
Network Coordinator

Enclosures:
Resume of Dustin Perkins

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APPENDIX B

PERSONS, ORGANIZATIONS, AND AGENCIES INVITED TO COMMENT ON PROPOSED FIRE MANAGEMENT PLAN

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A.D. Wallace Fencing
Adam's Insurance
TPW, Admiral Nimitz SHP
Advantage Copier
After Hours Automotive
Air Force-Army Newspapers
Alamo Area Council of Govts.
NPS, Alibates Flint Quarries NM
NPS, Amistad NRA
Arlington Morning News
Arriba Arts & Business News
Austin-American Statesman
Bamberger Ranch
Bandera Bulletin
Mr. & Mrs. Al Baethge
The Honorable John Cornyn
Banner Press
Belton Journal
Daily University Star
Fayette County Record
Flatonia Argus
Floresville Chamber of Commerce
Houston Chronicle
Ms. Freda Williams
Bassett Cabinet Co.
Bastrop Advertiser
Bay City C of C & Ag.
Ms. Becky Crider
Mr. Ben Moffett
Benson Farm & Ranch
NPS, Big Bend NP
Big Tex
NPS, Big Thicket NP
Mr. Bill Arbon
Blanco Chamber of Commerce
Blanco County Extension Office
Blanco County Farm Bureau
Blanco County Judge
Blanco County News
Blanco County Sheriff
Blanco County Supply Co., Inc.
Blanco Mayor
Grape Creek Vineyards
Parker Lumber Company
Johnson City City Council
Hutto Herald
La Nueva Opinion
Hayes & Kay Pits
Blanco National Bank
TPW, Blanco State Park
Mr. Bobby W. Hodges
Boerne Chamber of Commerce
Boot Hill Herbs
Burnet Bulletin
Burnet Chamber of Commerce
Capital Area Planning Council
Cap's Corner Market
Ms. Carolyn Holler

Carpenter & Associates
Ms. Carrol Ordner
Castroville News Bulletin
Cattleman's Bank
Cattleman's National Bank
Cave Creek Emus
Century 21
NPS, Chamizal NM
Chantilly Lace
Cheers Liquor Store
TPW, Choke Canyon SP
Church of Christ
Citizens Gazette
City of Boerne
City of Burnet
City of Fredericksburg
City of San Saba
TPW, Colorado Bend SP
Comfort News
Commercial Alternator
Community & Economic Devp.
Community Church of the Hills
Community Garden Club
Cook Elementary
Crenwelge Motor Sales
Croft's Funeral Home
CTEC, Inc.
Germania Insurance
Daily University Star
Darn It
Mr. & Mrs. Dave Mertens
Peake Construction
Crissy McCoy, Membership Mgr.
Mr. David Cox
Diamond H Satellite &
Communications/The Friendly Bar
Mr. & Mrs. Dick Welch
Dir. Of State Projects
Mr. & Mrs. Doc Stone
Mr. & Mrs. Don Burke
Mr. & Mrs. Donald Krall
Down Home
LBJ Medical Center
Dr. David White, DDS
Dr. Dee Ann Story
Dr. Mary Hagemeyer, DDS
Dr. Shirley Beck
Dr. Tim Barsch, DDS
Dripping Springs C of C
Dripping Springs Century News
Dripping Springs Dispatch
Duane Lokken & Co.
Eagle Lake C of C
Eagles Nest Day Care
Earth Share of Texas
Mr. Edwin C. Bearss
El Campo C of C and Ag.
Lake Travis Log

Latino Leaders
Robyn's Exclusives
Elgin Chamber of Commerce
Mr. & Mrs. Elliott Davis
Ms. Emma Jean Becker
TPW, Enchanted Rock SNA
Environmental Defense Fund
Ms. Evelyn Woods
Felps Automotive
First Baptist Church
First Christian Church
First United Methodist Church
Flatonia C of C
Flint River Crossing
NPS, Fort Davis NHS
Mr. & Mrs. Frank Arnosky
Fredericksburg C&VB
Fredericksburg ISD
Rose Hill Manor
Fredericksburg Mayor
Fredericksburg Parks & Rec.
Fredericksburg Standard-
Fredericksburg VFD
Free Press
Friends of LBJ Library
TPW, Ft. McKavett SHP
Ft. Worth Star Telegram
TPW, Garner State Park
Gem of the Hills
Gene Jordan & Son Const.
Giddings Times & News
Gillespie Co. Commissioner
Gillespie County Extension Office
Gillespie Co. Fair & Festivals Assn.
Gillespie Co. Historical Society
Gillespie Co. Historical Society
Gillespie County Commissioner
Schaeffer's Funeral Home, Inc.
Scherer's T Bar S Ranch
Security State Bank & Trust
Simon J. Burg Co., Inc.
Liberty Hill Independent
Save Our Springs Alliance
Gillespie County Commissioner
Gillespie County Commissioner
Gillespie County Judge
Gillespie County Sheriff
Global Strategy Consultants
Good Shepherd Catholic Church
TPW, Goose Island SP
Mr. & Mrs. Gordon L'Heureux
Governor's Committee of
Granger News
Greater Bastrop C of C
NPS, Guadalupe Mountains NP
TPW, Guadalupe River SP
Hambright Surveying
Hays County Free Press

National Park Service
Lyndon B. Johnson National Historical Park

Environmental Assessment
Fire Management Plan

Heart of Texas Rentals
Hill Country Cupboard
Hill Country Foundation
Hill Country News
Home Ranch Realty
Houston Chronicle
Johnson City Garden Club
Mr. Travis Weidenfeller
Mr. & Mrs. Robert Shoop
Mr. & Mrs. David Smith
Mr. James J. Smith
Ms. Julia Lott
Johnson City C of C
Pedernales Soil & Water
Bulverde Standard
Silver K Café
LCRA, Sarah Page
Llano News
National Parks & Conserv. Assoc.
New Texas
San Antonio Express News
Stonewall Bulletin
Williamson County Sun
Wimberley Valley News
NPS, Lake Meredith NRA
Alamo Area Council
The Hill Country Sun
Mr. & Mrs. Howard Edwards
TPW, Eisenhower SP
Mr. & Mrs. Jack Brummel
Mr. James Hines
JC Antique Emporium
Charlene Coakley
Mr. & Mrs. Jim Wimberly
Mr. Jim Hardin
Ms. Joan Marasek
Mr. Joe Herring, Jr.
Mr. & Mrs. John Grof
Johnson City Bank
Johnson City Chief of Police
Johnson City City Council
Johnson City Mayor
Johnson City Dairy Queen
Johnson City Recycling
Johnson City Independent
Johnson City Housing Authority
Johnson City Hydro Gas Co.
Johnson City ISD
Johnson City Library
Johnson City Mini Storage
Johnson City Post Office
Johnson City Record Courier
Johnson City Soda Factory
Johnson City VFD
Johnson City Women's Civic Club
Jourdan Bachman Pioneer Farm
Mr. & Mrs. Al Tasch
Julia Jarrell, ACC Dist.
Junction Eagle

JWJ Welding
Ms. Kathleen English
Ms. Kay Taebel
Keith, Weber & Mosty PLLC
Kerrville C of C
Kerrville Daily Times
TPW, Kerrville-Schreiner SP
Kingsland/Lake LBJ C of C
KJ Computers
Klepac Bros. Greenhouse
Kyle Eagle
La Presna De San Antonio
Lady Bird Johnson Municipal Park
Lady Bird Johnson Wildflower Ctr.
Lago Vista C of C
La Grange Area C of C
TPW, Lake Brownwood SP
Lake Buchanan/Inks Lake C of C
Lake Travis View
Lampasas C of C
Lampasas Dispatch Record
LaPresna Austin
LBJ Library & Foundation
LBJ Library & Museum
LBJ Museum @ San Marcos
Altwein Enterprises
LCRA, Gen. Mgr.
Lindig Construction
Lindig Trucking & Repair
Llano Chamber of Commerce
U.S. EPA, Reg. Environmental
Curtis Chubb
U.S. Fish & Wildlife
Texas Natural Resource Conserv.
Texas Water Devp. Board
Gillespie Soil & Water
Lockhart Post-Register
Lone Star Specialties
TPW, Lost Maples SNA
Luling Newsboy
Mr. & Mrs. Alvin Weinheimer, Jr.
Mr. & Mrs. Douglas Hubbard
Mr. & Mrs. Dwayne Hoppe
Mr. & Mrs. J.J. Pickle
Mr. & Mrs. James Eckert
Mr. & Mrs. Jimmy Duecker
Mr. & Mrs. Joel Honeycutt
Mr. & Mrs. Ken Cathey
Mr. & Mrs. Rex Armstrong
Mr. & Mrs. Roy Weinheimer
Mr. & Mrs. Ruben Reubsahm
Magnolia Oaks B & B
Marble Falls C of C
Marble Falls Highlander
Ms. Martha Knoll
Mr. & Mrs. Charles Klein
Mason County News
Sunday House Inn & Suites
Mr. & Mrs. Jim Brown

Mason Chamber of Commerce
Johnson City City Council
Mr. Davie Eugene Benner
Mr. D. R. Bushnell, Jr.
Sierra Club
Me & My Sister
Ms. Melody Webb
Metcalf Chevron
Mr. Michael A. Schuett, Ph.D.
Mid Tex Waste
Mr. Mike Adkins
Momentum Internet Services
Moursund & Moursund
Mr. & Mrs. Brent Covert
Mr. & Mrs. Harold Kusenberger
Mr. & Mrs. Jack Ebeling
Mr. & Mrs. Jeremy McIntosh
Mr. & Mrs. Lyndon Nugent
Mr. Birge Alexander
Mrs. Lynda Robb
Mrs. Lyndon B. Johnson
Ms. Catherine Robb
Ms. Claudia Nugent
Ms. Jennifer Robb
Ms. Luci Johnson
Ms. Lucinda Robb
National Park Foundation
Oakwood RV Park
FEMA
U.S. Army Corps of Engineers
Natural Resource Conserv. Service
NPS
NPS, IMR
NPS, IMR
NPS, RTCA Program
Native by Native Landscapes
Nat'l. Museum of the Pacific War
New Braunfels Herald-Zeitung
News 8 Austin
News Dispatch
North Blanco County EMS
North Lake Travis Log
North San Antonio Times
Nueva Opinion
Oak Hill Gazette
Oaktree Collectibles
Odiorne Feed & Ranch Supply
On the Square Clothing
NPS, Padre Island NS
Palacios Chamber of Commerce
Hill Country RV Park
Fredericksburg RV Park
FWS, Balcones NWR
Mr. J.F. Glosso, Jr.
NPS, Palo Alto Battlefield NHS
Pasquales
City of Johnson City
Mr. Pat Robertson
Ms. Patty Leslie Pasztor

PEC, Inc.	Stonewall Chamber of Commerce	Topwater
PEC, Inc.	Mr. Henry Burg	Travis Audubon Society
PEC, Inc., Economic Devp.	Mr. Jim Cathey	Tribune Progress
TPW, Pedernales Falls SP	Texas Department of	Trinity Lutheran Church
Pedernales Hills Resort	Blanco County Constable	Truvy's Hair Design
Pflugerville Pflag	Nature Conservancy of Texas	NPS, IMR
Pick a Paint	National Weather Service	M.P. Thompson
Ms. Priscilla Goeken	Stonewall Chamber of Commerce	Jo Swann, President
Redstone Ranch	Stonewall Chamber of Commerce	Mr. & Mrs. Merlyn Saxton
TPW Region 1 Headquarters	Stonewall Chamber of Commerce	Texas Department of Transportation
TPW Region 2 Headquarters	Stonewall Chamber of Commerce	Susan Rode Laughlin
TPW Region 3 Headquarters	Stonewall Elementary School	Texas Forest Service
TPW Region 4 Headquarters	Stonewall Farm Mutual	Texas Interagency Coord. Center
TPW Region 5 Headquarters	Stonewall Head Start, Inc.	Texas Forest Service
TPW Region 6 Headquarters	Stonewall Heritage Society	Western National Parks Assoc.
TPW Region 7 Headquarters	Ms. Hazel Hanson	Texas Dept. of Commerce
Ms. Anita Burg	Stonewall VFD	U.S. Dept. of Commerce
Blanco County Surveyor	Strickland Drugs	U.S. Secret Service
Blanco County Appraisal District	Stroher & Sons, Inc.	Uncle Kunkel's BBQ
TPW Region 8 Headquarters	Sunday Sun	United Pentecostal Church
Region VI, Heard Museum	Super S Foods	Vacations to Go
Reilly Elementary School	T Star Internet	Valley Freedom Newspaper
Mr. & Mrs. Richard Parrish	Mr. & Mrs. Lonnie Childs	Weimar C of C
Road Runner RV Park	Wildflower Inn	Westcave Preserve
Ronnie's BBQ	Two-Step Plumbing	Westlake Picayune
Round Rock Leader	Miller Creek RV Park	Wharton C of C
Salt Lick Feed	NPS, IMR	Whittington's Jerky, Inc.
Mr. Sammy Segner	Mr. & Mrs. Russell Schneider	Wildseed Farms, Inc.
San Antonio Business Journal	San Angelo Flight Service	Mr. William B. Hodges
San Antonio Current	San Antonio Missions NHP	Ms. Evelyn Klein
San Antonio Informer	Taylor Daily Press	Coleman Distributing
NPS, San Antonio Missions NHP	Terpstra & Moss Properties	Wimberley View
San Antonio Observer	Texans for State Parks	Texas Land Trust Council
San Antonio Register	Texas Hills Vineyard	Budget Inn Motel
San Saba County Chamber	Texas Nature Tourism Assoc.	Lone Star Computer Consultants
San Saba News & Star	TPW	Hill Country Savers
Blanco County Commissioner	TPW	Texas Historical Commission
Blanco County Commissioner	TPW	Texas Historical Commission
Blanco County Commissioner	Texas State Historical	Botanical Research Inst. Of Texas
Blanco County Constable	The Bar	Blanco-Pedernales Groundwater
Travis Audubon Society	The Boerne Star	TPW, Wendy Connally
Ms. Sandra Nevins	The Daily Texas	Hill Country Underground Water
Mr. & Mrs. Sarge Biggs	The Elgin Courier	President Carl Martin
Schulenburg C of C	The Exotic Resort Zoo	Fredericksburg Vet. Hospital
Scott's Custom Fencing	The Gazebo	Mr. & Mrs. Roy Bruemmer
TPW, Seminole Canyon SHP	The Hill Country Recorder	LCRA, John Gosdin, Mgr.
The Honorable Kay Bailey	The Honorable Lamar S. Smith	Kirk Cowan, Mgr., LCRA
Senior News	The Mountain Sun	LCRA Parks
Ms. Sheryl Smith-Rodgers	The Old Lumberyard	Brian Trusty, Supervisor
Sladek Real Estate	The Picayune	Michael D'Eath
Smith Investments	The Screen Door	Mr. Alton L. Klein
Smithville C of C	The Smithville Times	Ms. Billie Ruth Crider
South Llano River SP	The Texas Triangle	Jimmy & Dottie Deal
St. Francis Xavier Catholic Church	The Washboard	Johnson City Chevron
Sta Bilt Products	Mr. Tom Holubik	Johnson City City Office
Mr. Stan Klein	Mr. Thomas Felps	Cave Creek Realty
Mr. Steve Saxton	Times Guardian &	Edward Jones Investments
Stonewall Chamber of Commerce	Mr. & Mrs. Tom Koch	Chairperson Kevin Battise
	Tony's Garage	Chairman Juan Garza

National Park Service
Lyndon B. Johnson National Historical Park

Environmental Assessment
Fire Management Plan

President Sarah Misquez
Chairman Alonzo Chalepah
Chairperson Clifford McKenzie
Andy's Diner
Becker Farms, Inc.
Class A Rentals
Creative Awards & Trophies
Fredericksburg Inn & Suites
Stonewall Chamber of Commerce
Allied Ag
Arrowhead Bank
Bank One
Chem Tac, Inc.
Comfort Inn
Community Medical Rental &
Supply
Fredericksburg Realty
G & J Herefords
Gastehaus Schmidt
Geistweidt, Neffendorf, Klein &
Gillespie County Farm Bureau
Gillespie Livestock Co., Inc.
Gold Orchards, Inc.
Gordon's Repair Shop
Grape Creek Country Market
Guaranty Federal Savings Bank
Heimplatz Am Fluss
Herbert Schmidt Electric, Inc.
Hill Country Harvest
Hill Country Memorial Hospital
Hill Country Propane, Inc.
Immel Motors
Jek's Pit Stop, Inc.
Jenschke Furniture Co.
Kino Oil, Inc.

Knopp & Metzger, Inc.
Lindig's Café
Oma's Haus & Garten
Stonewall One Stop & Diner
Sonic Drive-In
Topicals "R" Fun
Vapo Butane Company
Vogel Orchards
Von Zensenburg Quilts
Weinheimer & Son, Inc.
Woodrose Winery
Mr. Lawrence J. Klein
Mr. A.J. Loth
Mr. & Mrs. Emory Long
Mr. Travis Lucas
Mr. & Mrs. Conrad Matysiak, Jr.
Rev. Jan McGrath
Mr. & Mrs. Albert E. Meier
Mr. Norman Nevins
Mr. Mike Daughtery
Mr. Bart English
Ms. Lydia Fishel
Mr. Roger W. Green
Mr. & Mrs. Lawrence Gold
Ms. Estella Hartmann
Mr. Guy W. Jones
Mr. & Mrs. Clark O'Briant
Mr. & Mrs. Ken Otte
Mr. & Mrs. John Pehl
Mr. & Mrs. Ricky Priess
Mr. & Mrs. Stanley Prochnow
Mr. Randy Ransleben
Mr. & Mrs. WM Schieve
Mr. & Mrs. Roy Schmidtzinsky
Mr. & Mrs. Charles Schumann

Mrs. Willie Schumann
Mr. & Mrs. Sam Smith
Mr. & Mrs. George Vogel
Mr. Kris Weidenfeller
Dallas Morning News
The Pearl
Highland Lakes Bank
Natural Resource Conserv. Svc.
Gillespie County Extension Office
TPW
Blanco Co. Historical
NPS, Texas State Coordinator
Hill Country Visitor Center
The Preserve at Walnut Springs
Hill Country Greetings
Backyard Arena
Sharp Construction
Mr. & Mrs. Tom Mills
Odiorne Fencing
D'Lee Pickett School of Dance
Mr. & Mrs. Bill Pollock
Texas Hill Country RV Site
Travel Mart Exxon
Lightning "W" Expeditions
The Gingerbread House
Texas Workforce Center
The Texas River Palace
Cellular One
Mr. & Mrs. Richard Bailey
Lightning "W" Expeditions
Mr. Larry Smith
Lone Star Loans
Blanco County Wheels and Feet

APPENDIX C

Five Year Fuels Treatment Plan

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Lyndon B. Johnson National Historical Park Five Year Fuels Treatment Plan

Fuels Treatments Key

PB = Prescribed Burn M= Mechanical Shredding G=Grazing

Burn Units	2005				2006				2007				2008				2009			
	W	SP	SU	F	W	SP	SU	F	W	SP	SU	F	W	SP	SU	F	W	SP	SU	F
LBJ Ranch FMU																				
E. Barley Field	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
N. Bailey Field	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
S. Bailey Field	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
Pecan Orchard			M	G			M	G			M	G			M	G			M	G
Jordan River Bottom	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
S. River Bottom	G	G	M,G	G	G	G	M	G	G	G	M,G	G	G	G	M,G	G	G	G	M,G	G
E. Oat/Air Field	G	G,M	G	G	G	G,M	G	G	G	G,M	G	G	G	G,M	G	G	G	G,M	G	G
Fish Tank	G	G	M,G	G	PB	G	M,G	G	G	G	M,G	G	PB	G	M,G	G	G	G	M,G	G
Hay Shed	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
Dales Trap	G	G	G	G	PB	G	G	G	G	G	G	G	PB	G	G	G	G	G	G	G
Leaky Tank	G	G	G	G	PB	G	G	G	G	G	G	G	PB	G	G	G	G	G	G	G
Little Tank	G	G	G	G	PB	G	G	G	G	G	G	G	PB	G	G	G	G	G	G	G
West Barley Field			M				M				M				M				M	
HQ Coastal			M				M				M				M				M	
Johnson City FMU																				
Praire Resoration		M				PB				PB				M				PB		
Horse/Steer Past.	G	G	G	G,M	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
Cabin area		M		M		M		M		M		M		M		M		M		M
Long Horn Past.	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
M. Long Horn Past.	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
S. Back 40		M				PB				PB				M				PB		
Bruckner Barn		M,G		G		PB		G		PB		G		M		G		PB		G
Back 40 Admin				M				M				M				M				M

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