



National Park Service
U.S. Department of the Interior
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
Texas

Fire Management Plan

Environmental Assessment



Prepared for:
National Park Service
U.S. Department of Interior
Lake Meredith National Recreation Area
And
Alibates Flint Quarries National Monument
Fritch, Texas

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Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument Fire Management Plan Environmental Assessment

Summary

Lake Meredith National Recreation Area (LAMR) and Alibates Flint Quarries National Monument (ALFL) are proposing to update their Fire Management Plan (FMP) to formally lay out the process and actions for prescribed burning on adjacent private ranchlands, including the attendant vegetation manipulation necessary along firelines to control these prescribed burns. National Fire Policy has changed in recent years and the updated terminology and policy would be incorporated into the FMP; these policy and terminology changes have been analyzed and approved on an interagency basis at the national level. Due to updates in environmental regulations and increasing the size of future prescribed burns, the National Park Service (NPS) has determined that it is necessary to do a NEPA analysis of the increased prescribed burning on private lands adjacent to LAMR.

This Environmental Assessment (EA) evaluates 2 alternatives; a No Action Alternative (I), and the Preferred Alternative (II).

Alternative I, No Action Alternative - This alternative represents what would occur at LAMR if the fire management program is limited to fuels management activities occurring only on NPS lands. This alternative provides a baseline for comparing and evaluating the impacts to the environment by the action alternative. The approved fire and fuels management program at LAMR would continue, but prescribed burning activities would be limited to NPS lands inside LAMR and ALFL. This would likely hinder successful prescribed burning in many areas, and result in limiting the acres and amount of vegetative fuels treated inside the park. This would result in a buildup of fuels in certain park areas that could lead to future uncontrollable wildfires, both within and adjacent to the park. These wildfires could threaten visitors, adjacent communities, NPS infrastructure, and oil and gas facilities both within and adjacent to NPS lands.

Alternative II, Preferred and Environmentally Preferred Alternative – Under this alternative, the LAMR fire management program would continue as it currently exists, with the addition of utilizing prescribed burning on NPS and immediately adjacent private lands, with the permission of landowners. The fire staff would use ranch roads as firelines where prescribed fires could be safely stopped and contained. Hand or mechanical treatments approved in the LAMR Fire Management Plan would be utilized to improve firelines where needed and to protect identified natural, cultural features, or facilities. Larger prescribed burns could be implemented to more effectively reduce wildfire risk, and prevent large wildfires in the area by creating blocks of reduced vegetation that would not carry fire. Thus these activities would protect visitors, nearby communities, park infrastructure, and oil and gas facilities better than the no action alternative.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) to provide the decision-making framework that:

- 1) analyzes a reasonable range of alternatives to meet objectives of the proposed plan;

- 2) evaluates potential issues and impacts to the natural and cultural resources of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument; and
- 3) identifies specific and required mitigation measures that are designed to lessen the degree or extent of these impacts.

Resource topics determined to potentially be affected by the alternatives include: Air Quality, Geologic and Soil Resources, Vegetation Resources (including Invasive Weeds), Wildlife, Special Status Species, Water Resources, Archeological, Historic Resources, Oil and Gas Development, Adjacent Landowners and Uses, and Human Health and Safety. Other resource topics were examined and dismissed because it was determined that this plan would result in only negligible or minor effects to those resources. No major effects are anticipated as a result of this program.

Public Comment

External scoping was conducted by distributing a scoping letter to inform the public and various agencies of the proposed fireline extension to include immediate adjacent private lands at LAMR and to solicit feedback on the EA. The scoping letter dated November 18, 2011 was mailed to various federal and state agencies, and affiliated Native American tribes. The Lake Meredith National Recreation Area FMP EA will be available via the internet at <http://parkplanning.nps.gov/Plans.cfm>. If you wish to make a comment on this EA, please submit written suggestions, comments, and concerns regarding the proposed project online at the NPS Planning, Environment, and Public Comment (PEPC) website at: <http://parkplanning.nps.gov/>. Click on Texas in the “Choose a State” pulldown menu, then click on the Lake Meredith National Recreation Area in the “Choose a Park” menu, then click on the “Expanded Prescribed Burning Adjacent to Lake Meredith National Recreation Area and Alibates Flint Quarry,” then click on “Open for Public Comment” on the left sidebar, then click on the document and finally click on “Comment on Document”.

If you are not able to submit comments electronically and wish to comment on this EA, please mail your comments to the name and address listed below. The EA will be available for public comments for 30 days; the comments are due by March 12, 2012. Please note the names and addresses of comments received become public record. If you wish your name and/or address to not be used, then you must state this at the beginning of your comments. All submissions made by organizations, businesses, and individuals identifying themselves as representatives or officials of organizations or businesses will be available for public review in their entirety.

Please address comments to:

Superintendent; Attn: Lake Meredith National Recreation Area; P.O. Box 1460, Fritch, TX 79036.

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1.0 PURPOSE AND NEED

1.1 Introduction

Historically, natural fire has helped to shape the native vegetation and local ecosystems of Lake Meredith National Recreation Area (LAMR) and Alibates Flint Quarries National Monument (ALFL). The short grass prairie was/is a fire dependent ecosystem that burned every 5-10 years prior to settlement (Wright and Bailey 1980), with ignitions from lightning or native peoples, (who utilized fire for multiple reasons; Pyne 2001). In addition, such natural systems contain plant and animal species that are characterized as fire-adapted or fire-dependent and require periodic fires to retain their ecological integrity. American/European settlement of the area reduced the number and frequency of natural, lightning caused fires by overgrazing, then by fire suppression in modern times. But fire suppression only works for so long; warming climate, drought, and the build-up of decadent fuels has allowed a resurgence of large, intense fires that have been damaging to humans, their property, and facilities in west Texas especially in the last 15 years. Some large ranches now employ prescribed burning to reduce fuels and make wildfires more manageable, and to renew grasslands for livestock grazing and wildlife.

Prescribed fire is the most aggressive form of resource management utilized in LAMR and ALFL. The authority for implementing prescribed fire is included in the National Park Service Organic Act of 1916. National Park Service (NPS) land managers are tasked with the mission to preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, and education of future generations.

In accordance with the NPS 2006 management policies, the wildland fire management program should be designed to protect natural and cultural resource objectives; address potential impacts on public and private land adjacent to the park; protect public health and safety; and provide for safety considerations for park visitors, employees, and developed facilities. The preservation of natural and cultural resources within LAMR is fundamental to its continued use and enjoyment by park visitors as a recreation area with natural resource values preserved as part of the National Park System.

LAMR and ALFL are managed under a joint Fire Management Plan (FMP), *FMP: Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument* (United States Department of Interior National Park Service 2008a). One of the goals of the FMP is to protect life, property, and resources from wildland fire by utilizing prescribed fire to reduce vegetative fuels which are susceptible to wildland fires that might threaten visitors, NPS infrastructures, oil and gas facilities, and nearby communities. A secondary goal is to safely emulate natural wildfires to restore and maintain primary natural resources and their processes by maintaining the short grass prairie and surrounding natural vegetation mosaics; and to reduce woody species (i.e., mesquite) from becoming overabundant and more predominant in the grasslands.

LAMR and ALFL are located in the Texas panhandle approximately 25 miles north of Amarillo, Texas (Figure 1). LAMR comprises approximately 44,977 acres and ALFL comprises approximately 1,371 acres, which includes a 292 acre private inholding. LAMR and ALFL are

contiguous and are surrounded primarily by private land, mostly large private ranches in the cattle grazing business, but also some sparsely settled communities. The community areas pose substantial wildland fire/urban interface problems. The surrounding ranches contain oil and gas facilities, which increase the economic value of the surrounding private land, thus creating a definitive value at risk from wildland fire.

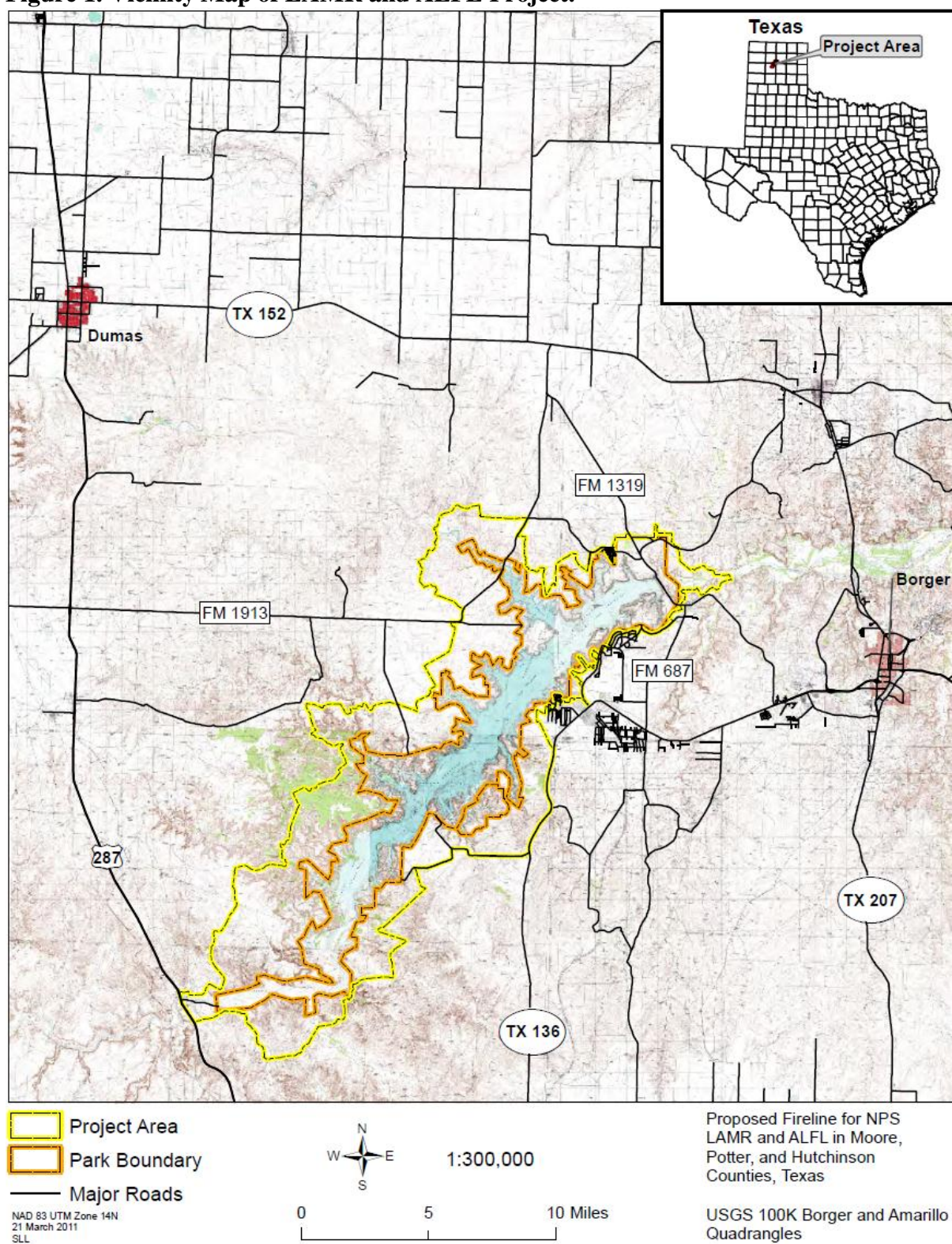
1.2 Description of the Park

Lake Meredith National Recreation Area

LAMR was created upon the construction of Sanford Dam in 1962. The primary purpose of LAMR is to provide public access to diverse water- and land-based recreational opportunities in the Canadian River breaks of the Texas panhandle, consistent with the protection of the area's scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters. The water levels in Lake Meredith fluctuate according to municipal and industrial water demands, annual rainfall, and releases from upstream reservoirs, with subsequent effects on recreational use. Dams upstream on the Canadian River, after a decade of low rainfall, have drastically decreased the average pool size in the lake. Population growth has increased the demand for lake water, keeping pool size decreased into the foreseeable future. The Sanford Dam is operated by the Canadian River Municipal Water Authority.

LAMR's significance is explained relative to the nation's natural and cultural heritage as the following:

- LAMR is the largest area of public lands in the Texas panhandle, providing opportunities for access to diverse, affordable, outdoor, water- and land-based recreation activities.
- Lake Meredith and the Canadian River basin within the recreation area provide aquatic, wetland, and riparian habitats, and are one of the few areas in the region with trees (e.g., cottonwoods). These habitats, the ecological transition zones, and the surrounding landscape support diverse plant and animal species, including migratory waterfowl.
- The natural and geologic resources of the recreation area have enabled human survival, subsistence, and adaptation that have resulted in a continuum of human presence in the Texas panhandle for more than 13,000 years. Cultural sites in Lake Meredith National Recreation Area offer views of lifeways in every cultural period that have been identified.
- The exposed geologic features of the Canadian River breaks in the recreation area reveal active geological processes that are easily visible to an extent not present elsewhere in the region. The topography and geography of the Canadian River breaks create a divergence from the surrounding landscape that offers scenic values and opportunities not found elsewhere in the region.

Figure 1. Vicinity Map of LAMR and ALFL Project.

Alibates Flint Quarries National Monument

ALFL was established by presidential proclamation in 1965 to provide for the preservation, protection, interpretation, and scientific study of Alibates flint deposits associated with activities and cultural resources of the indigenous peoples for the benefit of all. The monument is located immediately adjacent and surrounded by LAMR and is addressed as part of LAMR in this document.

The primary significance of ALFL is explained relative to the nation's natural and cultural heritage as the following:

- Alibates flint is only found in a small section of the Canadian River valley in the Texas panhandle. The national monument contains part of the only known exposed bedrock source of Alibates flint, and the flint is present in the monument in high concentrations.
- The physical characteristics of flint made it highly desirable for tool-making. It is very hard but also glass-like, so it holds an edge and can be worked. Additionally, its distinctive color pattern has made it identifiable even when it is away from the source, so the movement of the flint can be documented.
- The monument contains evidence of more than 13,000 years of continuous lithic resource detection, extraction, manipulation, and use. This evidence indicates about 300 years of actual quarrying activities, which resulted in about 700 quarry pits and development of a village.
- An unusually high number and variety of artifacts representing the entire spectrum of flint extraction and manufacturing have been recovered from the monument, providing opportunities for scientific research and knowledge of aboriginal quarry techniques.
- The Plains Village archeological sites in the monument include the only protected, and best remaining type site, for the Antelope Creek phase. The monument also contains petroglyphs, which are rare in the Texas panhandle. Together with sites in the adjacent Lake Meredith National Recreation Area, these ruins document a prehistoric sedentary lifestyle.
- Alibates Flint Quarries National Monument manages 800,000 collected objects associated with the monument. This collection represents 10 percent of all collections in the NPS Intermountain Region and almost 3 percent of all NPS collections.

The climate of both NPS areas is arid, dry, and windswept with hot summers and cold, dry winters. The mean annual temperature is 50.7°F, with a mean winter temperature of 29.9°F and a mean summer temperature of 93°F (Southern Regional Climate Center 2011). Precipitation comes from rare winter snow events or late summer thunderstorms from the Gulf of Mexico. The average annual precipitation is 19 inches with the majority of precipitation occurring between May to August (Southern Regional Climate Center 2011). The prevailing winds are southwesterly from October through April and southerly from May through September. The area receives constant winds with an average wind speed of 14 miles per hour. During frontal passages and particularly in spring, wind velocities can reach 30 to 40 miles per hour, with gusts to 75mph.

1.3 Purpose of the Environmental Assessment

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA), National Historic Preservation Act (NHPA), and the National Park Service (NPS) Director's Order (DO) -12 to provide the decision-making framework that:

- 1) analyzes a reasonable range of alternatives to meet objectives of the proposed plan;
- 2) evaluates potential issues and impacts to the natural and cultural resources of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument; and
- 3) identifies specific and required mitigation measures that are designed to lessen the degree or extent of these impacts.

1.4 Purpose and Need

LAMR is proposing to update its FMP to formally lay out the process and actions for prescribed burning on adjacent private ranchlands, including the attendant vegetation manipulation necessary along firelines to control these prescribed burns. National Fire Policy has changed in recent years and the updated terminology and policy would be incorporated into the FMP; these policy and terminology changes have been analyzed and approved on an interagency basis at the national level. Due to updates in environmental regulations and increasing the size of future prescribed burns, the NPS has determined that it is necessary to do a NEPA analysis of the increased prescribed burning on private lands adjacent to LAMR.

LAMR has successfully implemented large prescribed burns for over a decade, and wants to continue these actions. Several of these past burns have included substantial parcels of adjacent private land; the boundaries of these parcels made safer, more efficient, and less costly firelines than did the park boundary. The boundary of LAMR and ALFL is irregular and lengthy, and consists of 129 miles of exterior boundary. The park boundaries were not established on roads, topographic barriers, or vegetation changes – features that are helpful at controlling wildfires or prescribed burns. Access is difficult or non-existent for firefighting equipment in many boundary line locations. Many of the boundary lines are on steep slopes or in places where it is not safe or effective to hold or control a fire. In some places it would be possible to put in firelines on these slopes, but only at high cost and at risk to firefighters. In addition, slope firelines often cause erosion and habitat damage.

To promote efficiency and safety, LAMR has developed agreements with adjacent landowners to utilize adjacent ranch or oil/gas road systems as firelines, where the topography is conducive for safe and efficient fire management operations. This has been done on some of the past burns at and adjacent to LAMR. No burns would be done by LAMR on adjacent private lands without full agreement and cooperation of the adjacent landowner. LAMR would incur the cost of preparing the firelines and protection of any private land features in the burn area that needed protection during a prescribed burn. Generally, there are not many structures or facilities needing protection in the proposed prescribed burn areas or adjacent ranches.

This analysis is limited to examining the effects of prescribed burning and vegetative fuel manipulation on approximately 55,500 acres of private land immediately adjacent to LAMR and ALFL (Figure 1). The 55,500 acres of adjacent private land were determined by the LAMR fire staff in coordination with the landowners to be the maximum extent of prescribed burning they would utilize to reach defendable and useable fireline roads around LAMR. Since final determination of firelines for each prescribed burn has not been made, it is possible that some of these burns would be located on roads nearer to the park boundary, thus decreasing the size of the burns and the amount of private ranchland involved. The adjacent private land acreage would be burned with adjacent LAMR lands in parcels over time, perhaps taking a decade or more to get all the way around the external boundary of LAMR.

In summary the following objectives of this proposed action are:

- To continue the LAMR prescribed burning program in the most efficient and safe manner possible.
- To utilize firelines for prescribed burning that are located where it is safe and efficient to hold fire.
- To update FMP terminology and policy

1.5 Relationship to Other Plans and Policies

The proposed action is consistent with the draft 2011 General Management Plan (GMP), LAMR Resource Management Plan (NPS 1996), the Fire Management Plan (FMP), *FMP : Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument* (NPS 2008a), the 2006 Management Policies (NPS 2006), and the Director's Order 18, Guidance for Wildland Fire.

This project is consistent with the draft GMP, which propose the desired conditions for fire management as designed programs that meet the resource management objectives and that ensure the safety of firefighters and the public are not compromised. Extending the fireline boundary to include immediate adjacent private lands would help to ensure the safety of firefighters and the public, and to meet the resource management objectives

Extending the fireline boundary to include immediate adjacent private lands would meet the objectives of the Resource Management Plan, which includes using prescribed fire to reduce woody species to protect sensitive cultural resources; to perpetuate the natural occurrence of native vegetation ecosystems; and to perpetuate the natural occurrence of native wildlife species by maintaining a diversity of native plant communities.

Extending the fireline boundary to include immediate adjacent private lands is consistent with the goals and objectives of the FMP, which includes protecting life, property, and resources from wildland fire by utilizing prescribed fire to reduce vegetative fuels which are susceptible to wildland fires that might threaten visitors, NPS infrastructures, oil and gas facilities, and nearby communities.

In accordance with the NPS 2006 management policies, the wildland fire management program should be designed to protect natural and cultural resource objectives; address potential impacts on public and private land adjacent to the park; protect public health and safety; and provide for safety considerations for park visitors, employees, and developed facilities. Extending the fireline to include immediate adjacent private lands would help to preserve the natural and cultural resources within LAMR, which is fundamental to its continued use and enjoyment by park visitors as a natural area of the National Park System. In addition, the proposed expansion of the fireline boundary would help to protect public health and safety, and would provide safety considerations for park visitors, employees, and developed facilities.

Director's Order 18 (DO-18) states that "every NPS unit with burnable vegetation must have an approved FMP." DO-18 defines what an approved FMP must include; emphasizing that firefighter and public safety is the first priority and an interagency approach to managing fires on an ecosystem basis across agency boundaries. DO-18 also directs parks to identify, manage, and where appropriate, reduce hazardous fuels. Extending the fireline to include immediate adjacent private lands would help to manage and reduce hazardous fuels.

1.6 Scoping

Scoping is a process to identify the affected environment that may be impacted by the proposed project, and to identify alternatives for achieving the proposed action, while minimizing the potential impacts. The National Park Service (NPS) conducted both internal scoping with the appropriate LAMR personnel, and external scoping with the general public and interested/affected groups and agencies.

Internal scoping was conducted by an interdisciplinary team of professionals from LAMR and ALFL National Monument and the private contractor working on the EA. The interdisciplinary team met on December 1, 2010 and discussed the purpose and need for the project, identified potential alternatives to address these needs, determined potential environmental impacts, and discussed past, present, and foreseeable projects that may have cumulative effects, and potential mitigation measures. A site visit was conducted on December 1, 2010 to review and evaluate the proposed project area and to discuss resource impacts, potential mitigation measures, and other potential planning issues.

External scoping was conducted by distributing a scoping letter to inform the public and various agencies of the proposed fireline extension to include immediate adjacent private lands at LAMR and to solicit feedback on the EA. The scoping letter dated November 18, 2011 was mailed to various federal and state agencies, and affiliated Native American tribes. Information on the environmental assessment was also posted on the NPS Planning Environment and Public Comment (PEPC) website at <http://parkplanning.nps.gov/>. The Environmental Assessment will be available for public comments for 30 days; the comments are due by March 12, 2012.

1.7 Impact topics Retained for Further Analysis

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders, including the NPS 2006 Management Policies, and NPS knowledge of resources at LAMR/ALFL. Impact topics that are carried forward for further analysis in this Environmental Assessment are those where the proposed action may have a measurable effect. There were 11 impact topics retained for further analysis. The rationale for retaining each of these topics is listed below with a description of the existing setting or baseline conditions (i.e. affected environment) within the project area. Some impact topics were dismissed from further consideration when the environmental effects were estimated to be either minor or negligible. The following impact topics were retained for further analysis:

Natural Resources

- 1) Air Quality
- 2) Geologic and Soil Resources
- 3) Vegetation Resources
- 4) Wildlife
- 5) Special Status Species
- 6) Water Resources

Cultural Resources

- 7) Archeological
- 8) Historic Resources

Socioeconomic Resources

- 9) Oil and Gas Development
- 10) Adjacent Landowners and Uses

Social Resources

- 11) Human Health and Safety

Natural Resources

1) Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) established federal programs that provide special protection for air resources and air quality related values associated with NPS units. Specifically, Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. LAMR/ALFL is designated as a Class II air quality area under the Clean Air Act, which means emissions of particulate matter and sulfur dioxide are allowed up to the maximum increase in concentrations of pollutants over baseline concentrations as specified in Section 163 of the Clean Air Act. In addition, the Clean Air Act gives the federal land manager the responsibility to protect air quality related values (i.e., visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

The extension of the fire line boundary and prescribed fire would produce particulate matter and smoke which could affect air quality; thus this topic was retained for further analysis.

2) Geologic and Soil Resources

The 2006 NPS Management Policies states the NPS will preserve and protect geologic features and processes from disturbances. These policies also state NPS will aim to understand and preserve the soil resources and to prevent unnatural erosion, removal, or contamination of them. The Proposed Action requires hand or mechanical treatments for construction of firelines and prescribed burning, which both have potential to have a measurable impact on the geology and soil resources; therefore impacts to this topic will be analyzed further.

3) Vegetation Resources

The 2006 NPS Management Policies states the NPS will preserve and maintain all plants native to the naturally evolving park unit ecosystems by preserving and restoring the abundances, diversity, dynamics, habitats, distributions, and natural processes of native plants. The construction of firelines and prescribed burning would require removing areas of native vegetation for fuels reduction and there is a risk of invasive species introduction and spread associated with any ground disturbing activity; thus the topic of vegetation was retained for further analysis.

4) Wildlife

The 2006 NPS Management Policies states the NPS will preserve and maintain animals native to the naturally evolving park unit ecosystems by preserving and restoring the abundances, diversity, dynamics, habitats, distributions, and natural processes of native animals. There are over 318 vertebrate species recorded for LAMR/ALFL. The Proposed Action would require disturbing wildlife habitat; thus the topic of wildlife was retained for further analysis.

5) Special Status Species

The Endangered Species Act of 1973 requires an environmental assessment for projects on federally-managed lands to determine potential effects to all federally-listed endangered, threatened, and candidate species. Section 7 of the Endangered Species Act (ESA) requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed species or designated critical habitats. In addition, the 2006 NPS Management Policies and Director's Order 77 *Natural Resources Management Guidelines* require the NPS to examine the impacts on federal candidate species, as well as state-listed endangered, threatened, candidate, rare, declining, and sensitive species. The proposed prescribed burning could potentially disturb habitat for the federally-listed species within LAMR/ALFL. Therefore the topic of special status species was retained for further analysis.

6) Water Resources

NPS policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States. There are four water resources (i.e., Lake Meredith Reservoir, the Canadian River and associated tributaries, and the Ogalla Formation and the Red Sand Formation, groundwater aquifers) within the proposed fireline boundary; thus the topic of water resources was retained for further analysis.

Cultural Resources

7) Archaeological Resources

Section 106 of the National Historic Preservation Act (NHPA), as amended in 1992 (16 USC 470 *et. seq.*); the NPS's Director's Order 28 *Cultural Resource Management Guideline*; and NPS 2006 Management Policies require the consideration of impacts on historic properties that are listed, or eligible to be listed, in the National Register of Historic Places. The National Register is the nation's inventory of historic places and the national repository of documentation on property types and their significance. The above-mentioned policies and regulations require federal agencies to coordinate consultation with the State Historic Preservation Officer regarding the potential effects to properties listed on or eligible for the National Register of Historic Places.

The NPS, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. Management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources. The NPS will protect and manage cultural resources in its custody through effective research, planning, and stewardship in accordance with the policies and principles contained in the NPS 2006 Management Policies, federal laws, and the appropriate Director's Orders. Prescribed burns could potentially disturb archeological resources. Therefore, archeological resources will be further analyzed.

8) Historic Resources

The National Park Service, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. According to the National Park Service's 2006 *Management Policies and Director's Order-28 Cultural Resource Management*, management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources (NPS 2006). The National Park Service will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with these policies and guidelines.

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation an opportunity to comment in the consultation process. The term “historic properties” is defined as any site, district, building, structure, or object eligible or listed in the National Register of Historic Places, which is the nation’s inventory of historic places and the national repository of documentation on property types and their significance. More information about this consultation can be found in the *Consultation and Coordination* chapter.

The term “historic structures” refers to both historic and prehistoric structures, which are defined as constructions that shelter any form of human habitation or activity. The McBride House was listed on the National Register list in 1975, because it was determined to be locally significant. The house represents the small commercial farming and cattle ranching era in the Texas Panhandle. Other impartial remains include a carbon-black plant represents the 1920s era of oil production, gas refineries and carbon-black plants in the Texas Panhandle. These remains have not been evaluated for potential listing in the National Register of Historic Places. Impacts to historic resources would be minor; however historic resources were retained for further analysis due to the importance of preserving cultural heritage in LAMR/ALFL.

Socioeconomic Resources

9) Oil and Gas Development

There are currently 170 active well sites and 39 miles of transpark oil and gas pipelines with 40 miles of associated access roads. Prescribed fire may be introduced around oil and gas facilities that have high fuel loads to create a safety barrier and defensive zone from future wildfires. Oil and Gas operations access may be temporarily affected due to the Proposed Action; thus oil and gas was retained for further analysis.

10) Adjacent Landowners and Uses

Ranching is the major land use adjacent to LAMR/ALFL. Private land owners adjacent to LAMR/ALFL consist of several ranches. Other land uses adjacent to LAMR/ALFL include rural residential development and sand and gravel operations. Prescribed burns could have beneficial impacts by reducing fuel loads and potential for wildfires or limited disturbance to adjacent landowners and associated uses; thus, this resource topic was retained for further analysis.

Social Resources

11) Human Health and Safety

NPS 2006 Management Policies states park managers should strive to protect human life, by providing injury free visits and a safe and healthful environment for visitors and employees. Under the Proposed Action, the extension of prescribed burn project areas and firelines would be beneficial by developing agreements with adjacent landowners to utilize adjacent ranch or oil/gas road systems as firelines, where the topography is conducive for safe and efficient fire management activities to hold or control fires. Prescribed and wildland fires pose a significant

risk to the health and safety of firefighters, personnel, and the general public. Because activities addressed under the Proposed Action has the potential to impact human health and safety in and in the vicinity of the project area, human health and safety was retained for further analysis.

1.8 Impact topics Considered, but Dismissed from Further Analysis

1) Wetlands

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge of dredged or fill material or excavation within waters of the United States. NPS policies for wetlands as stated in 2006 Management Policies and Director's Order 77-1 *Wetlands Protection*, strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO 77-1 *Wetlands Protection*, proposed actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings for wetlands.

Historically, in the LAMR area, fire was a natural process that occurred every 5–10 years and helped shape the native vegetation. Wetland communities have evolved with the periodic fire regime and require fire to maintain the open wetland vegetation communities with sparse overstories and abundant herbaceous cover. Wetland plant species possess adaptations to fluvial disturbances that facilitate survival and reestablishment following fires, thus contributing to the rapid recovery of many wetland habitats. In addition, prescribed fires emulate the natural fire regime and are beneficial to wetlands by providing an influx of nutrients to the soil from the plant biomass burned, stimulates seed production, and helps to perpetuate the vegetation and wildlife species associated with wetlands. Extending the prescribed burn fireline to include adjacent private land would not result in the loss of wetlands or wetland values, but would be beneficial. Therefore, topic of wetlands was dismissed from further analysis.

2) Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The NPS guided by the 2006 Management Policies and Director's Order 77-2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 *Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a Statement of Findings for floodplains.

Historically, fire was a natural process that occurred every 5–10 years and helped shape the native vegetation. The Proposed Action would not involve the filling or alterations of floodplain areas, and would not require the construction of structures or firelines within floodplains. Given extending the prescribed burn fireline to include adjacent private land would not affect floodplain values; the topic of floodplains was dismissed from further analysis.

3) Cultural Landscapes

The National Park Service defines cultural landscapes as settings humans create in the natural world. They are intertwined patterns of things both natural and constructed, expressions of human manipulation and adaptation of the land (NPS's Director's Order 28 *Cultural Resource Management Guideline*). Cultural Landscape Inventories have not been completed for LAMR/ALFL. These inventories assess the character of the natural world that includes and encompasses historic districts. Such inventories describe a landscape's physical development over time, and evaluate its significance and integrity.

Although a cultural landscape inventory has not been conducted for LAMR/ALFL, there is the National Register-listed McBride Ranch house and its landscape is a potentially eligible historic vernacular landscape. The McBride Ranch landscape contains one of the few surviving family-scale, pioneer ranches in the Texas Panhandle, and the remains of the oldest ranch house in Potter County. The Alibates Flint Quarries and associated prehistoric occupation of the area may also be a potentially eligible historic cultural landscape. Under the Proposed Action, the LAMR Fire Management Plan would be utilized to improve firelines where needed and to protect identified natural, cultural features, or facilities. Because the Proposed Action is consistent with §1.4.7.1 of NPS *Management Policies* 2006 and no new impacts to cultural landscapes are expected, this topic has been dismissed from further consideration.

4) Ethnographic Resources

Director's Order 28 (DO-28), *Cultural Resource Management*, defines ethnographic resources as any site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a an associated traditional group. According to DO-28 and Executive Order 13007, *Indian Sacred Sites*, the NPS should preserve and protect ethnographic resources. The Proposed Action would be designed to minimize any impacts to known cultural resources and to restore native plant communities that could be identified as ethnographic resources. If prescribed burn treatment areas are proposed that would significantly alter the physical characteristics of a site all the tribes claiming cultural affiliation to LAMR/ALFL will be notified and given at least 30 days notice to respond. However, the Proposed Action would have negligible effects on ethnographic resources; thus ethnographic resources were dismissed from further analysis.

5) Paleontological Resources

The 2006 Management Policies for the National Park Service (NPS) states the paleontological resources (fossils), including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research.

There are two fossil-bearing rock units exposed within and around LAMR. The older unit is the Upper Triassic Dockum Group and the younger unit is the Miocene-Pliocene Ogallala Group, including the Clarendon and Goodnight Formations. A previous study conducted in Badlands National Park suggests that significant fire effects to fossils would be found under high spread rate and high intensity conditions even though there is no fuel contact (Benton and Reardon 2006). However, prescribed burns would be conducted at a low to moderate intensity and rate of spread and fire breaks would be maintained around these areas, which should result in minimal impact on fossil resources and no fuel contact. Therefore, there would be no likely impacts to paleontological resources as a result of the Proposed Action and the topic was dismissed from further assessment.

6) Museum Collections

The Director's Order 24 *Museum Collections* states that NPS is required to consider the impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. No museum collection items would be disturbed as a result of the Proposed Action. Therefore, museum collections were dismissed from further analysis.

7) Soundscape Management

In accordance with the 2006 Management Policies for the NPS and Director's Order 47 *Sound Preservation and Noise Management*, an important component of the NPS's mission is the preservation of natural soundscapes associated with national park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the combination of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each monument, being generally greater in developed areas and less in undeveloped areas.

Impacts to the soundscape could occur from equipment (e.g., chainsaw, bush/brush hog) used for reduction of hazardous fuels or firelines. These impacts should be minor and temporary and should not exceed the typical levels of man-made noise present during visitor season or regular ranch operations. Therefore, soundscape management was dismissed as an impact topic for further analysis.

8) Lightscape Management

The 2006 Management Policies for the NPS states the NPS will strive to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). NPS strives to limit the use of artificial outdoor lighting to the amount necessary for basic safety requirements. There should be no impacts to lightscape management; thus, this topic was dismissed from further analysis.

9) Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). Prime farmland is defined as land that has the best combination of physical and chemical properties for producing food, forage, fiber, and oil seed, and for other uses (e.g., pasture land, forest land, and crop land). Unique farmland is defined as land other than prime farmland that can produce high value and fiber crops, such as fruits, vegetables, and nuts. There are no prime and unique farmlands designated in the project area; thus this topic was dismissed from further analysis.

10) Indian Trust Resources

Secretarial Order 3175 mandates any anticipated impacts to Indian trust resources from proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. LAMR and ALFL are public holdings and are not considered Native American trust resources and do not have any designated Native American trust resources. Therefore, Indian Trust Resources was dismissed as an impact topic for further analysis.

11) Environmental Justice

Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low-income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minorities and low-income populations and communities. The Proposed Action would not be expected to have disproportionate health or environmental effects on minorities or low-income populations or communities as defined by the US EPA Environmental Justice Guidance (US EPA 1998). Therefore, environmental justice was dismissed from further analysis.

12) Wilderness

The 2006 Management Policies, Section 6 states, "The National Park Service will evaluate all lands it administers for their suitability for inclusion within the national wilderness preservation system. For those lands that possess wilderness characteristics, no action that would diminish their wilderness suitability will be taken until after Congress and the President have taken final action. The superintendent of each park containing wilderness will develop and maintain a wilderness management plan to guide the preservation, management, and use of the park's wilderness area, and ensure that wilderness is unimpaired for future use and enjoyment as wilderness." There are no lands designated as wilderness or proposed wilderness in or near the Proposed Action. Thus, wilderness was dismissed for further analysis.

13) Park Operations

Park operations include changes that may affect the current facilities or that may require a new level of maintenance or staffing. Under the Proposed Action, larger prescribed burns could be implemented to more effectively reduce wildfire risk, and prevent large wildfires in the area by creating blocks of reduced vegetation that would not carry fire, thus reducing the potential level of effort for future wildfires at LAMR/ALFL. The Proposed Action would not significantly change overall park operations; thus, park operations were dismissed from further analysis.

14) Visitor Use and Experience

NPS 2006 Management Policies states the fundamental purpose of all parks is for the enjoyment of park resources and values by the people of the United States. NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks, and will provide opportunities specifically suited for the natural and cultural resources found within the park. Some temporary disturbance would be visible to visitors, but would be minor and would have little effect to visitor experience. It is estimated that impacts to visitor use and experience would be short-term and minor; thus this topic was dismissed from further analysis.

2.0 ALTERNATIVES CONSIDERED

2.1 Alternative 1: No Action Alternative

This alternative represents what would occur at LAMR if the fire management program is limited to fuels management activities occurring only on NPS lands. This alternative provides a baseline for comparing and evaluating the impacts to the environment by the action alternative. The approved fire and fuels management program at LAMR would continue, but prescribed burning activities would be limited to NPS lands inside LAMR and ALFL. This would likely hinder successful prescribed burning in many areas due to the difficulty of stopping and holding fires on the park boundary. This limiting of prescribed burning would result in reducing the acres and amount of vegetative fuels treated inside the park. This would result in a buildup of fuels in certain park areas that could lead to future uncontrollable wildfires, both within and adjacent to the park. These wildfires could threaten visitors, adjacent communities, NPS infrastructure, and oil and gas facilities both within and adjacent to NPS lands.

Current fire suppression strategies would continue in accordance with National Fire Policy. All wildland fires would be suppressed using the appropriate response, utilizing direct or indirect tactics. Appropriate response options would include the use of minimum impact suppression actions that limit ground disturbance in certain areas, utilizing confine type tactics if values dictated that was the best option, and/or direct suppression actions on all or some perimeters of the wildland fire. The response to wildland fires would be based on fire behavior, values at risk, human safety, suppression costs, and the availability of fire management resources (NPS 2008a).

All wildland fires escaping initial attack would have a Wildland Fire Decision Support System (WFDSS) analysis completed in a timely manner. The analysis would serve as the decision record for selection of the appropriate response (NPS 2008a).

Mechanical and manual methods would continue to be used to reduce hazardous fuel conditions and to re-establish or maintain natural ecosystems. Priority treatments would be near developed areas, cultural, natural, and other resources with the highest values at risk and the highest probabilities of sustaining large, intense fires (NPS 2008a).

Chemical treatments may be utilized, after following the NPS regional approval process, to control and/or limit the establishment of weeds or exotic invasive species following a prescribed fire or wildfire; or to reduce hazardous fuels caused by exotic invasive species within park boundaries (NPS 2008a).

2.2 Alternative 2: NPS Preferred Alternative

Under the preferred alternative, the LAMR fire management program would utilize prescribed burning on NPS and immediately adjacent private lands, with the permission of landowners (Figure 2). The fire staff would use ranch roads as firelines where prescribed fires could be safely stopped and contained. Hand or mechanical treatments approved in the LAMR Fire Management Plan would be utilized to improve firelines where needed and to protect identified natural values, cultural features, or facilities. Larger prescribed burns could be implemented to more effectively reduce wildfire risk, and help prevent large, intense wildfires in the area by creating blocks of reduced vegetation that would not easily carry fire. Thus these preferred fire management activities would protect visitors, nearby communities, park infrastructure, and oil and gas facilities better than the no action alternative.

There are six large privately held ranches within the proposed project areas adjacent to the park where most of the burning would occur, and a number of smaller land owners. The burning on private lands is needed to effectively protect and preserve NPS lands and adjacent lands, a fire management policy mandate.

A Memorandum of Understanding (MOU) between NPS and six adjacent landowners was signed and became effective on June 6, 2011 (Appendix B). This MOU was entered to establish joint understanding of the need to initiate compliance with NEPA, NHPA, and ESA on NPS lands as well as on private lands that would be included in the proposed prescribed burns. The MOU also lays out the basic framework for communications and prescribed fire operational processes that will assist fire managers in ensuring that all parties are satisfied as work to implement burns moves forward.

Prior to initiating preparation or burning activities, landowners included in the burn plan would be consulted to identify facilities, power and pipelines, features important to the landowner, and known historic/archeological/cultural sites. Compliance with Section 106 of the National Historic Preservation Act will be completed prior to project implementation.

This Proposed Action satisfies all current NPS requirements to continue to carry out the fire management practices to insure effective, efficient resource protection and management, and to insure the safety of park employees, adjacent landowners, and visitors.

The Preferred Alternative would include the same wildland fire suppression tactics and mechanical hazardous fuel treatments as the No Action alternative, except that the mechanical/manual work on private lands would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. Any proposed application of herbicide would be covered under the existing, Aerial Application of Herbicide for Saltcedar Eradication at Lake Meredith National Recreation Area Environmental Assessment (NPS 2008b). Herbicide would not be applied on private lands by the NPS (Figure 2).

2.2.1 Alternatives Considered and Rejected

Two additional alternatives (Alternatives 3 and 4) were considered at the internal scoping session, but dismissed.

Alternative 3 would involve stopping all prescribed burning within LAMR and ALFL boundaries. This alternative was dismissed because it would not maintain healthy natural resources in a fire dependent ecosystem and would not comply with the NPS mandate for maintaining healthy ecosystems. In addition, stopping fuel treatments would ensure a build-up of vegetation that would eventually result in dangerous, uncontrollable wildfires that could injure or kill visitors, damage or destroy NPS infrastructure, oil and gas facilities, and adjacent ranches and communities.

Alternative 4 would limit prescribed burning to smaller areas on NPS lands, usually away from park boundaries, where fires could be safely stopped within NPS boundaries. This alternative would result in treating only a fraction of the NPS lands in the park from being treated by prescribed fire. Some areas that need to be treated cannot be accessed without equipment entering private lands; other areas cannot be accessed due to muddy or swampy riparian areas; other areas have steep slopes on the park boundary line where it is impractical-unsafe for firefighters-and costly to stop prescribed fires. This alternative was dismissed because it does not provide adequate fire protection to LAMR visitors and NPS infrastructure, adjacent communities, oil and gas facilities, and ranch lands, and would not comply with the NPS mandate for healthy ecosystem management at LAMR. In addition it was realized that this alternative is inherent in Alternative 1, the no action alternative.

2.3 Mitigation Measures during the Proposed Action

Protection of natural resources, cultural resources, and public safety require additional safeguards to protect resources, staff, visitors, and the adjacent communities. Resource Advisors (READ) will be assigned to planned projects or unplanned fire incidents, to assist lessening adverse impacts to resources during implementation of actions; READ responsibilities are typically completed by local or regional resource managers. The following mitigation measures were developed to minimize the degree and/or severity of fire management activities and potential adverse effects to and would be implemented when appropriate during the proposed action alternative, as needed:

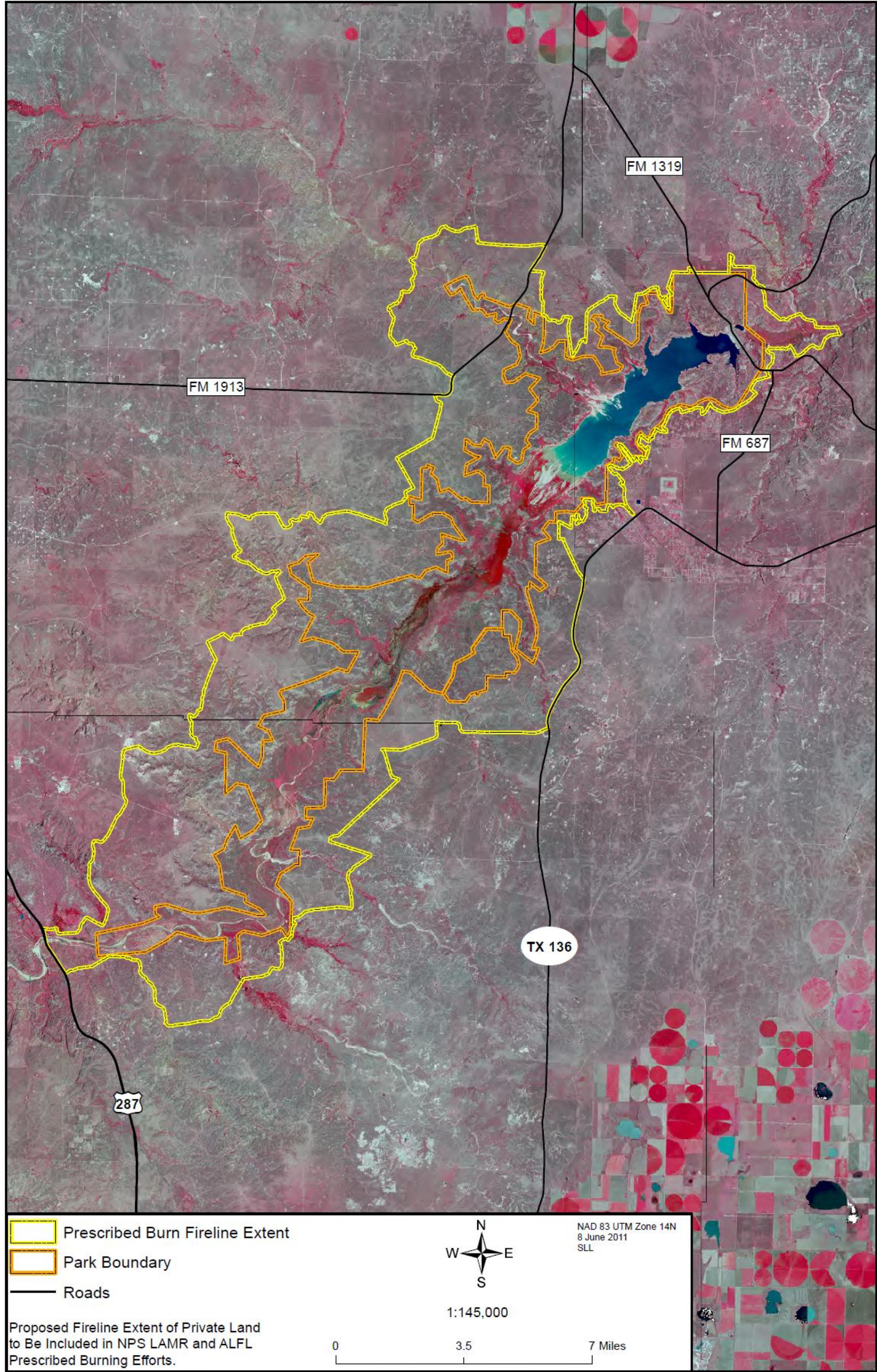
Air Resources

- No burns would be conducted when air regulatory agencies declare air pollution episodes or impaired air conditions for Moore, Hutchinson, or Potter Counties. All burns would be coordinated with Texas state air regulation agencies;
- Prescribed burns would usually be conducted Monday-Friday to limit disturbance to weekend visitor use during high visitation periods. Due to weather conditions and fuels, some lighting and/or residual burning might still occur on some weekends;
- Burns will usually be conducted when fuel moistures are relatively low to allow for better combustion which results in less smoke, better lofting, and less residual burning and smoke;
- Transport winds would be assessed for impacts to population areas;
- Prescribed Burns would only be conducted when adequate control equipment and sufficient fire personnel would be available for safe fire management;
- To manage smoke impacts, the number of acres and amount of fuel burned will be assessed and analyzed related to effects on populated areas;
- To manage smoke impacts, the timing and the method of ignition would be assessed to utilize techniques that minimize excessive smoke; and
- To manage smoke impacts, coordination with adjacent agencies and landowners would occur to limit the number fires occurring simultaneously.

Soils

- When appropriate prescribed burn firelines would be planned using natural barriers, vegetation changes, and existing roads or other features as firelines;
- Vegetation will be removed, cut, or manipulated along firelines only as necessary for fire control or to protect natural or cultural values;
- In general, fireline construction will utilize the minimum depth and width of soil and vegetation modification necessary for safe fire control purposes;
- Mowers, mulchers, weed-eaters, other equipment approved for LAMR fire management use may be utilized when they are the best tool to achieve applicable management objectives;
- All firefighting equipment would be inspected and maintained to prevent spills of lubricants, fuels, or other materials;
- Firelines may be covered with cut vegetation or removed organic materials after the fire is out as part of the rehabilitation process;
- Local mulch may be utilized to rehabilitate firelines if it does not introduce new exotic weed seeds;
- Burning intensity will be monitored and modified to prevent high intensity, soil sterilizing burning to predominate in prescribed burns;
- Waterbars or other erosion control devices may be employed where necessary to prevent fireline erosion; and
- Mop-up of hot spots or smoldering fire will be done utilizing safe methods which minimizes soil disturbance in that area.

Figure 2. Maximum extent of private land to be included in NPS prescribed burning efforts.



Water Resources

- Many of the erosion control measures outlined above under “Soils” will also be utilized to reduce impacts on water resources and reduce sedimentation;
- Rehabilitation of firelines may utilize waterbars, check dams or mulching to reduce sedimentation;
- Chemical retardant and foam application, and gasoline refueling will not be utilized within 200 feet of open waters (streams, rivers, ponds, and lakes);
- Existing roads and trails will be utilized by vehicles and equipment as much as possible to prevent development of new areas of bare ground;
- Helicopter dipping will be allowed only from approved water sources under established conditions; and
- Avoid fireline construction along steep hillsides near water resources.

Vegetation

- Implementing Best Management Practices (BMPs) to ensure firefighting equipment or supplies is not contaminated with noxious weeds or noxious weed seeds (e.g., pre-cleaning equipment or vehicles from outside the area before use in fire areas);
- Following the measures outlined above under “Soils” will also help minimize vegetation disturbance;
- In general, fireline construction will utilize the minimum depth and width of soil and vegetation modification necessary for safe fire control purposes;
- Whenever possible, fireline construction will utilize Minimum Impact Suppression Tactics (MIST), as found in the Incident Response Pocket Guide and other interagency and NPS guides that provide firefighters guidance in minimizing the long-term impact of fireline construction and control activities;
- After the fire is out, firelines may be covered with cut vegetation or organic materials, displaced during fireline construction, as part of the rehabilitation process. These materials help minimize erosion and facilitate regrowth of native plants;
- Although rarely done, replanting or reseeding of native plants on firelines may be considered as part of the prescribed burn planning process, as coordinated with the resource management staff; and
- Fireline rehabilitation will be completed upon consultation with park and/or regional Burned Area Emergency Rehabilitation (BAER) specialists.

Wildlife

- Existing roads, lake boat transport, and trails will be used to access fire areas to minimize disturbance to wildlife individuals and habitat;
- Chemical retardant and foam application, and gasoline refueling will not be utilized within 200 feet of open waters (streams, rivers, ponds, and lakes) to prevent damage to fisheries;
- Helicopter dipping will be allowed only from approved water sources under established conditions to help prevent wildlife disturbance;
- Helicopter use will be minimized and flight levels kept high as much as possible during raptor and waterfowl seasons to prevent unintentional bird collisions; and
- Best management practices will be used to ensure that spills of lubricants, fuels, or other chemicals do not occur.

Cultural Resources

- As each prescribed burn is planned, LAMR staff will ensure that compliance with Section 106 of the National Historic Preservation Act is completed prior to project. Where applicable, NPS responsibilities will be added to each project-specific burn plan to ensure protection of cultural values;
- The LAMR Chief of Resources Management will coordinate with the fire management staff at all stages of prescribed burns, from planning to implementation;
- The LAMR Chief of Resources Management will make recommendations to the Park Superintendent who ultimately approves all prescribed burn unit plans for protection;
- Local Native American tribes with affiliations to LAMR lands will be consulted during the planned projects. Affiliated tribes will be notified of wildland fire incidents on NPS lands;
- Adjacent private landowners included in the proposed prescribed fire projects will be consulted during planning for prescribed burns regarding any known archeological or historic sites located on their land. NPS actions will include protection of cultural resources, as necessary, and in consultation with private land owners/managers;
- The Fire Management staff will regularly update the Chief of Resources Management on the initial and extended attack response strategies, and any associated ground disturbance activities;
- If ground disturbing mechanized equipment is used for fire suppression, the Chief of Resources will be notified as soon as possible;
- If cultural resources are impacted during fire activities, the Chief of Resources Management will coordinate the inventory and assessment of the damaged sites and any required rehabilitation work;
- Resource base maps of known archaeological and historic site locations will be provided by the Chief of Resources Management to the incident commander or prescribed fire burn boss, or other involved staff as necessary;
- Existing roads, water areas, natural barriers, and trails will be utilized for firelines as much as possible to minimize impacts to cultural resources;
- If cultural resources are threatened by a fire or fire management activities, then archeologist or resource protection specialists should be made available to the incident commander as resource advisors to mitigate firefighting actions and coordinate rehabilitation efforts;
- Spot monitoring or actual accompaniment of working heavy equipment (e.g., bulldozers, road graders, etc.) by red carded archeologists should occur through all activities of a fire;
- Special flagging will be used to identify archeological and historic sites. Necessity of flagging must be monitored as fires are extinguished to prevent attracting undue attention to a cultural site;
- Fireline construction should avoid the vicinity of known archaeological or historic sites;
- If during fire management activities previously undiscovered archeological sites/resources are discovered, all work in the immediate vicinity of the discovery should be halted until appropriate NPS cultural staff are consulted. The resources should be identified and documented and an appropriate mitigation strategy developed in consultation with the State Historic Preservation Officer;

- Documentation and a photographic record of all archeological materials uncovered during fires and rehabilitation activities will be kept with the Chief of Resources Management; and
- Potential post-burn surveys may be considered in burned areas on LAMR lands to locate and identify any unknown cultural resources revealed by a burn.

Public Safety

- Initial attack and fire staff will determine the proximity of fire to visitors, adjacent landowners, and communities and coordinate with local agencies to inform them of potential hazards, and aid in evacuation if necessary;
- Neighboring ranches and residences adjacent to prescribed burns will be notified in advance of burns, then updated immediately prior to ignition;
- Landowners that will have prescribed burning on their land must approve the burn plan and have a prior written agreement;
- The prescribed fire burn boss must work with local residents on the residents safe location and activities during prescribed burns that involve private lands;
- Current fire information will be posted on appropriate area bulletin boards, visitor center, museum, and Alibates contact station;
- Park staff will be kept updated on prescribed burns via regular e-mail notifications. Supervisors will make sure all staff is aware of fire management activities;
- When wildland fire hazards are high, signs will be posted notifying the public of fire restrictions or burn bans that are in place;
- LAMR areas may be closed to the public if deemed necessary upon recommendation of the Fire Management Officer, approved by the Superintendent;
- Visitor use may be limited or prevented near prescribed fires and potentially affected areas, as approved by the Superintendent;
- The fire management staff will work with the protection staff to post closure and/or informational signs (e.g., dense smoke) for prescribed or wildland fires along roadways, visitor center, boat ramps, trailheads, and campsites;
- Rangers will inform visitors at all interpretive presentations and contacts of prescribed fire or wildland fires in progress.
- NPS staff will patrol the affected areas to educate visitors and adjacent land owners about the role of fire, to explain risks associated with getting too close to fires, and enforcing visitor compliance with closed areas;
- As approved by the Superintendent, media releases to the local newspapers, radio and television stations will be developed and kept current to inform the public about fire situations;
- Visitor use may be limited or prevented in burned areas after fires are out, until hazards are mitigated;
- Signs will be posted at previously burned areas to inform the public of potential hazards and appropriate safety precautions associated with traveling through or camping in these areas; and
- Handouts explaining NPS fire management program and neighboring agencies will be available when ongoing fires are burning in the area.

2.4 Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that “the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101.” Section 101 of the National Environmental Policy Act states that “...it is the continuing responsibility of the Federal Government to:

- (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- (3) attain the widest range of beneficial uses of the environment without degradations, risk to 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 which supports diversity and variety of individual choice;
- (5) achieve a balance between population and resource use which 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 resources.”

Alternative A, no-action alternative, would minimally meet the above six evaluation criteria because prescribed burning would be limited to NPS lands inside LAMR and ALFL increasing the risks of future uncontrollable wildfires. This would likely hinder successful prescribed burning in many areas, and result in limiting the acres and amount of vegetative fuels treated inside the park. This would result in a buildup of fuels in certain park areas that could lead to future uncontrollable wildfires, both within and adjacent to the park. These wildfires could threaten visitors, adjacent communities, NPS infrastructure, and oil and gas facilities both within and adjacent to NPS lands. These wildfires could also have adverse effects on park natural and cultural resource values.

Alternative B is the environmentally preferred alternative because it best addresses the six evaluation criteria listed above. Alternative B, *Utilizing Prescribed Burning on NPS and Immediately Adjacent Private Lands*, would help to insure the safety of NPS employees, visitors, nearby communities, park infrastructure, and oil and gas facilities. Alternative B would allow for larger prescribed burns, and burns in the appropriate areas. This would more effectively reduce wildfire risk, and help prevent large and/or high intensity wildfires in the area by creating blocks of reduced vegetation that would less likely to carry fire. The burning on private lands is needed to effectively protect and preserve NPS lands (e.g., historic, cultural, and natural aspects) and adjacent lands, a fire management policy mandate. Extending the prescribed burn firelines and burns onto adjacent private lands satisfies all current NPS requirements to continue to carry out the fire management practices to insure effective, efficient resource protection and management, and to insure the safety of park employees, adjacent landowners, and visitors.

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in

this document. Because it meets the purpose and need for the project, the project objectives, and is the environmentally preferred alternative, alternative B is also recommended as the National Park Service preferred alternative. For the remainder of the document, alternative B will be referred to as the preferred alternative.

Table 1 compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Preferred Alternative meets each of the objectives identified for this project, while the No Action Alternative does not address all of the objectives.

Table 1. Summary of the Proposed Action Objectives and Alternatives

Objectives	No Action Alternative	Preferred Alternative
To continue the LAMR prescribed burning program in the most efficient and safe manner possible.	No, would likely hinder successful prescribed burning in many areas, and results in limiting the acres and amount of vegetative fuels treated inside the park.	Yes, extending the prescribed burn firelines to include adjacent private lands satisfies all current NPS requirements to continue to carry out the fire management practices to insure effective, efficient resource protection and management, and to insure the safety of park employees, adjacent landowners, and visitors.
To utilize firelines for prescribed burning that are located where it is safe to hold fire.	No, prescribed burning would be limited to NPS lands inside LAMR and ALFL increasing the risks of future uncontrollable wildfires.	Yes, prescribed burning would include private land allowing for larger prescribed burns, which would more effectively reduce wildfire risk, and prevent large wildfires in the area by creating blocks of reduced vegetation that are less likely to carry fire.
To update FMP terminology and policy	No, would continue using the older, outdated terminology and policy	Yes, would implement updated terminology and policy to conform to current interagency standards
Does the alternative meet project objectives	No	Yes

Table 2. Comparison of Alternatives

Components	Alternative A No Action	Alternative B Proposed Action
Prescribed Burn	Prescribed burns within the park would be limited to accessible areas, executed in a safe manner.	Prescribed burns would include cooperating private landowners immediately adjacent to LAMR/ALFL boundary. This alternative would allow NPS managers to safely conduct prescribed burn actions by utilizing private land and existing ranch roads as firelines.
Fire Suppression Tactics	All wildland fires within LAMR/ALFL boundaries would be suppressed using the appropriate response, utilizing both direct and indirect tactics, depending on the specifics of each fire. Tactical alternatives that require suppression actions on private lands would be coordinated with local fire agencies and landowners.	All wildland fires within LAMR/ALFL boundaries would be suppressed using the appropriate response, utilizing both direct and indirect tactics, depending on the specifics of each fire. Tactical alternatives that require suppression actions on private lands would be coordinated with local fire agencies and landowners.
Mechanical and Manual (Mechanical includes wheeled and tracked equipment, such as mowers, grinders, brushcutters, and masticators) (Manual includes chainsaws powered weed cutters, blowers, hand mowers, and hand motorized equipment operated by an individual walking with the equipment)	Mechanical and manual treatments would be used to reduce hazardous fuel, prepare firelines, or prep units for prescribed burning within LAMR/ALFL. Focused treatment may occur near developments, cultural, natural, and other resources. Internal NPS and programmatic processes would be utilized to plan in advance and ensure protection of natural and cultural resources.	Mechanical and manual treatments would be used to reduce hazardous fuel, prepare firelines, or prep units for prescribed burning within LAMR/ALFL. Focused treatment may occur near developments, cultural, natural, and other resources. Some limited mechanical and manual may also occur on lands of private cooperating landowners immediately adjacent to LAMR/ALFL, if needed, to reduce hazardous fuels along firelines. Internal NPS and programmatic processes would be utilized to plan in advance and ensure protection of natural and cultural resources, and identified private property values.

Chemical	Chemical treatments may be utilized, following NPS approval processes, to control and/or limit the establishment of weeds or exotic invasive species following a prescribed fire or wildfire; or to reduce hazardous fuels caused by exotic invasive species within park boundaries.	Chemical treatment on private cooperating lands adjacent to the LAMR/ALFL boundaries would be the responsibility of the private landowner.
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2.5 Summary of Environmental Consequences of the Alternatives

Table 3 summarizes the anticipated environmental impacts for alternatives I and II. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

Table 3. Environmental Impacts Summary by Alternative.

Resource Topic	Alternative I No Action	Alternative II Preferred Alternative
Air Quality	<p>Direct, minor, adverse, short-term, localized impacts from particulate matter and smoke produced from prescribed burns.</p> <p>Direct, localized, short-term, and negligible to minor from air pollutants due to mechanical and manual hazardous fuel treatments.</p> <p>Indirect, minor, adverse, short-term, localized, and minor due to reduced visibility along roadways, reductions in recreation values due to visibility limitations, smoke and odors, and possible health effects to sensitive receptors, such as residents and visitors.</p> <p>Indirect, moderate, beneficial, long-term, regional impacts due to decrease in fuel loading.</p>	<p>Direct, minor, adverse, short-term, localized impacts from particulate matter and smoke produced from prescribed burns. Larger burns than alt. I, so more short-term smoke.</p> <p>Indirect, minor, adverse, short-term, localized, and minor due to reduced visibility along roadways, reductions in recreation values due to visibility limitations, smoke and odors, and possible health effects to sensitive receptors, such as residents and visitors.</p> <p>Indirect, moderate, beneficial, long-term, regional impacts due to decrease in fuel loading.</p>
Geologic and Soil Resources	<p>Direct, adverse, short-term, minor, localized impacts from fireline construction; adverse effects from attempts to build firelines on legal boundary (steeper slopes) which could cause more soil erosion; and</p>	<p>Direct, adverse, short-term, minor, localized impacts from fireline construction; benefits to soil development and soil nutrification</p> <p>Indirect, beneficial, long-term, minor to moderate, localized, impacts due</p>

Resource Topic	Alternative I No Action	Alternative II Preferred Alternative
	<p>benefits to soil development and soil nitrification</p> <p>Direct, negligible to minor, adverse, localized impacts to the soil due to fire suppression tactics.</p> <p>Indirect, adverse, long-term, minor to moderate, localized, impacts due to increased potential for locally severe fire effects on soil from fuel buildup due to fireline boundary within park.</p>	<p>to minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p>
Vegetation Resources	<p>Direct, minor to moderate, beneficial, long-term, localized impacts by restoring the native vegetation structure, composition, and function of historically fire-maintained vegetation associations.</p> <p>Indirect, adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on vegetation from fuel buildup due to fireline boundary within park.</p> <p>Climate change - Indirect effects would be beneficial, long-term, and localized due to reduced fuels and fire behavior potential in treated areas.</p>	<p>Direct, minor to moderate, beneficial, long-term, localized impacts by restoring the native vegetation structure, composition, and function of historically fire-maintained vegetation associations.</p> <p>Indirect, beneficial, minor to moderate, localized, long-term impacts due to minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p> <p>Climate change - Indirect effects would be beneficial, long-term, and localized due to reduced fuels and fire behavior potential in treated areas.</p>
Wildlife	<p>Direct, minor, adverse, short-term, and localized impacts due to temporary displacement and mortality of individual wildlife species.</p> <p>Mechanical and manual treatments used for hazardous fuel reduction would have direct, short-term, adverse, localized impacts on wildlife species that are less mobile due to stress and disturbance.</p> <p>Indirect, moderate, long-term, beneficial, localized impacts due to improved wildlife habitat quality from return of natural fire regime.</p> <p>Indirect, adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on wildlife habitat and individuals from fuel buildup due to</p>	<p>Direct, minor, adverse, short-term, and localized impacts due to temporary displacement and mortality of individual wildlife species.</p> <p>Mechanical and manual treatments used for hazardous fuel reduction would have direct, short-term, adverse, localized impacts on wildlife species that are less mobile due to stress and disturbance.</p> <p>Indirect, moderate, long-term, beneficial, localized impacts due to improved wildlife habitat quality from return of natural fire regime.</p> <p>Indirect, beneficial, minor to moderate, localized, long-term impacts due to minimizing the potential for future severe wildfires over time as the amount of area</p>

Resource Topic	Alternative I No Action	Alternative II Preferred Alternative
	the fireline boundary within park.	restored increases and fuel continuity is broken up.
Special Status Species	<p>Arkansas River shiner: Minor, short-term, adverse, site-specific affect on aquatic habitats due to vegetation removal; minor to moderate, long-term, beneficial, localized impacts to habitat due to increased stream flow where salt cedar infestations occur.</p> <p>Bald Eagle: Minor, short-term, adverse, localized impacts to individuals due to displacement and to their habitat due to fragmentation from prescribed fires.</p> <p>Texas Horned Lizard: Minor, short-term, adverse, localized impacts on individual Texas horned lizards and their habitat due to potential mortality and inability to be able to flee or avoid burn units and removal of prey species (i.e., harvester ants); minor to moderate, long-term, beneficial, localized impact on Texas horned lizards and their habitat by creating open, sparsely vegetated patches.</p> <p>Indirect, adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on individual special status species and their habitat from fuel buildup due to the fireline boundary within park.</p>	<p>Arkansas River shiner: Minor, short-term, adverse, site-specific affect on aquatic habitats due to vegetation removal; minor to moderate, long-term, beneficial, localized impacts to habitat due to increased stream flow where salt cedar infestations occur.</p> <p>Bald Eagle: Minor, short-term, adverse, localized impacts to individuals due to displacement and to their habitat due to fragmentation from prescribed fires.</p> <p>Texas Horned Lizard: Minor, short-term, adverse, localized impacts on individual Texas horned lizards and their habitat due to potential mortality and inability to be able to flee or avoid burn units and removal of prey species (i.e., harvester ants); minor to moderate, long-term, beneficial, localized impact on Texas horned lizards and their habitat by creating open, sparsely vegetated patches.</p> <p>Indirect, minor to moderate, beneficial, long-term, localized impacts by restoring the variety and diversity of vegetation communities and special status species habitat present and minimizing the potential for future severe wildfires.</p>
Water Resources	<p>Direct, minor, adverse, short-term , and localized impacts due to removal of vegetation along the stream banks; indirect, minor to moderate, short-term, beneficial, and localized impacts due to maintaining natural aquatic vegetation communities.</p> <p>Direct, adverse, localized, short-term, negligible to minor impacts could occur from mechanical and manual fuel reduction treatments due to trampling of stream banks or similar disturbances by felled and/or</p>	<p>Direct, minor, adverse, short-term , and localized impacts due to removal of vegetation along the stream banks; indirect, minor to moderate, short-term, beneficial, and localized impacts due to maintaining natural aquatic vegetation communities.</p> <p>Direct, adverse, localized, short-term, negligible to minor impacts could occur from mechanical and manual fuel reduction treatments due to trampling of stream banks or similar disturbances by felled and/or</p>

Resource Topic	Alternative I No Action	Alternative II Preferred Alternative
	<p>dragged trees.</p> <p>Indirect, adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects (i.e., increased soil erosion, turbidity, and sedimentation, reduced water quality, and potential pulses of water).</p>	<p>dragged trees.</p> <p>Indirect, minor to moderate, beneficial, long-term and localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p>
Archaeological Resources	<p>Direct, long-term, minor, adverse, site-specific effects on unknown archaeological resources; direct, minor to moderate, long-term, beneficial, and site-specific due to reduced probability of severe wildfires by conducting prescribed burns.</p> <p>Direct and indirect, localized, short-term, and minor due to fire suppression tactics and mechanical and manual hazard fuel reductions.</p> <p>Direct, long-term, minor to moderate, adverse, and localized due to potential fuel build up in certain park areas and the increased risk for severe wildfires.</p>	<p>Direct, long-term, minor, adverse, site-specific effects on unknown archaeological resources; direct, minor to moderate, long-term, beneficial, and site-specific due to reduced probability of severe wildfires by conducting prescribed burns.</p> <p>Direct and indirect, localized, short-term, and minor due to fire suppression tactics and mechanical and manual hazard fuel reductions.</p> <p>Direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p>
Historic Resources	<p>Direct, long-term, minor, adverse, site-specific effects on unknown historic resources; direct, minor to moderate, long-term, beneficial, and site-specific due to reduced probability of severe wildfires by conducting prescribed burns.</p> <p>Direct, long-term, minor to moderate, adverse, and localized due to potential fuel build up in certain park areas and the increased risk for severe wildfires.</p> <p>Localized, negligible to minor, direct and indirect adverse effects on historic structures due to fire suppression tactics.</p> <p>Indirect, localized, short-term to long-term, negligible to minor, and beneficial due to mechanical and manual hazardous fuels reduction.</p>	<p>Direct, long-term, minor, adverse, site-specific effects on unknown historic resources; direct, minor to moderate, long-term, beneficial, and site-specific due to reduced probability of severe wildfires by conducting prescribed burns.</p> <p>Direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p> <p>Localized, negligible to minor, direct and indirect adverse effects on historic structures due to fire suppression tactics.</p> <p>Indirect, localized, short-term to long-term, negligible to minor, and beneficial due to mechanical and</p>

Resource Topic	Alternative I No Action	Alternative II Preferred Alternative
Oil and Gas	<p>Direct, long-term, minor to moderate, beneficial, site-specific impact due to reduced potential for fuel build; direct, short-term, adverse, negligible to minor, and site-specific impacts due to road closures.</p> <p>Direct, long-term, minor to moderate, adverse, localized due to potential fuel build up in certain park areas and the increased risk for severe wildfires.</p> <p>Indirect impacts would be localized, short-term to long-term, negligible to minor, and beneficial due to mechanical and manual hazardous fuels reduction.</p>	<p>manual hazardous fuels reduction</p> <p>Direct, long-term, minor to moderate, beneficial, site-specific impact due to reduced potential for fuel build; direct, short-term, adverse, negligible to minor, and site-specific impacts due to road closures.</p> <p>Direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p> <p>Indirect impacts would be localized, short-term to long-term, negligible to minor, and beneficial due to mechanical and manual hazardous fuels reduction.</p>
Adjacent Landowners and Uses	<p>Direct, short-term, adverse, negligible to minor, and localized due to road closures</p> <p>Direct, short- to long-term, minor to moderate, adverse, localized due to potential fuel build up and the increased risk for severe wildfires</p>	<p>Direct, short-term, adverse, negligible to minor, and localized due to road closures; direct, short-term, minor, adverse, localized impacts due to portions of pastures may have to be deferred from grazing until regrowth of native vegetation occurs; indirect, short-term, minor, beneficial, and site-specific impacts due to increased amount available and nutritional quality of forage.</p> <p>Direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p>
Human Health and Safety	<p>Direct, short- to long-term, minor to moderate, adverse, localized due to potential fuel build up and the increased risk for severe wildfires.</p> <p>Direct, short-term, negligible to minor, adverse, localized due to fire management actions (i.e., Prescribed fire, mechanical and manual</p>	<p>Direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.</p>

Resource Topic	Alternative I No Action	Alternative II Preferred Alternative
	thinning, fire suppression tactics).	

3.0 ENVIRONMENTAL CONSEQUENCES

3.1 Methodology

The effects of each alternative are assessed for direct, indirect, and cumulative effects for each resource topic selected. Actions are first analyzed for their direct and indirect effects. Direct effects are impacts that are caused by the alternatives at the same time and in the same place as the action. Indirect effects are impacts caused by the alternatives that occur later in time or are farther in distance than the action. Potential impacts are described in terms of type, context, duration, and intensity. Specific impact thresholds are given for each resource at the beginning of each resource section. General definitions for potential impacts are described as follows:

Type: Describes the impact as either beneficial or adverse, direct or indirect:

Beneficial: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

Adverse: A change that moves the resource away from a desired condition or detracts from its appearance or condition.

Direct: An effect that is caused by an action and occurs in the same time and place.

Indirect: An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable.

Context: Describes the location or area where the impacts will occur.

- 1) site-specific - impacts would occur within the location of the proposed action
- 2) local – impacts would affect areas within the location of the proposed action and land adjacent to the proposed action
- 3) regional – impacts would affect areas within the location of the proposed action, land adjacent to the proposed action, and land in surrounding communities.

Duration: Describes the length of time an impact would occur, as either short-term or long-term.

Short-term: impacts that generally last for the duration of the project. Some impact topics will have different short-term duration measures and these will be listed with the resource.

Long-term: impacts that generally last beyond the duration of the project. Some impact topics will have different long-term duration measures and these will be listed with the resource.

Intensity: Describes the degree, level, or strength of an impact. The impacts can be *negligible*, *minor*, *moderate*, or *major*. Definitions of intensity can vary by resource topic and are provided separately for each impact topic analyzed.

3.2 Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations, which guide the implementation the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for all Alternatives.

Cumulative impacts were determined by combining the impacts of the alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at LAMR and ALFL and, if applicable, in the surrounding region. The geographic scope for this analysis includes elements within the LAMR and ALFL boundaries and surrounding private lands within the extended fire line boundary. NPS analyzed impacts from past actions dating back to 1996, when the Resources Management Plan was completed and provided goals for managing recreation at Lake Meredith. Cumulative impacts of future planned projects were also analyzed; however the number and timeline of reasonably foreseeable future actions is limited until the NPS completes the General Management Plan for the recreation area in 2011 which contains a planning horizon of 15 to 20 years.

The following projects, plans, or actions were identified as related to the purpose of conducting the cumulative effects analysis:

Resource Management Plan (1996). The Resources Management Plan provides goals for the LAMR and ALFL that address preserving park resources, providing for the public enjoyment and visitor experience, perpetuating cultural resources and enhancing recreational opportunities managed by partners, and ensuring organizational effectiveness.

Fire Management Plan (2008). Wildland fire has historically played an important part of the area's ecosystem. Its effects on vegetation and wildlife have always weighed heavily on the recreation area's natural processes. The Wildland Fire Management Plan for Lake Meredith National Recreation Area is a detailed program of action to implement a prescribed fire program and manage wildland fire. This plan is the primary reference for conducting all fire management activities and is intended to help achieve the resource management objectives as presented in the resource management plan and follow NPS Management Policies. Protection of life (employee and public), property, cultural resources, the perpetuation of natural resources and their associated processes, and protection of cultural and historic scenes are the highest priorities for the plan. This plan is based on a strategy to use prescribed burns and mechanical methods to remove excess fuel from the system, which would reduce the likelihood of major wildfires and would also provide benefits to fire dependent native vegetation and wildlife in the area.

Oil and Gas Management Plan (2002). The 2002 Oil and Gas Management Plan for LAMR and ALFL was prepared for the purpose of guiding the management of activities associated with the exploration and development of nonfederal oil and gas within the park. The Oil and Gas Management Plan identifies those park resources and values most sensitive to oil and gas exploration and development disturbance, and defines impact mitigation requirements to protect such resources and values. In order to protect park resources and values, the plan establishes performance standards for oil and gas exploration and development, and it provides pertinent information to oil and gas owners and operators to facilitate compliance with applicable regulations (NPS 2002). As of 2002, there were 170 active non-federal oil and gas operations in LAMR. Construction and operation of these facilities has the potential to impact soils, vegetation, visitor use and experience, and park operations.

Invasive Species Removal. Salt cedar (also known as tamarisk) is an invasive plant that occurs throughout Texas and extensively infests LAMR. There is anecdotal evidence that salt cedar infestations in and around Lake Meredith has reduced the inflow of runoff water from rainfall into the lake. In 2002, the Entomology Program at the Texas A&M Research and Extension Center began a cooperative effort with the Bureau of Reclamation (BOR) to develop a bio-control program for salt cedar at Lake Meredith. In 2004, as part of a research study, planned releases of *Diorhabda elongate*, a chrysomelid beetle that is an aggressive defoliator of salt cedar, were carried out at two sites at Lake Meredith. The NPS conducted aerial spraying in late August 2008 on a total of 5,298 acres. Herbicide was applied in an area starting at the southwest boundary of LAMR on the Canadian River at Rosita, to the Sanford Dam. This included lake-bottom (pre-drought), and much of the entire shoreline. The aerial spraying was completed in September 2009. Treatment for salt cedar and other exotic plants will continue by hand-crews in the future.

Ongoing Maintenance Activities. Throughout the park units, regularly-scheduled maintenance activities are conducted to ensure visitor health and safety. These activities have involved infrastructure maintenance and upkeep, such as ensuring water quality and access. Regular repairs to roads and concrete ramps have also occurred on a continuing basis. Regular park facility maintenance is continually occurring at Lake Meredith. To ensure historic structures remain in good condition, the NPS continually monitors the condition of the McBride House to ensure that if any degradation occurs, funding can be sought to stabilize and repair the structure (NPS 2008b). The potential for impacts to soils, vegetation, park operations, and visitor experience exists from maintenance activities.

Off-Road Vehicle (ORV) Use. There are two authorized ORV use areas at LAMR: Blue Creek and Rosita (also known as Rosita Flats). ORV use has taken place in these areas since at least the 1950s (NPS 2007); however, the two areas were not designated as ORV areas until the 1970s. The use of ORVs has resulted in impacts to soils, vegetation, park management, visitor experience, and visitor safety.

Sand Drag. The annual Sand Drag event, held every February, attracts thousands of spectators and hundreds of motorcycles, four wheelers, sand rails, and river buggies. Drivers of these vehicles compete against one another in ORV races. Although the Sand Drag is private and is held outside of the park units, there is a substantial increase in visitor use at Lake Meredith associated with this annual event. This dramatic increase in visitation necessitates greater law

enforcement and park management services, including increased NPS fire preparedness activities. This increased intensity of ORV use has the potential to negatively affect soils and other natural resources.

Increasing Demand for Regional Public Lands. LAMR is the largest area of public lands in the Texas panhandle, providing numerous opportunities for access to diverse, affordable outdoor land- and water-based recreation activities. In the State of Texas, only 3% of total land base is open to the public; this reflects a relative dearth of public recreational opportunities compared to other western states (NPS 2007). The next largest recreation area in the Lake Meredith region is Palo Duro Canyon State Park, which is located approximately 70 miles south of Lake Meredith and contains 26,275 acres of the scenic, northern-most portion of the Palo Duro Canyon. Amenities in Palo Duro Canyon State Park include an interpretive center, cabins, tent and RV sites, hiking and mountain bike trails, horse stables, and picnic areas (TPWD 2011a). Increasing demand for regional public lands can affect visitor use and experience.

General Management Plan (in development). The NPS has started an interactive planning process to develop a vision for the future of LAMR and ALFL. This process would result in a General Management Plan that would articulate the long-term vision that would guide management of the recreation area for the next 15 to 20 years. A general management plan is the broadest level of planning in the NPS. The general management plan lays the groundwork for the more detailed planning and day-to-day decision-making that will follow. The LAMR and ALFL General Management Plans would provide for public use at the park units, identify development and management actions which satisfy recreational needs, and guide all future recreation development and management (Federal Register 2009). Actions arising from this plan have the potential to increase resource protection and improve visitor use/experience.

ORV Management Plan/EIS (in development). The recreation area initiated a planning effort in October of 2007 for the purpose of preparing an EIS for an ORV management plan. The plan and corresponding regulations would address ORV use at both Rosita and Blue Creek. The ORV Management Plan/EIS would be used to guide the management and control of ORVs at the Recreation Area for approximately the next 15 to 20 years. The ORV management plan/EIS would assess potential environmental impacts associated with a range of reasonable alternatives for managing ORV impacts on park resources such as soils, wetlands, wildlife, cultural resources, visitor experience, and public safety.

3.4 Natural Resources

3.4.1 Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) established federal programs that provide special protection for air resources and air quality related values associated with NPS units. Specifically, Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. LAMR/ALFL (hereafter Project Area) is designated as a Class II air quality area under the Clean Air Act, which means emissions of particulate matter and sulfur dioxide are allowed up to the maximum increase in concentrations of pollutants over baseline concentrations as specified in Section 163 of the Clean Air Act. In addition, the Clean Air Act gives the federal land manager the responsibility to protect air quality related values (i.e.,

visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

3.4.1.1 Affected Environment

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

The Project Area is classified as a Class II area under the Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act of 1963 and amendments. 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 PM. The PSD permitting process 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 for SO₂, NO_x, O₃, and PM has not been routinely monitored for the Project Area, but is assumed to be in compliance with the NAAQS. The nearest ambient monitoring station until 1996 was in Amarillo, Texas for PM₁₀. All monitored values were in compliance with the PM₁₀ NAAQS (i.e., 150 ug/m³ standard).

Although, the Project Area is not subject to the visibility protection provisions that apply to PSD Class I areas, it does experience the widespread visible haze affecting this region of the country on some days. This haze may be attributed to a variety of existing sources, such as oil and gas-related activities, energy production, or sand and gravel operations. Based on extrapolation from visibility data collected from 1988-1997 by the IMPROVE (Interagency Monitoring of Protected Visual Environments) visibility monitoring network, the visual range experience on average in this area ranges from 48 to 96 kilometers or approximately half the distance it would be under natural visibility conditions.

Prescribed fire activity is subject to regulations of the TCEQ, but burning permits are not required prior to ignition in the panhandle of Texas. Each year, TCEQ is provided a letter identifying the location and number of burns predicted for the area. Twenty-four hour notice is given to TCEQ, local sheriffs and fire departments prior to all prescribed burn ignitions.

3.4.1.2 Methodology and Intensity Threshold

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. The thresholds of change for the intensity and duration of an impact are defined as follows:

Negligible: Operations would cause no changes 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.

Minor: Operations would cause measurable small, short-term, localized changes in air quality. Alteration to air quality would be temporary and limited smoke exposure to sensitive resources. No mitigation measures would be necessary.

Moderate: Operations would cause measurable, localized changes in air quality that would have consequences, but air quality standards would still be met. . Alteration to air quality resources would be short-term smoke exposure to sensitive resources. Mitigation measures would be necessary and would likely be successful.

Major: Operations would cause measurable, regional changes in air quality that would have substantial consequences, and would violate state and federal air quality standards and Class II air quality standards. Alteration to air quality resources would be long-term smoke exposure to sensitive resources. Extensive mitigation measures would be needed to offset any adverse effects and their success could not be guaranteed.

Duration:

Short-term: Recovers in 7 days or less.

Long-term: Takes more than 7 days to recover.

3.4.1.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Design and conduct operations in a manner that minimizes air pollution emissions and impacts.	NPS Organic Act of 1916, as amended; Clean Air Act, as amended; NPS Wildfire Management Reference Manual 18; NPS-77 Natural Resources Management Guidelines; NPS Management Policies; Texas Admin Code, title 30, Chapter 111; National Environmental Policy Act
Perpetuate best air quality to sustain human health, scenic vistas, visibility, and visitor enjoyment; and to conserve natural resources and systems and cultural resources.	

3.4.1.4 Analysis of Alternatives and Impacts on Air Quality

Impacts of Alternative I: No Action Alternative

Direct, minor, adverse, short-term, localized impacts to air quality would occur from particulate matter and smoke produced from prescribed burns. Fugitive dust generated from suppression activities and increased vehicle traffic associated with fire crews would also temporarily affect air quality. Smoke, particulate matter, and dust emissions impact visibility in the park and surrounding area. There may be an intermittent and short-term exceedance of air quality standards (especially particulates) resulting in short-term, localized, and negligible to minor adverse impacts to air quality and visibility. Mitigation measures would include rapid mop-up and extinguishing of the remaining burning, thus reducing smoke from heavy fuels. Another

mitigation measure is to burn during appropriate weather and fuel moisture conditions where fuels available to burn will burn out quickly, rather than smoldering for several days. Indirect adverse effects from these air emissions would include reduced visibility along roadways, reductions in recreation values due to visibility limitations, smoke and odors, and possible health effects to sensitive receptors, such as residents and visitors. These adverse indirect effects would be short-term, localized, and minor. The amount and duration of these smoke impacts should be limited by limiting the acres burned at one time and timing ignitions early in the day to allow for more complete combustion during daytime conditions.

Indirect long-term, beneficial effects would result from a decrease in fuel loading following implementation of prescribed burning. Therefore, there would be a decrease in particulate matter emissions and the impairment of visibility from wildfires when they occur. These beneficial indirect effects would be long-term, regional, and moderate.

Prior to any prescribed fire, the park would notify the TCEQ. 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 expected 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). Significant smoke situation that arises and threatens smoke-sensitive areas may trigger suppression and/or mitigation measures that terminate the prescribed burn.

Air pollutants would be generated by use of gasoline-powered equipment in mechanical and manual fuel reduction projects. The direct adverse effect of these pollutants on air quality, given the small size of the projects and infrequency of activity, would be localized, short-term, and negligible to minor. The indirect and longer-term adverse impacts would be negligible.

Cumulative Impacts

Within LAMR and ALFL boundaries (hereafter park), existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, routine maintenance of park roads, and public recreational activities such as boating, off-road vehicle use, and camp fires could contribute to air quality impacts.

Activities that could contribute to air quality impacts outside the park boundaries include non-federal oil and gas operations, petrochemical manufacturing plants, public utilities, agriculture, private land prescribed burns, cattle ranching, and urbanization could result in minor to moderate, adverse impacts on the regional airshed.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in minor to moderate, short-term, adverse, localized cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from the No Action alternative would be negligible, as most air quality impacts are from other sources.

Conclusion

The No Action alternative would result in direct, short-term, localized, and negligible to minor adverse impacts from prescribed burns to air quality. Cumulative effects under this alternative would be minor to moderate, short-term, adverse, and localized.

Impacts to Alternative II: Preferred Alternative

Air quality impacts under this alternative would be the same as the No Action alternative. Although, both alternatives have similar effects on air quality, the Preferred Alternative could potentially produce slightly higher emissions due to more acres being treated, leading to more particulate matter. However, it would likely lead to lower and less intense wildfire emissions, which would have a beneficial regional effect.

Cumulative Impacts

Within LAMR and ALFL boundaries (hereafter park), existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, routine maintenance of park roads, and public recreational activities such as boating, off-road vehicle use, and camp fires could contribute to air quality impacts.

Activities that could contribute to air quality impacts outside the park boundaries include non-federal oil and gas operations, petrochemical manufacturing plants, public utilities, agriculture, cattle ranching, and urbanization could result in minor to moderate, adverse impacts on the regional airshed.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in minor to moderate, short-term, adverse, localized cumulative impacts to air quality. Contribution to cumulative air quality impacts resulting from the Preferred Alternative would be negligible, as most air quality impacts are from other sources.

Conclusion

The Preferred Alternative would result in short-term, localized, and negligible to minor adverse impacts from prescribed burns to air quality. Cumulative effects under this alternative would be minor to moderate, short-term, adverse, and localized.

3.4.2. Geology and Soil Resources

3.4.2.1 Affected Environment

The park is located in the Canadian River Breaks of the Southwestern Tablelands, which is a broad erosional incision between the High Plains and the Central Great Plains (Griffeth et al. 2004). The Canadian River, the main feature, eroded a deeply incised canyon known as the Canadian River Breaks across the Texas Panhandle. The Canadian River Breaks consists of undulating gentle to steep hills, slopes, and canyons. Over 71% of ALFL and over 67% of LAMR lands are comprised of slopes greater than or equal to 12% (NPS 2002). Construction of firelines on steep slopes can be difficult, costly, and cause soil erosion and increased sedimentation in Lake Meredith.

The dissolution of underlying salt beds and the subsequent collapse of overlying rocks helped to create the present-day Canadian River pathway (Griffeth et al. 2004). The Canadian River eroded down through the Ogallala Formation, deepening the Canadian River Breaks. Evidence of salt deposits is visible where surface depressions are present from subsurface salt deposits dissolved. The salinity of the Canadian River (3,000 parts per million) suggests salt dissolution is still occurring today (NPS 2002).

Surface Geology

The Project Area consists of five geologic formations, and from youngest to oldest includes the Holocene alluvium, Pleistocene terrace deposits, Tertiary Ogallala Group, Triassic Dockum Group, and the Permian Quartermaster Formation (Butler 2001). The age of these surface deposits range from 245 million years old Permian “redbeds” to present-day fluvial alluvium sediments deposits.

During the Holocene and Pleistocene, eolian and fluvial silts and sands were deposited. These deposits are comprised of reworked sediments (i.e., volcanic deposits, sands, gravels, and clays) and newly eroded sediments. The Pleistocene-aged sands, gravels, and clays can be found along the canyon walls near the southern portions of Lake Meredith. Holocene-aged volcanic sediments can be found in the upper canyons and along the southern edge of Lake Meredith (NPS 2002).

Tertiary-aged silt, sand, and gravel deposits from the Ogallala Group can be found in the southwestern portion of the Project Area. A caliche caprock developed in the soils of the stabilized late Pliocene surface and forms the tops of the hills and bluffs that give the Llano Estacado its distinctive appearance. The Ogallala Group at LAMR consists of tan and white sandstone that can be seen on the dolomite ridges and rounded hills away from the Canadian River (Butler 2001). The thickness of the Ogallala Group varies with topography of the buried erosion surface and ranges from 50 – 500 feet thick (Evans and Meade 1945). The Ogallala Group is comprised of tan sand and gravel deposits that form an extensive groundwater aquifer where they dip into the subsurface north of LAMR. The Ogallala Aquifer provides water for 69% of the irrigated crops in Texas (Butler 2001), industrial, and municipal uses in the Great Plains.

Dockum Group consists of yellow, maroon, and lavender colored shales and poorly consolidated grey sandstone deposited during the Triassic Period 250 to 210 million years ago. This formation is thought to be equivalent in age and environment to portions of the Chinle Formation of Utah, New Mexico, and Arizona and contains petrified wood and fossils. Within LAMR, the Dockum Group rocks have eroded away and outcrop in isolated portions of the southwestern area of Lake Meredith (Butler 2001).

The Quartermaster Formation consists of dolomites, siltstones, claystones, and sandstone outcrops along the shores of Lake Meredith and in the surrounding canyon areas. The Quartermaster Formation is divided into three members, the Cloud Chief Gypsum, Whitehorse sandstone, and Alibates Dolomite. The ledges and cliffs that dominate the area are capped by Alibates Dolomite. The Alibates Dolomite is comprised of two white dolomite layers 12–15 feet thick separated by a red shale layer. The lower dolomite layer is locally replaced by silica and oxygen, which forms Alibates flint. Flint has been used for the past 13,000 years by Native Americans for making tools and is locally referred as Alibates flint (Butler 2001; see Cultural Resources section for more information).

Soils

Soils within the Project Area are represented by several different soil series as reported by the Natural Resource Conservation Service. The soils can be characterized as moderately deep to very deep, nearly level to strongly sloped, and fine sandy loams to clay loams (NRCS 2011a, 2011b, 2011c).

In areas with steeper slopes, the soils tend to be shallow (10 to 20 inches), well drained, calcareous loamy to gravelly soils with variable amounts of rock fragments. These soils are typically associated with rock outcrops in the Project Area. Soils on steep slopes are highly susceptible to water erosion and moderately susceptible to wind erosion.

On gentler slopes away from the reservoir, soils are very deep, well drained, and calcareous clay loams. These soils are highly susceptible to water erosion and moderately susceptible to wind erosion.

In the upper reaches of the reservoir on relatively level floodplain areas, there are deep, calcareous soils that are subjected to flooding every three to five years. Locally, there may be soils classified as hydric and wetlands in these floodplain areas. These soils are slightly susceptible to water erosion, but soil compaction may be an issue in these areas.

Above the reservoir on flat terrain are areas of dunes and sandy deposits. These soils are highly susceptible to wind erosion.

Problems associated with soils in the park are generally related to soil texture (i.e., grain size) and slope. Unprotected areas are subject to wind and water erosion. Within the NPS boundaries, soil compaction, erosion, and slumping occurs along roads, drillpads, flowlines, gathering lines, and pipelines (NPS 2002), and natural erosion and slumping occurs on steeper slopes. .

3.4.2.2 Methodology and Intensity Threshold

To analyze the impacts on geologic and soil resources, all available information on geological and soil resources in the Park was compiled, and was developed in consultation with NPS staff and other sources. The thresholds of change for the intensity and duration of an impact are defined as follows:

Negligible: Operations would not cause discernible alteration to geologic layers, surficial, and shallow geology. Alteration to geologic and soil resources would be so slight that their ability to sustain biota, water quality, and hydrology would not be affected, and reclamation would not be necessary.

Minor: Operations would cause localized or limited alteration to geologic layers, surficial, and shallow geology. Alteration to geology and soils would affect their ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 2 years. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Operations would cause alteration to geologic layers, surficial, and shallow geology. Alteration to geologic and soil resources would affect their ability to sustain biota, water quality, and hydrology, such that reclamation would be achievable within 3 to 5 years. Mitigation measures, if needed to offset adverse effects, could be extensive but would likely be successful.

Major: Operations would cause substantial alteration to geologic layers, surficial, and shallow geology. Alteration to geologic and soil resources would have a lasting effect on the ability of the geology and soil to sustain biota, water quality, and hydrology, such that reclamation could not successfully be achieved. Extensive mitigation measures would be needed to offset any adverse effects and their success could not be guaranteed.

Duration:

Short-term: Recovers in less than 3 years.

Long-term: Recovers in more than 3 years.

3.4.2.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Avoid or minimize soil compaction, soil loss or removal, and soil erosion.	NPS Organic Act of 1916, as amended; NPS-77 Natural Resources Management Guidelines; NPS Management Policies
Prevent soil contamination	
Re-establish contours and soil chemistry to support and sustain native vegetation communities that existed prior to initiation of actions.	

3.4.2.4 Analysis of Alternatives and Impacts on Geologic and Soils Resources

Impacts of Alternative I: No Action Alternative

Direct, adverse, short-term, minor, localized impacts from fireline construction to soils would occur from soil disturbance and could lead to increased erosion. If firelines were cut, they would be re-contoured and covered with cut vegetation after the suppression activities had taken place in order to minimize any damage that may have been done. If firelines were cut on the park boundary lines, some of which are on steep, highly erodible slopes, then soil erosion could be a major issue.

Prescribed fire would be beneficial by releasing 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).

The loss of some vegetative cover from prescribed fire could lead to a potential increase of wind soil erosion. However, problems with wind erosion would only result in minor, adverse, localized, and short-term 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 repellant. 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.

Wildland fire suppression tactics have the potential to cause increased soil erosion. Lack of action or ineffective suppression tactics can lead to larger wildfires with more high intensity and soil affecting results. However, on most wildfires minimum impact suppression tactics (e.g., select procedures, tools, and equipment that least impacts the environment, use waterbars on firelines to reduce erosion risk, re-contour area) would be used to reduce the impacts. Thus, wildland fire suppression tactics would result in direct, negligible to minor, adverse, localized impacts to the soil.

Mechanical and manual equipment used during hazardous fuel reduction treatments could impact soils due to increased erosion by removing vegetation, compaction of soils, or disrupting soil biotic crusts. However, implementing appropriate mitigation measures, minimizing use of mechanical to only when necessary, would minimize soil disturbance and prohibit potentially erosive actions in areas identified by field office resource specialists as containing highly erodible soils.

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the

difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on soil, including physical alteration of soil structure and development of hydrophobic layers.

Cumulative Impacts

Existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, recreational activities (e.g., off-road vehicle use), ranching and agriculture, residential development, and road construction within and adjacent to the park could contribute to geologic and soil resource impacts.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in minor, short-term, adverse, localized cumulative disturbance to soils. There would also be minor, long-term, cumulative beneficial impacts to park soils. Contribution to cumulative geologic and soil resource impacts resulting from the No Action alternative would be minor, as geologic and soil impacts are from the No Action alternative would be distributed throughout the park, rather than being concentrated in one area or at one time, thus minimizing the adverse cumulative effects.

Conclusion

The No Action alternative would result in short-term, localized, minor, and adverse impacts from prescribed burns and associated activities to soils. Cumulative effects under this alternative would be minor, short-term, adverse, and localized. Prescribed burns would also have long-term, localized, beneficial cumulative impacts to soils from increased nutrients.

Impacts to Alternative II: Preferred Alternative

General geology and soil resource impacts with regards to prescribed fires and fireline construction under this alternative would be the same or less than the No Action alternative. Although, both alternatives have similar effects on geology and soil resources, the Preferred Alternative would mostly utilize existing ranch roads as firelines, where prescribed fires could be safely stopped and contained. Using existing ranch roads as firelines would minimize soil disturbance that would be created from fireline construction. Whereas the No Action alternative may require building firelines in undesirable locations on steep sections of park boundary, which could result in more erosion than utilizing existing ranch roads. In addition, the Preferred Alternative would implement larger prescribed burns to more effectively reduce wildfire risk and prevent large wildfires in the area, which could mean less high severity fire damage and erosion of soils, and less emergency vehicle/equipment ground disturbance in wildfire areas. Indirect effects would be beneficial, minor to moderate, localized, long-term impacts due to minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

The Preferred Alternative would include the same wildland fire suppression tactics and mechanical hazardous fuel treatments as the No Action alternative, except that the

mechanical/manual work on private lands would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. Chemical would not be used on private lands by the NPS.

Cumulative Impacts

Existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, recreational activities (e.g., off-road vehicle use), ranching and agriculture, residential development, and road construction within and adjacent to the park could contribute to geologic and soil resource impacts.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in minor, short-term, adverse, localized cumulative disturbance to soils. There would also be minor, long-term, cumulative beneficial impacts to park soils. Contribution to cumulative geologic and soil resource impacts resulting from the Preferred Alternative would be minor, as geologic and soil impacts are from the Preferred Alternative would be distributed throughout the park, rather than being concentrated in one area or at one time, thus minimizing the adverse cumulative effects.

Conclusion

The Preferred Alternative would result in short-term, localized, minor, and adverse impacts from prescribed burns and associated activities to soils. Cumulative effects under this alternative would be minor, short-term, adverse, and localized. Prescribed burns would also have long-term, localized, beneficial cumulative impacts to soils from increased nutrients.

3.4.3 Vegetation

The 2006 NPS Management Policies states the NPS will preserve and maintain all plants native to the naturally evolving park unit ecosystems by preserving and restoring the abundances, diversity, dynamics, habitats, distributions, and natural processes of native plants.

3.4.3.1 Affected Environment

Vegetation within NPS boundaries is sparse due to soil and climatic conditions and consists mainly of grasses and drought-tolerant species. Constant winds and high temperatures contribute to high evaporative rates, which reduces precipitation available for plant growth. Much of the terrain surrounding LAMR and ALFL consists of flat and rolling grasslands. The predominant vegetation cover includes blue grama (*Bouteloua gracilis*), little bluestem (*Schizachyrium scoparium*), and buffalo grasses with interspersed scattered clumps of sand sagebrush (*Artemisia filifolia*), yucca (*Yucca* spp.), broom snakeweed (*Gutierrezia sarothrae*), plains pricklypear (*Opuntia polyacantha*), feather dalea (*Dalea formosa*), one-seeded juniper (*Juniperus monosperma*), and mesquite (*Prosopis grandulosa*). Cottonwood (*Populus fremontii*) and hackberry (*Celtis* spp.) stands are found in the side canyons along Lake Meredith (NPS 1996). The varying water levels of Lake Meredith have encouraged salt cedar (*Tamarix* spp.) encroachment in the floodplain areas.

The twelve plant communities that occur within LAMR and ALFL include sandhills and sandflats, sand valley bottoms, gravelly slopes, dolomite caprock, red slopes, gypsum outcrops, river and creek sides, lakeshore, marsh, borrow area, lawns and mowed roadsides, and old homesites (Nesom and O'Kennon 2005).

There are no prime or unique farmlands, or endangered or threatened plants located within the Project Area.

In 1999, in cooperation with U.S. Geologic Survey and the National Wetlands Research Center, NPS classified 13 landcover types for LAMR and ALFL as listed in Table 3 and shown in Figure 3. The landcover classifications also encompass the extended fireline boundary of adjacent private lands, which make up the Project Area.

Table 4. Landcover Classification Type and Percentage, LAMR and ALFL FMP Project Area.

Land Classification Type	LAMR		ALFL		Private	
	Acres*	Percentage	Acres	Percentage	Acres	Percentage
Water	10,757.27	25.83	0.34	0.03	136.43	0.25
Yucca Grassland	4,297.22	10.32	507.69	37.01	14,095.01	25.38
Mesquite Grassland	2,793.21	6.71	112.13	8.17	7,786.84	14.02
Mixed Grassland	5,091.66	12.23	225.67	16.45	13,524.67	24.35
Vegetated Cliffs	8,802.70	21.14	483.84	35.27	7,360.10	13.25
Disturbed Grassland	457.43	1.10	1.01	0.07	690.79	1.24
Riverine Grassland	197.51	0.47	1.78	0.13	22.42	0.04
Emergent Vegetation	1,373.28	3.30			51.59	0.09
Emergent Scrub/Shrub	2,106.93	5.06	1.20	0.09	55.53	0.10
Unconsolidated Shore	747.36	1.79			135.61**	0.24
Mixed Forest	4,033.86	9.71	38.84	2.83	641.89	1.16
Bare Land	942.63	2.26	1.10	0.08	1,212.15	2.18
Urban	12.53	0.03				
Private Not Classified					9,820.78	17.68
Total	41,646.97	100.00	1,371.82	100.00	55,533.80	100.00

Source: NPS 2009

*Acres are derived from the existing LAMR boundary map.

**Acres include streams flowing into Canadian River and /or Lake Meredith

Yucca Grassland: Densely vegetated areas dominated by yucca with mesquite (*Prosopis* spp.), small soapweed yucca (*Yucca glauca*), bluestems, grammas (*Bouteloua* spp.), and purple threeawn (*Aristida purpurea*).

Mesquite grassland: Densely vegetated areas dominated by mesquite with small soapweed yucca, bluestems, grammas, and purple threeawn.

Mixed Grassland: Densely vegetated with mesquite, small soapweed yucca, bluestems, purple threeawn, yucca, and other vegetation types.

Vegetated Cliffs: Sloped edges along ravines sparsely vegetated with bluestems, mesquite, grammas, netleaf hackberry (*Celtis reticulata*), soapberry (*Sapindus Saponaria*) among other vegetation types.

Disturbed Grassland: Sparsely vegetated with switchgrass (*Panicum virgatum*), common reed, seep willow (*Baccharis salicifolia*), salt cedar (*Tamarix* spp.), yellow or white clover (*Melilotus* spp.) among other vegetation types.

Riverine Grassland: Densely vegetated with switchgrass, common reed, seep willow, salt cedar, yellow or white clover among other vegetation types.

Emergent Vegetation: Low-lying areas occasionally inundated with freshwater from rain events or lake level fluctuations with reeds, rushes, cattails, scirpus among other vegetation types.

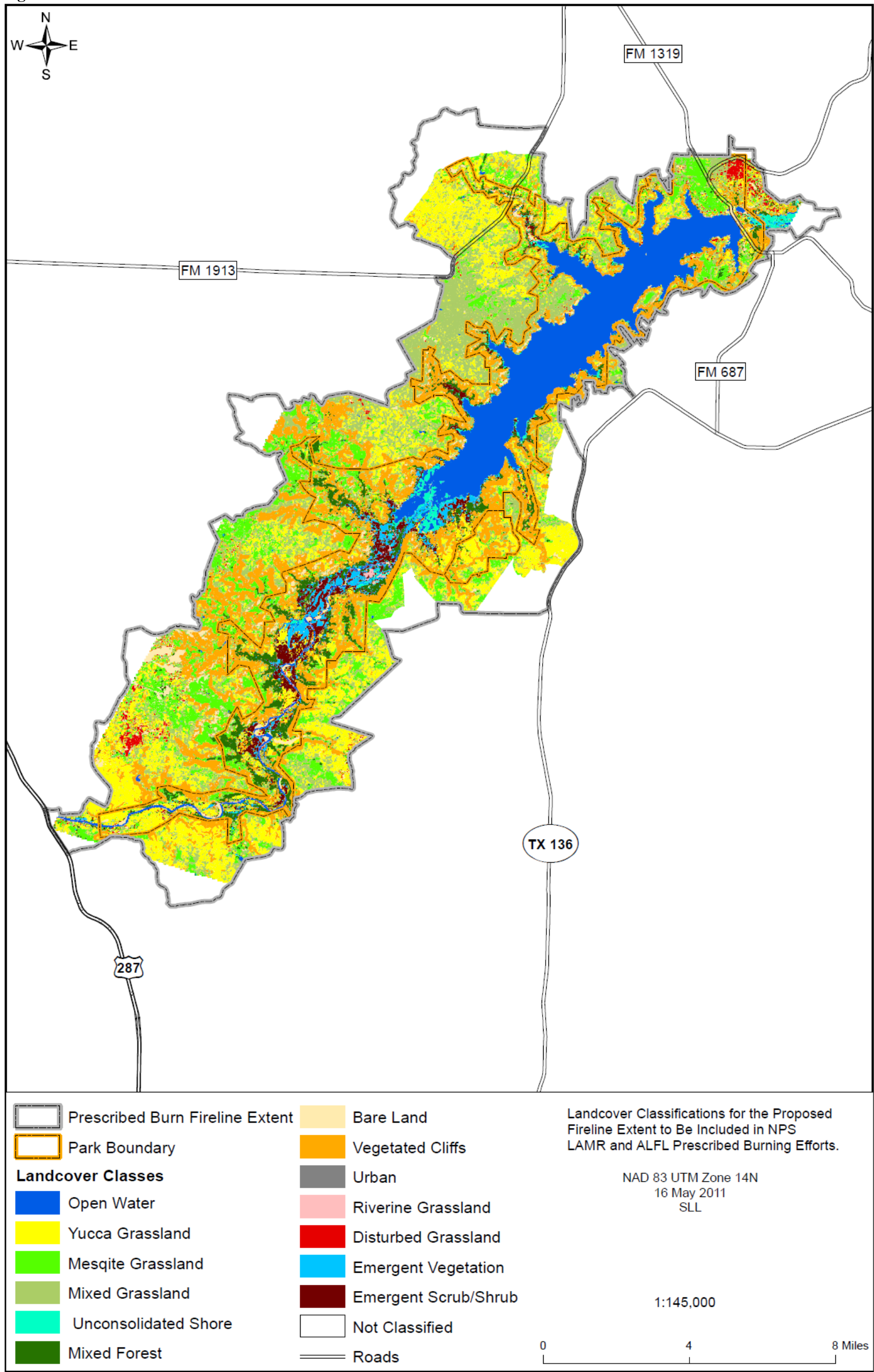
Emergent Scrub/Shrub: Low-lying areas that are occasionally inundated with freshwater from rain events or lake level fluctuations with cottonwoods, willows (*Salix* spp.), salt cedar, seep willow, reeds, and switchgrass.

Unconsolidated Shore: Adjacent to inland waters consisting of fine sands with little or no vegetation. If vegetation is present, it is sparse with species such as salt grass, salt cedar, or herbaceous plants.

Mixed Forest: Densely populated with trees including hackberry, one-seed juniper, cottonwoods, soapberry, mesquite, and salt cedar.

Not Classified: These areas were not included in the USGS project area. However, these areas are classified as mesquite shrub and mesquite-juniper brush with cottonwood-hackberry-salt cedar brush/woods in the northeastern corner by the Texas Parks and Wildlife.

Figure 3. Landcover Classifications



Rare and/or Imperiled Plant Communities in Texas. The Texas Natural Heritage Program maintains a list of plant communities in the state. The protection of plant communities, especially rare or imperiled plant communities, is important because they provide food and shelter for migrating and resident wildlife, biological diversity, aesthetics, nutrient cycling, and gene-banks. These plant communities are also important to future science and technological discoveries. Five plant communities are likely to occur in the Project Area: blue grama-buffalograss community, cottonwood-tallgrass community, oneseed-juniper community, redberry juniper-midgrass community, and the sideoats grama series. Out of these plant communities the blue grama-buffalograss community, cottonwood-tallgrass community, and sideoats grama series are classified by the state as rare or imperiled globally.

Blue grama-Buffalograss Community: This plant community is secure globally, but rare or uncommon in the state. It is typically found in upland soils, primarily in central and northern High Plains, but also the Trans-Pecos and Rolling Plains. Vegetation includes mesquite with a variety of mid and short grasses such as sideoats grama (*B. curtipendula*), sand dropseed (*Sporobolus cryptandrus*), and threeawns (*Aristida* spp.). This community type grades into midgrass communities on more mesic sites. This vegetation community may be found on upper slope positions and near the edges of mesa tops where there are shallow soils and/or rock outcrops with 100 feet of mesa top edges and the upper portions of vegetated cliffs.

Cottonwood-Tallgrass Community: This plant community is imperiled globally and in the state. It is typically found in sub-irrigated creek bottoms and swales, usually between dunes in the Panhandle of Texas. Vegetation includes big bluestem (*Andropogon gerardii*), switchgrass, gamagrass (*Tripsacum dactyloides*), Indiangrass (*Sorghastrum nutans*), and alakali sacaton (*S. airoides*). Seeps and marshes may be included and surrounding dunes are Havard shin oak (*Quercus havardii*)-little bluestem or sandsage-midgrass grasslands or shrublands. This vegetation community maybe located in and adjacent to principal swales and drainages (both permanent and seasonal/intermittent

Sideoats Grama Series: This plant community is threatened throughout its range and rare to uncommon in the state. It is typically found in uplands intermixed with redberry juniper shrubland over relatively steep, xeric soils and adjacent sandy soils within the sandsage (*Artemisia filifolia*)-midgrass series in the Rolling Plains. It also occurs in central and western Edwards Plateau. Vegetation includes blue grama (*B. gracilis*), Texas wintergrass (*Stipa leucotricha*), curlymesquite (*Hilaria belangeri*), slim tridens (*Tridens muticus*), threeawns, cane bluestem (*Bothriochlos bardinodis*), vine-mesquite (*Panicum obtusum*), little bluestem (*Schizachyrium scoparium*), Indiangrass, and California cottontop (*Digitaria californica*). This vegetation community may be found on mesa tops within the yucca, mixed grassland, and mesquite grassland landcover types.

Invasive Vegetation

There are 47 nonnative species known to occur in LAMR and ALFL with ten being classified as “highly invasive” and displacing native vegetation, and eight classified as “invasive and potentially problematic” (Nesom and O’Kennon 2005). Highly invasive species include, but are not limited to salt cedar, Russian thistle (*Salsola tragus*), and Mexican fireweed (*Bassia scoparia*). NPS estimates approximately 12,000 acres within LAMR are infested with non-native species (NPS 2008b), the most prevalent being salt cedar. The NPS has completed an EA

to address the control of salt cedar through chemical means and spraying took place in late August 2008 on a total of 5,298 acres. Herbicide was applied from the air in an area starting at the southwest boundary of LAMR on the Canadian River at Rosita to the Sanford Dam. This included lake-bottom (pre-drought), and much of the entire shoreline. Mechanical salt cedar eradication has been occurring intermittently since at least 2002.

3.4.3.2 Methodology and Intensity Threshold

The methodology used for assessing vegetation impacts included using available spatial data and literature to identify the plant communities present and identifying the potential effects to plant populations (e.g., composition, diversity, abundance) by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Operations would not affect native vegetation or some individual native plants would be affected, but there would be no effect on native plant species' populations (e.g., composition, diversity, abundance). The effects would be on a small scale.

Minor: Operations would affect some individual plants and a relatively limited portion of that species' population would also be affected. Mitigation measures, if needed to offset adverse effects, would be simple and successful. Reclamation is readily achievable through natural successional processes.

Moderate: Operations would affect some individual native plants and a sizeable segment of the species' population would also be affected over a relatively wide area. Mitigation measures, if needed to offset adverse effects, could be extensive, but would likely be successful. Reclamation is achievable but likely requires additional resources to accomplish goals.

Major: Operations would cause substantial alteration to individual native plants and affect a sizeable segment of the species' populations over a relatively wide area. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed. Reclamation may not be attainable even with substantial efforts.

Duration:

Short: Recovers in 3 years or less.

Long: Recovers in more than 3 years.

3.4.3.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Avoid or minimize damage to or removal of vegetation communities, particularly rare or imperiled plant communities identified by the State of Texas Parks and Wildlife Department.	NPS Organic Act of 1916, as amended; NPS-77 Natural Resources Management Guidelines; Executive Order 13112, Invasive Species; NPS Management Policies

Desired Condition	Source
<p>Reclaim all treated areas to a condition that is approximately equivalent to pre-treatment conditions in terms of sustained support of functional physical processes, biological productivity, biological organisms, and land uses.</p> <p>Prevent establishment of non-native vegetation in all disturbed areas.</p>	

3.4.3.4 Analysis of Alternatives and Impacts on Vegetation

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on vegetation, including physical alteration of vegetation structure, composition, and function and increased susceptibility to spread of noxious weeds.

Direct, adverse, short-term, minor, localized impacts from fireline construction and to soils would occur from soil disturbance and could lead to increased erosion and potential increase for noxious weeds. If firelines were cut, they would be re-contoured and covered with cut vegetation after the suppression activities had taken place in order to minimize any potential noxious weed infestations and damage that may have been done.

Prescribed fire would benefit the native plants communities by rejuvenating the soils with nutrients, reducing dense undergrowth and matting of grasses, reducing competition for limited resources with noxious weeds, increasing flower production and/or seed germination of fire-adapted plant species, and restoring the native vegetation structure, composition, and function of historically fire-maintained vegetation associations. Grassland and wetland plant communities have evolved with the periodic fire regime and require it to maintain the open vegetation communities with sparse overstories and abundant herbaceous cover. Wetland plant species possess adaptations to fluvial disturbances that facilitate survival and reestablishment following fires, thus contributing to the rapid recovery of many wetland vegetation communities.

The use of prescribed fire could result in the loss of individuals and communities of plants. However, prescribed fire would have direct, minor to moderate, beneficial, long-term, localized impacts by restoring the native vegetation structure, composition, and function of historically fire-maintained vegetation associations.

Potential spread of noxious weeds could occur from equipment used by fire crews both on prescribed fire and wildfire work, (i.e., carried in on equipment from outside the area, mechanical fuel reduction treatment equipment, fireline construction equipment). Following prescribed burns, areas that were treated would be monitored and invasive vegetation may be prevented or removed by chemical treatments. Impacts from the spread of invasive weed species would be long-term and adverse if viable seeds are transported and become established. However, due to BMPS that would be used (i.e., cleaning of equipment before and after use, avoid burning in when possible in areas at high risk for weed establishment or spread), impacts would be negligible.

Chemical treatment of invasive weed species to burn units after prescribed fires would be beneficial to re-establishment of native plant species. Controlling invasive weed species would eliminate competition for space, nutrients, and water resources to favor native plants. Chemical treatments may consist of spot treatments of salt cedar (a hazardous fuel) and other invasive species discovered during the pre-burn or post-burn monitoring period, thus impacts would be negligible.

Soil sterilizing, high intensity wildfires and wildfire suppression activities pose the greatest risk to soil degradation. However, minimum impact suppression tactics (MIST, NPS 2008c) would be used to further minimize the impacts to soils, thus reducing potential erosion impacts to vegetation. Fuel treatments help lower the risk of high intensity wildfires, thus reducing soil sterilizing events.

Areas left untreated would trend toward adverse effects on fire regimes and vegetation composition and structure. The continued fuel accumulation could lead to future uncontrollable wildfires, both within and adjacent to the park. This effect could be exacerbated by predicted climate change, which is expected to produce more drought and longer fire seasons in the Texas panhandle area.

Recent analysis on fire extent and climate during the past 35 years revealed an increase in frequency of large, high severe fires since the mid-1980's with longer wildfire duration and longer wildfire seasons (Westerling et al. 2006). It is likely that vegetation types that have experienced fuel accumulations and increased vegetation density are more sensitive to climatic variability (i.e., less resilient to fires during drought and warmer years). In the face of climate change, it is unknown whether the same or different vegetation would grow back following a large, severe fire.

In addition, there are potential future changes in plant communities from predicted climate change, as individual plant species respond to large and small scale changes in temperature and precipitation, fertilizing effect of increased carbon dioxide, and changing patterns of inter-specific competition (Shafer et al. 2001). Many future scenarios have been developed and modeled in an attempt to quantify future climate change (Solomon et al. 2007, McLachlan et al. 2011). Annual average temperature is predicted to increase in the region by 2.6–3.1 degrees Celsius and precipitation is predicted to decrease in the region approximately 32mm/year over the next 60 years compared to the year 2000 (McLachlan et al. 2011). However, at this time, the models are not sufficiently precise to address increases in temperature and water stress over the short duration of the planning period and the small scale of the project area.

Considered over a broad scale, areas treated with prescribed fire can remove additional environmental stressors on species and allow them to better adapt to climate change. Burn plan prescriptions and real-time fire modeling rely on current meteorological conditions and fuel characteristics, which reflect the uneven progression of longer-term changes. These planning and decision-making processes are an example of short-term adaptive management followed by the fire program under guidance in RM-18, Wildland Fire Management. As additional scientific information becomes available at a useful temporal, spatial, and/or ecological scale, it would also contribute to the longer-term adaptive management process through annual program reviews and revisions to the Fire Management Plan. Indirect effects would be beneficial, long-term, and localized due to reduced fuels and fire behavior potential in treated areas.

Cumulative Impacts

Within the park boundaries existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, and public recreational activities such as off-road vehicle use, and camp fires could contribute to vegetation resource impacts.

Activities that could contribute to vegetation resource impacts outside the park boundaries include non-federal oil and gas operations and associated rights-of-way, public utilities, agriculture, cattle ranching, and urbanization could contribute to vegetation resource impacts.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in moderate, long-term, beneficial, localized cumulative impacts to vegetation through the return of a natural fire regime and an increased trend of resilience to future climate warming or droughts. However, these positive changes would be limited in scope and size due to the NPS inability to apply the positive effects of prescribed burning to all subunits of the recreation area. There is the potential for minor to moderate, long-term, adverse, localized impacts to vegetation through future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in minor, adverse, short-term, and localized impacts from prescribed burns and associated fireline activities. Limiting the prescribed fire line to within the park boundaries could also have minor to moderate, long-term, adverse, localized impacts to vegetation through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be moderate, long-term, beneficial, and localized.

Impacts to Alternative II: Preferred Alternative

Although, both alternatives have similar effects on vegetation resources, the Preferred Alternative would extend the fireline boundary to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and reduce the likelihood of large wildfires in the area, thus removing larger blocks of vegetation from the effects of severe wildfires. Mechanical and manual hazardous fuel treatments would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes,

and that work would only occur with the permission of landowners. Chemical treatments on private lands would be the responsibility of the private landowner. Thus, the Preferred Alternative would have indirect, minor to moderate, beneficial, long-term, localized impacts by restoring the native vegetation structure, composition, and function of historically fire-maintained vegetation associations, minimizing the potential for future severe wildfires, and resulting toward an increased trend of resilience to future climate warming or droughts.

Cumulative Impacts

Within the park boundaries existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, and public recreational activities such as off-road vehicle use, and camp fires could contribute to vegetation resource impacts.

Activities that could contribute to vegetation resource impacts outside the park boundaries include non-federal oil and gas operations and associated rights-of-way, public utilities, agriculture, cattle ranching, and urbanization could contribute to vegetation resource impacts.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, moderate, long-term, beneficial, localized cumulative impacts to vegetation through extending the fireline boundary and the return of a natural fire regime and an increased trend of resilience to future climate warming or droughts.

Conclusion

The Preferred Alternative would result in direct, minor, adverse, short-term, and localized impacts from prescribed burns and associated fireline activities. Cumulative effects under this alternative would be direct, moderate, long-term, beneficial, and localized.

3.4.4 Wildlife

The 2006 NPS Management Policies states the NPS will preserve and maintain all animals native to the naturally evolving park unit ecosystems by preserving and restoring the abundances, diversity, dynamics, habitats, distributions, and natural processes of native animals. The Migratory Bird Treaty Act (16 USC 703-712) protects bird species that could occur in the proposed project area. Management practices to limit potential impacts to wildlife vary from park to park. However, parks generally have management practices that are designed to minimize potential impacts to wildlife, especially during sensitive periods of the year such as during mating or nesting seasons.

3.4.4.1 Affected Environment

There are approximately 60 species of mammals, 15 fish species, 32 reptile species, 11 amphibian species, and over 200 bird species recorded for LAMR and ALFL (NPS 1996). No recent biological studies have been completed for terrestrial wildlife species. However, checklists have been created for reptiles and amphibians and birds (Phillips 1977; Cain 1976).

Common mammals known to occur in and around LAMR and ALFL include mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), porcupine (*Erethizon dorsatum*), raccoon (*Procyon lotor*), skunks (*Spilogale putorius*, *Mephitis mephitis*), ground squirrels (*Spermophilus tridecemlineatus*), rabbits (*Sylvilagus audubonii*, *Sylvilagus floridanus*, *Lepus alifornicus*), pocket gopher (*Geomys bursarius*), mole (*Scalopus aquaticus*), a few bats, and several varieties of rats and mice. Turtles, lizards, frogs, and snakes, including two poisonous species (prairie rattlesnake [*Crotalus viridis*] and western diamondback rattlesnake [*Crotalus atrox*]) have also been recorded in and around LAMR and ALFL (NPS 1996).

Common bird species known to occur in and around LAMR and ALFL include wild Turkey (*Meleagris gallopavo*), Northern Bobwhite (*Colinus virginianus*), Scaled Quail (*Callipepla squamata*), Mourning Dove (*Zenaida macroura*), Greater Roadrunner (*Geococcyx californianus*), and Red-winged Blackbird (*Agelaius phoeniceus*). LAMR is located along the Central Flyway, which serves as a major north-south bird migration route. Large numbers of ducks, geese, and other migratory birds occur seasonally to utilize open water areas as well as wetland areas during the fall through spring months.

Protection under the Migratory Bird Treaty Act makes it unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. In addition, this act serves to protect environmental conditions for migratory birds from pollution or other ecosystem degradations. Although migratory birds use the open water and wetland areas, the Project Area contains a Great Blue Heron rookery located on Lake Meredith away from established roads.

Fish populations in Lake Meredith are plentiful, making the lake one of the most popular fishing areas of the region. Recent reduced lake levels have decreased fish availability and access. Boat launch areas are used to access areas of the lake, but have been mostly dry in recent years.

Common fish species known to occur within Lake Meredith include walleye, catfish, largemouth and sand bass, crappie, bluegill, and carp. Some shoreline fishing takes place in these developed areas, but most fishing takes place from boats upon the waters of Lake Meredith.

As previously mentioned, 11 amphibian species and 32 reptile species are found at Lake Meredith. Reptiles and amphibians are considered as indicators of aquatic health because they are sensitive to pollution and loss of habitat. They are important in the food chain and comprise a large portion of the vertebrate population in certain ecotypes. Turtles, lizards, and snakes can be found in the park.

Hunting is not permitted in the following areas of Lake Meredith National Recreation Area: Harbor Bay, Cedar Canyon, Sanford Yake, Spring Canyon, Upper Plum Creek, McBride Campground, Rosita, and all of ALFL. Hunting season begins September 1 and continues through May 10 each year. Texas state seasons and bag limits are enforced during this period for wild turkey, mule and white-tailed deer, bobwhite and scaled quail, mourning dove, as well as a variety of ducks and geese. Hunting is permitted for designated game species only (with the exception of coyotes, rabbits, and raccoons). Pronghorn antelope (*Antilocapra americana*) may

occasionally stray into the area, but they are primarily found in the flatter topography in upland prairies away from the Canadian River.

3.4.4.2 Methodology and Intensity Threshold

The methodology used for assessing wildlife impacts included using available literature to identify the wildlife species and habitat communities present and identifying the potential effects to wildlife populations (e.g., composition, diversity, abundance) by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: No wildlife species would be affected or some individuals could be affected as a result of the alternative, but there would be no effect on wildlife species' populations. Impacts would be well within natural fluctuations.

Minor: Some wildlife species would be affected and a limited part of the species' population would be affected as a result of the alternative. Mitigation measures, if needed, would be simple and successful.

Moderate: Some wildlife species would be affected and a sizeable part of the species' population would be affected as a result of the alternative over a relatively large area within LAMR. Mitigation measures, if needed, would be extensive and successful.

Major: A considerable effect on wildlife individuals and on a sizeable segment of the species' population as a result of the alternative over a relatively large area in and outside LAMR/ALFL. Extensive mitigation measures would be needed to offset any adverse effects and may not be successful.

Duration:

Short: If individual species or habitat recovers in ≤ 3 years.

Long: If individual species or habitat recovers in >3 years.

3.4.4.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Avoid or minimize disturbances to native wildlife habitat.	NPS Organic Act of 1916, as amended; NPS-77 Natural Resources Management Guidelines; Migratory Bird Treaty Act, as amended; Executive Order 13186, Migratory Birds; Lacey Act, as amended; NPS Management Policies
Prevent wildlife exposure to contaminants.	
Avoid or minimize death to wildlife.	
Reclaim disturbed wildlife habitat to provide for their survival.	

3.4.4.4 Analysis of Alternatives and Impacts on Wildlife

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. In addition without sufficient fire in these areas, the vegetation would continue to become more homogeneous resulting in wildlife habitat that is less varied. Without prescribed fire mimicking natural fire cycles in certain park areas, fire dependent vegetation may decrease in prevalence and vigor, with negative effects on wildlife species adapted to those vegetation types. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on wildlife habitat and individuals.

Use of prescribed fire would temporarily disturb wildlife species within the burn units. During prescribed fire activities, wildlife in the area would experience an increase in noise disturbance from equipment, human presence, smoke, fire, and soil disturbance. In addition, reproduction and survival for individuals may be affected due to increased stress and loss of foraging opportunities. Temporary displacement and habitat loss may occur for some individuals within the burn units. Mortality to wildlife species that are smaller and less mobile such as, small mammals, lizards, and snakes, may also occur from prescribed burns. However, these species are relatively common and/or widespread, and occasional impacts to individual animals generally do not affect wildlife populations, wildlife communities, or ecological processes.

Prescribed fire would benefit individual wildlife species and their habitat by emulating the natural fire regime and creating a more natural vegetation pattern across the park, enhancing the variety and diversity of vegetation communities and wildlife habitat present. Prescribed fire would also provide more nutrients to the soils in the short-term, which would increase plant growth and improve the amount available and nutritional quality of forage for wildlife species. The burned areas generally green up earlier than non-burned areas, thus providing earlier grazing (Redmon and Bidwell 2003).

Prescribed fires could directly impact nesting migratory birds if conducted during breeding season (generally between March – August) through mortality of fledglings that are unable to flee or avoid the burn units. Performing prescribed burns when possible outside the breeding season should mitigate these potential impacts.

Aquatic species in the park would not be affected by fireline 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.

Mechanical and manual treatments used for hazardous fuel reduction would have short-term, adverse, localized impacts on wildlife species that are less mobile due to stress and disturbance. Mitigations would include avoiding seasons when ground nesting birds are actively nesting.

Short-term impacts on more mobile wildlife species would be temporary displacement from the treatment areas.

Cumulative Impacts

Within the park boundaries existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, public recreational activities such as off-road vehicle use and hunting, and construction projects (e.g., roads, buildings) could contribute to wildlife resource impacts.

Activities that could contribute to wildlife resource impacts outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, public utilities, commercial facilities, agriculture, cattle ranching, and urbanization could contribute to wildlife resource impacts.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in minor, short-term, adverse, localized impacts due to displacement and habitat fragmentation from prescribed fires. In addition, moderate, long-term, beneficial, localized cumulative impacts to wildlife species and their habitats through improved habitat from the return of a natural fire regime. However, there is the potential for minor to moderate, long-term, adverse, localized impacts to wildlife habitat through future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in direct, minor, adverse, short-term, and localized impacts as well as indirect, moderate, long-term, beneficial, localized cumulative impacts. Limiting the prescribed fire line to within the park boundaries could also have minor to moderate, long-term, adverse, localized impacts to wildlife habitat through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be minor, short-term, adverse, localized and minor, long-term, beneficial, and localized impacts to wildlife resources.

Impacts to Alternative II: Preferred Alternative

Although, both alternatives have similar effects on wildlife resources, the Preferred Alternative would extend the fireline boundary to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and would reduce the likelihood of large wildfires in the area, thus removing larger blocks of vegetation from the effects of severe wildfires. Mechanical and manual hazardous fuel treatments would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. Chemical treatments on private lands would be the responsibility of the private landowner. Thus, the Preferred Alternative would have minor to moderate, beneficial, long-term, localized impacts by restoring the variety and diversity of vegetation communities and wildlife habitat present and minimizing the potential for future severe wildfires.

Cumulative Impacts

Within the park boundaries existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, public recreational activities such as off-road vehicle use and hunting, and construction projects (e.g., roads, buildings) could contribute to wildlife resource impacts. Activities that could contribute to wildlife resource impacts outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, public utilities, commercial facilities, agriculture, cattle ranching, and urbanization could contribute to wildlife resource impacts.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in minor, short-term, adverse, localized impacts due to displacement and habitat fragmentation from prescribed fires. In addition, moderate, long-term, beneficial, localized cumulative impacts to wildlife species and their habitats through improved habitat from the return of a natural fire regime. Cumulative effects under this alternative would be minor, short-term, adverse, localized and minor, long-term, beneficial, and localized impacts to wildlife resources.

Conclusion

The Preferred Alternative would result in minor, adverse, short-term, and localized impacts as well as moderate, long-term, beneficial, localized cumulative impacts from prescribed burns and associated fireline activities. Cumulative effects under this alternative would be minor, long-term, beneficial, and localized.

3.4.5 Special Status Species

The Endangered Species Act of 1973 requires an environmental assessment for projects on federally-managed lands to determine potential effects to all federally-listed endangered, threatened, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of federally listed species or designated critical habitats. In addition, the 2006 NPS Management Policies and Director's Order 77 *Natural Resources Management Guidelines* require the NPS to examine the impacts on federal candidate species, as well as state-listed endangered, threatened, candidate, rare, declining, and sensitive species. For the purposes of this analysis, the USFWS and the Texas Parks and Wildlife Department (TPWD) were contacted with regards to federally-listed and state-listed species to determine those species that could potentially occur in or near the project area.

3.4.5.1 Affected Environment

The USFWS was consulted on August 15, 2011 for a list of threatened, endangered, species of concern, or designated critical habitat for the proposed action. The USFWS referred to their website (<http://www.fws.gov/southwest/es/EndangeredSpecies/>) for a current list of federally-threatened and endangered species in Texas by county regarding impacts to wildlife or habitat

from the Proposed Action. A list of federally-listed species that may occur in or near the park was obtained from the USFWS website on August 15, 2011 and is summarized in table 4 along with the state-listed species and corresponding state status (USFWS 2011; Appendix C). The complete lists and associated summary descriptions of habitats for federally protected species that are likely to occur in Potter, Moore, and Hutchinson counties were reviewed on the USFWS Southwest Region's website at <http://www.fws.gov/southwest/es/EndangeredSpecies/lists/>. The Texas Parks and Wildlife Department (TPWD) was consulted for a list of state threatened, endangered, and species of concern. TPWD's list of rare species for these counties was obtained on that agency's website at <http://www.tpwd.state.tx.us/huntwild/wild/species/endang/index.phtml> (TPWD 2011b; Appendix C).

Currently, there is one federally-listed species, Arkansas River shiner (*Notropis girardi*), two state-listed species, Bald Eagle (*Haliaeetus leucocephalus*) and Texas horned lizard (*Phrynosoma cornutum*) that have been documented to occur within LAMR and/or ALFL.

Arkansas River Shiner

The Arkansas River Shiner was listed as a federally endangered species in 1998 with critical habitat designated in 2005. The USFWS designated 1,148 miles of rivers in four states, including portions of the Arkansas, Cimarron, Beaver/North Canadian, and Canadian/South Canadian Rivers in Oklahoma, New Mexico, and Kansas, and Texas. Within LAMR, Arkansas River shiner critical habitat was proposed for a portion of the Canadian River from the western park boundary downstream to the confluence with Coetas Creek, including a lateral distance of 300 feet on each side of the river beyond the full bank full width. However, the USFWS withdrew this critical habitat designation; thus no critical habitat currently exists within park for the Arkansas River shiner.

Historically, the Arkansas River shiner inhabited wide, sandy-bottomed rivers and streams throughout the Arkansas River Basin including Kansas, New Mexico, Oklahoma, and Texas. Currently, this species is found primarily in the Canadian/South Canadian River in Oklahoma, Texas, and New Mexico, a distance of about 508 river miles. Adults are uncommon in quiet pools or backwaters, and almost never occur in tributaries having deep water and bottoms of mud or stone. This species spawns in summer, usually following heavy rains, with the eggs drifting in the current flow 24-48 hours until hatching. In the park, the Arkansas River shiner is known to occupy the Canadian River in Potter County.

Threats to this species include habitat loss from construction of water impoundments, reduction of stream flows due to water diversions or groundwater withdrawals, degradation of water quality, and possible inadvertent collection of individuals by commercial fishing industry. The Red River shiner, an introduced species, is also a threat to the Arkansas River shiner in the Cimarron River.

Bald Eagle

The Bald Eagle is a winter resident and has been observed at Lake Meredith. This species roost and perch in tall trees near water and primarily feed on fish and waterfowl. Most wintering Bald

Eagles migrate north February to March. According to NPS staff, winter residents roost primarily in the Bonita Creek area on private land. No Bald Eagles are known to nest in LAMR or ALFL.

Texas Horned Lizard

The Texas horned lizard has been documented in LAMR and ALFL. Texas horned lizard is found in deserts, temperate grasslands, prairies, and scrubland, occurring in sandy, open areas with little vegetation. Defense mechanisms include inflating itself to appear larger and squirting blood from its eyes. The lizard hibernates during the late fall and winter months, coming out of hibernation in late April or May, depending on soil temperatures. The lizard digs for hibernation, nesting, and insulation purposes, and it often inhabits abandoned animal burrows or covers itself with loose sand. Mating occurs soon after emergence from hibernation, and continues into July. The lizard is often found near harvester ant mounds, which are its main source of prey, but it would also forage on grasshoppers, beetles, and isopods. It can consume up to 400 ants per day, and adult lizards must forage from several harvester ant colonies, so their daily feeding activities coincide with the times of highest ant activity.

All other federally- and state-listed species were dismissed for the following rationale described below.

Interior Least Tern. The interior least tern historically bred on sandbars along the Canadian River. The creation of Lake Meredith resulted in unfavorable vegetation succession along the river's sandbars, which has discouraged breeding. The species generally winters along the Gulf Coast and as far south as South America. Interior Least Terns have not been observed within the park and no breeding occurs within the park. The closest known breeding area is approximately 75 miles north of the park near the Oklahoma State line along the Canadian River.

Whooping Crane. Whooping Cranes winter in coastal Texas at the Aransas National Wildlife Refuge. The only self-sustaining wild population of Whooping Cranes migrates between the wildlife refuge and Wood Buffalo National Park in Canada. Whooping Cranes neither breed nor winter at Lake Meredith. They are potential migrant visitors at Lake Meredith and have not been documented in the park.

American Peregrine Falcon, Peregrine Falcon, Lesser Prairie-Chicken, and Mountain Plover. These species are listed as potentially occurring within Potter, Moore, or Hutchinson Counties, but have not been documented in the park.

Black Bear: Black bears are found throughout North America in habitats ranging from swamps to desert scrub. Two subspecies of Black Bear, Mexican Black Bear (*Ursus americanus eremicus*) and the New Mexico Black Bear (subspecies *U. a. amblyceps*), are found in West Texas in desert scrub or woodland habitats within scattered mountain ranges, predominantly the Chisos and Guadalupe Mountains. Black bears have not been documented in the park and the park does not have suitable habitat.

Gray Wolf. Gray wolves inhabit forests, brushlands, or grasslands where suitable cover and denning sites are available. Historically gray wolves were found throughout most of Texas. Currently, the species has been extirpated from the state.

Black-tailed Prairie Dog. Black-tailed prairie dogs typically inhabit dry, flat, short grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle. The black-tailed prairie dog is a key stone species, which provides food and/or shelter for other wildlife species (e.g., western burrowing owl, ferruginous hawk). One black-tailed prairie dog colony has been documented in LAMR; however the colony was eradicated in 2001 due to a bubonic plague outbreak.

Table 5. State and Federally-listed Threatened, Endangered, Proposed, or Candidate Species Known to Occur or Likely Occur within LAMR and/or ALFL.

Species	Federal Status	State Status	County Known to Occur (per USFWS Region 2)
Birds			
American Peregrine Falcon <i>Falco peregrines anatum</i>	Delisted	Threatened	—
Bald Eagle <i>Haliaeetus leucocephalus</i>	Delisted	Threatened	Hutchinson Moore Potter (Wintering only)
Interior Least Tern <i>(Sterna antillarum)</i>	Endangered	Endangered	Hutchinson
Lesser Prairie Chicken <i>(Tympanuchus pallidicinctus)</i>	Candidate	—	Moore
Mountain Plover <i>(Charadrius montanus)</i>	Potential Threatened	—	Potter
Peregrine Falcon <i>(Falco peregrinus)</i>	Delisted	Threatened	—
Whooping Crane <i>(Grus americana)</i>	Endangered	Endangered	Potter
Fish			
Arkansas River shiner <i>(Notropis girardi)</i>	Threatened	Threatened	Hutchinson Potter
Mammals			
Black bear <i>(Ursus americanus)</i>	—	Threatened (Only due to similarity to Louisiana Black Bear)	—
Gray wolf <i>(Canis lupus)</i>	—	Endangered	—
Reptiles			
Texas horned lizard <i>(Phrynosoma cornutum)</i>	—	Threatened	—

3.4.5.2 Methodology and Intensity Threshold

The methodology used for assessing special status impacts included using available GIS data and literature to identify the special status species and habitat communities present and identifying the potential effects to special status populations (e.g., composition, diversity, abundance) by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: No individuals of a special-status species would be affected but a very localized area of their habitats could be affected as a result of the alternative.

Minor: A few individuals of special status species or localized areas of their respective habitats would be affected, but the species' population would not be affected as a result of the alternative. Mitigation measures, if needed, would be simple and successful.

Moderate: A number of individuals of special status species populations or a limited portion of their respective habitats would be affected as a result of the alternative. The impacts would be difficult to detect using typical population monitoring techniques. Mitigation measures, if needed, would be extensive and successful.

Major: A measureable portion of a special-status population or their large portion of their respective habitats would be affected as a result of the alternative over a relatively large area within the park. The impacts would be readily detectable using typical population monitoring techniques. Extensive mitigation measures would be needed to offset any adverse effects and may not be successful.

Duration:

Short-term: If individual species or habitat recovers in ≤ 1 year; population recovers in ≤ 5 years.

Long-term: If individual species or habitat recovers in ≥ 1 year; population recovers in >5 years.

3.4.5.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Avoid adverse impacts on state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.	Endangered Species Act; NPS Organic Act of 1916, as amended; NPS-77 Natural Resources Management Guidelines; Migratory Bird Treaty Act, as amended; Executive Order 13186, Migratory Birds; Lacey Act, as amended; Texas Admin Code Title 31, Part 2, Chapter 65; NPS Management Policies;
Ensure the continued existence of state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.	
Ensure that permitted treatments aid in the	

Desired Condition	Source
recovery of state and federally listed threatened, endangered, sensitive, and candidate plant and animal species and their habitats.	National Environmental Policy Act

3.4.5.4 Analysis of Alternatives and Impacts on Special Status Species

Impacts of Alternative I: No Action Alternative

Arkansas River shiner:

Arkansas River shiners are known to occur within the Canadian River in Potter County. The No Action alternative could have minor, short-term, adverse, site-specific affect on aquatic habitats by degrading water quality and removing overstory which in turn would increase water temperatures. Prescribed fire could also have minor to moderate, long-term, beneficial, localized impacts by increasing stream flow where salt cedar infestations occur, thus improving Arkansas River shiner habitat. Prescribed burn plans would include mitigation measures to minimize any potential impacts to this species and its habitat.

However, under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. This could lead to larger, uncontrollable wildfires in the area and permanent damage to natural aquatic plant communities, reduce quality and quantity of habitat and forage for the Arkansas River shiner, increase the potential for soil erosion and adverse impacts on water quality, and could cause a loss of riparian area function. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on individual Arkansas River shiner and their habitat.

Thus the No Action alternative would result in may affect, but not likely to adversely affect the Arkansas River shiner.

Bald Eagle:

No Bald Eagles are known to nest in LAMR or ALFL, but Bald Eagles are known to winter along Bonita Creek on private property. The No Action alternative would have minor, short-term, adverse, localized impacts on individuals due to disturbance and/or displacement within a burn unit area and potential destruction of hunting perches (e.g., dead snags). Prescribed burn plans would include mitigation measures to minimize any potential impacts to this species.

However, under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be

executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. This could lead to severe habitat loss of current and future hunting perches and roosting sites along with altered aquatic prey habitat due to potential increased sedimentation to adjacent creeks. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on individual Bald Eagles and their habitat.

Texas horned lizard:

Texas horned lizards are known to occur in LAMR and ALFL. The No Action alternative would have minor, short-term, adverse, localized impacts on individual Texas horned lizards and their habitat due to potential mortality and inability to be able to flee or avoid burn units and removal of prey species (i.e., harvester ants). However, Texas horned lizards may be able to survive prescribed fires by burrowing into the soil. In addition, the Texas horned lizard occurs in sandy, open areas with little vegetation, which provides sparse fuel loads resulting in patchy spreads of fire, possibly, protecting this species from fire-related injury and mortality (Smith 2000). In areas with unnaturally heavy fuel loads, however, the risks associated with mortality might be higher.

Prescribed fires could also have a minor to moderate, long-term, beneficial, localized impact on Texas horned lizards and their habitat by creating open, sparsely vegetated patches. Open patches may facilitate increased mobility; may increase forage efficiency by allowing lizards to sit and wait for their prey; and may also increase the number of areas exposed to direct sunlight for thermoregulation. Previous studies have also shown prescribed fires may increase the primary prey species, harvester ants (Burrow et al 2002). Prescribed burn plans would include mitigation measures to minimize any potential impacts to this species.

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. These uncontrollable wildfires could sterilize the soil and destroy plant communities; that could lead to severe habitat loss and mortality of individuals. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased potential for locally severe fire effects on individual Texas horned lizards and their habitat.

Cumulative Impacts

Within the park boundaries existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, public recreational activities such as off-road vehicle use and hunting, and construction projects (e.g., roads, buildings) could contribute to special status resource impacts.

Activities that could contribute to special status species impacts outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way,

public utilities, commercial facilities, agriculture, cattle ranching, and urbanization could contribute to special status resource impacts.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in minor, short-term, adverse, localized impacts due to displacement and habitat fragmentation from prescribed fires. In addition, moderate, long-term, beneficial, localized cumulative impacts to special status species and their habitats through improved habitat from the return of a natural fire regime. However, there is the potential for minor to moderate, long-term, adverse, localized impacts to special status habitat through future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in minor, adverse, short-term, and localized impacts as well as moderate, long-term, beneficial, localized cumulative impacts from prescribed burns and associated fireline activities. Limiting the prescribed fire line to within the park boundaries could also have minor to moderate, long-term, adverse, localized impacts to wildlife habitat through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be minor, short-term, adverse, localized and minor, long-term, beneficial, and localized impacts to wildlife resources.

Impacts to Alternative II: Preferred Alternative

Although, both alternatives have similar effects on special status species, the Preferred Alternative would extend the fireline boundary to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and would reduce the likelihood of large wildfires in the area, thus removing larger blocks of vegetation from effects of severe wildfires. Mechanical and manual hazardous fuel treatments would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. Chemical treatments on private lands would be the responsibility of the private landowner. Thus, the Preferred Alternative would also have minor to moderate, beneficial, long-term, localized impacts by restoring the variety and diversity of vegetation communities and special status species habitat present and minimizing the potential for future severe wildfires.

Cumulative Impacts

Within the park boundaries existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, public recreational activities such as off-road vehicle use and hunting, and construction projects (e.g., roads, buildings) could contribute to special status resource impacts.

Activities that could contribute to special status species impacts outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, public utilities, commercial facilities, agriculture, cattle ranching, and urbanization could contribute to special status resource impacts.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in minor, short-term, adverse, localized impacts due to displacement and habitat fragmentation from prescribed fires. In addition, extending the prescribed fireline would also have moderate, long-term, beneficial, localized cumulative impacts to special status species and their habitats through improved habitat from the return of a natural fire regime.

Conclusion

The Preferred Alternative would result in minor, adverse, short-term, and localized impacts as well as moderate, long-term, beneficial, localized cumulative impacts from prescribed burns and associated fireline activities. Cumulative effects under this alternative would be minor, short-term, adverse, localized and minor, long-term, beneficial, and localized impacts to special status species.

3.4.6 Water Resources

The 2006 NPS Management Policies states the NPS will perpetuate surface and ground water as integral components of park ecosystems and avoid, whenever possible, the pollution of park waters by human activities occurring within and outside of parks. The NPS is required to protect surface water quality under the Clean Water Act, and to prevent contamination of current or future underground sources of drinking water under the Safe Drinking Water Act. The U.S. Army Corps of Engineers has the authority to review federal projects that result in potential degradation of waters of the United States and issue permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions which affect waters of the United States.

3.4.6.1 Affected Environment

The park contains important water resources, which includes Lake Meredith Reservoir, the Canadian River and associated tributaries, and the Ogalla Formation and the Red Sand Formation, groundwater aquifers. In general, the ground water quality in the area is good.

Lake Meredith was created by construction of the Sanford Dam in 1965, primarily to provide municipal water for eleven member cities in the Texas Panhandle. Currently, Lake Meredith provides municipal and industrial water to approximately 500,000 people and aids in flood control for the Canadian River downstream of the dam. Drought in the past several years has heavily impacted water deliveries. The primary drainage into and out of Lake Meredith is the Canadian River. The Texas portion of the Canadian River watershed encompasses approximately 12,700 square miles. The Canadian River flow depends on annual snowmelt in the mountains, precipitation, and groundwater discharge in the form of springs emerging from the Ogalla and other formations.

The Texas Commission on Environment Quality (TCEQ) and US Environmental Protection Agency (EPA) has identified approximately 55.5 miles of Lake Meredith as a 303(d) listed reach. The reason for 303 (d) listing is mercury found in fish tissue. These segments were categorized as 5c, which means additional data information will be gathered before a Total Maximum Daily Load (TMDL) is scheduled. For waters identified as a 303 (d) reach, a water

quality improvement plan must be developed. The water quality improvement plan known as TMDL establishes allowable pollutant loads set at levels to achieve water quality standards and is the responsibility of the TECQ and Texas State Soil and Water Conservation Board. The EPA must then approve these plans.

The primary groundwater sources occur in the Permian, Triassic, Cretaceous, Tertiary, and Quaternary strata with the Ogalla Formation as the primary aquifer. The thickness of the Ogallala formation varies greatly from 900 feet to a minimum of 20 feet. Precipitation in the form of rain and snow is the source of water to the aquifer. However, only a small percentage of the precipitation actually reaches the zone of saturation because of high evaporation and low infiltration. Substantial amounts of usable water are found in the Cretaceous, Triassic, and Jurassic rocks; however, water within the Permian has been found to be saline and unusable. Water is also present in the surficial Quaternary deposits, but is often unsuitable for most purposes because of pollutants caused by poor disposal of oil field brine and sewage.

3.4.6.2 Methodology and Intensity Threshold

The methodology used for assessing water resource impacts included using available GIS data and literature to identify the water resources present and identifying the potential effects to water resources (i.e., surface and ground water) by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: There would be no detectable change in the quality of natural surface water or water aquifers. There would be no risk of accidental discharge of wastewater into the surface environment.

Minor: There would be a detectable change in the quality of natural surface water or water aquifers at the immediate discharge point. The quality of affected waters would remain within permit standards under the Clean Water Act and/or Safe Drinking Water Act. For adverse impacts, any accidental wastewater discharge into the environment would remain small in volume, and be readily detected, controlled, and cleaned up. Any accidental pollutant release could be corrected by standard repairs and maintenance of the existing treatment/discharge system.

Moderate: There would be an observable or measurable change in the quality of natural surface water or water aquifer. For adverse impacts, the quality of affected waters might infrequently violate permit standards under the Clean Water Act and/or Safe Drinking Water Act. Any accidental wastewater discharge into the environment could cause limited environmental contamination and/or require substantial effort to contain, control, and clean up. Any accidental pollutant release could be addressed by upgrading or otherwise improving the existing wastewater treatment/discharge system.

Major: There would be extensive and substantial change in the quality of natural surface water or water aquifer. For adverse impacts, the quality of affected waters might chronically violate and/or impair natural surface water or groundwater under the Clean Water Act and/or Safe Drinking Water Act. There would be an unacceptable risk of a large accidental discharge into the surface environment which would cause widespread environmental contamination or

otherwise be extremely difficult to contain, control, and clean up. The violations could only be addressed by entirely replacing the existing wastewater treatment/discharge system.

Duration:

Short-term: If water quality recovers in one day or less.

Long-term: If water quality recovers in more than one day.

3.4.6.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Maintain existing quality of all surface water and groundwater resources.	Clean Water Act; NPS Organic Act of 1916, as amended; NPS-77 Natural Resources Management Guidelines; Executive Order 12088, Federal Compliance with Pollution Control Standards; NPS Management Policies; National Environmental Policy Act
Avoid diminishing the quantity of all surface water and groundwater resources.	
Avoid altering drainage characteristics, soil hydrology, and natural movement of groundwater.	

3.4.6.4 Analysis of Alternatives and Impacts on Water Resources

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. This could result in increased soil erosion, turbidity, sedimentation, and debris flushes with reduced water quality, and potentially large pulses of water delivered to water bodies within the park. The degree of impacts would depend on the severity and extent of the wildfire and rain events. Indirect effects would be adverse, minor to moderate, localized, long-term impacts due to increased soil erosion, turbidity, and sedimentation, reduced water quality, and potential pulses of water.

Prescribed fire may reduce vegetation along the stream banks, thus temporarily increasing stream temperatures, soil erosion and sediment yield. 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 water bodies within the park as a result of soil erosion following suppression activities could occur. However, problems with soil erosion would only result in direct, minor, adverse, short-term, and localized impacts. In addition,

impacts following a prescribed fire would be reduced and/or eliminated during the “green-up” as new herbaceous cover developed.

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 temporarily 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. However, since mitigation measures limit the use, type, and proximity to water bodies of fire retardants, impacts to water quality would be minimal.

In wildland fire suppression tactics, fire engines and other equipment are often driven off-road to control the fire perimeter. With an appropriate response, there would be less fireline constructed and a less off-road use of engines, as natural barriers are more likely to be used to confine wildland fires. The direct adverse effect of fire suppression efforts would be negligible unless water was drawn from spring and streams for firefighting. If this occurred, the direct adverse effects of reduced flow would be localized, short-term (hours), and minor. Indirect adverse effects could include destabilizing stream banks or pond shores due to off-road travel with fire engines and other equipment. They would be mitigated by reduced off-road travel and rehabilitation of any damaged stream banks. They would be mitigated by limiting access and care in off-road travel to water sources, and rehabilitation of any damaged stream banks.

Direct, adverse, localized, short-term, negligible to minor impacts could occur from mechanical and manual fuel reduction treatments due to trampling of stream banks or similar disturbances by felled and/or dragged trees. These effects could be mitigated by avoidance, where possible, and immediate rehabilitation using the appropriate mitigation measures. Indirect, localized, short-term, adverse, negligible impacts could be slightly increased streamflow due to a reduction in vegetation and thus less transpiration on the treated area.

Cumulative Impacts

Activities within and outside the park boundaries that could contribute to water resources impacts include existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, public recreational activities such as boating, swimming, and off-road vehicle use, ranching and agricultural activities, water impoundments (i.e., Lake Meredith), residential development, and construction projects (e.g., roads, buildings).

The No Action alternative in combination with the past, present, and foreseeable future actions would result in direct, minor, short-term, adverse cumulative impacts to water quality. However, there is the potential for indirect, minor to moderate, long-term, adverse, localized impacts to water quality through future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in direct, minor, adverse, short-term, and localized impacts as well as indirect, minor to moderate, short-term, beneficial, localized impacts from prescribed burns. Limiting the prescribed fire line to within the park boundaries could also have minor to moderate, long-term, adverse, localized impacts to water quality through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be minor, short-term, adverse, localized impacts to water resources.

Impacts to Alternative II: Preferred Alternative

Although, both alternatives have similar effects on water resources, the Preferred Alternative would extend the fireline boundary to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and reduce the likelihood of large, high severity wildfires in the area, thus removing larger blocks of vegetation from effects of severe wildfires. Mechanical and manual hazardous fuel treatments would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. Chemical treatments on private lands would be the responsibility of the private landowner. Thus, the Preferred Alternative would have indirect, minor to moderate, beneficial, long-term, and localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Cumulative Impacts

Activities within and outside the park boundaries that could contribute to water resources impacts include existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, new drilling and production wells, park construction, public recreational activities such as boating, swimming, and off-road vehicle use, ranching and agricultural activities, water impoundments (i.e., Lake Meredith), residential development, and construction projects (e.g., roads, buildings).

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, minor, short-term, adverse and beneficial cumulative impacts to water quality.

Conclusion

The Preferred Alternative would result in direct, minor, adverse, short-term, and localized impacts as well as direct, minor, long-term, beneficial, localized cumulative impacts from fire management activities. Cumulative effects under this alternative would be direct, minor, long-term, adverse and beneficial, and localized.

3.5 Cultural Resources

Section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq.*); the NPS's Director's Order 28 *Cultural Resource Management Guideline*; and NPS 2006

Management Policies (NPS 2006) require the consideration of impacts on historic properties that are listed, or eligible to be listed, in the National Register of Historic Places. The National Register is the nation's inventory of historic places and the national repository of documentation on property types and their significance. The above-mentioned policies and regulations require federal agencies to coordinate consultation with State Historic Preservation Officer regarding the potential effects to properties listed on or eligible for the National Register of Historic Places.

The NPS, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. Management decisions and activities throughout the National Park System must reflect awareness of the irreplaceable nature of these resources. The NPS will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the 2006 Management Policies and the appropriate Director's Orders.

3.5.1 Archaeological Resources Affected Environment

In addition to their natural diversity the parks preserve a rich, unique cultural record of prehistoric and historic sites. 100 percent of LAMR's collective acreage has been inventoried (surveyed) for the presence/absence of cultural resources. An inventory of archaeological resources within ALFL was completed in 1999. More than 510 archeological sites have been recorded within the park boundaries. This equates to 33 sites per square mile.

Prehistoric sites in the Texas Panhandle are divided into three temporal periods: Paleoindian sites from 10,000-5,000 BC; Archaic sites from 5,000 BC to AD 500; and Neoinian sites from AD 200-1541. They include village sites, camp sites, surface artifact scatters, quarry/workshops, rock shelters, petroglyph sites, and special function sites. Two sites from this period, Alibates Flint Quarries and McBride Canyon ruin are listed on the National Register of Historic Places (NHRP).

Historic sites are in the Plains Stage dating from AD 1541-1876. They include quarry/workshop sites, artifact scatters, tipi rings, and isolated features such as hearths and roasting pits. Historic sites during the Euroamerican period include ranch houses, line camps, corrals, and plaza sites along the Canadian River. The McBride ranch house is listed on the NHRP.

3.5.1.2 Methodology and Intensity Threshold

The methodology used for assessing archaeological resource impacts included using available GIS data and literature to identify the archaeological resources present and identifying the potential effects to archaeological resources by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact is at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial. For the purposes of Section 106, the determination of effect would be no adverse effect to archaeological resources.

Minor: Disturbance of a site(s) is confined to a small area with little, if any, loss of important information potential. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Disturbance of the site(s) would not result in the loss of integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Major: Disturbance of the site(s) is substantial and results in the loss of most or all of the site and its integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Duration:

Short-term: Any disturbance to archaeological resources would be permanent, and are considered long-term.

Long-term: Any disturbance to archaeological resources would be permanent, and are considered long-term.

3.5.1.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Provide protection of all archaeological resources by preventing the destruction, alteration, or impairment to all or part of the cultural resource. Prevent isolation from or alteration to cultural resources with its surrounding environment. In those cases where disturbance or deterioration is unavoidable, the archaeological resource is professionally documented and salvaged.	National Historic Preservation Act; Executive Order 11593, Protection and Enhancement of the Cultural Environment; Archeological and Historic Preservation Act; Archeological Resources Protection Act; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Management Policies; National Environmental Policy Act

3.5.1.4 Analysis of Alternatives and Impacts on Archaeological Resources

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. Potential for archaeological resource damage by wildfire would increase over time in areas of fuel build up, which increases the potential for high

intensity wildfire and destruction of unknown, unrecorded archaeological sites and known archaeological sites. Severe wildfire impacts include discoloration of surface artifacts, burning perishable materials, and checking or cracking of rock and ceramic artifacts. Archeomagnetic dates and pollen counts could also be altered from a severe, uncontrollable wildfire. This effect would be direct, long-term, minor to moderate, adverse, and localized due to potential fuel build up and the increased risk for severe wildfires.

Prescribed fire would allow for advance clearance and avoidance of cultural resources. Known archaeological resources could be excluded from prescribed burn units or local site – specific related mitigation measures could be implemented. Prescribed burning would reduce the probability of severe wildfires, thus reducing the potential for damage to known and unknown archaeological resources and enhancing protection of these resources. Standard management strategies would be adopted to preclude or minimize impacts (e.g., cultural resources inventories would be completed prior to all prescribed burns, a cultural specialist or an archeologist would monitor initial ground-disturbing activities, should archaeological resources be identified during prescribed burns, all work would cease in the immediate vicinity of the discovery until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the State Historic Preservation Officer). In burn units with known Native American Graves Protection and Repatriation Act (NAGPRA) sites, local Native American tribes will be consulted prior to the prescribed burn. Based upon current information, the No Action alternative impacts would be direct, minor to moderate, long-term, beneficial, and site-specific.

The direct, long-term, adverse, localized impact of fire suppression tactics and mechanical and manual hazard fuel reductions would be to displace surface materials; exposure of materials due to ground disturbance associated with the activities; or to disturb materials immediately below the surface with vehicle use due to earth moving or compaction. Indirect adverse impacts would include exposure of artifacts to erosion. With avoidance of known archeological resources and implementation of mitigation actions, the direct and indirect adverse impacts of fire suppression tactics or fire hazard fuel reductions would be localized, short-term, and minor.

Overall, however, the No Action alternative would have direct, minor, adverse, long-term, and localized effects on archaeological resources in the park. In addition the use of prescribed fire would have direct, long-term, minor to moderate, beneficial, site-specific effects by helping to maintain the archaeological resources.

Cumulative Impacts

Activities that could contribute to archaeological resource impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, road maintenance, future prescribed fires, and recreational uses (e.g., trails, camping).

The No Action alternative in combination with the past, present, and foreseeable future actions would result in indirect, minor to moderate, long-term, beneficial, site-specific impacts as well as direct, minor, adverse, long-term, and localized effects due to potential future severe wildfires

from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in direct, minor, adverse, long-term, and localized effects on archaeological resources in the park. In addition the use of prescribed fire would have direct, long-term, minor to moderate, beneficial, site-specific effects by helping to maintain the archaeological resources. Limiting the prescribed fire line to within the park boundaries could also have direct, minor to moderate, long-term, adverse, localized impacts to archaeological resources through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be direct, minor to moderate, long-term, beneficial, localized impacts to archaeological resources.

Impacts to Alternative II: Preferred Alternative

General impacts to archaeological resource sites would be similar to those described under the No Action Alternative. However, under this alternative the fireline boundary would be extended to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce high – intensity wildfire risk, and prevent large wildfires in the area, thus removing larger blocks of vegetation from high risk fires. Mechanical and manual hazardous fuel treatments would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. Thus, the Preferred Alternative would have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Adjacent landowners and the park have entered a MOU to establish a joint understanding for the prescribed burns that would be conducted on private lands as well as NPS lands. All private landowners include in a burn unit would be consulted prior to implementing the prescribed burn plan and would be consulted for any known archaeological resources. Any known archaeological resources would be marked with special flagging and mitigation measures would be taken to protect identified resources from prescribed burns.

The Preferred Alternative would have direct, long-term, minor, adverse, site-specific effects on unknown archaeological resources in the park or on adjacent lands within the fireline boundary. In addition, the use of prescribed fire would have direct, long-term, beneficial, localized effects on archaeological resources through minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Cumulative Impacts

Activities that could contribute to archaeological resource impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, road maintenance, future prescribed fires, and recreational uses (e.g., trails, camping).

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, minor to moderate, long-term, beneficial, site-specific impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Conclusion

The Preferred Alternative would result in direct, minor, adverse, long-term, and site-specific effects on unknown archaeological resources. In addition the use of prescribed fire in conjunction with the extended fireline boundary would have direct, long-term, minor to moderate, beneficial, site-specific effects by helping to maintain archaeological resources. Cumulative effects under this alternative would be direct, minor to moderate, long-term, beneficial, localized impacts to archaeological resources.

3.5.2 Historic Resources

3.5.2.1 Affected Environment

Historic resources are those human-made sites, structures, features, or objects that date from the time of the arrival of Euroamericans in approximately 1850, up until the middle of the 20th century (i.e., at least 50 years of age). Historic sites, by definition then, can be of Native American association but are most often associated with Euroamerican use and occupation.

There is only one historic structure and the remains of others in the park boundaries that represent historical connections with the region's past. The McBride ranch house represents the era of small commercial farming and cattle ranching and was determined locally significant and listed in the NHRP in 1975. The remains of a carbon-black plant in the park represent the 1920s era of oil production, gas refineries, and carbon-black plants in the Texas panhandle. These remains have not been documented and evaluated for potential listing in the NHRP.

3.5.2.2 Methodology and Intensity Threshold

The methodology used for assessing archaeological resource impacts included using available literature to identify the historic resources present and identifying the potential effects to historic resources by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impact is at the lowest levels of detection, barely measurable, with no perceptible consequences, either adverse or beneficial. For the purposes of Section 106, the determination of effect would be no adverse effect to historic resources.

Minor: Disturbance of a historic site(s) is confined to a small area with little, if any, loss of important information potential. For purposes of Section 106, the determination of effect would be no adverse effect.

Moderate: Disturbance of the historic site(s) would not result in the loss of integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Major: Disturbance of the historic site(s) is substantial and results in the loss of most or all of the site and its integrity. For purposes of Section 106, the determination of effect would be adverse effect.

Duration:

Short-term: Any disturbance to historic structures would be permanent, and are considered long-term.

Long-term: Any disturbance to historic structures would be permanent, and are considered long-term.

3.5.2.3 Regulations and Policies

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Provide protection of all historic resources by preventing the destruction, alteration, or impairment to all or part of the historic site.	National Historic Preservation Act; Executive Order 11593, Protection and Enhancement of the Cultural Environment; Archeological and Historic Preservation Act; the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; Programmatic Memorandum of Agreement Among the NPS, Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (1995); NPS Management Policies; National Environmental Policy Act
The qualities that contribute to the eligibility for listing or listing of historic properties on the NRHP are protected in accordance with the Secretary of the Interior's Standards (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable).	

3.5.2.4 Analysis of Alternatives and Impacts on Historic Resources

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. Potential for historic resource damage by severe, wildfire would increase over time in areas of fuel build up, which increases the potential for destruction of historic sites, such as corrals, pioneer cabins, and uninventoried historic resources. This effect would be direct, long-term, minor to moderate, adverse, localized due to potential fuel build up and the increased risk for severe wildfires.

Prescribed fire would allow for advance clearance and avoidance of historic resources. Known historic resources could be excluded from prescribed burn units. Prescribed burning would reduce the probability of severe wildfires, thus reducing the potential for damage to known and unknown historic resources and enhancing protection of these resources. Standard management

strategies would be adopted to preclude or minimize impacts (e.g., cultural resources inventories would be completed prior to all prescribed burns, a cultural specialist or an archeologist would monitor initial ground-disturbing activities, should historic resources be identified during prescribed burns, all work would cease in the immediate vicinity of the discovery until the resources could be identified and documented and an appropriate mitigation strategy developed in consultation with the State Historic Preservation Officer). Based upon current information, the No Action alternative impacts would be indirect, minor to moderate, long-term, beneficial, and site-specific.

The direct adverse impact of fire suppression tactics on historic structures would be limited to the potential to damage such structures by contact with firefighting equipment. Indirect adverse impacts include the possibility of damaging the historic integrity of sites. However, fire suppression tactics in conjunction with the proposed hazard fuel reduction projects near historic structures would result in localized, negligible to minor, direct and indirect adverse effects on historic structures.

Mechanical and manual hazardous fuels reduction would occur near historic structures. There would be no direct adverse impacts of mechanical and manual hazardous fuels reduction actions (ensuring that fuels reduction does not include removal of vegetation from cultural landscape) to such resources. Indirect beneficial impacts would include reducing the threat of wildland fire near the historic structures, reducing the potential damage of vegetation encroachment on the resources, and preserving more of the open character field associated with these types of sites. The indirect impacts would be localized, short-term to long-term, negligible to minor, and beneficial.

Overall, however, the No Action alternative would have direct, minor, adverse, long-term, and localized effects on unknown historic resources. In addition the use of prescribed fire would have direct, long-term, minor to moderate, beneficial, site-specific effects by helping to maintain the historic resources.

Cumulative Impacts

Activities that could contribute to historic resource impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, road maintenance, future prescribed fires, and recreational uses (e.g., trails, camping).

The No Action alternative in combination with the past, present, and foreseeable future actions would result in indirect, minor to moderate, long-term, beneficial, site-specific impacts as well as direct, minor, adverse, long-term, and localized effects due to potential future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in direct, minor, adverse, long-term, and localized effects on historic resources in the park. In addition the use of prescribed fire would have direct, long-term, minor to moderate, beneficial, site-specific effects by helping to maintain the archaeological resources. Limiting the prescribed fire line to within the park boundaries could also have direct, minor to moderate, long-term, adverse, localized impacts to historic resources through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be direct, minor to moderate, long-term, beneficial, localized impacts to historic resources.

Impacts to Alternative II: Preferred Alternative

General impacts to historic resource sites would be similar to those described under the No Action Alternative. However, under this alternative the fireline boundary would be extended to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and reduce the likelihood of large wildfires in the area, thus removing larger blocks of vegetation. Mechanical and manual hazardous fuel treatments would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. Thus, the Preferred Alternative would have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Adjacent landowners and the park have entered a MOU to establish a joint understanding for the prescribed burns that would be conducted on private lands as well as NPS lands. All private landowners include in a burn unit would be consulted prior to implementing the prescribed burn plan and would be consulted for any known historic resources. Any known historic resources would be marked with special flagging and would be protected from prescribed burns.

The Preferred Alternative would have direct, long-term, minor, adverse, site-specific effects on unknown historic resources in the park or on adjacent lands within the fireline boundary. In addition, the use of prescribed fire would have direct, long-term, beneficial, localized effects on historic resources through minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Cumulative Impacts

Activities that could contribute to historic resource impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, road maintenance, future prescribed fires, and recreational uses (e.g., trails, camping).

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, minor to moderate, long-term, beneficial, site-specific impacts by

minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Conclusion

The Preferred Alternative would result in direct, minor, adverse, long-term, and site-specific effects on unknown historic resources. In addition the use of prescribed fire in conjunction with the extended fireline boundary would have direct, long-term, minor to moderate, beneficial, site-specific effects by helping to maintain historic resources. Cumulative effects under this alternative would be direct, minor to moderate, long-term, beneficial, localized impacts to historic resources.

3.6 Socioeconomic Resources

3.6.1 Oil and Gas Development

3.6.1.1 Affected Environment

The park is located in the Panhandle West Field, an area of approximately 1,475,000 acres, of which approximately 1,000,000 acres are used for the production of sweet gas, and approximately 400,000 acres produce sour gas with hydrogen sulfide (H₂S). This area also produces around 250,000 acres (/yr) of crude oil.

Unlike most NPS units, oil and gas activities were permitted by Congress when LAMR was created. Currently, there are 170 existing wells that occupy a total of 82 acres. Approximately 40 miles of unpaved access roads exist in the park for a total ~96 acres.

Leaks and spills of oil and gas and other hazardous substances have affected park resources, primarily soils, vegetation, and water quality.

There are at least 53 documented plugged and abandoned wells in the park, many of which have not been reclaimed. Many nonessential roads (~ 104 miles; 253 acres) cover the areas that were once used for abandoned wells.

Forty-seven oil and gas pipeline segments cross the park, totaling 39.17 miles. Figuring a 50-ft. right-of-way, the pipelines cover approximately 237.45 acres.

Oil and gas exploration, development, and transportation play an important role in the local economy within the three-county area that includes the park, and are also important to the regional economy within Railroad Commission of Texas District 10.

3.6.1.2 Methodology and Intensity Threshold

The methodology used for assessing oil and gas resource impacts included using available literature to identify the oil and gas resources present and identifying the potential effects to oil and gas resources by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts would result in a change to oil and gas resources, but the change would be so slight that it would not be of any measurable or perceptible consequence.

Minor: Impacts would cause limited localized change to oil and gas resources. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Impacts would have measurable impacts to oil and gas resources that would be consequential, but would be relatively local. Mitigation measures, if needed, to offset adverse effects occurring outside the Park, would likely succeed.

Major: Impacts would cause substantial alteration to oil and gas resources on a regional scale. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Duration:

Short-term: Impacts that generally last for the duration of the project.

Long-term: impacts that generally last beyond the duration of the project

3.6.1.3. Regulations and Laws

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
Public participation in planning and decision-making will ensure that the Park Service fully understands and considers the public's interests in the parks, which are part of their national heritage, cultural traditions, and community surroundings. NPS will actively seek out and consult with existing and potential visitors, neighbors, people with traditional cultural ties to park lands, scientists and scholars, concessioners, cooperating associations, gateway communities, other partners, and government agencies. The Service will work cooperatively with others to improve the condition of parks; to enhance public service; and to integrate parks into sustainable ecological, cultural, and socioeconomic systems.	NPS Management Policies, National Environmental Policy Act
Possible conflicts between the proposed action and oil and gas operations for the project area and the extent to which the park will reconcile the conflict are identified in this NPS environmental document.	

3.6.1.4 Analysis of Alternatives and Impacts on Oil and Gas Development

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. Due to potential fuel build up in and around oil and gas facilities and the high occurrence of wildfires, the potential for a catastrophic accident would be higher and the safety to the public and firefighters would be placed at a higher risk. This effect would be direct, long-term, minor to moderate, adverse, localized due to potential fuel build up and the increased risk for severe wildfires that could damage oil/gas facilities.

Prescribed fires would reduce the potential for fuel build up in and around oil and gas facilities, thus creating a safety buffer and defensible space zones. Reduced fuel loads would limit the amount of heat that is generated during future wildfires, thus decreasing the potential for an explosion or damage to the oil and gas facilities and reducing the safety hazard to the public and firefighters. This would have a direct, long-term, minor to moderate, beneficial, site-specific impact.

Mechanical and manual hazardous fuels reduction would occur near oil and gas structures. There would be no direct adverse impacts of mechanical and manual hazardous fuels reduction actions to such resources. Indirect beneficial impacts would include reducing the threat of wildland fire near the oil and gas structures and reducing the potential damage of vegetation encroachment on the resources. The indirect impacts would be localized, short-term to long-term, negligible to minor, and beneficial.

There may also be temporary closures of areas being treated by prescribed fire to oil and gas operations. These closures would be related to protection of human health and safety, but would be short-term and coordinated with oil/gas operators. This effect would be direct, short-term, adverse, negligible to minor, and site-specific to oil and gas operations and should not change oil and gas resources.

Cumulative Impacts

Activities that could contribute to oil and gas resource impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, public utilities, and commercial facilities.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in direct, minor to moderate, long-term, beneficial, site-specific impacts as well as direct, minor to moderate, long-term, adverse, localized impacts due to potential future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in direct, negligible to minor, adverse, short-term, and site-specific impacts from temporary closures of burn unit areas during prescribed fires. Limiting the prescribed fire line to within the park boundaries could also have direct, minor to moderate, long-term, adverse, localized impacts to oil and gas resources through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be direct, minor to moderate, long-term, adverse, localized impacts to oil and gas resources.

Impacts to Alternative II: Preferred Alternative

General impacts to oil and gas resource would be similar to those described under the “No Action” Alternative. However, under this alternative the fireline boundary would be extended to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and prevent large wildfires in the area, thus removing larger blocks of vegetation. Due to reduced fuel build up in and around oil and gas facilities and the high occurrence of wildfires, the potential for a catastrophic accident would be reduced and the safety to the public and firefighters would also be placed as a low risk. Thus, the Preferred Alternative would have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

There may also be temporary closures of areas being treated to oil and gas operations. These closures would be related to protection of human health and safety, but would be short-term and would be coordinated with oil/gas operators. This effect would be direct, short-term, adverse, negligible to minor, and site-specific to oil and gas operations and should not change oil and gas resources.

Mechanical and manual hazardous fuel treatments would be limited to reducing hazardous fuel along firelines or ranch features for protection and control purposes, and that work would only occur with the permission of landowners. There would be no direct adverse impacts of mechanical and manual hazardous fuels reduction actions to such resources. Indirect beneficial impacts would include reducing the threat of wildland fire near the oil and gas structures and reducing the potential damage of vegetation encroachment on the resources. The indirect impacts would be localized, short-term to long-term, negligible to minor, and beneficial.

Cumulative Impacts

Activities that could contribute to oil and gas resource impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, public utilities, and commercial facilities.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, minor to moderate, long-term, adverse, localized impacts to oil and gas resources.

Conclusion

The Preferred Alternative would result in direct, negligible to minor, adverse, short-term, and site-specific impacts from temporary closures of burn unit areas. Extending the fireline boundary to include adjacent landowners would have direct, long-term, beneficial, localized impacts. Cumulative effects under this alternative would be direct, minor to moderate, long-term, beneficial, localized impacts to oil and gas resources.

3.6.2 Adjacent Landowners and Uses

3.6.2.1 Affected Environment

The main land use of adjacent lands is ranching. Other land uses adjacent to the park include rural resident development (Double Diamond Estates, Vinson Development), agricultural, sand and gravel operations, mobile home sites, oil and gas activities, and vacation cottages.

The primary, large adjacent landowners that would be included in the extended fireline boundary consist of 6 ranches. These ranches include Alibates Ranch, Crawford Ranch, Kritser Ranch, LX Ranch, Palo Duro Ranch, and Sneed Ranch.

3.6.2.2 Methodology and Intensity Threshold

The methodology used for assessing adjacent landowner impacts included using NRCS GIS data and available literature to identify the adjacent landowners and uses present and identifying the potential effects to adjacent landowners, uses, and resources by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts would result in a change to land use, but the change would be so slight that it would not be of any measurable or perceptible consequence.

Minor: Impacts would cause limited localized change to land use. Mitigation measures, if needed to offset adverse effects, would be simple and successful.

Moderate: Impacts would have measurable impacts to adjacent land uses that would be consequential, but would be relatively local. Mitigation measures, if needed, to offset adverse effects occurring outside the Park, would likely succeed.

Major: Impacts would cause substantial alteration to land use on a regional scale. Extensive mitigation measures would be needed to offset any adverse effects, and their success would not be guaranteed.

Duration:

Short-term: Impacts that generally last for the duration of the project.

Long-term: impacts that generally last beyond the duration of the project

3.6.2.3. Regulations and Laws

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
<p>Public participation in planning and decision-making will ensure that the Park Service fully understands and considers the public's interests in the parks, which are part of their national heritage, cultural traditions, and community surroundings. NPS will actively seek out and consult with existing and potential visitors, neighbors, people with traditional cultural ties to park lands, scientists and scholars, concessioners, cooperating associations, gateway communities, other partners, and government agencies. The Service will work cooperatively with others to improve the condition of parks; to enhance public service; and to integrate parks into sustainable ecological, cultural, and socioeconomic systems.</p> <p>In the spirit of partnership, the Service implemented an MOU for cooperative management agreements with the primary adjacent landowners, which will allow for more effective and efficient fire management of the parks, as authorized by §802 of the National Parks Omnibus Management Act of 1998.</p> <p>Possible conflicts between the proposed action and adjacent landowners (including local, state or Indian tribe), and the extent to which the park will reconcile the conflict are identified in this NPS environmental document.</p>	<p>NPS Management Policies, National Environmental Policy Act</p>

3.6.2.4 Analysis of Alternatives and Impacts on Adjacent Landowners and Uses

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense

wildfires that are difficult to suppress/ manage. Due to potential fuel build up and the high occurrence of wildfires, the potential for a large, high-intensity wildfire to damage adjacent ranches would be high and the safety to the adjacent landowners and surrounding communities would be placed at a higher risk. Severe wildfires could result in injuries or mortality to livestock, damage or loss to buildings (e.g., fences, facilities), loss of life if area residents were unable to escape a high intensity wildfire, permanent changes to vegetation due to soil sterilization, and/or physical alterations to the soil, leading to a decrease in forage amount and quality for livestock. This effect would be direct, short- to long-term, minor to moderate, adverse, localized due to potential fuel build up and the increased risk for severe wildfires.

Large wildfires could result in unpredictable, temporary closures of roads and reduced visibility from smoke to adjacent landowners and surrounding communities. Prescribed fires could result in predictable, temporary closures of roads and reduced visibility from smoke to adjacent landowners and surrounding communities. These road closures would be related to protection of human health and safety. This effect would be direct, short-term, adverse, negligible to minor, and localized and should not change land uses or adjacent lands resources.

Cumulative Impacts

Activities that could contribute to adjacent landowners and uses impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, public utilities, urban development, new construction projects (e.g., roads, buildings), and commercial facilities.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in direct, minor to moderate, short to long-term, adverse, localized impacts due to potential future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park.

Conclusion

The No Action alternative would result in direct, negligible to minor, adverse, short-term, and localized impacts from temporary road closures and reduced visibility. Limiting the prescribed fire line to within the park boundaries could also have direct, minor to moderate, long-term, adverse, localized impacts to adjacent landowners and uses through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be direct, minor to moderate, long-term, adverse, localized impacts to adjacent landowners and uses.

Impacts to Alternative II: Preferred Alternative

Under this alternative the fireline boundary would be extended to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and reduce the likelihood of large wildfires in the area, thus removing larger blocks of vegetation. The Preferred Alternative would protect adjacent landowners and nearby communities better than the No Action alternative. Thus, the Preferred Alternative would have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential

for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

There may also be temporary closures of roads and reduced visibility from smoke to adjacent landowners and surrounding communities. These road closures would be related to protection of human health and safety. Generally, most of the proposed burn areas are located away from major highways and communities. This effect would be direct, short-term, adverse, negligible to minor, and localized and should not change land uses or adjacent lands resources.

In addition, ranchlands that would be included in the extended fireline boundary would have direct, short-term, minor, adverse, localized impacts due to portions of pastures may have to be deferred from grazing until regrowth of native vegetation occurs. However, no burning of these areas would occur without the full agreement of the private landowner. Livestock would also have to be relocated during the treatment. In some cases livestock would need to be kept off of treated areas for a short time after a prescribed fire in order to give forage ample time to recover. The length of time would vary based on site conditions, but would ideally range from two to four growing seasons (Stinson 2001).

Prescribed fire would also provide more nutrients to the soils in the short-term, which would increase plant growth and vigor and improve the amount available and nutritional quality of forage for livestock. The burned areas generally green up earlier than non-burned areas, thus providing earlier grazing (Redmon and Bidwell 2003). This would result in indirect, short-term, minor, beneficial, and site-specific impacts.

Cumulative Impacts

Activities that could contribute to adjacent landowners and uses impacts within and outside the park boundaries include development and construction of oil and gas operations and associated rights-of-way, existing oil and gas wells and associated infrastructure (e.g., compressors, flowlines), transpark oil and gas pipelines, public utilities, urban development, new construction projects (e.g., roads, buildings), and commercial facilities.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, negligible, short-term, adverse, localized impacts due to potential road closures and deferred grazing. As well as direct, minor, beneficial, long-term, and localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Conclusion

The Preferred alternative would result in direct, negligible to minor, adverse, short-term, and localized impacts from temporary road closures and deferred grazing. As well as, direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up. Cumulative effects under this alternative would be direct and indirect, short-term and long-term, adverse and beneficial, localized impacts to adjacent landowners and uses.

3.7 Human Resources

3.7.1 Human Health and Safety

3.7.1.1 Affected Environment

The health and safety of visitors, employees, and surrounding landowners of the project area, and fire personnel are of primary importance to NPS. Fire management activities and wildfires can pose risks to the public and employees, but firefighters and other fire staff face direct risks. Smoke on roads in and adjacent to the park is of concern. Smoke from sources on and off the burn 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.

Wildfires are common in the region and represent a health and safety concern for local communities and visitors to the recreation area. In March 2006, a Texas state record was set for the largest area burned in one fire season. This fire, known as the Borger fire, reached as close as 15 miles northeast of Lake Meredith. It ultimately consumed 479,549 acres. The wildfires resulted in eleven civilian deaths, one firefighter death, one civilian injury, and nine firefighter injuries. Forty structures were destroyed including 32 homes. It was estimated that between four to six thousand cattle were killed, as well as countless feeding supplies such as hay and grass. The fires also indirectly affected thousands of area residents in the panhandle, as 1,040 electrical poles were destroyed (NWS 2006).

Prior to the ignition of any prescribed fire in the project area, all the burn parameters of the approved prescribed fire burn plan must be met to ensure a safe and effective prescribed fire. Neighboring ranches and residences adjacent to prescribed burns will be notified in advance of burns, then updated immediately prior to ignition. Visiting public will be informed and educated when prescribed burns take place. In the event of a potentially hazardous wildfire 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.

3.7.1.2 Methodology and Intensity Threshold

The methodology used for assessing human health and safety impacts included identifying the potential effects to human health and safety by the Proposed Action. The thresholds of change for the intensity of an impact are defined as follows:

Negligible: Impacts would not have a noticeable effect on human health and safety, with no injuries or loss of life.

Minor: Impacts would be detectable, but would not have an appreciable effect on human health and safety, with few or minor injuries and no loss of life.

Moderate: Impacts would have readily detectable impacts and would result in substantial, noticeable effects to human health and safety on a local scale, with possible serious injuries, but no loss of life.

Major: Impacts would have readily detectable impacts and would result in substantial, noticeable effects to human health and safety on a regional scale, or with the possibility of extremely serious injuries and/or loss of life.

Duration:

Short-term: Impacts that generally last for the duration of the project.

Long-term: impacts that generally last beyond the duration of the project

3.7.1.3. Regulations and Laws

Current laws and policies require that the following conditions be achieved in the park:

Desired Condition	Source
All necessary precautions to prevent human exposure to hazards (fire, chemical, smoke) will be taken.	NPS Management Policies; Director's Orders 58; NPS Wildfire Management Reference Manual 18

3.7.1.4 Analysis of Alternatives and Impacts on Adjacent Landowners and Uses

Impacts of Alternative I: No Action Alternative

Under this alternative prescribed burns would be restricted to park boundaries. Restricting prescribed fire to NPS lands is difficult due to the lack of trails/roads along the boundary and the difficult terrain. Due to lack of access and terrain, prescribed burns cannot be executed safely in many parts of the park. This could lead to a buildup of fuels, which could lead to more intense wildfires that are difficult to suppress/ manage. Due to potential fuel build up and the high occurrence of wildfires, the potential for a large, high-intensity wildfire would increase. Direct impacts to firefighter health and safety include exposure to heat, smoke inhalation, accidental spills from fire retardants and foams, injuries from the use of fire-fighting equipment or fireline construction, potential steep and rocky terrain, and in severe cases, injuries from wildfires. In addition damage to adjacent ranches would be high and the safety to the adjacent landowners and surrounding communities would be placed at a higher risk. Severe wildfires could result in injuries or mortality to livestock, damage or loss to buildings (e.g., fences, facilities), loss of life if area residents were unable to escape a high intensity wildfire, and exposure to smoke. Overall, this effect would be direct, short- to long-term, minor to moderate, adverse, localized due to potential fuel build up and the increased risk for severe wildfires.

Prescribed fire, mechanical and manual hazardous fuel reduction would involve pre- planning for the protection of health and safety, and operations would take place under more controlled conditions. Therefore, the potential for direct and indirect impacts associated with management actions, though it's not possible to eliminate them entirely, would overall be reduced. The

impacts to health and safety because of management actions would be short-term, negligible to minor, adverse, localized with minimal human health and safety concerns for fire fighters and the public.

Cumulative Impacts

Activities that could contribute to human health and safety impacts within and outside the park boundaries include oil and gas operations, water-related recreational activities (e.g., boating, swimming), future prescribed fires, surrounding community populations, and number of visitors to the parks.

The No Action alternative in combination with the past, present, and foreseeable future actions would result in direct, minor, short to long-term, adverse, localized impacts due to potential future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park and minor, long-term, beneficial, localized impacts due to the fuel reduction that would occur in safe, accessible areas within the park. The cumulative impacts to human health and safety because of management actions would be negligible to minor and short-term because of careful pre-planning and actions conducted within thoroughly prepared prescriptions.

Conclusion

Limiting the prescribed fireline to within the park boundaries could have direct, minor to moderate, long-term, adverse, localized impacts to firefighters, adjacent landowners, and the public through future severe wildfires from potential fuel buildup. Cumulative effects under this alternative would be direct, minor to moderate, long-term, adverse, localized impacts due to potential future severe wildfires from potential fuel buildup due to the limited acres and amount of vegetative fuels treated inside the park and minor, long-term, beneficial, localized impacts due to the fuel reduction that would occur in safe, accessible areas within the park.

Impacts of Alternative II: Preferred Alternative

Under this alternative the fireline boundary would be extended to include adjacent landowners, which would allow implementing larger prescribed burns to more effectively reduce wildfire risk, and reduce the likelihood of large wildfires in the area, thus removing larger blocks of vegetation. General impacts to human health and safety would be similar to those described under the “No Action” Alternative. However, the Preferred Alternative would reduce the fuel load and the risk of extreme or widespread wildfires more than the No Action alternative. Thus, the Preferred Alternative would have direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up.

Cumulative Impacts

Activities that could contribute to human health and safety impacts within and outside the park boundaries include oil and gas operations, water-related recreational activities (e.g., boating,

swimming), future prescribed fires, surrounding community populations, and number of visitors to the parks.

The Preferred Alternative in combination with the past, present, and foreseeable future actions would result in direct, negligible, short-term, adverse, localized impacts due to potential exposure to associated fire risks (e.g., heat, smoke inhalation). As well as direct, minor to moderate, beneficial, long-term, and localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up. The cumulative impacts to human health and safety because of management actions would be negligible to minor and short-term because of careful pre-planning and actions conducted within thoroughly prepared prescriptions.

Conclusion

The Preferred alternative would result in direct, minor to moderate, beneficial, long-term, localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up. Cumulative effects under this alternative would be direct, negligible, short-term, adverse, localized impacts due to potential exposure to associated fire risks (e.g., heat, smoke inhalation). As well as direct, minor to moderate, beneficial, long-term, and localized impacts by minimizing the potential for future severe wildfires over time as the amount of area restored increases and fuel continuity is broken up. The cumulative impacts to human health and safety because of management actions would be negligible to minor and short-term because of careful pre-planning and actions conducted within thoroughly prepared prescriptions.

4.0 CONSULTATION AND COORDINATION

The following federal and state agencies, affiliated Native American tribes, and affiliated interests were sent scoping information or were contacted for information regarding this EA.

Federal Agencies

U.S. Fish and Wildlife Service

State Agencies

Texas Parks and Wildlife Department

Texas State Historic Preservation Office

Affiliated Native American Groups

Apache Tribe of Oklahoma

Cheyenne-Arapaho Tribe

Caddo Tribe

Comanche Tribe

NAGPRA / Tribal Cultural Preservation Office

Fort Sill Apache Tribe

Jicarilla Apache Tribe

Kiowa Tribe

Mescalero Apache Tribe

Wichita & Affiliated Tribes

4.1 List of Preparers

LAMR and ALFL Staff

Arlene Wimer, Chief of Cultural Resources, Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument

Bruce Fields, Fire Management Officer, Lake Meredith National Recreation Area

Jason McDaniel, Supervisory Forestry Technician, Lake Meredith National Recreation Area

Steve Fisher, GIS Specialist, Lake Meredith National Recreation Area

Lisa Hanson, Fire Compliance and Planning, Intermountain Support Office

EMI Staff

Stephanie Lee, Biologist, Ecosystem Management, Inc.

Bob Lineback, Fire Specialist, Ecosystem Management, Inc.

Mike Tremble, Ecosystem Management, Inc.

4.2 Environmental Assessment Review and List of Recipients

The Environmental Assessment will be released for public review on February 12, 2012. To inform the public of the availability of the Environmental Assessment, NPS will publish and distribute a letter or press release to various agencies, tribes, and members of the public on the National Park's mailing list, as well as place an ad in the local newspaper. Copies of the Environmental Assessment will be provided to interested individuals upon request. Copies of the document will also be available for review at the LAMR visitor center and on the NPS PEPC website at www.parkplanning.nps.gov/lamr.

The Environmental Assessment is subject to a 30-day public comment period ending March 12, 2012. During this time the public is encouraged to post comments online at <http://parkplanning.nps.gov/Plans.cfm> or mail comments to Superintendent; Attn: Lake Meredith National Recreation Area; P.O. Box 1460, Fritch, TX 79036. Following the close of the comment period, all public comments will be reviewed and analyzed prior to the release of a decision document. NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the Environmental Assessment as needed.

Addressees included local landowners, state and local government officials and:

Federal Agencies

U.S. Fish and Wildlife Service

State Agencies

Texas Parks and Wildlife Department

Texas Dept. of Water Resources

Texas Commission on Environmental Quality

Texas Dept. of Transportation, Amarillo District
Texas State Historic Preservation Office
Texas Public Service
Texas Archeological Society

Affiliated Native American Groups

Apache Tribe of Oklahoma
Cheyenne-Arapaho Tribe
Caddo Tribe
Comanche Tribe
NAGPRA / Cultural Preservation Office
Fort Sill Apache Tribe
Jicarilla Apache Tribe
Kiowa Tribe
Mescalero Apache Tribe
Wichita & Affiliated Tribes

Individuals

Alibates Ranch
Crawford Ranch
Kritser Ranch
LX Ranch
Palo Duro Ranch
Sneed Ranch

5.0 REFERENCES

Executive Orders

Executive Order 11988 (Floodplain Management)
Executive Order 11990 (Protection of Wetlands)
Executive Order 12898 (Environmental Justice in Minority Populations and Low-income Populations)
Executive Order 13007 (Indian sacred sites)

NPS Director's Orders

DO-12 Conservation Planning, Environmental Impact Analysis and Decision Making
DO-18 Wildland Fire Management
DO-24 Museum Collections
DO-28 Cultural Resource Management
DO-47 Sound Preservation and Noise Management
DO-77 Natural Resources Management Guideline (NPS-77)
DO-77-1 Wetland Protection
DO-77-2 Floodplain Management

Federal and Government

36 CFR Parks, Forests, and Public Property
40 CFR Protection of Environment
50 CFR Wildlife and Fisheries

1916 Organic Act
1963 Clean Air Act, as amended
1964 Wilderness Act
1966 National Historic Preservation Act
1969 National Environmental Policy Act
1970 General Authorities Act
1972 Clean Water Act
1973 Endangered Species Act
1979 Archeological Resources Protection Act
1981 Farmland Protection Policy Act
1993 Government Performance Results Act
Secretarial Order No. 3175 – Departmental Responsibilities for Indian Trust Resources

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APPENDIX A: MOU BETWEEN NPS AND ADJACENT PRIVATE LANDOWNERS**Memorandum of Understanding****Between****United States Department of Interior****National Park Service****Lake Meredith National Recreation Area****And****Private Land Owners Adjacent to Lake Meredith National Recreation Area****I. Introduction**

The ecosystem of the panhandle of Texas is dominated by short grass prairie, bisected by riparian corridors including cottonwood tree galleries and adjacent wet meadow/riparian species. The National Park Service (NPS) strives to manage ecosystem with natural forces of disturbance, including wildland fire. The grass-shrub vegetation types located in Lake Meredith National Recreation Area (LAMR) evolved with the effects of wildland fire; in order to maintain the health of these systems, fire is a necessary element. Because of the size and resources to be protected within LAMR, natural ignitions of fire cannot be considered, but prescribed fire can be utilized to maintain the vegetation systems.

Prescribed fire in this vegetation type is usually contained by existing roads, trails or other natural/human-made features that are unburnable. LAMR is not currently bounded by roads or trails. Although fire containment lines can be constructed in some areas, LAMR includes rocky, steep terrain that would pose safety risks to the firefighters trying to protect these fire lines.

LAMR is surrounded by privately owned ranch lands. The adjacent private lands maintain private roads. If the NPS could utilize the existing private roads for prescribed burns, both the NPS and the private land owners would realize benefits. The NPS is proposing to use the existing private roads as fire containment lines for prescribed burns on NPS and on selected private lands adjacent to LAMR. Benefits to the NPS include completing prescribed burns for ecosystem management in a safe, cost-effective process, and completing fuels reduction in support of wildland fire management. Benefits to the private ranch land owners include reducing excess fuels, and stimulating forage for livestock.

Because the proposal of using private lands, and burning on private and federally owned property, the proposed action is considered a Federal Action, and is subject to compliance with the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and the Endangered Species Act (ESA).

II. Purpose

This Memorandum of Understanding (MOU) between the NPS and private land owners adjacent to LAMR is to establish joint understanding of the need to initiate compliance with NEPA, NHPA, and the ESA on NPS lands as well as on the private lands that would be included in the proposed prescribed burns.

III. Authority

The NPS enters into this agreement under the authority of 16 U.S.C. §§ 1-3, 16 U.S.C. §§ 460eee, *et seq.*, (2006) and pursuant to NPS Director's Order #18.

IV. Agreement

It is mutually agreed as follows:

1. NPS managers and Private land owners are cooperators on the compliance processes: NEPA, NHPA, and ESA. As cooperators, internal reviews will be available, and comments considered, before documents are released to the public. Private land owners can also comment on documents as members of the public.

2. All parties will allow interdisciplinary team members to collect archival information and data at a mutually agreed upon date(s) for the compliance processes.
3. Private land owners will work with LAMR fire management personnel on operational processes and the planning of prescribed burns on the private lands and roads to be impacted.
4. Private land owners whose lands are included in prescribed Burn Plans will have an opportunity to review and approve the prescribed Burn Plans.
5. An annual meeting between NPS land managers and private land owners whose lands may be included in prescribed Burn Plans, will be held to discuss potential prescribed burns during the upcoming year. Both private land owners and NPS land managers will establish a list of potential prescribed burn projects on NPS/private lands, with temporal/conditional restrictions on the private lands.

V. Agreement term

This MOU will be effective as of the date of the last signature and will continue in effect for a period of five years thereafter, unless it is terminated earlier upon thirty days notice in writing by any party. At the conclusion of the original five-year term, the parties may agree in writing to extend the agreement or to renew it for an additional five-year term. The agreement will be reviewed annually, beginning in January 2012, and may be amended as needed by mutual agreement of all parties in writing.

VI. Special Provisions

A. Non-Fund Obligor Document: This MOU is neither a fiscal nor funds obligation document. Any endeavor or transfer of anything of value involving reimbursement or contribution of funds between the parties to this MOU will be handled in accordance with applicable laws, regulations, and procedures including those for Government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate

statutory authority. This MOU does not provide such authority. Specifically, this MOU does not establish authority for noncompetitive award to the cooperator of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

B. Principal Contacts: The principal contacts for this instrument are:

Alibates Ranch

Ed Attenbury 806-359-8224

Crawford Ranch

Blair Kiser 806-676-9478

Kritser Ranch

Jack Miller 806-353-7321 xt 103

LX Ranch

Dave Anderson 806-654-6501

Palo Duro Ranch

Clay Schnell 806-659-5565

Sneed Ranch

Pam Stevens 806-679-7095

Lake Meredith National Recreation Area (NPS)

Bruce Fields 806-865-3360 x426

C. Non-Discrimination: All activities pursuant to this Understanding shall be in compliance with the requirements of the Executive Order 11246, as amended; Title VI of the Civil Rights Act of 1964 (78 Stat. 252; U.S.C. 2000 et seq.) and with all other federal laws and regulations prohibiting discrimination on the grounds of race, color, national origin, handicapped, religion, or sex in employment and in providing facilities and services to the people.

D. Congressional Delegate: No member or delegate to congress, or resident Commissioner, shall be admitted to any share or part of this MOU, or to any benefit that may arise there from, but this provision

shall not be construed to extend to this MOU if made with a corporation for its general benefit.

- E. **Freedom of Information Act (FOIA):** Any information furnished to any federal agency under this instrument is subject to the Freedom of Information Act (5 U.S.C. 552).
- F. **Participation in Similar Activities:** This MOU in no way restricts the parties from participating with other public or private agencies, organizations and individuals in similar activities.
- G. **Modification:** Modifications within the scope of this instrument shall be made by mutual consent of the parties, by the issuance of a written modification, signed and dated by all parties, prior to any changes being performed.

In witness whereof, the parties have caused this Memorandum of Understanding to be executed as of the date of the last signature below:

Approved:

LAKE MEREDITH NATIONAL RECREATION AREA (NPS)

By: 
Superintendent


Date: 5/31/2011

ALIBATES RANCH

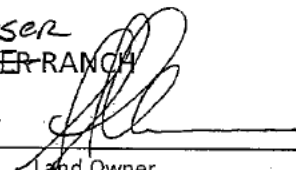
By: _____
Land Owner

Date: _____

CRAWFORD RANCH

By: 
Land Owner

Date: June - 8th - 11

Kritser
~~KRISTER~~ RANCH
By: 
Land Owner

Date: 5/31/11

In witness whereof, the parties have caused this Memorandum of Understanding to be executed as of the date of the last signature below:

Approved:

LAKE MEREDITH NATIONAL RECREATION AREA (NPS)

By: _____
Superintendent

Date: _____

ALIBATES RANCH

By: W.A. Att Pres Bison Development Co.
Land Owner

Date: 6/1/2011

CRAWFORD RANCH

By: _____
Land Owner

Date: _____

KRISTER RANCH

By: _____
Land Owner

Date: _____

LX RANCH

By: Dave Anderson
Land Owner

Date: 6-23-11

PALO DURO RANCH

By: Palo Duro Ranch, Inc. Ron C. Shaffer
Land Owner

Date: 5-31-11

SNEED RANCH

By: Joseph H. Pool
Land Owner

Date: 5-31-11

APPENDIX B: USFWS AND TPWD T&E DATA REQUEST RESPONSE LETTERS

From: John_Morse@fws.gov
To: [Stephanie Lee](#)
Subject: 21420-2011-I-0374 LAMR and ALFL Fireline Expansion Project
Date: Tuesday, August 23, 2011 6:53:13 AM

Ms. Lee,

This email is in response to the August 15, 2011, letter requesting a list of protected species regarding the proposed prescribed burn fireline boundary extension project to include adjacent private land for Lake Meredith NRA and Alibates Flint Quarries National Monument fire management plan in Potter, Moore and Hutchinson Counties, Texas. A current list of federally threatened and endangered species in Texas by county may be found at our website: <http://www.fws.gov/southwest/es/EndangeredSpecies/>.

If you have any further questions or concerns please do not hesitate to contact me.

John Morse
Fish & Wildlife Biologist
Arlington, Texas, Ecological Services
711 Stadium Dr., Suite 252
Arlington, TX 76011
ph: (817) 277-1100 ext. 30
fax: (817) 277-1129
email: john_morse@fws.gov



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Chairman-Emeritus
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Carter P. Smith
Executive Director

November 29, 2011

Ms. Stephanie Lee
Ecosystem Management, Inc.
3737 Princeton NE, Suite 150
Albuquerque, NM 87107

RE: Proposed Prescribed Burn Fireline Boundary Extension Project to Include Adjacent Private Land for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument Fire Management Plan; Potter, Moore, and Hutchinson Counties

Dear Ms. Lee:

Texas Parks and Wildlife Department (TPWD) received the request for information regarding the above-referenced modification to the Fire Management Plan (FMP) at Lake Meredith National Recreation Area (LAMR) and Alibates Flint Quarries National Monument (ALFL). TPWD staff has reviewed the information provided and offers the following comments concerning this project.

Please be aware that a written response to a TPWD recommendation or informational comment received by a state governmental agency may be required by state law. For further guidance, see the Texas Parks and Wildlife Code, Section 12.0011 which can be found online at <http://www.statutes.legis.state.tx.us/Docs/PW/htm/PW.12.htm#12.0011>. For tracking purposes, please refer to TPWD project number 16571 in any return correspondence regarding this project.

Project Description

The proposed project entails updating the FMP at LAMR and ALFL to include prescribed burning on adjacent private ranch lands. Actions performed on adjacent private lands would include vegetation manipulation along firelines to control the prescribed burns. The National Parks Service (NPS) has determined that it is necessary to do an analysis under the National Environmental Policy Act for the increased prescribed burning on private lands.

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

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Comment: TPWD supports the definition of fire management units based on roads and topography rather than the National Park boundary. This approach should reduce the costs of fire management, allow the NPS to affect more area, and limit the number of firelines constructed in locations that could adversely impact water quality such as slopes and areas adjacent to the lake. The following recommendations are provided to assist the NPS in further minimizing impacts to natural resources during fire management activities, such as vegetation removal for firelines, and in avoiding impacts to protected species.

Rare and Protected Species

The request for information specifically asked for a list of protected species that could occur in the project area. The TPWD county lists of rare and protected species for Hutchinson, Moore, and Potter counties are attached for your reference.

Recommendation: Please review the attached lists, as rare species could be present in the project area depending upon habitat availability. As your project progresses and the FMP is implemented, TPWD recommends the NPS check for updates to the TPWD county lists. The most current lists are available online at http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species.phtml. If during construction, the project area is found to contain rare species, natural plant communities, or special features, TPWD recommends that precautions be taken to avoid impacts to them. The U.S. Fish and Wildlife Service (USFWS) should be contacted for species occurrence data, guidance, permitting, survey protocols, and mitigation for federally listed species. For the USFWS rare species lists please visit http://www.fws.gov/southwest/es/EndangeredSpecies/EndangeredSpecies_main.cfm.

Federal Laws

Endangered Species Act (ESA)

Federally-listed animal species and their habitat are protected from “take” on any property by the ESA. Take of a federally-listed species can be allowed if it is “incidental” to an otherwise lawful activity and must be permitted in accordance with Section 7 or 10 of the ESA. Federally-listed plants are not protected from take except on lands under federal/state jurisdiction or for

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which a federal/state nexus (i.e., permits or funding) exists. Any take of a federally-listed species or its habitat without the required take permit (or allowance) from USFWS is a violation of the ESA.

The federal and state listed threatened Arkansas River shiner (*Notropis girardi*) has been documented in the Texas Natural Diversity Database (TXNDD) in the Canadian River upstream of Lake Meredith near US 287 (adjacent to the project area). A printout for this TXNDD record is attached for your reference.

Recommendation: TPWD recommends that adverse impacts to the Arkansas River shiner be minimized by protecting water quality in the Canadian River. Measures should include allowing vegetation on slopes immediately adjacent to the lake to remain unburned and function as filter strips during and after prescribed fires. Burning native vegetation within riparian corridors should also be avoided. TPWD recommends the NPS contact the USFWS for additional measures to minimize impacts to the Arkansas River shiner and to determine whether consultation will be required under Section 7 of the ESA.

Migratory Bird Treaty Act (MBTA)

The MBTA prohibits taking, attempting to take, capturing, killing, selling/purchasing, possessing, transporting, and importing of migratory birds, their eggs, parts and nests, except when specifically authorized by the Department of the Interior. This protection applies to most native bird species, including ground nesting species. The USFWS Migratory Bird Office can be contacted at (505) 248-7882 for more information on potential impacts to migratory birds.

Recommendation: If migratory bird species are found nesting on or adjacent to the project area, they must be dealt with in a manner consistent with the MBTA. TPWD recommends NPS avoid clearing vegetation for firelines during the general bird nesting season, March through August, to avoid adverse impacts to this group. If clearing vegetation during the migratory bird nesting season is unavoidable, TPWD recommends the NPS survey the area proposed for disturbance to ensure that no nests with eggs or young will be disturbed by operations. Any vegetation (trees, shrubs, and grasses) where occupied nests are located should not be disturbed until the eggs have hatched and the young have fledged.

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Species of Concern/Special Features

In addition to state- and federally-protected species, TPWD tracks special features, natural communities, and rare species that are not listed as threatened or endangered. These species and communities are tracked in the TXNDD, and TPWD actively promotes their conservation. TPWD considers it important to evaluate and, if necessary, minimize impacts to rare species and their habitat to reduce the likelihood of endangerment.

Printouts of TXNDD records in the project area are attached for your reference. Please note that absence of TXNDD information in an area does not imply that a species is absent from that area. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Although it is based on the best data available to TPWD regarding rare species, the data from the TXNDD do not provide a definitive statement as to the presence, absence or condition of special species, natural communities, or other significant features within your project area. These data are not inclusive and **cannot be used as presence/absence data**. They represent species that could potentially be in your project area. This information cannot be substituted for on-the-ground surveys. The TXNDD is updated continuously. As the project progresses and for future projects, please request the most current and accurate information at txndd@tpwd.state.tx.us.

Based on a review of TXNDD records, aerial photography, and limited ground surveys, the following rare species and special features could potentially be impacted by project activities:

Species of Concern

Ferruginous Hawk (*Buteo regalis*)
Western Burrowing Owl (*Athene cunicularia hypugaea*)
Black-tailed prairie dog (*Cynomys ludovicianus*)
Swift fox (*Vulpes velox*)

Special Features

Colonial Waterbird Rookeries
Prairie dog towns

The Black-tailed prairie dog is a keystone species which provides food and/or shelter for rare species tracked by TPWD such as the Ferruginous Hawk and the Western Burrowing Owl, as well as many other wildlife species. Prairie

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dog towns have been documented in the project area, and due to the limitations in TXNDD data described above, prairie dog towns not documented in the TXNDD may be present in the project area.

Recommendation: TPWD recommends the NPS avoid the disturbance of prairie dog burrows to the extent feasible during fire management activities.

The Western Burrowing Owl is a ground-dwelling owl that uses the burrows of prairie dogs and other fossorial animals for nesting and roosting. The Western Burrowing Owl is protected under the MBTA and take of these birds, their nests, and eggs is prohibited. Potential impacts to the Western Burrowing Owl could include habitat removal as well as displacement and/or destruction of nests and eggs if ground disturbance occurs during the breeding season.

Recommendation: If prairie dog towns would be disturbed as a result of the proposed project, TPWD recommends the burrows be surveyed for burrowing owls. If nesting owls are found, disturbance should be avoided until the eggs have hatched and the young have fledged.

A colonial waterbird rookery has been documented within the project area on in Saddle Horse Canyon.

Recommendation: As stated above, measures should be taken to ensure that migratory bird species are not adversely impacted by fire management activities. If active colonial waterbird rookeries are discovered within **or near** the proposed project site, activities should be scheduled and implemented when the birds are not present, after nesting activities have ceased. TPWD recommends avoiding vegetation removal and other forms of disturbance near colonial waterbird rookeries.

Determining the actual presence of a species in a given area depends on many variables including daily and seasonal activity cycles, environmental activity cues, preferred habitat, transiency and population density (both wildlife and human). The absence of a species can be demonstrated only with great difficulty and then only with repeated negative observations, taking into account all the variable factors contributing to the lack of detectable presence. If encountered during construction, measures should be taken to avoid impacting wildlife.

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I appreciate the opportunity to review and comment on this project. Please contact me at (512) 389-4579 or julie.wicker@tpwd.state.tx.us if we may be of further assistance.

Sincerely,

A handwritten signature in blue ink that reads "Julie C. Wicker". The signature is written in a cursive, flowing style.

Julie C. Wicker
Wildlife Habitat Assessment Program
Wildlife Division

JCW:gg.16571

Attachments (2)