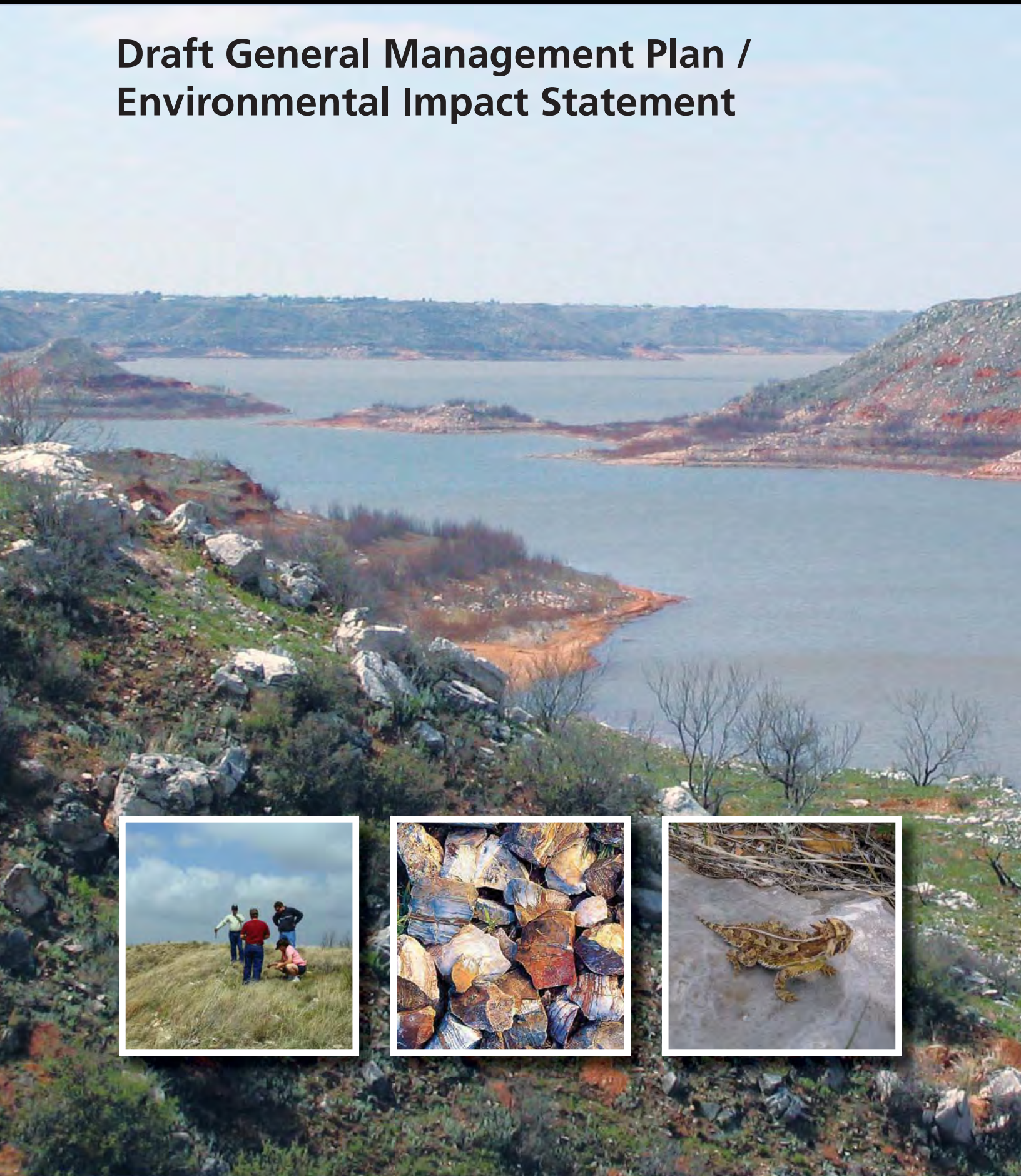
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
Texas

National Park Service
U.S. Department of the Interior

Draft General Management Plan / Environmental Impact Statement



Draft **General Management Plan / Environmental Impact Statement**

Lake Meredith National Recreation Area and
Alibates Flint Quarries National Monument
Hutchinson, Moore, and Potter Counties, Texas

Lake Meredith National Recreation Area was established by Congress in 1964, and its management was transferred to the National Park Service in 1990. Its primary purpose is to provide public access to diverse land- and water-based recreational opportunities in the Texas panhandle. Although its management has been guided by a master plan and statement for management, a general management plan has not previously been prepared for this national park unit.

Alibates Flint Quarries National Monument was established by Congress in 1965 to provide for the preservation, protection, interpretation, and scientific study of Alibates flint deposits. The national monument is on the eastern edge of Lake Meredith National Recreation Area and the two national park system units are managed jointly. A management plan for the national monument was prepared by the National Park Service in 1976 and amended in 1985, but it does not meet the requirements of a general management plan and is out of date.

This general management plan examines three alternatives for managing Lake Meredith National Recreation Area and three alternatives for managing Alibates Flint Quarries National Monument. The management timeframe is 15 to 20 years. The environmental impact statement component of this document analyzes the impacts of implementing each alternative.

Lake Meredith National Recreation Area

- Alternative 1, the no action / continue current management alternative, would extend existing conditions and trends of national recreation area management into the future. This alternative serves as a basis of comparison for evaluating the action alternatives.
- Alternative 2 would focus on providing quality recreation, enhancing traditional activities, and improving resource protection. The focus would be on providing a better visitor experience through additional or improved facilities and increased interpretation in accessible settings, and expanded opportunities in more natural rural and semi-primitive zones.
- Alternative 3 is the preferred alternative. It would promote both traditional and nontraditional uses, developing facilities and opportunities to address changing lake conditions and visitor uses. The national recreation area would become a destination for semi-primitive outdoor recreation opportunities and would strengthen partnerships to improve visitor experience.

The environmental impact statement evaluated impacts of the alternatives on special status species, soils, archeological resources, historic structures and buildings, visitor use and experience, socioeconomics, transportation and access, and NPS operations. Alternative 3, which would promote recreation that does not rely on the presence of the lake, would have major, long-term, beneficial impacts on visitor use and experience. All other impacts of the alternatives would be less than major.

Alibates Flint Quarries National Monument

- Alternative A, the no action / continue current management alternative, would extend existing conditions and management of the national monument into the future. This alternative serves as a basis of comparison for evaluating the action alternatives.
- Alternative B is the preferred alternative. It would expand interpretation and education to provide a better understanding and appreciation of the flint and the people who quarried and used it while maintaining access restrictions that protect the archeological resources.
- Alternative C would provide a greater understanding and appreciation for archeological protection through enhanced educational opportunities and research. It also would accommodate a wider range of visitor uses and experiences by zoning part of the national monument for unrestricted visitor access by foot.

Impact topics that were evaluated for Alibates Flint Quarries National Monument included archeological resources, visitor use and experience, and NPS operations. All aspects of the Alibates Flint Quarries National Monument alternatives would have impacts that were less than major.

This general management plan / environmental impact statement has been distributed to other agencies and interested organizations and individuals for review, and a notice of availability has been published in the *Federal Register*. Please see the section on "How to Comment on This Plan" if you want to comment on the environmental impact statement.

HOW TO COMMENT ON THIS PLAN

Public involvement throughout the planning process provides focused opportunities for NPS managers and the planning team to interact with the public and to learn about public concerns, expectations, and values. Understanding people's values regarding resources and visitor experiences contributes to success in developing decisions that can be implemented. Public involvement also provides opportunities to share information about the parks' purposes and significance and to present opportunities and constraints regarding the management of the parks' lands and surrounding areas.

Comments on this general management plan / environmental impact statement are welcome and will be accepted during the 60-day public review and comment period. During the comment period, comments may be submitted using any of these methods:

Online at http://parkplanning.nps.gov/lamr

We prefer that readers submit comments online through the parks' planning website identified above so the comments become incorporated into the National Park Service planning, environment, and public comment system. An electronic public comment form is provided through this website.

By U.S. Mail, address to

Lake Meredith National Recreation Area and
Alibates Flint Quarries National Monument General Management Plan

National Park Service
Denver Service Center – Erin Flanagan
P.O. Box 25287
Denver, CO 80225

Hand delivery to the parks' headquarters or at public meetings to be announced in the media following the release of this plan. The parks' headquarters address is

National Park Service
419 East Broadway
Fritch, TX 79036

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment — including your personal identifying information — may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

HOW TO USE THIS PLAN

The National Parks and Recreation Act of 1978 requires each unit of the national park system to develop a general management plan. The purpose of a general management plan is to ensure that a park has a clearly defined direction for resource preservation and visitor use in order to best achieve the National Park Service's requirement to preserve resources unimpaired for the enjoyment of future generations. General management planning also makes the National Park Service more effective, collaborative, and accountable, as follows:

- Planning helps balance continuity and adaptability in decision making. Defining the desired conditions to be achieved and maintained in a park unit provides a touchstone that allows managers and staff to constantly adapt their actions to changing situations while staying focused on what is most important about the park unit.
- Analyzing the park unit in relation to its surrounding ecosystem, cultural setting, and community helps managers and staff understand how the park unit can interrelate with neighbors and others in ways that are ecologically, socially, and economically sustainable. Decisions made in this larger context are more likely to succeed over time.
- Public participation provides everyone who has a stake in decisions affecting a park unit with an opportunity to contribute to the planning process and to understand the decisions that are made. National park units are often the focus of intense public interest. Public involvement throughout the planning process provides opportunities for managers and staff to interact with the public and learn about concerns, expectations, and values. Public involvement also provides settings for managers and staff to share information about the park unit's purpose and significance, address other guidelines for management, and discuss issues and constraints.

The ultimate outcome of general management planning for national park units is an agreement among the National Park Service, its partners, and the public on why each area is managed as part of the national park system, what resource conditions and visitor experience should exist there, and how those conditions can best be achieved and maintained over time.

The first chapter of this document provides legal, policy, and planning information that has a direct effect on the management of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. It also provides a brief description of the park units, an overview of the NPS planning process, the purpose and need for the plan, and the purpose and significance of both parks. This information is the basis for the plan. All proposals must comply with laws, regulations, and policies and must fall within the planning framework for Lake Meredith National Recreation Area or Alibates Flint Quarries National Monument. The second chapter presents three alternative future directions for each park unit. These include one "no-action" alternative and two "action" alternatives that are consistent with laws, policies, and the purpose of the parks.

Actions by the National Park Service are subject to the National Environmental Policy Act, which requires disclosure of impacts and the opportunity for public participation and input. Chapter 3 describes the affected environment in the parks, and chapter 4 assesses the consequences of implementing each alternative in each park unit. Chapter 5 describes consultation and coordination, including public involvement. Public input for this plan is critical to ensure the best management approaches at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. Members of the public are encouraged to review this document to better understand the planning framework limits and constraints so that they can effectively comment on the direction of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument and on the alternative ways identified to achieve the goals.

SUMMARY

PURPOSE AND NEED FOR THE PLAN

Lake Meredith National Recreation Area

Lake Meredith was created in 1964 when the Canadian River was impounded by the construction of Sanford Dam. Lake Meredith National Recreation Area consists of the lake and surrounding lands, totaling almost 45,000 acres. Its primary purpose is to provide public access in the Texas panhandle to diverse land- and water-based recreational opportunities. Congress transferred management of the national recreation area to the National Park Service (NPS) in 1990.

The current drought has dramatically reduced water levels in Lake Meredith. As a result, visitation at the national recreation area has decreased by about 40%. However, such droughts are typical of the long-term climate pattern of the Texas panhandle, historically occurring at a rate of one or two per century. Effects of climate change may influence this pattern. Therefore, Lake Meredith National Recreation Area needs to be managed to accommodate widely fluctuating water levels. A general management plan is needed to achieve a desired condition of more broad-based recreation opportunities, with the flexibility to accommodate varying lake levels and an approach that takes better advantage of the 80% of the national recreation area that is outside the normal lake footprint.

Alibates Flint Quarries National Monument

Alibates Flint Quarries National Monument was established by Congress in 1965 to provide for the preservation, protection, interpretation, and scientific study of Alibates flint deposits. This 1,371-acre national monument is on the eastern edge of Lake Meredith National Recreation Area, and the two national park system units are managed jointly. A management plan for the national monument was prepared by the National Park Service in 1978 and amended in 1985, but it does not meet the current standards for a general management plan. In addition, it does not address evolving management concerns, including the construction of a visitor contact station in 2006 that increased visitation and opportunities for interpretation and education. These changes have resulted in the need for an updated general management plan.

ALTERNATIVES

Development of this general management plan involved preparing three candidate management approaches for Lake Meredith National Recreation Area and three for Alibates Flint Quarries National Monument. For each NPS unit, these included a no-action / continue current management alternative and two action alternatives.

Lake Meredith National Recreation Area

Alternative 1: No Action / Continue Current Management. The National Park Service would continue current management approaches. Few additional facilities or amenities would be provided. Some infrastructure not being used would be removed. Staff at the national recreation area would continue to pursue partnerships to enhance outreach both within and outside the national recreation area boundary.

Alternative 2. This alternative would provide quality recreation, enhance traditional activities, and improve resource protection. The focus would be on providing a better visitor experience through additional or improved facilities and increased interpretation in accessible

settings, and expanded opportunities in more natural rural and semi-primitive zones.

Visitors would continue to have opportunities to enjoy traditional outdoor recreational activities. In addition, large areas of the national recreation area would be zoned as rural and semi-primitive. In these areas, visitors would experience a more natural setting with an opportunity for solitude away from roads. Rural zoning would provide for transitions between more developed areas and the semi-primitive zone that could be accessed by visitors using only nonmotorized means.

Electricity and water, which would be available for a fee, would be installed in about 10 campsites each at the Sanford-Yake and Fritch Fortress campgrounds. The McBride Canyon camping area would be improved to delineate individual sites. New, primitive campgrounds would be designated in the semi-primitive zone. Collectively, these actions would expand the range of camping experiences available to visitors.

Orientation information and other visitor services would continue to be available primarily at the headquarters in Fritch, Texas. New waysides and podcasts could provide orientation in the national recreation area and interpret features such as geology and history. Seasonal NPS programming at the Fritch Fortress amphitheater would be expanded, as would community outreach, interpretation, and education.

The headquarters would remain in Fritch. A new operations center would consolidate fire, law enforcement, and maintenance functions in new and existing buildings in the national recreation area near the existing maintenance yard off Sanford-Yake Road.

This alternative would include more flexibility than alternative 1 for managing visitor facilities in developed areas. If lake levels dropped and visitation declined, the National Park Service could respond by removing underused facilities such as shade shelters, picnic tables, and fire grates at any of the developed areas. When visitation increased as lake levels rose, the facilities could be replaced at their former sites.

Alternative 3: NPS Preferred Alternative. Alternative 3 would promote both traditional and nontraditional uses, developing facilities and opportunities to address changing lake conditions and visitor uses. It would encourage nonmotorized recreation such as hiking, biking, backpacking, horseback riding, and paddling by maximizing the area in the semi-primitive zone and by providing a water-based, no wake zone in several areas on the lake. Multi-use trails would be designated along existing roads, and trails for hiking, biking, and horseback riding would be marked in the semi-primitive zone. Scuba targets installed at Spring Canyon would increase opportunities for this sport. Increased interpretation and global positioning system-based recreation could prompt some people to participate in new activities or visit parts of the national recreation area they otherwise would not have used. As a result, visitors could participate in the national recreation area's traditional outdoor recreation or enjoy enhanced opportunities for other activities.

Elements of this alternative would support the resilience of the park to expected impacts from climate change, such as decreased precipitation; altered plant species range; changed vegetation cover and composition; increased rates of erosion and sediment transport to streams; increased tree mortality due to drought stress and insect outbreaks; increased frequency, size, and duration of wildfires; and increased probabilities of extinctions in plant and animal species. All of these may affect cultural and natural resources, as well as visitor experience.

As in alternative 2, the range of available camping experiences would be expanded

by providing electricity and water to some sites at the Sanford-Yake and Fritch Fortress campgrounds, improving the McBride Canyon camping area, and designating new, primitive campgrounds in the semi-primitive zone. In addition, a new campground at Bates Canyon would have potable water, a dump station, and about 12 sites with electrical hookups. Additional group campsites would be delineated at Harbor Bay.

Improved interpretation would result from rehabilitating the McBride Ranch House and opening it for guided tours during special events, installing interpretive waysides, and adding partner programming to increased NPS programming at the Fritch Fortress amphitheater. The new visitor contact station at the consolidated operations center would enhance orientation, education, and interpretation. As under alternative 2, community outreach, interpretation, and education would be expanded, but goals also would include increasing visitation from nontraditional user groups.

A consolidated headquarters, visitor contact station, and operations center would be constructed in the national recreation area in new and existing buildings near the existing maintenance yard off Sanford-Yake Road. This campus would provide adequate space for administrative staff and operations; flexibility to provide more interpretation and space for additional environmental, cultural, and outreach education; and more efficient staffing and emergency response. This alternative would also include the flexibility to remove and replace sometimes-underused facilities as indicated by visitor use levels.

Alibates Flint Quarries National Monument

Alternative A: No Action / Continue Current Management. Management would continue to focus on the preservation, protection, interpretation, and scientific study of Alibates flint deposits and the people who used them. Visitor experiences would continue to include visiting the existing visitor contact station and participating in guided quarry visits.

Alternative B: NPS Preferred Alternative. This alternative would expand interpretive and educational programs to provide a better understanding and appreciation of the flint and the people who quarried and used it. Access to the entire national monument would continue to be restricted, but guided tours of the quarries would continue and would include the interpretation of an excavated quarry near the trail. Additional visitor opportunities would be provided in nearby parts of Lake Meredith National Recreation Area. These would include a self-guiding interpretive trail near the visitor contact station and outdoor interpretive materials on the terrace above the visitor contact station that focused on an Antelope Creek-style dwelling. Information technologies also would be used to enhance interpretation.

Alternative C. This alternative would provide for a greater understanding and appreciation for archeological protection through enhanced educational opportunities and research. It also would accommodate a wider range of visitor uses and experiences by zoning part of the national monument for unrestricted visitor access by foot. Access to the remainder of the national monument would continue to be restricted.

This alternative would include the short interpretive trail near the contact station and outdoor interpretive materials focusing on an Antelope Creek-style dwelling that were identified in alternative 2. The National Park Service would work to facilitate citizen scientist participation in research activities at the national monument. Education, interpretation, and outreach would be expanded to focus on

stewardship and the research occurring at the national monument.

IMPACTS

The environmental impact statement evaluates impacts of the alternatives for Lake Meredith National Recreation Area on special status species, soils, archeological resources, historical structures and buildings, visitor use and experience, socioeconomics, transportation and access, and NPS operations. Impacts at Alibates Flint Quarries National Monument were evaluated for archeological resources, visitor use and experience, and NPS operations.

Most of the impacts of the alternatives would be negligible or minor. Impacts of greater intensity are summarized below.

Lake Meredith National Recreation Area Alternative 1: No Action / Continue Current Management

The following impacts of alternative 1 would be of moderate intensity:

- The planned new boat ramp on the northwest side of the lake would have minor to moderate, beneficial, long-term impacts on visitor use and experience. These same benefits would be available from implementing alternative 2 or alternative 3.
- Spending by visitors outside the parks would continue to have long-term, moderate, beneficial economic effects in Hutchinson and Moore Counties and the cities of Fritch and Borger. These same benefits would be available from implementing alternative 2 or alternative 3.
- Moderate, adverse impacts on park operations would result from the continued distribution of NPS staff in multiple locations; the inadequate space available in the Fritch headquarters building; the continued high level of incidents that increase maintenance requirements; and the continued use of worn, inefficient buildings.

Lake Meredith National Recreation Area Alternative 2

The expanded or enhanced recreation opportunities of alternative 2 would have long-term, beneficial impacts of moderate intensity on visitor use and experience.

Impacts from ending visitor automobile travel in the semi-primitive zone would depend on individual perceptions and could be beneficial or adverse, with intensities ranging from negligible to major. Individual perception also would determine impact intensity for visitors who currently enjoy driving the dirt roads that would fall in the semi-primitive zone, with intensities that would range from negligible to moderate. These same effects would result from implementing alternative 3.

Lake Meredith National Recreation Area Alternative 3: The NPS Preferred Alternative

Alternative 3 would not have any major, adverse impacts. Major beneficial impacts would include the following:

- The many expanded or enhanced recreation opportunities would collectively have major beneficial impacts on visitor use and experience.
- Long-term, major, beneficial impact would result from increasing the numbers of visitors using nonmotorized transportation, distributing them throughout a large part of the national recreation area, and attracting new visitors who wanted to enjoy these types of travel opportunities.

Moderate impacts would be associates with several aspects of this alternative and would include the following:

- Installing underwater scuba targets at Spring Canyon would have moderate benefits for visitors who enjoy this sport.
- Minor to moderate benefits would result from the new dimension to the visitor experience that would be provided by the expanded interpretation of cultural resources.
- Impacts of rehabilitating the McBride Ranch House would be long-term, beneficial, and of moderate intensity.
- NPS and partner presentations at the Fritch Fortress amphitheater and expanded community outreach might bring in new national recreation area users, resulting in benefits that could range up to moderate.
- Establishing a water-based, no wake zone would have minor to moderate, long-term, beneficial impacts on visitors participating in nonmotorized, water-based activities.
- Changes in spending by visitors outside the parks would have long-term, moderate, beneficial economic effects.
- Consolidating all park operations in a single location would have a long-term, moderate, beneficial impact.

Alibates Flint Quarries National Monument

None of the features of alternative A would result in impacts that would be greater than minor. None of the alternatives would produce major impacts. Moderate impacts of alternatives B and C would be identical and would include the following:

- Excavation of one quarry pit would have a moderate, long-term, adverse impact on that archeological resource, but would not affect any other quarry pits in the national monument or adjoining national recreation area.
- The new interpretive features outside the visitor contact station would have moderate, long-term, beneficial impacts on visitor experience.
- Increased frequency or diversity of special events would have long-term, beneficial impacts that could range from negligible to moderate.

This page is intentionally left blank

CONTENTS

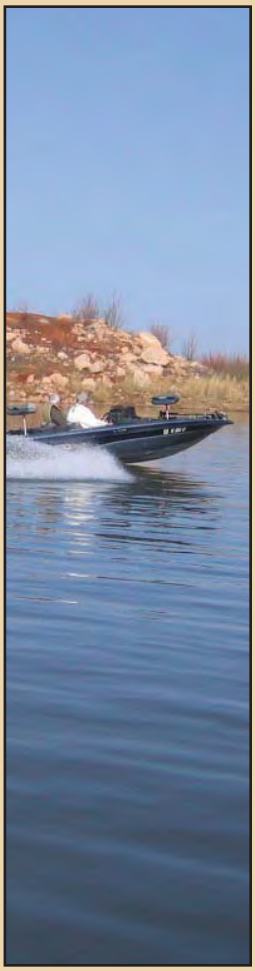
FIGURES

TABLES

This page is intentionally left blank

CHAPTER 1:

INTRODUCTION TO THE PARKS AND TO THE GENERAL MANAGEMENT PLAN



INTRODUCTION

This general management plan was prepared to help the National Park Service (NPS) carry out, as effectively and efficiently as possible, its mission at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument (collectively called "the parks"). It defines how the parks' resources, visitors, and facilities will be managed for the next 15 to 20 years. This document contains separate plans for the national recreation area and the national monument. It also separately analyzes the environmental consequences of the alternatives for each unit.

The general management plan is an umbrella plan that provides the basic guidance for decision making at units of the national park system. This plan establishes desired future conditions for resources and visitor experience and identifies activities that are appropriate in specified areas of the parks. In many cases, other plans implement the details needed to achieve the goals established in the general management plan.

The draft general management plan presents the parks' foundation statements, including park purpose, park significance, fundamental resources and values, and primary interpretive themes. It then considers options, or alternatives, for desired future conditions within the framework of the parks' foundations. To provide information to decision-makers and comply with the National Environmental Policy Act, it also discusses the effects of implementing each alternative.

As shown in figure 1, Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are adjacent NPS units in the Texas panhandle north of the city of Amarillo. Although the parks were established by Congress at different times to meet different purposes (discussed later in this chapter), the National Park Service operates the two parks using the same staff and facilities.

Consistent with the joint approach for administration, a single general management plan was prepared for the two parks. However, the foundation statements for the parks are different, reflecting their different purposes, and the alternatives for the parks are independent. The impacts of implementing each alternative are considered individually, followed by the cumulative impacts from implementing the alternatives in conjunction with all other past, present, and reasonably foreseeable actions by the National Park Service and by others.

BRIEF DESCRIPTION OF LAKE MEREDITH NATIONAL RECREATION AREA AND ALIBATES FLINT QUARRIES NATIONAL MONUMENT

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are NPS units in the western extension of the Rolling Plains and semiarid central panhandle of Texas. The Canadian River flows eastward into the western part of the national recreation area and into Lake Meredith. The river carved the narrow canyon, which is a considerable landscape feature in the region. Between this canyon and the cap rock of the high plains, many tributary streams have caused a rough and broken topography, known as the Canadian River breaks, that dominates the scenery in both parks.

LAKE MEREDITH NATIONAL RECREATION AREA

Lake Meredith National Recreation Area is just east of U.S. Route 287 approximately 40 miles north of Amarillo, Texas. It consists of 44,978 acres of federally owned land. The Canadian River carved a narrow, steep-walled canyon from 200 to 300 feet deep and up to 2 miles wide. The resulting exposed geologic features, known as the Canadian River breaks, are a dominant landscape feature in the national recreation area. Construction of Sanford Dam, which began in 1962 on the Canadian River between the canyon walls, created Lake Meredith, which began to fill in 1965.

The Canadian River Municipal Water Authority operates and maintains the dam and water supply infrastructure in addition to managing lake levels. Because Lake Meredith is primarily a water supply reservoir, its water levels fluctuate according to municipal and industrial water demands, rainfall in the watershed, and releases from upstream reservoirs. Recreation is among the other intended uses named in its establishing legislation.

The national recreation area annually receives about 1.6 million visits when lake levels are normal and about 0.8 to 1.0 million visits when lake levels are low (NPS 2010a). Popular recreation activities include boating, fishing, camping, hunting, off-road vehicle driving, and sightseeing. Peak visitor use occurs from May through August.

Nonfederal oil and gas production occurs within the national recreation area. Currently, there are 168 active well sites and associated roads and pipelines (NPS 2002c).

Natural resources of special interest include wetland and riparian areas associated with the floodplains of the Canadian River and its tributaries. In addition, the Arkansas River shiner, a small fish that is federally listed as threatened, is present in the Canadian River near Rosita. Several other species of federal or state concern also are known or are likely to occur in the national recreation area.

Cultural resources of special interest include the McBride Ranch House, which was built in the early 1900s. This house represents the early ranching era in the panhandle and is believed to be the oldest standing home in Potter County, Texas. The house is listed in the National Register of Historic Places and the NPS list of classified structures, and it is a Texas historic site with a state interpretive placard.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

Alibates Flint Quarries National Monument is about 5 miles southwest of Fritch, along the southeastern edge of Lake Meredith National Recreation Area between Bates Canyon and Harbor Bay (see figure 2). The visitor contact station for this NPS unit is in Lake Meredith National Recreation Area outside the national monument boundary. The visitor contact station includes exhibits depicting

the lifestyle, history, and culture of the American Indians who occupied the national monument area and quarried the flint outcrops at the site as raw material for tools.

The national monument totals about 1,371 acres, which includes about 292 acres of private inholding, in Potter County, Texas. The national monument shows evidence of human habitation for 13,000 years, and it is noted for the more than 700 flint quarries that were used to provide raw materials for the manufacture of tools and weapons. It also contains the only remaining village type-site for the Antelope Creek people and a series of petroglyphs.

The dominant landscape features of the national monument are upland hills, ridges, and canyons. There are no water features on the site. Predominant vegetation cover types include yucca grasslands, vegetated cliffs, mixed grasslands, and mesquite grasslands.

Because of the need to protect the resource, access to the national monument is limited to guided tours of the flint quarries. Many tours are led by trained volunteers. Annually, the national monument receives about 3,000 to 4,000 visits (NPS 2006a). Popular recreation activities include visiting the interpretive facilities at the nearby contact station and attending the guided tours. Peak visitor use occurs from mid-April through mid-June and September through October. There are no camping facilities, and hunting is not allowed on the national monument.

The one oil and gas wellhead within the boundary predates creation of the national monument. The national monument is designated as a special management area under the oil and gas management plan (NPS 2002b) and, as a result, future development of petroleum resources under the national monument would require directional drilling from outside the national monument boundary.

Natural resources of special interest include the Texas horned lizard (a state-listed threatened species). Cultural resources of special interest include the flint quarries, petroglyphs, and village ruins.

Figure 1: Regional Map of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument

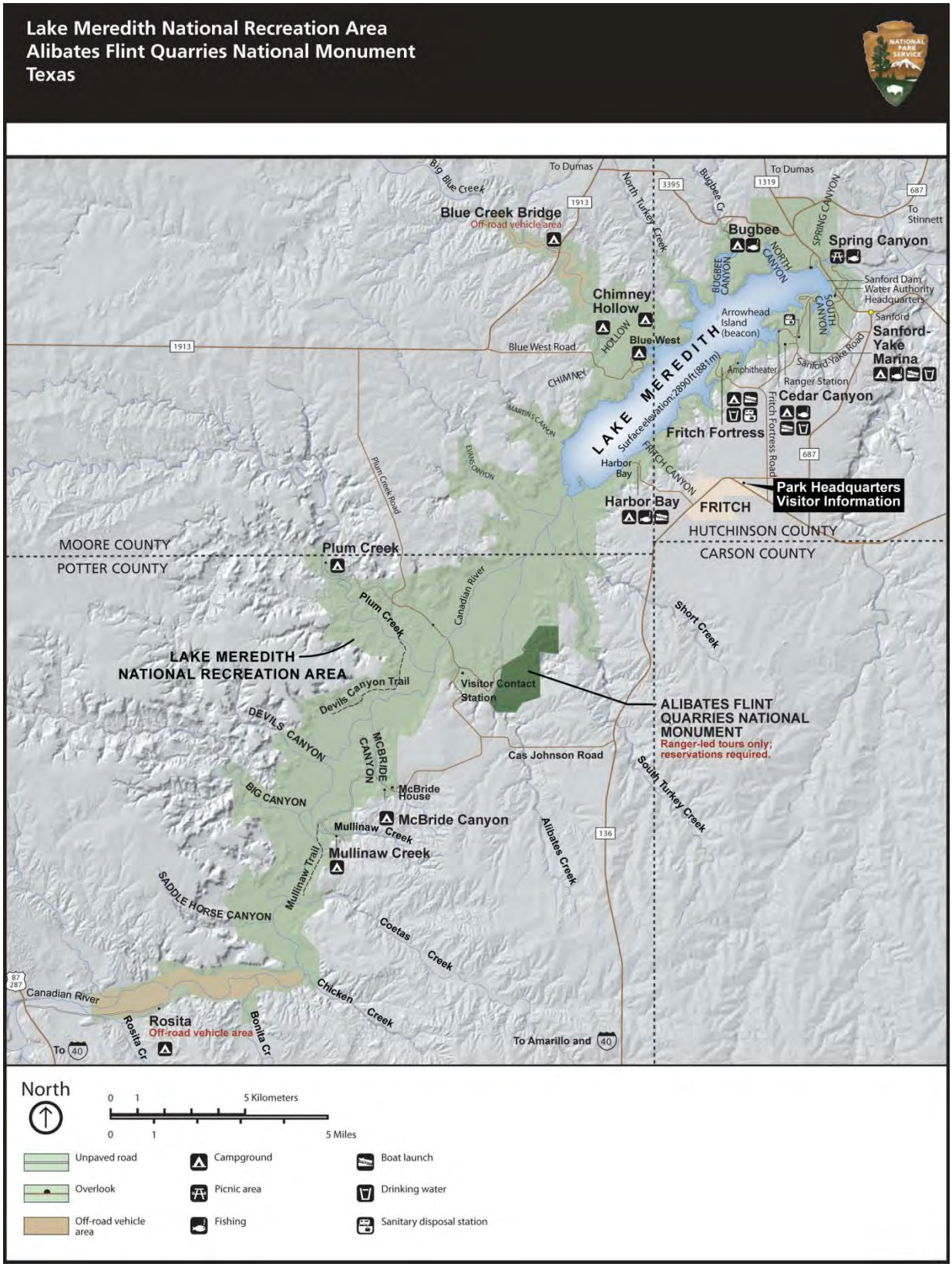


Figure 2: Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument

OVERVIEW OF THE NATIONAL PARK SERVICE PLANNING PROCESS

WHY THE NATIONAL PARK SERVICE PLANS

Overview of Park Planning and Decision Making

The National Park Service plans for one purpose: to ensure that the decisions it makes will carry out, as effectively and efficiently as possible, our mission.

> *The National Park Service preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.*

In carrying out this requirement, NPS managers constantly make difficult decisions about ways to preserve significant natural and cultural resources for public enjoyment, resolve competing demands for limited resources, establish priorities for using funds and staff, and address differing local and nationwide interests and views of what is most important.

Planning provides the National Park Service with methods and tools for resolving issues and for promoting beneficial solutions. Planning products articulate how public enjoyment of a park can be part of a strategy for ensuring that resources are protected unimpaired for future generations.

NPS planning provides a logical, trackable rationale for decision making by focusing first on why a park was established and what conditions should exist there. Meaningful decisions can be made only after these foundations are established. After defining the desired conditions that will be achieved and maintained, management teams can develop responses to changing situations while considering the park's most important features.

The planning process ensures that decision-makers have adequate information about benefits, costs, and impacts on natural and cultural resources, visitor use and experience, and socioeconomic conditions. Analyzing the park in relation to its surrounding ecosystem, historical setting, community, and the national system of protected areas helps park managers and staff members understand how the park can interrelate in systems that are ecologically, socially, and economically sustainable. Decisions made within this larger context are more likely to succeed over time.

Function of the General Management Plan in Park Planning

The National Parks and Recreation Act of 1978 (16 *United States Code* (USC) 1a-7(b)) requires the National Park Service to conduct comprehensive general planning. The general management plan fulfills this requirement.

Planning helps ensure and document that management decisions promote the efficient use of public funds and that managers are accountable to the public for those decisions. The ultimate outcome of planning for national park units is an agreement between the National Park Service and the public on why each area is managed as part of the national park system, what resource conditions and visitor experiences should exist there, and how those conditions can best be achieved and maintained over time. The general management plan can then be followed by timely planning and evaluation that results in specific actions that move the park toward those results. Follow-on plans that may be undertaken following a general management plan include, but are not limited to the following:

- program plans, which establish objective indicators and targets to

monitor attainment of the desired conditions defined in the general management plan

- strategic plans, which contain interim, five-year goals and how they will be achieved
- implementation plans, with schedules and cost estimates for specific projects or programs
- annual performance plans and annual performance reports, which allocate budget and staff toward the measurable goals the park intends to achieve and which document the results

WHAT IS REQUIRED IN A GENERAL MANAGEMENT PLAN

The National Parks and Recreation Act of 1978 (Public Law 95-625) and the Redwood Amendment of 1978 (Public Law 95-250 section 101(6)(b)) require the preparation and timely revision of general management plans for each unit of the national park system. NPS policies call for each general management plan to "set forth a management concept for the park [and] establish a role for the unit within the context of regional trends and plans for conservation, recreation, transportation, economic development, and other regional issues." Congress specifically directed the National Park Service, as part of the planning process, to address the following elements (16 USC 1a-7):

- *measures for the preservation of the area's resources*
- *indications of types and general intensities of development (including visitor circulation and transportation patterns, systems, and modes) associated with public enjoyment and use of the area, including general locations, timing of implementation, and anticipated costs*
- *identification of and implementation commitments for visitor carrying capacities[now called user capacity] for all areas of the unit*
- *indications of potential modifications to the external boundaries of the unit, and the reasons therefore*

WHAT THE NATIONAL PARK SERVICE CONSIDERS WHEN DEVELOPING A GENERAL MANAGEMENT PLAN

The Organic Act (16 USC, section 1) is the legislation that established the National Park Service in 1916. The Organic Act provides the fundamental management guidance for all units of the national park system, including Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. To meet the requirements of this act, the National Park Service must manage the parks' natural and cultural resources in a manner that "will leave them unimpaired for the enjoyment of future generations."

All management of these parks also must meet the requirements of their establishing legislation and other federal laws, agency regulations, and policies. Additional information regarding the foundations for planning and management is included later in this chapter. That section discusses park-specific legislation and the servicewide laws and policies applicable to both park units.

HOW NATIONAL ENVIRONMENTAL POLICY ACT REQUIREMENTS ARE INTEGRATED INTO THE GENERAL MANAGEMENT PLAN

This general management plan was organized to conform with the framework for presenting information to support decision making as prescribed by the National Environmental Policy Act and its implementing regulations from the Council on Environmental Quality (1978). It also incorporated the procedures specific to the National Park Service in *Director's Order 12 and Handbook: Conservation Planning, Environmental*

Impact Analysis, and Decision Making (NPS 2001), which integrates the requirements of the Organic Act into the National Environmental Policy Act process. These resources established the structure of each chapter of this document. To ensure compliance, the National Park Service also

- diligently involved interested or affected members of the public in the process
- fully considered the environmental impacts of the proposed actions and alternatives before making any decision to undertake an action

HOW PUBLIC INVOLVEMENT INFLUENCED GENERAL MANAGEMENT PLANNING

Public involvement throughout the planning process provided focused opportunities for the parks' managers and the planning team to interact with the public and learn about public concerns, expectations, and values. Understanding people's values regarding the parks' resources and visitor experiences contributes to success in developing decisions that can be implemented. Public involvement also provided opportunities to share information about the parks' purposes and significance and to present opportunities and constraints regarding the management of the parks' lands and surrounding areas. Opportunities for public input are described in chapter 5 under the heading "History of Public Involvement."

PURPOSE AND NEED FOR THE PLAN

PURPOSE OF THE PLAN

This general management plan for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument provides comprehensive guidance for the next 15 to 20 years by articulating the shared vision between the parks' management and the public on how to best achieve the parks' purposes and protect resources for future generations. It will serve as a framework to assist in making decisions and fulfill the requirements of the National Parks and Recreation Act of 1978 and the Redwood Amendment of 1978.

The general management plan will not describe how particular programs or projects will be implemented. These decisions are deferred to detailed implementation planning. It also will not provide specific details and answers to all issues facing the parks, nor will it provide funding commitments for implementation of the plan. All future plans relating to programs or projects will tier from the approved general management plan.

NEED FOR THE PLAN

Lake Meredith National Recreation Area

Lake Meredith National Recreation Area was established as a unit of the national park system in 1990. Although it has been guided by a master plan (NPS 1973) and statement for management (NPS 1976), a general management plan has not been prepared for this national park unit.

Lake Meredith is primarily a water supply reservoir. On December 29, 1950, Public Law 81-898 authorized its construction, operation, and maintenance and established its purposes for "irrigating land, delivering water for industrial and municipal use, controlling floods, providing recreation and fish and wildlife benefits, and controlling and catching silt." Copies of this and other legislation relating to Lake Meredith are in appendix A.

A recreation area was established on August 31, 1964, when Congress passed Public Law 88-536. This law authorized the Secretary of the Interior to provide for basic public outdoor recreation facilities at what was then called Sanford Reservoir, but it specifically stipulated that there was no allocation of water or reservoir capacity to recreation and that the recreation area could not "affect the priority for municipal use of water stored in [the lake], or the priority of use for municipal purposes of the capacity of said reservoir."

Congress established Lake Meredith National Recreation Area and transferred its management to the National Park Service on November 28, 1990, in Public Law 101-628. This act provides for outdoor recreation use and enjoyment of the lands and waters of the national recreation area while protecting the scenic, scientific, cultural, and other values. In taking this action, Congress again affirmed the primacy of the lake's water supply function.

Currently, Lake Meredith National Recreation Area is used primarily for water-based recreation, providing opportunities for activities that include fishing, boating, waterskiing, sailing, scuba diving, and swimming. Land-based recreation also occurs, but much of this is associated with the lake, including campgrounds near or overlooking the reservoir and hunting for waterfowl on or near shallow waters in the upper part of the lake.

Water levels in Lake Meredith fluctuate based on inputs, which include rainfall in the watershed and releases from upstream reservoirs, and outputs, which primarily are based on municipal and industrial water demands. Reservoir storage of Lake Meredith at the top of the conservation

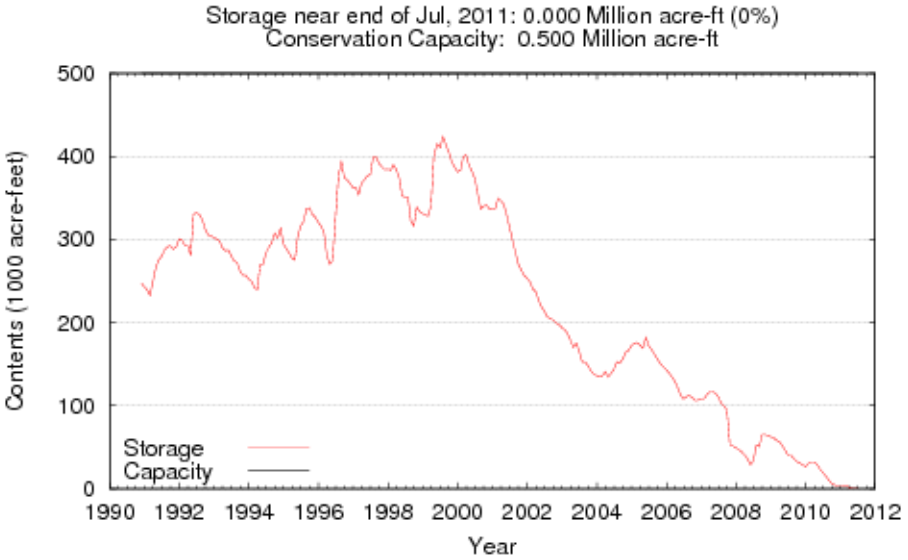
pool (at 2,936.5 feet above mean sea level) is 864,400 acre feet, which would result in a 16,500-acre reservoir (Canadian River Municipal Water Authority 2010). However, the lake has never been full; the highest measured lake level was at 2,915 feet above mean sea level. The average storage of the lake until the year 2000 was around 300,000 acre feet (Texas Water Development Board 2010b), which resulted in a reservoir surface area of about 10,000 acres, or about 20% of the 45,000-acre national recreation area.

A drought in the Canadian River drainage and much of Texas began around 2001. Since then, the water level in Lake Meredith has dropped to less than 1% of the available storage capacity. Figure 3 illustrates the variability in water levels in the lake that can occur over relatively short periods.

Because recreation at Lake Meredith National Recreation Area is so strongly tied to the lake, visitation decreased by about 40% as the lake levels dropped. Specifically, visits dropped from more than 1.6 million for each of the five years from 1996 through 2000 to about 1 million annually in the five years from 2006 through 2010. During this period, recreation visits to other national parks were largely unchanged, with about 285 million visits in both 2000 and 2009 (NPS 2010a). In discussions with park staff, some visitors indicated that activities not tied to the lake are limited and that they probably would continue to visit the park if there were other recreational opportunities.

Severe droughts have occurred in the region throughout recorded history (Dunn 2010) and, based on tree-ring data, at a rate of one or two per century for the past 2,000 years (Foster 2008). The recent conditions demonstrate that the national recreation area needs to be managed with the recognition that widely fluctuating water levels will occur. Therefore, a general management plan is needed to achieve a desired condition of more broad-based recreation opportunities at the national recreation area, with the flexibility to accommodate varying lake levels and an approach that takes better advantage of the 80% of the national recreation area that is outside the lake footprint.

Figure 3: Volume of Water Stored in Lake Meredith, 1990 through 2011 (thousands of acre-feet)



Source: Texas Water Development Board 2011, website.

Alibates Flint Quarries National Monument

Alibates Flint Quarries National Monument was established by Congress on August 31, 1965 (Public Law 89-154; see appendix A). It totals about 1,371 acres, which includes about 292 acres of private inholding. It is on the eastern edge of Lake Meredith National Recreation Area roughly between Bates Canyon and Harbor Bay. The national monument is managed jointly with the national recreation area.

A general management plan for the national monument was prepared by the National Park Service in 1978 and amended in 1985. It does not fulfill all of the current requirements for a general management plan and is out of date. In particular, a visitor contact station, which was built in 2006, has increased visitor interest in and increased opportunities at the national monument. Visitation has increased since the visitor contact station opened. Therefore, an updated general management plan is needed to meet NPS planning requirements and improve the ability of the public to experience, and gain an appreciation of, the cultural resources available at Alibates Flint Quarries National Monument.

FOUNDATION FOR PLANNING AND MANAGEMENT

INTRODUCTION

The foundation for planning and management defines the legal and policy requirements that define a park's basic management responsibilities, and it describes the resources and values that are fundamental to achieving the park's purpose as well as those that are otherwise important. Although all units of the national park system must be managed in compliance with a large body of federal laws and policies, each park has its own specific purpose, established by Congress or the president, which provides the context for park management.

The foundation for planning and management provides the base upon which all future planning and management efforts at a park are built. It includes a park's purpose and significance and helps focus future management and planning on what is most important about a park's resources and values. Those park resources that are "fundamental" to achieving the park's purpose and significance are identified along with the legal and policy requirements that define a park's basic management responsibilities. The foundation statement includes an analysis of the condition of the fundamental resources, and it documents the interpretive themes for the park.

Park purpose is a clear statement of why Congress or the president established an area as a unit of the national park system. Statements of park significance define what is most important about the park's resources and values; they are based on the unit's purpose. The purpose and significance statements guide all planning and management decisions made about the park. Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument have individual purpose and significance statements, described in the following sections.

Fundamental resources and values are those that warrant primary consideration during planning and management because they are critical to achieving the park's purpose and maintaining its significance. Fundamental resources and values may include features, systems, processes, experiences, stories, and scenes. If the fundamental resources and values are degraded, the purpose of the park and its significance may be jeopardized.

Interpretive themes are the most important ideas or concepts for the public to explore about the park. They connect the park's resources and values to the purpose and significance, providing the building blocks on which the interpretive program is based.

The purpose and significance statements and fundamental resources and values for each park were developed by an interdisciplinary team during a foundation workshop. The workshop participants used an iterative process that considered NPS guidance, legislation associated with each unit, and previous planning materials from both the national recreation area and national monument.

LAKE MEREDITH NATIONAL RECREATION AREA

Park Purpose

The purpose of the Lake Meredith National Recreation Area is to provide public access to diverse land- and water-based recreational opportunities in the Canadian River breaks of the Texas panhandle, consistent with the protection of the area's scenic, scientific, and cultural resources and with other values that contribute to public enjoyment.

Park Significance Statements

- Lake Meredith National Recreation Area is the largest area of public lands in the Texas panhandle,

providing opportunities for access to diverse, affordable, outdoor, land- and water-based recreation activities.

- Lake Meredith and the Canadian River basin within the national recreation area feature aquatic, wetland, and riparian habitats, as well as one of the few areas in the region with trees. These habitats and the surrounding landscape support diverse plant and animal species, including migratory waterfowl.
- The natural and geologic resources of the national 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 and the adjacent Alibates Flint Quarries National Monument offer views of lifeways in every cultural period that has been identified.
- The exposed geologic features of the Canadian River breaks in the national recreation area reveal active geologic 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.

Fundamental Resources and Values for Lake Meredith National Recreation Area Only

Public Land. Lake Meredith National Recreation Area consists of 44,978 acres of federally owned land and is the largest area of public land in the region.

Recreation Opportunities. Opportunities at the national recreation area provide diverse, affordable experiences for visitors of different interests and abilities. Examples of facilities that support these opportunities include boat ramps, horseback riding trails, and picnic areas.

Exposed Geological Features of the Canadian River Breaks. The features in the national recreation area provide value in the topographic and scenic variety they create and the active geologic processes associated with them.

Fundamental Resources and Values Common both to Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument

Because these NPS units are adjacent, it was determined that Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument share the following fundamental resources and values.

Diverse Habitats and Ecological Transition Zones. The parks have an unusually high diversity of flora and fauna for the region. According to the 2004 through 2006 vegetation classification report (BOR 2007), the area in Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument can be divided into 12 communities that have supported indigenous peoples for 13,000 years. The more prominent among these are

- honey mesquite shrubland complex, which is dominated by mesquite and is densely vegetated with a variety of short grasses
- upland slopes / rolling hills, where the upland slopes are sparsely vegetated with grasses and the rolling hills are more densely vegetated with mixed grasses and small woody vegetation

- cottonwood / mesic grass complex (Lake Meredith only), with the dominant components being cottonwood galleries interspersed with smaller tree species
- bottomlands (Lake Meredith only), which are dominated by grasses and herbaceous vegetation
- wetlands (Lake Meredith only), which are areas occasionally inundated with fresh water from rain events or from fluctuations in lake levels and are dominated by cattail, common reed, rushes, and bulrushes

Wide Range of Sites and Artifacts. The sites and artifacts in both parks document cultural use of the area by native peoples over thousands of years. Archeological evidence suggests the presence of early Paleoindian hunters and gatherers approximately 13,000 years ago. Evidence of later inhabitants (notably the people associated with the Antelope Creek culture from approximately AD 1150 to 1450) is reflected in the archeological record. Artifacts from early ranching also are preserved within the parks' boundaries.

Opportunity for Scientific Research. The unique resources present at both parks provide an opportunity for research. These resources include the following:

- the 13,000 years of continuous human use of lithic resources
- the poorly understood geological processes associated with the formation of Alibates flint
- ecological zones and habitats

Interpretive Themes for Lake Meredith National Recreation Area

- Sanford Dam was built by a consortium of 11 Texas panhandle cities to provide a precious, renewable water source for the long-term sustainability of urban life on the Texas high plains, and provides a variety of water- and land-based recreational activities.
- The Canadian River and its tributaries, which are the water sources for Lake Meredith, have long provided a critical resource to sustain human existence and success in the Texas panhandle.
- Lake Meredith National Recreation Area provides rare public access to landscapes that have been the stage for dramatic events in the history of the American southwest.
- The variety of habitats found at Lake Meredith National Recreation Area weaves a rich tapestry of biodiversity, affording opportunities for discovery and understanding.
- The exposed geologic features of the Canadian River breaks tell the story of ongoing geologic processes that continue to shape life in the panhandle.
- The juxtaposition of the oasis environment of the Canadian River breaks with the semiarid grasslands of the high plains has attracted people and wildlife for thousands of years and exemplifies how landscapes shape and influence human societies.

Park-specific Legislation for Lake Meredith National Recreation Area

Three pieces of legislation, described below, resulted in the establishment of Lake Meredith National Recreation Area. The relevant text from each act is provided in appendix A.

The initial legislation relating to the site that would become Lake Meredith National Recreation Area was the 1950 authorization by Congress, in Public Law 81-898, of the Canadian River reclamation project. The project was "for the purposes of irrigating land, delivering water for

industrial and municipal use, controlling floods, providing recreation and fish and wildlife benefits, and controlling and catching silt."

By 1964, construction of the dam was underway and the lake, then known as Sanford Reservoir, would soon start filling. That year, Congress passed Public Law 88-536, which provided for the establishment and administration of "basic public outdoor recreational facilities" around the reservoir. The law charged the Secretary of the Interior to acquire "such adjacent lands or interests therein as are necessary for present or future public recreation use, and to provide for the public use and enjoyment of project lands, facilities, and water areas in a manner coordinated with other project purposes."

Public Law 101-628, passed by Congress on November 28, 1990, established Lake Meredith National Recreation Area as a unit of the national park system. Except as described below, the federal lands, waters, and interests within the recreation area were transferred to the National Park Service. The Bureau of Reclamation was to continue in its role of "operation, maintenance, and replacement of the Canadian River Project facilities and its purposes of providing for municipal and industrial water supply and flood control." Congress reiterated the primacy of the lake's water supply function, stating that, "Nothing in this Act shall be construed to affect or interfere with . . . the Act of December 29, 1950 . . . to operate Sanford Dam and Lake Meredith in accordance with and for the purposes set forth in that Act."

Special Mandates and Administrative Commitments for Lake Meredith National Recreation Area

Special mandates and administrative commitments refer to park-specific requirements. These formal agreements are often established concurrently with the creation of a unit of the national park system. The following special mandates or administrative commitments were established in the enabling legislation for Lake Meredith National Recreation Area.

Hunting and Fishing. Hunting and fishing were recognized as important activities on the public lands around Lake Meredith in Public Law 88-536 (1964). The 1990 establishing legislation for the national recreation area specifically allows hunting and fishing except where and when it would not be appropriate "for reasons of public safety, administration, fish and wildlife management, or public use and enjoyment." The National Park Service and Texas Parks and Wildlife Department have a master memorandum of understanding that identifies the state as having the responsibility for the managing hunting and fishing.

Oil and Gas Production. This industry dates to 1918, with the lease of land in the Panhandle West Field to oil and gas companies. In 1923, J. C. Whittington completed the No. 1 Sanford well in Hutchinson County. Hydrocarbon production has been an important industry since then, and there are 168 active well sites and associated roads and pipelines in the national recreation area.

In the national recreation area, the National Park Service regulates surface disturbance associated with oil and gas development, such as pipelines, well pads, power lines, and access roads. These are managed by the oil and gas management plan (NPS 2002b) in conformance with regulations in 36 *Code of Federal Regulations* 9B.

Off-road Vehicle Use. The off-road use of vehicles in two defined areas of Lake Meredith National Recreation Area is mandated by Congress and predates the establishment of the national recreation area. These areas include a 275-acre area at Blue Creek and a 1,500-acre area at Rosita. Management of these areas is addressed in the national recreation area's

off-road vehicle management plan (NPS 2012a).

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

Park Purpose

The purpose of Alibates Flint Quarries National Monument is to provide for the preservation, protection, interpretation, and scientific study of Alibates flint deposits associated with the activities and cultural resources of the indigenous peoples for the benefit of all.

Park Significance

- 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 national monument in high concentrations.
- The physical characteristics of the Alibates 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 makes it identifiable even when it is away from the source, so the movement of the flint can be documented.
- The national monument contains evidence of more than 13,000 years of lithic resource detection, extraction, manipulation, and use, evidenced in features such as the village and approximately 700 quarry pits.
- An unusually high number and variety of artifacts representing the entire spectrum of flint extraction and manufacturing have been recovered from the national monument, providing opportunities for scientific research and knowledge of aboriginal quarry techniques.
- The Plains Village archeological sites in the national monument include the only protected, and best remaining, type-site for the Antelope Creek people, who occupied the area between AD 1150 and 1450. The national 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, together with Lake Meredith National Recreation Area, manages 623,000 collected objects associated with the area.
- The national monument was listed in the National Register of Historic Places on October 15, 1966.

Fundamental Resources and Values

Alibates Flint. The flint found within the national monument is a hard, sedimentary form of the mineral quartz. The exact mode of flint formation is not yet clear, but it is thought that it occurs as a result of chemical changes in compressed sedimentary rock formations. The flint is easily accessible on the surface, highly concentrated, and exposed in the national monument; it represents about 25% of the Alibates flint formation. Its physical characteristics, including hardness and glass-like qualities, made it desirable for use in tools by prehistoric peoples. Alibates flint has a distinctive color that makes it very identifiable and, on that basis, allows it to be easily tracked, such as along trade routes, from the national monument.

Alibates Ruin Archeological Site. This archeological site from the Plains Village period is one of two remaining type-sites for the Antelope Creek Phase. This site is

the first site named and is the type-site that provides a description to which others are compared.

Quarries. The flint quarries within the national monument contain evidence of more than 300 years of extraction (active mining) of flint from more than 700 quarries.

Museum Collection. The extensive museum collection from Alibates Flint Quarries National Monument provides an excellent opportunity for study and research of 13,000 years of human use. The collection is stored at the Panhandle-Plains Historical Museum in Canyon, Texas.

Additional fundamental resources and values common to both Alibates Flint Quarries National Monument and Lake Meredith National Recreation Area were addressed earlier in this chapter.

Interpretive Themes for Alibates Flint Quarries National Monument

- The geologic conditions that occurred here created a unique, hard, fine-grained, multicolored stone that has attracted people for millennia and demonstrates the value that people place on uncommon things.
- The selection and use of Alibates flint for more than 13,000 years by a variety of peoples illustrates the sophistication of early cultures, the crafting of tools to improve quality of life, and that people's basic needs have not changed — only the means to achieve them.
- The ongoing study of Alibates flint and its importance to the lives of those who used it provides insights into the ways that knowledge is acquired, interpreted, updated, shared, and preserved.

Park-specific Legislation for Alibates Flint Quarries National Monument

Enabling legislation for Alibates Flint Quarries National Monument is provided in Public Law 89-154, passed August 31, 1965. This NPS unit was designated "Alibates Flint Quarries and Texas Panhandle Pueblo Culture National Monument." The legislation included the requirements that it should be administered, protected, and developed subject to the Organic Act of 1916 (16 USC 1) and Historic Sites Act of 1935 (Public Law 74-292). These public laws and acts are included in appendix A.

On November 10, 1978, Public Law 95-625 clarified the boundaries of the national monument through reference to a map, allowing minor boundary adjustments by the Secretary of the Interior. It also renamed this NPS unit "Alibates Flint Quarries National Monument."

Special Mandates and Administrative Commitments for Alibates Flint Quarries National Monument

The only special mandates or administrative commitments for Alibates Flint Quarries National Monument relate to oil and gas production. There is one active gas well on the national monument. The national monument has been designated as a special management area under the oil and gas management plan (NPS 2002b) and due to this designation, future development of petroleum resources under the national monument would require directional drilling from outside the national monument boundary.

SERVICEWIDE LAWS AND POLICIES APPLICABLE TO BOTH PARKS

This section identifies what must be done at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument to comply with federal laws and with the policies of the National Park Service. The National Park Service must meet these measures, regardless of the

alternatives selected for the long-term management of the parks. Examples of servicewide requirements and policies include the following:

- laws that are applicable primarily to units of the national park system, including the 1916 Organic Act that created the National Park Service, the General Authorities Act of 1970, the act of March 27, 1978 relating to the management of the national park system, and the 1998 National Parks Omnibus Management Act
- other federal legislation, such as the Endangered Species Act, National Historic Preservation Act, and Americans with Disabilities Act
- executive orders, such as those relating to wetlands (No. 11990), Indian sacred sites (No. 13007), and environmental justice (No. 12898)
- Department of the Interior secretarial orders such as No. 3289 (Sec. 3a) requiring consideration of climate change impacts in long-range plans
- policies of the National Park Service that are presented in director's orders and related documents (available on the Internet at http://home.nps.gov/applications/npspolicy/DOrders.cfm)

Appendix B identifies many of the laws and executive orders that guide national park management, with their legal citations. Most are applicable throughout the nation, such as requirements for clean air and clean water, protection of cultural resource sites on federal land that are listed or eligible for listing in the National Register of Historic Places, and access opportunities for individuals with impaired mobility.

Even under the no-action / continue current management alternative, the National Park Service must meet all servicewide requirements and policies. Appendix C provides desired future conditions based on servicewide requirements and policies for the many aspects of the parks' management that will be addressed throughout the life of this general management plan.

The National Park Service Organic Act

The NPS Organic Act (16 USC chapter 1, subchapter I, section 1) provides the fundamental management direction for all units of the national park system. The National Park Service is required to

> *promote and regulate the use of the Federal areas known as national parks, monuments, and reservations. . .by such means and measure as conform to the fundamental purpose of said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.*

The National Park System General Authorities Act (16 USC chapter 1, Subchapter I, section 1a-1 *et sequens*) affirms that while all national park system units remain "distinct in character," they are "united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective directives apply equally to all units of the system. Further, amendments state that NPS management of parks should not result "in derogation of the purposes and values for which the Park was established."

GENERAL MANAGEMENT PLANNING ISSUES AND CONCERNS TO BE ADDRESSED

One of the purposes of this plan is to provide guidance to NPS managers about the future of the parks as conditions change. For example, this would include guidance on how the recreation area should be managed when the water level in Lake Meredith is low.

During the scoping period (early information gathering) for this general management plan, issues and concerns were identified by the general public, NPS staff, agency representatives, partners, resource experts, and representatives from interested organizations. An issue or concern is defined as an opportunity, conflict, or problem regarding the use or management of public lands. Comments were solicited at public meetings, through planning newsletters, and on the parks' websites (see Chapter 5: Consultation and Coordination).

Comments received during the scoping process demonstrated that the public values much about both parks, especially the recreational opportunities and unique natural and cultural resources.

Issues and concerns expressed during scoping generally focused on expanding opportunities and education while protecting resources at both parks. The general management plan alternatives provide strategies for addressing the issues within the context of each park's purpose, significance, and fundamental resources and values. The following issues and concerns identified during scoping for the general management plan were framed into broad questions on the kinds of places that Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument could be.

Issues Specific to Lake Meredith National Recreation Area

- What recreational activities should occur at Lake Meredith National Recreation Area?
- How could recreational opportunities be expanded, particularly when the water level at Lake Meredith is low?
- What is the most efficient and effective way to manage visitor facilities to accommodate fluctuating water levels in Lake Meredith?
- How can the national recreation area be managed to protect its natural and cultural resources while supporting recreational activities?

Recreation opportunities are a fundamental resource of Lake Meredith National Recreation Area and are a critical component of achieving the national recreation area's purpose and maintaining its significance.

Issues Specific to Alibates Flint Quarries National Monument

- How can the National Park Service provide more opportunities to experience the resources at the national monument while still protecting the resources from vandalism and theft?

Alibates flint, the Alibates Ruin archeological site, and the flint quarries are all fundamental resources of Alibates Flint Quarries National Monument and are critical components of achieving the national monument's purpose and maintaining its significance.

General Issues That Apply to Both Units

- How can visitor services, education, and outreach be expanded to increase appreciation and stewardship of the resources in the national recreation area and national monument?
- How can these services be provided both efficiently and effectively?
- How can the efficiency and the sustainability of park operations be improved?

Climate Change

Climate change refers to any substantial changes in average climatic conditions (such as average temperature, precipitation, or wind) or climatic variability (such as seasonality or storm frequencies) lasting for an extended period of time (decades or longer). Recent reports by the U.S. Climate Change Science Program, the National Academy of Sciences, and the United Nations Intergovernmental Panel on Climate Change (IPCC 2007) provide clear evidence that climate change is occurring and will accelerate in coming decades. The effects of climate change on national parks are beginning to emerge as both science and impacts become clearer; however, it is difficult to predict the full extent of the changes that are expected under an altered climate regime.

The National Park Service recognizes that the main drivers of climate change are outside the control of the agency. However, the effects of climate change throughout the national park system cannot be discounted. The National Park Serve has identified climate change as one of the major threats to natural park units, and has developed a climate change response strategy (NPS 2010c) that focuses on science, adaptation, mitigation, and communication. Some of these effects are already occurring or are expected to occur at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument in the timeframe of this general management plan. Therefore, climate change is included in this document to recognize its role in the changing environment of the parks and provide an understanding of its effect.

Although climate change is a global phenomenon, it manifests differently depending on regional and local factors. In general, "arid ecosystems are particularly sensitive to climate change and climate variability because organisms live near their physiological limits for water and temperature stress. Slight changes in temperature or precipitation regimes, or in magnitude and frequency of extreme climatic events, can significantly alter the composition, abundance, and distribution of species" (Archer and Predick 2008).

It has been determined that the management alternatives described in this document would only emit a negligible amount of greenhouse gases that contribute to climate change. Therefore, this impact topic has been dismissed from detailed analysis. See the section titled, "Carbon Footprint" under the "Impact Topics Considered but Eliminated from Detailed Analysis" portion of chapter 1 for more information.

Climate change could alter resource conditions in many ways at Lake Meredith National Recreation and Alibates Flint Quarries National Monument, but the type and intensity of these changes are uncertain. The potential influences of climate change are described under select resource topics in chapter 3. These include special status species and their habitats, soils, historic buildings and structures, and visitor experience.

The National Park Service is aware that there are ongoing studies related to climate change and its potential effects. As these studies become available, the National Park Service will incorporate the findings as appropriate into resource, visitor use, and operations management consistent with this plan.

Commercial Visitor Services

Units of the national park system are special places, saved by the American people so that all may experience the country's natural and cultural heritage. The national parks movement of the mid-19th century was fueled by a determination to save beautiful and historic spots in America, in part to keep them from being overrun with hotels, curio shops, and amusements.

The National Park Service recognizes that while over-commercialization and development can spoil the character of the places visitors come to see, some commercial activities are appropriate and may be necessary in national park units. They help visitors enjoy natural and cultural wonders to which they might not otherwise have access. Often, commercial providers help protect park resources.

All commercial activities that occur within lands administered by the National Park Service must be authorized by a permit, contract, or other written agreement (36 *Code of Federal Regulations* 5.3). Commercial activities may be authorized through a range of legal authorities using a variety of legal instruments, depending on the type and location of the activity.

The National Park Service must determine what types and levels of commercial activities are permissible under applicable laws and regulations. At a minimum, all commercial activities must operate in a manner that is consistent with the mission of the park and should provide high-quality visitor experiences while protecting important natural, cultural, and scenic resources. Other requirements may also apply. For example, the NPS Concessions Management Improvement Act of 1998 (Concessions Act) limits the development of commercial visitor services to those that are necessary and appropriate for public use and enjoyment of the park unit and that are consistent to the highest practicable degree with the preservation and conservation of the resources and values of the unit.

The Organic Act of 1916 that established the National Park Service and the Concessions Act both emphasize conservation and preservation of park resources, while allowing for their use and enjoyment by means that leave them unimpaired for future generations. The Concessions Act mandates the use of concession contracts for authorizing any visitor services except as may otherwise be authorized by law (such as through a commercial use authorization in limited circumstances). That act further places significant limitations on the types and kinds of public accommodations, facilities, and services that may be authorized by concession contracts. Such public accommodations, facilities, and services must be "necessary and appropriate for public use and enjoyment" of the unit and must be "consistent to the highest practicable degree with the preservation and conservation of the resources and values of the unit" (16 USC section 5951).

Depending on the analysis of commercial activities, different types of authorizations may be issued by the National Park Service. If an activity is found to be appropriate but not necessary, then a commercial use authorization may be issued. If an activity is found to be necessary *and* appropriate, then a concession contract may be issued.

The Organic Act, the purpose and significance of the parks, and this general management plan together form the basis for determining commercial services that are necessary and/or appropriate for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. The criteria in table 1 would be used to evaluate the existing and potential future commercial activities at the parks to determine if these activities are necessary and/or appropriate. For actions that are necessary and/or appropriate, market and financial analysis also will be used to support the selection of commercial visitor services.

Table 1. Commercial Services Evaluation Criteria

Necessary	Appropriate
A service that is necessary accomplishes one or more of the following:	A service that is appropriate accomplishes all of the following:
• The service contributes to visitor understanding and appreciation of the parks' purpose and significance. • The service enhances visitor experiences consistent with the parks' philosophies. • The service assists the National Park Service in managing visitor use and educating visitors. • The service is an essential service or facility not available within a reasonable distance from the parks.	• The service is consistent with the purpose and significance of Lake Meredith National Recreation Area and/or Alibates Flint Quarries National Monument. • The service is consistent with laws, regulations, and policies. • The service does not compromise public health and safety. • The service does not significantly impact or impair the parks' resources or values. • The service does not unduly conflict with other uses and activities within the parks. • The service does not exclude the general public from participating in limited recreational opportunities.

Based in the criteria in table 1, types of commercial visitor services that were identified by the planning team as necessary and/or appropriate at Lake Meredith National Recreation Area include the following:

- food services
- campground operation
- marina services, if a marina is warranted by lake levels

The latter could provide fuel, rental slips, rental vessels, a store that sold small items such as snacks and fishing permits, a covered fishing house, and a tow service for disabled boats.

No commercial visitor services were identified as necessary and/or appropriate at Alibates Flints Quarries National Monument at this time. However, over the life of this plan, additional activities may be considered at the national recreation area and/or the national monument and would be evaluated on the necessary and appropriate criteria.

ISSUES AND CONCERNS NOT ADDRESSED

Not all issues or concerns raised by the public are included in this general management plan. Some were not considered because they are already prescribed by law, regulation, or policy (see the previous "Servicewide Laws and Policies" section). Issues were also excluded from consideration in this general management plan if they

- would violate laws, regulations, or policies
- were outside the scope of a general management plan
- were at a level that was too detailed for a general management plan and would be more appropriately addressed in subsequent planning documents

This section briefly summarizes some of these issues and the basis for excluding them from this general management plan.

Issues to Be Addressed by Law, Regulation, and Policy

The following issue would be addressed by law and policy independently from implementation of this general management plan.

Universal Accessibility. Concerns were expressed about inadequate accessibility by visitors with disabilities. The National Park Service is required by law and policy to provide accessible facilities and will continue to update these facilities as funds become available.

Issues for Other Planning Projects

Off-road Vehicle Use. Off-road vehicle use is allowed in two designated areas of Lake Meredith National Recreation Area. A separate off-road vehicle plan addresses the use of off-road vehicles in these areas of Lake Meredith National Recreation Area. Therefore, alternatives for management of off-road vehicle use at Lake Meredith National Recreation Area are not addressed in the general management plan.

A Multi-use Trail on the South Side of Lake Meredith. A multi-use trail starting at Harbor Bay, with phased development to Fritch Fortress and to South Turkey Creek, will increase land-based recreational opportunities. Development of this multi-use trail within Lake Meredith National Recreation Area is included in the no-action / continue current management alternative.

Issues outside the Scope of a General Management Plan

A common concern was that low water levels would limit recreational activities on the lake. Lake Meredith was established by Congress to provide a source of municipal and industrial water. The water in the lake is managed by the Canadian River Municipal Water Authority, and the National Park Service only manages recreational activities on and around Lake Meredith. Because the National Park Service has no control over the level of water in the lake, alternatives cannot address water level management.

The recent fluctuation in the water level in Lake Meredith highlighted the need to manage the recreation area to provide a wider range of appropriate recreational activities at both high and low water levels. The action alternatives proposed in this plan promote a greater array of activities that are not water-dependent. They also provide flexibility to add, remove, or move visitor facilities based on the level of water in the lake.

IMPACT TOPICS
(INCLUDING TOPICS CONSIDERED AND TOPICS DISMISSED)

This section identifies the topics within which park resources and values could be affected by the alternatives. Justifications are provided for why some impact topics were retained for further analysis in the environmental impact statement and why there was no need to examine some impact topics in detail.

Effective planning requires understanding the consequences of decisions. This was achieved by integrating compliance with the National Environmental Policy Act into the general management planning process. Input from scoping and the alternatives development processes was used to develop the list of potential impact topics and to determine which should be retained and which should be dismissed from detailed consideration. Multiple alternatives for managing each park were then developed; these are presented in chapter 2. The existing conditions for each impact topic are characterized in chapter 3, and impacts that would occur on park resources and visitors from implementing each park management approach are described in chapter 4.

The following factors were used to determine the impact topics that should be considered in this general management planning process:

- Topics identified in section 4.5.F.2 of *Director's Order 12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001). These include all topics included in Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act.
- Resources and values cited in the legislation that authorized Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, and other legislation relating to the parks, all of which are provided in appendix A. The relevant elements of the legislation are incorporated in the "Park Purpose" sections earlier in this chapter.
- Resources recognized as important by other laws or regulations. Appendix B lists many of the important congressional acts and executive orders that guide the management of all NPS facilities, including these parks.
- Resources critical to maintaining the significance and character of each park. The "Park Significance Statements" earlier in this chapter describe the defining features of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument that were used to establish the resources critical to maintaining each park's significance and character.
- Values of concern to the public during scoping for the general management plan. As described in chapter 5, the National Park Service conducted public information and scoping meetings to acquire input from the public and other agencies. This helped the National Park Service develop alternatives and identify resources and values of high interest in the parks.

Table 2 presents the impact topics initially considered for this environmental impact statement. The table identifies whether each was retained for detailed analysis or dismissed, with justifications provided in the text that follows the table. Impact topics were eliminated from detailed analysis either because the management alternatives would have a negligible or minor effect on the resource or because the resource does not occur within the boundaries of the parks.

Table 2: Summary of Impact Topics Retained and Dismissed

Impact Topic	Retain or Dismiss	
	Lake Meredith National Recreation Area	Alibates Flint Quarries National Monument
Natural Resources		
Air quality	Dismiss	Dismiss
Aquatic life	Dismiss	Dismiss
Ecologically critical areas, wild and scenic rivers, or other unique natural resources	Dismiss	Dismiss
Special status species and their habitats	Retain	Dismiss
Geology	Dismiss	Dismiss
Natural soundscape	Dismiss	Dismiss
Night skies	Dismiss	Dismiss
Prime and unique agricultural lands	Dismiss	Dismiss
Soils	Retain	Dismiss
Vegetation	Dismiss	Dismiss
Visual quality of viewsheds and landscapes	Dismiss	Dismiss
Water quality and hydrology	Dismiss	Dismiss
Wetlands and floodplains	Dismiss	Dismiss
Wildlife and their habitats	Dismiss	Dismiss
Cultural Resources		
Archeological Resources	Retain	Retain
Historic Structures and Buildings	Retain	Dismiss
Cultural landscapes	Dismiss	Dismiss
Ethnographic resources	Dismiss	Dismiss
Museum collections	Dismiss	Dismiss
Social and Economic Environment		
Energy requirements and conservation potential	Dismiss	Dismiss
Environmental justice: socially or economically disadvantaged populations	Dismiss	Dismiss
Indian trust resources	Dismiss	Dismiss
Natural or depletable resource requirements and conservation potential	Dismiss	Dismiss
Potential conflicts between the proposal and land use plans, policies, or controls.	Dismiss	Dismiss
Public health and safety	Dismiss	Dismiss
Visitor use and experience (includes recreation and interpretation)	Retain	Retain
Socioeconomics	Retain	Dismiss
Transportation and access	Retain	Dismiss
NPS Operations	Retain	Retain

"Chapter 4 Environmental Consequences," analyzes the effects on retained impact topics from implementing the general management plan alternatives.

LAKE MEREDITH NATIONAL RECREATION AREA IMPACT TOPICS CONSIDERED AND ANALYZED IN DETAIL

Management approaches described in the alternatives of this general management plan have the potential for impacts that are greater than minor on the following impact topics.

Special Status Species and Their Habitats

The Endangered Species Act requires an examination of impacts on all federally listed threatened or endangered species. Several federal or state species of concern are known to or have the potential to occur in the national recreation area. Because of the potential for actions associated with this plan to affect special concern species, this impact topic was retained for further analysis.

Soils

Proposed actions in the alternatives for Lake Meredith National Recreation Area, such as building new trails, modifying roads, and constructing new structures, could result in new soil disturbance or could reduce currently occurring soil losses. Therefore, this impact topic was retained for more detailed analysis.

Archeological Resources and Historic Structures and Buildings

The need to consider important archeological and other cultural resources, including those listed or eligible for the National Register of Historic Places, is based on the requirements of the National Historic Preservation Act of 1966 (particularly Section 106 and its implementing regulations at 36 *Code of Federal Regulations* 800, and Section 110). Consideration of cultural resources also is required under the implementing regulations for National Environmental Policy Act (Council on Environmental Quality 1978). Listed cultural resources in Lake Meredith National Recreation Area include the McBride Ranch House. Other sites in the national recreation area may be eligible for listing (NPS 2002c). Because the alternatives could change the management of this resource or could result in construction near currently unidentified sites, this impact topic was retained for additional analysis.

Visitor Use and Experience

Providing for visitor enjoyment, understanding, and stewardship is one of the fundamental purposes of the National Park Service. Many actions proposed in this general management plan could affect patterns of visitor use and the type and quality of visitor experiences in Lake Meredith National Recreation Area. Specific elements of the visitor experience include visitor access, activities and destinations, orientation and interpretation, recreation, and visitor services. Therefore, this impact topic will be examined in detail in the environmental impact statement.

Socioeconomics

Section 1508.8 of the Council on Environmental Quality (1978) guidelines for implementing the National Environmental Policy Act establishes that "effects" include "ecological, aesthetic, historic, cultural, economic, social, or health." However, section 1508.14 clarifies that economic and social effects need to be considered only when they are interrelated with natural or physical environmental components regarding effects on the broader "human environment."

Employment levels and business activity in nearby communities and counties could be affected by actions proposed in the alternatives in this general management

plan. The availability of new opportunities, sometimes associated with fee changes (such as for campsites with hookups) could alter spending by visitors. To examine these, the topic of socioeconomics was retained for more detailed investigation.

Transportation and Access

The alternatives could change the sizes of the road and trail networks available to the public in the national recreation area and could change the distribution of transportation modes (for example, motorized vehicle, bicycle, or pedestrian) in some areas. To investigate these effects, this impact topic was retained for more detailed analysis.

NPS Operations

The alternatives proposed in this plan could affect NPS operations and facilities in Lake Meredith National Recreation Area by increasing staff and complexity of park management and operations. Therefore, the topic of impacts on NPS operations was retained for further analysis.

LAKE MEREDITH NATIONAL RECREATION AREA IMPACT TOPICS CONSIDERED BUT NOT ANALYZED IN DETAIL

Some impact topics commonly considered during the planning process were not relevant to this general management plan for Lake Meredith National Recreation Area, either because the resource does not occur in the area or because implementing the alternatives would have only a negligible or minor effect on the resource or value. Negligible or minor effects would include the following:

- An effect would be negligible if the resource would not be affected or if the effect would be so small that it would not be of detectable or measurable.
- A minor effect would be detectable or measurable, but it would be of little importance. For example, a beneficial effect on plants would result from restoring vegetation in a former road bed, but the intensity would be minor because the restoration would not alter the viability of any plant populations or the diversity of plant communities in the area.

A detectable or measurable impact would depend on the type and location of the measurement system being used. For example, opacity measurements within a construction site where utilities were being installed at the Sanford-Yake campground might indicate reduced air quality because of the local presence of suspended dust and engine emissions from the use of heavy equipment. The same opacity test might find no change from background at a site 500 yards downwind from the construction site. The dust and engine emissions from the Sanford-Yake site also would not be detectable (that is, could not be differentiated from background levels of air pollutants) at any of the area's four regional air quality monitors because of dilution, mixing with air pollutants from other sources, and the deposition of some particles such as dust and soot. As a result, a minor, adverse effect on air quality at Sanford-Yake could occur, but the effect on air quality in the remainder of the national recreation area and regionally would be negligible.

Because potential impacts on dismissed impact topics would be nonexistent or slight, the contribution of the general management plan toward cumulative effects for dismissed topics also would be low.

Air Quality

In the Clean Air Act, Congress addressed the need to protect and enhance the quality of the nation's air resources and deal with dangers that air pollution presents to public health and welfare.

Most of the nation, including Lake Meredith National Recreation Area and its vicinity, is identified as Class II for air quality protection and enhancement. Lake Meredith National Recreation Area is *not* among the NPS units designated as Class I, which conveys a higher level of protection.

The Texas Commission on Environmental Quality collects data from four air monitoring sites in Amarillo. According to data on the U.S. Environmental Protection Agency's AirData interactive web site at http://epa.gov/air/data/geosel.html, the entire panhandle region of Texas, including Lake Meredith National Recreation Area, is in attainment with air quality standards for all six criteria pollutants, which include carbon monoxide, nitrogen dioxide, ground-level ozone, particulate matter, sulfur dioxide, and lead.

The AirData interactive web site shows that for Potter County from 2004 through 2008, based on the Air Quality Index, between 96% and 99% of all days each year had "good" air quality. The remaining days were in the "moderate" category. Data from the AirData site for 2000 and 2001, before Lake Meredith water levels dropped and visitor numbers declined, exhibited these same characteristics.

Most emissions within the national recreation area are generated during the summer. Air pollutants originating in the national recreation area include emissions from cars, off-road vehicles, boat engines, existing oil and gas-related activities, and energy production (NPS 2002c); and particulates, such as dust from unpaved roads and smoke from campfires.

Construction associated with the action alternatives would result in short-term, localized emissions from construction equipment and from soil removal and excavation activities. Best management practices would minimize fugitive dust and engine emissions. As a result, the intensity of short-term, adverse impacts from construction would be minor locally and negligible on a parkwide and regional basis.

After construction was completed and sites were restored to control the generation of dust, air emissions would return to preconstruction levels. Because the action alternatives would primarily encourage nonmotorized recreation, they would produce little change in air emissions. Fluctuations in emissions based on visitation changes in response to changing lake levels would not be detectable, even at the nearest air quality monitors. Therefore, all of the long-term impacts on air quality would be negligible in intensity.

All of the impacts on air quality would be negligible or minor and localized. Therefore, air quality was dismissed from additional analysis.

Aquatic Life

Lake Meredith is a created water body that has historically been stocked to establish a recreational fishery that consists almost entirely of nonnative fish. These include walleye, catfish, largemouth and sand bass, crappie, bluegill, and carp. Eleven amphibian species and many species of snakes, turtles, and frogs are known in the national recreation area. The food chain is supported by a wide variety of aquatic and semiaquatic invertebrates. The Texas Department of Parks and Wildlife continues to stock the ponded area of the Stilling Basin with nonnative trout twice each year (NPS 2002b).

Upstream from Lake Meredith within the national recreation area, the Canadian River contains a healthy population of the federally threatened Arkansas River shiner. This species is discussed under "Endangered, Threatened, or Other Special Concern Species and Their Habitats."

It has been suggested that nonnative predatory sports fish, baitfish minnows, and crayfish used for bait in Lake Meredith should be managed to prevent them from moving upstream and

negatively affecting the Arkansas River shiner population via predation, competition, and hybridization. Effects on the Arkansas River shiner would be more likely from the continued use of these species for bait in the upstream Canadian River reservoirs, including Ute Lake and Conchas Lake in New Mexico. However, during the 2009 survey when the healthy Arkansas River shiner population was documented, only one individual from among the most common baitfish species, a fathead minnow, was found. These results indicate that the Arkansas River shiner population is fairly resistant to effects from nonnative species and that the continued presence of nonnative sport and bait species in Lake Meredith would have a negligible or minor effect on the shiner.

A bigger concern regarding the Arkansas River shiner is loss of habitat from the past construction of Ute Lake, Conchas Lake, and Lake Meredith, and their interruption of the natural flow of water in the Canadian River. Actions to encourage the shiner in its remaining Canadian River habitat are included in the Arkansas River shiner management plan (Canadian River Municipal Water Authority 2005). None of the alternatives would affect habitat availability, river flow, or implementation of the management plan for this species.

Under all of the alternatives, aquatic life would continue to be managed in accordance with NPS policies and management recommendations from the Texas Parks and Wildlife Department. Fishing would continue as an important recreational activity that would affect the types, numbers, and conditions of fish and their prey species in the lake. Aquatic life would continue to be affected more by lake water levels than by any other factor. None of the alternatives would change the management approach or measurably alter aquatic habitat availability or quality.

For all of these reasons, the alternatives would have a negligible or minor effect on aquatic life. Therefore, this impact topic was dismissed from further consideration.

Carbon Footprint

For this planning effort, "carbon footprint" is defined as the sum of all emissions of carbon dioxide and other greenhouse gases (for example, methane and ozone) that would result from implementing any of the management alternatives. Understanding the carbon footprint of each alternative is important for determining its contribution to climate change.

Rehabilitation and marking of trails would improve visitor experiences by providing better orientation within the national recreation area but would not change vehicle emissions or vehicle miles by visitors traveling to or within the national recreation area. Similarly, changes to campsites, including facilities primarily intended for use by recreational vehicles, would improve visitor experiences without altering emissions or vehicle miles traveled. Greenhouse gases emitted to generate electricity used at campsites might be offset by a reduction in the number of campfires in the campground. Reducing the dirt road network in the national recreation area and consolidating NPS operations could reduce vehicle miles driven and associated greenhouse gas emissions, but these changes would not be detectable compared to greenhouse gas emissions that would continue from visitors, ongoing NPS operations, and other sources in the nearby communities or counties.

Development of a consolidated operations center or consolidated headquarters, visitor contact, and consolidated operations center would allow for separate facilities to be removed and the land to be restored. The new facilities would be constructed to Leadership in Energy and Environmental Design standards. To the extent practicable, the national recreation area would continue to employ management measures to minimize greenhouse gas emissions from park operations. Because of the negligible difference in the amount of greenhouse gas emissions that would result from each

alternative, a quantitative measurement of their carbon footprint was determined by the planning team not to be practical.

The management alternatives described in this document would negligibly alter the amount of greenhouse gases that contribute to climate change. Therefore, this impact topic has been dismissed from detailed analysis in this plan.

Ecologically Critical Areas, Wild and Scenic Rivers, or Other Unique Natural Resources

In the discussion of how to determine the significance of a proposed action, the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act recommend evaluating unique characteristics, such as "proximity to . . . wild and scenic rivers, or ecologically critical areas" (section 1508.27). There are no congressionally designated wild and scenic rivers within or near Lake Meredith National Recreation Area, and the vicinity does not contain any other areas considered ecologically critical. Therefore, this category was dismissed from further consideration.

Geology

The Canadian River breaks are a rugged geologic formation where the Canadian River and its tributaries cut through the resistant Alibates dolomite caprock, creating ledges and cliffs, and then eroded the softer underlying layers to form a canyon up to 2 miles wide and 300 feet deep (NPS 2002c). Although the reservoir behind Sanford Dam has inundated part of the Canadian River breaks in the national recreation area, the steep cliffs and slopes are visible above the level of the lake pool.

Section 4.8 of *Management Policies 2006* (NPS 2006b) states, "The Park Service will preserve and protect geologic resources as integral components of park natural systems. As used here, the term 'geologic resources' includes both geologic features and geologic processes. The Service will (1) assess the impacts of natural processes and human activities on geologic resources; (2) maintain and restore the integrity of existing geologic resources; (3) integrate geologic resource management into Service operations and planning; and (4) interpret geologic resources for park visitors."

Under all of the alternatives, a borrow site on national recreation area land between Farm to Market Road 1319 and North Canyon would continue to serves as a source for fill material for NPS and Canadian River Municipal Water Authority projects. Removal of the material, primarily sand and gravel, from the site would have little impact on geologic resources because the site does not contain important geologic features, the borrow area is small, and a small amount of material is removed annually. The impact would be negligible because the site's continued use would not represent a change from current management.

Some of the proposed actions in the alternatives for Lake Meredith National Recreation Area could modify the area geology by constructing building foundations on or laying underground utilities within the near-surface bedrock. Impacts on geologic resources from these actions would be negligible because the area affected would be small, any excavations would be shallow, and the bedrock integrity around and beneath any disturbances would be maintained. No disturbances would occur to geologic features that are identifiable as part of the Canadian River breaks.

The action alternatives would increase interpretation of geology, resulting in beneficial effects. The intensity would be minor because geology would be among many features interpreted in the national recreation area.

All of the impacts on geologic resources would be localized and negligible or minor in intensity. Therefore, geology was dismissed from additional analysis.

Natural Soundscape

In accordance with section 4.9 of *Management Policies 2006* (NPS 2006b), preservation of natural soundscapes associated with national park system units is an important part of the NPS mission. Natural soundscapes exist in the absence of human-caused sound. The natural soundscape is the aggregate of all natural sounds that occur in a park, together with the physical capacity for transmitting natural sounds.

The frequencies, magnitudes, and durations of human-caused sound considered "acceptable" vary among national park system units as well as within each park. Acceptable levels of human-caused sound generally are greater in developed areas and intensively used or motorized recreation areas than in more natural areas.

Background sound at Lake Meredith primarily is caused by the near-constant winds, which average 12 to 14 miles per hour and can reach 30 to 40 miles per hour during early spring. Human-caused sound in the area primarily is from oil and gas facilities and from recreational activities such as boating, hunting, driving, using generators while camping, and off-road vehicle use. Sound from oil and gas production and from off-road vehicle use are addressed in other plans.

During busy summer days, areas of Lake Meredith National Recreation Area where natural sound predominates generally occur only where topography blocks sound from vehicle (including boat) engines and from oil and gas equipment. This condition would not change with any of the alternatives (negligible impact).

Construction of buildings and other facilities in association with implementing the action alternatives would locally increase human-caused sound. Construction sound would be temporary, lasting only as long as the construction activity. Typical measures that could be implemented to minimize construction sound would include

- requiring equipment to be in good working order with properly functioning mufflers
- employing acoustical shrouds, such as sound-reducing blankets or hay-bale shields, around noisy equipment such as air compressors
- installing sound baffling devices during activities such as excavation and grading

Perception of construction sound would be reduced by installing facilities primarily during the late fall, winter, and early spring when there were fewer visitors. Also, performing construction in areas that receive little visitor use, such as near the maintenance yard, or in areas where visitors were absent because the area was closed, would limit sound impacts. These types of measures to reduce the perceived level of sound would result in noise impacts from construction that were negligible or minor.

In the long-term, new facilities could alter the local sound footprint. For example, a new visitor contact station would result in increased vehicle sound, sound from voices, and buildings operations sound. However, these structures would be sited in or near already developed zones, could include sound mitigation, and would be close to existing roads. As a result, impacts on the natural soundscape would be minimal.

All of the impacts on the natural soundscape would be localized and negligible or minor in intensity. Therefore, the natural soundscapes was dismissed from additional analysis.

Night Skies and Lightscape Management

In accordance with *Management Policies 2006* (NPS 2006b), the National Park Service strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human-caused light. At Lake Meredith

National Recreation Area, the National Park Service limits the use of artificial outdoor lighting to that which is necessary for basic safety requirements and ensures that all outdoor lighting is shielded to the maximum extent possible. All of the proposed actions would continue these practices (negligible impact). If fugitive light was found to be a problem at campgrounds with utilities, visitors would be provided with educational materials on controlling their light emissions. As a result, their impacts on night skies would be minor. Because all of the impacts on lightscapes would be localized and negligible or minor in intensity, this impact topic was dismissed from further consideration.

Prime and Unique Agricultural Lands

Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Unique land is land other than prime farmland that is used for production of specific high-value food and fiber crops. Both categories require that the land is available for farming uses (CEQ 1980).

The American Farmland Trust, which identifies high-quality farmland as areas that have relatively large amounts of prime or unique farmland, does not identify any high-quality farmland within Hutchinson, Moore, or Potter Counties (American Farmland Trust 2009). Additionally, the lands in Lake Meredith National Recreation Area have not been available for farming for more than half a century, and none of the alternatives would result in a change in use that would allow use for agriculture. Therefore, this topic was dismissed from further analysis.

Vegetation

The upland terrain in the national recreation area consists primarily of grasslands. The predominant vegetative cover includes blue grama, little bluestem, and buffalo grasses, with scattered clumps of sand sagebrush, yucca, broom snakeweed, plains prickly pear, feather dalea, one-seeded juniper, and mesquite. Stands of cottonwood and hackberry trees are found in the canyons. The varying lake levels have encouraged the encroachment of saltcedar in the floodplain areas (NPS 2002b).

No endangered or threatened plants are known to occur within the boundaries of the national recreation area.

Past human activity, including recreation, oil and gas operations, and grazing, have introduced at least 37 nonnative plant species. The most common are Russian thistle, kochia, and saltcedar. Management of invasive exotics includes cutting, burning, and treatment with approved herbicides (NPS 2002b).

Vegetation throughout the national recreation area is managed in accordance with NPS policies. To increase the abundance and quality of native vegetation, the National Park Service will continue such actions as protecting trees in riparian corridors and encouraging their regeneration, controlling invasive species such as saltcedar and mesquite, and using fire to restore native grassland species. None of these practices would change because of the implementation of any of the general management plan alternatives (negligible impact).

The alternatives would result in some removal of vegetation in association with actions such as the construction of buildings and installation of utilities. Other areas, such as existing roads that are closed, would be revegetated. In all cases, best management practices would be used to limit vegetation removal, and most areas would be revegetated following construction. The permanent conversion of vegetated areas to other purposes would total a few acres and could be largely or entirely offset by vegetation restoration on roads that could be closed. Individually and collectively, these adverse and beneficial impacts on vegetation would be minor in intensity.

Regardless of management actions by the National Park Service, wetland vegetation would continue to experience a cycle of development and demise as described below under "Wetlands and Floodplains." The areal extent of this ongoing change will far exceed any vegetation modifications resulting from the alternatives.

All of the impacts on vegetation that would result from implementing the alternatives would be localized and minor in intensity. Therefore, vegetation was dismissed from additional analysis.

Visual Quality of Viewsheds and Landscapes

The Canadian River breaks and the reservoir provide a scenic contrast to the high plains of the Texas panhandle region and are an important part of visitor experience. Viewsheds and landscapes are considered as part of the visitor experience analysis and are not examined as a separate impact topic.

Water Quality and Hydrology

Water is not a fundamental national recreation area resource. Water in the reservoir is managed by the Canadian River Municipal Water Authority. Inflows are from precipitation in the watershed and releases from upstream reservoirs, while outflows depend on demand from the municipalities it serves. Except for in the reservoir and Canadian River channel, surface water is scarce in Lake Meredith National Recreation Area, and most streams flow intermittently.

The Canadian River Municipal Water Authority and National Park Service coordinate to educate boaters and other lake users about protection of water quality from pollution such as fuel and human waste. Oil and gas production facilities in the national recreation area comply with regulations requiring secondary containment, such as berms, to prevent spills or leaks from reaching waterways. None of these hydrology and water quality features would change under any of the alternatives, resulting in negligible impacts.

Water quality is tested at the designated swim beach in the Spring Canyon area in accordance with state law. If concerns about human health are indicated, management actions could include closing the swim beach. This management would continue under any of the alternatives and would not be affected by the zoning applied to the Spring Canyon area. Therefore, impacts of the alternatives on water quality at the swim beach would be negligible.

The action alternatives would not substantially alter the effects of visitor activities or national recreation area development on water resources, compared to continuing current management. Actions would not increase water-based recreation; instead, increased emphasis would be placed on nonwater-based activities in upland areas. Revegetation of roads after they were closed could slightly reduce sediment transport to the lake. While some construction would occur with the action alternatives, such as the construction of a consolidated operations and installation of utilities at some campsites, it would not be near water bodies and mitigation would ensure that there were negligible or minor effects on hydrology and water quality. For example, storm water or sedimentation basins and silt fences would retain surface flows on the construction site and would prevent sediment from reaching waterways. Temporary ground covers, such as erosion matting or weed-free straw, would be installed to protect soil from erosion and transport until a natural vegetative cover was reestablished. Because all of these actions would have negligible or minor effects on water quality and hydrology, this impact topic was dismissed from further consideration.

Wetlands and Floodplains

Guidance requires the National Park Service to preserve floodplain values and

to minimize potentially hazardous conditions associated with flooding. For wetlands, the National Park Service is required to protect and enhance natural wetland values and to examine the impacts of actions on wetlands. NPS policy is to avoid affecting wetlands and to minimize impacts when they are unavoidable.

Except for boat ramps, which do not affect floodplain capacity and are not damaged by inundation, the National Park Service does not have any permanent structures within the floodplain or reservoir pool. Any near-shore structures that were associated with any of the alternatives would be designed to be moved to accommodate changing water levels in the reservoir. Therefore, the impacts of the alternatives on floodplains would be negligible, and this impact topic was dismissed from further consideration.

As the water level in Lake Meredith has receded with the drought, high-value wetlands have developed in large areas of the former lake footprint, particularly near the river channel in the upstream areas of the national recreation area. However, all of these wetlands are ephemeral. Some at higher elevations already are dying or transitioning from obligatory to facultative wetland species or upland species as the water table drops below the reach of the roots. When the drought breaks and the reservoir fills, these wetlands will be inundated, and a new wetland zone will develop wherever favorable slope, soil, and moisture conditions occur. In the long term, there will be a cycle of wetland inundation or desiccation and regrowth that will not be affected by any of the general management planning actions of the National Park Service.

Few areas of wetlands occur elsewhere in the national recreation area. All facilities would be sited to avoid wetlands, if feasible. If avoiding wetlands was not feasible, other actions would be taken to comply with NPS and other federal guidelines and with section 404 of the Clean Water Act, which regulates the discharge of dredged or fill material into wetlands and other waters of the United States. These actions would include preparing National Environmental Policy Act documentation and obtaining a permit under section 404 of the Clean Water Act. It also could include design specifications to mitigate adverse impacts to the maximum feasible extent. Compensation for remaining unavoidable adverse impacts on wetlands would be made by restoring wetlands outside the lake pool area that previously were destroyed or degraded. As a result, impacts on wetlands from implementing the general management plan would be minimal and no further analysis is needed.

Wildlife and Their Habitats

About 60 mammal species, more than 200 bird species, 11 amphibian species, and 32 reptile species have been identified at Lake Meredith National Recreation Area. Feral hogs appeared in the area in the early 1990s, but management actions have limited their numbers to fewer than 10 individuals (NPS 2008c).

Wildlife is managed in accordance with NPS policies and the management recommendations of the Texas Parks and Wildlife Department. In compliance with the 1990 establishing legislation for the national recreation area, wildlife management includes hunting. Monitoring of species and adjustments to harvest bag limits will continue to be important tools for achieving healthy wildlife populations.

The availability of high-quality habitat is a key factor for wildlife numbers and condition. To enhance habitat, the National Park Service will continue to implement actions such as the protection and improvement of riparian corridors, control of invasive species such as saltcedar and mesquite, and use of prescribed burns to restore native grassland species. However, the location and extent of wetlands, which provide high-quality habitat, will continue to be heavily influenced by the water level in the

lake. As described above for wetlands, a cycle of wetland development and demise will continuously change the size, location, and quality of the national recreation area's wildlife habitat. None of these factors would change with the implementation of any of the general management plan alternatives.

Impacts on wildlife habitat outside the lake pool area would be the same as those described for vegetation. These would include habitat removal and restoration at most construction sites, conversion of a small amount of upland habitat to other uses, and restoration of wildlife habitat along closed roads. Individually and collectively, these adverse and beneficial impacts on wildlife habitat would be minor in intensity.

Closing some national recreation area roads would reduce habitat fragmentation, but the benefits would be largely offset by marking trails in the semi-primitive zone and encouraging more nonmotorized recreation. The intensity of these beneficial and adverse impacts would be negligible or minor.

All of the impacts on wildlife and their habitats that would result from implementing the alternatives would be negligible or minor in intensity. Therefore, this impact topic was dismissed from additional analysis.

Cultural Landscapes

A cultural landscape is a reflection of human adaptation and use of natural resources that is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

This impact topic is based on the requirements in section 1502.16 of the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act. It is interpreted to include cultural landscapes that are listed or eligible for listing in the National Register of Historic Places.

The McBride Ranch landscape, which includes the national register-listed McBride Ranch House, is a potentially eligible historical vernacular landscape. A cultural landscape assessment and inventory has not been conducted and a formal determination of national register eligibility has not been completed for the site. Therefore, the area needs to be managed as though it were eligible for listing until the determination is complete. The boundary of the landscape would be larger than the area of the ranch house and could include the areas and features associated with the entire farming/ranching operation. Dryland crops were grown on top of the mesas and the canyons were used for growing hay.

Within the former McBride property, one cultural landscape element identified as significant is the canyon environment, which includes the McBride Creek riparian corridor and cottonwood grove. In addition to the remains of Anglo-American ranching activity, McBride Canyon contains evidence of use by prehistoric and historic American Indian tribes.

The McBride landscape contains one of the few surviving, family-scale, pioneer ranches in the Texas panhandle, with the remains of the oldest ranch house in Potter County. McBride developed the road into McBride Canyon and hired stone masons to construct the limestone building, now known as the McBride Ranch House, between 1903 and 1906. The McBride ranching operation started during the time of unfenced open range in the Texas panhandle and continued through the 1920s. The McBride Ranch House and surrounding property stayed in family ownership until it was purchased for the national recreation area in 1963 (NPS 2002c).

Under any of the alternatives, the National Park Service would continue to protect

the McBride Ranch landscape in accordance with federal regulations, and loss of any character-defining features over time would be slight. Implementation of the general management plan alternatives would not include new development within the McBride Ranch landscape and/or would seek to improve the landscape components. Any improvements to the adjacent McBride Canyon campground would not extend beyond the existing footprint of development. Because these resources would either benefit from or not be affected by actions being considered in this general management plan, cultural landscapes were dismissed from further consideration.

Sacred Sites and Other Ethnographic Resources

Ethnographic resources are defined by the National Park Service as any "site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it" (NPS 1998). Ethnographic resources are associated with cultural practices, beliefs, the sense of purpose, or existence of a living community that is rooted in that community's history or is important in maintaining its cultural identity and development as an ethnically distinctive people.

Ethnographic resources relate to particular places or areas that contemporary peoples link to their traditional way of life and cultural heritage. The Antelope Creek Culture has not been directly connected or claimed by any neighboring tribal entity. The following tribes have been involved in conversations with the National Park Service concerning affiliations and protocols at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument (Moss 1999) and in connection with this general management plan:

- Apache Tribe of Oklahoma
- Caddo Nation of Oklahoma
- Cheyenne-Arapaho Tribe, Oklahoma
- Comanche Nation, Oklahoma
- Delaware Nation, Oklahoma
- Fort Sill Apache Tribe, Oklahoma
- Jicarilla Nation, New Mexico
- Kiowa Indian Tribe of Oklahoma
- Mescalero Apache Tribe of the Mescalero Reservation, New Mexico
- Tonkawa Tribe of Indians of Oklahoma
- Wichita and Affiliated Tribes, Oklahoma

No ethnographic resources have been formally identified as traditional cultural properties eligible for listing or listed in the National Register of Historic Places within Lake Meredith National Recreation Area or Alibates Flint Quarries National Monument.

Although there are currently no national register-listed ethnographic resources in the parks, previous consultations have revealed that archeological sites, especially those with the potential to contain human remains, hold particular cultural sensitivity to tribes and should be considered as ethnographic resources. In addition to archeological sites in general, the flint quarries and all petroglyph sites play an important role in tribal histories and retain specific cultural importance. Previous consultations also indicate that certain plant and animal species in the parks may retain specific cultural significance, but these resources are not well defined to the parks' managers (NPS 2002c).

Traditional cultural concerns also were raised with regard to disturbing natural processes such as erosion. Some tribal members consider efforts to arrest or slow the natural deterioration of prehistoric structures and other cultural sites and resources associated with American Indian activities as disrupting natural cycles of renewal, decay, and the return of materials to the earth. NPS managers respect this point of view, and also strive to ensure that important cultural resources and values of the parks are protected and preserved.

Archeological and other appropriate cultural resource surveys would precede any ground disturbance, and significant resources would be avoided during construction. If previously unknown archeological resources were discovered during construction, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented. If the resources could not be preserved *in situ*, an appropriate mitigation strategy would be developed in consultation with the Texas state historic preservation officer and associated American Indian tribes. In the unlikely event that human remains, funerary objects, sacred objects, or objects of cultural patrimony were discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (25 USC 3001) of 1990 would be followed.

In addition, the National Park Service would continue to recognize the past and present existence of peoples in the region and the traces of their use as an important part of the cultural environment to be preserved and interpreted, and would develop and accomplish programs in a way that respects the beliefs, traditions, and other cultural values of the American Indian tribes who have ancestral ties to the parks' lands. Therefore, impacts on ethnographic resources would be negligible or minor compared to the effects of current management and were dismissed as an impact topic.

Museum Collections

The parks' archeological and natural history museum collections include 623,000 items from Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. These primarily consist of prehistoric and historic objects formed from stone, bone, metal, glass, and clay; archival material such as maps, photographs, and archeological field notes; and natural history collections such as plants, insects and other animals, and paleontological and geological specimens.

Title 36 *Code of Federal Regulations*, chapter 79 requires that federally owned collections be housed in institutions that comply with curation regulations; protect the collections from potentially destructive elements such as fire, rodents, and insects; and provide humidity and temperature control. The curation facility is also required to maintain complete and accurate records and to ensure that collections are properly managed. Human remains and grave goods require special consideration under the Native American Graves Protection and Repatriation Act.

Consistent with the servicewide museum collection and storage plan, items in the parks' collection are stored at the Panhandle-Plains Historical Museum in Canyon, Texas. This facility complies with federal regulations governing the management of museum collections. Additionally, traveling displays from the collection are transported, stored, and displayed in compliance with federal regulations.

None of these factors would change with the implementation of any of the general management plan alternatives, and museum collections would continue to be acquired, accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines.

Energy Requirements and Conservation Potential

Most of the energy use would continue to be for visitor and staff travel to, from, and within the national recreation area. Smaller amounts of fuel would continue to be consumed in the engines of boats, off-road vehicles, and generators during recreation activities. The action alternatives would require the use of fuel in construction equipment, while the consolidation of park operations and encouragement of nonmotorized recreation might decrease fuel use. None of these changes in fuel use associated with the alternatives would be detectable at gas stations in nearby Fritch and Borger, and the effects of the alternatives would be negligible.

Rehabilitated or new NPS facilities would take advantage of energy conservation materials and designs to decrease energy requirements. Providing electricity to about 30 campsites (depending on the alternative) would increase energy use. These changes might be detectable in the NPS' annual utility bills but could not be discerned in the load requirements of the utility providers. Therefore, the intensity of the impact would be minor.

The National Park Service would pursue sustainable practices whenever possible in all decisions regarding park operations, facilities management, and development in Lake Meredith National Recreation Area. This approach is consistent with the NPS' *Management Policies 2006* (NPS 2006b).

All of the impacts on energy requirements and conservation potential that would result from implementing the alternatives would be negligible or minor in intensity. Therefore, this impact topic was dismissed from additional analysis.

Environmental Justice: Socially or Economically Disadvantaged Populations

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/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Guidelines for implementing this executive order under the National Environmental Policy Act are provided by the Council on Environmental Quality (1997). According to the U.S. Environmental Protection Agency (1998), environmental justice is

> *The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.*
>
> *The goal of this "fair treatment" is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.*

There are both minority and low-income populations in the general vicinity of Lake Meredith National Recreation Area. However, environmental justice is dismissed as an impact topic for the following reasons:

- NPS staff actively solicited public participation as part of the planning process and gave equal consideration to input from all persons, regardless of age, race, income status, or other socioeconomic or demographic factors.

- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The NPS staff does not anticipate that any adverse impacts on public health and/or the socioeconomic environment would appreciably alter the physical and social structure of the nearby minority or low-income populations or communities.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by agencies of the Department of the Interior 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 directives of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources in Lake Meredith National Recreation Area. The lands in the national recreation area are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources were dismissed as an impact topic.

Natural or Depletable Resource Requirements and Conservation Potential

Natural or depletable resources address the quality, recycling, or conservation of petroleum products and other natural resources. The use and conservation of fuels and other energy sources, including petroleum products, was discussed above under energy requirements and conservation potential.

Limited construction in the national recreation area would use small amounts of raw materials such as concrete and metals. However, the volumes of these common and readily available materials used would be small compared to the use of these materials annually in the surrounding counties. Moreover, once built, NPS facilities typically remain in service for many decades, providing efficient use of the materials they contain. Because impacts on natural or depletable resources would be negligible or minor, no further analysis of this impact topic was conducted.

Potential Conflicts between the Proposal and Land Use Plans, Policies, or Controls

Section 4.5.F.2 of Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2001) states that an environmental impact statement must consider "possible conflicts between the proposal and land use plans, policies, or controls for the area concerned (including local, state, or Indian tribe)." This requirement is based on sections 1502.16 and 1506.2 (d) of the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act.

Lake Meredith National Recreation Area and the predecessor Sanford Recreation Area have occupied the site for nearly 50 years. State and local planning agencies, including those of Hutchinson, Moore, and Potter Counties, support the national recreation area and accommodate it in their land use planning, policies, and controls. Infrastructure components such as roads are adequately sized to accommodate visitation levels that would occur with any of the alternatives. Because there would not be any potential conflicts between the proposal and land use plans,

policies, or controls with any of the alternatives, this impact topic was dismissed from further consideration.

Public Health and Safety

The need to consider effects on public health and safety is based on the requirements in section 1508.27 of the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act.

At Lake Meredith National Recreation Area, public health and safety already are addressed in a variety of plans and regulations. Examples include the national recreation area's fire management plan (NPS 2008c) and the superintendent's compendium, prepared to comply with Title 36, *Code of Federal Regulations*, chapter 1, parts 1 through 7. The National Park Service also publishes brochures covering activities such as boating and hunting that emphasize safety. Under any of the alternatives, the plans and regulations that affect public health and safety would remain in effect, and their character and scope would not change. Therefore, the proposed alternatives would have a negligible impact on public health and safety. For this reason, public health and safety has not been further analyzed in this document.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT IMPACT TOPICS CONSIDERED AND ANALYZED IN DETAIL

Three impact topics were retained for detailed analysis, based on the existing resource and proposed management actions at Alibates Flint Quarries National Monument.

Archeological Resources

Alibates Flint Quarries National Monument was designated a national monument in 1965 in recognition of the need to protect its unique cultural resources. This importance was reaffirmed by listing of the site in the National Register of Historic Places in 1966. Because the alternatives could change the activities near some archeological resources, this impact topic was retained for additional analysis.

Visitor Use and Experience

Providing for visitor enjoyment, understanding, and stewardship is one of the fundamental purposes of the National Park Service. Many actions proposed in this general management plan could affect patterns of visitor use and the type and quality of visitor experiences in Alibates Flint Quarries National Monument. Specific elements of the visitor experience include visitor access, activities and destinations, and interpretation and education. Therefore, this impact topic will be examined in detail in the environmental impact statement.

NPS Operations

The alternatives could affect NPS operations and facilities in Alibates Flint Quarries National Monument by increasing staff and complexity of national monument management and operations. Therefore, the topic of impacts on NPS operations was retained for further analysis.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT IMPACT TOPICS CONSIDERED BUT NOT ANALYZED IN DETAIL

Many impact topics at Alibates Flint Quarries National Monument do not need to be analyzed in the environmental impact statement because they do not occur on the site (such as aquatic life), there would not be any change in management that would affect them, or they are protected by restricted public access, which would continue under any of the alternatives. The effects of the alternatives on other impact topics would be negligible or minor for the same reasons described for Lake Meredith

National Recreation Area. The reasons supporting the dismissals of impact topics are provided below.

Special Status Species

For all of the alternatives, special status species would continue to be protected by restricted public access to the national monument. The only action alternative element in the national monument with the potential to affect special status species would involve excavating one quarry pit near the existing trail, constructing a canopy over the site, and using the excavated quarry for interpretation. The small area of disturbance (perhaps 50 feet on a side) would first be surveyed for the Texas horned lizard, which is the only special status species with the potential to occur at the site. If lizards were found in the area, mitigation would be used during construction to protect individuals from harm. Examples include performing construction in winter when the animals are hibernating or enclosing the site to be excavated with a lizard-proof fence (could be the same as the silt fence used for protection of soil) and then trapping and relocating any lizards within its perimeter. As a result of these actions, the effects on special status species during quarry excavation would be negligible or minor.

The excavated quarry and shelter would not pose hazards to the Texas horned lizard. Animals that entered the quarry's shallow pit should be able to climb out on its rough stone surface, which would be similar to the surface of the flint that outcrops throughout the site. If the selected quarry was steeper than anticipated and the potential for entrapment existed, a lizard escape route, such as n natural-appearing log extending from the pit base to the lip, would be installed. The open-sided structure over the quarry would not obstruct lizard movement, and lizards might occasionally take shelter from the hot sun in the canopy's shade. All of these effects on special status species would be negligible or minor in intensity.

In Lake Meredith National Recreation Area, elements associated with one or both of the action alternatives for Alibates Flint Quarries National Monument would include installing interpretive materials focusing on an Antelope Creek-style dwelling and constructing a short (half-mile or less), self-guiding interpretive trail near the contact station. The Texas horned lizard would be the only special status species of concern at these sites, and mitigation like that described above would be implemented to protect animals during construction. Effects from operating these facilities would be limited to increased human foot traffic in the immediate vicinity, which would have a negligible or minor effect on the highly mobile lizard.

As a result of ongoing protections combined with mitigation, impacts on special status species would be negligible or minor. Therefore, this impact topic was dismissed from detailed consideration for actions at Alibates Flint Quarries National Monument.

Soils

Actions that could affect soils would be the same as those described for special status species. These would include excavating a quarry and using it for interpretation, installing interpretive materials focusing on an Antelope Creek-style dwelling, and constructing a short interpretive trail near the contact station. Impacts on soils would be minor because of the small areas that would be disturbed and the NPS' use of standard best management practices for soil protection and restoration. Therefore, this impact topic was dismissed from further consideration.

Socioeconomics

Socioeconomics were eliminated from detailed consideration because the alternatives would involve very small changes in facilities and employment that

would occur over the 20-year planning period. Impacts would be negligible because the changes would be too small to detect, even at the local level.

Transportation

Transportation into the national monument would continue to be on foot, except for visitors with impaired mobility who, during accompanied tours, could access some sites in motor vehicles. This would not represent a change from the current approach. Therefore, this impact topic was dismissed from further consideration.

Other Impact Topics

The following impact topics were not considered because they do not occur in the national monument:

- aquatic life
- ecologically critical areas, wild and scenic rivers, or other unique natural resources
- prime and unique agricultural lands
- water quality and hydrology (which was not considered because there are no bodies of water in the national monument and proposed actions would not affect drainage patterns or any potential subsurface water resources)
- wetlands and floodplains

The following impact topics were not considered in detail for the same reasons presented under Lake Meredith National Recreation Area:

- air quality
- carbon footprint
- geology
- natural soundscape
- night skies and lightscape management
- vegetation
- visual quality of viewsheds and landscapes
- wildlife and their habitats
- cultural landscapes
- sacred sites and other ethnographic resources
- museum collections
- energy requirements and conservation potential
- environmental justice: socially or economically disadvantaged populations
- Indian trust resources
- natural or depletable resource requirements and conservation potential
- potential conflicts between the proposal and land use plans, policies, or controls
- public health and safety

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS GENERAL MANAGEMENT PLAN

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are in Hutchinson, Moore, and Potter Counties. Most properties near the parks are privately owned and are used for agricultural and residential purposes. At Sanford Dam, the Bureau of Reclamation owns adjacent land, which is administered by the Canadian River Municipal Water Authority. The state of Texas owns the roads designated FM 687 and FM 1913, and the Texas Department of Transportation owns approximately 300 feet on either side of the bridge at Rosita. The Bureau of Land Management owns land adjacent to the west side of the Texas Department of Transportation land, and the land to the east is owned by the state and National Park Service. There are no tribal lands nearby.

Several plans and/or management actions associated with multiple government jurisdictions and private interests could affect or would be influenced by the approved general management plan for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. This section discusses planning and other management actions and their relationship to the parks.

OTHER NPS PLANNING

The following planning efforts at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument have the potential to affect or be influenced by the approved general management plan.

Resources Management Plan, 1996

The resources management plan provides goals for the parks that address preserving resources, providing for public enjoyment and visitor experience, perpetuating cultural resources, enhancing recreational opportunities managed by partners, and ensuring organizational effectiveness. One goal promotes conditions where "visitors safely enjoy and are satisfied with the availability, accessibility, diversity, and quality of park facilities, services, and appropriate recreational opportunities" (NPS 1996). The actions in the general management plan would be consistent with the resources management plan.

Oil and Gas Management Plan and Environmental Impact Statement, 2002

This plan guides oil and gas activities at the parks. It defines a direction for long-term management of existing and anticipated oil and gas operations associated with the exercise of nonfederal oil and gas interests underlying the parks and for management of existing trans-park oil and gas pipelines and activities in their rights-of-way. The management approach protects the parks' resources, visitor use and experience, and human health and safety, and it prevents impairment to the parks' resources and values. Activities conducted as part of this general management plan will be consistent with the guidelines in the oil and gas management plan.

Arkansas River Shiner Management Plan, 2005

The Arkansas River shiner is a small, native fish that is federally listed as a threatened species. They are present in the Canadian River upstream from the Lake Meredith pool. The Canadian River Municipal Water Authority (2005) prepared a management plan for the Arkansas River shiner in the Canadian River stretch that includes Lake Meredith National Recreation Area. The plan is a cooperative effort among local, state, and federal entities, including the National Park Service, and is being used to identify and enact conservation strategies for this species. Goals of the plan include conserving and protecting the existing,

healthy, self-sustaining population of the fish; maintaining and improving habitat integrity; encouraging landowners to employ good management practices on lands adjacent to the river to protect and improve habitat; and contributing to the eventual delisting of the species.

Wildland Fire Management Plan, 2008

This is a detailed program of action to implement a prescribed fire program and to manage wildland fire in both parks. This plan is the primary reference for conducting all fire management activities and is intended to help achieve the resource management objectives presented in the resource management plan. 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 plan's highest priorities. 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 sizeable wildfires and would provide benefits to native vegetation and wildlife in the area.

Lake Meredith National Recreation Area Multi-use Trail Environmental Assessment, 2010

The multi-use trail, to be constructed in five phases, will result in a trail totaling about 22 miles that will be suitable for pedestrian and bicycle use. The purpose of the project is to provide visitors with a wider range of nonwater-based, nonmotorized visitor experiences and to provide improved emergency access within the national recreation area (NPS 2010b).

Off-road Vehicle Management Plan and Regulation Environmental Impact Statement, 2012

An off-road vehicle management plan addresses the use of off-road vehicles in Lake Meredith National Recreation Area's two designated areas at Rosita and Blue Creek (NPS 2012a). The purpose of the plan is to manage off-road vehicle use for visitor enjoyment and recreation opportunities, while minimizing and correcting damage to resources. Some of the goals include promoting safe operation of off-road vehicles and the safety of all visitors, minimizing conflicts among different types of off-road vehicle users, controlling soil erosion and restoring vegetation, preserving and protecting significant cultural resources in the off-road vehicle areas, and reducing the NPS' operations and costs. The development of a sense of stewardship among off-road vehicle users and recognition of their responsibilities as they pertain to the national recreation area are important components of the plan.

PLANNING EFFORTS OF OTHERS

Regional Activities

The protection of resources such as air, water, and scenery will require cooperative action among many public and private entities. Examples of coordinated planning and management for these regional resources include the following.

The development of renewable wind or solar energy in the area could involve individual structures or groups of structures. The National Park Service will work with landowners and energy developers to minimize impacts on scenic views and may be able to provide information on avoiding or mitigating impacts on other important natural and cultural resources.

State Jurisdictions

Planning decisions made in the states of Texas could impact park management with respect to natural and cultural resource protection and management, the development of mineral rights, and transportation. The responsibilities of key state agencies as they relate to Lake

Meredith National Recreation Area and Alibates Flint Quarries National Monument are summarized below.

The Texas Commission on Environmental Quality is the lead environmental agency responsible for protecting the state's natural resources, including air and water, and the safe management of waste. This agency works with the National Park Service on environmental concerns such as air quality, prescribed burning, water quality, and hazardous materials.

The Texas Historical Commission is responsible for protecting and preserving the state's historic and prehistoric resources for use, education, enjoyment, and economic benefit. The state historic preservation officer is the executive director of the Texas Historical Commission and is responsible for formal consultation with the National Park Service under the National Historic Preservation Act.

The Texas Department of Transportation is responsible for the farm to market roads that run through and adjacent to the parks. This includes providing directional signs on roads leading to the parks. All other roads are managed by the National Park Service, except the Cas Johnson, Plum Creek, and Blue West Roads, which are managed by the counties in which they reside.

The Texas Railroad Commission oversees the Texas oil and gas industry. This includes gas utilities, pipeline safety, safety in the liquefied petroleum gas industry, and the surface mining of coal and uranium. The National Park Service works with the Texas Railroad Commission to comply with safety regulations regarding such factors as the transport and storage of propane, pipeline safety, and the management and sealing of old oil wells.

The Texas Parks and Wildlife Department is responsible for the management and conservation of natural and cultural resources. Activities include providing outdoor recreation, managing parks and historic areas, and managing and protecting wildlife and wildlife habitat. Agency staff members work with the National Park Service to manage wildlife, ensure that species of management concern are considered in the parks' activities, issue hunting licenses, and coordinate wildlife and wildlife habitat issues that relate to the parks.

The Texas Archeological Research Laboratory keeps the archeological site files for the state. It assigns all site numbers for archeological sites in the parks.

County Jurisdictions

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are in parts of Hutchinson, Moore, and Potter Counties in Texas. The governments of these counties could affect the parks through regulations and policies relating to areas such as land use, roads, and service improvements. Texas counties do not have zoning authority, and no current county planning conflicts with the park management recommendations in this plan.

The metropolitan area associated with Amarillo is expanding and has the potential to influence many aspects of the parks, including dark skies and visitor numbers and expectations. The National Park Service will continue to work with Potter County on growth-related issues that could affect both parks.

Local Jurisdictions

Local planning in Fritch and Borger could encourage development through such actions as extending city utility services. However, only limited growth is expected in the populations of the counties that contain these communities between now and 2030 (Texas Water Development Board 2010a). No current local planning is in conflict with planning in the parks.

NEXT STEPS IN THE PLANNING PROCESS

FINALIZING THE PLAN

After distribution of the draft general management plan and environmental impact statement, there will be a 60-day public review and comment period. See the front of this document for instructions on how to comment.

After the comment period closes, the NPS planning team will evaluate comments from organizations, businesses, other agencies, and individuals regarding the draft plan. Appropriate changes will be incorporated into the final general management plan and environmental impact statement. The final plan will also include letters from governmental agencies and tribes (if applicable), any substantive comments on the draft document, and NPS responses to those comments.

Following distribution of the final plan and a 30-day no-action period, the "record of decision" will document the NPS selection of an alternative for implementation. Once the record of decision is signed, the plan would be implemented as funding and staffing allow.

IMPLEMENTATION OF THE PLAN

The approval of this plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. The implementation of the approved plan will depend on future funding, and it could be affected by factors such as changes in NPS staffing, visitor use patterns, and unanticipated environmental changes. Full implementation could be many years in the future.

Once the general management plan has been approved, additional feasibility studies and more detailed planning, environmental documentation, and consultations would be completed, as appropriate, before certain actions in the selected alternative would be carried out. Future program and implementation plans describing specific actions that managers intend to undertake and accomplish in the parks will tier from the desired conditions and long-term goals set forth in this general management plan.

CHAPTER 2:

ALTERNATIVES

INTRODUCTION

As noted in chapter 1, many aspects of the desired conditions of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are defined in the establishing legislation, the parks' purpose and significance statements, and the servicewide requirements and policies that apply to all units of the national park system. Within these parameters, the NPS planning team solicited input regarding each park's desired condition from the public, NPS staff, government agencies, and other organizations. The National Park Service then used this information to develop three planning alternatives for the national recreation area and three planning alternatives for the national monument. The alternatives for each park reflect the range of ideas proposed by the National Park Service and the public.

This chapter describes the management zones that define desired conditions for resources and visitor experiences in each park. It then presents the alternative approaches for managing each park for the next 15 to 20 years. Each alternative includes the concept, management zones, and costs. The no-action alternative does not include management zones.

For each park, the NPS planning process developed two action alternatives. At Lake Meredith National Recreation Area, the action alternatives are alternative 2 and alternative 3 (the NPS preferred alternative).

For Alibates Flint Quarries National Monument, alternative B (the NPS preferred alternative) and alternative C are the action alternatives.

This chapter also identifies mitigation measures that would be applied regardless of the alternatives selected, future plans that would be needed, and alternatives or actions that were not included in any of the alternatives, with explanations of why they were dismissed. The environmentally preferable alternative is identified, and tables are presented that highlight the differences among the alternatives and summarize their impacts.

FORMULATION OF ALTERNATIVES

Each general management plan alternative represents a different approach to managing the national recreation area or national monument. To develop the draft alternatives, the general management plan team considered the following:

- why Congress established the national recreation area and the national monument, including consideration of the purpose of each
- the hopes, interests, and concerns for the future of the parks that citizens shared during public meetings and through written comments
- how the national recreation area and national monument can be operated efficiently and effectively
- how the National Park Service can best manage the parks to provide visitor enjoyment while still meeting all requirements of laws and NPS policy (for example, at Lake Meredith National Recreation Area, how can the National Park Service continue to provide recreation opportunities in free-flowing segments of the Canadian River upstream from the lake pool while protecting the Arkansas River shiner, a federally designated endangered species?)

Sections 1502.14 and 1508.25 of the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act require that the alternative of no action be included in all environmental evaluations. Accordingly, the National Park Service developed no-action alternatives, designated alternative 1 for Lake Meredith National Recreation Area, and alternative A for Alibates Flint Quarries National Monument. The no-action alternative proposes a continuation of current management direction. The current management direction for the parkway is not based on management zones. Thus, it serves most importantly as a basis of comparison for the action alternatives.

The no-action alternatives do not necessarily meet all goals and objectives that are critical for the National Park Service to consider the general management plan successful. Under the no-action alternative, the National Park Service may also have difficulty satisfying some of each park's specific purposes, significance statements, or mission goals and some of the servicewide requirements and policies that were presented in chapter 1 and appendix C.

The two action alternatives for each park present different ways to address the issues, manage resources and visitor use, and improve facilities and infrastructure at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. A management concept was first developed for each action alternative. Consistent with its general concept, each action alternative was then designed so that it would meet all NPS general management planning goals and objectives and would facilitate meeting servicewide requirements and policies.

Within this framework at Lake Meredith National Recreation Area, the following two action alternatives were designed:

- Alternative 2 would focus on providing quality recreation, enhancing traditional activities, and improving resource protection.
- Alternative 3 (the NPS preferred alternative) would promote both legislated and nontraditional uses, developing facilities and opportunities to address changing conditions, including visitor uses and patterns. The National Park Service also would focus on partnership opportunities that employ science-based resource management and compatible land management uses.

Within this framework at Alibates Flint Quarries National Monument, the following two action alternatives were designed:

- Alternative B (the NPS preferred alternative) would expand interpretive and educational programs to provide a better understanding and appreciation of the role of the national monument's resources in the greater human story.
- Alternative C would provide a greater understanding and appreciation for archeological protection through enhanced educational opportunities and research and would accommodate a wider range of visitor uses and experiences.

Management zones identify desired conditions for park resources and visitor experiences in different areas of each park. Collectively, the management zones include the complete range of potential, appropriate resource conditions, visitor experiences, and facilities within the scope of each park's purpose and significance.

Each management zone employs a different approach for managing resources or uses in a specified area. Management approaches include desired conditions for the resources; intended visitor experiences; and appropriate kinds and levels of management, access, and development.

There are multiple ways to achieve the park's purpose, maintain its significance, and preserve its fundamental resources and values. The action alternatives would achieve this and embody the range of what the public and the National Park Service want to see accomplished at both parks with regard to managing park resources and addressing planning issues for natural and cultural resource conditions, visitor use and experience, and NPS management and operations.

Some actions considered by the planning team and discussed with the public, while consistent with the objectives of the plan in general and one or more of the alternatives in particular, have not been carried forward as actions under the alternatives. While the actions are consistent with the alternatives, they are not necessary for successful implementation of the alternative. In addition, it is unlikely that the parks could focus on and implement these actions in the timeframe of this general management plan. These actions are noted in the description of alternatives but are not part of the proposed actions in this plan. Therefore, they have not been included in the cost estimate for each alternative and the impacts of these actions were not analyzed in chapter 4. If the resources became available in the future to implement these actions, the National Park Service would complete any necessary environmental compliance prior to implementation of the action. However, because these actions already are consistent with the general management plan no amendment to the plan would be required.

Some management actions proposed by the public do not conform with NPS planning goals and objectives for the parks or conflict with servicewide requirements and policies. These actions, which were not incorporated into any of the alternatives, are discussed later in this chapter under "Alternatives and Actions Considered but Dismissed from Further Consideration."

CONSIDERATION OF BOUNDARY ADJUSTMENTS

The National Park and Recreation Act of 1978 requires general management plans to address whether boundary modifications should be made to park units. Boundary adjustments may be recommended to

- protect significant resources and values, or to enhance opportunities for public enjoyment related to park purposes

- address operational and management issues, such as the need for access or the need for boundaries to correspond to logical boundary delineations such as topographic or other natural features or roads
- otherwise protect park resources that are critical to fulfilling park purposes

Additionally, all recommendations for boundary changes must meet the following criteria:

- The added lands will be feasible to administer considering their size, configuration, and ownership; costs; the views of and impacts on local communities and surrounding jurisdictions; and other factors such as the presence of hazardous substances or exotic species.
- Other alternatives for management and resource protection are not adequate.

For a boundary adjustment to be recommended, at least one of criterion in the firsts group must be met, as well as both criteria in the second group.

With the consent of willing sellers or donors, the National Park Service may consider the acquisition of properties outside the current authorized boundaries provided that acquisition would expand NPS protection of sensitive resources or make a significant contribution to the purposes for which the parks were created. Boundary expansion would focus on areas that have unique features, provide access, and act as buffer zones. Where fee simple acquisition may not be feasible, protective easements would also be sought to provide buffer for areas adjoining the parks. The acquisition of any lands for visitor or operational facilities outside the existing NPS boundaries of the parks would likely require congressional approval.

In the case of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, no specific boundary adjustments were identified. Thus, none of the alternatives in this general management plan propose changes to the parks' boundaries. This plan does not preclude future consideration of boundary adjustments should needs or conditions change.

USER CAPACITY

The national parks contain natural and cultural resources of great importance to the nation, and the public has a high level of interest in seeing and experiencing these areas. However, visitors affect park resources and other visitors by their presence. Intentional or unintentional impacts of visitors have been observed on soils, water, vegetation, wildlife, soundscapes, and cultural resources in parks.

The concept of carrying capacity, or user capacity, is intended to safeguard the quality of both park resources and visitor experiences. Under the 1978 National Parks and Recreation Act (Public Law 95-625), the National Park Service is required to address the issue of user capacity in its general management plans. NPS management policies and planning standards acknowledge this responsibility.

The National Park Service defines user capacity as the types and level of visitor use that can, or should, be accommodated while sustaining desired resource conditions and visitor experiences that complement the purpose of a park. In addressing user capacity, the National Park Service identifies indicators, standards, and potential future management strategies, allocated by management zones. Managing user capacity in national parks is complex and depends not only on the number of visitors, but also on where they go, and the "footprints" they leave behind. Thus, when managing for user capacity, the park staff employs multiple management tools and strategies, rather than solely regulating the number of people in a park or simply establishing limits on visitor use.

User capacity for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, including indicators, standards, and management strategies, is discussed in detail after the descriptions of the alternatives. This discussion applies only to the two action alternatives for each park.

IDENTIFICATION OF THE NATIONAL PARK SERVICE PREFERRED ALTERNATIVE

The National Park Service uses a value analysis method called "Choosing by Advantages" to decide which general management plan alternative is the preferred alternative. The "Choosing by Advantages" process is a tool for determining the specific advantages each alternative would provide towards meeting specific park objectives. The advantages described in the process represent the benefits that would be gained under each alternative. The advantages for each alternative are compared to the expected costs to determine the cost/benefit ratio of each alternative. The alternative that provides the most benefit per dollar, with the least adverse environmental impacts, is the best value alternative and the one that is labeled "preferred" in this plan.

IDENTIFICATION OF THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

In addition to identifying the NPS preferred alternative, an environmentally preferable alternative is identified. Although the NPS preferred and environmentally preferable alternatives often are the same, there is no requirement that they match. Section 1505.2(b) of the Council on Environmental Quality's (1978) regulations implementing the National Environmental Policy Act requires the identification of the environmentally preferable alternative. The environmentally preferable alternative is "…the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." The environmentally preferable alternative is determined based on the results of the analysis of natural and cultural resource impacts described in chapter 4.

MANAGEMENT ZONES USED IN THE ACTION ALTERNATIVES

Management zones identify and describe the appropriate variety of resource conditions and visitor experiences that could be achieved and maintained in the parks. The placement of management zones will depend on the concept expressed in each alternative.

- Some management zones may be used in most or all of the action alternatives, but they are applied to different areas in different alternatives.
- Some management zones may be used in only one or two alternatives.

Management zoning is not part of the alternative of no action / continue current management for either park (alternative 1 for Lake Meredith National Recreation Area and alternative A for Alibates Flint Quarries National Monument). When top-level plans previously were prepared for each park in the 1960s and 1970s, management zoning was not a component of the NPS planning process.

The management zones developed for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument specify the natural and cultural resource conditions, visitor experiences, and kinds and levels of management, access, and development that are to be managed toward in the parks. Each of the action alternatives for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument consists of a combination of several of the 10 management zones described below.

Each management zone emphasizes different physical and biological conditions, as well as visitor opportunities and experiences. These factors then define the types of activities or facilities that are appropriate within the area to which the zone is applied.

Although the configuration of the management zones is different in each of the action alternatives, all action alternatives are designed to meet their respective park's purposes and significance statements plus all servicewide requirements and policies that were described earlier in this general management plan. For example, an archeological site will be protected, regardless of the zone in which it occurs. However, the *use* of that site for interpretive or educational purposes could vary, depending on the management zone applied to the site.

The 10 management zones used in the action alternatives are described in table 3 and include:

- water-based, motorized
- water-based, no wake
- swim/scuba
- cultural
- developed
- administrative
- motorized scenic
- off-road vehicle
- rural
- semi-primitive

APPLYING MANAGEMENT ZONES

Management concepts are different for each alternative. They broadly define the character of a park in terms of particular kinds of resource conditions and associated visitor experiences (the features of management zones). Different management concepts provide different approaches to addressing general management plan-level issues.

In formulating the alternatives, the management zones were placed in different locations or configurations on the map, according to the concept of each

alternative. That is, the management alternatives represent different ways to apply the management zones to the parks. For example, an alternative based on a concept of increasing camping and hiking opportunities for a broad range of skill levels would have more land assigned to zones that involve lower levels of development, such as rural or semi-primitive, than an alternative based on a concept of increasing motorized access throughout the national recreation area.

In some cases, the assignment of zones was guided by the locations of existing facilities. For example, the Sanford-Yake, Harbor Bay, Blue West, and Cedar Canyon areas in Lake Meredith National Recreation Area and the contact station for Alibates Flint Quarries National Monument contain parking lots, buildings, and other features that already support visitor activities and administrative services. Therefore, these areas were assigned to the developed zone in both action alternatives. Similarly, the existing paved roads in the parks were assigned to the motorized scenic corridor zone, and areas that historically have been inundated by the lake were placed in the water-based, motorized or water-based, no wake zones. Where water and land zones meet, the zone boundaries shown on the maps later in this chapter are fixed and do not change as water levels fluctuate.

The National Park Service inventoried environmental data, including natural, cultural, and scenic attributes. These resources were mapped, compared with locations for known activities and uses of the parks, and recorded in a geographical information systems (GIS) database. The maps helped guide the assignment of management zones to areas of the parks. For example, areas with existing development and administrative facilities were more likely to be managed as high-use areas that could accommodate potential new development, than previously undisturbed areas. Areas with limited vehicle access would be in a management zone that emphasized nonmotorized access by visitors and that minimized development.

Table 3: Management Zones for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument General Management Plan

Resource Conditions	Visitor Experience	Appropriate Activities and Facilities
Water-based, Motorized Zone		
In this area of lake inundation, the natural environment could be highly modified to accommodate visitor activities and facility development. As needed, significant or sensitive cultural and natural resources would be protected to minimize impacts. This area is managed as a water zone even when the lakebed is dry.	Interaction and encounters with other visitors and NPS staff would be common in a flat-water reservoir setting. Visitors could choose from an array of activities. Interaction with NPS staff on the water would likely be safety related.	Activities would include boating with motorized and nonmotorized vessels, fishing, waterskiing, swimming, and scuba diving. In season and during high water, water-based hunting may need boats to get into canyons. Consistent with its management as a water zone, wheeled vehicles are not allowed if there is dry lakebed. Facilities would be floating, such as a marina, boat docks, and/or boat fuel facility. A floating restroom and pump-out station could be possible in high water.
Water-based, No wake Zone		
The landscape could include lake flat-water, shallow coves, or relatively natural river channel, all with minimal development. As needed, significant or sensitive cultural and natural resources would be protected to minimize impacts. This area is managed as a water zone even when the lakebed is dry.	Visitors would expect a moderate level of interaction and encounters with other visitors and NPS staff. They could participate in an array of nonmotorized activities and motorized boating at no wake speed. Visitors could anticipate a safe recreational visit. Interaction with NPS staff on the water would likely be safety-related.	Activities would include the use of kayaks, canoes, sail-boards, paddle boats, and other nonmotorized watercraft in addition to motorized watercraft operating at no wake speeds. Visitors could also participate in activities such as swimming, scuba diving, fishing, nature observation, and hunting (such as for ducks) in season. Consistent with its management as a water zone, wheeled vehicles are not allowed if there is dry lakebed. This zone would not include any facilities on the water. However, it usually would be close to zones that provided easy access to the water via paved or dirt roads with nearby parking and, potentially, camping or picnicking.
Swim/Scuba Zone		
This zone would include both water and adjacent land areas. The natural environment would be highly modified and intensively managed to accommodate visitor activities and facility development. As needed, significant or sensitive cultural and natural resources would be protected to minimize impacts. Water quality would be monitored and actions would be taken as needed to mitigate water quality degradation. Capacity limits would be established and achieved by limiting facilities such as parking spaces or picnic tables.	Interaction and encounters with other visitors and NPS staff would be common in a park-like setting, with little or no opportunity for solitude. However, overcrowding would be avoided. Visitor services would be highly accessible and convenient. The level of physical exertion could range from low for activities such as picnicking to high for swimming. Education and interpretation would be accomplished using techniques such as wayside displays.	Water-based activities would include swimming, fishing, and scuba diving. Typical land-based activities would include picnicking, hiking, and nature observation. Because of the high concentrations of people, hunting would not be allowed. Developments on or in the water might include fishing piers and scuba targets for diving. Land-based facilities could include picnic tables, shade structures, fire grates, vault toilets, and trash receptacles. Access would be easy via parking areas near paved roads. This zone could accommodate small commercial services.

Table 3 (continued): Management Zones for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument General Management Plan

Resource Conditions	Visitor Experience	Appropriate Activities and Facilities
Developed Zone		
The natural environment could be highly modified, but development would be located away from sensitive areas. Most visitor services would be in this zone. Facilities would be designed to accommodate land- and water-based activities and a high percentage of the parks' visitors. Future development or expansion of visitor use areas would be on previously disturbed land to the maximum feasible extent and would incorporate sustainable design and low-impact features. Any new facilities would be designed to complement the surrounding landscape. Partnership activities or facilities could be accommodated in this zone.	Developed visitor facilities for day and overnight use would concentrate most of the parks' visitors in these areas. Visitors would experience high levels of interaction with other users. Developed comfort facilities would be available, and visitors would not have to pack out trash or plan for extended time away from facilities and commercial services. Personal and nonpersonal interpretive services would be provided to visitors. Orientation would inform visitors of other areas and opportunities. Visitors would expect that rangers would respond to calls for assistance within a reasonable time.	Activities would include camping and picnicking, nature observation, viewing programs at the amphitheater, and visiting contact stations and other interpretive facilities. Appropriate water-related activities would include boat launching and recovery; shoreline fishing; and land use associated with swimming, wading, and scuba diving. Facilities would include but not be limited to campgrounds, picnic areas, the amphitheatre, trailheads and walkways designed to comply with the Architectural Barriers Act Accessibility Standard, visitor contact stations, waysides, kiosks, and small covered demonstration area for talks on subjects such as safety, weather, or interpretation. Near-shore facilities would include boat launch ramps and docks that would provide access to the lake. Other facilities could include fish-cleaning stations and the land-based portion of the marina. Developed use areas would be easily accessible using maintained paved and unpaved roads and parking areas. Developed trails with waysides and guides or brochures would provide interpretation of resources and identification of opportunities. Commercial visitor services could be available.
Administrative Zone		
Administrative facilities would be in this zone. Any new facilities in this zone would be on previously disturbed lands to the maximum feasible extent. Designs and construction would complement surrounding topography and would take advantage of energy efficiency and sustainable design standards. The National Park Service would seek to avoid or minimize any disturbance of significant or sensitive cultural and natural resources.	These areas would not be intended for visitor use except for official visitors or NPS business. If visitor facilities, such as a visitor center or contact station, were incorporated into a future administrative structure, development would be designed to accommodate both functions.	Activities would include support for park operations. Facilities could include existing or new development. They would provide adequate space and facilities to support planned park operations and management.
Rural Zone		
Natural conditions would predominate, but with modifications to accommodate moderate visitor use. Effects of concentrated visitor use in areas such as campsites would be monitored, with mitigation as needed.	Visitors would expect to see other visitors and their vehicles and would have a moderate level of interaction with other visitors, particularly on weekends. However, visitors willing to walk away from roads could find solitude and quiet with	Activities would include driving for pleasure on paved and unpaved roads, hunting, camping in tents or vehicles in a rustic setting, hiking, nature observation, biking, and

Table 3 (continued): Management Zones for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument General Management Plan

Resource Conditions	Visitor Experience	Appropriate Activities and Facilities
Management actions could include temporary closures or limitations on levels of use. Significant or sensitive cultural and natural resources would be protected to minimize impacts.	a sense of remoteness. Low-profile signs and exhibit panels would provide a limited amount of interpretation and education. Short interpretive trails could allow visitors to discover areas of special interest.	horseback riding. Oil and gas production would continue. Facilities could include contact stations, paved and unpaved roads, vault toilets, picnic tables, fire grates, trash receptacles, and wayside interpretation exhibits. Short interpretive trails could allow visitors to discover areas of special interest. Longer hiking trails could connect with other areas and would be accessed from trailheads with parking lots.
Semi-primitive Zone		
In this area of nonmotorized access, the landscape would be predominantly natural, and facilities would blend with the surroundings. The emphasis would be on minimizing human impacts on sensitive environments and species. Resources and uses would be monitored, and mitigation would be used when undesirable conditions were indicated. Management actions could include use restrictions or active restoration of natural vegetation. Semi-primitive islands in the lake would be for foot traffic only.	Visitors would expect occasional encounters with others but would see only limited evidence of human use. Except for views of the lake and distant sounds from boat and aircraft engines and from oil and gas production, natural sights and sounds would predominate. Visitors would have the opportunity to experience solitude, tranquility, and quiet, and to interact with nature. Knowledge of basic outdoors skills would be recommended in an area that could provide physical challenges, with access ranging from moderate to difficult.	Activities would include hiking, hunting, backpacking, primitive camping, nature observation, biking, and horseback riding. Oil and gas production would continue. Visitor travel would be on foot, bicycle, or horseback. A system of improved and primitive trails, some of which could follow former road alignments, would provide visitor access. The only motorized travel would be for administrative purposes, including NPS functions and oil and gas production. New roads would not be constructed to provide access into currently unroaded canyons. In areas with multiple roads, some could be closed. Primitive campgrounds may be designated in some areas. Signs may provide direction and some interpretation.

Table 3 (continued): Management Zones for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument General Management Plan

Resource Conditions	Visitor Experience	Appropriate Activities and Facilities
Cultural Zone		
This zone would be managed to provide a high level of resource protection. Some impacts could be allowed for interpretation; for example, one or more quarries could be excavated, or access could be provided to the McBride Ranch House for interpretation and education. All other significant or sensitive cultural and natural resources would be managed to minimize impacts.	Visitors would be provided with moderately to highly controlled interpretive and educational opportunities. Recreation activities would be limited. Visitors would expect moderate to high levels of interaction and encounters with other visitors and NPS staff.	Activities primarily would include guided walks or hikes on established trails, but there could be self-discovery options. Archeological research would be permitted. Access to cultural sites and landscapes would be controlled. Development could include trails, waysides, and shade-shelters with benches. Most visitors would access the area by foot, although visitors with impaired mobility could join guided tours that could take them closer to interpretive sites by car, although some assistance to get to the sites would still be required.
Off-road Vehicle Zone		
Visitors, sites, and trails would be intensively managed to ensure resource protection and public safety. Naturally functioning ecosystem components and processes would predominate. Resources could be modified to provide recreation such as trails and facilities and would be designed to harmonize with the natural environment. Except along designated routes, tolerance for resource degradation would be low. Along the routes, resource degradation would be monitored and managed.	Visitors would expect a high potential for contact with other visitors and NPS staff. During busy periods, it would be a noisy, active place, but during the off-season, many areas could be relatively quiet, particularly on weekdays. Visitors could anticipate a safe, controlled opportunity to enjoy and appreciate motorized recreation in a less-developed environment.	Within this zone, visitors could participate in dispersed recreation activities that would include riding off-road vehicles in defined areas. Other activities would include camping, picnicking, and nature observation. Facilities would include campsites, outback toilets, and signs or other features to designate off-road vehicle routes.
Motorized Scenic Corridor		
This zone applies to vehicle corridors with a developed road that passes through natural settings.	These corridors would be intended primarily for access by automobile and bicycle, although some visitors may travel them on foot. Visitors would experience diverse, scenic landscapes and frequent encounters with other people and vehicles.	Activities primarily would include scenic driving and biking, and wildlife viewing. Facilities would include roads, signs, and pullouts.

USER CAPACITY

OVERVIEW

General management plans for national park system units are required by law to identify and address implementation commitments for user capacity, also known as carrying capacity. The National Park Service defines user capacity as the types and levels of visitor use that can be accommodated while sustaining the quality of park resources and visitor experiences consistent with the purposes of the park. Managing user capacity in national parks is inherently complex and depends not only on the number of visitors but also on where the visitors go, what they do, and the "footprints" they leave behind. In managing user capacity, NPS staff and partners employ a variety of management tools and strategies rather than relying solely on regulating the number of people in a park area. In addition, the ever-changing nature of visitor use in parks requires an adaptive approach to user capacity management.

The foundations for making user capacity decisions in this general management plan are the purpose, significance, special mandates, and management zones associated with each of the parks. The first three define why each park was established and identify the most important resources, values, and visitor opportunities that would be protected and provided. The management zones in each action alternative describe the desired resource conditions and visitor experiences, including appropriate types of activities and general use levels, for different locations in the parks. The zones, as applied in the alternatives, are consistent with, and help the National Park Service achieve, each park's specific purpose, significance, and special mandates. As part of the National Park Service's commitment to implementing user capacity, the park staff would abide by these directives for guiding the types and levels of visitor use that would be accommodated while sustaining the quality of park resources and visitor experiences consistent with the park's purposes.

This section provides indicators and standards for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. Indicators and standards are measureable features that would be monitored to track changes in resource conditions and visitor experiences. The indicators and standards help the National Park Service ensure that desired conditions are being attained, supporting the fulfillment of the park's legislative and policy requirements. The general management plan also identifies the types of management actions that would be taken to achieve desired conditions and related legislative and policy requirements.

Table 4 includes the indicators, standards, and potential future management strategies, allocated by management zones, which would be implemented. Many potential issues and related indicators that would identify impacts of concern were considered, but those in the table were most significant, based on the importance and vulnerability of the resource or visitor experience affected by visitor use. The planning team also reviewed the experiences of other parks with similar issues to help identify meaningful indicators.

After the most appropriate indicators were identified, standards that represent the minimum acceptable condition for each indicator were assigned. The standards incorporate qualitative descriptions of the desired conditions, data on existing conditions, relevant research studies, staff management experience, and scoping on public preferences.

Table 4: Summary of User Capacity Indicators, Standards, and Potential Management Strategies

Indicator	Zone	Standard	Management Strategies
Percent of flint removed from a representative sample per 500 visitors at designated sampling sites	Cultural	No more than 5% of flint removed from sample sites per 500 visitors	Education (difference between sites over time, less flint over time) Signage Formalized interpretive programs Have more than one ranger on a tour at a time Clearer demarcation of trail (for example, use post and rope markers, boardwalks, or curbs) Reduce the number of visitors on tours
Trail condition class assessment	Developed Rural Semi-primitive	Designated trails will not exceed condition class 2 (to be measured annually)	Leave No Trace education Make sure that trails are clearly marked Install additional signs Use roving ranger patrols on the trails Remotely monitor trails (for example, with cameras)
Number of breaches to the designated boundary per month	Off-road vehicle Semi-primitive	No more than six breaches of designated off-road vehicle boundary per month	Educate users on impacts of leaving designated off-road vehicle areas Remotely monitor trails (for example, with cameras) Require permits Implement temporary closures
Change in campsite condition class	Developed Off-road vehicle Rural Semi-primitive	No less than 15% above condition class 4 based on site condition assessment (to be measured annually)	Educate visitors in a program that includes the use of designated sites and the prohibition on camping outside designated areas; tools could include flyers, press releases, public events such as with hunters, and information postings at the visitor contact station and on waysides Mark designated campsites, survey with global positioning system equipment, and incorporate the results in the geographic information system to provide a baseline Increase enforcement
Number of incidences of camping outside designated areas	Developed Off-road vehicle Rural Semi-primitive	Zero tolerance for camping in undesignated areas	Same as strategies for change in campsite condition class
Number of ticketed incidents related to damage of park resources per six-month period	Parkwide	No more than one ticketed violations related to park resources per six-month period	Provide pre-incident education Increase patrols based on locations of incidents / increase number of signs Implement more intensive mitigation measures based on resource impacted, such as applying coating that prevents graffiti from sticking, or rerouting trails Close facilities or areas if incidents continue
Number of incidences of vehicles traveling outside the designated road or route	Cultural Developed Off-road vehicle Rural	Three informal roads within 0.5 mile of designated road or route	Educate visitors to increase awareness of the impacts associated with travelling on undesignated roads Increase number of signs, with Carsonite® poles Increase the number of patrols Close area to mitigate resource damage Physical damage and productivity

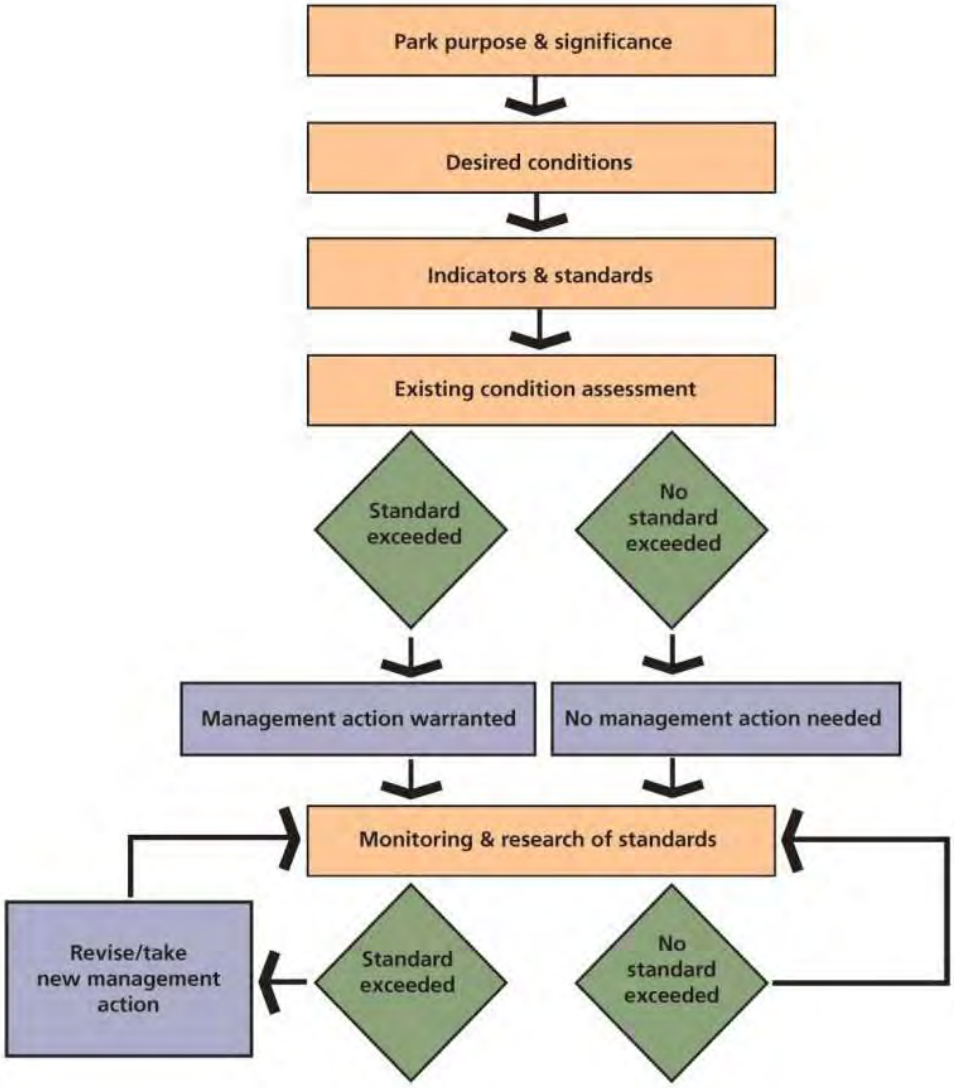
User capacity decision making is a form of adaptive management (see figure 4) in that it is an iterative process in which management decisions are continuously informed and improved. Indicators are monitored and adjustments are made as appropriate. As monitoring of conditions continues, managers may decide to modify or add indicators if better ways are found to measure important changes in resource and social conditions. Information on NPS monitoring efforts of visitor use management actions, and any changes to the indicators and standards, would be available to the public.

INDICATORS AND STANDARDS

The priority indicators for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are associated with the following issues:

- visitor removal of flint from Alibates Flint Quarries National Monument
- designated, nonmotorized trails within a defined trail class condition
- breaches of designated boundaries of off-road vehicle use areas

Figure 4: User Capacity Framework



- designated campsites within a defined condition class
- camping outside designated areas
- incidences of ticketed violations regarding damage to park resources
- social roads off the designated road or route

Visitor Removal of Flint from Alibates Flint Quarries National Monument

Visitor use impacts on irreplaceable archeological sites include intentional and unintentional disturbances and theft of archeological resources, such as Alibates flint. These resources are nonrenewable, so impacts, especially those resulting from unlawful behavior, must be minimized to the extent possible.

The national monument staff is already using internal guidelines to monitor cultural resources; these would now include the loss of flint related to visitor theft. The indicator for visitor impacts to the flint quarries is based on this existing monitoring protocol. Management efforts would focus on maintaining the integrity and condition of all sites within the quarries, so the standard has been set at no more than 5% of flint removed from established sample sites per 500 visitors. Possible management strategies to ensure that this standard is maintained include continuing visitor education and enforcement of national monument regulations, increasing the number of formal ranger programs to reduce the amount of people per group, and fencing and potentially closing particularly vulnerable areas.

Designated, Nonmotorized Trails within a Defined Trail Class Condition

Trails, particularly in Lake Meredith National Recreation Area, are susceptible to overuse, which leads to erosion, compaction, and visitor created trails. These impacts degrade the area adjacent to the trail and also lead to a diminished visitor experience. Conditions such as muddiness, standing water, and exposed tree roots are common on overused trails.

The trail condition class system of Leung and Marion (2000) would be used to monitor visitor impacts. The condition class is rated on a scale of 1 to 5, with 1 being a barely discernable trail and 5 being a highly eroded trail, often beyond repair. To protect the nonmotorized trails from impacts associated with overuse, the standard is that the trails in the developed, semi-primitive, and rural zones would not go above a condition class 2. If the condition of the trails begins to deteriorate, managers can increase the amount of Leave No Trace education that visitors receive. Clearly marking all trails and ensuring sufficient signs along the trail may also help keep the trails within standard. If the standard is consistently near or over standard, managers may consider roving patrol of the trails or placing remote cameras in problem areas. In extreme cases, the trails may need to be temporarily or permanently closed to visitor use to allow recovery of the area.

Breaches of Designated Boundaries of Off-road Vehicle Use Areas

Lake Meredith National Recreation Area includes two designated areas for off-road vehicle use. Each is enclosed by a fence along most of the official NPS boundary.

The lands adjacent to the national recreation area are primarily private property that accommodates a wide variety of uses. Entry into the national recreation area by off-road vehicles from these private lands is a long-time problem. Trespassing often is accompanied by vandalism, which mostly involves cutting and/or destroying national recreation area fences. Monitoring this activity may reveal access and use patterns of the off-road vehicle users who improperly enter the national recreation area.

NPS staff have a protocol for monitoring the fence line of the parks in the off-road vehicle areas. This protocol would serve as the basis for an indicator measuring the

number of intentional breaches to the designated national recreation area boundary. The standard is no more than six breeches of the designated boundary per month.

If the standards are violated, an important management strategy would involve developing stronger relationships with surrounding landowners and creating a neighborhood watch program to foster a sense of stewardship. Managers may also consider increasing the number of patrols of the fence line and placing remote cameras in known problem areas. If these management actions are unsuccessful, managers may consider a permit system for off-road vehicle use. If the standard is continually exceeded, permanent or temporary closures may be necessary.

Designated Campsites within a Defined Condition Class

Campsites within the national recreation area are susceptible to overuse, which leads to natural resource damage such as erosion, compaction, vegetation loss, and damage to trees. Overuse also affects social factors such as cleanliness of the site (for example, the amount of litter). These impacts also can degrade the area adjacent to the campsites, which can lead to a diminished visitor experience.

A campsite condition class system, such as those from Frissell (1978) or Marion (1991), can be used to monitor visitor impacts. The condition class is rated on a scale of 1 to 5, with 1 representing a condition where the vegetation in the campsite is not permanently damaged and there is minimal physical change to the site, and 5 being a highly eroded site that may be beyond repair, with trees that are highly impacted or dead. A standard of condition class 4 would be used to protect campsites in Lake Meredith National Recreation Area from impacts associated with overuse and to rehabilitate already affected sites.

If the conditions of the campsites begin to degrade, park managers can increase the amount of Leave No Trace education that visitors receive. A public outreach program focused on hunters may be incorporated to convey the importance of camping in designated sites and following the campsite regulations. Clearly marking all campsites and making sure there is adequate signage may also help keep the campsites within standard. If the sites are consistently near or over standard, park mangers may consider roving patrols of the campgrounds or placing remote cameras in problem areas. In extreme cases, the campsites may need to be temporarily or permanently closed to visitor use to allow recovery of the area.

Camping outside Designated Areas

The national recreation area provides visitors with a spectrum of camping opportunities, from developed camping at Sanford-Yake and Fritch Fortress to more primitive options in McBride Canyon and Mullinaw Creek. However, some visitors create their own campsites in the national recreation area, particularly in the areas that would be in the developed, off-road vehicle, rural, and semi-primitive zones.

The impacts caused by visitors creating their own campsites are similar to those related to overuse of existing campsites. They include natural and cultural resource damage such as erosion, compaction, vegetation loss, damage to trees, and loss of cultural site integrity. Undesignated sites also impact social factors, such as the amount of litter and improper disposal of human waste. These impacts also degrade the areas adjacent to the undesignated campsites and can lead to a diminished visitor experience. If designated campsites are maintained or improved, visitors may find it less attractive to create their own campsites.

An indicator measuring the number of incidences of visitors camping outside designated areas was developed. The standard would be zero tolerance for visitors camping in undesignated areas. This standard is intentionally stringent, and many of the potential management

strategies would need to be implemented immediately, such as a visitor education campaign to convey the importance of camping only in designated areas, which are available throughout the national recreation area. Managers may also consider clearly marking designated campsites and increasing enforcement to ensure visitors are staying in designated campsites only.

Incidences of Ticketed Violations Regarding Damage to Park Resources

Natural and cultural resources are vulnerable to intentional acts of vandalism, such as cutting trees or applying graffiti on rocks or historical structures. Park assets, such as bathrooms, signs, and buildings are also susceptible to intentional vandalism.

The NPS staff is already tracking this visitor impact on park resources. The indicator for incidences of ticketed violation regarding damage to park resources is based on this existing monitoring protocol. Management efforts would be focused on maintaining the integrity and condition of all park resources by not allowing more than one incident of a ticketed violation regarding damage to park resources every six months.

To ensure that this standard is maintained, visitor education and enforcement of park regulations would be continued. Other actions could include an increase in surveillance and possible closure of particularly vulnerable areas.

Social Roads off the Designated Road or Route

Visitors driving off designated roads can cause erosion, compaction of soils, loss of vegetation, and the creation of disturbed areas that are prime habitat for invasive species. Visitor-created roads leading to precarious overlooks, areas of loose rock, and sensitive cultural and natural areas also are a concern for NPS staff because of concerns about safety and the potential for damage to resources.

Monitoring the number of visitor-created roads per year would allow staff to ensure that the resources adjacent to designated roads are not being adversely impacted. The standard of three visitor-created roads within a half-mile of the designated road, per year was chosen because of its flexibility in measuring several visitor impacts (such as erosion or compaction) at once.

If the standard for this indicator is exceeded and it is determined that unauthorized roads are caused by visitor use, management strategies would include visitor education, increased enforcement, improved delineation of designated roads and overlooks, redesign and relocation of roads and overlook areas, closure and revegetation of unauthorized roads, formalization of unauthorized roads to accommodate visitor interest, installation of temporary or permanent signs, and limited or reduced types and levels of use. If the standard is continually violated, temporary or permanent road closures may be considered.

LONG-TERM MONITORING

NPS staff would continue monitoring use levels and patterns throughout Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. In addition, NPS staff would monitor these user capacity indicators. The rigor of monitoring the indicators, such as the frequency of monitoring cycles and the geographic area monitored, might vary considerably, depending on how close existing conditions are to the standards. If the existing conditions are well below the standard, the rigor of monitoring might be less than if the existing conditions are close to or trending toward the standard.

Initial monitoring of the indicators would determine if the indicators are accurately measuring the conditions of concern and if the standards truly represent the

minimally acceptable condition of the indicator. NPS staff might decide to modify the indicators or standards and revise the monitoring program if better ways are found to measure changes caused by visitor use. Most of these types of changes should be made within the first several years of initiating monitoring. After this initial testing period, adjustments would be less likely.

If use levels and patterns change appreciably, NPS staff might need to identify new indicators to ensure that desired conditions are achieved and maintained. This iterative learning and refining process, a form of adaptive management, is a strength of the NPS user capacity management program.

LAKE MEREDITH NATIONAL RECREATION AREA
ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

CONCEPT

The National Park Service would continue current management approaches. Few additional facilities or amenities would be provided. Some infrastructure not being used would be removed. Staff at the national recreation area would continue to pursue partnerships to enhance outreach both within and outside the national recreation area boundary. A summary of the features of this alternative is provided in a table at the end of this chapter.

FACILITIES AND ASSOCIATED VISITOR ACTIVITIES

Administrative and Operations Facilities

The following facilities would remain in separate locations under alternative 1:

- The *headquarters and visitor information building* would stay in Fritch, outside the national recreation area boundary.
- The *fire cache facility* would remain south of Sanford Dam near the Canadian River Municipal Water Authority headquarters.
- The *maintenance facility* would stay at its current site within the national recreation area boundary off Sanford-Yake Road.
- The *ranger station and law enforcement facilities* would remain within the maintenance compound off Sanford-Yake Road. With regard to visitor services, the ranger station serves strictly as an information area providing national recreation area brochures.

Issues associated with the current locations of the NPS administrative and other support facilities would continue to include the following:

- Although more than half of the headquarters and visitor information building is occupied by NPS staff offices, the space is too small. Additionally, the building lacks space for research, training, or interpretation relating to the parks' museum collections.
- The headquarters and visitor information building lacks flexibility to meet interpretive needs such as space for environmental, cultural, and outreach education.
- Problems associated with ineffective layout are encountered by visitor protection, maintenance, and wildland fire management staff members, who are located in separate facilities within the national recreation area boundary.
- The separate locations of headquarters and support operations create inefficiencies because staff must travel to attend meetings or consult with other staff. This also results in higher vehicle maintenance and gasoline costs.

Developed Areas

Developed areas are shown on figure 5 and are described below, starting at Sanford Dam and moving clockwise around the lake. Developed areas at Lake Meredith National Recreation Area would continue to provide the following facilities and activities.

Spring Canyon, which is below the dam, would continue to offer day use, including fishing and swimming in the stilling basin, picnicking, and hiking. Facilities would continue to include picnic sites, primitive toilets, and a parking lot, boardwalk, swim beach, and fishing pier. Additional primitive toilets could be installed here if the need was indicated by high visitation numbers.

The *Sanford-Yake* area would continue to offer camping at 49 developed sites that provide tables, shade structures, and grills. Bathrooms have flush toilets and potable water. Boat launch facilities, supported by two large parking lots that can handle 150 or more vehicles (depending on how many have trailers), would continue to provide lake access, water levels permitting. The water tower in this area could be removed as part of alternative 1.

During periods of high water, a marina or marina-type service at Lake Meredith, accessed from Sanford-Yake, could be operated through a commercial visitor service agreement including a concession contract or a commercial use authorization. The marina could include indoor and outdoor fishing docks, a courtesy dock, monthly and overnight slip rentals, boat rentals, a dump station, phone, fuel, a limited grocery, and fishing supplies. Whenever there was sufficient water, the National Park Service could continue provide a floating boat dock with about 10 slips and a covered fishing pier at the end of the boat dock.

Cedar Canyon is a small cove between Sanford-Yake and Fritch Fortress. The area features beach camping but no developed campsites. Facilities include bathrooms with flush toilets and potable water, parking, and picnic tables. A courtesy dock and launch ramp (which are useable when the lake level is above about 2,885 feet above mean sea level) also are present. All of these facilities would be maintained with the implementation of alternative 1.

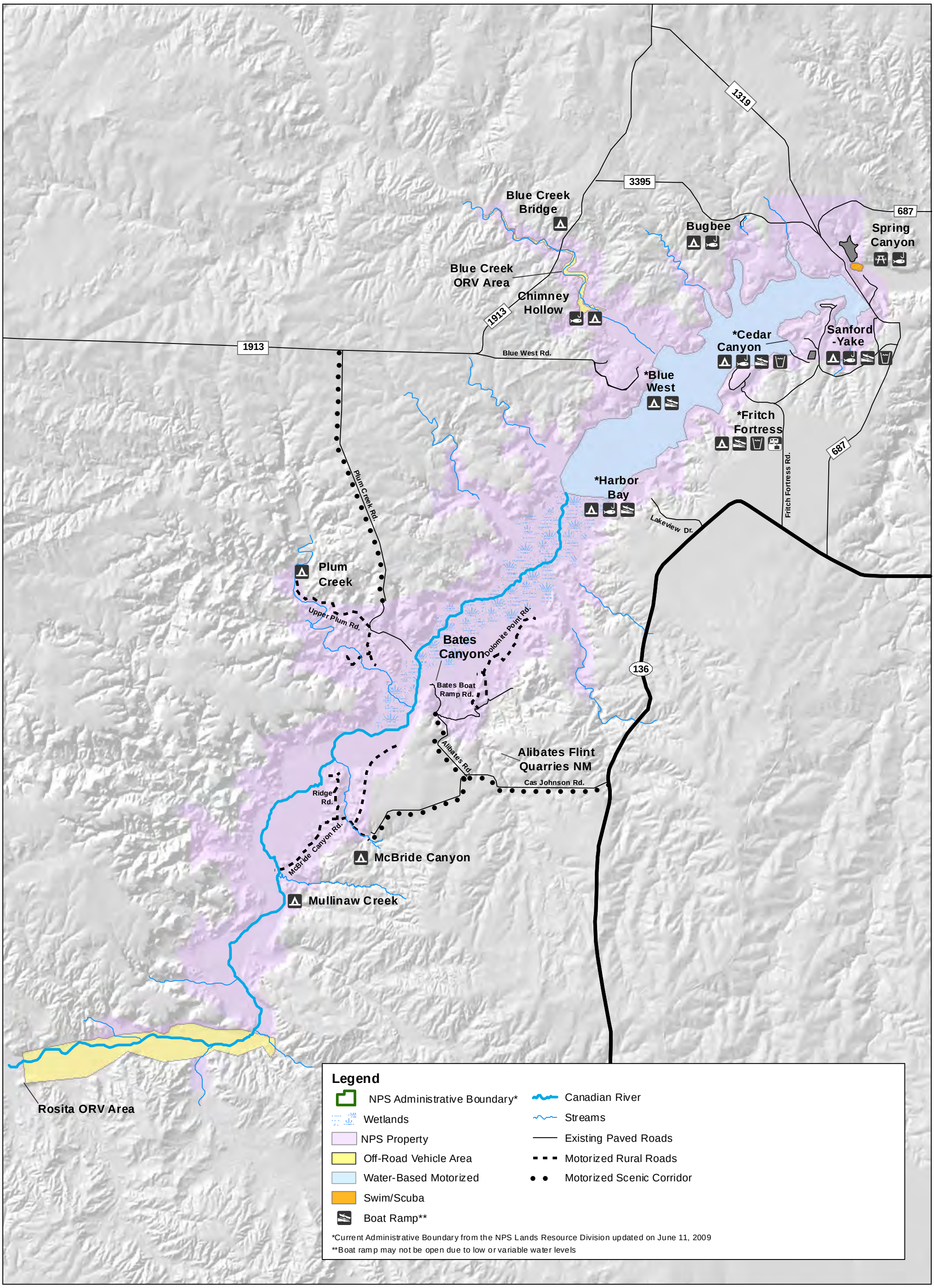
At *Fritch Fortress*, the 10-site campground would remain in use, along with the bathrooms with flush toilets and potable water, parking lots, courtesy dock, and boat ramp, which is functional when the lake level is above about 2,858 feet above mean sea level. The Fritch Fortress amphitheater would continue to be used by the National Park Service for seasonal programming and special events.

Harbor Bay would continue to provide camping in a large, open area near the lake shore and about six developed sites farther from the shore. Facilities include primitive toilets and some picnic tables. The smaller boat ramp would be usable whenever lake levels were at 2,867 feet above mean sea level, and the main boat ramp would be available when the water was at least 2,880 feet above mean sea level. Depending on water levels, fishing and windsurfing would continue to be popular activities in this area.

Preparation is underway for a new *multi-use trail* on the south side of the lake. Construction will start at Harbor Bay, with phased development to the north and south to create a primitive trail suitable for pedestrian and bicycle use from Fritch Fortress to South Turkey Creek (NPS 2010b). Although the direct distance between its farthest points is about 7 miles, the total trail length will be about 22 miles because it generally will follow the topography and have several loops that will enhance its attractiveness for shorter trips. This trail is included in all alternatives.

The *Alibates Flint Quarries National Monument visitor contact station* is on an upland site within the boundaries of Lake Meredith National Recreation Area. The parking lot, flush toilets, contact station, and auditorium would continue to be open to visitors whenever staff resources were available, with the use of seasonal staff to ensure that this facility normally would be open during periods of highest visitation. A lockable gate would continue to prevent unrestricted visitor access to the quarries. *Dolomite Point Road*, which is north of the contact station, would continue to be a popular location for scenic driving because of the views it provides of the Canadian River breaks.

The *Bates Canyon* area has a parking lot and a boat ramp. This ramp was only useable for a short time and for shallow-draft boats. Because of their limited utility, the parking lot and boat ramp would be removed. This action could continue under alternative 1.



N

0 2.5 5 Kilometers

0 2.5 5 Miles

Figure 5: Alternative 1 - No Action

Lake Meredith National Recreation Area, Texas

United States Department of the Interior / National Park Service

Intermountain Region Geographic Resources Program Denver, Colorado September 2011

McBride Canyon and *Mullinaw Creek* have undeveloped campgrounds where visitors would continue to recreate using the picnic tables, grills, primitive toilets, and horse corrals. When the lake was low, this area would continue to provide a river crossing point for hunters during the hunting season.

The 1903 *McBride Ranch House* in McBride Canyon is listed in the National Register of Historic Places and is associated with historical ranching in the area. Under alternative 1, the McBride Ranch House would remain fenced and closed to visitors.

The *Mullinaw Trail*, which begins at a trailhead in the Mullinaw campground, would continue to be available to visitors. However, erosion problems would continue, particularly on the Mullinaw Trail, where they could lead to limits on use.

Rosita would remain a designated off-road vehicle use area that also would continue to provide other recreation, such as camping and hiking. This area would continue to be undeveloped, with no picnic tables, toilets, or running water. Existing hunter and backcountry access would be maintained. Management of Rosita would continue to be in accordance with the national recreation area's off-road vehicle management plan (NPS 2012a).

Plum Creek would continue to have a campground that serves as a center for activities such as horseback riding, hiking, and bicycling. In the autumn, it would continue to provide access for hunting. *Devil's Canyon Trail* would continue to be popular, particularly on weekends. Facilities at Plum Creek include picnic tables, grills, a primitive toilet, horse corrals, and a solar powered water well. A small boat ramp in this area is usable when the lake level is at 2,913 feet above mean sea level, but that is close to the lake's record high water, so it has rarely been used.

Blue West has 19 developed campsites, but after the size optimization that is part of this alternative, it would have 10 sites with picnic tables, shade shelters, grills, and primitive toilets. This campground has excellent views of the Canadian River breaks and the upper part of the lake. A boat ramp and courtesy dock are usable when the lake level is above 2,883 feet above mean sea level. Blue West is used primarily for camping and for boating access when lake levels are sufficiently high.

Chimney Hollow is in a cove created by the inundation of lower Blue Creek. Facilities at this remote, semideveloped campground would continue to include a primitive toilet and picnic tables. Camping is the primary activity and, when lake levels are high enough, the area is popular for shoreline fishing.

The *Blue Creek* area has a campground and is popular for horseback riding and off-road vehicle use (in the creek bed only). Facilities would continue to include picnic tables, grills, and a primitive toilet. Under alternative 1, additional primitive toilets may be installed if warranted by visitation numbers. Management of off-road vehicle use would continue to be in accordance with the national recreation area's off-road vehicle management plan (NPS 2012a).

Blue East, which is across the Blue Creek cove from Chimney Hollow, would continue to be maintained as a primitive campground only accessible by boat.

Bugbee would continue to provide camping and shoreline fishing, with facilities that include a primitive toilet and picnic tables.

Depending on lake levels, a *new boat ramp* is being considered by the National Park Service for an as-yet-undetermined site on the northwest side of the lake near the dam. Because planning began before the start of this general management plan, this ramp could be constructed as part of alternative 1.

The Lake

All parts of Lake Meredith would continue to be accessible by motorized and nonmotorized vessels traveling at safe speeds and operating in a manner consistent with Texas boating regulations. The islands in the lake would continue to be used for hiking. In periods of low water, motor vehicles are not allowed to drive in the lakebed.

Roads

The management of the national recreation area's roads would not change. The current road system includes state-managed farm to market roads (see figure 5); county-managed roads, including Cas Johnson Road, Plum Creek Road, and Blue West Road; and an extensive network of NPS-managed roads. Visitors could drive on all paved and dirt roads in the national recreation area, including the multiple roads that sometimes access the same destination and roads that were developed primarily to service oil and gas production facilities. As needed, the National Park Service would continue to take management action, which sometimes could include road closures, to address resource concerns such as soil erosion.

NATURAL RESOURCES

The management of threatened or endangered species and other species of concern would continue to comply with requirements and direction from federal and state laws and regulations, and with NPS policy (NPS 2006b). Other native species of management concern, such as rare, declining, sensitive, or unique species and their habitats, would continue to be managed to maintain or expand their distribution and abundance. Habitats within the national recreation area would continue to be fragmented by the existing dirt road network.

Exotic species would continue to be managed under the current program to extirpate exotic species (primarily saltcedar, Russian thistle, and kochia) and to restore native short-grass prairie. Cottonwood trees would continue to be replanted if necessary and as conditions permit. Mesquite would continue to be managed through thinning or burning, as described in the parks' fire management plan.

Hunting would continue to be allowed in parts of the national recreation area. All seasons and bag limits would conform with Texas hunting regulations. The National Park Service would continue to publish a hunting map that shows areas open to hunting. Although hunters would be responsible for being aware of their location, current problems of entering and illegally hunting on adjoining land, including private land and land in Alibates Flint Quarries National Monument, probably would continue.

A program to prevent the introduction of zebra and quagga mussels into Lake Meredith could be implemented. This could include the addition of decontamination equipment for boats and trailers before they were allowed to use boat ramps.

There would be no changes in the management of wetlands, floodplains, and aquatic environments under the no-action alternative. The National Park Service would continue to comply with federal laws and servicewide management policies, including *Management Policies 2006;* Director's Order 77-1, Wetland Protection; Director's Order 77-2, Floodplain Management; and their associated procedural manuals (NPS 2002a, 2004b, 2006b, and 2008d).

Lake Meredith would continue to be operated as a municipal water supply reservoir. Water quality and quantity would continue to be managed by the Canadian River Municipal Water Authority.

CULTURAL RESOURCES

Archeological sites would continue to be managed according to the standards of the

Secretary of the Interior (1995), Director's Order 28: *Cultural Resource Management* (NPS 1998), and Director's Order 28A: *Archeology* (NPS 2004a). The continuation of existing management practices would include

- inventorying resources to establish a baseline against which future conditions can be compared to determine change
- maintaining most sites in an unmarked condition for their protection
- monitoring for stable conditions and taking action whenever the need was indicated

Historic structures would continue to be managed in accordance with Director's Order 28: *Cultural Resource Management* (NPS 1998). The McBride Ranch House, which is listed in the National Register of Historic Places, would continue to be protected by fencing and would be closed to visitors. As necessary, preservation would continue in accordance with the standards of the Secretary of the Interior (1995). Historic structures such as remnants of historical ranching activities and former oil and gas production sites, would be documented and assessed for national register eligibility. Sites that are adequately stabilized and not at risk of disturbance by visitor use would be preserved and managed as discovery sites, providing visitors with opportunities for unguided site access and exploration.

The cultural landscape around the McBride Ranch House would continue to be managed as though it were eligible for listing. This would include protecting the canyon environment with its riparian corridor and cottonwood grove, which contrast sharply with the dry upland character outside the canyon.

Items collected from Lake Meredith National Recreation Area would continue to be managed as described in chapter 1. All collections would continue to be acquired, accessioned and cataloged, preserved, protected, and made available for access and use according to NPS standards and guidelines.

VISITOR USE AND UNDERSTANDING

There are multiple aspects to visitor use and understanding. These include, but may not be limited to

- visitor experience
- visitor education, interpretation, and orientation
- interpretive and educational outreach programs and media
- visitor access, parking, safety and circulation
- hike and bike trails, trailheads, and horse use

Many elements of visitor use and understanding already have been described in other elements of alternative 1, particularly “Facilities and Associated Visitor Activities.” To avoid repetition, this section focuses on the broad nature of visitor use and understanding that would be associated with this alternative, plus features that contribute to visitor use and understanding that were not covered previously.

Visitor Experience

Visitors would continue to receive an introduction to the national recreation area primarily at the headquarters and visitor information building in Fritch. Within the national recreation area, brochures would continue to be available at the ranger station in the maintenance compound off Sanford-Yake Road.

Water-based recreation would continue to include activities such as boating, fishing, wading, swimming, and kayaking and canoeing. Lake water levels would continue to dictate the locations at which these activities could occur.

Hunting and fishing would continue to be permitted with current Texas hunting and/or fishing licenses and in

conformance with state regulations. National recreation area lands open to hunting would continue to offer the only public hunting lands in the area. Hunters would continue to pursue geese, ducks, quail, dove, turkey, white-tailed deer, and mule deer.

Off-road vehicle use would continue to be permitted in both the Rosita and Blue Creek areas, as described in the off-road vehicle management plan.

Camping and picnicking would continue to be offered in multiple locations throughout the national recreation area. Depending on the location, available facilities would include picnic tables, grills, shade shelters, tent sites, restrooms, potable water, and parking areas.

Visitor Education, Interpretation, and Orientation

Opportunities would continue to be limited to the headquarters and visitor information facility in Fritch. Bulletin boards would provide general information and safety-oriented messages. Seasonal educational programs would continue to be offered when and if funding was available.

Interpretive and Educational Outreach Programs and Media

Programs would continue to be offered to national recreation area visitors and regional schools and groups. Seasonal presentations would continue to be provided, such as Junior Ranger Day, Flint Fest, and ruins tours during Texas Archaeological month. Publications would be updated or replaced as needed.

Visitor Access, Circulation, and Parking

Roads within the national recreation area would continue to provide visitor access from those roads outside the boundary. New roads would not be built, and existing roads would not be upgraded. The extensive network of unpaved roads in the national recreation area accessible primarily by high-clearance vehicles would remain open. Alternative 1 would not include any changes to parking facilities beyond routine maintenance.

Hiking Trails, Trailheads, and Horse Use

Some horse trails could be improved to meet NPS standards. Existing formal and informal trails would continue to offer access into interior parts of the national recreation area not accessible by car.

Existing trailheads would provide access to national recreation area trails. Trailheads would be maintained as minimally improved facilities.

The multi-use trail from Fritch Fortress to South Turkey Creek was described previously. This trail would provide access between many of the developed areas on the south side of the lake.

Horseback riding would continue to be allowed on a designated trail at Plum Creek and on the Mullinaw Trail. Other trails would be for foot and bike use only. Public corrals would continue to be available at Plum Creek and McBride Canyon.

PARK OPERATIONS

Many elements of park operations have been described earlier, particularly in "Facilities and Associated Visitor Activities." To avoid repetition, this section emphasizes operational components that were not covered previously.

The national recreation area would continue to be managed jointly with Alibates Flint Quarries National Monument. The parks' operations buildings would remain in their existing locations and configurations. Facilities would be maintained at current conditions. Few new facilities would be constructed. In addition to features described earlier for this alternative the following features would be implemented:

- There was little concern for energy or water efficiency when the facilities were constructed. Incremental improvements in the efficient use of resources would be made, but inefficiencies that result from the basic design would continue.
- Additional facilities could be installed according to visitation requirements. For example, primitive toilets might be added in areas of high visitation.
- There would be no expansion of the types of commercial visitor services considered in the national recreation area.
- Fee programs for boating and for most special use permits would still be required.
- Some special use permits, including grasshopper collecting, would remain free of charge.
- The current level of partnerships with federal, state, local, and nonprofit entities would be maintained.

BOUNDARY ADJUSTMENT

No boundary adjustments were identified as needed, and no changes to the national recreation area's boundaries would be proposed. The National Park Service would continue to work with surrounding landowners to negotiate preservation agreements and to acquire (through willing sellers) or accept through donation lands considered critical to protecting important national recreation area-related resources from incompatible uses.

ESTIMATED COSTS

Cost estimates for alternative 1 are identified in table 5. These cost estimates, in 2011 dollars, are only intended to indicate a general relative comparison of costs among the alternatives; they are not intended to be used for budgeting purposes.

Costs were developed using NPS and industry cost estimating guidelines to the extent possible. Because actual costs could be higher or lower, these estimates should not be used for budgeting. Project-specific costs will be determined in subsequent, more detailed planning and design exercises and will consider the design of facilities, identification of detailed resource protection needs, and changing visitor experience goals.

Actual costs to the National Park Service will vary, depending on if and when the actions are implemented and on contributions by partners and volunteers. The implementation of the approved plan would depend on future NPS funding levels; servicewide priorities; and partnership funds, time, and effort.

Identification of these costs does not guarantee future NPS funding. Funding for these projects may not come all at once. More likely, it would take several years to secure funds which may be partly obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the national recreation area may not receive enough funding to achieve all desired conditions within the timeframe of this general management plan (the next 15 to 20 years).

Costs have been broken down into two categories: annual operating costs and one-time capital costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and leases.

One-time costs include projects such as construction of new buildings, trail building, native species restoration, and structure rehabilitation.

Annual Costs

The national recreation area may employ up to the equivalent of 41 full-time positions (one full time equivalent staff is

one person working 40 hours per week for one year, or the equivalent). This staffing level would be maintained for alternative 1. Seasonal and student employees, as well as volunteers, supplement the staff and would continue to support the national recreation area. Employee salaries and benefits make up a large part of the parks' annual operating costs. Under this alternative, the parks' annual operating budget would continue to be $3,100,000.

One-time Costs

Current facilities would remain under alternative 1. The headquarters for the national recreation area would stay in the existing building in Fritch. Additional primitive toilets would be installed in areas with high visitation. The availability of these facilities would address concerns related to health and safety and resource protection, and they could increase operational efficiency. Some facilities not currently in use, such as picnic tables not being used because the water level is low, could be removed and placed in storage. Others facilities could be removed altogether. Operational efficiency would be improved through the installation of energy-efficient technologies.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in the park that were not preformed when scheduled. Assets include infrastructure such as buildings, docks, roads, trails, interpretive waysides, pipelines, and treatment plants. The park staff has identified approximately $3,255,000 worth of deferred maintenance related to assets in the park. This figure is representative of when the assessment was made and does not necessarily indicate future deferred maintenance needs.

Park personnel have already addressed deferred maintenance associated with the paved roads in the park and will continue to address the deferred maintenance needs of park assets as expeditiously as possible. In addition under this alternative, the park staff would address deferred maintenance related to infrastructure that is not being used, such as docks that are above the current low water levels.

Table 5: Summary of Costs for Alternative 1

Annual Operating Costs	
Annual operating costs (includes operation of Alibates Flint Quarries National Monument)	$3,100,000
Increased staffing	$0.00
Staffing (additional full time equivalent staff)	41 (+0)
One-Time Capital Costs	
Facility (construction): Visitor infrastructure and experience • New multi-use trail–Harbor Bay segment • Additional primitive toilets Subtotal	$372,000
Resource management and visitor safety • Monitor and control exotic species	$50,000
Operational improvements: • Install energy and water-efficient technologies • Remove unused or underused facilities • Retrofit national recreation area buildings with storm shelters Subtotal	$890,000
Deferred Maintenance	$3,255,000
Total One-time Capital Costs	$1,312,000

LAKE MEREDITH NATIONAL RECREATION AREA
ALTERNATIVE 2

CONCEPT

Lake Meredith National Recreation Area would provide quality recreation to visitors by offering improved opportunities for outdoor activities that are not affected by changing lake levels. This would include enhancing traditional activities and expanding visitor experiences by using information technology. More ecologically sensitive approaches to traditional activities would promote resource protection.

Large areas of the national recreation area would be zoned as rural and semi-primitive. In these areas, visitors would experience a more natural setting with an opportunity for solitude away from roads. Rural zoning would provide transitions between more developed areas and the semi-primitive zone that could be accessed by visitors only through nonmotorized means.

Visitors would continue to have opportunities to enjoy traditional outdoor recreational activities, such as boating, fishing, wading, and swimming in the lake and camping, picnicking, hunting, and driving for pleasure on the land. The focus would be on providing a better visitor experience through additional or improved facilities and increased interpretation in accessible settings and through expanded opportunities in more natural rural and semi-primitive areas. Park operations would be improved through facilities consolidation within the national recreation area boundary.

Many of the features of alternative 2 would be the same as alternative 1. This section focuses on the differences of this alternative compared to continuing current management in the no-action alternative.

MANAGEMENT ZONING, FACILITIES, AND ASSOCIATED VISITOR ACTIVITIES

Management zoning for alternative 2 is shown on figure 6. This alternative would use 9 of the 10 available management zones. The zoning and use of the areas of the national recreation area are described below. A summary of the features of this alternative is provided in a table at the end of this chapter.

Administrative and Operations Facilities

All administrative and operations facilities in the national recreation area would be in the administrative zone. The *headquarters and visitor information center* would stay in the existing building Fritch. Zoning would not be applied to this facility because it is outside the national recreation area boundary.

A new *consolidated operations center* would be constructed within the national recreation area near the existing maintenance facility off Sanford-Yake Road. The new facility would be in the administrative zone. This center would consolidate the maintenance, fire cache, and law enforcement functions. The buildings would employ energy and water-efficient technologies and sustainable design, and would include storm shelters. This consolidation would provide more efficient use of staff and would improve response to emergencies.

Developed Areas

This alternative would include more flexibility in the management of visitor facilities in developed areas in response to changing conditions. For example, when

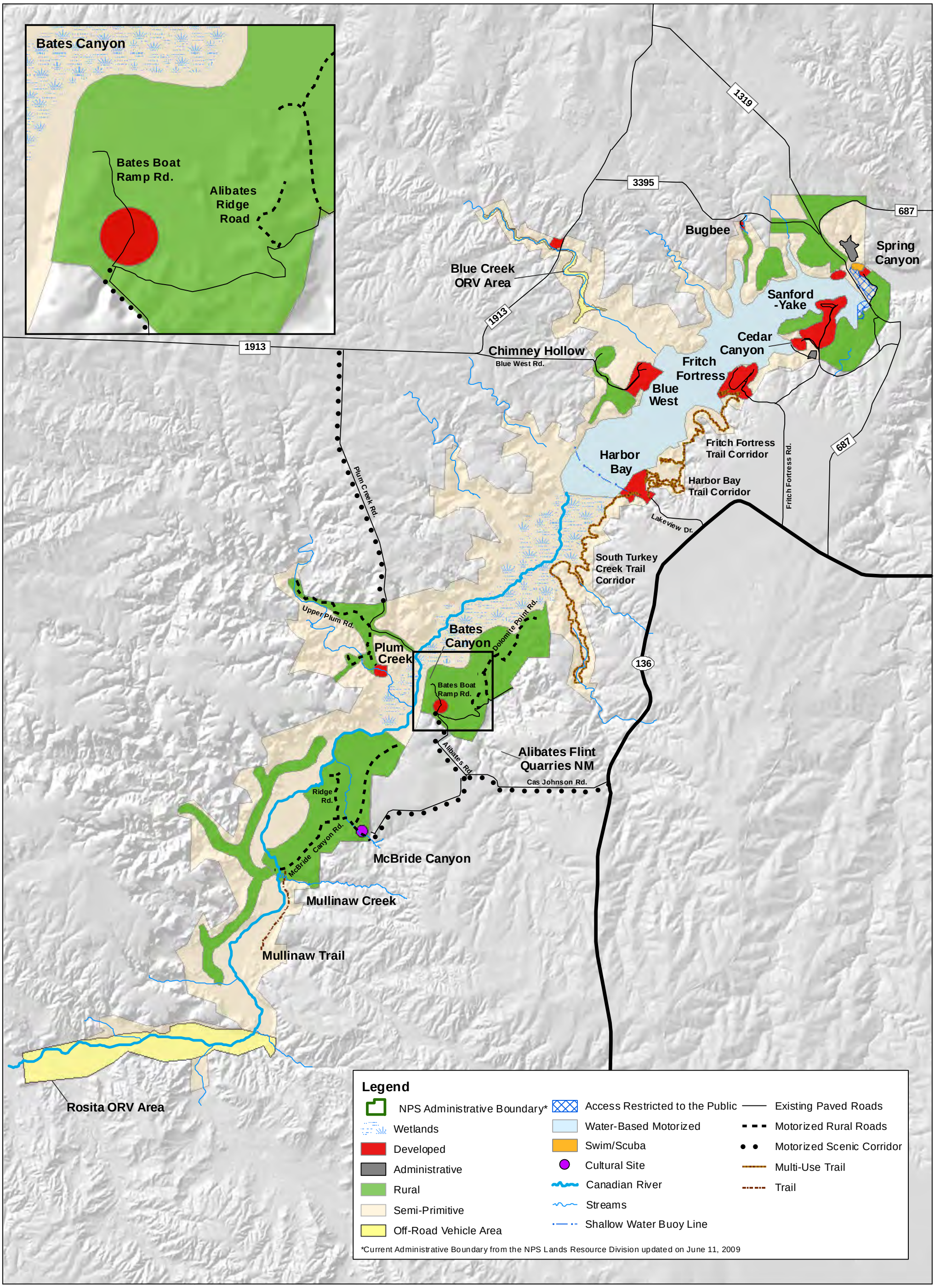


Figure 6: Alternative 2

Lake Meredith National Recreation Area, Texas

United States Department of the Interior / National Park Service

Intermountain Region Geographic Resources Program Denver, Colorado September 2011

lake levels drop and visitation declines, the National Park Service could remove or relocate underused facilities. As lake levels rise, the facilities would be replaced at their former sites. This would decrease NPS maintenance costs and would allow natural processes to restore features such as soils, vegetation, and wildlife habitat at developed areas. Therefore, all actions in this alternative that are described as "continuing current management as described for alternative 1" would include this option of adjusting available facilities, up to year 2010 levels, to match visitation levels. No *increases* in facilities beyond those that existed in 2010 could occur except as explicitly described in this alternative.

Management zoning would be applied under alternative 2 as shown on figure 6. The following four areas would be in the developed zone, but their management would not change from the continuation of current management described for alternative 1.

- *Cedar Canyon*
- *Harbor Bay*
- *Plum Creek*
- *Bugbee*

The *Spring Canyon* area would be managed the same as in alternative 1 but would have the following four management zones:

- The developed zone would be applied to the visitor use area that includes features such as picnic tables and parking lots.
- The stilling basin and surrounding shore and facilities, such as the swim beach and fishing pier, would be in the swim/scuba zone.
- The existing law-enforcement target range north of the visitor area at Spring Canyon would be zoned administrative. This range would continue to be used by NPS and other law enforcement staff and would remain closed to the public.
- The remainder of the area, which is used for activities such as hiking, would be in the rural zone.

The visitor facilities in the *Sanford-Yake area* would be in the developed zone. Differences from alternative 1 would include the installation of utilities, including electricity and water, which would be available for a fee at about 10 campsites at the Sanford-Yake campground. If justified by adequate lake levels and visitor numbers, commercial visitor services could include marina services and/or food operations.

The consolidated operations center that was described previously would be constructed near the existing maintenance facility off Sanford-Yake Road. This area would be in the administrative zone.

Fritch Fortress would be in the developed zone. As under alternative 1, the amphitheater would be used for seasonal NPS programs and special events. In addition, more frequent NPS programming could be added during the summer. Utilities, including electricity and water, would be available for a fee at about 10 campsites at the Fritch Fortress campground.

The *multi-use trail* primarily would be in the semi-primitive zone, with segments near Harbor Bay and Fritch Fortress in the developed zone. Management of the trail would be the same as described for alternative 1.

The *Bates Canyon* area would be in the rural zone. This area would be managed as described in alternative 1, including removal of the unused boat ramp.

The *Alibates Flint Quarries National Monument visitor contact station* would be in the developed zone in Lake Meredith National Recreation Area. Management of this area would not change under alternative 2. However, both of the action alternatives for Alibates Flint Quarries National Monument would implement actions in this area, which is in the national recreation area and outside the national monument. These actions could

include construction of a self-guiding trail and outdoor interpretive materials focusing on an Antelope Creek-style dwelling for interpretive purposes. These actions are discussed later in this chapter in association with the Alibates Flint Quarries National Monument alternatives. If either Alibates action alternative was implemented, the size of the developed zone on figure 6 could be expanded to include all new facilities in the vicinity.

McBride Canyon mostly would be in the rural zone. The cultural zone would be applied around the *McBride Ranch House*, but this historical site would continue to be managed as described in alternative 1. The McBride Canyon camping area would be improved to delineate individual sites, and additional primitive toilets would be installed. Interpretive waysides would be installed on the Ridge Road in McBride Canyon to provide information on the area's geological and cultural resources.

In the *Mullinaw Creek* area, lands to the north, including the campground, would be in the rural zone. The area south of the Mullinaw Creek campground would be in the semi-primitive zone. This would include the *Mullinaw Trail*, which would be rehabilitated to control erosion and provide additional trail markers.

Rosita would be in the off-road vehicle zone. As with alternative 1, this area would continue to be managed in accordance with the national recreation area's off-road vehicle management plan (NPS 2012a). In addition, a fee for off-road vehicle use would be considered.

The *Blue West* area would be in the developed zone. If water levels increased, unused camping facilities that previously were removed from this area could be replaced to accommodate increased visitation.

Four management zones would be applied in the area around the Blue Creek arm of Lake Meredith. Although zoning would be applied under this alternative, except as noted below, management in developed parts of this area would be the same as described for alternative 1.

- *Chimney Hollow* would be in the rural zone.
- The *Blue Creek* area would be in the developed zone.
- The *creek bottom* would be in the off-road vehicle zone and would continue to be managed in accordance with the national recreation area's off-road vehicle management plan (NPS 2012a). In addition, a fee for off-road vehicle use would be considered.
- The *Blue East* area would be in the semi-primitive zone.

Undeveloped Locations

The rural and semi-primitive zones would be applied to the undeveloped areas of the national recreation area. Rural zones generally would include

- the areas on the north end of the lake from the east side of Bugbee Canyon around the dam to Fritch Fortress that were not designated as other zones
- the area north and west of Alibates Flint Quarries National Monument, extending south to the Mullinaw Creek area
- the Plum Creek drainage
- the west and north parts of the Blue Creek drainage

The undeveloped, land-based parts of the national recreation area that were not described elsewhere would be in the semi-primitive zone, as shown in figure 6.

Additional camping opportunities would be made available in the semi-primitive zone, particularly in the areas of Martins and Evans Canyons, by designating primitive campgrounds along the lake and in upland sites. Avoidance of archeological sites and other high-value natural and cultural resources would be a key factor in siting the primitive

campgrounds. Individual sites in these campgrounds would not be delineated unless required for resource protection.

The Lake

The entire body of Lake Meredith would be in the water-based, motorized zone. All parts of the lake would be accessible by motorized and nonmotorized vessels traveling at safe speeds and operating in a manner consistent with Texas boating regulations. In periods of low water, motor vehicles would not be allowed to drive in the lakebed and the zoning would not change.

Islands in the lake would be in the semi-primitive zone. Use of the islands would continue to be limited to foot travel only.

Roads

Roads in the national recreation area would carry the same zoning as the surrounding land use, such as developed or rural. Particularly in the rural zone, where multiple dirt roads can lead to the same site, one route to that destination could be identified for use and the others could be closed and revegetated to restore natural conditions. This would reduce the size of the dirt road network.

In the semi-primitive zone, visitors would travel by foot, bicycle, or on horseback. The only use of motorized vehicles in this zone would be for administration, which would include oil and gas production.

A comprehensive travel/road management plan would be conducted to reduce the size of the dirt road network. Each road would be evaluated to determine if it should be maintained, converted to a trail, or closed and restored to native vegetation.

Outside the national recreation area, the Plum Creek Road on the west and the Cas Johnson, Alibates, and McBride Roads on the east would be zoned as motorized scenic corridor. Because the National Park Service does not have authority outside the boundary, the management of these roads for scenic access to the national recreation area would require cooperative actions from the surrounding counties and Texas Department of Transportation.

NATURAL RESOURCES

Natural resource management would emphasize more intensive measures related to visitor activities. Trail conditions would be monitored more often, and the National Park Service would be more assertive about closing social trails and limiting use in areas requiring additional resource protection.

The size of the dirt road network in the national recreation area would be reduced by closing some roads where more than one led to the same location and by returning the road beds to a more natural condition. Roads in the semi-primitive zone that were needed by the National Park Service or oil and gas producers would be marked for nonmotorized and administrative use only.

The area known as Rosita Flats, upstream from Chicken Creek, would be in the off-road vehicle zone. In this zone, the area that is legislatively designated for off-road vehicle use is within the river bottom and up to 3000 feet in elevation. The off-road vehicle plan includes measures to minimize impacts on the area's natural resources, such as limiting access points. Throughout this zone, resources would be monitored, and mitigation would be used when undesirable conditions were indicated. Management actions could include use restrictions or temporary closures.

Management of threatened or endangered species, other species of concern, exotic species, floodplains, water quality and quantity, and aquatic environments would be the same as described for alternative 1.

CULTURAL RESOURCES

Management of cultural resources would be the same as described for alternative 1.

VISITOR USE AND UNDERSTANDING

Many elements of visitor use and understanding would be the same as those described in alternative 1. To avoid repetition, this section focuses on differences associated with alternative 2.

Visitor Experience

Orientation information and other visitor services would continue to be available primarily at the headquarters in Fritch. In the national recreation area, visitors would have expanded opportunities to enjoy traditional outdoor recreational activities. Examples include

- use of the amphitheater for additional seasonal NPS programming
- primitive camping on the west side of the national recreation area
- utility hookups at some campsites at Fritch Fortress and Sanford-Yake

Visitor Education, Interpretation, and Orientation

Interpretive waysides would be installed along the multi-use trail and at overlooks such as on Ridge Road near McBride Canyon. Information technology such as podcasts could be developed to provide orientation to the national recreation area and interpret features such as geology and history. This technology would also enable virtual tours of the national recreation area.

Interpretive and Educational Outreach Programs and Media

The amphitheater at Fritch Fortress would be used for additional seasonal NPS programs. Community outreach, interpretation, and education also would be expanded.

Visitor Access, Circulation, and Parking

The dirt road network would be reduced by closing some roads where more than one road led to the same location. Motorized travel by visitors would not occur in the semi-primitive zone. Otherwise, management of paved roads, parking areas, and off-road vehicle areas would be the same as alternative 1.

Hiking Trails, Trailheads, and Horse Use

Management of hiking trails, trailheads, and horse use would continue as described for alternative 1 except that the Mullinaw Trail would be rehabilitated.

PARK OPERATIONS

Many elements of park operations would be the same as those described in alternative 1. Alternative 2 would change the following park operations:

- A consolidated operations center for maintenance, fire, and law enforcement would be constructed in the national recreation area boundary and the existing law enforcement building would be removed.
- Energy and water-efficient technologies would be installed in current facilities, and new construction would incorporate sustainable design.
- Storm shelters would be built into all new buildings.
- Staff would be increased by two full-time-equivalent personnel.
- Operational services would change based on the need to maintain the new buildings and utilities in the national recreation area, the removal of old buildings, and the absence of visitor motorized travel in the semi-primitive zone.

- In response to changing conditions, such as lake fluctuations, facilities could be removed or relocated.
- Commercial visitor services could be expanded to include food services, campground operations, and marina services, if a marina was warranted by lake levels.
- Partnerships would be expanded to include community user groups, with an increased focus on community outreach, interpretation, and education.

Existing fee programs for boating and special use permits would continue as described for alternative 1. A fee for off-road vehicle use at Rosita and Blue Creek would be considered.

A fee would be required for all campsites with water and/or electrical hookups. In addition, the National Park Service would consider fees for all camping in the national recreation area except in the semi-primitive zone. A study would determine the most appropriate fee structure, but it could include a low rate for areas such as McBride Canyon, where facilities include picnic tables and primitive toilets, and a higher rate at sites such as Sanford-Yake that have shade shelters, potable water, and flush toilets. The National Park Service would consider a concession contract for campground operations.

BOUNDARY ADJUSTMENT

No boundary adjustments were identified as needed, and no changes to the national recreation area's boundaries would be proposed. The National Park Service would continue to work with surrounding landowners to negotiate preservation agreements and to acquire (through willing sellers) or accept through donation lands considered critical to protecting important national recreation area-related resources from incompatible uses.

ESTIMATED COSTS

Cost estimates for alternative 2 are identified in table 6. These cost estimates, in 2011 dollars, are only intended to indicate a general relative comparison of costs among the alternatives; they are not intended to be used for budgeting purposes.

Costs were developed using NPS and industry cost estimating guidelines to the extent possible. Because actual costs could be higher or lower, these estimates should not be used for budgeting. Project-specific costs will be determined in subsequent, more detailed planning and design exercises and will consider the design of facilities, identification of detailed resource protection needs, and changing visitor experience goals.

Actual costs to the National Park Service will vary, depending on if and when the actions are implemented and on contributions by partners and volunteers. The implementation of the approved plan would depend on future NPS funding levels, servicewide priorities, and partnership funds, time, and effort.

Identification of these costs does not guarantee future NPS funding. Funding for these projects may not come all at once. More likely, it would take several years to secure funds which may be partly obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the national recreation area may not receive enough funding to achieve all desired conditions within the time frame of this general management plan (the next 15 to 20 years).

Costs have been broken down into two categories: annual operating costs and one-time capital costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and leases. One-time costs include projects such as construction of new buildings, trail building, native species restoration, and structure rehabilitation.

Annual Costs

Implementation of alternative 2 is estimated to result in $3,205,700 in annual costs in 2011 dollars (including annual operating costs plus increased staffing costs from table 6), a 3% increase over alternative 1. These costs include additional staff salaries and benefits, as well as facility operations. The staffing costs include two additional full-time-equivalent professional positions to support resource protection and community outreach associated with increased visitor activities. Staffing levels would increase over time as the proposed actions were implemented. Seasonal and student employees, as well as volunteers, would continue to supplement the staff and support the national recreation area.

One-time Costs

Alternative 2 would have estimated one-time costs of $6,831,000 in 2011 dollars. These costs primarily would result from the development of additional visitor facilities, including the multi-use trail. To address employee safety concerns and increase operational efficiency, a consolidated operations center is proposed.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in the park that were not preformed when scheduled. Assets include infrastructure such as buildings, docks, roads, trails, interpretive waysides, pipelines, and treatment plants. The park staff has identified approximately $3,255,000 worth of deferred maintenance related to assets in the park. This figure is representative of when the assessment was made and does not necessarily indicate future deferred maintenance needs.

Park personnel have already addressed deferred maintenance associated with the paved roads in the park and will continue to address the deferred maintenance needs of park assets as expeditiously as possible. In addition under this alternative, the park staff would address deferred maintenance related to infrastructure that is not being used, such as docks that are above the current low water levels.

Table 6: Summary of Costs for Alternative 2

Annual Operating Costs	
Annual operating costs	$3,205,700
Increased staffing (based on professional positions on the civil service general schedule pay scale)	$105,700
Staffing (additional full-time equivalent staff)	43 (+2)
One-time Capital Costs	
Facility (construction): Visitor infrastructure and experience • Installation of waysides and development of materials • Utilities for recreational vehicle camping (water and electricity) • Additional group sites at Harbor Bay • Additional primitive toilets • Improved equestrian infrastructure • New multi-use trail–Harbor Bay segment • Rehabilitate the McBride Trail Subtotal	$911,000
Resource management and visitor safety: • Monitor and control exotic species • Close and rehabilitate some roads Subtotal	$1,300,000
Operational improvements • Install energy and water-efficient technologies • Remove unused or underused facilities • Consolidated operations center (facilities, law enforcement, natural resources, and fire) Subtotal	$4,620,000
Deferred Maintenance	$3,255,000
Total One-time Capital Costs	$6,831,000

LAKE MEREDITH NATIONAL RECREATION AREA
ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

CONCEPT

Management of Lake Meredith National Recreation Area would promote both traditional and nontraditional uses, providing development of facilities and opportunities to address changing lake conditions and visitor uses. It would become a destination for semi-primitive outdoor recreation opportunities for a broad range of skill levels. The national recreation area would strengthen partnership opportunities that employ science-based resource management and compatible land management uses to improve visitor experience and wildlife habitat.

- This alternative would encourage nonmotorized recreation such as hiking, biking, backpacking, and paddling by maximizing the area in the semi-primitive zone and by providing a water-based, no wake zone in several areas on Lake Meredith.
- In addition to existing types of outdoor recreation, visitors would have the opportunity to enjoy additional activities, including defined trails for hiking and biking on the west side of the national recreation area and the addition of global positioning system-based recreation.
- Park operations would be improved through facilities consolidation, including locating the headquarters within the national recreation area boundary.
- Parks would provide increased interpretation and an expanded range of recreational opportunities, supported by improved or additional facilities.

As in alternative 2, rural zoning would provide transitions between more developed areas of the national recreation area and the semi-primitive zone that could be accessed by visitors only through nonmotorized means. However, compared to alternative 2, the acreage in the rural zone would be smaller, and the acreage in the semi-primitive zone would be larger. This alternative also would include a water-based, no wake zone to provide a more natural setting for nonmotorized water-based recreation.

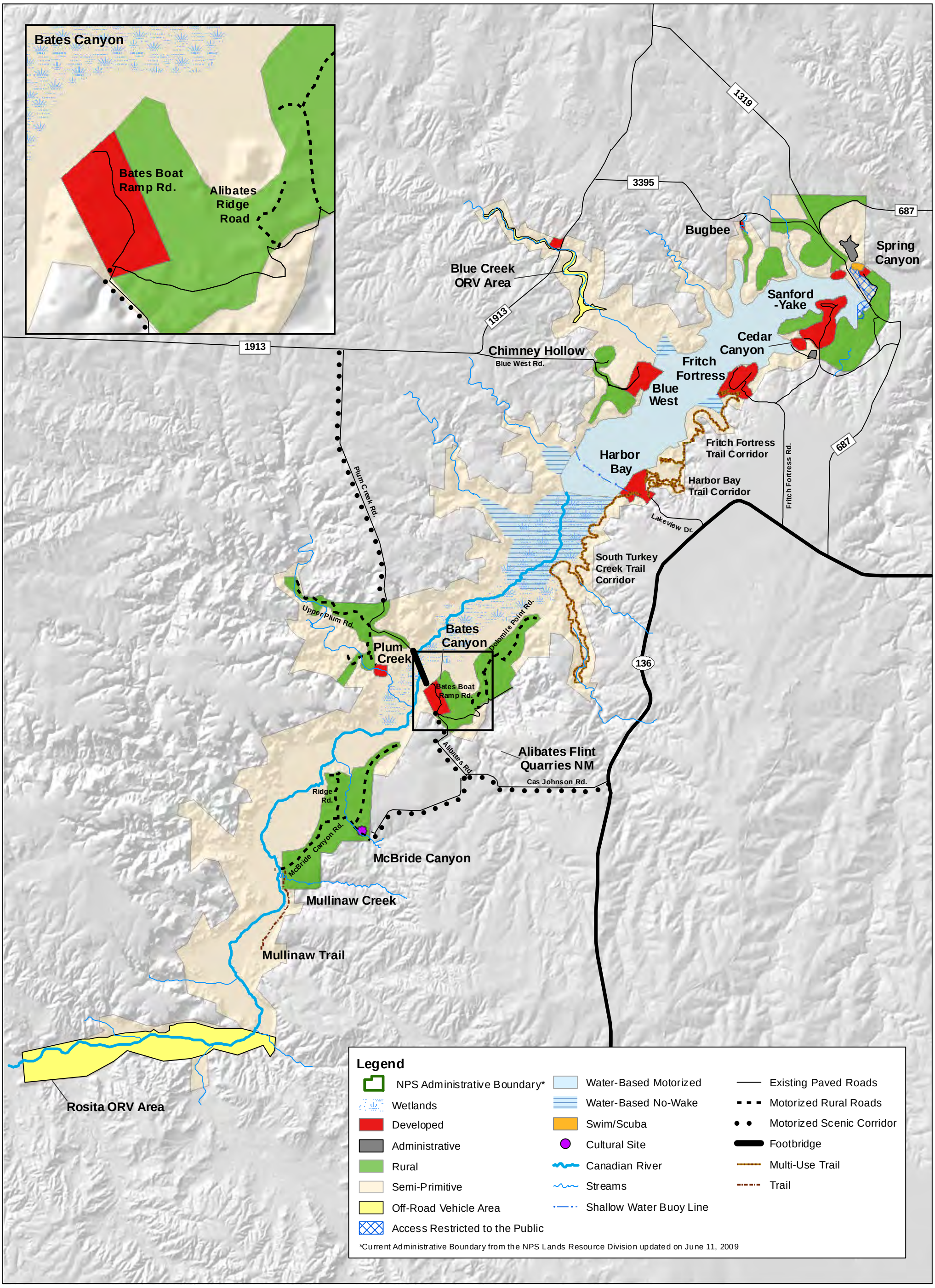
Many of the features of Alternative 3 would be the same as those already described for alternative 1 or alternative 2. To reduce redundancy, references will be made to features in those alternatives and detailed descriptions will be provided only for new or different elements in alternative 3.

MANAGEMENT ZONING, FACILITIES, AND ASSOCIATED VISITOR ACTIVITIES

Figure 7 shows the zoning that would be applied with alternative 3. This alternative would use all of the available management zones. The zoning and use of the areas of the national recreation area are described below. A summary of the features of this alternative is provided in a table at the end of this chapter.

Administrative and Operations Facilities

The following changes would be implemented to administrative and operations facilities under alternative 3, the NPS preferred alternative. All of these facilities in the boundary of the national recreation area would be in the administrative zone.



N

0 2.5 5 Kilometers

0 2.5 5 Miles

Figure 7: Alternative 3

Lake Meredith National Recreation Area, Texas

United States Department of the Interior / National Park Service

Intermountain Region Geographic Resources Program Denver, Colorado September 2011

In the near term, the headquarters and visitor information center would be maintained in its current configuration in Fritch, and the maintenance facility, fire cache, and law enforcement facilities would remain at their current sites in the national recreation area. However, when funding became available, a new *consolidated headquarters, visitor contact station, and operations facility* would be constructed in the national recreation area near the existing maintenance facility off Sanford-Yake Road. The consolidated center would provide the following:

- adequate space for administrative staff and operations (because of increased emphasis on interpretation, the facility would also include space for research, training, and interpretation relating to the parks' museum collections, which is limited in the current headquarters facility)
- flexibility to provide more interpretation and space for additional environmental, cultural, and outreach education to visitors
- more efficient staffing and emergency response
- a major reduction in expenditures of time and fuel spent by staff traveling between the separate facilities
- improvements in employee health and safety and the use of resources, because storm shelters and energy and water-efficient technologies would be installed and sustainable design would be employed

Developed Areas

Management zoning would be applied under alternative 3 as shown on figure 7. As with alternative 2, this alternative would include the flexibility to remove underused facilities in developed areas and then add them back, up to the levels necessary to fully implement in this alternative, based on fluctuating lake levels and visitor use. Therefore, all actions in this alternative that are described as "continuing current management as described for alternative 1" would include this option of readily adjusting available facilities. Beyond this consideration, the NPS preferred alternative would result in the following conditions at each of the developed areas in the national recreation area:

Zoning at *Spring Canyon* would be the same as described in alternative 2, except that the area north of this site would be in the semi-primitive (rather than rural) zone. A limited number of underwater scuba targets would be installed to encourage use of this area for scuba diving. Through partnerships, activities such as scuba trainings and/or events could be held.

The *Sanford-Yake* and *Cedar Canyon* areas would be in the developed zone. Management of this area would be identical to alternative 2, except that the area of the consolidated operations center off Sanford-Yake Road would also include the national recreation area headquarters and a visitor contact station.

The *Fritch Fortress* area would be in the developed zone. Management would be identical to alternative 2 except that programs by partners, in addition to NPS programs, could be provided at the amphitheater.

The *Harbor Bay* area would be in the developed zone. Additional group campsites would be delineated, with minimal facilities that could be moved in response to changing water levels.

Zoning and management of the *multi-use trail* would be identical to alternative 2.

The areas of *Bates Canyon* and the *Alibates Flint Quarries National Monument visitor contact station* would be merged into a single developed zone. The underused parking lot would be considered for removal. New construction associated with the new campground (described below) and Alibates Flint Quarries National Monument action alternatives in

this area could slightly expand the size of the developed zone.

A new campground intended for use primarily by recreational vehicles would be created at Bates Canyon. The campground would have potable water, a dump station, and about 12 sites with electrical hookups. A planning study would determine the optimum location, capacity, and configuration of the new campground.

Management of the *McBride Canyon* area would be the same as described for alternative 2 except in the area of the *McBride Ranch House*. The house and surrounding landscape would be in the cultural zone. The house would be rehabilitated in accordance with the standards of the Secretary of the Interior (1995), which would involve some restoration elements but would also allow limited modifications to allow adaptive use of the property for interpretation. It would then be opened for guided tours during special events in the summer. At all other times, the house would be locked and protected, with fencing if necessary. However, interpretive waysides could be installed in a visitor-accessible area to provide information regarding the house and agricultural development of the area around 1903, when the house was built.

Management of the *Mullinaw Canyon* area and *Mullinaw Trail* would the same as described for alternative 2.

Rosita would be in the off-road vehicle zone and would be managed as described in alternative 2.

The *Plum Creek* and *Blue West* areas would be in the developed zone. Management of these areas would be identical to alternative 2.

Zoning and management at *Chimney Hollow, Blue Creek*, the Blue Creek bottom, and the *Blue East* area would be the same as in alternative 2. However, the remainder of the Blue Creek drainage would be in the semi-primitive zone, and nonmotorized recreation would be emphasized.

The *Bugbee* area would be in the developed zone. Management of this area would be identical to alternative 2.

Undeveloped Locations

The rural and semi-primitive zones would be applied to the undeveloped parts of the national recreation area. More of the national recreation area would be in the semi-primitive zone, with less in the rural zone, than in alternative 2. Rural zones primarily would include

- a crescent-shaped area from the dam to Cedar Canyon, except the areas discussed previously as being in other zones
- the corridor around the Dolomite Point Road
- parts of the McBride Canyon and Mullinaw Creek drainages
- the corridors around the roads in the Plum Creek drainage
- the corridors around Farm to Market Roads 3395, 1319, and 687 northwest of Sanford Dam

As described for alternative 2, additional camping opportunities would be made available in the semi-primitive zone, particularly in the areas of Martins and Evans Canyons, by designating primitive campgrounds along the lake and in upland sites. Avoidance of archeological sites and other high-value natural and cultural resources would be a key factor in siting the primitive campgrounds. Individual sites in these campgrounds would not be delineated unless required for resource protection.

Throughout the semi-primitive zone, trails would be defined for hiking, horseback riding, and biking. Most of these would follow former roads that would continue to support motorized access only for NPS administration and oil and gas facility servicing.

Many of the roads in the national recreation area that remained open to motorized vehicles would also be marked

as bicycle and pedestrian routes. In addition, the National Park Service could work cooperatively with the surrounding counties and Texas Department of Transportation to mark connecting routes outside the national recreation area where nonmotorized travel could be encouraged.

The Lake

The main body of Lake Meredith from Harbor Bay to the dam would be in the water-based, motorized zone. This part of the lake would be accessible by all vessels traveling at safe speeds and operating in a manner consistent with Texas boating regulations.

The water-based, no wake zone would be applied to an area between the shallow water buoy line and the inlet of the Canadian River, and in the coves created by Evans Canyon, Martins Canyon, Blue Creek, and Fritch Canyon. Areas in the zone would vary in size and extent depending on fluctuating lake levels. Motorized vessels could use these areas, but they and all other vessels would have to travel at a speed that would not produce a wake or swell. Nonmotorized boat use in these areas would be permitted without restriction.

As in alternative 2, islands in the lake would be in the semi-primitive zone and use would be limited to foot travel only.

In periods of low water, motor vehicles would not be allowed to drive in the lakebed and the zoning would not change.

Roads

The management of roads in the national recreation area would be the same as described in alternative 2. This would include zoning roads to match the zoning of the surrounding land use and conducting a comprehensive travel/road plan to determine the appropriate management (maintain, convert to a trail, or close) for each dirt road. Application of the motorized scenic corridor would be the same as in alternative 2.

NATURAL RESOURCES

Natural resource management would be as in alternative 2 and would emphasize more intensive management related to visitor activities. It also would include reducing the dirt road network by closing some roads and restoring natural vegetation. More roads than in alternative 2 would be designated for hiking, biking, horseback riding, and administrative use only.

Management of wetland areas upstream from the normal Lake Meredith pool in the semi-primitive zone would be identical to alternative 2.

Management of threatened or endangered species, other species of concern, exotic species, floodplains, water quality and quantity, and aquatic environments would be the same as described for alternative 1.

CULTURAL RESOURCES

Management of the McBride Ranch House was described under "Management Zoning, Facilities, and Associated Visitor Activities."

Other historical structures, such as the remnants of historical ranching activities and former oil and gas production sites, would be documented and assessed for eligibility for listing in the National Register of Historic Places. Suitable sites would be stabilized, preserved, and managed as discovery sites. Management of other sites would not change. Further cultural landscape inventories and reports would be conducted as necessary to document cultural landscapes that may exist in association with historic sites such as the McBride Ranch House.

Some archeological sites would be interpreted in ways that would discourage damage from visitors. This could include choosing sites with no surface materials and interpreting the resource with waysides. It may not be necessary to use an actual site; interpretation could be achieved at a representative location.

Management of other archeological sites would not change.

VISITOR USE AND UNDERSTANDING

Many elements of visitor use and understanding would be the same as those described in alternative 1. Differences are identified below.

Visitor Experience

Visitors would receive an introduction at the new visitor contact station in the consolidated center within the national recreation area boundary that also would include the NPS headquarters and operations facility.

Visitors would have the opportunity to enjoy both traditional outdoor recreational activities and new uses at Lake Meredith National Recreation Area. All activities available in alternative 2 also would be included in alternative 3. In addition, this alternative would include

- global positioning system-based recreation, where visitors could improve their skills in map use by navigating to specified locations, and which could have an interpretation and education component
- more defined trails for hiking, biking, and horseback riding and, potentially, coordination with improved nonmotorized travel outside the national recreation area
- more opportunities for primitive camping in a nonmotorized setting
- a water-based, no wake zone that would encourage the use of nonmotorized vessels such as kayaks and canoes
- improved opportunities for scuba diving at Spring Canyon
- programs by partners at the Fritch Fortress amphitheater
- additional opportunities for group camping at Harbor Bay
- camping, with electricity at some sites, in a new recreational vehicle campground at Bates Canyon

Visitor Education, Interpretation, and Orientation

Alternative 3 would include all of the improvements identified for alternative 2. In addition, increased interpretation of cultural sites in a manner that would not expose them to vandalism would provide new opportunities for visitors to learn about the area's resources.

Interpretive and Educational Outreach Programs and Media

As under alternative 2, community outreach, interpretation, and education would be expanded. Expanded programming at the amphitheater at Fritch Fortress, including presentations run by partners, would increase the number and diversity of opportunities available to visitors. Additionally, visitation from nontraditional user groups would be encouraged, with the goal of increasing visitation and a sense of stewardship.

Visitor Access, Circulation, and Parking

As discussed in alternative 2, the dirt road network would be reduced and motorized travel by visitors would not occur in the semi-primitive zone. The designation of more trails throughout all management zones, and potential coordination with the counties and state to mark nonmotorized travel routes outside the national recreation area, would increase opportunities for hiking, biking, and horseback riding. Otherwise, the management of paved roads, parking areas, and off-road vehicle areas would be the same as alternative 1.

A water-based, no wake zone would be established in Martins and Evans coves, the cove northeast of Blue West, the cove

southwest of Fritch Fortress, and an area between the shallow water buoy line and the inlet of the Canadian River. Areas in the zone would vary depending on fluctuating lake levels. Motorized boat use in these areas would be restricted to operating at a speed that did not produce a wake. Nonmotorized boat use in these areas would be allowed without restriction.

Hiking Trails, Trailheads, and Horse Use

Multi-use trails would be marked along existing roads. Trails in the semi-primitive zone on the west side of the national recreation area would be defined for hiking, horseback riding, and biking. The Mullinaw Trail would be rehabilitated. Otherwise, management of hiking trails, trailheads, and horse use would continue as described for alternative 1.

PARK OPERATIONS

Many elements of park operations would be the same as those described in alternative 1. However, this alternative would substantially improve the efficiency of park operations and make them more sustainable. Alternative 3 would change the following park operations:

- A consolidated headquarters, visitor contact station, and operations center for maintenance, fire, and law enforcement would be constructed within the national recreation area boundary.
- As in alternative 2, energy and water-efficient technologies would be installed and new construction would incorporate sustainable design.
- As in alternative 2, storm shelters would be available to all employees.
- Staff would be increased by one full-time-equivalent position.
- Operational services would change based on the need to maintain the new or upgraded facilities such as buildings, utilities, campgrounds, trail markers, and interpretive waysides and the absence of visitor motorized travel in the semi-primitive zone.
- Unused and underused facilities would be removed so that resources could be focused on higher-priority actions and facilities (e.g., the law enforcement and natural resources building would be removed once the consolidated headquarters development is completed).
- As in alternative 2, the National Park Service would consider obtaining commercial visitor services for food, campground operations, and marina services, if a marina was warranted by lake levels.
- Existing fee programs would continue as described for alternative 1. Additional fees would be established and/or considered as described for alternative 2.
- Partnerships would be expanded to include community user groups, with an increased focus on community outreach, interpretation, and education.
- Visitation by nontraditional user groups would be encouraged with the goal of increasing visitation and a sense of stewardship.

BOUNDARY ADJUSTMENT

No boundary adjustments were identified as needed, and no changes to the national recreation area's boundaries would be proposed. The National Park Service would continue to work with surrounding landowners to negotiate preservation agreements and to acquire (through willing sellers) or accept through donation lands considered critical to protecting important national recreation area-related resources from incompatible uses.

IMPLEMENTATION PRIORITIES

The planning team categorized each action that would be consistent with the intent of the alternative as essential, desirable, or not necessary for the successful implementation of the alternative. Five actions that would be consistent with the concept of this alternative and that were discussed with the public were placed in the third category. These actions, which are described below, were not included in the cost estimate for this alternative or in the impact evaluations in chapter 4. If resources to complete these actions became available, these actions could be implemented without a general management plan amendment because they are consistent with the concept of this alternative. None of these actions would be implemented until the appropriate National Environmental Policy Act, National Historic Preservation Act, and other compliance was completed.

The National Park Service could maintain a presence in Fritch by installing an information site, such as an unstaffed kiosk, that would direct visitors to the new consolidated visitor contact station. Candidate sites would include the Lake Meredith Aquatic and Wildlife Museum, which was established in 1976 as an American Bicentennial project by the citizens of Fritch, City of Fritch, and National Park Service, and which remains an NPS partner.

Pullouts could be developed on some roads to provide visitors with a safe opportunity to stop and enjoy the resources. These pullouts might be constructed in conjunction with the waysides or other interpretive exhibits that would be included in alternative 3, or they could provide access to scenic vistas.

Kayak and canoe trails could be marked around the undeveloped coves on the west side of the lake as described for alternative 2. In the semi-primitive zone, these water trails could be coordinated with the primitive campgrounds that would be designated as part of this alternative.

When lake water levels were so low that the former river channel was exposed, a trail and foot bridge could be installed to connect the Bates Canyon area on the southeast side of the national recreation area with the Plum Creek area to the northwest. The bridge would be a modest structure that could be removed when lake levels rose so that it would not present a hazard to boating. This river crossing would expand nonmotorized recreation opportunities, particularly on the west side of the Canadian River. A trail between Bates Canyon and Plum Creek would be marked when the footbridge across the river was available.

During periods of high water, a floating restroom with pump-out could be provided on the lake. As described for alternative 2, factors such as visitor numbers and concerns about water quality that were substantiated by monitoring would be used to determine when and where such a facility was needed.

ESTIMATED COSTS

Cost estimates for alternative 3 are identified in table 7. These cost estimates, in 2011 dollars, are only intended to indicate a general relative comparison of costs among the alternatives; they are not intended to be used for budgeting purposes.

Costs were developed using NPS and industry cost estimating guidelines to the extent possible. Because actual costs could be higher or lower, these estimates should not be used for budgeting. Project-specific costs will be determined in subsequent, more detailed planning and design exercises and will consider the design of facilities, identification of detailed resource protection needs, and changing visitor experience goals.

Actual costs to the National Park Service will vary, depending on if and when the actions are implemented and on

contributions by partners and volunteers. The implementation of the approved plan would depend on future NPS funding levels, servicewide priorities, and partnership funds, time, and effort.

Identification of these costs does not guarantee future NPS funding. Funding for these projects may not come all at once. More likely, it would take several years to secure funds which may be partly obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the national recreation area may not receive enough funding to achieve all desired conditions within the time frame of this general management plan (the next 15 to 20 years).

Costs have been broken down into two categories; annual operating costs and one-time capital costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and leases. One-time costs include projects such as construction of new buildings, trail building, native species restoration, and structure rehabilitation.

Annual Costs

Implementation of alternative 3 is estimated to result in $3,134,000 in annual costs in 2011 dollars (including annual operating costs plus increased staffing costs from table 7), a 1% increase over alternative 1. These costs include additional staff salaries and benefits, as well as facility maintenance. The staffing costs include one additional full-time-equivalent seasonal position for increased programming and resource management activities that result from allowing additional access into the national recreation area. Staffing levels would likely increase over time as the proposed actions were implemented. Seasonal and student employees, as well as volunteers, would continue to supplement the staff and support the national recreation area.

One-time Costs

Alternative 3 would have estimated one-time costs of $10,055,000 in 2011 dollars. These costs primarily would result from the development of additional visitor facilities, including the multi-use trail and utility sites for recreational vehicles. To increase operational efficiency, a consolidated operations center is proposed.

The one-time costs are shown in tables 8 and 9, respectively, as those that are essential and those that are desirable for implementation of this alternative. Essential projects are those that are required to preserve fundamental resources and experiences and would likely require federal funding. Desirable projects are important to fulfill implementation of the alternative but may be accomplished with nonfederal funds or with federal funding many years in the future.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in the park that were not preformed when scheduled. Assets include infrastructure such as buildings, docks, roads, trails, interpretive waysides, pipelines, and treatment plants. The park staff has identified approximately $3,255,000 worth of deferred maintenance related to assets in the park. This figure is representative of when the assessment was made and does not necessarily indicate future deferred maintenance needs.

Park personnel have already addressed deferred maintenance associated with the paved roads in the park and will continue to address the deferred maintenance needs of park assets as expeditiously as possible. In addition under this alternative, the park staff would address deferred maintenance related to infrastructure that is not being used, such as docks that are above the current low water levels.

Table 7: Summary of Costs for Alternative 3

Annual Operating Costs	
Annual operating costs	$3,134,000
Increased staffing (based on seasonal employment position)	$34,000
Staffing (additional full time equivalent staff)	42 (+1)
One-time Capital Costs	
Facility (construction): Visitor infrastructure and experience • Installation of waysides and development of materials* • Utilities for recreational vehicle camping (water and electricity)* • Utilities for recreational vehicle camping (electricity) • Additional group sites at Harbor Bay* • Additional primitive toilets • Improved equestrian infrastructure* • New multi-use trail–Harbor Bay segment • Mark existing roads for multi-use in semi-primitive zone • Install SCUBA targets Subtotal	$1,480,000
Resource management and visitor safety: • Monitor and control exotic species • Close and rehabilitate some roads Subtotal	$1,300,000
Operational improvements: • Installation of energy and water-efficient technologies • Remove unused or underused facilities • Consolidated operations center (all) and visitor contact station Sub Total	$7,275,000
Deferred Maintenance	$3,255,000
Total One-time Capital Costs**	$10,055,000

* These projects are desirable, but lower priority; while important to the full implementation of the alternative, they may be accomplished with non-federal funds or many years in the future.

** Total includes costs for both essential and desirable projects.

Table 8: Essential One-time Capital Costs for Alternative 3

	Visitor Infrastructure and Experience	Resource Management and Visitor Safety	Operational Improvements	Total
Interpretation/trails and access	$1,480,000			$1,480,000
Resource management		$1,300,000		$1,300,000
Operational improvements			$7,275,000	$7,275,000
Total one-time capital costs	**$1,480,000**	**$1,300,000**	**$7,275,000**	**$10,055,000**

Table 9: Desirable One-time Capital Costs for Alternative 3

	Visitor Infrastructure and Experience	Resource Management and Visitor Safety	Operational Improvements	Total
Interpretation/trails and access	$754,500			$754,500
Resource management		$0		$0
Operational improvements			$0	$0
Total one-time capital costs	**$754,500**	**$0**	**$0**	**$754,500**

ALIBATES FLINT QUARRIES NATIONAL MONUMENT
ALTERNATIVE A: NO ACTION / CONTINUE CURRENT MANAGEMENT

CONCEPT

The National Park Service would continue current management approaches. Management would continue to focus on the preservation, protection, interpretation, and scientific study of Alibates flint deposits. Visitor experiences at the national monument would primarily involve the existing visitor contact station and guided visits to the quarry sites. Figure 8 shows the no-action alternative for Alibates Flint Quarries National Monument.

FACILITIES AND ASSOCIATED VISITOR ACTIVITIES

Administrative and Operations Facilities

The national monument would continue to be managed jointly with the Lake Meredith National Recreation Area.

The *Alibates National Monument visitor contact station* would remain in its current location about a mile west of the national monument boundary within Lake Meredith National Recreation Area. The contact station was completed in 2006 and includes an information desk, space for permanent and seasonal displays, auditorium, and small gift shop. Associated facilities include a restroom with flush toilets and a parking lot with space for about 20 vehicles, including eight pull-through spaces for buses or for vehicles towing trailers. The visitor contact station would remain the primary location for orientation and interpretation for the national monument and would continue to be the meeting point for all guided tours of the Alibates flint quarries.

At the *Alibates flint quarries*, a locked gate prevents access by unaccompanied visitors. Beyond the gate, a road appropriate for high-clearance vehicles leads to a trailhead with a primitive toilet and a parking lot for about five vehicles. A half-mile-long foot trail with improved drainage and rustic steps in steep areas leads east up the hill to the quarries. Four shade structures with benches provide rest areas along the trail and often are used by guides as sites for short interpretive talks. The quarry area also can be accessed via a locked gate and dirt road; this route is used only for visitors who have impaired mobility with advance reservations. All of these facilities and their uses would be maintained in alternative A.

NATURAL RESOURCES

Alibates Flint Quarries National Monument is on an upland site with no wetlands, floodplains, or aquatic environments. For other natural resources, the National Park Service would continue current management practices, which are the same as those described for alternative 1 at Lake Meredith National Recreation Area.

Unauthorized pedestrian access in the national monument would continue to be of concern for the following reasons:

- It contributes to soil erosion in areas of steep slopes (which are common throughout the national monument).
- Unauthorized access is used to enter the national monument and illegally remove Alibates flint, which is a limited geological resource.

Therefore, the NPS resource management and law enforcement staff would continue to coordinate to control unauthorized pedestrian access.

Hunting is not permitted in the national monument. During hunting seasons, trespass is a common problem. It usually involves hunters from the adjacent national recreation area who have lost track of their position and crossed into the national monument or private land.

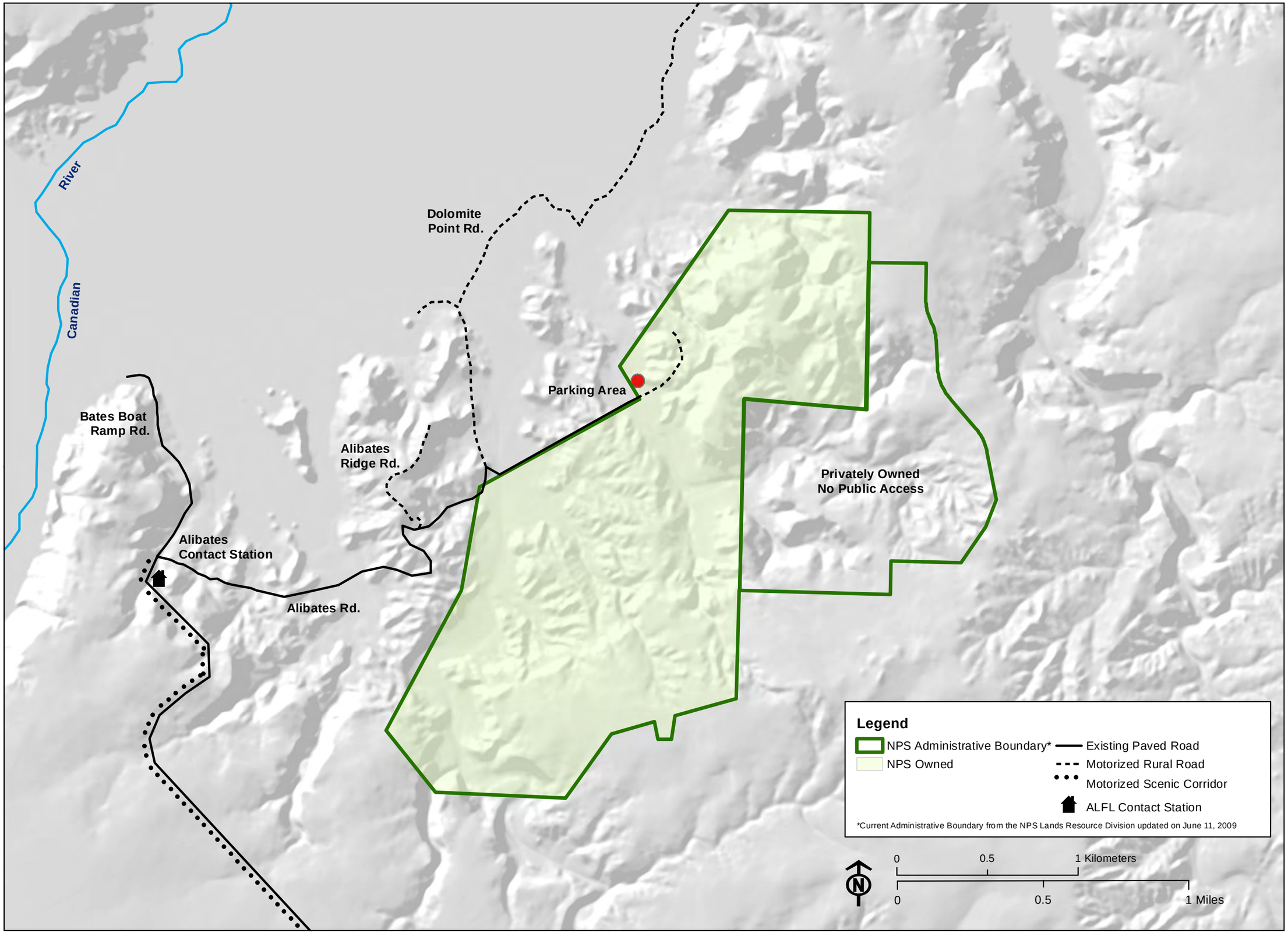


Figure 8:
Alternative A - No Action
Alibates Flint Quarries National Monument, Texas
United States Department of the Interior / National Park Service
Intermountain Region Geographic Resources Program Denver, Colorado September 2011

CULTURAL RESOURCES

Archeological resources would continue to be managed as described for alternative 1 for Lake Meredith National Recreation Area. Looting and vandalism of cultural resources would continue to be of concern in the national monument. Therefore, continuation of existing management practices would include

- restricting access to the flint quarries to tours guided by NPS staff or volunteers and available only through reservations
- restricting access to petroglyphs and other archeological resources to special events and guided auto tours offered once a year in October in association with Texas Archeological Month
- maintaining most sites in their current, unmarked condition

The national monument's museum collections would continue to be stored at the Panhandle-Plains Historical Museum in Canyon, Texas, in a manner consistent with NPS preservation and security standards.

VISITOR USE AND UNDERSTANDING

Visitors would continue to receive their primary orientation to the national monument at the Alibates visitor contact station. Visitors would continue to have opportunities to see the quarries with NPS staff or volunteers on tours typically offered twice daily by reservation. Additionally, special events such as flint knapping demonstrations would continue to be offered at the national monument, usually in cooperation with partners.

Access to other areas of the national monument would continue to be restricted. Motorized access to the quarry area using the dirt road from the south would be available only for guided tours for visitors with impaired mobility who had made advance reservations. The national monument would continue to provide guided auto tours to ruins and petroglyphs during special events and in October during Texas Archeology Month.

Education, interpretation, and orientation opportunities would continue to be offered through displays and video media at the Alibates visitor contact station and through the guided tours offered daily by reservation.

Outreach would continue to be offered to regional schools and during special events.

Current practices of visitor access, circulation, and parking would continue. Cas Johnson Road would continue to provide visitor access from Texas Highway 136 to the national monument. Interior roads in the national monument would remain gated, and access would be restricted to guided tours. Roads and parking facilities would continue to receive routine maintenance.

Access to and use of the half-mile-long trail to the flint quarries would continue to be restricted to visitors on guided tours. Maintenance of the trailhead, trail, and shade shelters would continue on an as-needed basis. No additional trails would be constructed in the national monument.

PARK OPERATIONS

The National Park Service would continue to try to staff the visitor contact station full time; however, because primarily volunteers perform this function, the station sometimes could be closed during its normal hours of operation. Guided tours would continue to be provided by NPS staff and volunteers. Law-enforcement activities would continue to focus on preventing looting and vandalism of cultural resources.

All facilities would remain in their existing locations and configurations and would be maintained at current conditions. No new facilities would be anticipated. Upgrades would be limited to the installation of energy and water-efficient technologies.

The current level of partnerships with federal, state, local, and nonprofit entities

would be maintained. These would include partnerships to facilitate visits by school groups.

As shown on figure 8, about a quarter of Alibates Flint Quarries National Monument is privately owned with no public access. The National Park Service would continue to work cooperatively with the land owner to protect the cultural resources in this part of the national monument and to exclude visitor access. With the landowner's permission, occasional visits to the cultural resources in this area would continue to be led by NPS staff. The National Park Service would not seek any change from the present approach unless the landowner altered his current, effective stewardship of the land and its resources.

BOUNDARY ADJUSTMENT

No boundary adjustments were identified as needed, and no changes to the national monument's boundaries would be proposed. The National Park Service would continue to work with surrounding landowners to negotiate preservation agreements and to acquire (through willing sellers) or accept through donation lands considered critical to protecting important national monument-related resources from incompatible uses.

ESTIMATED COSTS

Cost estimates for alternative A are identified in table 10. These cost estimates, in 2011 dollars, are only intended to indicate a general relative comparison of costs among the alternatives; they are not intended to be used for budgeting purposes.

Costs were developed using NPS and industry cost estimating guidelines to the extent possible. Because actual costs could be higher or lower, these estimates should not be used for budgeting. Project-specific costs will be determined in subsequent, more detailed planning and design exercises and will consider the design of facilities, identification of detailed resource protection needs, and changing visitor experience goals.

Actual costs to the National Park Service will vary, depending on if and when the actions are implemented and on contributions by partners and volunteers. The implementation of the approved plan would depend on future NPS funding levels, servicewide priorities, and partnership funds, time, and effort.

Identification of these costs does not guarantee future NPS funding. Funding for these projects may not come all at once. More likely, it would take several years to secure funds which may be partly obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the national monument may not receive enough funding to achieve all desired conditions within the time frame of this general management plan (the next 15 to 20 years).

Costs have been broken down into two categories; annual operating costs and one-time capital costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and leases. One-time costs include projects such as construction of new buildings, trail building, native species restoration, and structure rehabilitation.

Annual Costs

Because operational costs associated with Alibates Flint Quarries National Monument are incorporated in the annual operating costs for Lake Meredith National Recreation Area, the estimated costs associated with management of the national monument under this alternative would be the same as for alternative 1, no action for the national recreation area. Under alternative A, the parks' annual operating budget would continue to be $3,100,000.

One-time Costs

Under alternative A, the current level of facilities in the national monument would remain. The national monument would continue to maintain the visitor contact station. The one-time capital costs in alternative A are associated with increasing visitor understanding of the resources in the national monument and resource management. No changes to park operations would be expected. The estimated one-time costs associated with implementation of this alternative would be $70,000.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in a park that were not preformed when scheduled. Assets include infrastructure such as buildings, trails, roads, and interpretive waysides.

The National Park Service identified approximately $145,000 worth of deferred maintenance related to assets in the national monument. This figure is representative of when the assessment was made and is not necessarily indicative of future deferred maintenance needs. The deferred maintenance activities in the national monument when this assessment was completed include upgrade and repair to gravel roads and work at the visitor contact station. The NPS staff will continue to address the deferred maintenance needs of national monument assets as expeditiously as possible.

Table 10: Summary of Costs for Alternative A

Annual Operating Costs	
Annual operating costs (same as alternative 1 costs for Lake Meredith National Recreation Area)	$3,100,000
Increased staffing (same as for alternative 1 in Lake Meredith National Recreation Area)	$0.00
Staffing (additional full time equivalent staff) (same as for alternative 1 in Lake Meredith National Recreation Area)	41 (+0)
One-Time Capital Costs	
Facility (construction): • Visitor infrastructure and experience • Improve signage for interpretation and education Subtotal	$36,000
Resource management and visitor safety: • Monitor and control exotic species Subtotal	$34,000
Operational improvements (not applicable)	$0
Deferred Maintenance	$145,000
Total One-time Capital Costs	$70,000

ALIBATES FLINT QUARRIES NATIONAL MONUMENT
ALTERNATIVE B: NPS PREFERRED ALTERNATIVE

CONCEPT

The National Park Service would expand interpretive and educational programs at Alibates Flint Quarries National Monument to provide visitors, researchers, and the public with a better understanding and appreciation of the role of this significant resource in the greater human story. Visitor opportunities would be expanded through self-guiding outdoor interpretation and information technologies.

Several of the features of alternative B would be the same as alternative A. This section focuses on the differences of this alternative compared to continuing current management in the no-action alternative. The zoning and features of alternative B, the NPS preferred alternative, are shown on figure 9.

MANAGEMENT ZONING, FACILITIES, AND ASSOCIATED VISITOR ACTIVITIES

In Alibates Flint Quarries National Monument

All of the national monument owned by the National Park Service except the trailhead and parking area for the quarries trail guided tour would be in the cultural zone. The trailhead and parking area would be in the developed zone. No zoning would be applied to the eastern quarter of the national monument, which would remain privately owned.

No changes would be made to the existing facilities or to visitor activities in the national monument boundary. Visitors would continue to access the site only on guided tours.

One quarry pit close to the trail used for guided tours would be excavated for interpretive purposes. Data from this single quarry pit would be compared to data collected during previous excavation of a different quarry. Excavation would be accomplished using controlled archeological methods. Once the excavation was complete, the site would be properly covered and used for interpretive purposes. During excavation, visitors would have an opportunity to observe, but not participate in, the process. No other quarry excavations are planned under this general management plan, and the more than 700 other quarries would remain unmarked and undisturbed.

In Lake Meredith National Recreation Area

The Alibates Flint Quarries National Monument visitor contact station, which is in Lake Meredith National Recreation Area, would be in the developed zone. No changes would be made to the contact station, parking lot, and restroom facilities or their management.

Interpretive materials that could include waysides and/or other outdoor interpretive materials focusing on an Antelope Creek-style dwelling, based on resources found at the national monument and photos of other type-sites, would be installed in the developed zone on the terrace above the contact station. They would be available for unguided exploration. Interpretive waysides could provide information regarding the people who inhabited these types of dwellings and the importance of the Alibates flint to their culture.

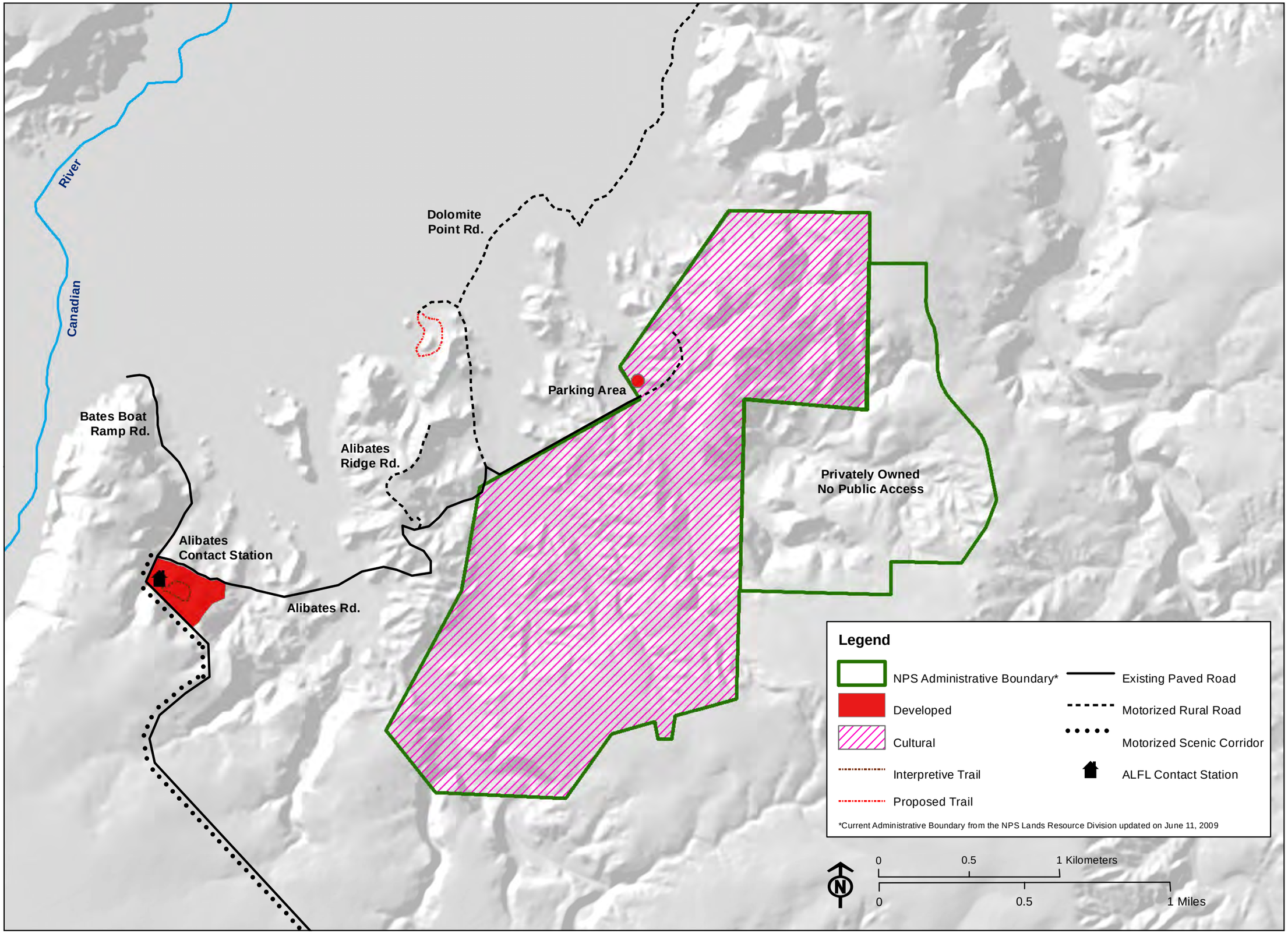


Figure 9: Alternative B

Alibates Flint Quarries National Monument, Texas

United States Department of the Interior / National Park Service

Intermountain Region Geographic Resources Program Denver, Colorado September 2011

A new trail that interpreted the resources of the area would be constructed in association with the national monument. However, it would be built in the national recreation area. This self-guiding interpretive trail would be near the visitor contact station. It would consist of an easy, half- or third-mile loop trail on relative flat terrain that would introduce visitors to the resources of the area. The entire route of this trail likely would be in the developed zone.

NATURAL RESOURCES

Natural resource management would be identical to alternative A.

CULTURAL RESOURCES

Management of most cultural resource would be identical to alternative A. One quarry pit close to the trail used for guided tours would be excavated for interpretive purposes. Excavation would be accomplished using controlled archeological methods.

VISITOR USE AND UNDERSTANDING

The visitor contact station would continue to be the primary location for orientation and interpretation of the cultural resources at Alibates Flint Quarries National Monument. The current facilities would be maintained, and increased opportunities for education and interpretation would be provided, both in association with the building and at the nearby trail and outdoor interpretive materials focusing on an Antelope Creek-style dwelling.

Visitors would continue to have opportunities to see the quarries with NPS staff or volunteers on tours typically offered twice daily by reservation. The archeologically excavated quarry would be featured on these tours. Access to other areas of the national monument would continue to be restricted.

Guided auto tours to ruins and petroglyphs would be granted by special request only. Typically, these would involve researchers and other cultural resource specialists and would not be available to the general public.

Special events and demonstrations would be expanded in cooperation with partners. These potentially could evolve into one or more annual events focusing on specialized skills such as flint knapping.

Education, interpretation, and orientation opportunities would be offered through displays, video media at the Alibates visitor contact station, outdoor interpretive materials focusing on an Antelope Creek-style dwelling, the interpretive trail, and the excavated quarry. Information technologies would be developed to expand visitor opportunities and allow virtual exploration of the national monument and its resources.

Education, interpretation, and outreach would be expanded with an increased focus on stewardship and the value of the resources at the national monument. Additional outreach would focus on school and community participation to promote protection of cultural resources and provide a greater sense of stewardship regarding the national monument.

Cas Johnson Road would continue to provide visitor access from Highway 136 to the national monument. Access to interior roads in the national monument would remain gated and restricted to those on guided tours.

PARK OPERATIONS

Park operations would be similar to alternative A. However, changes would be associated with

- the need to monitor and maintain the new interpretive facilities, including the trail and outdoor materials focusing on an Antelope Creek-style dwelling

- increased efforts to organize the expanded program of special events and demonstrations
- increased partnerships and increased outreach to schools and the community

BOUNDARY ADJUSTMENT

No boundary adjustments were identified as needed, and no changes to the national monument's boundaries would be proposed. The National Park Service would continue to work with surrounding landowners to negotiate preservation agreements and to acquire (through willing sellers) or accept through donation lands considered critical to protecting important national monument-related resources from incompatible uses.

IMPLEMENTATION PRIORITIES

In alternative B, one additional action that would be consistent with the concept of this alternative was considered by the general management planning team and discussed with the public. However, it was not included in this alternative because it is unlikely that this action could be implemented in the timeframe of the plan. Therefore, this action was not included in the costs presented below or in the impact evaluations in chapter 4. If resources to complete this action became available, it could be implemented without a general management plan amendment because it is consistent with the concept of this alternative. This action would not be implemented until the appropriate National Environmental Policy Act, National Historic Preservation Act, and other compliance was completed.

A self-guiding trail that focused on geology would be associated with Alibates Flint Quarries National Monument. This trail would start at a new day-use parking area and would be routed to provide visitors with a broad understanding of the area's geology, possibly including the sedimentary processes that laid down the area's limestone and the associated dolomite flint formation, the erosion processes that created the Canadian River breaks, and the formation and extraction of oil and gas deposits. A feature known as "the chimney" could be featured along the trail. A trail study might be required to select the optimum route. Because of the topography, visitors might find some parts of the trail challenging, and shade shelters, similar to those currently used in Alibates Flint Quarries National Monument, might be provided.

The self-guiding geology trail might start in the Alibates developed zone but likely would extend into a surrounding management zone in Lake Meredith National Recreation Area. Depending on which management alternative was selected for Lake Meredith National Recreation Area, this would include the rural zone or the semi-primitive zone (see figures 6 and 7). Either zone would be compatible with the proposed trail use.

ESTIMATED COSTS

Cost estimates for alternative B are identified below in table 11. These cost estimates, in 2011 dollars, are only intended to indicate a general relative comparison of costs among the alternatives; they are not to be used for budgeting purposes.

Costs were developed using NPS and industry cost estimating guidelines to the extent possible. Because actual costs could be higher or lower, these estimates should not be used for budgeting. Project-specific costs will be determined in subsequent, more detailed planning and design exercises and will consider the design of facilities, identification of detailed resource protection needs, and changing visitor experience goals.

Actual costs to the National Park Service will vary, depending on if and when the actions are implemented and on contributions by partners and volunteers. The implementation of the approved plan would depend on future NPS funding

levels, servicewide priorities, and partnership funds, time, and effort.

Identification of these costs does not guarantee future NPS funding. Funding for these projects may not come all at once. More likely, it would take several years to secure funds which may be partly obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the national recreation area may not receive enough funding to achieve all desired conditions within the time frame of this general management plan (the next 15 to 20 years).

Costs have been broken down into two categories; annual operating costs and one-time capital costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and leases. One-time costs include projects such as construction of new buildings, trail building, native species restoration, and structure rehabilitation.

Annual Costs

Because operational costs associated with Alibates Flint Quarries National Monument are incorporated into the annual operating costs for Lake Meredith National Recreation Area, the estimated costs associated with management of the national monument under this alternative would be the same as for alternative 3, the preferred alternative for the national recreation area. Under alternative B, the parks' annual operating budget would continue to be $3,134,000.

One-time Costs

Alternative B would have estimated one-time costs of $132,000 in 2011 dollars. Under alternative B, the current level of facilities in the national monument would remain. The national monument would continue to maintain the visitor contact station. The one-time capital costs in alternative B are associated with increasing visitor understanding of the resources in the national monument and resource management through improved interpretive signage. Activities to monitor and control exotic species would continue. No changes to park operations would be expected.

The one-time costs are shown in tables 12 and 13, respectively, as those that are essential and those that are desirable for implementation of this alternative. Essential projects are those that are required to preserve fundamental resources and experiences and would likely require federal funding. Desirable projects are important to fulfill implementation of the alternative but may be accomplished with nonfederal funds or with federal funding many years in the future.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in a park that were not preformed when scheduled. Assets include infrastructure such as buildings, trails, roads, and interpretive waysides.

The National Park Service identified approximately $145,000 worth of deferred maintenance related to assets in the national monument. This figure is representative of when the assessment was made and is not necessarily indicative of future deferred maintenance needs. The deferred maintenance activities in the national monument when this assessment was completed include upgrade and repair to gravel roads and work at the visitor contact station. The NPS staff will continue to address the deferred maintenance needs of national monument assets as expeditiously as possible.

Table 11: Summary of Costs for Alternative B

Annual Operating Costs	
Annual operating costs (Same as alternative 3 costs for Lake Meredith)	$3,134,000
Increased staffing (same as for alternative 3 in Lake Meredith National Recreation Area)	$34,000
Staffing (additional full time equivalent staff) (same as for alternative 3 in Lake Meredith National Recreation Area)	42 (+1)
One-Time Capital Costs	
Facility (construction): Visitor infrastructure and experience • Improve signage for interpretation and education* • Develop outdoor interpretive display of Antelope Creek dwelling • Self-guiding interpretive trail near visitor contact station • Excavate single quarry for research and interpretation Subtotal	$98,000
Resource management and visitor safety • Monitor and control exotic species Subtotal	$34,000
Operational improvements (not applicable)	$0
Deferred Maintenance	$145,000
Total One-time Capital Costs**	$132,000

* These projects are desirable, but lower priority; while important to the full implementation of the alternative, they may be accomplished with non-federal funds or many years in the future.

** Total includes costs for both essential and desirable projects.

Table 12: Essential One-time Capital Costs for Alternative B

	Visitor Infrastructure and Experience	Resource Management and Visitor Safety	Operational Improvements	Total
Interpretation/trails and access	$62,000			
Resource management		$34,000		
Operational improvements			$0	
Total one-time capital costs	**$62,000**	**$34,000**	**$0**	**$96,000**

Table 13: Desirable One-time Capital Costs for Alternative B

	Visitor Infrastructure and Experience	Resource Management and Visitor Safety	Operational Improvements	Total
Trails and access	$36,000			
Resource management		$0		
Headquarters area			$0	
Total one-time capital costs	**$36,000**	**$0**	**$0**	**$36,000**

ALIBATES FLINT QUARRIES NATIONAL MONUMENT
ALTERNATIVE C

CONCEPT

Alibates Flint Quarries National Monument would provide a greater understanding and appreciation for archeological protection through enhanced educational opportunities and research. Partnerships with appropriate entities would encourage more research at the national monument. A wider range of visitor uses and experiences would be accommodated.

Several of the features of alternative C would be the same as alternative A. This section focuses on the differences of this alternative compared to continuing current management in the no-action alternative. In cases where features would be the same as those described in alternative B, the descriptions there are referenced. The zoning and features of alternative C are shown on figure 10.

MANAGEMENT ZONING, FACILITIES, AND ASSOCIATED VISITOR ACTIVITIES

In Alibates Flint Quarries National Monument

This alternative would include the application of three management zones, as described below and shown on figure 10.

- The southwest part of the national monument would be zoned as semi-primitive. Access on foot in this area would be unrestricted.
- The trailhead and parking area for the quarries trail guided tour would be in the developed zone.
- The remainder of the national monument that is owned by the National Park Service would be in the cultural zone. No changes would be made to the existing facilities or to visitor activities in this zone, and visitors would continue to access this zone only on guided tours.

No zoning would be applied to the eastern quarter of the national monument, which would remain privately owned.

As describe for alternative B, one quarry pit close to the guided tours trail would be excavated for interpretive purposes using controlled archeological methods and would then be used for interpretation. All other quarries would remain unmarked and undisturbed.

In Lake Meredith National Recreation Area

The Alibates Flint Quarries National Monument visitor contact station, which is in Lake Meredith National Recreation Area, would be in the developed zone. No changes would be made to the contact station, parking lot, and restrooms facilities or their management.

A self-guiding interpretive trail, identical to that described in alternative B, would be constructed near the visitor contact station. Although interpretation along this trail would relate primarily to the national monument, it would be in the developed zone in the national recreation area.

NATURAL RESOURCES

Natural resource management would be identical to alternative A.

CULTURAL RESOURCES

Management of cultural resources would be identical to alternative B, the NPS preferred alternative.

VISITOR USE AND UNDERSTANDING

As in alternative A, the visitor contact station would continue to be the primary orientation point for the national

monument. In addition, visitors would have a greater opportunity to observe research activities as they occur at the national monument; including observing the new quarry excavation or participating in a Texas Archeological Society field school activity.

Visitors' opportunities to see the quarries with NPS staff or volunteers on tours would be the same as in alternative A. Access to other sensitive areas of the national monument would continue to be restricted. The southwest portion of the national monument would be accessible on foot without an NPS guide.

Guided auto tours to ruins and petroglyphs would be expanded from the alternative A approach that provides tours during special events and in October during Texas Archeology Month. Alternative C also would include scheduled visits on one weekend during each of the other seasons, for a total of three weekends outside October with scheduled tours.

Opportunities for special events and flint knapping demonstrations would be expanded as described in alternative B.

Education, interpretation, and orientation opportunities would be offered through displays, videos at the Alibates visitor contact station, one interpretive trail, and the excavated quarry.

Education, interpretation, and outreach would be expanded with an increased focus on stewardship and the research occurring at the national monument. Opportunities to participate as citizen scientists would be expanded with the Texas Archeological Field School and Earth Watch when research was occurring at the national monument.

Visitor access, circulation, and parking would not change from alternative A.

PARK OPERATIONS

Park operations would be similar to alternative A. However, changes would be associated with

- the need to monitor and maintain the new interpretive trail
- increased efforts to organize the expanded program of special events, demonstrations, and auto tours
- increased partnerships and increased outreach to citizen scientists

BOUNDARY ADJUSTMENT

No boundary adjustments were identified as needed, and no changes to the national monument's boundaries would be proposed. The National Park Service would continue to work with surrounding landowners to negotiate preservation agreements and to acquire (through willing sellers) or accept through donation lands considered critical to protecting important national monument-related resources from incompatible uses.

ESTIMATED COSTS

Cost estimates for alternative C are identified below in table 14. These cost estimates, in 2011 dollars, are only intended to indicate a very general relative comparison of costs among the alternatives; they are not to be used for budgeting purposes.

Costs were developed using NPS and industry cost estimating guidelines to the extent possible. Because actual costs could be higher or lower, these estimates should not be used for budgeting. Project-specific costs will be determined in subsequent, more detailed planning and design exercises and will consider the design of facilities, identification of detailed resource protection needs, and changing visitor experience goals.

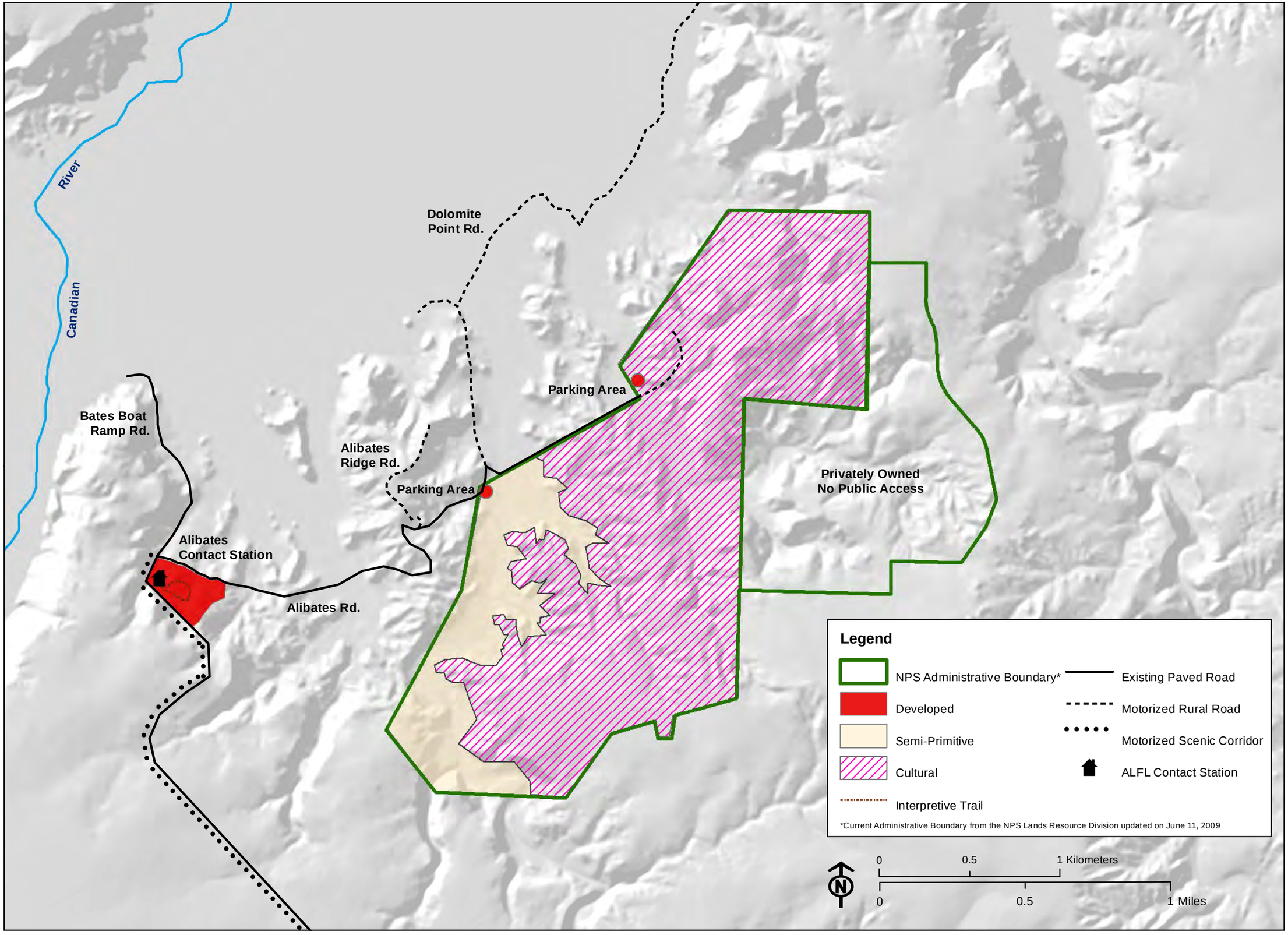


Figure 10: Alternative C

Alibates Flint Quarries National Monument, Texas

United States Department of the Interior / National Park Service

Intermountain Region Geographic Resources Program Denver, Colorado September 2011

Actual costs to the National Park Service will vary, depending on if and when the actions are implemented and on contributions by partners and volunteers. The implementation of the approved plan would depend on future NPS funding levels, servicewide priorities, and partnership funds, time, and effort.

Identification of these costs does not guarantee future NPS funding. Funding for these projects may not come all at once. More likely, it would take several years to secure funds which may be partly obtained through partners, donations, or other non-NPS federal sources. Although the National Park Service hopes to secure this funding, the national recreation area may not receive enough funding to achieve all desired conditions within the time frame of this general management plan (the next 15 to 20 years).

Costs have been broken down into two categories- annual operating costs and one-time capital costs. Annual costs include the costs associated with ongoing maintenance, utilities, staffing, supplies and materials, and leases. One-time costs include projects such as construction of new buildings, trail building, native species restoration, and structure rehabilitation.

Annual Costs

Because operational costs associated with Alibates Flint Quarries National Monument are incorporated into the annual operating costs for Lake Meredith National Recreation Area the estimated costs associated with management of the national monument under this alternative would be the same as for alternative 3, the preferred alternative for the National Recreation Area. Under this alternative, the national monument's annual operating budget would continue to be $3,134,000.

One-time Costs

Alternative 3 would have estimated one-time costs of $124,000 in 2011 dollars. These costs would be primarily due to the continued development additional visitor facilities including the multi-use trail and sites for recreational vehicles. To increase operational efficiency a consolidated operations center is proposed.

The one-time costs are shown below as those that are essential and those that are desirable for implementation of this alternative. Essential projects are those that are required to preserve fundamental resources and experiences and would likely require federal funding. Desirable projects are important to fulfill implementation of the alternative but may be accomplished with nonfederal funds or with federal funding many years in the future.

Deferred Maintenance

Deferred maintenance refers to maintenance activities for assets in a park that were not preformed when scheduled. Assets include infrastructure such as buildings, trails, roads, and interpretive waysides.

The National Park Service identified approximately $145,000 worth of deferred maintenance related to assets in the national monument. This figure is representative of when the assessment was made and is not necessarily indicative of future deferred maintenance needs. The deferred maintenance activities in the national monument when this assessment was completed include upgrade and repair to gravel roads and work at the visitor contact station. The NPS staff will continue to address the deferred maintenance needs of national monument assets as expeditiously as possible.

Table 14: Summary of Costs for Alternative C

Annual Operating Costs	
Annual operating costs (same as for alternative 3 in Lake Meredith National Recreation Area)	$3,134,000
Increased Staffing (same as for alternative 3 in Lake Meredith National Recreation Area)	$34,000
Staffing (additional full time equivalent staff) (same as for alternative 3 in Lake Meredith National Recreation Area)	42(+1)
One-Time Capital Costs	
Facility (construction): • Visitor infrastructure and experience • Improve signage for interpretation and education • Self-guiding interpretive trail near visitor contact station • Excavate single quarry for research and interpretation Sub Total	$90,000
Resource management and visitor safety • Monitor and control exotic species Sub Total	$34,000
Operational improvements (not applicable)	$0
Deferred Maintenance	$145,000
Total One-time Capital Costs	$124,000

COST SUMMARY OF THE ALTERNATIVES

National Park Service decision-makers and the public must consider an overall picture of the complete costs and advantages of the alternatives, including the no-action alternatives, to make wise planning and management decisions for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. In estimating the costs of the alternatives, both annual recurring and one-time project costs were considered.

The cost figures shown in tables 15 and 16 and throughout the plan are intended to provide only an estimate of the relative costs of the alternatives. NPS and industry cost estimating guidelines were used to develop the costs (in 2011 dollars) to the extent possible, but the estimates should not be used for budgeting purposes. Specific costs will be determined in subsequent, more detailed planning and design exercises, and with consideration for resource protection needs and changing visitor expectations. Actual costs to the National Park Service will vary depending on if and when the actions were implemented, and on contributions by partners and volunteers.

Table 15: Estimated Costs of the Lake Meredith National Recreation Area Alternatives (in 2011 dollars)

Feature	Alternative 1 (No Action)	Alternative 2	Alternative 3 (NPS Preferred)
Annual operating costs	$3,100,000	$3,205,700	$3,134,000
Staffing (additional full time equivalent staff)	41 (+0)	43 (+2)	42 (+1)
One-time capital costs*	$1,312,000	$6,831,000	$10,055,000

* Total includes costs for both essential and desirable projects.

Table 16: Estimated Costs of the Alibates Flint Quarries National Monument Alternatives (in 2011 dollars)

Feature	Alternative A (No Action)	Alternative B (NPS Preferred)	Alternative C
Annual operating costs	Same as alternative 1 costs for Lake Meredith National Recreation Area	Same as alternative 3 costs for Lake Meredith National Recreation Area	Same as alternative 3 costs for Lake Meredith National Recreation Area
Staffing (additional full time equivalent staff)	Same as alternative 1 costs for Lake Meredith National Recreation Area	Same as alternative 3 costs for Lake Meredith National Recreation Area	Same as alternative 3 costs for Lake Meredith National Recreation Area
One-time capital costs**	$70,000	$132,000	$124,000

* Total includes costs for both essential and desirable projects.

Note: Since both parks share annual operating costs and staffing, costs under alternatives B and C for Alibates Flint Quarries are the same as the preferred alternative for Lake Meredith National Recreation Area.

The implementation of the approved plan, no matter which alternatives are selected, will depend on future funding levels and servicewide priorities, and on partnership funds, time, and effort. The approval of this plan does not guarantee that funding and staffing needed to implement the plan will be forthcoming. Full implementation of the plan could be many years in the future.

Annual operating costs are the total costs per year for maintenance and operations associated with each alternative, including utilities, supplies, staff salaries and benefits, leasing, and other materials. Cost and staffing estimates assume that the

alternative is fully implemented as described in the narrative.

The staffing figure (total number of full-time-equivalent staff) is the number of person-years of staff required to maintain the assets of the parks at a good level, provide acceptable visitor services, protect resources, and generally support the parks' operations. The full-time-equivalent staff number indicates operationally funded NPS staff only, not volunteer positions or positions funded by partners. Full-time-equivalent staff salaries and benefits are included in the annual operating costs.

One-time capital costs include projects related to facilities, preservation of resources, and other park management activities that would require substantial funding above park annual operating costs.

MITIGATION MEASURES

Congress charged the National Park Service with managing the lands under its stewardship "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations" (Organic Act, 16 USC 1). As a result, the National Park Service routinely evaluates and implements mitigation whenever conditions occur that could adversely affect the sustainability of national park system resources.

To ensure that implementation of the action alternatives would protect unimpaired the natural and cultural resources and the quality of the visitor experience, a consistent set of mitigation measures would be applied to actions proposed in this plan. As appropriate, the National Park Service would prepare appropriate environmental review, as required by the National Environmental Policy Act, National Historic Preservation Act, and other relevant legislation, for future actions. As part of the environmental review, the National Park Service would mitigate adverse impacts to the maximum feasible extent.

The implementation of a compliance-monitoring program could be considered to stay within the parameters of such requirements as the National Environmental Policy Act and National Historic Preservation Act. Any compliance monitoring program would oversee mitigation measure implementation and would include reporting protocols.

The following mitigation measures and best management practices would be applied to avoid or minimize potential impacts from implementation of the alternatives. Additional mitigation could be implemented based on need. These measures would apply to all alternatives in both parks. Any construction or other actions would meet these mitigative measures.

NATURAL RESOURCES

Exotic Species

Implement an invasive weed abatement program. Standard measures could include ensuring that construction-related equipment arrives on the site free of mud or seed-bearing material, certifying all seeds and straw material as weed-free, identifying areas of invasive weeds before construction begins, requiring visitors to certify that all horse feed, including hay, carried into the national recreation area is weed free, treating invasive weeds or invasive weed topsoil before construction, and revegetating with appropriate native species.

Natural Soundscape

Implement standard noise abatement measures during construction and daily operations. Standard noise abatement measures could include a schedule that minimizes impacts on adjacent noise-sensitive uses, the use of the best available noise control techniques wherever feasible, the use of hydraulically or electrically powered impact tools when feasible, and the location of stationary noise sources as far from sensitive uses as possible.

Apply mitigation measures to protect the parks' natural sounds. Specific actions could include, but would not be limited to, siting and designing facilities to minimize objectionable sound and exploring opportunities to reduce the sounds of human-caused sound.

Plant Communities and Vegetation

- Monitor areas used by visitors, such as roads and trails, for signs of native vegetation disturbance, such as trampling of vegetation, driving off existing roads, creating social trails, and widening trails beyond constructed width through use.

When concerns are indicated by monitoring, apply management strategies as described in User Capacity.

- Use public education, revegetation of disturbed areas with native plants, erosion control measures, and barriers to control potential impacts on plants from trail erosion or creation of social trails.
- Use barriers and closures to prevent trampling and loss of riparian vegetation.
- Develop revegetation plans for disturbed areas and require the use of native species. Specify measures such as seed or plant source, seed and plant mixes, and soil preparation. Use salvaged vegetation to the maximum extent possible.

Special Status Species and Their Habitat

Mitigation actions would occur during normal park operations as well as before, during, and after construction to minimize immediate and long-term impacts to rare, threatened, and endangered species. These actions would vary by specific project and area of the parks affected. Many of the measures listed below for vegetation and wildlife would also benefit rare, threatened, and endangered species by helping to preserve habitat. Mitigation actions specific to rare, threatened, and endangered species would include the following:

- Conduct surveys for rare, threatened, and endangered species, as warranted, to inform management and development decisions.
- Site and design facilities or actions to avoid adverse effects on rare, threatened, and endangered species. If avoidance is infeasible, minimize and compensate for adverse effects as appropriate and in consultation with the appropriate resource agencies.
- Develop and implement restoration and/or monitoring plans, as warranted. Plans should include methods for implementation, performance standards, monitoring criteria, and applying adaptive management techniques when concerns are indicated.
- Implement measures to reduce adverse effects of nonnative plants and wildlife on rare, threatened, and endangered species.

Scenic Resources

- Design, site, and construct facilities to avoid or minimize visual intrusions on natural and cultural resources and landscape.
- Provide vegetative screening, where appropriate.
- Continue cooperative measures regionally to protect air quality, which affects scenic views.

Soils

- Build new facilities on soils and slopes that are suitable for development.
- Design trails and roads to minimize compaction and soil erosion.
- Minimize soil erosion by limiting the time that soil is left exposed.
- Apply erosion control measures such as erosion matting, silt fencing, and sedimentation basins in construction areas to reduce erosion, surface scouring, and discharge to water bodies.
- To conserve available organic matter, retain and replace any topsoil that is present.
- Once work is completed, quickly revegetate construction areas with native plants.

- Monitor for visitor impacts, particularly in sensitive or highly visited areas and, when concerns are indicated, apply management strategies as described in "User Capacity."
- Implement a spill prevention and pollution control program for hazardous materials, including fuels. Standard measures could include hazardous materials storage and handling procedures; spill containment, cleanup, and reporting procedures; and limitation of refueling and other activities to upland or nonsensitive sites.

Water Resources

- To prevent water pollution during construction, use erosion control measures, minimize discharge to water bodies, and regularly inspect construction equipment for leaks of petroleum and other chemicals.
- Build runoff detention or filtration systems to minimize water pollution from larger parking areas.
- Minimize erosion from trails and dirt roads.

Water Quality

- Provide information on water quality protection at visitor contact stations and in brochures. Stress the lake's function as a municipal water supply source. Coordinate messaging with the Canadian River Municipal Water Authority.
- Post signs at boat ramp areas emphasizing the need to use restrooms and not deposit human waste in the water or on the lakeshore.
- At horse corrals, provide educational materials on the need for horse owners to remove horse manure. Remove horse manure from public corrals if visitors fail to do so. Encourage horse riders to stay on the trail in areas close to the Canadian River.
- During times of high water, install a floating restroom with a pump-out to encourage boaters to reduce the amount of human waste in Lake Meredith.
- Educate users of off-road vehicles of the need to refuel vehicles at least 100 yards from the Canadian River or its tributaries and to take steps to eliminate fuel spills.
- Have spill kits readily available at the fueling station at the marina.

Wetlands

- Delineate wetlands before construction work so they can be avoided or protected, and apply protection measures during construction. Delineation should be done by qualified NPS staff or certified wetland specialists and clearly marked.
- Perform construction activities using best practices to prevent damage caused by equipment, erosion, or siltation.
- Improve existing trails through wetland areas and design new trails to minimize impacts on vegetation.

Wildlife

- Employ techniques to reduce impacts on wildlife, including visitor educational programs, restrictions on visitor activities, and ranger patrols.
- Implement a natural resource protection program. Standard measures could include scheduling construction outside sensitive periods such as nesting, biological monitoring, erosion and sediment control, the use of fencing or other means to protect sensitive resources

adjacent to construction, the removal of all food-related items or rubbish, topsoil salvage, and revegetation. This could include specific construction monitoring by resource specialists as well as treatment and reporting procedures.

- Schedule activities in or near water sources to minimize disturbance to wildlife.

CULTURAL RESOURCES

The National Park Service would preserve and protect, to the greatest extent possible, resources that reflect the human occupation of what is now Lake Meredith National Recreation Area and/or Alibates Flint Quarries National Monument. Specific mitigation measures, if needed, would include the following:

- Carry out projects in accordance with site-specific planning and section 106 compliance. Make all efforts to avoid adverse impacts through use of the *Secretary of the Interior's Standards for Archeology and Historic Preservation* (1995) and by using sensitive design that would be compatible with historical resources. If adverse impacts could not be avoided, mitigate impacts through a consultation process with all interested parties.
- Before disturbing or modifying any cultural resources that are eligible or listed in the National Register of Historic Places, consult with the Texas state historic preservation officer, Advisory Council on Historic Preservation, any associated American Indian tribes, and other concerned parties.
- Inventory all unsurveyed areas in the parks for archeological, ethnographic, and historical resources. Conduct archeological surveys in unsurveyed areas where development would occur to determine the extent and significance of archeological resources, and carry out projects to avoid adverse resource impacts or effectively mitigate impacts through a consultation process with all interested parties.
- Document cultural and ethnographic landscapes in the parks and identify treatments.
- Conduct archeological site monitoring and routine protection. Where protection or site avoidance during design and construction is infeasible, conduct data recovery excavations at archeological sites threatened with destruction.
- Continue ongoing consultations with associated American Indian tribes. Protect sensitive traditional-use areas to the maximum extent feasible.
- Whenever possible, modify project design features to avoid adverse effects on cultural resources. Locate new developments on sites that blend with cultural resources and that are not adjacent to ethnographic resources. If necessary, use vegetative screening to minimize visual impacts on cultural resources and ethnographic resources.
- Encourage visitors through the interpretive programs to respect and leave undisturbed any inadvertently encountered archeological resources.
- Strictly adhere to NPS standards and guidelines on the display and care of artifacts. This would include artifacts used in exhibits in the visitor facilities.

VISITOR SAFETY AND EXPERIENCES

- Implement a traffic control plan during construction, as warranted. Include strategies to maintain safe and efficient traffic flow.

- Implement measures to reduce adverse effects of construction on visitor safety and experience.
- Incorporate safety into interpretation and educational programs.
- Use interpretation and educational programs to promote a sense of stewardship among the parks' visitors.
- Implement a strategy to maximize accessibility for people with impaired mobility.

SOCIOECONOMIC ENVIRONMENT

- Work with local communities and county governments during the future planning and implementation of the approved general management plan to further identify potential impacts and mitigation measures that would best serve the interests and concerns of both the National Park Service and the local communities.
- Pursue partnerships to improve the quality and diversity of community amenities and services.

SUSTAINABLE DESIGN AND AESTHETICS

- Design projects to work in harmony with the surroundings. This would include reducing, minimizing, or eliminating air and water pollution and the generation of solid or hazardous wastes.
- Make projects sustainable to the maximum feasible extent.
  - Recycle and reuse materials
  - Minimize materials
  - Minimize energy and water consumption, and the generation of carbon emissions, during project construction and throughout the lifespan of the project

FUTURE STUDIES AND PLANS

Numerous studies and plans are required to implement this general management plan. By alternative, these include the following.

LAKE MEREDITH NATIONAL RECREATION AREA

Alternative 1

- As situations arose, the National Park Service would prepare environmental compliance actions and other planning-related documents.
- Research and studies, such as an ethnographic resource overview and assessment, resource stewardship plans, and cultural landscape inventories and reports would be prepared to fulfill responsibilities under Section 110 of the National Historic Preservation Act.

Alternative 2

The following specific planning documents would be necessary to implement the actions identified as part of alternative 2.

1. A siting study, followed by a site plan and construction plans, would be prepared for the new consolidated operations facility in the national recreation area.
2. A commercial visitor services plan would be prepared to evaluate the range of commercial visitor services determined to be necessary and appropriate in the park and to guide implementation.
3. A restoration and development concept plan would be completed to reduce the dirt road network within the national recreation area. This might be prepared in conjunction with a travel/road management plan.
4. A site plan would be completed to improve and delineate camping sites in McBride Canyon.
5. A siting study would be completed to determine appropriate locations for primitive camping on the west side of the national recreation area.
6. A trails plan would be completed for the entire national recreation area. It would include monitoring of trails for resource protection and would define management actions, including closure, with monitoring for success.
7. A fee study, which would include determination of appropriate fees, would be completed to install recreational vehicle utilities at the Fritch Fortress and Sanford-Yake campgrounds.

Alternative 3, the NPS Preferred Alternative

In addition to planning documents 2 through 7 under alternative 2, the following planning documents would be necessary to implement actions identified as part of the NPS preferred alternative.

1. A siting study, followed by a site plan and construction plans, would be prepared for the new consolidated headquarters, visitor contact station, and operations facility in the national recreation area.
2. A site-specific plan, which would include determination of appropriate fees, would be completed for the new recreational vehicle campground at Bates Canyon.
3. A restoration and site-specific plan would be developed to open the McBride Ranch House for guided tours during special events.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

Alternative A

As situations arose, the National Park Service would prepare environmental compliance actions and other planning-related documents.

Alternative B, the NPS Preferred Alternative

The following specific planning documents would be necessary to implement the actions identified as part of the NPS preferred alternative.

1. A plan would be prepared to guide the development and installation of outdoor interpretive materials focusing on an Antelope Creek-style dwelling.
2. The comprehensive interpretive plan would be updated to address information technologies opportunities and increased outreach education and interpretation.
3. A site-specific plan would be completed for archeological excavation of a quarry pit.

Alternative C

In addition to planning document and 3 under alternative B, the following planning document would be necessary to implement actions identified as part of alternative C.

1. A plan, such as a resource stewardship strategy, would identify opportunities for research with partners within the national recreation area.

IMPLEMENTATION PLANS

The following implementation plans would be needed for different aspects of management under all alternatives. Each plan would cover both parks unless otherwise noted.

Implementation plans are needed to fulfill the requirements to adequately manage the parks and are identified as requirements by Department of the Interior or NPS policy, government regulation, or other sources. The content of these plans may vary, depending on the alternative selected. However, the goals, objectives, and direction for all implementation plans are established in this general management plan, which is the umbrella document from which all future planning efforts will tier.

Implementation plans require periodic review and revision, as well as environmental compliance and public review. Implementation plans will include but may not be limited to the following:

- a land protection plan
- a natural resources stewardship strategy, which includes management of exotic species and special status species, including those that are endangered or threatened, and was last revised in 1996
- a cultural resources management plan, including museum collections

HOW EACH ALTERNATIVE ACHIEVES REQUIREMENTS OF THE NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act requires an analysis of how each alternative meets or achieves the purposes of the act, as stated in section 101(b). Each alternative analyzed in a National Environmental Policy Act document must be assessed as to how it meets the followings purposes:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations
2. assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences
4. preserve important historical, 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
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources

The Council on Environmental Quality has promulgated regulations for federal agencies implementation of the National Environmental Policy Act (40 *Code of Federal Regulations* parts 1500-1508). Section 1500.2 states that federal agencies shall, to the fullest extent possible, interpret and administer the policies, regulations, and public laws of the United States in accordance with the policies set forth in the act (sections 101(b) and 102(1)); therefore, other acts and NPS policies are referenced as applicable in the following discussion.

Criterion #1. Fulfill the Responsibilities of Each Generation as Trustee of the Environment for Succeeding Generations

All alternatives considered in this general management plan / environmental impact statement, including the alternative of no action / continue current management (alternative 1 for Lake Meredith National Recreation Area and alternative A for Alibates Flint Quarries National Monument A), must comply with federal laws and NPS policies, including the Organic Act of 1916 and *Management Policies 2006*, that require the agency to manage parks by such means and in such a manner "that will leave them unimpaired for the enjoyment of future generations." A more detailed discussion of this subject is in chapter 1 under the heading, "Servicewide Laws and Policies Applicable to Both Parks." Each alternative meets this criterion, although the "action alternatives" would be more effective in enhancing the National Park Service's ability to meet this condition because they were designed specifically to address concerns that have arisen relating to visitor use of the parks while the National Park Service conserves their natural and cultural resources for future generations.

Criterion #2. Assure for All Americans Safe, Healthful, Productive, and Esthetically and Culturally Pleasing Surroundings

Comments received from the public during scoping (see chapter 5) supported the findings of the most recent visitor study (Arizona State University 2004), that most visitors are pleased with virtually all aspects of the parks that can be controlled by the National Park Service. Under all alternatives, including the no-action alternatives, the parks would strive to

provide for safe, healthful, productive, and aesthetically and culturally pleasing surroundings.

Compared to the no-action alternative, the action alternatives for Lake Meredith National Recreation Area would be more effective in promoting physical activity, with its related health benefits, because they offer a wider range of recreational opportunities. Also, the management of user capacity and implementation of an adaptive management program under the action alternatives would increase the ability of the National Park Service to protect the parks' natural and cultural resources that contribute to the parks' esthetically and culturally pleasing surroundings,

Criterion #3. Attain the Widest Range of Beneficial Uses of the Environment without Degradation, Risk of Health or Safety, or Other Undesirable and Unintended Consequences

The elements of "without degradation" and "risk of health or safety" are included in the consideration of conditions 1 and 2. Therefore, this discussion focuses on attaining the widest range of beneficial uses of the environment without other undesirable and unintended consequences.

Under all of the alternatives, the parks would continue to provide a broad range of beneficial recreation, education, and interpretation uses that are rare elsewhere in the southern High Plains. Within the region, there are virtually no other opportunities for water-based recreation, and there is very little public land where citizens can engage in activities such as camping, hiking, biking on trails, nature study, horseback riding, cultural resource interpretation, and hunting. Because of the National Park Service's extensive experience in managing such activities at these and other national park system units, undesirable and unintended consequences associated with these beneficial uses can be anticipated and avoided or mitigated.

When compared to the no-action alternative at each park, features of the action alternatives would improve the National Park Service's ability to provide park use without undesirable and unintended consequences. These include these alternatives' expanded recreation and interpretation opportunities, plus the management of user capacity and the adaptive management aspects of the action alternatives.

Criterion #4. Preserve Important Historic, Cultural, and Natural Aspects of Our National Heritage and Maintain, Wherever Possible, an Environment That Supports Diversity and Variety of Individual Choice

All alternatives would continue not only to preserve but also to restore the parks' "scenery and the natural and historic objects and the wild life," the conservation of which is established as the National Park Service's mission by the Organic Act. For example, beneficial consequences of all of the alternatives would continue to include the control of invasive plant species, implementation of a managed fire regime with a natural fire intensity and period of recurrence, and reestablishment of native vegetation. Collectively, these produce beneficial effects on other aspects of the environment, such as soils, wildlife, and visitor use and experience. Under the action alternatives, these gains would increase even as beneficial recreation opportunities were expanded, providing more diversity and variety of individual choice. Examples include the rehabilitation or restoration of the McBride Ranch House, increased opportunities for interpretation at the McBride Ranch House, new opportunities for a backcountry experience in the semi-primitive zone, and the restoration of native vegetation on dirt roads that were removed from the road network.

Criterion #5. Achieve a Balance between Population and Resource Use Which Will Permit High Standards of Living and a Wide Sharing of Life's Amenities

The availability of recreation, education, and interpretation opportunities in the parks that contribute to the quality of life for users of the parks would continue under all alternatives. Beyond this, the action alternatives include a user capacity program, with monitoring of indicators for compliance with standards and the implementation of management strategies under a flexible adaptive management program. This will enable the National Park Service to better balance visitor use of the parks with resource protection and to continue to improve the condition of the natural and cultural resources while serving a larger, more diverse visitor population.

Criterion #6. Enhance the Quality of Renewable Resources and Approach the Maximum Attainable Recycling of Depletable Resources

Under all alternatives, NPS managers would continue to apply both traditional and innovative thinking to the wise management of resources. The former includes maximizing the use of electronic information transfer rather than travel and emphasizing energy and water efficiency in all equipment purchases. The latter includes allowing grasshopper collecting by citizens, which provides a beneficial use of a pest species, and a one-time event that allowed visitors to collect and remove as firewood the waste wood that was produced by the National Park Service's cutting of an invasive tree species.

Improved management of renewable and depletable resources would occur under the action alternatives. Consolidating the locations of the parks' administrative, maintenance, law enforcement, fire management, and interpretive staffs would substantially reduce travel and its associated energy use. All new buildings would be constructed to high standards of energy and water efficiency, which would conserve these resources. They also could be designed to accommodate or include renewable energy production, particularly solar panels that could be installed on the roofs without causing adverse visual effects or increasing the development footprint.

ALTERNATIVES AND ACTIONS CONSIDERED BUT DISMISSED FROM FURTHER CONSIDERATION

Public involvement, including scoping conducted while preparing this general management plan, is described in Chapter 5, Consultation and Coordination. Some of the alternatives or actions suggested during scoping were not incorporated into this general management plan. Consistent with section 1502.14 of the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act, this section identifies those alternatives or actions and briefly discusses the reasons why each was eliminated.

As described in chapter 5, the identification of issues and development of alternatives provided opportunities for public and agency input through responses to newsletters, at meetings, and via the Internet. However, some actions or alternatives received through these avenues were eliminated from further consideration because they

- were not feasible
- are already prescribed by law, regulation, or policy
- would be in violation of laws, regulations, or policies
- were too detailed for the broad scope of a general management plan

In developing the alternatives, the National Park Service considered the complete range of suggestions received during public scoping. This section briefly describes the suggestion that were not incorporated and the basis for excluding them from this general management plan.

RESOURCE MANAGEMENT

Maintain Higher Water Levels in Lake Meredith

According to the enabling legislation for Sanford Dam and Lake Meredith National Recreation Area, the National Park Service manages the land within the national recreation area, but the water is managed by the Bureau of Reclamation and Canadian River Municipal Water Authority. Therefore, lake water levels cannot be included in this general management plan.

Preserve Unique Flora, Fauna, Geologic, and Paleontological Resources

This already is required by federal law and is an important component of all NPS management activities in the parks.

Protect Historical, Archeological, and Ethnographic Resources

This already is required by federal law and is an important component of all NPS management activities in the parks.

Protect Air Quality

Air quality is protected by federal and state law, and activities by the National Park Service, oil and gas producers, and visitors to the parks comply with all requirements. The parks are classified as Class II areas under the Clean Air Act. Air quality has improved since the Clean Air Act was passed in 1970, and the Texas panhandle, where the parks are located, is in attainment for all criteria pollutants, including carbon monoxide, lead, nitrogen dioxide, ozone, particulates, and sulfur dioxide. The National Park Service will continue to cooperate with industries and other government agencies to continue to improve regional air quality, but this is not a general management planning issue.

Prohibit Actions That Impair Resources

The Organic Act requires that park resources must be protected from impairment. The National Park Service does not allow action that would impair

park resources, and it evaluated each proposed action, including the alternatives for this general management plan, to ensure that impairment would not occur.

Place a Limit on the Size of Deer Taken during Hunting Season in Lake Meredith National Recreation Area

Hunting in the national recreation area is managed by the Texas Parks and Wildlife Department in accordance with the regulations of the state of Texas. The National Park Service works cooperatively with the Texas Parks and Wildlife Department to maintain a healthy deer population.

PUBLIC USE AND UNDERSTANDING

Reduce, Expand, or Incorporate a Boundary Change with Regard to Off-road Vehicle Use Areas in Lake Meredith National Recreation Area

Off-road vehicle use is being addressed in the off-road vehicle management plan and environmental impact statement.

Allow Grazing in Lake Meredith National Recreation Area

Grazing is permitted, but not mandated, by the establishing legislation. The National Park Service has determined that allowing grazing is not currently in the best interest of the national recreation area, but it could be included in future management.

Institute an Entrance Fee

Implementation and enforcement of an entrance fee would be difficult, because Lake Meredith National Recreation Area includes 19 entry points, and travel among parts of the national recreation area often requires exiting and then reentering the national recreation area. Therefore, it was determined that a more appropriate approach was to consider fees for activities that had higher management, maintenance, or enforcement costs, such as boating, use of off-road vehicles, and camping.

FACILITIES AND OPERATIONS

Maintain the Quality of Park Facilities

Based on federal law, the parks' facilities must be harmonious with park resources, compatible with natural processes, aesthetically pleasing, functional, energy efficient, cost effective, and as accessible as possible to all segments of the population. Management actions included in the general management plan alternatives would encourage the development of a sense of stewardship in park users, which would help reduce problems such as vandalism that are adversely affecting the parks' facilities.

End Public Trespassing or Uses outside the Boundaries

NPS policy directs park managers to work with adjacent owners on issues of concern such as trespassing. Tools such as the hunting map are prepared by the National Park Service to help visitors avoid trespassing on adjacent lands.

Encroachment onto NPS land is a common problem at many NPS units, including Lake Meredith National Recreation Area, and it could occur at Alibates Flint Quarries National Monument. Concerns also arise when visitors cross the national recreation area boundary onto private lands, such as in the Rosita area. The National Park Service will continue to work with adjacent landowners to ensure maintenance of boundaries.

THE NPS PREFERRED ALTERNATIVE

The preferred alternative is the alternative that the National Park Service believes would best accomplish its goals for managing a park unit. Selection of the preferred alternative is based on consideration of environmental, technical, economic, and other factors.

A Choosing by Advantages workshop was conducted to evaluate the alternatives and to recommend an NPS preferred alternative for each park. Based on the results, alternative 3 is the NPS preferred alternative for Lake Meredith National Recreation Area and alternative B is the NPS preferred alternative for Alibates Flint Quarries National Monument.

The factors that were included in analyzing the Lake Meredith National Recreation Area alternatives included the following:

- prevents loss, maintains, and improves conditions of natural resources
- provides an appropriate range of visitor experiences and recreational opportunities
- improves operational efficiency, safety, and sustainability

For each of these factors, alternative 3 was found to have the greatest advantage for the national recreation area. Features that substantially contributed to this finding included its increase in opportunities for recreation regardless of the lake level; the improved park operational efficiencies that would result from locating all administration, operations, and management functions at a single location, and its emphasis on maximizing a semi-primitive experience, which has the added benefit of enhancing natural resources. For each factor, alternative 2 provided greater advantage than the no-action / continue current management alternative, but did not provide as much advantage as alternative 3.

The factors that were included in analyzing the Alibates Flint Quarries National Monument alternatives included the following:

- preserves cultural resources
- provides an appropriate range of visitor experiences
- improves operational efficiency, safety, and sustainability

Alternative B was found to provide the greatest advantage for Alibates Flint Quarries National Monument when considering each of these factors. Advantages were achieved through increased opportunities for visitors to learn about the flint deposits and the people who used them and the maximum protection of cultural resources that would be achieved by assigning most of the national monument to the cultural zone.

Adjustments were made to the NPS preferred alternatives for each park to incorporate features that would increase that alternative's advantages. The NPS preferred alternatives described earlier in this chapter reflect the results of the Choosing by Advantages workshop. Complete results are presented in a report titled *Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument Choosing by Advantages Final Workshop Meeting Report* (Parsons 2010).

THE ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The National Park Service is required to identify the environmentally preferable alternative in its National Environmental Policy Act documents for public review and comment. Guidance from the Council on Environmental Quality (1981) states that the environmentally preferable alternative will promote the national environmental policy as expressed in section 101 of the National Environmental Policy Act. Further, it is "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources."

LAKE MEREDITH NATIONAL RECREATION AREA

Alternative 3 has been identified as the environmentally preferred alternative for Lake Meredith National Recreation Area. Features of this alternative that would result in the least damage to the biological and physical environment and would best protect, preserve, and enhance the national recreation area's valuable historic, cultural, and natural resources include the following:

- Compared to alternatives 1 or 2, alternative 3 provides additional protection to national recreation area resources by designating a larger part of the land area as a semi-primitive zone and by establishing a water-based, no wake zone in part of Lake Meredith. Establishing these zones would provide the greatest opportunity to protect and enhance the natural and cultural resources in their boundaries. Additionally, this alternative's emphasis on nonmotorized activities would help reduce the carbon footprint associated with recreation.
- This alternative would consolidate the headquarters, visitor contact station, and operations center into one facility instead of the separate facilities that would be used with the other alternatives. This consolidation would have multiple environmental advantages. For example, it would reduce the number of staff trips in vehicles between locations, with a related reduction in fuel consumption and greenhouse gas emissions; eliminate the need for duplicative office equipment in multiple locations; and allow staff time to be used for managing natural and cultural resources rather than traveling.
- The McBride Ranch House would be restored under alternative 3. This action would preserve an important historical resource.

Alternative 1 (no-action / continue current management) was not considered environmentally preferable because of inefficiencies resulting from the separate administrative, visitor contact, and maintenance facilities and use of motorized vehicles throughout the national recreation area.

The types of beneficial impacts expected under alternative 2 would be similar to those expected under alternative 3. However, they would occur at a reduced intensity in alternative 2 because of the lesser consolidation of facilities and the smaller part of the national recreation area that would be zoned for nonmotorized used by visitors.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

Alternative A has been identified as the environmentally preferable alternative for Alibates Flint Quarries National Monument. This alternative would result in the least damage to the biological and physical environment and would best protect the national monument's valuable cultural resources.

Compared to alternatives B or C, alternative A provides the greatest protection to national monument resources by maintaining restricted access and not developing any additional infrastructure or facilities. Under alternative A, no construction or excavations would occur and, therefore, no impacts on natural or cultural resources would result from development. Continuing the current restrictions on access to the national monument would provide be greatest protection from vandalism and looting of the national monument's cultural resources.

Alternative B also would restrict access to the national monument, but it would impact natural and cultural resources through the development of self-guiding trails, the development of outdoor interpretive materials focusing on an Antelope Creek-style dwelling, and controlled archeological excavation of a quarry pit. Alternative C was not environmentally preferable because it would have some of the same development proposed for alternative B and because part of the national monument would be designated within the semi-primitive zone, which would allow unrestricted access to the national monument, increasing the potential for vandalism and looting of cultural resources.

ALTERNATIVE COMPARISON TABLES

NPS guidance in Director's Order 12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001) requires that environmental impact statements include several summaries that will facilitate reader understanding.

The important differences and costs among alternatives for Lake Meredith National Recreation Area are summarized in table 17. Detailed descriptions of the features of each alternative were provided earlier in this chapter. Table 18 summarizes the effects of each alternative on the impact topics retained for analysis for Lake Meredith National Recreation Area. Details regarding impacts of each alternative are presented in chapter 4.

Similar information is provided for Alibates Flint Quarries National Monument. Table 19 summarizes the features and costs of each alternative and the impacts of each alternative are presented in table 20.

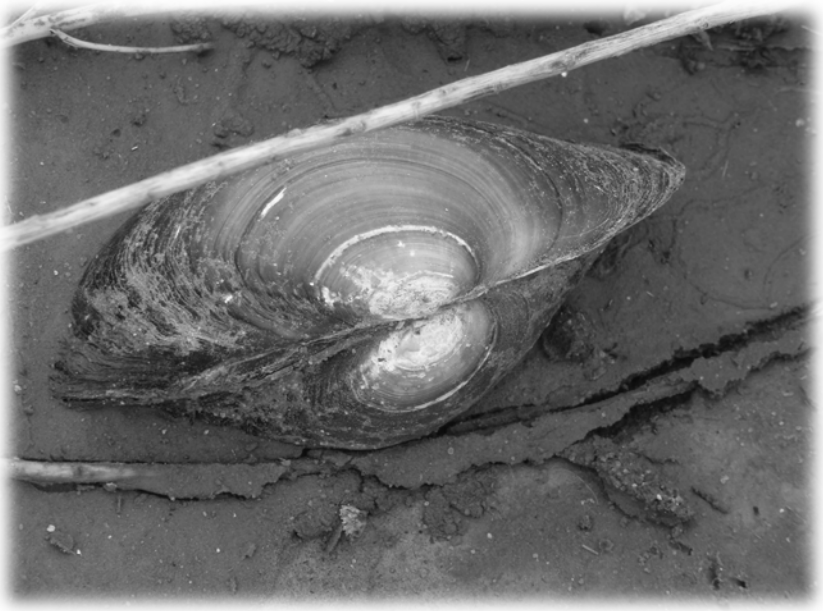


Table 17: Features of the Lake Meredith National Recreation Area Alternatives

Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Zoning		
Do not apply management zones.	Apply management zones as shown on figure 6.	Apply management zones as shown on figure 7.
Natural Resources		
Continue to manage natural resources in a manner consistent with all laws and NPS policies.	Same as alternative 1, except as follows: Prepare a comprehensive travel/road management plan to reduce the size of the dirt road network. Evaluate each road to determine if it should be maintained, converted to a trail, or closed and restored to native vegetation and implement the findings. Allow motorized vehicles in the semi-primitive zone only to support park administration and oil and gas production. Rehabilitate the Mullinaw Trail to control erosion. Increase management of areas requiring additional resource protection, as with more monitoring and mitigation.	Same as alternative 2.
Cultural Resources		
Continue to manage cultural resources in a manner consistent with all laws and NPS policies. Document and assess historical resources such as remnants of ranching activities and former oil and gas production sites. Preserve sites that are adequately stabilized and not at risk of disturbance by visitor use and manage them as discovery sites. Continue to acquire, accession and catalog, preserve, protect, and make museum collections available for access and use according to NPS standards and guidelines.	Same as alternative 1.	Same as alternative 1, except as follows: Rehabilitate the McBride Ranch House and provide guided tours during special events. Install waysides to increase interpretation of archeological sites.

Table 17: Features of the Lake Meredith National Recreation Area Alternatives (continued)

Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Visitor Experience		
Continue traditional visitor recreation activities. These include, but are not limited to boating, kayaking, canoeing, fishing, camping, hunting, hiking, horseback riding, use of off-road vehicles in two locations, and driving for pleasure.	Same as alternative 1, except as follows: Enhance traditional activities by improving existing facilities. Encourage a broader range of camping experiences by providing primitive camping in the semi-primitive zone and installing water and electricity at some developed campsites. Provide better trail markers for the Mullinaw Trail. In the rural and semi-primitive zones, provide an opportunity to experience a more natural setting with an opportunity for solitude away from roads. Promote more use on the west side of the national recreation area. Use information technology, such as podcasts, to provide orientation, interpret features such as geology and history, and/or provide virtual tours of the national recreation area.	Same as alternative 1, except as follows: Provide a new visitor contact station in the consolidated operations center off Sanford-Yake Road. Promote recreation that does not rely on the presence of the lake, such as hiking, biking, group and primitive camping, and GPS-based exploration. Become a destination for semi-primitive recreation opportunities for a broad range of skill levels. Encourage a broader range of camping experiences by providing primitive camping in the semi-primitive zone and installing water and electricity at some developed campsites. Provide better trail markers for the Mullinaw Trail. In rural and semi-primitive zones, provide an opportunity to experience a more natural setting with an opportunity for solitude away from roads. Include a larger semi-primitive zone than alternative 2. Apply a water-based, no wake zone to lake coves and the Canadian River inlet to encourage activities such as canoeing and kayaking. Promote more use on the west side of the national recreation area.

Table 17: Features of the Lake Meredith National Recreation Area Alternatives (continued)

Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Recreational Activities		
Maintain all current activities in their current locations. Construct a new multi-use trail starting at Harbor Bay, with phased development from Fritch Fortress to South Turkey Creek. Continue with plans that might result in the construction of a new boat ramp on the northwest side of the lake near the dam. Manage the Rosita and Blue Creek areas in accordance with the off-road vehicle plan.	Same as alternative 1, except as follows: Provide more flexibility in managing visitor facilities in developed areas by removing underused facilities when the lake drops and replacing them, up to year 2010 levels, when the lake rises. Provide primitive camping on the west side of the national recreation area (for example, in Martins and Evans Canyons). Identify camping areas, but do not designate individual sites unless required for resource protection. Rehabilitate the Mullinaw Trail. Provide electricity and water to approximately 10 campsites at Fritch Fortress and 10 campsites at Sanford-Yake. Improve the Mc Bride Canyon camping area by delineating individual sites and installing additional primitive toilets.	Same as alternative 2, except as follows: Develop additional opportunities for hiking, biking, and horseback riding in the national recreation area: • Mark multi-use trails along existing roadways. • Define semi-primitive trails for hiking, horseback riding, and biking on the west side of the national recreation area. • Designate some existing roads for hiking, biking, horseback riding, and administrative use only. Provide additional activities, such as global positioning system-based recreation. At Bates Canyon, construct a new campground with electrical hookups. At Harbor Bay, provide additional group campsites with minimal facilities that can be moved as water levels change. Promote nonmotorized activities by providing more trails, establishing water-based, no wake zones, and increasing the size of the semi-primitive zone. At Spring Canyon, install underwater scuba targets.
Operations		
Maintain current locations of maintenance and law enforcement functions off Sanford-Yake Road and the fire cache near the south side of Sanford Dam. Continue to use the existing headquarters and visitor information building in Fritch. Provide additional facilities as required by visitation, such as primitive toilets in high-use areas. Remove unused or underused facilities, including the water tower, Bates Canyon boat ramp, and some Blue West campsites. Install energy-efficient lighting and appliances. Continue fee programs for boating and special use permits.	Same as alternative 1, except as follows: Construct a consolidated operations center for maintenance, fire, and law enforcement in the national recreation area at the site of the existing maintenance yard off Sanford-Yake Road. Include storm shelters in all new buildings. Employ sustainable design for new buildings. Consider establishing fees for ORV users. Consider establishing campgrounds fees. Consider a concession contract for campground operations.	Same as alternative 2, except as follows: Develop a headquarters, visitor contact station, and consolidated operations center that includes maintenance, fire, and law enforcement at the site of the existing maintenance yard off Sanford-Yake Road. Expand community outreach, interpretation, and education.

Table 17: Features of the Lake Meredith National Recreation Area Alternatives (continued)

Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Interpretation		
Continue to use bulletin boards to provide general information and safety-oriented messages.	Same as alternative 1, except as follows: Outside the Alibates contact station, construct a self-guiding interpretive trail and outdoor interpretive materials focusing on an Antelope Creek-style dwelling. Install interpretive waysides along the multi-use trail and at overlooks, such as on Ridge Road near Mullinaw Canyon. Increase the use of the amphitheatre at Fritch Fortress for NPS programming. Develop information technology, such as podcasts, to provide orientation to the national recreation area, interpret features such as geology and history, and/or provide virtual tours or visitation. Expand community outreach, interpretation, and education.	Does not include the information technology element of alternative 2. Otherwise, same as alternative 2, except as follows: Enhance interpretation through the development of additional waysides and onsite interpretation of cultural resources. Interpret additional cultural sites in a manner that discourages damage from visitors. Conduct guided tours of the McBride Ranch House during special events. Use the amphitheatre at Fritch Fortress for partner as well as NPS programs.
Commercial Visitor Services		
If water levels increase, evaluate the potential for water-based commercial visitor services, such as operation of a marina.	Consider using commercial visitor services for marina or marina-type services, food services, and/or campground operations.	Same as alternative 2.
Partnerships		
Maintain the current level of partnerships with federal, state, local, and nonprofit entities.	Same as alternative 1, except as follows: Expand partnerships to include community user groups, with an increased focus on community outreach, interpretation, and education.	Same as alternative 2, except as follows: Encourage visitation by nontraditional user groups, with the goal of increasing visitation and a sense of stewardship.
Effectiveness in Meeting the Purpose and Need and Objectives of the Plan		
Maintains current management approaches and does not improve the ability to accommodate varying lake levels and provide recreation that does not rely on the presence of the lake. Maintains current inefficiencies that result from having administrative, operations, and maintenance functions in multiple locations.	Improves recreation opportunities but continues to focus primarily on water-based recreation. Improves NPS operations by consolidating operation and maintenance functions in a single location but continues inefficiencies that result from having administration functions outside the national recreation area.	Is most effective in providing more broad-based recreation opportunities at the national recreation area, with the flexibility to accommodate varying lake levels and an approach that takes better advantage of the 80% of the national recreation area that is outside the normal lake footprint. Improves operations by consolidating all administrative, operations, and maintenance functions in a single location.

Table 18: Summary of Impacts of the Lake Meredith National Recreation Area Alternatives

Impact Topic	Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Endangered, threatened, and other special status species and their habitats	All impacts would continue to be negligible or minor in intensity. The long-term effects would be beneficial with regard to providing habitat for special status species that rely on lake, river, or wetland habitats; removing underused facilities; and controlling of mesquite and saltcedar. Adverse, long-term effects would continue with regard to water quality, disturbance at developed areas and less-used sites, habitat fragmentation by the road network, disturbances along trails, and road kill. All of these impacts individually and collectively would result in a *may affect, but not likely to adversely affect* section 7 finding. Cumulative impacts would add negligible to minor, beneficial and adverse impacts from this alternative to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.	Many impacts would be the same as for the no-action alternative, resulting in a negligible intensity. These include impacts from ongoing use and maintenance of facilities, fluctuating lake levels, removal of underused facilities, management and control of mesquite and saltcedar, and continued use of off-road vehicles in the Rosita area. Short-term, adverse impacts would result from the construction of new facilities, restoration of sites from which facilities were removed, and rehabilitation of the Mullinaw Trail. The intensities would be negligible to minor, and the impacts would end shortly after the projects were completed. All long-term impacts would be negligible or minor. Impacts would be beneficial with regard to restoring the sites of the existing fire cache and law enforcement facilities; decreasing the size of the dirt road network; rehabilitating the Mullinaw Trail; increasing the monitoring and management of resource conditions; implementing a fee for off-road vehicle use; increasing visitor education regarding special status species; and reducing road kill of individual animals. Adverse impacts would result from the construction or installation of new facilities and with increased visitor presence because of the designation of primitive camping areas on the west side of the national recreation area. Individually and collectively, impacts would result in a *may affect, but not likely to adversely affect* section 7 finding under the Endangered Species Act. Cumulative impacts would add negligible to minor, beneficial and adverse impacts from this alternative to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.	Except as follows, the impacts of the preferred alternative on special status species would be the same as those described for alternative 2: • Construction of a consolidated visitor contact, headquarters, and operations center, and the construction of a new campground with electrical hookups at Bates Canyon, would have short- and long-term, adverse impacts of negligible to minor intensity. • Long-term, adverse impacts of minor intensity would result from marking and using additional trails throughout the national recreation area. • Additional group campsites at Harbor Bay would have negligible impacts. • The no wake zone would have a negligible impact on special status species that use shoreline habitats. Individually and collectively, all of these impacts would result in a *may affect, but not likely to adversely affect* section 7 finding under the Endangered Species Act. Cumulative impacts would add negligible to minor, beneficial and adverse impacts from this alternative to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.

Table 18: Summary of Impacts of the Lake Meredith National Recreation Area Alternatives (continued)

Impact Topic	Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Soils	Soil disturbance from ongoing use and maintenance of facilities would continue to have minor, adverse, long-term impacts. Removing underused facilities would result in minor, short-term, adverse soil disturbances and a long-term, minor, beneficial impact because of site restoration. Impacts of past development, such as the creation of impervious surfaces and the compaction of soils, would continue to be long-term, adverse, and minor in developed areas and negligible in other areas. Cumulative impacts would add minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.	Impacts relating to ongoing use and maintenance of facilities, removal of underused facilities, and past development. Impacts would be negligible. Short-term, minor, adverse impacts would result from new facilities construction and utility installation. The long-term, adverse impacts associated with new development would be negligible to minor. Long-term, minor, beneficial impacts would result from each of the following: restoring sites from which facilities had been removed, rehabilitating trails, closing some dirt roads and restoring native vegetation, designating some dirt roads for administrative use only, and increasing monitoring and management. Short-term, minor, adverse impacts and long-term, minor, beneficial impacts would result from improvements at the McBride Canyon campground. The addition of primitive camping on the west side of the national recreation area would result in long-term, negligible to minor, adverse impacts. Cumulative impacts would add negligible to minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.	Except as follows, impacts would be the same as those described for alternative 2: • Short-term, adverse, minor impacts would result from constructing a consolidated visitor contact, headquarters, and operations center; building a new campground with electrical hookups at Bates Canyon; and installing interpretive waysides. Long-term impacts would be negligible or adverse with minor intensity. • Long-term impacts from marking and using trails throughout the national recreation area would be minor and adverse. • Negligible impacts would result from placing group campsites within the normal lake pool at Harbor Bay. Cumulative impacts would add negligible to minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.
Archeological resources	Impacts would be negligible. There would be no cumulative effect from this alternative.	Because archeological sites would be avoided, new construction would have negligible impacts. Long-term, beneficial impacts of minor intensity would result from the improved education and interpretation features of this alternative and from reducing access by automobile in the semi-primitive zone. There would be no cumulative effect from this alternative.	Because archeological sites would be avoided, this alternative's larger amount of new construction would have negligible impacts. Long-term, beneficial impacts of minor intensity would result from the improved education, interpretation, and outreach features of this alternative and from reducing access by automobile in the semi-primitive zone. There would be no cumulative effect from this alternative.

Table 18: Summary of Impacts of the Lake Meredith National Recreation Area Alternatives (continued)

Impact Topic	Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Historic buildings and structures	Long-term impacts from continuing to maintain the McBride Ranch House would be minor and beneficial. Impacts on other historical features would be negligible. There would be no cumulative effect from this alternative.	Impacts from alternative 2 would be negligible. There would be no cumulative effect from this alternative.	Impacts on the McBride Ranch House would be long-term, beneficial, and of moderate intensity. Other historical structures that received treatments would be long-term, beneficial, and of negligible to minor intensity. Impacts at sites where no action was taken would be negligible. There would be no cumulative effect from this alternative.
Visitor use and experience	The new boat ramp on the northwest side of the lake would have minor to moderate, beneficial, long-term impacts. Installation of additional primitive toilets in high-use areas would have a minor, beneficial, long-term impact. Negligible impacts would result from removing unused or underused facilities. Cumulative impacts would add minor to moderate, beneficial impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The incremental contribution of this alternative to the cumulative impact would be small.	The expanded or enhanced recreation opportunities would have long-term, beneficial impacts of moderate intensity. Impacts from establishing fees for camping and off-road vehicle use would be negligible. Impacts from excluding visitor automobile travel in the semi-primitive zone would depend on individual perceptions and could be beneficial or adverse, with intensities ranging from negligible to major. Cumulative impacts would add mostly beneficial impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The incremental contribution of this alternative to the cumulative impact would be modest.	Most impacts would be beneficial and long-term: • The many expanded or enhanced recreation opportunities would have major beneficial impacts. • Installing underwater scuba targets at Spring Canyon would have moderate benefits for visitors who enjoy this sport. • Minor to moderate benefits would result from the new dimension to the visitor experience that would be provided by the interpretation of cultural resources. • NPS and partner presentations at Fritch Fortress and expanded community outreach might bring in new national recreation area users, resulting in negligible to moderate benefits. • Benefits from the new campsite at Bates Canyon would be negligible because a similar experience would be available elsewhere. Establishing a no wake zone would have minor to moderate, long-term, beneficial impacts on visitors participating in nonmotorized, water-based activities and negligible to minor, adverse impacts on users of motorboats.

Table 18: Summary of Impacts of the Lake Meredith National Recreation Area Alternatives (continued)

Impact Topic	Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Visitor use and experience (continued)			Impacts of some components could be viewed as beneficial or adverse, with a range of intensities. These include the impacts perceived by hunters because more visitors were using the less-developed parts of the national recreation area, and impacts from excluding visitor automobile travel in the semi-primitive zone. Impacts from establishing fees for camping and off-road vehicle use would be perceived as negligible by most visitors. Cumulative impacts would add mostly beneficial impacts to the minor to moderate, beneficial effects from other actions, resulting in moderate, beneficial effects. The incremental contribution of this alternative to the cumulative impact would be substantial.
Socioeconomics	Spending by visitors outside the parks would continue to have long-term, moderate, beneficial economic effects in Hutchinson and Moore Counties and the cities of Fritch and Borger. The economic effects of NPS operations would continue to be negligible and beneficial. Cumulative impacts would add moderate, beneficial impacts to the moderate, beneficial effects from other actions, resulting in continued, moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be modest.	Changes in spending by visitors outside the parks would have long-term, minor, beneficial economic effects. The economic effects of NPS operations with regard to construction and jobs would be negligible and beneficial. Cumulative impacts would add minor, beneficial impacts to the moderate, beneficial effects from other actions, resulting in continued, moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be modest.	Changes in spending by visitors outside the parks would have long-term, moderate, beneficial economic effects. The economic effects of NPS operations with regard to construction and jobs would be negligible and beneficial. Cumulative impacts would add moderate, beneficial impacts to the moderate, beneficial effects from other actions, resulting in continued, moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be modest.

Table 18: Summary of Impacts of the Lake Meredith National Recreation Area Alternatives (continued)

Impact Topic	Alternative 1: No Action / Continue Current Management	Alternative 2	Alternative 3: The NPS Preferred Alternative
Transportation and access	Alternative 1 would have negligible impacts on transportation. This alternative would have no cumulative impacts.	Long-term impacts that could be perceived as adverse and moderate could occur for visitors who currently enjoy driving the dirt roads that would fall in the semi-primitive zone. It would have negligible or minor beneficial effects on the other modes of travel used on land and negligible impacts on transportation on the water. This alternative would have no cumulative impacts.	Long-term impacts that could be perceived as adverse and moderate could occur for visitors who currently enjoy driving the dirt roads that would fall in the semi-primitive zone. Long-term, major, beneficial impact would result from increasing the numbers of visitors using nonmotorized transportation, distributing them throughout a large part of the national recreation area, and attracting new visitors who wanted to enjoy these types of travel opportunities. This alternative would have no cumulative impacts.
NPS operations	Beneficial impacts would continue from sharing of staff by the two parks, removal of unused or underused facilities, installation of additional primitive toilets, and improvement in energy efficiency. The intensity of all beneficial impacts would be minor. Adverse impacts would result from the continued distribution of NPS staff in multiple locations; the inadequate space available in the Fritch headquarters building; the continued high level of incidents that increase maintenance requirements; continued use of worn, inefficient buildings; and the continued absence of storm shelters. The intensity of all adverse impacts would be moderate. This alternative would have no contribution to cumulative impact.	Beneficial impacts would result from consolidating maintenance, fire, and law enforcement in a single location; providing storm shelters; replacing old, worn, inefficient buildings with new structures; eliminating motorized travel by visitors in the semi-primitive zone; and reducing the dirt road network. Adverse impacts would result from increased management needs relating to the expansion of partnerships, and from new maintenance needs associated with new facilities such as utilities at campsites, interpretive waysides, and podcast equipment. The intensity of all of these impacts would be minor or moderate. Cumulative impacts would add negligible to moderate, beneficial and minor, adverse impacts to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. The contribution of this alternative to the cumulative impact would be small.	Impact types and intensities would be the same as described in alternative 2, except that consolidating all park management facilities in a single location would have a moderate rather than minor beneficial impact. Cumulative impacts would add negligible to moderate, beneficial and minor, adverse impacts to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. The contribution of this alternative to the cumulative impact would be small.

Table 19: Features of the Alibates Flint Quarries National Monument Alternatives

Alternative A: No Action / Continue Current Management	Alternative B: The NPS Preferred Alternative	Alternative C
Visitor Experience		
Continue visitor orientation at the Alibates visitor contact station. Provide guided tours to the quarries with NPS staff or volunteers. Continue to restrict access to other areas of the national monument. Continue to provide guided auto tours to the ruins and petroglyphs during special events and in October during Texas Archeology Month. Provide special events, often with partners, such as flint knapping demonstrations.	Same as alternative A, except as follows: Provide increased education and interpretive opportunities outside the visitor contact station, including a short, self-guiding interpretive trail near the visitor contact station; and outdoor interpretive materials focusing on an Antelope Creek-style dwelling on the terrace above the visitor contact station. Include interpretation of an archeologically excavated quarry in the guided tours of the quarries. Provide guided tours to the ruins and petroglyphs by special request only. Expand special events with the cooperation of partners. Support their development into annual events if sufficient interest is available. Expand visitor opportunities using information technologies to allow virtual exploration of the national monument and its resources.	Same as alternative A, except as follows: Allow unrestricted access to the southwest part of the national monument. Provide increased education and interpretive opportunities outside the visitor contact station by constructing a short, self-guiding interpretive trail near the visitor contact station. Include interpretation of an archeologically excavated quarry in the guided tours of the quarries. Facilitate citizen scientist participation in research activities as they occur at the national monument. Expand guided auto tours to the ruins and petro-glyphs to include scheduled visits on one weekend each during winter, spring, and summer. Expand special events as described in alternative B.
Natural Resources		
Continue management actions that are prescribed by law and NPS policy. Focus particularly on protecting geologic resources (the Alibates flint), reducing unauthorized pedestrian access and soil erosion, and preventing entry into the national monument by hunters.	Same as alternative A.	Same as alternative A.
Cultural Resources		
Continue management actions that are prescribed by law and NPS policy. This includes allowing visitor access only during guided tours.	Same as alternative A, except as follows: Using controlled archeological methods, excavate a quarry pit for interpretation. Expand education, interpretation, and outreach to increase understanding of the value of the resources at the national monument, promote protection of cultural resources, and provide a greater sense of stewardship regarding the national monument.	Same as alternative A, except as follows: Using controlled archeological methods, excavate a quarry pit for interpretation. Expand education, interpretation, and outreach to focus on stewardship and the research occurring at the national monument.

Table 19: Features of the Alibates Flint Quarries National Monument Alternatives (continued)

Alternative A: No Action / Continue Current Management	Alternative B: The NPS Preferred Alternative	Alternative C
Operations		
Continue to rely on volunteers to provide much of the staffing at the visitor contact station and to lead many of the quarry tours.	Incorporate maintenance of new facilities into the larger operations program for Lake Meredith National Recreation Area. Increase coordination with volunteers and partners to present special events. Expanded education, interpretation, and outreach using paid and volunteer staff.	Same as alternative B.
Interpretation, Education, and Outreach		
Continue interpretation at the Alibates visitor contact station. Provide access to the quarries and other resources through guided tours. Continue outreach to schools and during special events.	Same as alternative A, except provide all of the expanded opportunities described earlier in this table under “Visitor Experience” and “Cultural Resources.	Same as alternative A, except provide all of the expanded opportunities described earlier in this table under “Visitor Experience” and “Cultural Resources.
Partnerships		
Maintain the current level of partnerships with Friends of Alibates Flint Quarries National Monument and Windows on a Wider World.	Continue the partnerships identified in alternative A. Increase partnerships with schools and community organizations.	Continue the partnerships identified in alternative A. Increase partnerships with citizen scientists and organizations that can conduct research in the summer, such as the Texas Archeological Field School.
Effectiveness in Meeting the Purpose and Need and Objectives of the Plan		
Does not address evolving management concerns, including the construction of a visitor contact station in 2006 that increased visitation and opportunities for interpretation and education.	Expands interpretive and educational programs to provide a better understanding and appreciation of the flint and the people who quarried and used it. New outdoor interpretive facilities complement the resources available at the visitor contact station. Maintains maximum protection of cultural resources.	Same as alternative B, but zoning that allows unaccompanied visitors in part of the national monument is less effective in protecting cultural resources.

Table 20: Summary of Impacts of the Alibates Flint Quarries National Monument Alternatives

Impact Topic	Alternative A: No Action / Continue Current Management	Alternative B: The NPS Preferred Alternative	Alternative C
Archeological resources	Impacts would be negligible. There would be no cumulative effect from this alternative.	Excavation of one quarry pit would have a moderate, long-term, adverse impact on that quarry pit. Other actions would have negligible impacts on national register-eligible or -listed archeological resources. Increased visitor access to guided tours of the ruins and petroglyphs would have, long-term, adverse impacts of negligible intensity. Long-term, minor, beneficial impacts would result from improved education, interpretation, and outreach. There would be no cumulative effect from this alternative.	Impacts would be the same as alternative B, except that a negligible to minor, long-term, adverse impact would result from allowing unrestricted access on foot to the southwest part of the national monument. There would be no cumulative effect from this alternative.
Visitor use and experience (includes recreation and interpretation)	Impacts would be negligible. There would be no cumulative effect from this alternative.	The new interpretive features outside the visitor contact station would have moderate, long-term, beneficial impacts on visitor experience. Excavating a quarry that can be interpreted as part of the guided tour would have minor, long-term, beneficial impacts. Guided tours of the ruins and petroglyphs would have a negligible impact on most visitors. Special events would have long-term, beneficial impacts that could range from negligible to moderate. Impacts of information technologies to allow virtual exploration would be long-term, beneficial, and minor. There would be no cumulative effect from this alternative.	Most impacts would be the same as those described for alternative B. The ability to visit the ruins and petroglyphs on guided auto tours and to participate in research projects would have long-term, minor, beneficial impacts. There would be no cumulative effect from this alternative.
NPS operations	NPS operations of Alibates Flint Quarries National Monument would continue to represent a minor part of the joint operations of the two parks. There would continue to be long-term, minor to moderate, adverse cumulative impacts from other actions. This alternative would not contribute to cumulative impacts.	Impacts from the ongoing use of existing facilities and from the maintenance of the new trail, interpretive dwelling, and excavated quarry would be negligible. Expanded education, interpretation, and outreach would have a long-term, minor, adverse impact on NPS operations that would be addressed by the addition of one new staff position. Cumulative impacts would add negligible to minor, adverse effects to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. This alternative would contribute a small increment to cumulative impacts.	Most impact types and intensities would not differ from those occurring with the preferred alternative. The need for an additional law enforcement presence would have a long-term, adverse, minor impact on NPS operations. Cumulative impacts would add negligible to minor, adverse effects to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. This alternative would contribute a small increment to cumulative impacts.

CHAPTER 3:

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the existing environment of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. The focus is on the parks' resources, visitor uses and experiences, socioeconomic environment, and park operations and facilities that could be affected by implementation of the alternatives. These topics were selected based on federal laws and regulations, executive orders, NPS expertise, and concerns expressed by other agencies or members of the public during scoping for this general management plan. The conditions described in this chapter establish the baseline for the evaluation of environmental consequences provided in chapter 4.

The Council on Environmental Quality (1978) guidelines for implementing the National Environmental Policy Act require that the description of the affected environment focus on describing the resources that might be affected by implementation of the alternatives. To enhance reader understanding, the first section in this chapter gives a broad overview of the parks and their regional context. The following sections provide more detailed descriptions of the existing conditions of the parks' resources that could be affected by implementing any of the alternatives described in chapter 2.

THE PARKS AND THEIR REGIONAL CONTEXT

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are near the geographic center of the Texas panhandle in an area where the High Plains are incised into canyons and draws by the Canadian River. The parks are in Potter, Moore, and Hutchinson Counties.

The closest metropolitan areas are Amarillo, Texas (population 189,400), which is about 30 miles southeast of the parks, and Lubbock, Texas (population 225,850), which is about 140 miles south of the parks. The regional economy is diverse and includes manufacturing, education, medical and financial services, wholesale and retail trade, construction services, and agriculture. Commercial airline services to the area are available at Amarillo and Lubbock.

The nearby communities that are most affected by the presence of the parks include the following:

- Fritch, a city of about 2,000 people near Harbor Bay on the southeastern side of the lake, about a quarter-mile east of the national recreation area boundary (the parks' headquarters are in Fritch)
- Sanford, a community of about 190 people southeast of the Sanford Dam, less than a half-mile from the national recreation area boundary
- Borger, the largest city in Hutchinson County, with a population of about 12,650 people (the town serves as a shipping point for agricultural produce and petroleum products and is the site of several inland petrochemical complexes)
- Dumas (population 14,160), the county seat of Moore County, which is about 24 miles northwest of the national recreation area

The Ogallala formation serves as the primary aquifer in the area, and pumping of the aquifer allows farmers to irrigate and grow water-intensive, high-value crops, primarily cotton. Groundwater also is used by area industries, including oil refineries.

Land uses adjacent to the parks include ranching and rural residential development. The latter includes the community of Bugbee, the Double Diamond Estates adjacent to Harbor Bay, and Lake Meredith Harbor and Vinson Development near Fritch Fortress. Private land development near Lake Meredith National Recreation Area has produced mixed communities of mobile homes, permanent residences, and vacation cottages. Some sand and gravel operations also occur near the parks (NPS 2002c).

Lake Meredith National Recreation Area contains approximately 44,978 acres of federal land. Alibates Flint Quarries National Monument contains approximately 1,371 acres, approximately 292 of which are not federally owned. Most of the surrounding land is privately owned.

The Canadian River breaks are a stark contrast to the surrounding, relatively flat topography. The scenic, steep-sided cliffs expose millions of years of geologic history and created a setting that has attracted human use from prehistoric peoples through 19th century settlers and ranchers. Several sites in the parks are listed in or eligible for listing in the National Register of Historic Places. Between 1962 and 1965, the Sanford Dam was constructed at a narrow point between the cliff walls to create Lake Meredith.

Highway access to the parks includes the following:

- Ranch Road 687 turns off U.S. Highway 136 just east of Fritch and passes northwest through the national recreation area, crossing the dam before turning north toward Stinnett, Texas. About 4 miles of this paved, two-lane road are within the national recreation area boundary.
- Ranch Roads 3119 and 3395, both of which are paved, two-lane roads, pass through the northern portion of the national recreation area before merging with Ranch Road 687 within the national recreation area boundary.
- Ranch Road 1913 crosses the Blue Creek bridge in the northwest part of the national recreation area. Less than a half-mile of the road is within the national recreation area boundary. Outside the national recreation area south of the bridge, Blue West Road turns off Ranch Road 1913 and leads to the Blue West area. Farther west, the turn onto Plum Creek Road provides access to the Plum Creek area of the national recreation area.
- The west side of the national recreation area at Rosita is accessed by a dirt road that turns off U.S. Route 87/287 about 20 miles north of Amarillo.
- Alibates Flint Quarries National Monument is accessed from Texas Highway 136 about 6.5 miles south of Fritch. Drivers turn west onto Cas Johnson Road and travel about 5 miles to the Alibates visitor contact station.

Oil and gas development has occurred throughout the region, including on the NPS property. The National Park Service (2002) prepared an oil and gas management plan for this resource in the parks. Currently, there are 168 active wells within Lake Meredith National Recreation Area, but this number changes as wells are drilled or plugged as oil and gas production continues in accordance with the plan.

There is one active well in Alibates Flint Quarries National Monument. Future surface disturbance is prevented by the oil and gas plan requirement for alternate methods, such as offsite directional drilling, to further develop energy resources under the national monument.

Other federal lands in the region are shown in the regional map in chapter 1 and include the Rita Blanca, Comanche, Cimarron, McClellan Creek, and Black Kettle National Grasslands. All of these units are managed by the U.S. Forest Service.

CLIMATE

Precipitation

Average annual precipitation in the region is about 20 inches, with the highest monthly average in June and 75% of the average precipitation falling from April through September. Most precipitation is associated with thunderstorms. While severe storms are infrequent, damaging hail, wind, and heavy rains occur most years, mainly during the spring and summer.

The current drought in the Texas panhandle began around 2001. As described in chapter 1 under "Need for the Plan," severe droughts have occurred in the region at a rate of one or two per century for the past 2,000 years. Cycles of precipitation and drought in the future may not resemble historic patterns. The Intergovernmental Panel on Climate Change (2007a) reported that most climate models project decreased precipitation in the southern part of the nation (including Texas) over the next century.

The climate is semiarid temperate. The area is subject to rapid, large temperature

changes, especially during the winter when cold fronts from the northern Rocky Mountains and plains states sweep across the level plains at speeds up to 40 miles per hour.

Light winter precipitation and the historical removal of vegetative cover by agriculture makes the spring season favorable for dust storms that occasionally reduce the visibility to less than a mile. Humidity in the area is generally low, frequently dropping below 20%.

Temperatures

The average daily maximum for the warmest month (July) is about 91 degrees Fahrenheit, and temperatures above 90 degrees Fahrenheit are common. The average monthly temperature in the Amarillo area for the coldest month (January) is 23 degrees Fahrenheit, with frequent lows in the 20s (NOAA 2011).

Winds

The area receives almost constant winds, with an average of 12 to 15 miles per hour. The prevailing air movement is from the south and southwest.

During early spring, wind gusts often exceed 25 miles per hour and can reach 40 miles per hour. Lake wind warnings (wind speeds in excess of 25 miles per hour) are issued by the National Weather Service for the panhandle region about 200 days per year. These high winds create dangerous conditions for boaters on Lake Meredith, and they can cause considerable damage to shoreline facilities. High winds can create wave action up to 6 feet high along the lakeshore, which erodes soils and floods facilities and structures in this zone (NPS 2002c; NOAA 2011).

The parks are in the western portion of "Tornado Alley." More than 30 tornadoes were reported in Potter County between 1950 and 2007 (National Climatic Data Center 2010).

PHYSIOGRAPHY

Lake Meredith lies on the dry, windswept High Plains of the Texas panhandle in a region known as *Llano Estacado*, or Staked Plain. Through this plain, the Canadian River has incised 200-foot-deep canyons called breaks. Lake Meredith, which was created by the construction of Sanford Dam, fills many breaks whose walls are crowned with white limestone caprock and contain scenic buttes, pinnacles, and red-brown, wind-eroded coves. The arid plains above the breaks are vegetated with grasses, mesquite, prickly pear, and yucca. The sheltered creek beds contain cottonwoods, soapberry, and sandbar willows.

HYDROLOGY

Historically, the Canadian River allowed eastern woodlands to extend their range along its banks deep into the otherwise arid plains region. Humans have lived on the harsh *Llano Estacado* for about 13,000 years. Pioneer settlement began in 1875, and a railroad followed in 1877 to serve cattle ranching. Discovery of oil and natural gas in the area caused a boom in the 1900s. Water, grasslands, oil, and gas are the resources that support the region's economic base.

Lake Meredith National Recreation Area includes several small creeks that drain into the Canadian River or Lake Meredith. These include Rosita, Bonita, Chicken, Coetas, Mullinaw, Alibates, Plum, South Turkey, Short, Big Blue, North Turkey, and Bugbee Creeks. Most of the creeks are small, with intermittent flows. Big Blue Creek and Plum Creek are larger, with continuous flows. The principal direction of flow is toward the river or the lake. Alibates Flint Quarries National Monument is on an upland site and does not include any named creeks.

CLIMATE CHANGE AND ITS INFLUENCE ON THE PARKS' ENVIRONMENT

Climate change is expected to modify the arid southwest of the United States, including the Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument vicinity. Precipitation and flooding events are projected to become more extreme, even as drought conditions intensify. Observed and projected climate changes are expected to

- alter plant species ranges
- change vegetation cover and composition
- increase rates of erosion and sediment transport to streams
- increase tree mortality because of drought stress and insect outbreaks
- increase the frequency, size, and duration of wildfires
- increase the probability of extinctions in plant and animal species

Most climate models show that arid regions will become drier and that the transition to a more arid climate is already underway.

Western Texas has been identified as a climate change "hot spot" that is predicted to be especially sensitive to climate change (Diffenbaugh *et al*. 2008). Based on projections made by the Intergovernmental Panel on Climate Change (2007a and 2007b) and results from the United Kingdom Hadley Centre's climate model (HADCM2), over the long term, temperatures in Texas could increase by about 3 degrees Fahrenheit in spring and about 4 degrees in other seasons. Precipitation is estimated to decrease by 5% to 30% in winter and increase by 10% in the other seasons. Increases in summer could be slightly higher (up to 30%) than in spring and fall. Other climate models may show different results. The amount of precipitation on extreme wet days in winter is likely to decrease, and the amount of precipitation on extreme wet days in summer is likely to increase. The frequency of extreme hot days in summer would increase because of the general warming trend (EPA 1997).

Changes in streamflow tend to magnify changes in precipitation. Water resources in drier climates tend to be more sensitive to climate changes. Because evaporation is likely to increase with a warmer climate, it could result in lower river flow and lower lake levels, particularly in the summer. If streamflow and lake levels drop, groundwater recharge could be reduced. In addition more intense precipitation could increase flooding (U.S. Environmental Protection Agency 1997). Increased severity of flood events could cause a change in surface water flow and the availability of water to wildlife and vegetation in Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument.

This chapter describes the resource conditions of the parks to better understand the effects of the alternatives. For each resource topic, this chapter identifies past, present, and future trends in resource conditions. Because climate change is an important factor that could influence future resource conditions, it is included as part of the description of the affected environment of the parks for those impact topics that could be affected.

The potential influences of climate change are described under the special status species and their habitats, soils, historic buildings and structures, and visitor experience resource topics. These are the resources that the planning team considers to be at the greatest risk from the impacts of climate change.

SPECIAL STATUS SPECIES AND THEIR HABITATS

THREATENED, ENDANGERED, OR CANDIDATE SPECIES

To comply with the Endangered Species Act of 1973, the National Park Service is responsible for protecting federally listed, candidate, and proposed species and their habitats. Table 21 includes the special status species that the U.S. Fish and Wildlife Service identified as known or likely to occur in the counties that include the national recreation area and national monument. They include four bird species, one mammal species, one fish species, and one plant species. Brief descriptions of each of these species are provided below.

Table 21: Federally Listed, Proposed, or Candidate Species Known or Likely to Occur in Hutchinson, Moore, and Potter Counties

Species	Federally Protection Status
Birds	
Interior least tern (*Sterna antillarum athalassos)*	Endangered
Lesser prairie-chicken (*Tympanuchus pallidicinctus)*	Candidate
Northern aplomado falcon (*Falco femoralis septentrionalis)*	Endangered
Whooping crane (*Grus americana)*	Endangered
Mammals	
Black-footed ferret (*Mustela nigripes)*	Endangered
Fish	
Arkansas River shiner (*Notropis girardi)*	Threatened
Plants	
Slender rush-pea (*Hoffmannseggia tenella)*	Endangered

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument do not have designated critical habitat for any federally listed species. Summary descriptions of habitats for federally protected species that are likely to occur in Hutchinson, Moore, and Potter Counties are available from the U.S. Fish and Wildlife Service's website at http://www.endangered/fws.gov.

The *interior least tern* was listed as endangered in 1985. It is the smallest member of the tern family, with a wingspan of 20 inches. Preferred nesting areas for interior least terns include bare or sparsely vegetated sand, shell, and gravel beaches, sandbars, islands, and salt flats associated with rivers and reservoirs. Nesting success requires water levels that remain constant enough that the birds' nests stay dry. The recreational use of nesting habitat by humans is a major threat to the tern's reproductive success (USFWS 1992). Although there is no designated critical habitat within the parks and no recorded occurrences of this species, areas along the Canadian River in Lake Meredith National Recreation could provide shoreline and sandbar habitat for interior least terns.

The *lesser prairie-chicken* is a candidate species for listing. Lesser prairie-chickens inhabit mixed grass and dwarf shrub communities that occur on sandy soils; principally these include the sand sagebrush-bluestem and the shinnery oak-bluestem associations that occur in both parks, although no occurrences have been recorded. In spring and fall, adults congregate on leks where males engage in communal courtship displays at sunrise and before sunset. Leks typically occur on knolls or ridges with relatively short and/or sparse vegetation. Lesser prairie-

chicken leks may be on human-created open areas (for example, oil well pads, roads, reverted cropland, cultivated fields, and areas treated with herbicides) and recently burned areas. Nests often are under sand sagebrush or shinnery oak shrub or amid tall bunchgrasses (NatureServe 2009).

The *northern aplomado falcon*, which was listed as endangered in 1986, is smaller in body than the peregrine falcon but can have a wingspan of nearly four feet. Their habitat is variable and includes the desert grassland associations found in Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. No critical habitat for the northern aplomado falcon has been designated within the parks. The essential habitat elements appear to be open terrain with scattered trees; relatively low ground cover; an abundance of prey that includes insects, small to medium birds, rodents, small snakes, and lizards; and a supply of nest sites (USFWS 2011a). This species has not been observed in the parks but it is easily confused with the peregrine falcon.

The *whooping crane* was listed as endangered by the U.S. Fish and Wildlife Service in 1967. These tall, mostly white birds breed, migrate, winter, and forage in habitats that include coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields. While potential habitat for the crane occurs within the parks, the crane is not believed to occur in Potter, Moore, or Hutchinson Counties(USFWS 2011b), and no designated critical habitat occurs within the parks.

The *black-footed ferret*, which was listed as endangered in 1967, is a member of the weasel family. Ferrets occupy underground burrows excavated by prairie dogs and were extirpated across most of their historical range, primarily as a result of prairie dog eradication. An estimated 100 to 150 acres of occupied prairie dog habitat are required to sustain a ferret (NatureServe 2009). A prairie dog town near upper Bugbee in Lake Meredith National Recreation Area could provide suitable habitat for black-footed ferrets, but this endangered species has not been recorded in Texas since 1963 (Texas Parks and Wildlife Department 2009a). There is no designated critical habitat for the black-footed ferret in the parks.

The *Arkansas River shiner* was federally listed as a threatened species in 1998. Historically, this small fish was widespread throughout the Arkansas River drainage, in the Canadian River throughout the Texas panhandle, and across Oklahoma in both the Canadian and North Canadian Rivers. Today, they occupy only about 20% of their historical habitat but are known to occur in the states of Arkansas, Kansas, New Mexico, Oklahoma, and Texas. Recent studies that were conducted with Lake Meredith at low levels confirmed that the Arkansas River shiner is present in the Canadian River in Lake Meredith National Recreation Area upstream from the reservoir pool, although no critical habitat has been designated within the national recreation area.

The Arkansas River shiner is a 2-inch-long minnow. Arkansas River shiners generally occupy the main channel of wide, shallow streams. Spawning probably occurs in early summer. The eggs hatch within a day or two, and the larvae continue to drift with the current for another three or four days until they are capable of swimming. They then seek out backwater pools and quiet water at the mouths of tributaries where food is more abundant (Canadian River Municipal Water Authority 2005). Most of the eggs that are laid in the Canadian River several miles upstream from Lake Meredith probably drift into the reservoir before the larvae have the opportunity to swim to suitable habitat where they could develop into adults.

The U.S. Fish and Wildlife Service (2005 *Federal Register* 70: 59808) evaluated the potential for critical habitat for the Arkansas River shiner in the Canadian River, but no designation resulted from the evaluation. However, the Canadian

River Municipal Water Authority developed a management plan for this species upstream from Lake Meredith and is using the plan to identify and enact conservation strategies for this species. The goal of the plan is to improve existing stream habitat by removing invasive plant species (primarily saltcedar) and protecting riparian zones to prevent loss of habitat (Canadian River Municipal Water Authority 2005).

The *slender rush-pea*, which was listed as endangered in 1985, exists only in Texas. Historically, this plant was not recorded outside Nueces and Kleberg Counties (Texas Parks and Wildlife Department 2009b). Therefore, this plant is unlikely to occur in the parks.

STATE SPECIES OF CONCERN

NPS policy directs that state-listed species and other species identified by the park staff as being of management concern are to be managed in parks in a manner similar to that for federally listed species. In addition to the federally listed species, the following species that might occur in the vicinity of the parks are recognized to be threatened or endangered by the Texas Park and Wildlife Department:

- bald eagle (threatened)
- American peregrine falcon (threatened)
- gray wolf (endangered)
- Texas horned lizard (threatened)

Bald eagles were removed from the federal endangered or threatened species list in 2007 but remain protected by the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. A finding in the February 25, 2010, *Federal Register* determined that there was no basis for listing the separate Sonoran Desert population as threatened (USFWS 2010).

According to national recreation area staff, bald eagles winter in the area in substantial numbers but roost primarily in the Bonita Creek area in the southern end of Lake Meredith, where between four and seven eagles can be found on an average winter day. During the winter, bald eagles scavenge and eat mammals and waterfowl at the upper end of Lake Meredith (NPS 2002c). There is no known summer nesting of bald eagles in the area.

The *peregrine falcon* formerly was listed federally, but populations recovered and the species was delisted in 1999. However, it is still listed as threatened by the state of Texas and also is protected by the Migratory Bird Treaty Act. Their habitat in includes open situations from tundra to subtropical, including human population centers. They typically nest on ledges of vertical rocky cliffs, often with a sheltering overhang. They prey primarily on medium-size birds, lizards, and fish, and occasionally on small mammals and insects (NatureServe 2009). Peregrine falcons probably use the parks for foraging, but there are no recent records of activity such as nesting.

The *gray wolf* is represented in the region by the Mexican gray wolf, which is part of the broader listing of gray wolves as endangered throughout much of the lower United States. However, the Mexican gray wolf in Texas is considered a nonessential experimental population and does not fall under this designation (USFWS 2011c). Wolf distribution varies depending on prey abundance, and the animals are highly mobile. While gray wolves may pass through the area, it is unlikely that any permanently reside in Lake Meredith National Recreation Area or Alibates Flint Quarries National Monument.

The *Texas horned lizard* is a federal species of concern and is listed as threatened by the state of Texas. It has been documented within both Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument.

The distribution of the Texas horned lizard historically was from Kansas south to Louisiana, and west through Texas,

Arizona, and into northern Mexico (NatureServe 2009). In Texas, numbers dropped dramatically in the 1950s and 1960s because of the pet trade, habitat loss, and introduction of exotic fire ants. For the past two decades, Texas horned lizards have seldom been seen outside the western third of the state. This species is generally found in deserts, temperate grasslands, prairies, and scrubland (NPS 2008a).

These lizards use sandy, open areas with little vegetation, often inhabiting abandoned animal burrows. They often are found near harvester ant mounds, which are its main source of prey, but they also feed on grasshoppers, beetles, and isopods. They hibernate from late summer to late spring and, therefore, are only seen on warm days from about May through August. Breeding begins once they emerge from hibernation in late April and continues into July.

MIGRATORY BIRDS

Most birds in the parks are protected by the Migratory Bird Treaty Act. This act protects migratory birds, their parts, and nests or eggs.

BLACK-TAILED PRAIRIE DOG

The black-tailed prairie dog is of management concern to the National Park Service because of its declining numbers and its ecological significance. Recently, the U.S. Fish and Wildlife Service (2009) determined that listing the black-tailed prairie dog as either threatened or endangered was not warranted. However, the "prairie dog is a keystone species, which creates and sustains habitat for a myriad of associated wildlife, and serves as a prey base for many raptors and mammalian predators. As prairie dogs decline, so too do the birds, herptiles, carnivores, and insects, that benefit from, and in some cases require, the keystone functions" (Rosmarino 2004).

The federally endangered black-footed ferret and many species of hawks and eagles use prairie dogs as a food source. The rare burrowing owl use burrows created by prairie dogs (USFWS 2009). Therefore, the National Park Service will manage the black-tailed prairie dogs that have been documented in Lake Meredith National Recreation Area to ensure their continued ability to provide this plains ecosystem function.

Lake Meredith National Recreation Area contains one prairie dog town on the northwest side of the national recreation area in an area known as upper Bugbee. This is upland grassland away from general visitor use. The area is frequented by hunters and an occasional oil and gas vehicle. The small, developing prairie dog town was discovered in 2007. Previously, there was a prairie dog town in the Sanford-Yake area, but the animals died from naturally occurring bubonic plague in 2003 (NPS 2008a).

CLIMATE CHANGE EFFECTS ON SPECIAL STATUS SPECIES

Climate change is anticipated to affect the special status species and habitats of the parks because of the projected increases in annual temperature, changes in precipitation patterns, and increases in severity of storms. However, the rate and magnitude of these changes and the impact on specific populations of special status species would vary widely based on localized features such as elevation and slope aspect, and on the competitive advantage that climate change gives to insects, diseases, and nonnative or invasive species.

Arid ecosystems are particularly sensitive to climate change and climate variability because organisms in these regions live near their physiological limits of water and temperature stress. Slight changes in temperature and precipitation regimes, or in the magnitude and frequency of extreme climatic events, can substantially alter composition, abundance, and distribution of species.

GENERAL SOIL CHARACTERISTICS

Lake Meredith National Recreation Area contains the steep-walled Canadian River breaks, and more than two-thirds of its area consists of slopes of 12% or more (NPS 2010b). Above the breaks, the areas within Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument primarily consist of gently to steeply rolling hills.

Floodplain soils are located in the canyon areas and lake bed. These soils were deposited primarily by water erosion, and in side canyons, they support the most well-developed and diverse vegetative communities in the national recreation area. Topography provides better protection against wind erosion than in other areas of the national recreation area, but their relatively recent deposition makes these soils susceptible to remobilization and water erosion. Lakebed soils that are newly exposed by declining water levels are susceptible to wind erosion until a protective vegetative cover develops.

On the slopes above Lake Meredith, soils are generally sandy or stony. The soils tend to be shallow and well drained. Construction and maintenance activities on slopes anywhere in the national recreation area can be difficult and require control measures to prevent erosion.

The soils in flatter areas above the rugged Canadian River breaks are moderately deep to very deep, well-drained, fine sandy loams to clay loams. Throughout both parks, these upland soils are highly susceptible to erosion (NRCS 2011). Therefore, the National Park Service has "hardened" many heavily used areas with paving or gravel.

The current drought has exacerbated impacts on soils. Park staff have noted that taking a single party of visitors off-trail, such as to an archeological site, establishes a visible path that remains for an extended period. Therefore, the National Park Service has implemented management actions that include emphasizing the need to remain on established trails, and reducing or eliminating visits to off-trail sites until wetter conditions return. Throughout the duration of this general management plan, park managers will continue to adjust activities to ensure adequate protection of the soil resource.

SOILS AT EACH OF THE NATIONAL RECREATION AREA'S DEVELOPED OR ACTIVITY AREAS

Information regarding soils at each developed site in Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument was obtained from the Web Soil Survey tool provided by the Natural Resources Conservation Service (2011). All of the soils in the parks are mapped, but interpretation is challenging because the parks cover parts of three counties that sometimes have different map unit names for soils that have similar descriptions of characteristics. For example, soils on areas of 20% to 70% slopes, ridges, and knolls that cover much of the rough, broken topography known as the Canadian River breaks are variously designated as Burson Stony Loam, steep (Hutchinson County); Burson-Quinlan-Rock outcrop association, steep (Potter County); or rough broken land (Moore County). Therefore, this description of existing conditions focuses on the characteristics of soils that support or constrain development in the parks without relying on map unit names.

The large parts of Lake Meredith National Recreation Area that are inundated when the lake is full are designated on Natural Resources Conservation Service maps as "water." Depending on their location, their characteristics probably are similar to the soils of the nearby upland areas or to the bottomland soils that still are

evident near the Canadian River channel in the south part of the national recreation area near Rosita. However, because none of the general management plan alternatives would install permanent structures in the inundation pool area, none of the soils in this area would be affected by this plan.

The Natural Resources Conservation Service (2011) stresses that in managing soils, variables such as climate and biological activity need to be considered along with the soil properties. While soil conditions are predictable over long periods of time, events such as the current drought can increase the erosion potential or decrease the ability to support vegetative cover. Therefore, NPS planning needs to include the flexibility to implement mitigation when it is needed to protect the parks' soil resources.

Soils occurring in the vicinity of each developed area of the national recreation area are described below. The arrangement at each site generally reflects increasing slope. The applicable county and map unit names are shown in parentheses. References are made to previously described soils to minimize redundancy.

Spring Canyon (Hutchinson County, Map Units BP and Ln)

The area north of Spring Lake is borrow pit consisting of caliche spoil or earthy fill. Soils underlying the remainder of this area are sandy bottomland with slopes that range from 0% to 1%. The parent material is sandy alluvium in a landform that consists of flood plains in river valleys. Slopes are essentially flat, and if the dam were not present immediately upstream, frequent flooding would be the greatest development concern. The excess water in these soils limits their recommended use mainly to pasture, range, forestland, or wildlife food and cover.

Fire Cache Facility and Ranger Station (Hutchinson County, Map Units DaB and DrB)

These facilities are underlain by a fine, sandy loam of 1% to 3% slopes and an urban complex (composed of the buildings of the Canadian River Municipal Water Authority and the National Park Service) with fine, sandy loam on slopes of 0% to 3%. The parent material is a calcareous, loamy colluvium or alluvium. This soil does not have constraints such as slope, flooding, or ponding, but its susceptibility to erosion poses severe limitations, and it requires very careful management.

Maintenance Facility (Hutchinson County, Map Units DaC and TaE)

Soils in the flatter part of this area are similar to those described for the fire cache and ranger station area, except that the steeper slopes of 3% to 5% pose a more severe erosion problem and the soils require careful management.

The gravelly loam on slopes from 3% to 20% was formed from calcareous sandy and gravelly alluvium. This soil has limitations in the rooting zone, such as shallowness, stones, low moisture-holding capacity, or low fertility. The limitations are so severe that its use is limited mainly to pasture, range, forestland, or wildlife food and cover.

Sanford-Yake (Hutchinson County, Map Units DaC, TaE, OQE, and BxF)

Soils in the flatter areas are similar to those described for the fire cache and ranger station.

The gravelly loam on slopes from 3% to 20% previously was described for the maintenance facility.

A loamy prairie soil also occurs on slopes between 3% to 20%. This soil is derived from residuum weathered from calcareous sandstone or from siltstone. Depth to bedrock is about 15 to 50 inches.

The high susceptibility of this soil to erosion limits its use to pasture, range, forestland, or wildlife food and cover.

This is among the most widespread soils in the parks. It consists of a stony loam interspersed with rock outcrop on the rough breaks landform that locally is called the Canadian River breaks. Slopes range from 20% to 70%, and the soil depth typically is no more than about 6 inches. The parent is a loamy residuum weathered from sandstone and siltstone. Use of this soil is so severely restricted by its slope or rooting zone limitations that the Natural Resources Conservation Service recommends that it should be maintained undisturbed for recreation, wildlife, water supply, or esthetic purposes.

Cedar Canyon (Hutchinson County, Map Unit BxF)

This area transitions quickly from the inundation pool to the stony loam on the rough breaks landform described for the Sanford-Yake area. Mapping by the Natural Resources Conservation Service does not indicate a map unit for the narrow area that supports visitor facilities.

Fritch Fortress (Hutchinson County, Map Units DaB and BxF)

The perimeter of this area consists of the stony loam on the rough breaks landform described for the Sanford-Yake area. The flat center consists of the fine, sandy loam of 1% to 3% slopes that was described for the fire cache and ranger station area.

Harbor Bay (Moore County, Map Unit Ro)

This area transitions quickly from the inundation pool to the stony loam on the rough breaks landform described for the Sanford-Yake area. Mapping by the Natural Resources Conservation Service does not indicate a map unit for the narrow area that supports visitor facilities.

Alibates Flint Quarries National Monument (Potter County, Map Units AcB, AcC, APD, MfD, MTE, ERE, TAF, and BQG)

The slopes and ridges of the national monument show a complex arrangement of multiple, interfingered soil types. They are described below by generally increasing slope.

A deep, well-drained loam that covers slopes of 1% to 5% is represented by two map units that are differentiated by slope. It is derived from calcareous loamy colluvium and/or alluvium. Its susceptibility to erosion poses limitations that range from severe to very severe, and it requires very careful management.

Undulating areas with slopes from 3% to 8% have a soils association that consists of a silty clay loam mixed with a very fine sandy loam. Parent materials include silty colluvium, silty and clayey residuum weathered from siltstone, and loamy eolian sands. Their high susceptibility to erosion leads to use limitations that range from careful management to use only for pasture, range, forestland, or wildlife food and cover.

A fine, sandy loam covers many of the hillslopes ranging from 5% to 12%. It typically is more than 80 inches deep and is derived from calcareous sandy colluvium and/or alluvium. Its high susceptibility to erosion leads to recommended uses that include pasture, range, forestland, or wildlife food and cover.

The fine, sandy loam described above occurs in an association with a gravelly loam on slopes from 3% to 20%. The gravelly loam is derived from a calcareous sandy and gravelly alluvium. Uses of this association are restricted to pasture, range, forestland, or wildlife food and cover either because of susceptibility to erosion or because of limitations within the rooting zone.

A shallow, gravelly to cobbly, clay loam mixed with rock outcrop occurs on rolling

slopes from 5% to 20%. The parent material is loamy colluvium over cherty limestone, and the depth to bedrock usually is less than 18 inches. Use of this soil is so severely restricted by its slope and rooting zone limitations that it should be maintained undisturbed for recreation, wildlife, water supply, or esthetic purposes.

A gravelly to very gravelly loam occupies slopes of 3% to 30%. Parent materials consist of calcareous sandy and gravelly alluvium, and the depth to bedrock is more than 80 inches. Limitations within the rooting zone restrict uses to pasture, range, forestland, or wildlife food and cover.

The stony loam on the rough breaks landform of mixed shallow soil and rock outcrops with slopes from 20% to 70% was described for the Sanford-Yake area.

Alibates Flint Quarries National Monument Visitor Contact Station (Potter County, Map Units WeB, AQF, and BQG)

The soil underlying the contact station is a deep, well-drained clay loam with slopes from 1% to 3%. It is derived from calcareous loamy alluvium and/or colluvium. Its susceptibility to erosion poses its greatest constraint, and it requires special conservation practices.

The soil south and east of the contact station is a silty clay loam with slopes of 5% to 12%. It is derived from silty colluvium over silty and clayey residuum weathered from siltstone. Its high susceptibility to erosion limit recommended uses to pasture, range, forestland, or wildlife food and cover.

West of the contact station, soils occur in the rough breaks landform of mixed shallow stony loam and rock outcrops with slopes from 20% to 70% that was described for the Sanford-Yake area.

Bates Canyon (Potter County, Map Unit BQG)

This area transitions quickly from the inundation pool to the stony loam on rough breaks landform described for the Sanford-Yake area. Mapping by the Natural Resources Conservation Service does not indicate a map unit for the narrow area that supports visitor facilities.

McBride Canyon (Potter County, Map Units Cc, Lf, APD, TAF, and BQG)

A deep, occasionally flooded, silty clay loam with slopes of 0% to 1% occurs on the canyon floor and alluvial fan at the canyon mouth where it discharges flow to the Canadian River. This loamy bottomland soil type was derived from mixed loamy alluvium. It has fewer development concerns than most other soils in the parks and requires only moderate conservation practices to address its sometimes excess water.

Moving upstream, the soils on the canyon floor consist of sandy bottomland with slopes that range from 0% to 1%. This soil type was described for Spring Canyon.

Above the canyon floor are undulating areas with slopes from 3% to 8% and a soils association that consists of a silty clay loam mixed with a very fine sandy loam. This soil association was described for Alibates Flint Quarries National Monument. The McBride Ranch House was built on this soil association.

Farther up the slope, soils consist of the gravelly to very gravelly loam on slopes of 3% to 30% that was described for Alibates Flint Quarries National Monument.

Particularly on the north and east, the canyon walls consist of the stony loam on the rough breaks landform of mixed shallow soil and rock outcrops with slopes from 20% to 70% that was described for the Sanford-Yake area.

Mullinaw Creek (Potter County, Map Units Cc, MTE, TAF, and BQG)

This drainage has some of the same soils as McBride Canyon, including the deep, occasionally flooded, silty clay loam near its mouth; gravelly to very gravelly loam on slopes of 3% to 30%; and the stony loam on the rough breaks landform of mixed shallow soil and rock outcrops. It also has areas of the association of fine, sandy loam with gravelly loam on slopes from 3% to 20% that was described for Alibates Flint Quarries National Monument.

Rosita (Potter County, Map Units Rw, Lf, Cc, Yo APD, MfD, MTE, BQG, LeD, Tf, and TAF)

The soils along the Canadian River channel upstream from Mullinaw Creek include unconsolidated river wash, the two types of bottomland soils described previously for Spring Canyon and McBride Canyon, and a frequently flooded loamy bottomland with 0% to 1% slopes. The use of the frequently flooded loamy bottomland is limited to pasture, range, forestland, or wildlife food and cover because of excess water.

On the slopes above the river, soils generally occur in beds running parallel to the river channel, but there is considerable intermixing based on topography, underlying bedrock, and past deposition of alluvium. Soils that have been described previously include the following:

- Undulating areas with slopes from 3% to 8% with a soils association that consists of a silty clay loam mixed with a very fine sandy loam were described for Alibates Flint Quarries National Monument.
- The fine, sandy loam that covers many of the hillslopes ranging from 5% to 12% was described for Alibates Flint Quarries National Monument.
- The association of fine, sandy loam and gravelly loam on slopes from 3% to 20% was described for Alibates Flint Quarries National Monument.
- The stony loam in the rough breaks landform of mixed shallow soil and rock outcrops with slopes from 20% to 70% was described for the Sanford-Yake area.

Soils that have not previously been described that occur on slopes in the Rosita area include the following:

- A loamy fine sand occurs as dunes on hillslopes of 1% to 8%. It is derived from wind-altered calcareous sandy colluvium and/or alluvium. Susceptibility to erosion limits use of this soil to pasture, range, forestland, or wildlife food and cover.
- A fine sand on slopes of 5% to 12% forms sandhills that are characterized as deep and excessively drained. The parent material is eolian sands. Erosion imposes severe limitations that restrict use to grazing, forestland, and wildlife.
- A gravelly to very gravelly loam is on slopes of 3% to 30%. This deep, well-drained soil is derived from calcareous sandy and gravelly alluvium. Its restricted use for pasture, range, forestland, or wildlife food and cover is based on rooting zone limitations.

Plum Creek (Potter County, Map Units Cc, APD, and BQG)

The soils in the Plum Creek area previously have been described. They include the following:

- At the canyon floor and mouth, the deep, occasionally flooded, silty clay loam with slopes of 0% to 1% was described for McBride Canyon.

- The undulating areas with slopes from 3% to 8% have a soils association that consists of a silty clay loam mixed with a very fine sandy loam that was described for Alibates Flint Quarries National Monument.
- Stony loam that occurs in the rough breaks landform of mixed shallow soil and rock outcrops with slopes from 20% to 70% was described for the Sanford-Yake area.

Blue West (Moore County, Map Units EnD and Ro)

The campground is on a very fine sandy loam with 5% to 8% slopes. This deep, well-drained soil typically forms terraces on river valleys and is derived from loamy, eolian sands. High susceptibility to erosion dictates the need for careful management of this soil.

Below the campground, stony loam occurs in the rough breaks landform of mixed shallow soil and rock outcrops with slopes from 20% to 70% that was described for the Sanford-Yake area.

Chimney Hollow (Moore County, Map Unit Ro)

This area transitions quickly from the inundation pool to the stony loam on rough breaks landform described for the Sanford-Yake area. Mapping by the Natural Resources Conservation Service does not indicate a map unit for the narrow area that supports visitor facilities.

Blue Creek (Moore County, Map Units RW, TaE, TMc, and Ro)

Unconsolidated river wash occurs in the valley bottom.

The gravelly loam on slopes from 3% to 20% was described previously for the maintenance facility. It also occurs in an association with two map units that consist of fine sandy loams on slopes of 3% to 8%. Concerns include both susceptibility to erosion and limitations in the rooting zone, so that uses generally should be limited to pasture, range, forestland, or wildlife food and cover.

Closer to the creek channel, stony loam occurs in the rough breaks landform of mixed shallow soil and rock outcrops with slopes from 20% to 70% that was described for the Sanford-Yake area.

Blue East (Moore County, Map Unit Ro)

This area transitions quickly from the inundation pool to the stony loam on rough breaks landform described for the Sanford-Yake area. Mapping by the Natural Resources Conservation Service does not indicate a map unit for the narrow area that supports visitor facilities.

Bugbee (Hutchinson County, Map Units VeB, MVE, and BxF)

The developed area between Bugbee Canyon and North Canyon is underlain by soils that are similar to those described for the fire cache and ranger station area.

The soils on slopes from 5% to 20% consist primarily of a fine, sandy loam mixed with a sandy, clay loam. Parent materials include calcareous sandy or loamy colluvium and alluvium. The high susceptibility of theses soils to erosion limits recommended uses to pasture, range, forestland, or wildlife food and cover.

The stony loam in the rough breaks landform of mixed shallow soil and rock outcrops with slopes from 20% to 70% was described for the Sanford-Yake area.

New Boat Ramp (Hutchinson County, BxF)

The area for a new boat ramp has not been defined, but it would be in an area that transitions quickly from the inundation pool to the stony loam in the rough breaks landform described for the Sanford-Yake area.

Trails and Roads

These national recreation area features cross numerous map units in all three counties. Road and trail inclines generally are less than 6%, but these relatively flat inclines sometimes are achieved by long transits across steep slopes. Based on the development constraints identified for soil map units that occur in the parks, virtually all of the soils crossed by trails and roads must be considered susceptible to erosion and require effective engineering to prevent soils losses.

CLIMATE CHANGE EFFECTS ON SOILS

Soils within the parks are likely to incur some long-term changes because of climate change. Longer periods of drought or rain could alter soil moisture, affecting soil stability, nutrient content, and structure.

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument contain important cultural resources related to approximately 13,000 years of human use. Cultural resources remain from the prehistoric Paleo-Indian period; the Plains Village period, which was a protohistoric period prior to European contact; the historic American Indian period; and the European American periods of 19th century exploration, military operations, and settlement, which was typified by small-scale ranches. Twentieth century ranching operations consolidated and grew in size, sometimes supported by oil and gas development.

Human occupation in the area that would become the parks occurred as the climate gradually changed from a wetter to a more arid environment. This resulted in a change in the dominant vegetation from grasslands to creosote bush and similar plants, which particularly expanded their coverage when overgrazing occurred, beginning around 1875.

ARCHEOLOGICAL RESOURCES

Alibates Flint Quarries National Monument is listed as a historic district in the National Register of Historic Places. However, the listing only included the original 91-acre portion, which was established in 1965 as Alibates Flint Quarries and Texas Panhandle Pueblo Culture National Monument. A change to the current name, and a boundary expansion to include the current 1,371-acre area, occurred in November 1978.

The entire national monument represents a significant archeological resource. The flint that is exposed on, or lies just below, the surface has been used by humans for about 13,000 years, until people of European descent settled in the area in the 1870s. Most of these prehistoric people apparently were nomadic, but they left many tools that had been essential to their survival. Tools knapped from the flint obtained from the Alibates area can be found in many places across the Great Plains and Southwest. Stone tools, along with bone and clay artifacts, make up most of the 623,000 museum pieces collected from Alibates Flint Quarries National Monument and Lake Meredith National Recreation Area.

The richest and most varied cultural assemblage is associated with a group now known as the Antelope Creek people who occupied the area from AD 1150 and 1450. They may have been the most southwestern of the Indian cultures making up the Plains Village Tradition, who lived in the region from North Dakota to Texas, but they may also have been part of, or influenced by, the Puebloan culture that was expanding east at the same time. Therefore, they have been referred to by archeologists as the "Panhandle Pueblo Culture." It is believed that extensive, severe drought, coupled with raids from aggressive tribes to the west, drove the Antelope Creek people out of this region by the end of the 15th century (NPS 2005).

The Antelope Creek people constructed permanent villages and smaller, outlying farming and gathering communities. Villages were built of rock-slab houses from one to 100 rooms. Most were single-unit dwellings, although some rooms were connected (NPS 2005). The Plains Village archeological sites in the national monument include the only protected, and best remaining, type-site for the Antelope Creek phase.

Although they primarily were farmers, the Antelope Creek people also quarried flint and bartered it for such items as pottery, seashells, pipestone, and obsidian. They are believed to have dug the more than 700 quarry pits in Alibates Flint Quarries National Monument (NPS 2005). These pits vary from 5 to 25 feet across and were originally about 4 to 7 feet deep. Over the

centuries, the quarry pits filled with blowing dust and vegetation, creating the current landscape of shallow depressions (NPS 2011a).

The Antelope Creek people also are believed responsible for creating most of the petroglyphs in the Texas panhandle area, including the petroglyphs in Alibates Flint Quarries National Monument (Derrick 2007). These include carvings of two turtles, a bison, a large footprint, and a man-like figure with its arms spread above its head.

Lake Meredith National Recreation Area contains the same types of prehistoric artifacts as Alibates Flint Quarries National Monument, although the concentration generally is lower. Archeological resources in Lake Meredith National Recreation Area, including within the lake area, consist of quarries, lithic scatters, tools, camp and home sites, and petroglyphs. All of the archeological resources in both parks are managed in accordance with federal laws and NPS policies.

Between 1998 and 2007, surface reconnaissance inventories were completed for all areas in both parks as part of the fire management program. Consistent with NPS policy, more detailed, subsurface inventories and the avoidance of significant sites would continue to be performed in association with planning for ground-disturbing actions such as trail construction or the siting of buildings or campsites. In visitor use areas, siting would be used to direct visitors away from sensitive areas. In addition, the National Park Service monitors the condition of significant archeological resources and, under any alternative, would continue to take measures to ensure that visitor use impacts on sensitive sites were avoided.

Archeological inventories of the reservoir site were conducted prior to the dam's construction. Although no comprehensive surveys are planned for areas exposed by dropping water levels, the National Park Service will continue to assess and manage discovered archeological, paleontological, and geological resources in accordance with applicable laws and policies.

HISTORIC BUILDINGS AND STRUCTURES

The most notable historic structure in Lake Meredith National Recreation Area is the *McBride Ranch House*, which is listed in the National Register of Historic Places. Cultural resource inventories also have located the remnants of at least five other ranching endeavors within the boundary of the national recreation area. No historic buildings or other structures were found in Alibates Flint Quarries National Monument.

The McBride Ranch House is in the southeastern portion of Lake Meredith National Recreation Area. This single-family stone house is associated with the era of small commercial farming and cattle ranching that brought some prosperity to the region from 1900 to 1920. In 1897, David Nicholas McBride purchased four sections of land. For a few years, the family lived in a frame house in the area. In 1903, he built this two-room, 700-square-foot, limestone building in the area now known as McBride Canyon.

The McBride Ranch House is the oldest remaining ranch house in Potter County, Texas, and is representative of early 20th century Anglo-American ranching on the *Llano Estacado* / Southern High Plains. It is one of the most substantial structures dating from the early ranching era and was listed in the National Register of Historic Places in 1975 (NPS no date).

The National Park Service has stabilized the structure, and a marker explains its significance. It is enclosed by a chain link fence, and there is no public access.

Several other features of the oil and gas industry still contribute to landscapes of the parks. Development of the Panhandle West Field, which includes the Lake Meredith area, dates to 1918. There are

168 active wells and many abandoned or reclaimed operations sites in the park boundaries. Forty-seven oil and gas pipeline segments cross the parks, for a total distance of 39 miles. The pipelines transport natural gas, crude oil, liquid petroleum gas, natural gas liquids, and refined products (NPS 2002c). The early oil and gas wells and the related infrastructure are a resource that has not been investigated. However, similar features associated with the oil and gas industry are widespread throughout the region, and the features in the parks are not known to meet any of the criteria that would make them eligible for listing in the National Register of Historic Places.

Climate Change Effects on Historic Buildings and Structures

An anticipated increase in severe weather and drought may increase the rate of erosion in the long term around this structure and others like it. Additional undiscovered historical sites may be uncovered or exposed to the elements during storms or floods. The McBride Ranch House may also be vulnerable to damage from an increase in freeze/thaw cycles that can affect the fabric of the structure and its foundation.

LAKE MEREDITH NATIONAL RECREATION AREA

Visitation

Between 2000 and 2009, about 1 million people visited the national recreation area annually. However, visitation decreased from the previous decade, when the national recreation area received about 1.6 million visits annually. Declining visitor numbers corresponded to declining lake levels.

Many of the options for recreation at Lake Meredith National Recreation Area depend on lake levels, but land-based activities also were identified by visitors as very important. Water-based recreation activities include, but are not be limited to, fishing, boating, waterskiing, sailing, scuba diving, and swimming. Some of the popular land-based activities include hunting, camping, horseback riding, hiking, off-road vehicle use, picnicking, and bicycling (NPS 2011b).

In 2009, NPS estimates included 22,237 overnight stays for camping, 57,067 people using the Rosita and Blue Creek off-road vehicle areas, and 792 people using the area for hunting (NPS 2011c). However, these probably are undercounts, because there are no definitive measures, such as fees, to define use levels.

According to a 2004 visitor study, the average time spent by day visitors was 3.31 hours and the average group size was three or more people. Of the 481 onsite visitors surveyed during the study, nearly a quarter engaged in overnight use at the national recreation area (Arizona State University 2004). This correlated reasonably well with the 32% who, in the same study, self-reported participation in camping. Based on about a million visitors per year, these use levels would result in 250,000 to 300,000 overnight stays for camping annually.

As shown in table 22, visitors indicated that they participated in a variety of activities, the most common of which were picnicking, swimming, boating, fishing, and camping (Arizona State University 2004).

Table 22: Activity Participation in Lake Meredith National Recreation Area [a/]

Recreational Activity	Percentage of Respondents Who Engaged in the Activity [b/]
Picnicking	50.1
Swimming	48.0
Boating	38.4
Fishing from shore	34.4
Tent and recreational vehicle camping	32.0
Trail hiking	14.1
Riding off-road vehicles	14.1
Wildlife viewing	13.9
Photography	12.0
Dune buggy or sand rail driving	8.0
Motorized trail biking / dirt biking	7.7
Visiting archeological sites	5.9
Mountain biking	2.4

a/ Source: Arizona State University 2004.
b/ Respondents could check all that applied so column total exceeds 100%.

Only 14% of visitors engaged in trail hiking and 2.4% went mountain biking, probably because of the lack of trails at the national recreation area. Statistics are not available about the distances traveled by national recreation area visitors. However, informal surveys by park staff indicate that 90% or more of visitors are from the Texas panhandle, particularly the cities of Amarillo and Lubbock. The national recreation area sees few international visitors.

Visitor facilities at Lake Meredith National Recreation Area include three information stations, four developed trails or paths, 16 day and overnight use areas, and two off-road vehicle use areas. Depending on water levels, boat launching is available at up to six ramp and parking lot areas. An amphitheater at Fritch Fortress currently is used for seasonal and special occasions but was employed in the past for NPS and partner programs. Access is provided by 53 miles of national recreation area-maintained dirt and paved roads and a large, additional network of unmaintained dirt roads. Although the national recreation area includes relatively remote areas, none are specifically designated for primitive camping or back-country use.

Generally, visitation at the national recreation area is highest from May to August. Regardless of season, most visitor use occurs on weekends.

- In the spring, visitors enjoy fishing, boating, horseback riding, bird watching, and off-road vehicle use.
- In the summer, camping and lake use by boaters are among the most common activities.
- In the fall, visitation drops slightly and fishing and hunting become the primary recreational uses. During hunting season, some nonhunting visitors may limit their hiking, biking, and horseback riding activities because of safety concerns.
- Winter use of the national recreation area is generally light, consisting of mainly regional visitors making day trips.

Decline in Water-Based Activities

The water area of Lake Meredith is well below the average surface area. As a result, access to the lake has been limited and the availability of water-based activities within the national recreation area has decreased. Continued or expanded access to land and water for recreation was identified by visitors as critical to having a high-quality experience in Lake Meredith National Recreation Area.

Transportation and Access

Within Lake Meredith National Recreation Area, the National Park Service maintains 53 miles of dirt and paved roadways, occupying an estimated 193 acres (based on a typical 30-foot-wide road corridor). However, the national recreation area road system is discontinuous, and travelers often must leave the NPS boundary and travel on federal, state, county, or farm to market roads to get to other, nearby national recreation area locations. There are 19 road entry points to Lake Meredith National Recreation Area, none of which are regulated or monitored.

Lake Meredith National Recreation Area also includes many miles of unmaintained dirt roads that also are used by visitors. Many connect to old or existing oil and gas production facilities, but others lead to informal use areas. These roads fragment the landscape and provide motorized access into areas that would otherwise experience more primitive conditions.

Hiking, Biking, and Horse Use

Currently, there are four trails and paths in Lake Meredith National Recreation Area. Visitors have expressed interest in having additional hiking, biking, and horseback riding trails.

The Spring Canyon paved trail is a little longer than a half-mile, and Spring Canyon North Trail is just 243 feet long. Both of these trails are in the northern section of the national recreation area. Spring Canyon experiences heavy day use on weekends throughout the spring and summer seasons. At Plum Creek, the Devil's Canyon trail is approximately 1.5 miles long and is used by horseback riders, bikers, and hikers. The Mullinaw Trail is approximately 5 miles long and is primarily used by horseback riders and hikers.

The multi-use trail being constructed on the south side of Lake Meredith will be completed in five phases as funding becomes available. When complete, the trail will provide visitors with additional recreational and educational opportunities while providing increased emergency access and also a partial firebreak at the urban-wildland interface. Phase one of the trail will be in the Harbor Bay and Fritch Canyon area; phase two will go from Harbor Bay southwest toward Short Creek; phase three will continue from Short Creek to the entrance of South Turkey Creek; phase four will consist of a loop trail that will go from the mouth of South Turkey Creek up the canyon and back; and phase five will be between the Fritch Fortress day use area and the northern portion of phase one. The estimated total linear distance of all phases of the multi-use trail will be approximately 22 miles (NPS 2010b).

Camping

Eleven campgrounds are available to visitors year round. All are free of charge to users. There are no hookups for water, sewer, or electricity at any of the campgrounds. Picnic tables are located at select campground sites, and running water is available at the Sanford-Yake and Fritch Fortress campgrounds, which also have flush toilets. The other campgrounds are equipped with chemical or vault toilets (NPS 2011b).

Hunting

Hunting is allowed in designated areas of Lake Meredith National Recreation Area. Game species include dove, turkey, quail, goose, white-tailed deer, and mule deer. Hunters are required to have a Texas hunting license with appropriate endorsements to match the game being hunted. During the general deer season and youth whitetail seasons, all hunters are required to wear blaze orange (NPS 2011b). In addition to using existing trails, hunters use deer trails and the dirt road network to move through the more remote areas of Lake Meredith National Recreation Area.

Fees

Currently, fees are charged only for boating. Fees are not charged for entry into the national recreation area. There also are no fees for the use of facilities such as campsites or the off-road vehicle areas.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

Between 2000 and 2009, about 2,500 people visited the national monument annually, including 2,918 people in 2009 (NPS 2011c). Generally, visitation is highest in the spring, declines slightly in the summer because of high temperatures, and then increases in the fall.

Hiking

The Alibates Flint Quarries Trail is about 3,960 feet long (NPS 2010b). Visitors are only allowed to hike this trail while accompanied by park staff (including trained volunteers) to discourage flint collecting, which is prohibited. Each day, there are two national monument-led hikes, weather permitting.

Contact Station

The Alibates contact station is outside the national monument on land in Lake

Meredith National Recreation Area. It is normally open daily, but may be closed when NPS staff are conducting tours, which normally take about an hour. The contact station and its parking lot occasionally support special activities such as flint-knapping demonstrations. Most visitors to Alibates Flint Quarries National Monument include a visit to the contact station in their activities.

CLIMATE CHANGE EFFECTS ON VISITOR USE AND EXPERIENCE IN BOTH PARKS

Climate change could alter the timing of visits and activities at the national recreation area and the national monument. As discussed above, most visitation to the national recreation area occurs from May to August when temperatures are warmest and lake-based activities are most frequent. Visitor numbers currently tend to dip in the fall and winter months. Higher temperatures and lower lake levels associated with climate change could shift more national recreation area visitation toward cooler seasons and nonlake-based activities. In the national monument, most visitation occurs in the spring and fall when temperatures are more moderate. Visitor numbers currently tend to dip in the warmest summer months and coldest winter months. Higher temperatures associated with climate change could shift more national monument visitation toward the winter.

SOCIOECONOMICS

The National Environmental Policy Act requires an examination of social and economic impacts caused by federal actions. Jurisdictions that most likely would be affected by this general management plan include the three counties that contain the parks (Hutchinson, Moore, and Potter Counties) and the cities of Fritch and Borger.

REGIONAL SETTING

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are in the arid, sparsely populated panhandle of Texas. Amarillo is 38 miles south of the parks' headquarters.

- Hutchinson County contains the north and northeast parts of the national recreation area, including Bugbee, Spring Canyon, Sanford Dam, Sanford-Yake, Cedar Canyon, Fritch Fortress, and Harbor Bay. The parks' headquarters in Fritch also is in Hutchinson County. These facilities are in the southwest corner of this 887-square-mile county.
- Moore County contains the northwest part of the national recreation area, including the developed areas of Blue Creek, Chimney Hollow, and Blue West. These facilities are in the southeast corner of this 900-square-mile county.
- All of Alibates Flint Quarries National Monument is in Potter County. This county also contains approximately the southern half of Lake Meredith National Recreation Area, including the Alibates contact station, McBride Canyon, Mullinaw Creek, Rosita, and Plum Creek. These facilities are in the northeast corner of this 909-square-mile county.

The primary road on the east side of the parks is Texas Highway 136, which connects Interstate 40 in Amarillo to Fritch. Borger is 12 miles east of Fritch on Texas Highway 136. U.S. Highway 87/287 provides access to the Rosita area and to Texas farm to market roads that are used to access the west side of the lake.

Borger is the largest city in Hutchinson County and is home to more than 55% of the county's residents. In addition to Fritch, other small communities near the parks include Sanford, Stinnett, and Masterson.

ECONOMIC CONDITIONS

The largest metropolitan center near the parks is Amarillo, which has experienced recent economic and population growth. Closer to the parks, the population is dispersed and economic development has been more limited. As shown in table 23, population in Hutchinson County is expected to be basically stable between now and 2040. A 56% population increase is expected over the next 30 years in Moore County, but because of the small current population, that growth represents only about 11,000 people. The population in Potter County, which includes Amarillo, also is expected to grow by over 50%, which represents about 60,000 additional people.

Table 24 shows employment by industrial category. In general, percentages are similar across all three counties and the state of Texas. As expected, a greater ratio of the work force in rural Hutchinson and Moore Counties is engaged in the agriculture and extractive industries than in more urban Potter County and across Texas. Manufacturing also is more important in these two rural counties. Hutchinson and Moore Counties show a lower work force engagement in the recreation, accommodation, and food services sectors that typically support NPS

units than the levels in Potter County and across the state.

The economic sectors most likely to be affected by the presence of the national park system units include retail sales and accommodation and food service sales. The former includes purchases such as gasoline and groceries by visitors but also includes local NPS purchases, such as fuel, office supplies, and equipment and tools for maintenance and repairs. It also includes household purchases by NPS employees as they spend their salaries in the three counties on items such as groceries, gasoline, and clothing. Accommodation and food service sales reflect restaurant meals and overnight lodging by visitors to the parks. Table 25 provides the most recent data available on spending in these sectors.

NEARBY COMMUNITIES

The headquarters for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are outside the parks in the city of Fritch, Texas. Fritch, which has about 2,000 residents, provides limited overnight lodging and some retail and service functions. Some of these include the Sanford-Fritch Independent School District, which includes three public schools with a total enrollment of about 870 students; a post office; several churches; a local newspaper; grocery store; and restaurants. Six police officers serve on the Fritch police department.

Borger, about 12 miles east of Fritch, has a population of about 12,650 people. It is the nearest city to the parks that offers a wide range of shopping and services for consumers and businesses. In addition to the services described for Fritch, amenities for residents and visitors include overnight lodging, the 19-bed Golden Plains Community Hospital and clinic, and the Frank Phillips College. School system enrollment in Borger totals about 2,800 students.

Table 23: County Populations with Projections through 2040 [a/]

County	2000	2010	2020	2030	2040
Hutchinson	23,857	24,320	24,655	24,311	23,513
Moore	20,121	23,049	26,241	29,057	31,293
Potter	113,546	127,580	142,703	156,846	172,950

a/ Source: Texas Water Development Board 2010a.

Table 24: Employment by Industrial Category, 2005-2009 [a/]

Industry	Hutchinson County	Moore County	Potter County	Texas, Statewide
Total civilian labor force	9,822	9,339	58,336	11,652,848
Agriculture, forestry, fishing and hunting, and mining	713 (7%)	597 (6%)	957 (2%)	306,509 (3%)
Construction	1,042 (11%)	816 (9%)	5,191 (9%)	979,269 (8%)
Manufacturing	1,669 (17%)	2,069 (22%)	6,293 (11%)	1,074,433 (9%)
Retail trade	1,296 (13%)	885 (9%)	7,457 (13%)	1,261,440 (11%)
Educational services, health care, and social assistance	1,608 (16%)	1,414 (15%)	10,108 (17%)	2,193,568 (19%)
Arts, entertainment, recreation, accommodation, and food services	609 (6%)	596 (6%)	5,616 (10%)	893,441 (8%)

a/ Source: U.S. Census Bureau 2010.

Table 25: Retail Activity by County, 2007 a/

Industry	Hutchinson County	Moore County	Potter County	Texas, Statewide
Retail sales	$211 million	$218 million	$2.49 billion	$311 billion
Accommodation and food services sales	$21 million	$23 million	$326 million	$42 billion

a/ Source: U.S. Census Bureau 2010.

Borger is home to some of the world's largest inland petrochemical complexes. Chevron-Phillips Chemical Company and ConocoPhillips Petroleum Company produce chemicals and process crude oil and natural gas liquids at plants in or near the city. Additionally, Agrium manufactures nitrogen fertilizer in its Borger plant. Borger also has Sid Richardson Carbon Company and Degussa Engineered Carbons, Inc., which produce carbon black.

Amarillo, which is 38 miles southwest of the parks' headquarters, has a population of almost 200,000. This city provides comprehensive services similar to those available in metropolitan areas nationwide.

ECONOMIC CONTRIBUTIONS OF THE PARKS

Annual visitation at Lake Meredith National Recreation Area ranked 68th out of 360 among NPS units (NPS 2009), with 1,080,644 visitors in 2009. Alibates Flint Quarries National Monument ranked 352nd out of 360 NPS units with 2,918 visitors in 2009. Based on informal surveys by park staff, about 90% of visitors to the national recreation area are from the Texas panhandle, particularly the cities of Amarillo and Lubbock. Visitors to the national monument are more likely to be from outside the region.

The economic contributions of the parks to the local economy was estimated using data from the NPS' most recent economic benefits analysis (Stynes 2011). NPS system-wide spending averages for 2009 show that spending within 60 miles of a park is $39 per day per person for local residents who are on a day trip and $66 if the person is nonlocal. Visitors who stayed in NPS campgrounds spent about $97 per day (Stynes 2011). Based on values earlier in this section that about 25% of visitors camp overnight (Arizona State University 2004) and 90% are from the Texas panhandle region, spending in communities within 60 miles of the parks totals about $55 million annually with total visitation at the parks of about 1 million per year. That value increases to about $88 million when lake levels are higher and visitation totals about 1.6 million per year.

The budget for both parks in fiscal year 2010 was $3.2 million. Almost the entire amount goes toward park operational costs, which includes salaries, wages, and fringe benefits paid to park personnel (which are then spent locally for expenses such as housing, food, automobiles and gasoline, clothing, and entertainment), and for park operating expenses such as utilities, office supplies, fuel, and vehicle and facility maintenance. Most of these annual expenditures circulate through the regional economy in the form of consumer and business purchases, yielding indirect economic impacts.

Authorized staffing at the parks is currently at 42 full-time-equivalent employees. The economic contribution analysis (Stynes 2011) indicates that every NPS position helps generate about 4.5 jobs in the community. Therefore, the parks support the generation of approximately 189 jobs in the three-county area.

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are managed jointly by the National Park Service. Together, they have a staff of 29 permanent and 18 seasonal positions.

The headquarters, administrative functions, and most visitor services are in the city of Fritch, east of the lake and outside the parks' boundaries. Other staff work from the fire cache near the south end of Sanford Dam and from the maintenance facility and ranger station buildings off Sanford-Yake Road. All of these facilities are within the national recreation area boundary. During normal operating hours, a member of the interpretive staff usually is available at the Alibates visitor contact station, which is in Lake Meredith National Recreation Area.

The multiple locations of park administrative facilities result in major inefficiencies relating to staff travel time and fuel consumption. To avoid travel, personnel try to maximize telephone communications, and printers have been installed in multiple locations. However, the current arrangement results in numerous daily trips by automobile among administrative facilities within and outside the parks.

MANAGEMENT ACTIVITIES

Common park management activities include planning and administration, visitor orientation and interpretation services, vegetation management to control exotic and invasive species and encourage native species; fire plan implementation, including prescribed burns; ranger patrols; maintenance and repairs of buildings, utilities, and outdoor facilities; and care of visitor use areas, such as grass mowing and trash pickup. Most interactions with visitors occur during interpretation and education activities and through law enforcement patrols. The outreach program provides citizens with opportunities to interact with NPS staff outside the parks. Other responsibilities are identified below in the descriptions of the parks' six divisions.

The *Office of the Superintendent* and the *Division of Administration* conduct all management and support activities, including external affairs, park-level planning, human resource management, information technology, and financial management. The superintendent and the administrative division are based in the headquarters building in Fritch. The current headquarters building is too small to meet current needs and does not include space for research, training, and interpretation relating to the parks' museum collections.

The *Resource Management Division* is responsible for the management, preservation, and protection of the parks' cultural and natural resources, including scientific research, management, restoration, and resource protection planning. This includes managing oil and gas operations in accordance with the approved oil and gas plan (NPS 2002b). This team is based in the Fritch headquarters, where it encounters the same space constraints as the administration staff. Efficient operations also are reduced by the need to make several trips into the parks each week to meet with staff from other divisions at their buildings.

The *Southern Plains Fire Group* is based at the fire cache in the national recreation area. This group is responsible for implementing the approved fire plans at these two parks and several others, including Chickasaw National Recreation Area and Washita Battlefield National Historic Site. It also has cooperative agreements with public and private fire management organizations throughout the region. In a typical year, this group will work with as many as 40 cooperating agencies to implement prescribed burns

and other hazardous fuel reduction and ecosystem restoration actions. It also assists local fire departments and other federal agencies, particularly during fire emergencies.

The *Law Enforcement / Ranger Division* protects resources and people, patrols land and water areas of the parks, prevents crime, conducts investigations, apprehends criminals, and serves the needs of the visitors. It is based at the ranger station near Cedar Canyon. Personnel from this division must travel extensively to coordinate with the other divisions, all of which are in different locations.

The *Division of Interpretation* works to facilitate a personal connection between the interests of the visitor and the importance of resources in the national recreation area and national monument. Interpretive staff provides information using the information desks at the Fritch headquarters and the Alibates contact station, guided tours, signs, kiosks, visitor contact station displays, and campfire programs. Outreach activities extend this function to school classrooms and community groups throughout the Texas panhandle. This team is based in the Fritch headquarters and encounters the same space constraints as the administration staff.

The *Maintenance Division* provides stewardship of assets through maintenance practices and preservation techniques. The staff in this division maintains all of the parks' facilities, including but not limited to, roads, parking lots, trails, buildings, utilities, restrooms, campgrounds, and boat ramps. Extensive coordination with other divisions results in numerous automobile trips from the office and shop area in South Canyon.

UTILITIES

Electrical power is available only on the north and east sides of Lake Meredith National Recreation Area, from the Bugbee area to the Alibates visitor contact station. The electrical poles and lines within the national recreation area are maintained by the service provider. Electricity for the headquarters in Fritch also is purchased from this provider.

Telephone and Internet services to in-park administrative facilities are purchased from a local provider, which maintains the poles and lines. The copper transmission lines are much slower than the fiber-optic lines that serve the parks' headquarters in Fritch. Therefore, staff at the fire, maintenance, and ranger facilities may limit functions requiring a speedy connection, such as large file transfers, to off-peak hours or when they travel to Fritch.

Natural gas is used for space and water heating in the headquarters in Fritch. Natural gas is not available at any locations in the parks.

Potable water from wells is supplied to the administrative areas in the parks, including the law enforcement, fire cache, and maintenance structures. Potable water also is available at the visitor use areas at Sanford-Yake, Cedar Canyon, and Fritch Fortress. All wells are of sufficient capacity and depth to meet demand from park operations and visitors, even during the severe drought that began in 2001. The headquarters building in Fritch is on the municipal water system.

Wastewater is treated using septic tank and leach field systems in all of the parks' areas that are served with potable water. All of these systems are sized to handle the visitor numbers that occur on peak summer weekends.

Several other high-visitor-use areas are served by vault toilets. These and the sanitary disposal stations (also called trailer dump stations) at Fritch Fortress, Cedar Canyon, and Blue West are pumped regularly, and the wastes are transported to the publically owned treatment works. Facilities are adequate in most areas, but

some popular use sites such as Spring Canyon will continue to be monitored to determine if additional vault toilets should be installed.

The Rosita area does not have any sanitary facilities. The National Park Service installed vault toilets in the past, but they were soon destroyed by vandals. Therefore, sanitation in this area is limited to education regarding proper management of human waste. Because of the proximity of this area to Amarillo, some visitors may leave the national recreation area to find restroom facilities.

Sanitation on the lake is a primary concern because of its function as a drinking water source. Restrooms are available close to all boat ramps, and messages regarding proper management of human waste are an important component of visitor education, both by the National Park Service and by the Canadian River Municipal Water Authority. This message is believed to be effective, in part because many visitors to Lake Meredith are from nearby communities that receive their drinking water from the lake.

SUSTAINABILITY

The National Park Service and all other federal agencies are required by Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, to reduce energy intensity and greenhouse gas emissions by 3% each year, leading to a cumulative 30% reduction by the end of 2015, compared to a 2003 baseline. This goal was given the weight of law when it was ratified by the Energy Independence and Security Act of 2007. The executive order also has renewable energy requirements, high-performance and sustainability standards for new construction and substantial renovations, and requirements for incorporating sustainable practices into at least 15% of the existing federal capital asset building inventory of each agency by the end of 2015.

Executive Order 13423 also has sustainability requirements for water. Federal agencies must reduce water intensity (gallons per square foot) by 2% each year through 2015 for a total of 16%, based on water consumption in 2007. Executive Order 13514 expands this by requiring agencies to reduce *potable* water consumption intensity 2% annually through 2020, to a cumulative total of 26% relative to a 2007 baseline.

The National Park Service is implementing measures to reduce energy use, water use, and the emissions of greenhouse gases relating to the operation of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. Some of these include the

- installation of low-flow toilets and automatic water faucets
- elimination of paper towels within the parks
- installation of solar panels on vault toilets to power the ventilation fans
- use of dual-fuel vehicles by NPS staff
- installation of recycling stations throughout the parks
- installation of energy-efficient light bulbs
- installation of high-efficiency air conditioning units at the ranger station
- installation of insulation at the ranger station

It is expected that improved sustainability will be a standard operating practice throughout the life of this general management plan.

FACILITIES CONDITIONS

Most of the structures in Lake Meredith National Recreation Area were installed in the 1960s and 1970s. None of the facilities used for park operations meet the eligibility requirements for listing in the National Register of Historic Places.

The role of the National Park Service is to "care for special places saved by the American people so that all may experience our heritage." The agency applies the effective management practices it has learned through implementing this role to all of its facilities, not only those deemed "special." As a result, all of the facilities associated with Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument are in generally good operating condition. However, they pose some of the following operational concerns:

- As described previously, the headquarters, fire cache, law enforcement, and maintenance facilities are in different locations, which sometimes requires redundant resources and results in considerable travel.
- Some of the buildings, including the headquarters, are too small to effectively meet current needs or those projected for the life of this plan.
- Some of the buildings in the national recreation area were built for other purposes and are being used adaptively, which impedes functions. Examples include the Cedar Canyon contact station, which is currently used for storage.
- There was little concern for energy or water efficiency when the facilities were constructed. As a result, most are poorly designed with regard to sustainability and would require substantial renovations to meet modern standards and the improvements required in Executive Orders 13423 and 13514.
- Some facilities are unused, such as the water tank. Others are underused, including some of the campsites at the seldom-full Blue West campground. The ongoing need to maintain these facilities has not been a good use of scarce funds. Therefore, plans are underway to remove these facilities and return their sites to a more natural condition. Other national recreation area facilities may fall in the "underused" category, so that the parks would benefit from a systematic evaluation to optimize facilities.
- The Texas panhandle region, where the parks are located, is rated by the Federal Emergency Management Agency (2007) as "high risk" for both frequency of tornados and wind speed, with winds that can exceed 250 miles per hour. The NPS facilities outside the parks do not have a storm shelter. If there was enough time, NPS staff and visitors near the law enforcement building or the Canadian River Municipal Water Authority building near Sanford Dam might be able to shelter in basements. All other staff, including those in the headquarters building in Fritch, have no opportunity to seek shelter from these deadly storms.

High levels of vandalism and trash dumping occur in Lake Meredith National Recreation Area. As a result, trash cleanup and the ongoing replacement and repair of damaged facilities requires substantial attention from maintenance personnel and adversely affects the NPS' ability to maintain other national recreation area facilities. In the Rosita area, the ongoing high level of damage caused the National Park Service to remove all amenities, including restrooms, picnic tables, and trash barrels. The problem persists, although at lower levels, particularly in areas of the national recreation area that are easily accessed by road but that have lower visitor levels.

CHAPTER 4:

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The National Environmental Policy Act requires that environmental impact statements disclose the impacts of proposed federal actions. In this case, the proposed federal action involves establishing and implementing a general management plan to guide National Park Service actions at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument for the next 20 years.

This chapter analyzes the effects of the alternative of no action / continue current management in each park (alternatives 1 and A for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, respectively) and two action alternatives for each park. Effects were considered for each of the impact topics that were identified as "retained" in table 2.

The chapter describes the methods used to analyze impacts of the alternatives. It then presents the analysis for each impact topic in terms of type (beneficial or adverse), intensity (negligible, minor, moderate, or major), duration (short-term or long-term), and context (geographic area affected) for each alternative relative to the issues identified during scoping. Each analysis includes a determination of cumulative impacts and a summary of conclusions.

The evaluation also includes an evaluation of the effects of the alternatives on sustainability and long-term management. This includes the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, irreversible and irretrievable commitments of resources, and unavoidable adverse impacts.

CUMULATIVE IMPACTS AND PROJECTS THAT MAKE UP THE CUMULATIVE IMPACT SCENARIO

A cumulative impact is described in the Council on Environmental Quality's regulation 1508.7 as follows:

> *"Cumulative impact" is 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. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

The cumulative impact scenario identifies the past, present, and reasonably foreseeable future actions that are affecting or will affect conditions in and around Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. Generally, it includes the approximately 2,700-square-mile area of Hutchinson, Moore, and Potter Counties but, as appropriate, it addresses conditions in a larger region, such as the Texas panhandle.

The cumulative impact analysis evaluates the relationship of other resource planning and management discussed in chapter 1 to this general management plan. The NPS plans that were included in that section and that are part of the cumulative impact scenario include the

- resources management plan (NPS 1996)
- oil and gas management plan and environmental impact statement (NPS 2002b, 2002c)

- wildland fire management plan (NPS 2008c)
- multi-use trail environmental assessment (NPS 2010b)
- off-road vehicle management plan and regulation environmental impact statement (NPS 2012a)

As appropriate, the effects of each on the resources that are affected by this general management plan are described under each impact topic.

Other actions that were included in the scenario include the following.

Management of the Arkansas River shiner. A cooperative effort among local, state, and federal entities, including the National Park Service, is being used to identify and enact conservation strategies for this species. Management is guided by a plan prepared by the Canadian River Municipal Water Authority (2005) and approved by the U.S. Fish and Wildlife Service.

Oil and gas production. Development of the Panhandle West Field, which includes the Lake Meredith area, dates to 1918. The communities of Sanford, Fritch, and Borger were founded to accommodate the new businesses and their employees. Oil and gas exploration and development in the region and in the parks has led to the development of drill pads, pipelines, and extensive dirt road networks to these sites. Currently, there are 168 active wells and many sites of former operations in the national recreation area and one active well in the national monument. Concerns related to oil and gas exploration and production include increased soil erosion, road development, air pollution, habitat loss and fragmentation, and reduced visibility, both for daytime scenic vistas and the visibility of the night sky.

Wind and other renewable energy development. Wind farms for the generation of electricity have been constructed throughout the Texas panhandle, including sites in Hutchinson, Moore, and Potter Counties, and many additional wind turbines are planned. The area also is suitable for solar power generation, although its development has been limited. Some of the effects of this development that contribute to the cumulative impact scenario include the long-term commitment of land to these purposes, visibility of wind generators, direct impacts to birds and bats from turbine blade strikes, sound pollution, more roads, increased loss of plant cover and wildlife habitat, new jobs to construct and maintain the equipment, and more demand for recreation opportunities.

METHODS FOR ANALYZING IMPACTS

GENERAL ANALYSIS METHOD

The National Park Service based impact analyses and conclusions on data from existing literature, information and insights provided by NPS and other agency experts, and professional judgment.

For each impact topic, a brief description of relevant components of the existing condition is provided. This information is then used as a basis for determining the effects of implementing each alternative. The impact analyses involved the following steps:

- Define concerns, based on internal and public scoping.
- Identify the geographic area that could be affected.
- Define the resources within that area that could be affected.
- Impose the alternative on the resources within the geographic area of potential effect.
- Identify the effects caused by the alternative, in comparison to Alternative 1 or Alternative A: No Action / Continue Current Management, to determine the relative change.
- Characterize the effects based on the following factors:
  - whether the effect would be beneficial or adverse
  - the intensity of the effect, as negligible, minor, moderate, or major
  - duration of the effect, either short-term or long-term (impact-topic-specific definitions for each of these durations are provided in each impact topic methods section)
  - the area affected by the alternative, such as the immediate area of a proposed action, within the park(s) boundary, or within Hutchinson, Moore, and Potter Counties
- Determine cumulative effects by evaluating the effect in conjunction with past, present, or reasonably foreseeable future actions for the parks and the region.

Impact Topic Threshold Definitions

The impact-topic-specific thresholds that were used to define the intensity of effects are provided in each impact topic methods section. Threshold values were developed based on the guidance in sections 4.5.G.4. and 4.5.G.5. of Director's Order 12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001). The goal was to apply thresholds that were accurate, scientifically credible, quantified as much as possible, and understandable to a lay readership.

The National Park Service does not have standardized impact threshold definitions for National Environmental Policy Act documents. Instead, it uses the guidance outlined in Director's Order 12 to develop park- and project-specific impact threshold definitions, taking into consideration existing conditions within that park, the types of actions proposed, and the context, intensity, duration, and timing of potential impacts. All of the impact threshold definitions for every impact topic evaluated in this environmental impact statement were developed using this park- and project-specific approach.

In evaluating the intensity of effects on each impact topic, the National Park Service characterizes those effects as negligible, minor, moderate, or major. These thresholds help establish the sideboards for understanding the severity and magnitude of the impact. The National Park Service equates the term "major" effects (or impacts) to the term

"significant" as used in the National Environmental Policy Act and its implementing regulations. It thus distinguishes between proposed actions with associated effects that would require the preparation of an environmental impact statement versus those that may require only preparation of an environmental assessment and finding of no significant impact. The term major, by itself, does not and is not intended to have a specific meaning in the context of the NPS Organic Act. Specifically, the term "major" does not by itself indicate an impact that rises to the level of impairment or that is "unacceptable" as described in *Management Policies 2006* (NPS 2006b).

Analyses by Time Period

The general management plan is intended to define how the parks will be managed for the next 15 to 20 years. Therefore, this environmental impact statement evaluated actions between now and 2032, the 20 years from implementation of the general management plan.

CULTURAL RESOURCE EVALUATION METHOD

The cultural resource evaluation method is based on 36 *Code of Federal Regulations* part 800, Protection of Historic Properties, and the Council on Environmental Quality (1978) guidelines for implementing the National Environmental Policy Act. In this environmental impact statement, consistent with the Council on Environmental Quality guidelines, potential impacts on cultural resources, including cumulative impacts, are described in terms of

- type (whether the impacts are beneficial or adverse)
- context (whether the impacts are site-specific, local, or regional)
- duration (whether the impacts are short-term, long-term, or permanent)
- intensity (whether the degree or severity of impacts would be negligible, minor, moderate, or major)

Because definitions of intensity vary by impact topic, intensity definitions are provided separately for each impact topic analyzed in this environmental impact statement.

These effect analyses are also intended to comply with the requirements of section 106 of the National Historic Preservation Act. In accordance with the Advisory Council on Historic Preservation's regulations implementing section 106 of the National Historic Preservation Act (36 *Code of Federal Regulations*, part 800, Protection of Historic Properties), effects on cultural resources were identified and evaluated by

- determining the area of potential effects
- identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places
- applying the criteria of adverse effect to affected, national register-eligible or -listed cultural resources
- considering ways to avoid, minimize, or mitigate adverse effects

Under the Advisory Council's regulations, a determination of either *adverse effect* or *no adverse effect* must also be made for affected national register-listed or -eligible cultural resources, as follows:

- An *adverse effect* occurs whenever an impact alters, directly or indirectly, any characteristic of a cultural resource that qualifies it for inclusion in the National Register of Historic Places. This could include diminishing the integrity (or the extent to which a resource retains its historic appearance) of its location, design, setting, materials, workmanship, feeling, or

association. Adverse effects also include reasonably foreseeable effects caused by an alternative that would occur later in time, be farther removed in distance, or be cumulative (36 *Code of Federal Regulations* 800.5, Assessment of Adverse Effects).

- A determination of *no adverse effect* means there could be an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the National Register of Historic Places.

Council on Environmental Quality (1978) regulations and Director's Order 12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001) also call for a discussion of mitigation and an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (for example, reducing the intensity of an impact from major to moderate or minor). However, any resultant reduction in intensity of impact that results from mitigation is an estimate of the effectiveness of mitigation under the National Environmental Policy Act only. It does not suggest that the level of effect as defined by section 106 is similarly reduced. With the exception of some plant materials found in cultural landscapes, cultural resources are nonrenewable resources, and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under section 106 may be mitigated, the effect remains adverse.

Cumulative impacts on cultural resources were evaluated using the same approach described above under the heading "Cumulative Effects Analysis Method."

IMPACT ANALYSIS METHODS

Special status species impacts were evaluated as described in the "Methods for Analyzing Impacts" section.

Impact Threshold Definitions

The following concepts were used to assess impacts on threatened and endangered species:

Population Level Impact: The extent to which a change in habitat, reproductive success, habitat fragmentation, or mortality would be likely to occur.

Human-caused Disturbance: Implementation and perpetuation of all or part of an alternative would cause or prevent the displacement of individuals.

Potential for "Take": For endangered or threatened species, the potential for a "take" to occur is the primary impact measure examined. According to the Endangered Species Act, the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

Determination of Effects for Species Listed under the Endangered Species Act: The following effects determinations from the *Endangered Species Consultation Handbook* (USFWS and NMFS 1998) were made for each species protected under the Endangered Species Act. These determinations apply to the interior least tern, northern aplomado falcon, whooping crane, black-footed ferret, Arkansas River shiner, and slender rush pea. They also are being applied in this impact analysis to the lesser prairie-chicken, which is a candidate species and is managed by the National Park Service as if it were listed.

- **No effect** is the conclusion when the proposed action would not affect listed species or critical habitat.
- **May affect, but not likely to adversely affect** is the conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Discountable effects are those effects that would be extremely unlikely to occur. Insignificant effects relate to the intensity of the impact and would not reach the scale where take occurs. Beneficial effects are positive effects without any adverse effects on the species. Based on best judgment, a person would not be able to meaningfully measure, detect, or evaluate insignificant effects or expect discountable effects to occur.
- **Likely to adversely affect** is the conclusion if any adverse effect to a listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial. In the event the overall effect of the proposed action is beneficial to the listed species, but also is likely to cause some adverse effects, then the proposed action is *likely to adversely affect* the listed species. A *likely to adversely affect* determination requires formal section 7 consultation.

National Environmental Policy Act impact threshold definitions are as follows for special status species:

Negligible: No federally listed species would be affected, or the effect on an individual or its critical habitat would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Negligible effect would equate with an Endangered Species Act "**no effect**" determination.

Minor: Individuals of a listed species or its critical habitat may be affected, but the effect would be relatively small. Minor would equate with an Endangered Species Act determination of *may affect, but not likely to adversely affect* for the species.

Moderate: An individual or population of a listed species or its critical habitat would be noticeably affected. Moderate would equate with an Endangered Species Act "may affect" determination and would be accompanied by a statement of *not likely to adversely affect* or *likely to adversely affect* the species.

Major: An individual or population of a listed species or its critical habitat would be noticeably affected. Major would equate with an Endangered Species Act "may affect" determination and would be accompanied by a statement of *not likely to adversely affect* (for a beneficial impact) or *likely to adversely affect* the species.

Short-term: Impact has a duration less than or equal to one year.

Long-term: Impact has a duration greater than one year.

Geographic Area Considered

The geographic area considered for impacts on special status species included the land within the boundaries of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument.

Concerns

Three concerns relating to special status species were identified during scoping:

- effects on habitat within the national recreation area
- effects on special status species from development
- effects on special status species from visitor activities occurring within the parks

These concerns are addressed together in this analysis because the impacts on national recreation area habitat are integrated with effects on all special status species.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Existing facilities would continue causing impacts on special status species and their movement through habitat loss and fragmentation. Developments producing these effects would continue to include the dam and reservoir, roads, parking areas, trails, campgrounds, picnic areas, buildings, and utility systems.

With the implementation of alternative 1, people would continue to concentrate at developed areas intended for public and administrative use, disturbing special status species and reducing the value of habitat at those sites and along the trails to and from those sites. Some species, such as prairie dogs, are habituated to humans and human developments, while other species avoid such areas. Considering the large acreage of the national recreation area, the small percent of the national recreation area's wildlife habitat that has been developed, and the ability of some special status species to habituate to humans and human developments, these long-term, adverse impacts would have minor intensity. This equates to a *may affect, not likely to adversely affect* section 7 finding.

Visitors to less-used sites, such as areas away from access roads, would continue to cause intermittent disruption to some special status species and could disrupt their movement and behavior. This adverse, minor, long-term impact would equate to a *may affect, not likely to adversely affect* section 7 finding.

Continuing habitat fragmentation and motor vehicle access to the network of dirt roads in the national recreation area could adversely affect upland special

status species, including the lesser prairie-chicken, northern aplomado falcon, peregrine falcon, black-tailed prairie dog, and Texas horned lizard. Because they would be recurring, the adverse impacts would be long-term. However, the National Park Service would continue to monitor disturbances and implement measures as needed, such as educating visitors about the need to avoid these species and, possibly, closing areas to visitor use. As a result, the intensity would be minor and would equate to a finding of *may affect, not likely to adversely affect* for section 7.

The ongoing development, maintenance, and visitor use of trails under alternative 1 might cause some special status species and their prey to avoid the area when activities were occurring. However, these activities would not be expected to affect the prey abundance or result in population-level effects on special status species. These actions would result in adverse, long-term, minor effects on special status species, which is a *may affect, not likely to adversely affect* section 7 finding.

River, lake, and wetland habitats in the national recreation area are used by the Arkansas River shiner, interior least tern, and whooping crane. The locations and conditions of these habitats would continue to be influenced by water levels in Lake Meredith that fluctuate based on rainfall in the watershed and water use within the Canadian River Municipal Water Authority service area.

The National Park Service would continue to work with the Canadian River Municipal Water Authority to implement its Arkansas River shiner management plan in the national recreation area. This would include maintaining and improving habitat integrity in the southern part of the national recreation area where the Canadian River flows freely, particularly when reservoir levels are low. For the tern and crane, the National Park Service would continue to monitor their use of the national recreation area and would implement measures as needed, such as educating visitors about the need to avoid these species and, possibly, closing areas to visitor use. Compared to impacts from fluctuating lake levels, impacts from NPS management would be small. However, they would continue to have long-term, minor, beneficial impacts. This equates to a *may affect, not likely to adversely affect* section 7 finding.

The removal of underused facilities would occur primarily in or near developed areas that receive little use by special status species. However removal of the Bates Canyon boat ramp would occur in an area that is lightly used by visitors and, depending on lake levels, could be near the riparian zone that provides valuable wildlife habitat. Depending on location, the long-term, beneficial impacts of removing underused facilities would be negligible or minor in intensity, which is a *may affect, not likely to adversely affect* section 7 finding.

Special status species would continue to benefit from NPS management and control of mesquite and invasive saltcedar in the national recreation area. These efforts to restore native vegetation would have long-term, negligible to minor, beneficial impacts on special status species, which equates to a *may affect, not likely to adversely affect* section 7 finding.

The potential for degradation of Arkansas River shiner habitat would continue from activities throughout the national recreation area. Activities such as driving on dirt roads, mowing, maintaining roads, and servicing oil and gas production sites could increase erosion and sedimentation or could result in spills that would reduce water quality. While the Rosita area would be managed in accordance with the off-road vehicle management plan (NPS 2012a), increased sediment loading in the river would continue from visitors driving vehicles on river banks and in the water. The intensity of the continuing long-term, adverse impacts on special status species would be minor. This equates to a *may*

affect but not likely to adversely affect section 7 finding.

Vehicle traffic in the national recreation area would continue to cause a relatively low incidence of road kill of special status species, particularly the Texas horned lizard. The long-term, adverse impacts would be minor in intensity.

Cumulative Impacts

The effects of alternative 1 on special status species all would be negligible or minor in intensity. The long-term effects would be beneficial with regard to providing habitat for special status species that rely on lake, river, or wetland habitats; removal of underused facilities; and NPS control of mesquite and saltcedar. Adverse, long-term effects would continue with regard to water quality, disturbance at developed areas and less-used sites, habitat fragmentation by the road network, disturbances along trails, and road kill.

Throughout the national recreation area, the impacts of other actions that would contribute to cumulative impacts include the following:

- The resource management plan (NPS 1996) has a minor to moderate beneficial impact by providing documented goals and commitments to protect and enhance special status species and establishing a basis for determining actions to be taken and measuring accomplishments.
- Oil and gas activities are having moderate adverse impacts because the construction and use of features such as roads, well pads, and pipelines remove and fragment habitat and can cause direct mortality of individual animals, particularly the Texas horned lizard. Implementation of the oil and gas management plan (NPS 2002b) is having minor to moderate beneficial impacts because this plan improved protection of important resources such as riparian habitat, special management areas, and rare plant communities.
- Implementation of the wildland fire management plan (NPS 2008c) is having a long-term, minor to moderate beneficial impact on special status species. This is because the plan stresses their protection during initial attack operations and the protection of habitats in prescribed burn plans and wildland fire situation analyses. Moreover, the control of mesquite and saltcedar and the enhancement of native vegetation that results from plan implementation is having a long-term, moderate beneficial impact on special status species.
- Future construction and use of the multi-use trail on the east side of Lake Meredith National Recreation Area will have a negligible impact on special status species.
- Ongoing off-road vehicle use will have continued minor to moderate adverse effects on the Arkansas River shiner. This primarily results from habitat degradation in the Canadian River but could also include direct mortality. Beneficial impacts would occur because the off-road vehicle management plan (NPS 2012a) would improve protection for this species. These impacts would be limited to the Rosita area.

Within and outside Lake Meredith National Recreation Area, implementation of the Arkansas River shiner management plan prepared by Canadian River Municipal Water Authority (2005) will continue to have minor to moderate beneficial impacts on this species.

Other activities outside the national recreation area that affect special status species include oil and gas production and the development of renewable energy resources, particularly wind power.

Impacts on special status species in the geographic area affected by this plan from these activities are negligible and adverse.

Collectively, the actions inside the parks are having long-term, minor to moderate, beneficial cumulative impacts on special status species. Outside the parks, the collective impact on special status species in the geographic area affected by this plan is long-term, adverse, and of negligible intensity.

The negligible to minor, beneficial and adverse impacts associated with alternative 1, when added to the long-term, minor to moderate, beneficial effects from other park management actions, would result in continued, minor to moderate, beneficial effects on special status species in the geographic area affected by this plan. The contribution of this alternative to the cumulative impact would be small.

Conclusions

In Lake Meredith National Recreation Area, all impacts on special status species would continue to be negligible or minor in intensity. The long-term effects would be beneficial with regard to providing habitat for special status species that rely on lake, river, or wetland habitats; removal of underused facilities; and NPS control of mesquite and saltcedar. Adverse, long-term effects would continue with regard to water quality, disturbance at developed areas and less-used sites, habitat fragmentation by the road network, disturbances along trails, and road kill. All of these impacts individually and collectively would result in a *may affect, but not likely to adversely affect* section 7 finding.

Cumulative impacts on special status species would add negligible to minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other park management actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

Many of the impacts of alternative 2 on special status species would be the same as those described for the no-action alternative. Therefore, this alternative would have negligible impacts (equates to a *no effect* section 7 finding) with regard to

- disturbance, habitat loss, and fragmentation from ongoing use and maintenance of facilities, including paved roads, in Lake Meredith National Recreation Area
- fluctuating lake levels and associated changes to wetland and shoreline habitat
- removal of underused facilities
- management and control of mesquite and saltcedar
- off-road vehicle use in the Rosita area

Construction or installation of the following facilities under alternative 2 would result in new disturbance to special status species and/or their habitat:

- a consolidated operations center
- electricity and water hookups for about 10 campsites at Fritch Fortress and 10 campsites Sanford-Yake
- potential reinstallation of previously removed campsites if visitation levels were to increase

All of these projects would occur in areas that were previously disturbed. Therefore, impacts would be lower than if the same types of actions were implemented at new sites.

All of the listed facilities would be located in upland areas. Sites would be surveyed

for special status species and their habitats, and any areas of concern would be avoided. During and after construction, the National Park Service would require the use of best management practices to avoid or minimize potential impacts on special status species and their habitat. During construction, the short-term impacts on special status species would be adverse and negligible to minor. The long-term, adverse impacts associated with new development also would be negligible to minor in intensity. These impacts would equate to a *may affect, not likely to adversely affect* section 7 finding.

Following the construction of a consolidated operations center in the national recreation area, the existing fire cache and law enforcement facilities would be removed and the sites would be restored. During the removal, the short-term impacts on special status species would be adverse and negligible to minor as a result of increased noise and disturbance in the area. The long-term impacts from site restoration would be minor and beneficial. These impacts would equate to a *may affect, not likely to adversely affect* section 7 finding.

Reducing the dirt road network would involve closing some roads in the national recreation area and restoring native vegetation. Other roads would be marked for administrative use only. Reducing the size of the dirt road network would have a proportional decrease in road kill of special status species, particularly the Texas horned lizard. Long-term impacts on special status species from these actions would be minor and beneficial and would equate to a *may affect, not likely to adversely affect* section 7 finding. Rehabilitation of the Mullinaw Trail would reduce erosion and trail maintenance in problem areas, which would reduce impacts on surrounding habitats. During implementation, the short-term impacts would be adverse and negligible to minor. The long-term, beneficial impacts would be minor. These impacts would equate to a *may affect, not likely to adversely affect* section 7 finding.

Increased monitoring and management of resource conditions under alternative 2 that could include use restrictions, temporary closures, and/or active restoration would minimize or reverse habitat degradation. The results would be long-term, minor, and beneficial and would equate to a *may affect, not likely to adversely affect* section 7 finding.

Primitive camping areas would be added on the west side of the lake, which could increase visitor presence in areas that may be used seasonally by the federally listed interior least tern and whooping crane. However, if problems were detected by monitoring, mitigation such as education of visitors and selective area closures would be employed. As a result, the long-term, adverse impacts would be negligible to minor in intensity, which would equate to a *may affect, not likely to adversely affect* section 7 finding.

Implementing a user fee for the use of off-road vehicles in the Blue Creek and Rosita areas could decrease the number of users. Additionally, during scoping, some members of the public said that a fee might prompt some users in these areas to behave more responsibly. Either result would have long-term, beneficial impacts of minor intensity on special status species, particularly the Arkansas River shiner. These impacts would equate to a *may affect, not likely to adversely affect* section 7 finding.

Interpretive waysides and information technology educating the public could change visitor use patterns and decrease activities that reduced the value of special status species habitat in the national recreation area. Education could also help users understand and appreciate concerns about special status species beyond NPS boundaries and encourage their support for species and habitat protection and restoration on a broader scale. The long-term, beneficial impacts would be minor and would equate to a *may affect, not likely to adversely affect* section 7 finding.

Cumulative Impacts

All short- and long-term impacts of alternative 2 would be negligible or minor in intensity. Short-term, adverse impacts would result from the construction of new facilities, restoration of sites from which facilities were removed, and trail rehabilitation. Long-term impacts would be beneficial with regard to restoring the sites of the existing fire cache and law enforcement facilities, decreasing the size of the dirt road network, rehabilitating the Mullinaw Trail, increasing the monitoring and management of resource conditions, implementing a fee for the use of off-road vehicles, increasing visitor education regarding special status species, and reducing road kill of individual animals. Adverse long-term impacts would be associated with the construction or installation of new facilities in the national recreation area and with increased visitor presence because the designation of primitive camping areas on the west side of the lake.

Past, current, and foreseeable future actions within and outside the national recreation area that cumulatively could impact special status species would be the same as those described for alternative 1.

The negligible to minor, beneficial and adverse impacts associated with alternative 2, when added to the long-term, minor to moderate, beneficial effects from other actions, would result in continued, minor to moderate, beneficial effects on special status species in the geographic area affected by this plan. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Many impacts of alternative 2 would be the same as for the no-action alternative, resulting in a negligible intensity. These include impacts from ongoing use and maintenance of facilities, fluctuating lake levels, removal of underused facilities, management and control of mesquite and saltcedar, and continued use of off-road vehicles in the Rosita area.

Short-term, adverse impacts would result from the construction of new facilities, restoration of sites from which facilities were removed, and rehabilitation of the Mullinaw Trail. The intensities would be negligible to minor, and the impacts would end shortly after the projects were completed.

All long-term impacts on special status species would be negligible or minor in intensity. Impacts would be beneficial with regard to restoring the sites of the existing fire cache and law enforcement facilities, decreasing the size of the dirt road network, rehabilitating the Mullinaw Trail, increasing the monitoring and management of resource conditions, implementing a fee for the use of off-road vehicles, increasing visitor education regarding special status species, and reducing road kill of individual animals. Adverse impacts would be associated with the construction or installation of new facilities and with increased visitor presence because of the designation of primitive camping areas on the west side of the national recreation area.

Individually and collectively, all of these impacts would result in a *may affect, but not likely to adversely affect* section 7 finding under the Endangered Species Act.

Cumulative impacts on special status species would add negligible to minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

Aspects of the preferred alternative that would have the same negligible impacts on special status species relative to the no-action alternative would be the same as those listed for alternative 2. These include ongoing use and maintenance of facilities, fluctuating lake levels, removal of underused facilities, management and control of mesquite and saltcedar, and continued use of off-road vehicles in the Rosita area.

Construction and/or installation of the following facilities under the preferred alternative would result in new disturbance to special status species and/or their habitat:

- a consolidated visitor contact, headquarters, and operations center
- electricity and water hookups for about 10 campsites at Fritch Fortress and 10 campsites at Sanford-Yake
- a new campground with electrical hookups at Bates Canyon
- potential reinstallation of previously removed campsites if visitation levels were to increase

Effects would be the same as those described for alternative 2, including short- and long-term, adverse impacts of negligible to minor intensity. These impacts would equate to a *may affect, not likely to adversely affect* section 7 finding.

Other features of the preferred alternative might vary from those in alternative 2 with regard to size or location, but they would have similar impacts and intensities that would be negligible or minor compared to the no-action alternative.

- Short-term, adverse impacts would result from restoring sites from which facilities were removed and from rehabilitating the Mullinaw Trail.
- Long-term, beneficial impacts would result from restoring the sites of the existing fire cache and law enforcement facilities; decreasing the size of the dirt road network; rehabilitating the Mullinaw Trail; increasing the monitoring and management of resource conditions; implementing a fee for the use of off-road vehicles; increasing visitor education regarding special status species; and reducing road kill of individual animals.
- Long-term, adverse impacts would result from providing primitive camping areas on the west side of the national recreation area.

Marking trails along existing roads throughout the national recreation area and defining new, semi-primitive trails for hiking, horseback riding, and biking on the west side of the national recreation area would employ best management practices to minimize impacts on special status species. This would include surveying for special status species and their habitats, and avoiding high-value areas. However, areas around new trails would experience the same types of adverse effects that were described for trails in alternative 1. The intensity of the long-term, adverse impacts would be minor and would equate to a *may affect, not likely to adversely affect* section 7 finding.

The additional group campsites at Harbor Bay would have minimal facilities, and all facilities could be moved as water levels changed, so their installation would have negligible impacts on special status species or their habitat. The increased levels of human use could cause special status species to avoid the area, but this area is already developed, so the additional facilities would not substantially alter species' behavior. Therefore, the long-term impacts on special status species from these campsites would be negligible.

These impacts would equate to a *no effect* section 7 finding.

A no wake zone would be established in several coves around the lake and near the inlet of the Canadian River. Areas in the zone would vary in size and location, depending on fluctuating lake levels. The no wake zone would reduce noise and the size of the waves on the beach, which could be beneficial for the shore-nesting interior least tern. However, it could also encourage more use of the area by canoes and kayaks, which are more likely than motorboats to be pulled out so the visitors can recreate on the shore, which would increase the risk to interior least tern nests. The net effect on special status species that use shoreline habitats in these areas would be negligible and would equate to a *no effect* section 7 finding.

Cumulative Impacts

All short- and long-term impacts of the preferred alternative would be negligible or minor in intensity. Short-term, adverse impacts would result from the construction of new facilities, restoration of sites from which facilities were removed, and trail rehabilitation. Beneficial, long-term impacts would result from restoring the sites of the existing fire cache and law enforcement facilities, decreasing the size of the dirt road network, rehabilitating the Mullinaw Trail, increasing the monitoring and management of resource conditions, implementing a fee for the use of off-road vehicles, increasing visitor education regarding special status species, and reducing road kill of individual animals. Adverse, long-term impacts would be associated with the construction or installation of new facilities and with increased visitor presence because of additional trails throughout the national recreation area and the designation of primitive camping areas on the west side of the lake.

Past, current, and foreseeable future actions within and outside the national recreation area that cumulatively could impact special status species would be the same as those described for alternative 1.

The negligible to minor, beneficial and adverse impacts associated with alternative 3, when added to the long-term, minor to moderate, beneficial effects from other actions, would result in continued, minor to moderate, beneficial effects on special status species in the geographic area affected by this plan. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Except as follows, the impacts of the preferred alternative on special status species would be the same as those described for alternative 2:

- Construction of a consolidated visitor contact, headquarters, and operations center, and the construction of a new campground with electrical hookups at Bates Canyon, would have short- and long-term, adverse impacts of negligible to minor intensity.
- Long-term, adverse impacts of minor intensity would result from marking and using additional trails throughout the national recreation area.
- Additional group campsites at Harbor Bay would have negligible impacts.
- The no wake zone would have a negligible impact on special status species that use shoreline habitats.

Individually and collectively, all of these impacts would result in a *may affect, but not likely to adversely affect* section 7 finding under the Endangered Species Act.

Cumulative impacts on special status species would add negligible to minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The

contribution of this alternative to the cumulative impact would be small.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

This impact topic was dismissed from further analysis in Alibates Flint Quarries National Monument. Please refer to chapter 1 under the heading "Alibates Flint Quarries National Monument Impacts Topics Considered But Not Analyzed in Detail."

IMPACT ANALYSIS METHODS

Impacts on the national recreation area's soils were evaluated using the process described in the "Methods for Analyzing Impacts" section.

Impact Threshold Definitions

Impact threshold definitions for soils are as follows.

Negligible: Soils would not be affected or the effects on soils would be below or at the lowest levels of detection.

Minor: The effects on soils would be detectable, but changes in soil character or productivity would be of little importance because, for example, they were highly localized. Mitigation might be needed to offset adverse effects, would be relatively simple to implement, and would be successful.

Moderate: The effects on soils would be readily apparent and would result in a change to the soil character and/or productivity over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and likely would be successful.

Major: The effect on soils would be readily apparent and would substantially change the character and/or productivity of the soils over a large area of the national recreation area. Mitigation measures to offset adverse effects would be needed and extensive, and their success could not be assured.

Short-term: Changes to soil properties such as productivity and erosion would not be detectable three years after the end of a discrete action, such as construction.

Long-term: Changes to soil properties such as productivity and erosion would be detectable after more than three years.

Geographic Area Considered

The geographic area considered for impacts on soils included the land within the boundaries of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, plus in Fritch.

Concerns

Concerns relating to soils that were identified during scoping include

- effects on soils, such as erosion and compaction, from development
- effects on soils and soil features from visitor use and park operations

These concerns are addressed together in this analysis because the impacts on physical characteristics of national recreation area soils are integrated with national recreation area use.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Developed areas associated with operation and use of the national recreation area by the National Park Service and public would continue to disturb soils. Examples include the visitor facilities at Bates Canyon, Blue Creek, Blue West, Chimney Hollow, Fritch Fortress, Harbor Bay, McBride Canyon, Plum Creek, Rosita, and Sanford-Yake; and the fire cache, ranger, and maintenance facilities south of the dam. Existing facilities causing impacts on soils at these sites include roads, parking areas, boat ramps, trails, campgrounds, picnic areas, buildings, and utility systems (water, wastewater, pipelines, and poles for overhead power lines).

As described in chapter 3, soils at all of these sites have limitations that are

classified as severe or greater. Concerns are related either to high susceptibility to erosion or to limitations in the rooting zone, such as shallowness, stones, low moisture holding capacity, or low fertility (NRCS 2011). Recommendations for use range from "special conservation practices" to avoidance of all disturbances and "limit[ing] their use to recreation, wildlife, or water supply or esthetic purposes" (NRCS 2010). Therefore, the National Park Service has implemented, and would continue, soil protection measures that include

- maintenance of native vegetation ground cover
- rapid reestablishment of native vegetation in disturbed areas, sometimes augmented with techniques such as mulching or protective netting
- avoidance of areas that are most susceptible to soil loss
- hardening of heavily used areas with pavement or gravel
- engineered approaches, such as drainage structures, to control runoff and minimize soils losses

At sites throughout Lake Meredith National Recreation Area, impacts would continue to be directly related to the NPS' existing facilities, such as the past removal of topsoil or installation of impervious surfaces. Impacts also would continue from actions such as trampling of vegetation by visitors using an area, which exposes the soil to increased erosion by wind or water.

Alternative 1 would result in ongoing soil disturbance caused by the use of NPS facilities by the public. Ongoing soil disturbances also would result from NPS activities such as maintaining and repairing trails and roads, buildings, and water and wastewater systems. These ongoing actions would be restricted to small areas that previously had been disturbed. Sites with soil disturbance would continue to have accelerated wind and water erosion, at least temporarily, until soils were stabilized through mitigation or natural processes. Disturbances from ongoing use and maintenance of national recreation area facilities would continue to have minor, adverse, long-term impacts on the soil resource.

Vehicle use on roads and hiker and horse traffic on trails would continue to compact soils, prevent vegetative growth, decrease permeability, alter soil moisture, and diminish nutrient content and water storage capacity. Also, vehicle traffic would continue to suspend dust particles in the air, where they could be blown away. Collectively, these conditions would continue to cause erosion and changes in soil composition and chemistry. Because of the relatively small areas involved, the intensity of the ongoing, long-term, adverse impacts would be minor.

To minimize soil erosion, most visitor developments have been constructed where slopes are 5% or less, and slopes of 3% or less are preferred. Roads across slopes have been engineered to minimize erosion, and features such as culverts are designed to maintain natural drainages and minimize sediment transport. Trails are constructed to minimize impacts on soils by concentrating hikers on a maintained surface, with water and erosion control measures to mitigate impacts. Ongoing mitigation, such as trail maintenance, would continue to correct problems whenever they occurred in areas where the slopes were high or soils were eroded by wind and water. Despite these measures, accelerated rates of soil erosion by wind and water would continue to cause minor, long-term, adverse impacts in previously disturbed areas.

Soil disturbance associated with removing underused facilities such as the Bates boat ramp and some of the Blue West campsites would be restricted to the immediate project vicinity. All equipment needed would travel on existing roads and operate on sites that previously had been altered. The resulting short-term impacts

would be adverse, with minor intensity. Because impervious surfaces would be removed and the sites would be restored to more natural conditions, the removal of these facilities would have long-term, beneficial effect of minor intensity on soil.

Past development has created impervious surfaces, such as building roofs, paved roads, and parking lots. In addition, soils that have been compacted have reduced rates of water infiltration. To minimize or mitigate adverse impacts on soils from changes in drainage, the National Park Service would continue to implement management actions such as designing and installing drainage structures to handle the increased runoff without increasing soil loss; hardening (such as with pavement or gravel) heavily used areas such as roads, parking lots, heavily used trails, and campsites; designating facility boundaries to limit the areas of disturbance, and restoring impacted sites. Because of these actions, the impacts would continue to be minor, long-term, and adverse in developed areas and negligible compared to natural conditions in undeveloped areas of the national recreation area.

Cumulative Impacts

All of the effects of alternative 1 on soils would be minor in intensity. Adverse impacts would result from soil disturbance associated with ongoing use and maintenance of facilities, removing underused facilities (a short-term impact), and past development that created impervious surfaces and resulted in the compaction of soils. Beneficial impacts would result from the restoration of sites from which underused facilities were removed.

Throughout the national recreation area, the impacts of other actions that would contribute to cumulative impacts include the following:

- The resource management plan (NPS 1996) has a minor to moderate beneficial impact by providing documented goals and commitments to protect and enhance soils, identifying resource status and threats, and establishing a basis for determining actions to be taken and measuring accomplishments.
- Oil and gas activities conducted in accordance with the oil and gas management plan (NPS 2002b) are having minor adverse impacts on soil relating to the construction and use of features such as roads, well pads, and pipelines. These include erosion, compaction, and pollution from the release of hydrocarbons. Operating stipulations in the plan that minimize adverse impacts on soils are having minor beneficial impacts.
- Implementation of the wildland fire management plan (NPS 2008c) is having a minor beneficial impact on soils. Prescribed burns reduce the need for soil-disturbing activities that result from fighting unplanned ignitions and reduce the intensity of fires so that the organic components of soils are not consumed. The plan also considers rehabilitation actions to stabilize soils after burns, if needed, and reduce erosion.
- Future construction and use of the multi-use trail on the east side of Lake Meredith National Recreation Area would have minor adverse impacts on soils resulting from changes in soil character and increased potential for erosion, but all impacts would be at and adjacent to the trail.
- Ongoing off-road vehicle use will have continued adverse effects on soils resulting from changes in soil character and increased potential for erosion, but these will be limited to the Rosita and Blue Creek areas. Expanded resource protection and use restrictions that will be implemented by the off-road vehicle management plan (NPS

2012a) will have minor beneficial effects compared to the soil impacts that would occur without the plan.

Outside the national recreation area, impacts on soils associated with oil and gas production and the development of renewable energy resources, particularly wind power, are negligible in the geographic area affected by this plan.

Collectively, other actions are having long-term, minor to moderate, beneficial cumulative impacts on soils in the geographic area affected by this plan.

The minor, beneficial and adverse impacts on soils associated with alternative 1, when added to the long-term, minor to moderate, beneficial effects from other actions, would result in continued, minor to moderate, beneficial effects on soils in the geographic area affected by this plan. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Soil disturbance from ongoing use and maintenance of facilities in Lake Meredith National Recreation Area would continue to have minor, adverse, long-term impacts.

Removing underused facilities would result in minor, short-term, adverse soil disturbances and a long-term, minor, beneficial impact because of site restoration.

Impacts of past development, such as the creation of impervious surfaces and the compaction of soils, would continue to be long-term, adverse, and minor in developed areas and negligible in other areas.

Cumulative impacts on soils would add minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The incremental contribution of this alternative to the cumulative impact would be small.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

Many of the impacts of alternative 2 on soils would be the same as for the no-action alternative, including

- soil disturbance from ongoing use and maintenance of facilities in Lake Meredith National Recreation Area
- removal of underused facilities
- impacts of past development

Compared to alternative 1, impacts from these components of alternative 2 would be negligible.

Construction and/or installation of the following facilities under alternative 2 would result in new disturbance to soil:

- a consolidated operations center
- recreational vehicle utilities at Fritch Fortress and Sanford-Yake
- potential reinstallation of previously removed campgrounds if visitation levels were to increase

The consolidated operations center would be near the existing maintenance facility. A key criterion in selecting this site was the relatively flat topography, which would help prevent soil erosion.

As a standard component of all construction activities, the National Park Service would require the use of best management practices to prevent soil loss during and after construction. For example, this would include installing silt fences, conserving available organic matter by retaining and replacing topsoil, and requiring prompt revegetation. During construction, the short-term impacts on soils would be adverse and minor. The long-term, adverse impacts associated with new development would be negligible to minor.

Following the construction of a consolidated operations center in the national recreation area, the existing fire cache and law enforcement facilities would be removed and the sites would be restored. During the removal, the short-term impacts on soils would be adverse and minor. The long-term impacts from site restoration would be minor and beneficial.

Reducing the dirt road network would involve closing some roads in the national recreation area and restoring native vegetation. Other roads would be marked for administrative use only, which would include continued use by oil and gas production service vehicles. Long-term impacts on soils from the removal of visitor vehicle traffic on some of the dirt roads would be minor and beneficial.

Rehabilitation of the Mullinaw Trail under alternative 2 would reduce soil erosion and trail maintenance in problem areas. During implementation, the short-term impacts on soils would be adverse and minor. Long-term impacts in these areas would be minor and beneficial. The delineation of individual campsites and installation of additional primitive toilets at the McBride Canyon campground would reduce the areal extent of soil erosion. Applying other mitigation measures if they were needed, such as hardening erosive surfaces or installing water diversion structures, would help reduce erosion rates in heavily used areas. During construction, the short-term impacts on soils would be adverse and minor. Long-term impacts in the campground would be minor and beneficial.

Increased monitoring and management of resource conditions under alternative 2 could result in use restrictions, temporary closures, and/or active restoration. Impacts on soils from these actions would be long-term, minor, and beneficial.

This alternative would add primitive camping on the west side of the national recreation area, with no defined campsites unless required for resource protection. It is expected that the dispersed use would result in negligible, adverse impacts on soils. However, if problems were detected by monitoring, mitigation such as selective area closures or some of the actions described above for the McBride Canyon campground might be employed. In this case, the short- and long-term, adverse impacts would be negligible or minor in intensity.

Implementing a user fee for the use of off-road vehicles in the Blue Creek and Rosita areas could decrease the number of users. Additionally, during scoping, some members of the public said that a fee might prompt some users in these areas to behave more responsibly. Either result would have a long-term, beneficial impact of minor intensity on soils.

Cumulative Impacts

All short- and long-term impacts of alternative 2 would be negligible or minor in intensity. Short-term, adverse impacts on soils would result from new facilities construction, utility installation, and McBride Canyon campground upgrades. Long-term, adverse impacts would result from new facilities construction and the addition of primitive camping on the west side of the national recreation area. Long-term, beneficial impacts would result from restoring sites from which facilities had been removed, rehabilitating trails, closing some dirt roads and restoring native vegetation, designating some dirt roads for administrative use only, upgrading the McBride Canyon campground, and increasing monitoring and management.

Past, current, and foreseeable future actions within and outside the national recreation area that cumulatively could impact soil resources would be the same as those described for alternative 1. Collectively, these other actions are having long-term, minor to moderate, beneficial cumulative impacts on soils in the geographic area affected by this plan.

The negligible to minor, beneficial and adverse impacts on soils associated with

alternative 2, when added to the long-term, minor to moderate, beneficial effects from other actions, would result in continued, minor to moderate, beneficial effects on soils in the geographic area affected by this plan. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Many impacts of alternative 2 on soils would be the same as for the no-action alternative, resulting in a negligible impact. These include impacts from ongoing use and maintenance of facilities, from the removal of underused facilities, and from past development.

Short-term, minor, adverse impacts on soils would result from new facilities construction and utility installation. The long-term, adverse impacts associated with new development would be negligible to minor.

Long-term, minor, beneficial impacts would result from each of the following: restoring sites from which facilities had been removed, rehabilitating trails, closing some dirt roads and restoring native vegetation, designating some dirt roads for administrative use only, and increasing monitoring and management.

Short term, minor, adverse impacts and long-term, minor, beneficial impacts on soils would result from improvements at the McBride Canyon campground.

The addition of primitive camping on the west side of the national recreation area would result in long-term, negligible to minor, adverse impacts on soils.

Cumulative impacts on soils would add negligible to minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

Many of the impacts of the preferred alternative on soils would be the same as for the no-action alternative, including

- soil disturbance from ongoing use and maintenance of facilities in Lake Meredith National Recreation Area
- removal of underused facilities
- impacts of past development

Compared to alternative 1, impacts from these components of the preferred alternative would be negligible.

Construction and/or installation of the following facilities under the preferred alternative would result in new disturbance to soil:

- a consolidated visitor contact, headquarters, and operations center
- a new campground at Bates Canyon and the installation of individual campsite utility hookups there and at up to 10 sites each in the Fritch Fortress and Sanford-Yake campgrounds
- potential reinstallation of previously removed campgrounds if visitation levels were to increase

As in alternative 2, the consolidated center would be near the existing maintenance facility, in part because the relatively flat topography would help prevent soil erosion.

As in alternative 2, the use of best management practices would be a standard component of all construction activities. As a result, the short-term, construction-related impacts on soils would be adverse and minor, and the long-term impacts would be adverse and negligible to minor.

Impacts would be the same as described for alternative 2 for the following components of the preferred alternative:

- removing the fire cache and law enforcement facilities and restoring the sites
- reducing the dirt road network
- rehabilitating the Mullinaw Trail
- improving the McBride Canyon campground
- adding primitive camping on the west side of the national recreation area
- implementing a user fee for off-road vehicle use in the Blue Creek and Rosita areas

Marking and using trails along existing roads and defining new, semi-primitive trails for hiking, horseback riding, and biking on the west side of the national recreation area would employ best management practices to minimize impacts on soils. However, these areas would experience the same adverse effects described for trails in alternative 1, including compacted soils, reduced or no vegetative growth, decreased permeability, altered soil moisture, and diminished nutrient content and water storage capacity. Because of the relatively small areas involved, the intensity of the long-term, adverse impacts would be minor.

The additional group campsites at Harbor Bay would have minimal facilities, and all facilities could be moved as water levels changed, so their installation would have negligible impacts on soils. Adverse effects in areas that received increased use could result from actions like trampling and compaction of soil. However, such impacts would be erased whenever lake levels rose and water inundated the formerly used group campsites. Therefore, the long-term impacts on national recreation area soils from these campsites would be negligible.

Installation of interpretive waysides would result in short-term, minor, adverse impacts on soils during construction. Long-term, minor, adverse impacts would result from additional trampling and compaction of soils around the new interpretive sites.

Cumulative Impacts

All short- and long-term impacts of alternative 3 would be negligible or minor in intensity. Short-term, adverse impacts on soils would result from constructing new facilities, installing utilities, and upgrading the McBride Canyon campground. Long-term, adverse impacts would result from constructing new facilities, marking and using new trails, and adding primitive camping on the west side of the national recreation area. Long-term, beneficial impacts would result from restoring sites from which facilities had been removed, rehabilitating trails, closing some dirt roads and restoring native vegetation, designating some dirt roads for administrative use only, upgrading the McBride Canyon campground, and increasing monitoring and management.

Past, current, and foreseeable future actions within and outside the national recreation area that cumulatively could impact soil resources would be the same as those described for alternative 1. Collectively, these other actions are having long-term, minor to moderate, beneficial cumulative impacts on soils in the geographic area affected by this plan.

The negligible to minor, beneficial and adverse impacts on soils associated with alternative 3, when added to the long-term, minor to moderate, beneficial effects from other actions, would result in continued, minor to moderate, beneficial effects on soils in the geographic area affected by this plan. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Except as follows, the impacts of the preferred alternative on soils would be the same as those described for alternative 2:

- Short-term, adverse, minor impacts would result from constructing a consolidated visitor contact, headquarters, and operations center; building a new campground with electrical hookups at Bates Canyon; and installing interpretive waysides. Long-term impacts would be negligible or adverse with minor intensity.
- Long-term impacts from marking and using trails throughout the national recreation area would be minor and adverse.
- Negligible impacts would result from placing group campsites within the normal lake pool at Harbor Bay.

Cumulative impacts on soils would add negligible to minor, beneficial and adverse impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be small.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

This impact topic was dismissed from further analysis in Alibates Flint Quarries National Monument. Please refer to chapter 1 under the heading "Alibates Flint Quarries National Monument Impacts Topics Considered But Not Analyzed in Detail."

IMPACT ANALYSIS METHODS

Impacts on archeological resources were evaluated using the process described under the heading "Cultural Resource Evaluation Method" at the beginning of this "Environmental Consequences" section.

Impact Threshold Definitions

Impact threshold definitions for archeological resources are as follows.

Negligible: The impact would be at the lowest levels of detection, barely measurable and with no perceptible consequences, either adverse or beneficial, to archeological resources.

Minor adverse: Disturbance of an archeological site would result in little, if any, loss of significance or integrity. For purposes of section 106, the determination of effect would be no adverse effect.

Minor beneficial: The action would maintain or preserve archeological sites. For purposes of section 106, the determination of effect would be no adverse effect.

Moderate adverse: Disturbance of an archeological site would result in some loss of significance or integrity. For purposes of section 106, the determination of effect would be adverse effect.

Moderate beneficial: The action would stabilize an archeological site. For purposes of section 106, the determination of effect would be no adverse effect.

Major adverse: An archeological site is obliterated. For purposes of section 106, the determination of effect would be adverse effect.

Major beneficial: The action provides active intervention to preserve an archeological site. For purposes of section 106, the determination of effect would be no adverse effect.

Because archeological resources are irreplaceable, all impacts would be long-term.

Geographic Area Considered

The geographic area evaluated for impacts on archeological resources included all of the lands within the boundaries of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, including the part of the national monument that still is privately owned.

Cumulative effects that would occur within and outside this area were determined based on the "Cumulative Effects Analysis Method" section.

Concerns

Three concerns were identified during scoping and addressed in the impact analysis with regard to archeological resources, including

- effects of constructing new facilities on archeological resources
- effects of education and interpretation actions, including the excavation of a quarry pit for interpretive purposes
- effects of changes in visitor access

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

The alternative of no action / continue current management would not result in the construction of new facilities, changes to education or interpretation, or changes in visitor access. NPS staff would continue to monitor known archeological sites and

would take action only if the sites appeared to be at risk from erosion or from discovery by visitors. The National Park Service would continue to survey previously unsurveyed areas for archeological resources prior to conducting any ground-disturbing activities, such as facility maintenance.

Archeological sites in the national recreation area would continue to be protected primarily by their inconspicuousness. Although there are numerous sites throughout the region that remain from the habitation of the area for the past 13,000 years, soil transport by wind and water has resulted in soil being smoothed across the sites and allowed vegetation to grow over them. Occasionally, sites are revealed by erosion along the lake, cliffs, canyons, or roads, or a visitor will find an intact or broken flint tool or a pottery shard on the soil surface. In some cases, the individual may dig further to see if they can find other artifacts, but looting is rare in the national recreation area, and it is more likely that the person either would pocket the find and move on, or leave the artifact at the site and, possibly, report the find to park staff.

As new sites were found or reported, the National Park Service would continue its ongoing practice of investigating and then determining and implementing the most appropriate course of action. Therefore, impacts of implementing alternative 1 on the archeological resources of Lake Meredith National Recreation Area would be negligible.

Cumulative Impacts

Impacts from implementing alternative 1 in Lake Meredith National Recreation Area would be negligible. No actions in the cumulative impact scenario are affecting the archeological resources that would be affected by implementing the general management plan. As a result, there would be no cumulative effect from this alternative.

Conclusions

Impacts from implementing alternative 1 in Lake Meredith National Recreation Area would be negligible. There would be no cumulative effect from this alternative.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative 1 would have no adverse effect on the archeological resources in and near Lake Meredith National Recreation Area that are listed, or eligible for listing, in the National Register of Historic Places.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

In most parts of Lake Meredith National Recreation Area, impacts on archeological resources would not change from those described for alternative 1, and impacts would be negligible.

Surveys for archeological resources would be performed as part of the initial site investigations for any new construction or facilities siting. If archeological resources that were potentially eligible for listing in the National Register of Historic Places were found, the project would be sited, designed, and constructed to avoid that site. Sites that were determined to be not eligible would be recovered in accordance with NPS guidance. As a result, construction of new facilities would result in negligible impacts to national register-eligible or -listed archeological resources.

This alternative would provide improved interpretation and education using tools such as waysides along roads and trails, NPS programs at the amphitheater, and information technology, such as podcasts. These actions would provide some visitors

with an increased appreciation for the archeological resources in the national recreation area and the need to protect them from inadvertent disturbance, such as by walking off the trail, and the need to report vandalism if they see or suspect that it is occurring. As a result, this aspect of alternative 2 would result in long-term, beneficial impacts of minor intensity.

Alternative 2 would eliminate driving by visitors in the semi-primitive zone. This could reduce pot-hunting or vandalism at archeological sites in this zone, because people who engage in these activities typically want to leave the area quickly by automobile and would be less likely to enter this zone by foot or bicycle carrying heavy tools. Therefore, zoning part of the national recreation area as semi-primitive would have a long-term, minor, beneficial impact on archeological resources.

Cumulative Impacts

Because archeological sites would be avoided, new construction in the national recreation area would have negligible impacts on archeological resources. Beneficial educational and interpretive aspects of this alternative might increase awareness regarding the need to protect these resources but would not affect any archeological sites. No actions in the cumulative impact scenario are affecting the archeological resources that would affected by implementing the general management plan. Therefore, alternative 2 would have no cumulative impacts.

Conclusions

Because archeological sites would be avoided, new construction in the national recreation area would have negligible impacts on archeological resources. Long-term, beneficial impacts of minor intensity would result from the improved education and interpretation features of this alternative and from reducing access by automobile in the semi-primitive zone. Alternative 2 would have no cumulative impacts.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative 2 would have no adverse effect on the archeological resources in and near Lake Meredith National Recreation Area that are listed, or eligible for listing, in the National Register of Historic Places.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

The potential impacts on archeological resources would be the same as described for alternative 2.

Cumulative Impacts

Cumulative impacts on archeological resources would be the same as those describe for alternative 2. Alternative 3 would have no cumulative impacts.

Conclusions

Because archeological sites would be avoided, new construction in the national recreation area would have negligible impacts on archeological resources. Long-term, beneficial impacts of minor intensity would result from the improved education, interpretation, and outreach features of this alternative and from reducing access by automobile in the semi-primitive zone. Alternative 3 would have no cumulative impacts.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of

alternative 3 would have no adverse effect on the archeological resources in and near Lake Meredith National Recreation Area that are listed, or eligible for listing, in the National Register of Historic Places.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE A: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Alternative A would not result in the construction of new facilities, changes to education or interpretation, or changes in visitor access. Therefore, under alternative A, there would be no impacts on the archeological resources of Alibates Flint Quarries National Monument.

Cumulative Impacts

Impacts from implementing alternative A in Alibates Flint Quarries National Monument would be negligible. No actions in the cumulative impact scenario are affecting the archeological resources that would be affected by implementing the general management plan. As a result, there would be no cumulative effect from this alternative.

Conclusions

Impacts from implementing alternative A in Alibates Flint Quarries National Monument would be negligible. Alternative A would have no cumulative impacts.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative A would have no adverse effect on the archeological resources in and near Alibates Flint Quarries National Monument that are listed, or eligible for listing, in the National Register of Historic Places.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE B: NPS PREFERRED ALTERNATIVE

Analysis

Alternative B would result in the controlled archeological excavation of one quarry pit that was close to the trail used for guided tours. Nonintrusive surface geophysics techniques such as ground-penetrating radar might first be used to select a quarry pit that had optimal characteristics to support interpretation. During excavation, the integrity of the quarry pit would not be altered. Instead, activities would involve using archeological techniques to remove the debris such as soil, plant material, rock chips, and any discarded tools that had accumulated in the pit over the millennia; recording the results; and as appropriate, cataloguing and adding the contents of the pit to the NPS' museum collection. A protective shelter may then be erected over the pit, potentially large enough to also provide shade to tour groups. The shelter may be designed to match the visitor shade shelters along the trail. As needed, dust that later accumulated in the excavated quarry pit after windy days would be cleaned out to maintain the utility of the quarry pit for interpretation.

With regard to the National Environmental Policy Act, the impacts on the quarry pit that would be excavated would be long-term and adverse. The intensity would be moderate because this would affect a fundamental resource of the national monument. The other 700 quarry pits that have been mapped, and the additional quarry pits that are believed to exist in the national monument and possibly on nearby national recreation area and private lands, would not be affected by this action.

Although the integrity of the excavated quarry would not be affected, disturbance of the site would be considered an adverse effect under section 106. Prior to beginning the excavation, the National Park Service would consult with the Texas state historic preservation officer, the Advisory Council on Historic Preservation, and all associated Indian tribes to identify appropriate mitigation.

Aside from a shelter at the excavated quarry, this alternative would not involve the construction of any new facilities in Alibates Flint Quarries National Monument. Additional development, including outdoor interpretive materials and trails, would be constructed at or near the Alibates contact station in Lake Meredith National Recreation Area. As described for the action alternatives for Lake Meredith National Recreation Area, siting studies would be used to identify and avoid sensitive sites, so that the new facilities would have negligible impacts on national register-eligible or -listed archeological resources.

Increased visitor access would result from expanded interpretation associated with new, guided tours to the ruins and petroglyphs by special request. All such tours would be conducted by NPS staff, and participants would be monitored to ensure that they did not damage archeological resources. Therefore, impacts from expanded tours would be long-term, adverse, and negligible.

Other changes to education, interpretation, and outreach would occur near the Alibates contact station, outside the national monument boundary. These changes would have the same types of long-term, beneficial impacts of minor intensity that were described for alternative 2 for Lake Meredith National Recreation Area.

Cumulative Impacts

Activities associated with alternative B would have a moderate, long-term, adverse impact on one quarry pit in the national monument. There are no other actions that would affect this or other quarries on the national monument or adjacent national recreation area. The owners of private lands that contained quarries (a small number compared to the high concentration of quarries within the national monument) would probably maintain their strong record of protecting these irreplaceable resources. No actions in the cumulative impact scenario are affecting the archeological resources that would be affected by implementing the general management plan. The absence of other actions that would affect archeological resources would mean that there would be no cumulative effect from this alternative.

Conclusions

Excavation of one quarry pit would have a moderate, long-term, adverse impact on that quarry pit. Other actions would have negligible impacts on national register-eligible or -listed archeological resources. Increased visitor access to guided tours of the ruins and petroglyphs would have long-term, adverse impacts of negligible intensity. Long-term, minor, beneficial impacts would result from improved education, interpretation, and outreach. Alternative B would have no cumulative effect on archeological resources.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that the quarry excavation component of alternative B would have an adverse effect under section 106 on a cultural resource that is listed in the National Register of Historic Places. Prior to excavation, the National Park Service would consult with the Texas state historic preservation officer, the Advisory Council on Historic Preservation, and all associated Indian tribes to identify appropriate mitigation.

For the other archeological resources in and near Alibates Flint Quarries National Monument that are listed, or eligible for listing, in the National Register of Historic Places, implementation of alternative B would have no adverse effect under section 106.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE C

Analysis

Impacts of alternative C would be the same as those from alternative B except as follows.

This alternative would zone the southwest part of the national monument as semi-primitive. Access on foot to this area, which would be closed under the other alternatives, would be unrestricted. While archeological resources are less abundant in this area than in the part of the national monument that would be in the cultural zone, they would be exposed to a greater potential for vandalism or looting. Continued ranger patrols and emphasis on visitor education would discourage vandalism and inadvertent destruction of cultural remains, and any adverse impacts would be expected to be negligible to minor.

Changes to education, interpretation, and outreach would be less extensive than those that would occur with alternative B. Therefore, although they would have long-term, beneficial impacts of minor intensity, the benefit would be slightly smaller than with alternative B.

Cumulative Impacts

Activities associated with alternative C would have a moderate, long-term, adverse impact on one quarry pit in the national monument. The absence of other actions that would affect quarries would be the same as described for alternative B. Therefore, alternative C would have no cumulative effect on archeological resources in the area.

Conclusions

Impacts would be the same as alternative B, except that a negligible to minor, long-term, adverse impact would result from allowing unrestricted access on foot to the southwest part of the national monument. Alternative C would have no cumulative effect on archeological resources.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that the quarry excavation component of alternative C would have an adverse effect under section 106 on a cultural resource that is listed in the National Register of Historic Places. Prior to excavation, the National Park Service would consult with the Texas state historic preservation officer, the Advisory Council on Historic Preservation, and all associated Indian tribes to identify appropriate mitigation.

For the other archeological resources in and near Alibates Flint Quarries National Monument that are listed, or eligible for listing, in the National Register of Historic Places, implementation of alternative C would have no adverse effect under section 106.

IMPACT ANALYSIS METHODS

Impacts on historic structures and buildings were evaluated using the process described in the "General Evaluation Method" section.

Impact Threshold Definitions

National Environmental Policy Act intensity threshold definitions are provided within the no adverse effect category. For impacts of minor intensity, the threshold definitions address adverse or beneficial changes. The threshold definitions for moderate and major impacts only consider beneficial changes because unfavorable changes of these magnitudes would result in a section 106 finding of adverse effect (see above).

Negligible: Impacts would be at the lowest levels of detection and would be barely perceptible or measurable. For purposes of section 106, the determination of effect would be no adverse effect.

Minor adverse: Impacts would affect character-defining features but would not diminish the overall integrity of the building or structure. For purposes of section 106, the determination of effect would be no adverse effect.

Minor beneficial: Stabilization/preservation of character defining features would occur in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. For purposes of section 106, the determination of effect would be no adverse effect.

Moderate adverse: Impacts would alter a character-defining feature(s), diminishing the overall integrity of the building or structure to the extent that its national register eligibility could be jeopardized. For purposes of section 106, the determination of effect would be adverse effect.

Moderate beneficial: Rehabilitation would occur in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. For purposes of section 106, the determination of effect would be no adverse effect.

Major adverse: Impacts would alter character-defining features, diminishing the integrity of the building or structure to the extent that it would no longer be eligible to be listed on the national register. For purposes of section 106, the determination of effect would be adverse effect.

Major beneficial: Restoration would occur in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. For purposes of section 106, the determination of effect would be no adverse effect.

Duration: Impacts on historical buildings and structures would be long-term because virtually all of these items are nonrenewable and irreplaceable.

Geographic Area Considered

The geographic area considered for impacts on historical structures and buildings included the land within Lake Meredith National Recreation Area. There are no historical structures or buildings in Alibates Flint Quarries National Monument.

Concerns

Concerns identified during scoping and addressed in the impact analysis with regard to historical structures and buildings included effects from restoring the McBride Ranch House and using it for interpretation.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

This alternative would not alter any aspects of the management of the McBride Ranch House. The National Park Service would continue to provide preservation actions in accordance with the Secretary of the Interior's (1995) standards for the treatment of historic properties. Ongoing preservation maintenance would have long-term, minor, beneficial impacts.

Management of other historical features, such as remnants of historical ranching activities and former oil and gas production sites, would not change. Impacts of alternative 1 on these cultural resources would be negligible.

Cumulative Impacts

Impacts from implementing alternative 1 would be long-term, minor, and beneficial for the McBride Ranch House and negligible for other historical features. There are no actions in the cumulative impact scenario that would affect any of these historical resources. The absence of other actions would mean that alternative 1 would have no cumulative effect on historical structures.

Conclusions

Long-term impacts from continuing to maintain the McBride Ranch House would be minor and beneficial. Impacts on other historical features would be negligible. Alternative 1 would have no cumulative effect on historical structures.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative 1 would have no adverse effect on the historical structures and buildings in and near Lake Meredith National Recreation Area that are listed, or eligible for listing, in the National Register of Historic Places.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

Management of the McBride Ranch House and other historical structures, such as remnants of historical ranching activities and former oil and gas production sites, would not differ under this alternative from management under alternative 1. Therefore, alternative 2 would have negligible impacts compared to alternative 1.

Cumulative Impacts

The negligible impacts from this alternative, when combined with the absence of other actions that would affect historical structures and buildings in the national recreation area, would mean that alternative 2 would have no cumulative effect on historical structures.

Conclusions

Impacts from alternative 2 would be negligible. alternative 2 would have no cumulative effect on historical structures.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative 2 would have no adverse effect on the cultural resources in and near Lake Meredith National Recreation Area that are listed, or eligible for listing, in the National Register of Historic Places.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

This alternative would rehabilitate or restore the McBride Ranch House and provide guided tours during special events. Rehabilitation of this building is the most likely treatment because it would employ some restoration elements to enhance the character-defining elements of the building but would also allow limited modifications to provide adaptive use of the property for interpretation. Restoration would have a long-term, moderate, beneficial impact on this property, which is listed in the National Register of Historic Places.

Other historical structures, such as remnants of historical ranching activities and former oil and gas production sites, would be documented and assessed for national register eligibility. Suitable sites would be stabilized, preserved, and managed as discovery sites. These sites would be at low risk of adverse effects on character-defining features so their integrity would not be affected. Impacts would be long-term, beneficial, and negligible to minor. Impacts at sites where no action was taken would be negligible.

Cumulative Impacts

The impacts from this alternative, when combined with the absence of other actions that would affect historical structures and buildings in the national recreation area, would mean that alternative 3 would have no cumulative effect on historical structures and buildings.

Conclusions

Impacts on the McBride Ranch House would be long-term, beneficial, and of moderate intensity. Other historical structures that received treatments would be long-term, beneficial, and of negligible to minor intensity. Impacts at sites where no action was taken would be negligible. Alternative 3 would have no cumulative effect on historical structures and buildings.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effects (36 *Code of Federal Regulations* section 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative 3 would have no adverse effect on the cultural resources in and near Lake Meredith National Recreation Area that are listed, or eligible for listing, in the National Register of Historic Places.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

This impact topic was dismissed from further analysis within Alibates Flint Quarries National Monument. Please refer to chapter 1 under the heading "Alibates Flint Quarries National Monument Impacts Topics Considered But Not Analyzed in Detail."

IMPACT ANALYSIS METHODS

Impacts on visitor experience were evaluated using the process described in the "Methods for Analyzing Impacts" section.

Impact Threshold Definitions

Impact threshold definitions for visitor use and experience are as follows.

Negligible: Changes in visitor use and the visitor experience would not occur. There would not be any perceived change in visitor experience or in defined indicators of visitor satisfaction or behavior.

Minor: Changes in visitor use and/or experience would be small but detectable. Visitors could be aware of the effects, but the changes would not appreciably alter critical characteristics of the visitor experience, visitor satisfaction, or levels of use at park facilities.

Moderate: Some changes in critical characteristics of the park experience would be readily apparent, or the number of visitors engaging in an activity or in the use of areas within the parks would be substantially altered. Most visitors would be aware of changes, and many would be able to express an opinion regarding the difference. Visitor satisfaction would change as a result of the impact.

Major: Changes in multiple critical characteristics of the desired experience would be readily apparent. Most visitors would be aware of the effects and would likely express a strong opinion about the changes. Participation in desired experiences or in park visitation would be considerably altered and would result in substantial changes in the defined indicators of visitor satisfaction or behavior.

Short-term: Effects on visitor enjoyment and recreational opportunities would be associated with a discrete activity with a defined term, such as construction or a treatment action. The effect would end concurrently with or shortly after the end of the specified activity.

Long-term: Effects on visitor enjoyment and recreational opportunities would not be associated with a discrete activity with a defined term, and the effects of the change would be evident for a period exceeding five years.

Geographic Area Considered

The geographic area evaluated for impacts on visitor use and experience included the lands within Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument.

Concerns

Concerns relating to visitor use and experience that were identified during scoping included the following:

- effects on the general character of the experience for the people using the national recreation area or national monument
- the availability of traditional and expanded activities

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Changes in visitor use and experience that would be associated with alternative 1 would be minimal and would have the following impacts:

- The removal of unused or underused facilities would have a negligible effect on visitor experience because the experiences available at these sites can be found at other locations in the national recreation area.

- The new boat ramp that is being considered by the National Park Service for an as-yet-undetermined site on the northwest side of the lake near the dam would substantially increase boat-launching capabilities when lake levels were low and most other boat ramps were out of the water. Under these conditions, this ramp would have moderate, beneficial, long-term impacts. During higher lake levels when other boat ramps were available, the intensity of the impact would be minor.
- Some visitors would perceive installation of additional primitive toilets in high-use areas as a minor, beneficial, long-term impact.

Cumulative Impacts

All of the measurable impacts of alternative 1 would be beneficial. These would include minor to moderate impacts from a new boat ramp and minor impacts from installing additional primitive toilets.

The national recreation area's resource management plan (NPS 1996) and fire management plan (NPS 2008c) indirectly have minor, beneficial impacts by improving the quality of the setting in which visitors recreate. The multi-use trail (NPS 2010b) will have moderate, beneficial effects because it will expand recreation opportunities. The off-road vehicle management plan for the Rosita and Blue Creek areas (NPS 2012a) will be moderate and beneficial by providing more amenities, improving the experience of visitors by better controlling illegal activity and other violations, separating uses, improving safety, and enhancing resource conditions.

The minor to moderate, beneficial impacts of alternative 1, when added to the minor to moderate, beneficial cumulative effects of other actions, would result in continued, minor to moderate, beneficial cumulative impacts on visitor use and experience. Alternative 1 would contribute a small increment to the cumulative impacts.

Conclusions

The new boat ramp that is being considered for the northwest side of the lake would have minor to moderate, beneficial, long-term impacts. Installation of additional primitive toilets in high-use areas would have a minor, beneficial, long-term impact. Negligible impacts would result from removing unused or underused facilities.

Cumulative impacts would add minor to moderate, beneficial impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The incremental contribution of this alternative to the cumulative impact would be small.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

This alternative would expand the numbers and types of recreation facilities and opportunities by providing

- additional interpretive displays
- electrical and water hookups at about 10 campsites at Fritch Fortress and 10 campsites at Sanford-Yake
- designation of new backcountry camping areas in the semi-primitive zone
- a rehabilitated Mullinaw Trail
- delineated campsites at the McBride Canyon camping area
- commercial visitor services to provide necessary and appropriate services, depending on conditions
- expanded partnerships to include community user groups

- additional NPS programming at the Fritch Fortress amphitheater
- information technology to provide orientation and interpretation

These features largely would expand or enhance existing recreation opportunities. Many visitors might be aware of these changes, but most visitors probably would not have a substantially altered recreation experience. Collectively, these features would have long-term, beneficial impacts of moderate intensity on visitor experiences.

This alternative would include establishing camping fees for some or all campsites outside the semi-primitive zone, with additional fees for campsites with utilities. Fees also might be required for use of off-road vehicles in the two designated areas. The impacts of fees would depend on the perceptions of individual visitors. However, visitor comments have indicated that most would accept paying fees that were equivalent to or lower than the fees charged at a commercial campground or off-road vehicle park and that a fee would have a negligible impact on their experience.

Visitors would no longer be allowed to drive automobiles in the part of the national recreation area that was zoned semi-primitive or to drive on the roads that were closed as part of reducing the dirt road network. Visitors who previously enjoyed driving for pleasure in these areas would probably perceive adverse impacts, while those who appreciated traveling in these parts of the national recreation area by foot, bicycle, or horse in the absence of visitor automobile traffic would perceive beneficial impacts. Depending on personal preferences, the intensity of these impacts could range from negligible to major.

Cumulative Impacts

The expanded or enhanced recreation opportunities associated with this alternative would have long-term, beneficial impacts of moderate intensity. Impacts from establishing fees for camping and off-road vehicle use would be negligible. Impacts from excluding visitor automobile travel in the semi-primitive zone would depend on individual perceptions and could be beneficial or adverse, with intensities ranging from negligible to major.

Past, current, and foreseeable future actions within the national recreation area that cumulatively could impact visitor use and experience would be the same as those described for alternative 1. There would be minor to moderate, beneficial cumulative effects.

The mostly beneficial impacts of alternative 2, when added to the minor to moderate, beneficial cumulative effects of other actions, would result in continued minor to moderate, beneficial cumulative impacts on visitor use and experience. Alternative 2 would contribute a modest increment to the cumulative impacts.

Conclusions

The expanded or enhanced recreation opportunities associated with this alternative would have long-term, beneficial impacts of moderate intensity. Impacts from establishing fees for camping and off-road vehicle use would be negligible. Impacts from excluding visitor automobile travel in the semi-primitive zone would depend on individual perceptions and could be beneficial or adverse, with intensities ranging from negligible to major.

Cumulative impacts would add mostly beneficial impacts to the minor to moderate, beneficial effects from other actions, resulting in continued, minor to moderate, beneficial effects. The incremental contribution of this alternative to the cumulative impact would be modest.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

In addition to the increased numbers and types of opportunities for hiking, biking, and horseback riding that would be included alternative 2, the preferred alternative would develop additional visitor opportunities by

- marking multi-use trails along existing roads
- designating some existing roads for hiking, bike, horseback riding, and administrative use only
- defining semi-primitive trails for hiking, horseback riding, and biking on the west side of the national recreation area
- adding group campsites at Harbor Bay
- providing global positioning system-based recreation, which could prompt some people to visit parts of the national recreation area they otherwise would not have entered

Collectively, with the components that were evaluated for alternative 2, these actions would promote recreation that does not rely on the presence of the lake. As a result, the national recreation area would be expected to become a destination for land-based, semi-primitive outdoor recreation for a broad range of skill levels. This would result in major, long-term, beneficial impacts on visitor use and experience.

Hunting currently is a popular activity in the parts of the national recreation area that would be zoned rural and semi-primitive and that would have increased hiking, biking, and horseback riding activity under the preferred alternative. Some hunters might feel that the quality of their experience would be decreased by crowding or by nonhunters scaring the game, while others might appreciate the added activity that would "move the game around." However, other visitors often avoid these parts of the national recreation area during hunting season, so changes in visitor numbers might not occur. The impacts perceived by hunters could be beneficial or adverse, and probably would range from negligible to moderate.

A water-based, no wake zone would promote nonmotorized, water-based activities in coves and upstream parts of the lake. Adverse impacts on visitors in motorboats would be negligible to minor because they could still enter these areas at no wake speed and because many drivers would use slow speeds in these areas regardless of zoning because of the potential for hull damage or grounding in the shallow water. Visitors participating in nonmotorized, water-based activities in this zone would perceive beneficial impacts because the setting would be quieter, with less water turbulence, less silt in the water, and less concern about being struck by a rapidly moving boat or personal watercraft. The intensity of beneficial impacts on these users would range from minor to moderate.

Currently, there is little use of the national recreation area for scuba diving. The installation of underwater targets at Spring Canyon would increase opportunities for this sport, particularly for beginners who wanted to gain experience in a relatively controlled setting that nonetheless provided items of interest. The numbers of visitors engaging in scuba diving probably would increase, and the intensity of the long-term, beneficial impacts they would perceive would be moderate.

A new campsite at Bates Canyon with electrical hookups would promote additional activity in this area, particularly by owners of recreational vehicles. Impacts on visitor experience would be long-term and beneficial, but the intensity would be negligible because a similar experience would be available in other parts of the national recreation area.

The preferred alternative would rehabilitate or restore the McBride Ranch House and provide guided tours during special events. It also would provide interpretation of cultural sites using media such as displays at the new visitor contact station and waysides along national recreation area roads and trails. These actions would provide a new dimension to the visitor experience at Lake Meredith National Recreation Area, resulting in long-term benefits of minor to moderate intensity.

Alternative 3 would expand activities at Fritch Fortress to include partner presentations and would expand community outreach. Both actions might bring in new users who otherwise might not have come to the national recreation area. The intensity of the beneficial, long-term impact on visitor use and experience would depend on how intensively the National Park Service and partners developed these opportunities and could range from negligible to moderate.

As described for alternative 2, visitors would no longer be allowed to drive automobiles in the part of the national recreation area that was zoned semi-primitive, or drive on the former roads that were closed as part of reducing the dirt road network in other zones. Depending on personal preferences, impacts would be beneficial or adverse, and the intensity of the impacts could range from negligible to major.

Fees for camping and/or off-road vehicles could be included in alternative 3. Impacts would be the same as described for alternative 2: while they would be based on individual perceptions, the impacts would be viewed as negligible by most visitors.

Cumulative Impacts

Collectively, the expanded or enhanced recreation opportunities associated with this alternative would have long-term, beneficial impacts of major intensity. Impacts on hunting and from excluding visitor automobile travel in the semi-primitive zone would depend on individual perceptions and could be beneficial or adverse.

Past, current, and foreseeable future actions within the national recreation area that cumulatively could impact visitor use and experience would be the same as those described for alternative 1. There would be minor to moderate, beneficial cumulative effects.

The mostly beneficial impacts of alternative 3, when added to the minor to moderate, beneficial cumulative effects of other actions, would result in moderate, beneficial cumulative impacts on visitor use and experience. Alternative 3 would contribute a substantial increment to the cumulative impacts.

Conclusions

Most of the impacts on visitor use and experience would be beneficial and long-term.

- The many expanded or enhanced recreation opportunities associated with this alternative would have major beneficial impacts on visitor use and experience.
- Installing underwater scuba targets at Spring Canyon would have moderate benefits for visitors who enjoy this sport.
- Minor to moderate benefits would result from the new dimension to the visitor experience that would be provided by the interpretation of cultural resources, including the McBride Ranch House.
- NPS and partner presentations at Fritch Fortress and expanded community outreach might bring in new national recreation area users, resulting in negligible to moderate benefits.
- Benefits from the new campsite at Bates Canyon would be negligible

because a similar experience would be available elsewhere.

Establishing a water-based, no wake zone would have minor to moderate, long-term, beneficial impacts on visitors participating in nonmotorized, water-based activities and negligible to minor, adverse impacts on users of motorboats.

Depending on individual perceptions, impacts of some components of this alternative could be viewed as beneficial or adverse, with a range of intensities. These include the impacts perceived by hunters because more visitors were using the less-developed parts of the national recreation area, and impacts from excluding visitor automobile travel in the semi-primitive zone.

Impacts from establishing fees for camping and off-road vehicle use would be perceived as negligible by most visitors.

Cumulative impacts would add mostly beneficial impacts to the minor to moderate, beneficial effects from other actions, resulting in moderate, beneficial effects. The incremental contribution of this alternative to the cumulative impact would be substantial.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE A: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Negligible impacts would occur compared to current conditions. The Alibates visitor center would continue to be the focus of most visitor activities, and a smaller number of visitors would participate in guided tours to quarry sites.

Cumulative Impacts

Impacts from implementing alternative A would be negligible. No actions from the cumulative impact scenario are affecting visitor use and experience. As a result, this alternative would have no cumulative impacts on visitor use and experience.

Conclusions

This alternative would have negligible impacts on visitor use and experience. It would not contribute to cumulative effects.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE B: NPS PREFERRED ALTERNATIVE

Analysis

Visitor opportunities would be expanded by the self-guiding interpretive trail near the visitor contact station and outdoor interpretive materials focusing on an Antelope Creek-style dwelling near the visitor contact station. These facilities would provide visitors with outdoor opportunities for learning and discovery in a setting that is not overseen by a guide. They also would help visitors understand the importance of the natural setting on the American Indians who quarried flint in the area. Together, these would introduce a new dimension to the visitor experience at Alibates Flint Quarries National Monument. The long-term impacts on the visitor experience would be beneficial and of moderate intensity.

Interpretation of an archeologically excavated quarry would be included in the guided tours of the quarries. Visitors already are receiving substantial appreciation of the resource from the existing guided tour, so the additional beneficial impact would be minor and long-term.

Guided tours of the ruins and petroglyphs would not be available to most visitors. While expanding guided access to these sites would be important for scholars, it would have a negligible impact on the experience of most visitors to the national monument.

Special events can be effective in engaging visitors who otherwise might not visit the national monument. Depending on how intensively the National Park Service and partners developed these opportunities, the long-term, beneficial impacts could range from negligible to moderate.

Information technologies to allow virtual exploration of the national monument and its resources would provide opportunities to people worldwide who may never have the opportunity to visit the site. Long-term, beneficial impacts would be minor. Beneficial, minor impacts could result if interest increased because of exposure on the Internet and national monument visitation increased.

Cumulative Impacts

All of the impacts of alternative B would be beneficial and, collectively, would have a moderate impact on visitor use and experience. None of the other plans or actions that are included in the cumulative impact scenario would affect visitor use and experience in the national monument. Therefore, alternative B would have no cumulative impact.

Conclusions

The new interpretive features outside the visitor contact station would have moderate, long-term, beneficial impacts on visitor experience. Excavating a quarry that can be interpreted as part of the guided tour would have a minor, long-term, beneficial impact. Guided tours of the ruins and petroglyphs would have a negligible impact on most visitors.

Special events would have long-term, beneficial impacts that could range from negligible to moderate. Impacts of information technologies to allow virtual exploration would be long-term, beneficial, and minor.

This alternative would have no cumulative impact on visitor use and experience in the national monument.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE C

Analysis

Most of the impacts of this alternative would be the same as those described for alternative B. More visitors would be able to visit the ruins and petroglyphs on guided auto tours, which would result in an additional minor, beneficial impact on visitor use and experience.

The ability to participate in research activities could be life-changing for some visitors and, depending on personal reactions, could have impacts from negligible to major. However, as a whole, the intensity of the impact probably would be minor.

Cumulative Impacts

All of the impacts of alternative C would be beneficial and, collectively, would have a moderate impact on visitor use and experience. None of the other plans or actions that are included in the cumulative impact scenario would affect visitor use and experience in the national monument. Therefore, alternative C would have no cumulative impact.

Conclusions

Most impacts would be the same as those described for alternative B. The ability to visit the ruins and petroglyphs on guided auto tours and to participate in research projects would have long-term, minor, beneficial impacts. This alternative would have no cumulative impact on visitor use and experience in the national monument.

SOCIOECONOMICS

This section focuses on Lake Meredith National Recreation Area. However, the budget for the parks is consolidated, so a small part of the economic impact would result from the approximately 3,000 people who visit Alibates Flint Quarries National Monument annually.

IMPACT ANALYSIS METHODS

Impacts on socioeconomics were evaluated using the process described in the "Methods for Analyzing Impacts" section.

Impact Threshold Definitions

Impact threshold definitions for socioeconomics are as follows.

Negligible: The socioeconomic environment would be basically unchanged, with very small or no detectable change in local socioeconomic indicators such as employment, retail sales, food and lodging sales, and construction.

Minor: Measurable changes in some socioeconomic indicators, such as employment, retail sales, food and lodging sales, or construction, would occur in nearby communities such as Fritch and Borger.

Moderate: The effects on socioeconomic indicators would be readily apparent in the economies of local communities and would be measurable in the economy of one or more of the counties that contain parts of the national recreation area.

Major: Widespread, readily apparent regional changes would occur in socioeconomic indicators, such as employment, retail sales, food and lodging sales, and construction in Hutchinson, Moore, and Potter Counties.

Short-term: Effects would be associated with a discrete activity with a defined term, such as construction. The effect would end concurrently with or shortly after the end of the activity.

Long-term: Effects would extend over a prolonged period.

Geographic Area Considered

The geographic area considered for impacts on socioeconomics included the cities of Fritch and Borger and the counties of Hutchinson, Moore, and Potter in Texas.

Concerns

The following concerns relating to socioeconomics were identified during scoping:

- economic impacts from visitation: and
- economic impacts related to NPS operations

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Economic Impacts from Visitation. The fundamental visitor experience at Lake Meredith National Recreation Area would remain largely unchanged. Consequently, annual visitation under the no-action alternative would continue at levels of about 1 million visitors when lake levels were low and 1.6 million visitors when lake levels were normal. The retail activity and economic contributions of national recreation area visitors to the local economy would continue at the levels presented in chapter 3.

At $55 million to $88 million annually, national recreation area-related visitor spending within 60 miles of the parks would continue to represent a substantial

part of the retail sales of Hutchinson and Moore Counties and the cities of Fritch and Borger. It would continue to be particularly important in the sector of accommodation and food service sales (see table 25). Therefore, spending by visitors associated with this alternative would continue to have long-term, moderate, beneficial economic effects.

Economic Impacts Related to NPS Operations. The budget for operating the NPS units would continue to be about the size of the current budget of $3.1 million per year. In addition, this alternative would have one-time capital costs of about $1.3 million and deferred maintenance costs of about $8.7 million, spread over 20 years (see table 5). This spending would be broadly distributed among the three counties and, at about 0.1% of their combined annual retail sales, would not be detectable. Under alternative 1, NPS operations would continue to have a negligible, beneficial impact on the local economy.

Cumulative Impacts

Collectively, the alternative 1 economic activity associated with spending by visitors and park operations would have long-term, moderate, beneficial economic effects in Hutchinson and Moore Counties and the cities of Fritch and Borger. The economic contributions from other actions in the cumulative impact scenario, including oil and gas production and the development of wind and other renewable energy resources, are resulting in long-term, moderate, beneficial cumulative impacts.

This alternative's moderate, beneficial impacts, when added to the moderate, beneficial effects of other actions in the cumulative impact scenario, would result in continued, moderate, beneficial cumulative impacts on socioeconomics in the geographic area affected by this plan. Alternative 1 would contribute a modest increment to the cumulative impacts.

Conclusions

Spending by visitors outside the parks would continue to have long-term, moderate, beneficial economic effects in Hutchinson and Moore Counties and the cities of Fritch and Borger. The economic effects of NPS operations would continue to be negligible and beneficial.

Cumulative impacts would add moderate, beneficial impacts to the moderate, beneficial effects from other actions, resulting in continued, moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be modest.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

Economic Impacts from Visitation. The National Park Service has not conducted studies to determine the number of additional visits that would occur at Lake Meredith National Recreation Area under alternative 2. It also has not analyzed the relative spending of visitors engaged in different activities, such as spending by boaters versus spending by bicyclists. However, if it was assumed that the increased recreation opportunities associated with this alternative increased visitation by about 10% and that all visitors continued to spend at the rates identified by Stynes (2011), the annual increase in spending within 60 miles of the parks would be about $5 million to $9 million. This change would be measurable in nearby communities, particularly in Fritch, but probably could not be detected in the retail economies of any of the three counties. Therefore, the economic impacts from visitation would be long-term, beneficial, and minor in intensity.

Economic Impacts Related to NPS Operations. Alternative 2 would have annual operating costs of about $3.3

million per year. In addition, this alternative would have one-time capital costs of about $6.8 million, spread over 20 years (see table 6). This spending would be broadly distributed among the three counties and, at about 0.1% of their combined annual retail sales, would not be detectable. As a result, one-time capital costs under this alternative would have a negligible, beneficial impact on the local economy.

NPS staffing would increase by two full-time-equivalent positions which, at a multiplier of 4.5 additional jobs in the community (Stynes 2011) would add about 10 jobs to the three-county area. This increase would not be detectable compared to the 70,000-person labor force in the three counties. For construction and jobs, the long-term, beneficial impacts of alternative 2 would be negligible.

Cumulative Impacts

In alternative 2, visitation and park operations would have minor beneficial effects. As described for alternative 1, the economic contributions from other actions in the cumulative impact scenario, including oil and gas production and the development of wind and other renewable energy resources, are resulting in long-term, moderate, beneficial cumulative impacts.

This alternative's minor, beneficial impacts, when added to the moderate, beneficial effects of other actions in the cumulative impact scenario, would result in continued moderate beneficial cumulative impacts on socioeconomics in the geographic area affected by this plan. Alternative 2 would contribute a modest increment to the cumulative impacts.

Conclusions

Changes in spending by visitors outside the parks would have long-term, minor, beneficial economic effects. The economic effects of NPS operations with regard to construction and jobs would be negligible and beneficial.

Cumulative impacts would add minor, beneficial impacts to the moderate, beneficial effects from other actions, resulting in continued, moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be modest.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

Economic Impacts from Visitation. The National Park Service has not conducted studies to determine the number of additional visits that would occur at Lake Meredith National Recreation Area under alternative 3. It also has not analyzed the relative spending of visitors engaged in different activities, such as spending by boaters versus spending by bicyclists. However, if it was assumed that the increased recreation opportunities associated with this alternative increased visitation by about 25% and that all visitors continued to spend at the rates identified by Stynes (2011), the annual increase in spending outside the national recreation area would be about $14 million to $22 million. This change would be readily apparent in the nearby communities of Fritch and Borger, and probably would be detectable in the economies of Hutchinson and Moore Counties, particularly for the accommodation and food service sector. As a result, visitation associated with this alternative would have long-term, moderate, beneficial economic effects.

Economic Impacts Related to NPS Operations.

Alternative 3 would have annual operating costs of about $3.3 million per year. In addition, this alternative would have one-

time capital costs of about $10.1 million, spread over 20 years (see table 7). This spending would be broadly distributed among the three counties and, at about 0.1% of their combined annual retail sales, would not be detectable. As a result, one-time capital costs under this alternative would have a negligible, beneficial impact on the local economy.

NPS staffing would increase by one full-time-equivalent positions which, at a multiplier of 4.5 additional jobs in the community (Stynes 2011) would add about 5 jobs to the three-county area. This increase would not be detectable compared to the 70,000-person labor force in the three counties. For construction and jobs, the long-term, beneficial impacts of alternative 3 would be negligible.

Cumulative Impacts

In alternative 3, visitation and park operations would have moderate, beneficial effects. As described for alternative 1, the economic contributions from other actions in the cumulative impact scenario, including oil and gas production and the development of wind and other renewable energy resources, are resulting in long-term, moderate, beneficial cumulative impacts.

This alternative's moderate beneficial impacts, when added to the moderate, beneficial effects of other actions in the cumulative impact scenario, would result in continued moderate, beneficial cumulative impacts on socioeconomics in the geographic area affected by this plan. Alternative 3 would contribute a modest increment to the cumulative impacts.

Conclusions

Changes in spending by visitors outside the parks would have long-term, moderate, beneficial economic effects. The economic effects of NPS operations with regard to construction and jobs would be negligible and beneficial.

Cumulative impacts would add moderate, beneficial impacts to the moderate, beneficial effects from other actions, resulting in continued, moderate, beneficial effects. The contribution of this alternative to the cumulative impact would be modest.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

This impact topic was dismissed from further analysis within Alibates Flint Quarries National Monument. Please refer to chapter 1 under the heading "Alibates Flint Quarries National Monument Impacts Topics Considered But Not Analyzed in Detail."

IMPACT ANALYSIS METHODS

Impacts on transportation and access were evaluated using the process described in the "Methods for Analyzing Impacts" section.

Impact Threshold Definitions

Impact threshold definitions for transportation and access are as follows.

Negligible: Transportation within the national recreation area would not be affected, or the effects would not be measurable for factors such as transportation modes used; road or access point locations; or vehicle counts at specified sites such as at national recreation area entrances, on national recreation area roads, on boat ramps, or at particular lake locations.

Minor: Effects on transportation or access within the national recreation area would be detectable and would include measurable variations with regard to factors such as transportation modes used, road or access point locations, or vehicle counts at specified sites.

Moderate: Effects on transportation or access within the national recreation area would be readily apparent and would include substantial changes for factors such as transportation modes used, road or access point locations, or vehicle counts at specified sites. Changes to these factors outside the national recreation area would be detectable.

Major: Effects would be widespread throughout the national recreation area and would alter multiple features relating to transportation and access, such as transportation modes used, road or access point locations, and vehicle counts at specified sites. Changes to these factors outside the national recreation area would be readily apparent.

Short-term: Effects would occur only during and shortly after a specified action or treatment.

Long-term: Effects would persist well beyond the duration of a specified action or treatment, or would not be associated with a particular activity such as construction.

Geographic Area Considered

The geographic area considered for impacts on park operations included the 46,349 acres within Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, the City of Fritch, plus the road alignments from Fritch to both the national recreation area and the national monument.

Concerns

Concerns relating to transportation and access that were identified during scoping included the following:

- changes in the ability of visitors to access the national recreation area by automobile
- changes in the availability of opportunities for nonmotorized transport, both on land and in the water

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Alternative 1 would have negligible impacts because it would not alter any aspects of transportation or access in Lake Meredith National Recreation Area.

- Visitors could continue to use automobiles in all parts of the

national recreation area that had paved or dirt roads.

- Visitors could hike or bike anywhere in the national recreation area, including on national recreation area roads, with the recognition that automobiles would continue to dominate the use of roads.
- Horseback riding would continue to be allowed on a designated trail at Plum Creek and on the Mullinaw Trail, and on roads throughout the national recreation area (which would be dominated by automobiles).
- Motorized watercraft could continue to access all parts of the lake without restrictions, other than those imposed by Texas boating regulations.

Cumulative Impacts

Impacts from implementing alternative 1 would be negligible. No actions in the cumulative impact scenario would result in cumulative impacts on transportation. As a result, this alternative would have no cumulative impacts on transportation and access.

Conclusions

Alternative 1 would have negligible impacts on transportation. It would have no cumulative effects.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

On the land, this alternative would eliminate motorized transportation by visitors in part of the national recreation area and would reduce the miles of roads that could be driven in other parts of the national recreation area. Road closures and elimination of motorized uses would occur primarily in the semi-primitive zone. While this would cover a large percentage of the land portion of the national recreation area, the affected roads are widely dispersed, generally undeveloped, and used by a small set of visitors who are familiar with the local terrain. The resulting long-term impacts probably would be perceived as moderate and adverse by visitors who enjoy driving the affected roads or who use these roads to access recreation sites. It would have a negligible or minor beneficial effect on the other modes of travel used in the national recreation area or on the perceptions of visitors who participate in hiking, bicycling, and horseback riding.

Watercraft on the lake would be managed in the same manner as in alternative 1. Therefore, this alternative would have negligible impacts on transportation and access on the water.

Cumulative Impacts

Impacts of alternative 2 would be adverse for some visitors who access parts of the national recreation area in motorized vehicles and negligible or minor and beneficial for visitors who use other transportation modes. The multi-use trail (NPS 2010b) and off-road vehicle management plan (NPS 2012a) would not contribute to cumulative effects because they would not apply to the rural and semi-primitive zones where the alternative 2 changes would occur. None of the actions in the cumulative impact scenario would affect visitor transportation and access. Therefore, alternative 2 would have no cumulative impact.

Conclusions

Alternative 2 would have long-term impacts that could be perceived as adverse and moderate by visitors who currently enjoy driving the dirt roads that would fall in the semi-primitive zone. It would have negligible or minor beneficial effects on the other modes of travel used on land and negligible impacts on transportation

on the water. This alternative would have no cumulative impacts.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

Alternative 3 would involve the same road closures in the semi-primitive zone and reductions of the remaining dirt road network that were described in alternative 2. Because the semi-primitive zone would be somewhat larger in this alternative than in alternative 2, the automobile exclusion zone also would be larger. However, it would not close many additional miles of dirt roads and probably would affect the same group of visitors in the same manner, so that they would perceive the same long-term, adverse impact of moderate intensity that were described for alternative 2.

Alternative 3 would increase opportunities for nonmotorized travel on land and water.

- By marking multi-use trails along existing national recreation area roads, the National Park Service would emphasize the need for equal sharing among transportation modes, including automobiles, hikers, bikers, and horseback-riders. Increased education, signage, and enforcement may be needed, particularly during early implementation. If hikers, bikers, and horseback-riders were encouraged to use national recreation area roads and perceived that they would be safe, a substantial change in modes of transportation that were used on these roads could occur.
- Some former roads in the semi-primitive zone could be designated as trails. Additional trails might be marked in areas in this zone that currently are unroaded. These actions would increase use of the semi-primitive zone for nonmotorized travel.
- Establishing a water-based, no wake zone would increase the perception of safety by users of nonmotorized watercraft and increase their use of these areas.

Collectively, these actions would have a long-term, major, beneficial impact by increasing the numbers of visitors using nonmotorized transportation and distributing them throughout a large part of the national recreation area. The actions also could attract new visitors who enjoy these activities but did not previously consider them as part of the suite of travel opportunities that were available at the national recreation area.

Cumulative Impacts

Impacts of alternative 3 would be adverse for visitors who access some parts of the national recreation area in motorized vehicles and beneficial for visitors who use other transportation modes. As described for alternative 2, none of the actions in the cumulative impact scenario would affect visitor transportation and access in the zones involving road and trail management. Therefore, alternative 3 would have no cumulative impact.

Conclusions

Alternative 3 would have long-term impacts that could be perceived as adverse and moderate by visitors who enjoy driving the dirt roads that would fall in the semi-primitive zone. Long-term, major, beneficial impact would result from increasing the numbers of visitors using nonmotorized transportation, distributing them throughout a large part of the national recreation area, and attracting new visitors who wanted to enjoy these types of travel opportunities. This alternative would have no cumulative impact.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

This impact topic was dismissed from further analysis within Alibates Flint Quarries National Monument. Please refer to chapter 1, under the heading "Alibates Flint Quarries National Monument Impacts Topics Considered But Not Analyzed in Detail."

IMPACT ANALYSIS METHODS

Impacts on the parks' operations were evaluated using the process described in the "Methods for Analyzing Impacts" section.

Impact Threshold Definitions

Impact threshold definitions for NPS operations are as follows.

Negligible: NPS operations would not be affected, or effects would not be perceptible or measurable outside normal variability.

Minor: Effects would be measurable but would not appreciably change park operations. Effects would be perceived by NPS staff but probably would not be noted by visitors.

Moderate: Effects would be readily apparent and would result in a substantial change in NPS operations in a manner that would be noticed by park visitors.

Major: Effects would be readily apparent and would result in a substantial change in NPS operations in a manner that would be noticed by park visitors as markedly different from existing operations.

Short-term: Effects would occur only during and shortly after a specified action or treatment.

Long-term: Effects would persist well beyond the duration of a specified action or treatment, or would not be associated with a particular activity such as construction.

Geographic Area Considered

The geographic area considered for impacts on park operations included the lands within Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, the city of Fritch, and the road alignments from Fritch to both parks.

Concerns

Concerns relating to NPS operations that were identified during scoping included the following:

- effective management
- facilities conditions and maintenance
- sustainability

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 1: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Effective Management. Lake Meredith National Recreation Area would continue to be jointly managed with Alibates Flint Quarries National Monument. This would include using a shared staff for all administrative, maintenance, resource management, law enforcement, and interpretation functions. This would continue to save national recreation area budget and reduce staffing requirements, a long-term, minor, beneficial impact.

The parks would continue to be operated from multiple locations, including the headquarters in Fritch, fire cache near Sanford Dam, law enforcement and maintenance facilities at the building complex off Stanford-Yake Road, and interpretive functions at the Fritch office and Alibates contact station near Bates Canyon. These multiple locations would continue to require redundant equipment and reduce efficiency primarily because of the need for frequent travel among sites. They also would continue to impede effective communications among staff. The wide distribution of park staff would continue to have moderate, long-term, adverse effects on park operations.

There originally were operational efficiencies from combining the parks'

administration and visitor functions at the centralized Fritch headquarters. However, the space is now too small for both purposes. In addition, there is no space available for research, training, and interpretation of the parks' museum collections in this facility. These conditions would continue and increase under the no-action alternative and would result in long-term, moderate, adverse impacts on operations.

The existing lack of storm shelters in buildings used by NPS staff and visitors would continue. The need to find other shelter during storms, such as in the Canadian River Municipal Water Authority building near Sanford Dam or in other buildings in Fritch, would have an adverse effect on the ability of the National Park Service to manage for a safe and healthful environment whenever storm warnings were issued for the area.

Facilities Condition and Maintenance. Compared to other NPS units, the maintenance staff at Lake Meredith National Recreation Area must respond to an unusually high number of incidents, such as littering, trash dumping, vandalism, and cutting of the boundary fence. Although law enforcement, interpretive, and maintenance personnel would continue to coordinate to reduce the number of incidents, the moderate, long-term, adverse impacts that currently are occurring would persist under the no-action alternative.

The removal of unused or underused facilities, such as the Bates boat ramp and many Blue West campsites, would eliminate the maintenance requirements for these facilities. The impact on park operations would be a long-term, minor benefit.

Additional primitive toilets would be installed in locations as required by visitation, such as Spring Canyon and Blue Creek. While these facilities could require some additional attention, they would reduce maintenance required from inappropriate or overuse of these areas. The net effect would be long-term, minor, beneficial effects on maintenance.

Sustainability. The National Park Service would continue to use buildings that were constructed in the 1960s and 1970s. Problems associated with low energy efficiency and wear on components after 40 or 50 years of use would continue, resulting in long-term, moderate, adverse effects.

Incremental increases in energy efficiency would occur through the ongoing installation of energy-efficient light bulbs and purchase of Energy Star appliances for all replacements. The long-term impacts resulting from decreased energy use would be minor and beneficial.

Cumulative Impacts

Alternative 1 would continue moderate, adverse impacts in the areas of continued distribution of park staff in multiple locations; the inadequate space available in the Fritch headquarters building; the continued high level of incidents that increase maintenance requirements; continued use of worn, inefficient buildings; and the continued absence of storm shelters. Minor, beneficial impacts would result from continued sharing of staff by the two parks, removal of unused or underused facilities, installation of additional primitive toilets, and improvements in energy efficiency.

Activities conducted in accordance with the resource management plan (NPS 1996), oil and gas management plan (2002) and fire management plan (NPS 2008c) are well-established components of the operating baseline of the national recreation area. Additional demands on park operations will result from the maintenance needs for the multi-use trail. The off-road vehicle plan will require additional efforts from park staff in the areas of law enforcement, resource management, interpretation, and facilities management. Collectively, these actions are having a long-term, minor to

moderate, adverse cumulative impact on park operations.

The moderate adverse and minor beneficial impacts associated with alternative 1 would have no net contribution to the cumulative impacts on park operations. There would continue to be long-term, minor to moderate, adverse cumulative impacts from other actions. This alternative would have no cumulative impact.

Conclusions

Aspects of alternative 1 that would have beneficial impacts on park operations would include sharing of staff by the two parks, removal of unused or underused facilities, installation of additional primitive toilets, and improvement in energy efficiency. The intensity of all beneficial impacts would be minor.

Adverse impacts would result from the continued distribution of park staff in multiple locations; the inadequate space available in the Fritch headquarters building; the continued high level of incidents that increase maintenance requirements; continued use of worn, inefficient buildings; and the continued absence of storm shelters. The intensity of all adverse impacts would be moderate.

This alternative would have no cumulative impact.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 2

Analysis

Effective Management. Aspects of alternative 2 that would be the same as the no-action alternative include joint management of the two parks and location of the headquarters outside the boundary in Fritch. Impacts of alternative 2 would be negligible for these features.

The consolidated operations center would combine the fire cache, maintenance, and law enforcement operations into one location. This would reduce the need for redundant equipment at multiple locations and the need to travel, and would have a minor, long-term, beneficial impact on park operations.

The expansion of partnerships to include community user groups with an increased focus on community outreach, interpretation, and education would require additional management. Long-term impacts on interpretive operations would be minor and adverse.

Storm shelters would be constructed as part of all new buildings or building groups and would be retrofitted into some existing buildings. This would have a beneficial effect on the ability of the National Park Service to manage for a safe and healthful environment whenever storm warnings were issued for the area.

Facilities Condition and Maintenance. There would be no differences from alternative 1 with regard to the following:

- removal of unused or underused facilities
- installation of additional facilities as required by visitation
- installation of energy-efficient technologies

Therefore, impacts on operations for these features of alternative 2 would be negligible.

The national recreation area's 40- and 50-year-old buildings would be replaced by the consolidated operations center. Maintenance requirements would be lower than for the old structures, resulting in a minor, long-term, beneficial impact on park operations.

Alternative 2 would include new facilities, including utilities to individual campsites in Fritch Fortress and Sanford Yake, interpretive waysides, and podcast equipment. It also would make more frequent use of the amphitheater at Fritch Fortress. Based on need, other facilities

could include additional primitive toilets, and replacement of previously removed campsites. All of these would increase maintenance demands, resulting in a minor, long-term, adverse impact on park operations.

The semi-primitive zone would be closed to driving by visitors. Enforcement by rangers probably would be aided by reports from other visitors who enjoyed recreating in a nonmotorized setting. As a result, this zone would experience a decrease in acts of trash dumping and vandalism that usually are committed using a vehicle for hauling or for quick exit from the area. Reducing the size of dirt road network might result in fewer secluded places for these types of incidents. The effect on park operations would be minor, beneficial, and long-term.

Sustainability. This alternative would include the same energy efficiency measures as alternative 1. It also would replace old, energy-inefficient buildings with modern structures that employed energy-efficient technologies and sustainable design. Impacts on park operations would be moderate, beneficial, and long-term.

Cumulative Impacts

Negligible to moderate, beneficial impacts on NPS operations would result from consolidating maintenance, fire, and law enforcement in a single location; providing storm shelters; replacing old, worn, inefficient buildings with new structures; eliminating motorized travel by visitors in the semi-primitive zone; and reducing the dirt road network. Minor adverse impacts would result from increased management needs relating to the expansion of partnerships and from new maintenance needs associated with new facilities such as utilities at campsites, interpretive waysides, and podcast equipment.

Other actions that would contribute to cumulative impacts on park operations would be the same as those described for alternative 1. Collectively, these actions are having a long-term, minor to moderate, adverse cumulative impact on park operations.

The negligible to moderate, beneficial impacts and the minor, adverse impacts on NPS operations associated with alternative 2, when added to the long-term, minor to moderate, adverse effects from other actions, would result in continued, minor to moderate, adverse effects on NPS operations. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Beneficial impacts on NPS operations would result from consolidating maintenance, fire, and law enforcement in a single location; providing storm shelters; replacing old, worn, inefficient buildings with new structures; eliminating motorized travel by visitors in the semi-primitive zone; and reducing the dirt road network. Adverse impacts would result from increased management needs relating to the expansion of partnerships, and from new maintenance needs associated with new facilities such as utilities at campsites, interpretive waysides, and podcast equipment. The intensity of all of these impacts would be minor or moderate.

Cumulative impacts would add negligible to moderate, beneficial and minor, adverse impacts to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. The contribution of this alternative to the cumulative impact would be small.

LAKE MEREDITH NATIONAL RECREATION AREA ALTERNATIVE 3: NPS PREFERRED ALTERNATIVE

Analysis

Most impacts of the preferred alternative would be the same as those described for alternative 2. Differences are identified below.

Effective Management. All park operations, including the headquarters, visitor contact station, and operations center would be consolidated in a single location off Stanford-Yake Road. The improved efficiencies would have a moderate, long-term, beneficial impact on park operations compared to alternative 1.

Facilities Condition and Maintenance. Facilities requiring maintenance in addition to those identified for alternative 2 would include the McBride Ranch House; a new Bates Canyon campground with utilities to individual sites; additional, movable group campsites at Harbor Bay; underwater scuba targets at Spring Canyon; and additional waysides and onsite interpretation of cultural resources. All of these would increase maintenance demands, resulting in a minor, long-term, adverse impact on park operations.

Although the area in the semi-primitive zone would be larger than in alternative 2, the impact relative to alternative 1 would still be minor, beneficial, and long-term.

Sustainability. This alternative would include the same energy efficiency measures as alternative 1. It also would replace old, energy inefficient buildings with modern structures that employed energy-efficient technologies and sustainable design. Impacts on park operations would be moderate, beneficial, and long-term.

Cumulative Impacts

Negligible to moderate, beneficial impacts on NPS operations would result from consolidating maintenance, fire, and law enforcement in a single location; providing storm shelters; replacing old, worn, inefficient buildings with new structures; eliminating motorized travel by visitors in the semi-primitive zone; and reducing the dirt road network. Minor, adverse impacts would result from new maintenance needs associated with new facilities such as utilities at campsites and interpretive waysides.

Other actions that would contribute to cumulative impacts on park operations would be the same as those described for alternative 1. Collectively, these actions are having a long-term, minor to moderate, adverse cumulative impact on park operations.

The negligible to moderate, beneficial impacts and the minor, adverse impacts on NPS operations associated with alternative 3, when added to the long-term, minor to moderate, adverse effects from other actions, would result in continued, minor to moderate, adverse effects on NPS operations. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Impact types and intensities would be the same as described in alternative 2 except that consolidating all park management facilities in a single location would have a moderate rather than minor beneficial impact.

Cumulative impacts would add negligible to moderate, beneficial and minor, adverse impacts to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. The contribution of this alternative to the cumulative impact would be small.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE A: NO ACTION / CONTINUE CURRENT MANAGEMENT

Analysis

Operational requirements at Alibates Flint Quarries National Monument would continue to be associated with maintenance of the visitor contact station and trail; daily education and interpretation activities; law enforcement to prevent the collection of flint while on guided tours and unauthorized entry into the national monument; outreach to schools and other groups; and the management of special events, often with partners. Collectively, these represent a minor part of the joint operations of the two parks.

Effective Management and Sustainability. The analysis of impacts for Lake Meredith National Recreation Area includes a discussion of the long-term benefit from joint management of the two parks. Energy- and water-using facilities would continue to be limited to the visitor contact station and restroom, which were constructed in 2006 and 2010, respectively, using energy-efficient technologies and sustainable design. The no-action alternative would have a negligible impact on effective management and sustainability.

Facilities Conditions and Maintenance. The visitor contact station, parking lot, and restrooms are new, and the trail to the quarries recently was reconstructed to improve drainage and provide steps in steep areas. Maintenance of these facilities would be a minor part of NPS operations of the two parks for the duration of this general management plan.

Cumulative Impacts

Impacts from implementing alternative A in Alibates Flint Quarries National Monument would be negligible or minor.

Other actions that would contribute to cumulative impacts on park operations would be the same as those described for alternative 1 for Lake Meredith National Recreation Area. Collectively, these actions are having a long-term, minor to moderate, adverse cumulative impact on park operations.

The negligible to minor, beneficial impacts associated with alternative A would make no net contribution to the cumulative impacts on park operations. There would continue to be long-term, minor to moderate, adverse cumulative impacts from other actions. This alternative would have no cumulative impact.

Conclusions

NPS operations of Alibates Flint Quarries National Monument would continue to represent a minor part of the joint operations of the two parks. This alternative would not contribute to cumulative impacts.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE B: NPS PREFERRED ALTERNATIVE

Analysis

Effective Management and Sustainability. The preferred alternative would not change the joint management of the parks and would not add any energy- or water-using facilities. Its effects on these aspects of effective management and sustainability would be negligible.

Education, interpretation, and outreach would be expanded, which would require a greater staff commitment for management and visitor contact. One full-time-equivalent position (see table 11) would be added to the park staff to meet

this need, which would represent a 2% increase in the size of the staff. Impacts on NPS operations would be long-term, minor, and adverse.

Facilities Conditions and Maintenance. The preferred alternative would provide new facilities, including a self-guiding interpretive trail, outdoor interpretive materials focusing on an Antelope Creek-style dwelling, and an archeologically excavated quarry. All would be constructed with appropriate design features such as drainage, and all are outdoor facilities that would not have mechanical components that could wear or break. Their minimal maintenance requirements would result in a negligible, adverse impact on park operations.

Cumulative Impacts

Impacts from implementing alternative B in Alibates Flint Quarries National Monument would be negligible or would be minor and adverse.

Other actions that would contribute to cumulative impacts on park operations would be the same as those described for alternative 1 for Lake Meredith National Recreation Area. Collectively, these actions are having a long-term, minor to moderate, adverse cumulative impact on park operations.

The negligible and minor, adverse impacts associated with alternative B, when added to the long-term, minor to moderate, adverse effects from other actions, would result in continued, minor to moderate, adverse effects on NPS operations. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Impacts from the ongoing use of existing facilities and from the maintenance of the new trail, interpretive dwelling, and excavated quarry would be negligible. Expanded education, interpretation, and outreach would have a long-term, minor, and adverse impact on NPS operations that would be addressed by the addition of one new staff position.

Cumulative impacts would add negligible to minor, adverse effects to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. This alternative would contribute a small increment to cumulative impacts.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT ALTERNATIVE C

Analysis

Effective Management and Sustainability. Except as follows, impacts would be the same as those described for the preferred alternative. Allowing unrestricted access on foot to the southwest part of the national monument could facilitate the unauthorized and unaccompanied entry into the quarry area by people who intended to remove flint. The additional law enforcement presence that would be needed in this area would have a long-term, adverse, minor impact on NPS operations.

Facilities Conditions and Maintenance. This alternative would have the same negligible maintenance requirements that were described for alternative 2.

Cumulative Impacts

Impacts from implementing alternative C in Alibates Flint Quarries National Monument would be negligible or would be minor and adverse.

Other actions that would contribute to cumulative impacts on park operations would be the same as those described for alternative 1 for Lake Meredith National Recreation Area. Collectively, these actions are having a long-term, minor to moderate, adverse cumulative impact on park operations.

The negligible and minor, adverse impacts associated with alternative C, when added to the long-term, minor to moderate, adverse effects from other actions, would result in continued, minor to moderate, adverse effects on NPS operations. The contribution of this alternative to the cumulative impact would be small.

Conclusions

Most impact types and intensities would not differ from those occurring with alternative B. The need for an additional law enforcement presence would have a long-term, adverse minor impact on NPS operations.

Cumulative impacts would add negligible to minor, adverse effects to the minor to moderate, adverse effects from other actions, resulting in continued, minor to moderate, adverse effects. This alternative would contribute a small increment to cumulative impacts.

SUSTAINABILITY AND LONG-TERM MANAGEMENT

Consideration of long-term impacts and the effects of foreclosing future options are addressed in this section. The term "sustainability" refer to sections 102(2)(C)(ii), (iv), and (v) of the National Environmental Policy Act, not to the more recent context that includes features like water conservation techniques and green building standards. The intent of this analysis is to identify sustainable development that meets the needs of the present without compromising the ability of future generations to meet their needs.

LAKE MEREDITH NATIONAL RECREATION AREA

The Relationship between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

The intent of this determination is to identify whether any of the alternatives would result in trading the immediate use of the land for any long-term management possibilities or the productivity of national recreation area resources that would affect future generations. It is intended to determine whether each of the alternatives would be a sustainable action that could continue over the long term without environmental problems.

Alternatives 1, 2, and 3 primarily would consist of restorative actions and small-scale development in previously disturbed areas that would not change the use of Lake Meredith National Recreation Area or affect the long-term productivity of lands affected by its operation for future generations.

Any Irreversible or Irretrievable Commitments of Resources which Would Be Involved Should the Alternative Be Implemented

The intent of this evaluation is to identify whether any of the alternatives would result in effects on resources that could not be changed over the long term or would be permanent. An effect on a resource would be irreversible if the resource could not be reclaimed, restored, or otherwise returned to its condition before the disturbance. Irretrievable commitments of resources are those that are lost for a period of time.

Alternative 1 would not involve any irreversible or irretrievable commitments of resources.

Under alternatives 2 and 3, impacts on soils associated with facility construction, such as the consolidated operations center, would be an irretrievable commitment of resources. The soils that would be covered by buildings or pavements would be removed from other productive purposes throughout the life of the structures. The profiles of soils that were disturbed by construction but not covered by impervious surfaces would be altered, but these effects could be mitigated and the soil returned to near-natural productivity. A long-term commitment of this resource would be highly localized.

Traditionally, the use of building materials, such as concrete and metal, has been considered an irreversible commitment. However, modern sustainable design is developing construction techniques so that buildings can be completely disassembled and recycled at the end of their useful lives. Depending on the approach used at Lake Meredith National Recreation Area, the commitment of building materials might be classified as either as irreversible or as irretrievable for the life of each building.

Any Adverse Impacts which Cannot Be Avoided Should the Action Be Implemented

The intent of this determination is to identify whether any of the alternatives would result in impacts that could not be

fully mitigated or avoided. NPS guidance states that the analysis should focus on environmental issues that would involve major impacts if action were taken (NPS 2001).

Based upon the absence of major adverse impacts associated with the alternatives, and the environmental issues identified there would not be any environmentally consequential impacts that could not avoided.

ALIBATES FLINT QUARRIES NATIONAL MONUMENT

The Relationship between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity

Alternative A, B, and C would be a sustainable action that would not change the use of Alibates Flint Quarries National Monument or affect the long-term productivity of lands affected by its operation for future generations.

Any Irreversible or Irretrievable Commitments of Resources which Would Be Involved Should the Alternative Be Implemented

Alternative A would not cause any irreversible loss of resources. The controlled, archeological excavation of one quarry pit in Alternatives B and C would cause the irreversible loss of this resource. There would not be any irretrievable loss of resources under any of the Alibates Flint Quarries National Monument alternatives.

Any Adverse Impacts which Cannot Be Avoided Should the Action Be Implemented

None of the alternatives at Alibates Flint Quarries National Monument would result in major adverse impacts. Therefore, they would not produce any adverse impacts that could not be avoided.

This page is intentionally left blank

CHAPTER 5:

CONSULTATION AND COORDINATION

PUBLIC AND AGENCY INVOLVEMENT

The *General Management Plan / Environmental Impact Statement* for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument represents thoughts of the National Park Service, other agencies, American Indian groups, and the public. Consultation and coordination among these groups were vitally important throughout the planning process.

The public had three primary avenues by which it participated during the development of the plan, including participation in public meetings, responses to newsletters, and comments on the NPS Internet site.

PUBLIC MEETINGS AND NEWSLETTERS

Public meetings and two newsletters kept the public informed and involved in the planning process for the parks. A mailing list consisted of members of governmental agencies, nongovernmental groups, businesses, legislators, local governments, and interested citizens.

The notice of intent to prepare an environmental impact statement was published in the *Federal Register* on June 9, 2009.

More than 35 people commented in writing on the first newsletter (April 2009) and more than 100 comments were received at the four public meetings held at Fritch, Borger, Dumas, and Amarillo in April 2009. A total of 48 people attended these meetings.

Through these venues, many points of view about future visions for the parks and management concerns were obtained from local citizens, partnering organizations, and other interested groups. Although each commenter may have had a different vision of the parks, everyone had a common interest in its valuable resources.

Some respondents commented on special park features such as wildlife, scenic beauty, hiking, fishing, and hunting. Additional comments focused on activities in the parks and appreciation for their availability given their lack of availability elsewhere in the Texas panhandle. There was concern about the behavior of some national recreation area visitors, such as dumping trash or vandalizing park features.

There was a divergence of opinion expressed on access for hunting in the national recreation area. The need for better-developed camping facilities and provisions for increased accessibility for visitors with disabilities also were mentioned.

Concerns over fluctuating lake levels were raised by responders (although the National Park Service does not manage the lake), in addition to requests for increased shoreline accessibility. Other comments recognized the value of cultural resources within the parks, especially within Alibates Flint Quarries National Monument, and addressed a desire to increase appreciation and interpretation of these resources.

The second newsletter was distributed in April 2010 and described the proposed management zones for the parks and the draft alternatives. Eighteen people commented in writing or online through the Planning, Environment, and Public Comment website, and more than 15 comments were received at the three public meetings were held in Amarillo, Dumas, and Fritch in April 2010. A total of 21 people attended these meetings.

Almost half of the comments were in regards to the proposed alternatives for Lake Meredith National Recreation Area, and these were dominated by comments regarding agreement or disagreement with alternative 3. Additional comments addressed facilities within the national recreation area. Many comments

expressed interests and concerns regarding existing recreational activities and the opportunity for additional activities. Only a small portion of comments addressed Alibates Flint Quarries National Monument specifically and about a third of the comments were directed at both parks or did not specify either.

CONSULTATION WITH OTHER AGENCIES, OFFICIALS, AND ORGANIZATIONS

Section 7 Consultation for Threatened and Endangered Species

On April 15, 2009, letters were sent to the U.S. Fish and Wildlife Service and to Texas Parks and Wildlife Department requesting information on federal- and state-listed threatened and endangered species, other species of concern, and designated critical habitats in Potter, Moore, and Hutchinson Counties. The U.S. Fish and Wildlife Service responded with a letter that is provided in appendix D. Should an alternative be selected that would potentially impact any of the listed or candidate species or their habitat, the National Park Service would initiate consultation with the U.S. Fish and Wildlife Service.

The U.S. Fish and Wildlife Service provided an updated species list on May 4, 2009, which also is found in appendix D. This letter did not identify any critical habitat for any of the species of concern within Lake Meredith National Recreation Area or Alibates Flint Quarries National Monument.

The analysis of special status species in chapter 4 determined that all of the effects of implementing the preferred alternative would result in a section 7 judgment of "may affect, is not likely to adversely affect" for all of the species identified by the U.S. Fish and Wildlife Service. This environmental impact statement will be sent to the U.S. Fish and Wildlife Service for their review and comment.

Section 106 Consultation

Agencies that have direct or indirect jurisdiction over historic properties are required by section 106 of the National Historic Preservation Act of 1966, as amended (16 *USC* 270, *et sequens)* to take into account the effect of any undertaking on properties eligible for listing in the National Register of Historic Places. To meet the requirements of 36 *Code of Federal Regulations* 800, the National Park Service sent letters to the Texas state historic preservation officer and the Advisory Council on Historic Preservation on April 15, 2009, inviting their participation in the planning process. Both offices were sent all of the newsletters with a request for comments.

Under the terms of the 2008 programmatic agreement among the National Park Service, Advisory Council on Historic Preservation, and National Conference of State Historic Preservation Officers, the National Park Service will consult with federal, state, and local agencies, Indian tribes, and the private sector to ensure implementation of the National Historic Preservation Act and 36 *Code of Federal Regulations* 800, the Advisory Council on Historic Preservation regulations implementing section 106. Both agencies acknowledged receipt, and the Advisory Council suggested that the National Park Service consult with associated tribes.

The National Park Service will consult with the Texas State Historic Preservation Office, associated tribes, the Advisory Council on Historic Preservation, and other concerned parties as necessary for future undertakings that may be proposed for implementation arising from this general management plan.

Consultation with U.S. Army Corps of Engineers

On April 15, 2009, a letter was sent to the Tulsa District of the U.S. Army Corps of Engineers requesting a list of any projects that they are currently conducting or

planning in the vicinity of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. A copy of this letter is provided in appendix D.

Consultations with Associated Tribes

Through ethnographic and ethnohistorical evidence, park staff have identified 10 tribes that have historic ties to the area within what is now Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument:

- Apache Tribe of Oklahoma
- Caddo Tribe
- Cheyenne-Arapaho Tribes of Oklahoma
- Comanche Tribe of Oklahoma
- Delaware Nation of Oklahoma
- Fort Sill Apache Tribe of Oklahoma
- Jicarilla Apache Tribe
- Kiowa Tribe
- Mescalero Apache
- Wichita and Affiliated Tribes

Representatives of these tribes were notified of and provided with the opportunity to be involved with the development of this general management plan. To date, none have raised concerns about specific cultural resources or traditional cultural properties.

On April 13, 2009, the parks' superintendent sent letters of invitation to consult about the ongoing general management planning process. One tribe responded by phone on May 18, 2009, but no written responses were received from any of the associated tribes.

FUTURE COMPLIANCE REQUIREMENTS

The section on "Future Studies and Plans" in chapter 2 listed the plans and studies that would be needed to implement the preferred alternative for this general management plan. Each of the actions presented there would require documentation to comply with the National Environmental Policy Act. Depending on complexity and controversy, the appropriate level of documentation could range from a categorical exclusion to an environmental impact statement.

Some of the actions in "Future Studies and Plans" also would require other compliance before they could be implemented. Table 26 identifies the additional compliance requirements that would be associated with implementing the preferred alternative.

Table 26: Future Compliance Required for Implementation of Specific Actions of the Preferred Alternative

Action in Preferred Alternative	Compliance Requirement
Lake Meredith National Recreation Area	
Cultural Resources. Reducing the dirt road network in the national recreation area would be covered by existing compliance documentation.	No further state historic preservation officer review would be necessary.
Cultural Resources. Development of a new consolidated headquarters, visitor contact station, and operations facility would require archeological surveying. Such surveying also would be required for the following: • the new kayak/canoe trails and associated campsites on the west side of the lake • improvements to the campsites in McBride Canyon • before any trail and road widening and facility development occurred in previously undisturbed ground If newly discovered or known sites eligible for or listed in the National Register of Historic Places could not be avoided, state historic preservation officer concurrence for mitigation would be required. Rehabilitation of the McBride Ranch House would be done with state historic preservation officer consultation.	Future state historic preservation officer review may be necessary at the design stage of the project.
Cultural Resources. Ranching and oil extraction remnants (as historic structures and objects reminiscent of past ranching and oil operations) would be systematically evaluated for eligibility for listing in the National Register of Historic Places. Those not eligible would be allowed to deteriorate or would be removed for public safety reasons. Consultation and concurrence with the state historic preservation officer would be part of eligibility evaluation and of any mitigation that might be required if, for some reason, eligible historic properties could not be preserved.	Further state historic preservation officer review might be necessary before making a decision to allow a particular historic structure or object to deteriorate. Review would be necessary for any mitigation concurrence.
Natural Resources. Rehabilitation of trails or establishment of new trails, campsites, or facilities in areas where there may be special status species or habitat would involve consultation with the U.S. Fish and Wildlife Service.	Further section 7 consultation with the U.S. Fish and Wildlife Service would be required.

Table 26: Future Compliance Required for Implementation of Specific Actions of the Preferred Alternative (continued)

Action in Preferred Alternative	Compliance Requirement
Alibates Flint Quarries National Monument	
Cultural Resources. Development of a self-guiding interpretive trail by the visitor contact station would require archeological surveying. Such surveying also would be required for the following: • controlled, archeological excavation of a quarry pit • development of outdoor interpretive materials focusing on an Antelope Creek-style dwelling If newly discovered or known sites eligible or listed in the National Register of Historic Places could not be avoided, state historic preservation officer concurrence for mitigation would be required. Rehabilitation of the McBride Ranch House would be done with state historic preservation officer consultation.	Further state historic preservation officer review may be necessary at the design stage of the project.
Cultural Resources. In accordance with section 5.2.1 of *Management Policies 2006* (NPS 2006b), the parks will consult with associated American Indian tribes before permitting any increased visitor use of the quarries and/or petroglyphs areas.	Section 5.2.1 of *Management Policies 2006* (NPS 2006b) states in part that "traditionally associated peoples should be consulted about:…proposed NPS actions that may affect the treatment of, use of, and access to cultural and natural resources with known or potential cultural meaning for the groups."
Cultural Resources. Ranching and oil extraction remnants (as historic structures and objects reminiscent of past ranching and oil operations) would be systematically evaluated for eligibility for listing in the National Register of Historic Places. Those not eligible would be allowed to deteriorate or would be removed for public safety reasons. Consultation and concurrence with the state historic preservation officer would be part of eligibility evaluation and of any mitigation that might be required if, for some reason, eligible historic properties could not be preserved.	Further state historic preservation officer review might be necessary before making a decision to allow a particular historic structure or object to deteriorate. Review would be necessary for any mitigation concurrence.
Natural Resources. Establishment of new trails or facilities in areas where there may be special status species or habitat would involve consultation with the U.S. Fish and Wildlife Service.	Further section 7 consultation with the U.S. Fish and Wildlife Service would be required.

LIST OF PREPARERS

The people identified below were primarily responsible for preparing this environmental impact statement. Information includes their expertise, experience, and roles in preparing this document.

PLANNING TEAM

Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument

Cindy Ott-Jones, Former Superintendent: Responsible for overall review and development of the management plan. Has 32 years with the National Park Service, 8 of those years as a national park superintendent. Has worked in nine national parks and monuments throughout the country. Has a B.S. in natural resource management from Kansas State University.

Michael Bland, Former Fire Management Officer for the Southern Plains Fire Group, based at Lake Meredith National Recreation Area: Interdisciplinary team member through development of the alternatives. Over 15 years experience at various levels in the fire organization, including Incident Commander Type 3 and Prescribed Burn Boss 2. Has worked for several agencies, including the U.S. Fish and Wildlife Service and the Bureau of Land Management.

Steve Bullard, General Maintenance Supervisor: Responsible for the day-to-day maintenance operations at Lake Meredith. Provided input about future facility recommendations. Has 13 years of experience with the National Park Service, 11 years of experience with the Bureau of Mines, and 3 years experience with the Bureau of Land Management in various maintenance positions.

Steve Cunningham, Former Law Enforcement Park Ranger: Responsible for enforcement of the criminal laws of the United States at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. Interdisciplinary team member through identification of the preferred alternatives. Has several years of experience as a ranger with the National Park Service and is now serving as a Law Enforcement Ranger with the Bureau of Land Management in Colorado. Has an M.S. in criminal justice.

Stephen Fisher, Geographic Information Systems Specialist with the Southern Plains Fire Group, based at Lake Meredith National Recreation Area: Interdisciplinary team member for planning and scoping sessions. Has over 20 years of NPS experience in numerous positions, including law enforcement, and as an interpretation ranger at several parks across the country. Has a B.S. in geography, with an emphasis in geographic information systems and architectural technology.

Paul Franke, Equipment Operator: Has 3 years of experience with the National Park Service. Experience prior to NPS employment includes general construction.

Paul Jones, Chief Ranger: Responsible for oversight of the law enforcement program at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. Has over 13 years of experience as a ranger with the National Park Service, 4 of those years as Chief Ranger. Has worked in 5 national parks and monuments throughout the country. Has a degree in engineering and criminal justice.

Jimmy Muncy, Facility Manager: Responsible for providing input about future facility recommendations. Has 12 years of experience with the National Park Service and 14 years of experience with the Bureau of Land Management. Has a B.A. in management and a 4-year apprenticeship in tool and die making.

Rozanna Pfeiffer, Chief of Interpretation, Public Information Officer: Responsible for review and development of the general management plan, focusing on visitor services and interpretation of natural and cultural resources. Has 15 years of experience with the National Park Service at eight different parks and monuments and 17 years as an independent archeologist. Has a B.A. in English and religion, an M.A. in Near Eastern archeology, and an M.A. in Near Eastern studies.

Rose Pollard, Administrative Officer: Interdisciplinary team member for planning and scoping sessions. Has 40 years of experience with the National Park Service at Lake Meredith National Recreation Area, 34 of those years as the administrative officer. Attended business school.

Peter Stephens, Budget Analyst: Interdisciplinary team member for planning and scoping sessions. Has 13 years of experience with the National Park Service: 8 years in the Pacific West Region and 5 years in the Intermountain Region. Returned Peace Corps volunteer, Niger 1995–1997. Has a B.S. degree in forest management from University of New Hampshire.

Arlene Wimer, Chief of Resource Management: Responsible for overall review and development of the management plan, with emphasis on natural and cultural resources. Has 11 years of experience with the National Park Service and 5 years as an independent biological monitor for the state of Texas in the oil and gas industry. Has a B.S. in biology and an M.S. in environmental science.

Denver Service Center

Erin Flanagan, Project Manager, Community Planner: Responsible for overall development and review of the plan. Has 8 years of experience with the National Park Service and 10 years of experience with the Environmental Protection Agency. Has an M.S. in resources law studies and an M.S. in urban and regional planning.

CONSULTANTS

John Hoesterey, Project Manager and Facilitator with Parsons: Oversaw document preparation and facilitated foundation, alternatives development, and choosing by advantages workshops. Has over 35 years of experience. Has a B.A. in zoology and an M.S. in geography and planning.

Alexa Miles, Environmental Scientist at Parsons: Responsible for writing and editing portions of the environmental impact statement and creating some of the document graphics. Has 9 years of experience. Has a B.A. in environmental studies and an M.S. in landscape architecture.

Bruce Snyder, Environmental Scientist and Technical Director with Parsons: Responsible for technical reviews of the document. Has over 35 years of experience. Has a B.S. in biology and an M.S. in wildlife biology.

Jan Snyder, Environmental Scientist with Parsons: Responsible for writing and editing portions of the environmental impact statement. Has over 32 years of experience. Has a B.S. in zoology.

AGENCIES AND ORGANIZATIONS RECEIVING A COPY OF THIS DOCUMENT

FEDERAL AGENCIES

U.S. Bureau of Reclamation, Natural Resource Specialist
U.S. Army Corps of Engineers, Tulsa District
U.S. Fish and Wildlife Service

ELECTED OFFICIALS

Hutchinson County Judge
Mayor of Amarillo
Mayor of Borger
Mayor of Dumas
Mayor of Fritch
Mayor of Stinnett
Texas State Senate
- Honorable Robert Duncan, District 28
- Honorable Kel Seliger, District 31

Texas State House of Representatives
- Honorable John T. Smithee, District 86
- Honorable Walter Price, District 87
- Honorable Warren Chisum, District 88

U.S. House of Representatives
- Honorable William Thornberry, District 13
- Honorable Randy Neugebauer, District 19

U.S. Senate
- Honorable John Cornyn
- Honorable Kay Bailey Hutchison

STATE AND LOCAL AGENCIES

City of Fritch
Texas Historical Commission–State Historical Preservation Officer
Texas Parks and Wildlife
Texas Commission on Environmental Quality
Texas Department of Agriculture

AMERICAN INDIAN TRIBES ASSOCIATED WITH NPS LANDS

Apache Tribe of Oklahoma
Caddo Nation of Oklahoma
Cheyenne and Arapahoe Tribes
Comanche Nation
Delaware Nation
Fort Sills Apache Tribe of Oklahoma
Jicarillo Apache Nation
Kiowa Indian Tribe of Oklahoma
Mescalero Apache Tribe
Witchita and Affiliated Tribes

ORGANIZATIONS AND BUSINESSES

Atmos Energy
Borger Chamber of Commerce
Chesapeake Natural Gas
Conoco Phillips Company
DCP Midstream
Eagle Rock
Fritch Chamber of Commerce
Holco Oil and Gas
Lake Meredith Aquatic and Wildlife Museum
LERA
Linn Energy
Losure Petroleum
Luxor Oil and Gas
Momentum Operation Company, Incorporated
Myriad Resources Corporation
Natural Gas Pipeline Company of America
Oil Well Operators, Incorporated
Panhandle Plains Historical Museum
Pantera Energy
Phillips Pipeline Company
Pioneer Natural Resources
Sargeco, Incorporated
SNW Operating

APPENDIXES, REFERENCES, AND INDEX

APPENDIX A: LEGISLATION

Lake Meredith National Recreation Area

Public Law 81-898, Enabling Acts and Memoranda of Understanding for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, 1950.

Public Law 88-536, Establishment of Recreational Facilities at Sanford Reservoir Area, Texas, 1964.

Public Law 101-628, Enabling Legislation for Lake Meredith National Recreation Area, 1990.

Alibates Flint Quarries National Monument

Public Law 89-154, Enabling Legislation for Alibates Flint Quarries National Monument, 1965.

Public Law 95-625, Alibates Flint Quarries and Texas Panhandle Pueblo Culture, 1978.

PARK LEGISLATION

LAKE MEREDITH NATIONAL RECREATION AREA

PUBLIC LAW 81-898 **December 29, 1950**

AN ACT

To authorize the construction, operation, and maintenance by the Secretary of the Interior of the Canadian River reclamation project, Texas.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, for the purposes of irrigating land, delivering water for industrial and municipal use, controlling floods, providing recreation and fish and wildlife benefits, and controlling and catching silt, the Secretary of the Interior, acting pursuant to the Federal reclamation laws (Act of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto), is authorized to construct, operate, and maintain the Canadian River reclamation project, Texas, described in the report of the Commission of Reclamation approved by the Secretary May 3, 1950, entitled "Plan for Development, Canadian River Project, Texas", Project Planning Report Number 5-12.22-1, at an estimated cost of $86,656,000, the impounding works whereof shall be located at a suitable site on the Canadian River in that area known as the Panhandle of Texas. In addition to the impounding works, the project shall include such main canals, pumping plants, distribution and drainage systems, and other works as are necessary to accomplish the purposes of this Act. The use by the project of waters arising in Ute and Pajarito Creeks, New Mexico, shall be only such use as does not conflict with use, present or potential, of such waters for beneficial consumptive purposes in New Mexico.

SEC.2.(a) Notwithstanding any recommendations in the above-mentioned report to the contrary, only the costs of construction allocable to flood control and, upon approval by the President of a suitable plan thereof, to the preservation and propagation of fish and wildlife, and operation and maintenance costs allocable to the same purposes, shall be nonreimbursable.

(b) Actual construction of the project herein authorized shall not be commenced, and no construction contract awarded therefor, until (1) the Congress shall have, consented to the interstate compact between the States of New Mexico, Oklahoma, and Texas agreed upon by the Canadian River Compact Commission at Santa Fe, New Mexico, December 6, 1950, in conformity with Public Law 491, Eighty-first Congress, and (2) repayment of that portion of the actual cost of constructing the project which is allocated to municipal and industrial water supply and of interest on the unamortized balance thereof at a rate (which rate shall be certified by the Secretary of the Treasury) equal to the average rate paid by the United States on its long-term loans outstanding at the time of repayment contract is negotiated minus the amount of such net revenues as may be derived from temporary water supply contracts or from other sources prior to the close of the repayment period, shall have been assured by a contract satisfactory to the Secretary, with one central repayment contract organization, the term of which shall not exceed fifty years from the date of completion of the municipal and industrial water supply features of the project as determined by the Secretary.

(c) The repayment contract shall provide, among other things, (1) that the holder thereof shall have a first right, to which right the rights of the holders of any other type of contract shall be subordinate, to a stated share or quantity of the project's available water supply for use by its

constituent industrial and municipal water users during the repayment period and a permanent right to such share or quantity thereafter subject to payment of such costs as may be incurred by the United States in its operation and maintenance of any part of the project works; (2) that, subject to such rules and regulations as the Secretary may prescribe, the care, operation, and maintenance of such portions of the pipeline and related facilities as are used solely for delivering such water to the contract holder and its constituent organizations shall, as soon as is practicable after completion of the municipal and industrial water supply features of the project, pass to the contract holder or to an organization which is designated by it for that purposes and which is satisfactory to the Secretary; and (3) that title to such portions of the pipeline and related facilities shall in like manner pass to the contract holder or its designee or designees upon payment to the United States of all obligations arising under this Act or incurred in connection with the project.

SEC. 3. There are hereby authorized to be appropriated, out of any moneys in the Treasury not otherwise appropriated, such sums as may be required to carry out the purposes of this Act.

Approved December 29, 1950

LAKE MEREDITH NATIONAL RECREATION AREA

PUBLIC LAW 88-536 **August 31, 1964**

AN ACT

To provide for the establish and administration of public recreational facilities at the Sanford Reservoir area, Canadian River project, Texas, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is hereby authorized to investigate, plan, construct, operate and maintain, or otherwise provide for basic public outdoor recreation facilities at the Sanford Reservoir area, Canadian Federal reclamation project, to acquire or otherwise include within the project area such adjacent lands or interests therein as are necessary for present or future public recreation use, and to provide for the public use and enjoyment of project lands, facilities, and water areas in a manner coordinated with other project purposes: *Provided,* That this Act shall not provide the Secretary with a basis for allocation to recreation of water, reservoir capacity, or joint project costs of the Canadian River project nor affect the priority for municipal use of water stored in Sanford Reservoir, or the priority of use for municipal purposes of the capacity of said reservoir. The Secretary is authorized to enter into agreements with Federal agencies or State or local public bodies for the operation, maintenance, or additional development of project lands or facilities, or to dispose of project lands or facilities to Federal agencies or State or local public bodies by lease, transfer, conveyance or exchange upon such terms and conditions as will best promote the development and operation of such lands or facilities in the public interest for recreation purposes. The cost of providing basic recreation facilities shall be nonreimbursable. In carrying out the aforesaid activities the Secretary shall take cognizance of the effect of the fish and wildlife plan approved by the President December 19, 1962, pursuant to the Act of December 29, 1950 (64 Stat. 1124) in providing facilities at the Canadian River project which have general recreation utility.

SEC. 2. There are authorized to be appropriated such amounts, but not more than $1,100,000, as may be necessary for the investigation, preparation of plans, construction and acquisition of lands authorized in this Act.

Approved August 31, 1964.

Legislative History:
House Report No. 891 (Comm. on Interior & Insular Affairs).
Senate Report No. 1461 (Comm. on Interior & Insular Affairs).
Vol. 109 (1963): Nov. 18, considered and passed House.
Vol. 110 (1964): Aug. 18, considered and passed Senate.

Enabling Legislation for Lake Meredith National Recreation Area
Public Law 101-628

8. Lake Meredith

Public Law 101–628
101st Congress

An Act

Nov. 28, 1990
[H.R. 2570]

To provide for the designation of certain public lands as wilderness in the State of Arizona.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

* * * * * * *

104 STAT. 4492
Natural resources.

TITLE V—NATIONAL PARK SYSTEM UNITS IN TEXAS

* * * * * * *

16 USC 460eee.

SEC. 502. LAKE MEREDITH NATIONAL RECREATION AREA

(a) ESTABLISHMENT.—In order to provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters, there is hereby established the Lake Meredith National Recreation Area (hereafter in this Act referred to as the "recreation area").

(b) AREA INCLUDED.—The recreation area shall consist of the lands, waters, and interests therein within the area generally depicted on the map entitled "Lake Meredith National Recreation Area Boundary Map, 'Fee-Take Line'", numbered SWRO–80,023–A, and dated September 1990. The map shall be on file and available for public inspection in the offices of the National Park Service, Department of the Interior. The Secretary of the Interior (hereafter in this Act referred to as the "Secretary") may from time to time make minor revisions in the boundary of the recreation area.

104 STAT. 4493

(c) TRANSFER.—(1) Except as provided in paragraph (2), the Federal lands, waters, and interests therein within the recreation area are hereby transferred to the National Park Service.

(2) Those lands depicted on the map referred to in subsection (b) that are necessary for the continued operation, maintenance, and replacement of the Canadian River Project facilities and its purposes of providing for municipal and industrial water supply and flood control shall remain under the jurisdiction of the Bureau of Reclamation.

16 USC 460eee–1.

SEC. 503. ADMINISTRATION.

(a) IN GENERAL.—The Secretary shall administer the recreation area in accordance with this Act and the provisions of law generally applicable to units of the national park system, including the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916 (39 Stat. 535; 16 U.S.C. 1, 2–4),

and the Act of August 7, 1946 (60 Stat. 885). In the administration of such recreation area, the Secretary may utilize such statutory authority as may be available to him for the protection of natural and cultural resources as he deems necessary to carry out the purposes of this Act.

(b) OPERATION OF CANADIAN RIVER PROJECT.—Nothing in this Act shall be construed to affect or interfere with the authority of the Secretary under the Act of December 29, 1950 (Public Law 81–898; 43 U.S.C. 600b et seq.), to operate Sanford Dam and Lake Meredith in accordance with and for the purposes set forth in that Act.

(c) LAND ACQUISITION.—Within the boundary of the recreation area, the Secretary may acquire lands and interests in lands by purchase with donated or appropriated funds, exchange, or transfer without reimbursement from any Federal agency.

(d) CULTURAL RESOURCES.—The Secretary shall conduct a survey of the cultural resources in the immediate vicinity of the recreation area. The Secretary is authorized to enter into cooperative agreements with public or private entities, including landowners, for the purpose of conducting the survey required by this subsection. Not later than three years after the date on which funds have been made available, the Secretary shall submit a report to the Committee on Interior and Insular Affairs of the House of Representatives and the Committee on Energy and Natural Resources of the Senate on the results of the survey required by this subsection.

Reports.

(e) HUNTING AND FISHING.—(1) The Secretary shall permit hunting and fishing on lands and waters under the Secretary's jurisdiction within the recreation area in accordance with applicable Federal and State law. The Secretary may designate zones where, and establish periods when, hunting or fishing will not be permitted for reasons of public safety, administration, fish and wildlife management, or public use and enjoyment.

(2) Except in emergencies any regulations issued by the Secretary under this subsection shall be put into effect only after consultation with the appropriate State agencies responsible for hunting and fishing activities.

104 STAT. 4494

(f) COOPERATIVE AGREEMENTS.—For purposes of administering the recreation area, the Secretary may enter into cooperative agreements with any Federal agency, the State of Texas, or any political subdivision thereof, including the Canadian River Municipal Water Authority, for the rendering, on a reimbursable basis, of rescue, firefighting, law enforcement, fire preventive assistance, and other needs. The Secretary may enter into a cooperative agreement with the city of Fritch, Texas, to develop and operate a joint venture information center. Federal funds may be expended on non-Federal lands and improvements through cooperative agreements for the purpose of this section on a 50–50 matching basis.

SEC. 504. AUTHORIZATION OF APPROPRIATIONS.

16 USC 460eee-2.

There are authorized to be appropriated such sums as may be necessary to carry out the purposes of sections 502 and 503 of this Act.

* * * * * * *

Approved November 28, 1990.

Enabling Legislation for Alibates Flint Quarries National Monument Public Law 89-154

PUBLIC LAW 89-154 **August 31, 1965**
79 Stat. 587

2. Alibates Flint Quarries and Texas Panhandle Pueblo Culture

An Act to authorize the establishment of the Alibates Flint Quarries and Texas Panhandle Pueblo Culture National Monument. (79 Stat. 587)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled. That the Secretary of the Interior may designate, acquire and administer as a national monument lands and interests in lands comprising the Alibates Flint Quarries and the Texas Panhandle Pueblo Culture sites, together with any structures and improvements thereon, located in and around Potter County, Texas.

SEC. 2.(a) The property acquired under the provisions of the first section of this Act shall be set aside as a national monument for the benefit and enjoyment of the people of the United States and shall be designated as the Alibates Flint Quarries and Texas Panhandle Pueblo Culture national Monument. The Secretary of the Interior shall administer, protect, and develop such monument, subject to the provisions of the Act entitled "An Act to establish a National Park Service, and for other purposes", approved August 25, 1916, as amended and supplemented, and the Act entitled "An Act to provide for the preservation of historic American sites, buildings, objects, and antiquities of national significance, and for other purposes", approved August 21, 1935, as amended.

(b) In order to provide for the proper development and maintenance of such national monuments, the Secretary of the Interior is authorized to construct and maintain therein such markers, buildings, and other improvements, and such facilities for the care and accommodation of visitors, as he may deem necessary.

SEC. 3. There is hereby authorized to be appropriated not to exceed $5,000 for the acquisition of land and not to exceed $260,000 for the development of the area.

Approved August 31, 1965.

Legislative History
House Report No. 148 (Committee on Interior and Insular Affairs).
Senate Report No. 581 (Committee on Interior and Insular Affairs).
Congressional Record, Vol. 111 (1965):
Apr. 5: Considered and passed House.
August 16: Considered and passed Senate, amended.
August 17: House concurred in Senate amendment.

2. Alibates Flint Quarries and Texas Panhandle Pueblo Culture

An Act to authorize additional appropriations for the acquisition of lands and interests in lands within the Sawtooth National Recreation Area in Idaho. (92 Stat. 3467) (P.L. 95-625)

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE III - ALIBATES FLINT QUARRIES AND
TEXAS PANHANDLE PUEBLO CULTURE
NATIONAL MONUMENT

SEC. 321. (a) The first section of the Act of August 31, 1965 (79 Stat. 587) is amended by adding at the end thereof the following: "The national monument shall comprise the area generally depicted on the map entitled 'Boundary Map Alibates Flint Quarries', numbered 432-80,021, and dated November 1976. Minor boundary adjustments may be made from time to time by the Secretary.".

(b) Section 3 of such Act is amended by deleting "$260,000" and inserting "$4,291,000" in lieu thereof.

(c) The Act of August 31, 1965 (79 Stat. 587) is hereby amended to redesignate the Alibates Flint Quarries and Texas Panhandle Pueblo Culture National Monument as the Alibates Flint Quarries National Monument.

Approved November 10, 1978

APPENDIX B: LAWS AND EXECUTIVE ORDERS

NATIONAL PARK SERVICE ENABLING LEGISLATION

- Act of June 30, 1864, 13 Statute (Stat.) 325, 16 USC, Section (§)48
- Act of March 1, 1872, 17 Stat. 32, 16 USC §21 *et sequens* (*et seq*., meaning "and following legislation")
- Lacey Act of 1900, as amended by Public Law (PL) 97-79, 18 USC Sections (§§)42-44, Title 50 *Code of Federal Regulations* (CFR)
- Act of August 25, 1916 (National Park Service Organic Act), PL 64-235, 16 USC §1 *et seq*.
- Act of June 5, 1920, 41 Stat. 917, 16 USC §6
- Act of February 21, 1925, 43 Stat. 958, (temporary act, not classified)
- Act of May 26, 1930, 16 USC §17-17j
- Reorganization Act of March 3, 1933, 47 Stat. 1517
- Parks, Parkways, and Recreational Programs Act, June 23, 1936, 49 Stat. 1894, 16 USC §§17k-n
- Act of August 8, 1953, 16 USC §1b-1c
- Act to Improve the Administration of the National Park System, August 18, 1970; PL 91- 383, 84 Stat. 825, as amended by PL 94- 458, PL 95- 250, and PL 95- 625; 16 USC § 1a1 *et seq*.
- General Authorities Act, October 7, 1976, PL 94-458, 90 Stat. 1939, 16 USC §1a-1 *et seq*.
- Act amending the Act of October 2, 1968 (commonly called Redwoods Act), March 27, 1978, PL 95- 250, 92 Stat. 163, 16 USC §§1a- 1, 79a- q
- National Parks and Recreation Act, November 10, 1978, PL 95-625, 92 Stat. 3467; 16 USC §1 *et seq*.
- NPS Resources, Improve Ability to Manage, PL 101-337, 16 USC §19jj
- National Parks Omnibus Management Act of 1998, PL 105-391, Title IV, National Park Service Concessions Management Improvement Act of 1998

OTHER LAWS AFFECTING THE NATIONAL PARK SERVICE

Accessibility

- Americans with Disabilities Act, PL 101-336, 104 Stat. 327, 42 USC §12101
- Architectural Barriers Act of 1968, PL 90-480, 82 Stat. 718, 42 USC §4151 *et seq*.
- Rehabilitation Act of 1973, PL 93-112, 87 Stat. 357, 29 USC §701 *et seq*. as amended by the Rehabilitation Act Amendments of 1974, 88 Stat. 1617

Cultural Resources

- Antiquities Act of 1906, PL 59-209, 34 Stat. 225, 16 USC §432 and 43 CFR 3
- Historic Sites, Buildings and Antiquities Act, 16 U.S.C. 461 through 467; Aug. 21, 1935, ch. 593, 49 Stat. 666
- National Trust Act of 1949, PL 81-408, 63 Stat. 927, 16 USC §§468c-e
- Management of Museum Properties Act of 1955, PL 84-127, 69 Stat. 242, 16 USC 70 §18f, 18f-2, 18f-3
- Executive Order (E.O.) 11593: Protection and Enhancement of the Cultural Environment, 3 CFR 1971

- Protection of Historic and Cultural Properties, E.O. 11593; 36 CFR 60, 61, 63, 800; 44 FR 6068
- Archaeological and Historic Preservation Act of 1974, PL 93- 291, 88 Stat. 174, 16 USC §469
- American Folklife Preservation Act of 1976, PL 94- 201, 89 Stat. 1130, 20 USC §§2101- 2107
- Public Buildings Cooperative Use Act of 1976, PL 94- 541, 90 Stat. 2505, 42 USC §4151- 4156
- Tax Reform Act of 1976, PL 94-455, 90 Stat. 1916
- Archaeological Resources Protection Act of 1979, PL 96-95, 93 Stat. 712, 16 USC §470aa *et seq*. and 43 CFR 7, subparts A and B, 36 CFR 79
- Historic Preservation Certifications Pursuant to the Tax Reform Act of 1976, Revenue Act of 1978, Tax Treatment Extension Act of 1980, and Economic Recovery Tax Act of 1981, 36 CFR 67
- World Heritage Convention, 1980, PL 96-515, 94 Stat. 3000
- Native American Grave Protection and Repatriation Act, PL 101-601, 104 Stat. 3049, 25 USC §§3001-3013
- Presidential Memorandum of April 29, 1994 "Government-to-Government Relations with Native American Tribal Governments, " 59 FR 85
- American Indian Religious Freedom Act, PL 95-341, 92 Stat. 469, 42 USC §1996
- Executive Order 13007: Indian Sacred Sites, May 24, 1996
- National Historic Preservation Act as amended, PL 89-665, 80 Stat. 915, 16 USC §470 *et seq*. and 36 CFR 18, 60, 61, 63, 68, 79, 800

Natural Resources

- Migratory Bird Treaty Act of 1918, PL 186, 40 Stat. 755
- Fish and Wildlife Coordination Act of 1958 as amended, P.L. 85-624, 72 Stat. 563, 16 U.S.C. §661 *et seq*.
- Water Resources Planning Act of 1965 (PL 89-80, 42 USC § 1962 *et seq*.) and Water Resource Council's Principles and Standards, 44 FR 723977
- National Flood Insurance Act of 1968, PL 90-448, 82 Stat. 572, 42 USC §4001 *et seq*.
- Endangered Species Conservation Act of 1969
- National Environmental Policy Act of 1969, PL 91-190, 83 Stat. 852, 42 USC §4321 *et seq*.
- Protection and Enhancement of Environmental Quality, E.O. 11514 as amended, 1970, E.O. 11991, 35 FR 4247; 1977, 42 FR 26967)
- Federal Advisory Committee Act of 1972, PL 92-463, 86 Stat. 770
- Endangered Species Act of 1973, as amended, PL 93- 205, 87 Stat. 884, 16 USC §1531 *et seq*.
- Flood Disaster Protection Act of 1973, PL 93- 234, 87 Stat. 975, 12 USC §24, §1709- 1
- Manguson Fishery Conservation and Management Act of 1976, P.L. 94-625, 90 Stat. 331m 16 U.S.C. §1801 *et seq*.
- Resource Conservation and Recovery Act, PL 94-580, 30 Stat. 1148, 42 USC §6901 *et seq*.
- Executive Order 11988: Floodplain Management, May 24, 1977, 42 *Federal Register* 26951, as amended by Executive Order. 12148, July 20, 1979, 44 *Federal Register* 43239 [42 U.S.C. 4321], 3 *Code of Federal*

Regulations 121 (Supplement (Supp) 177)

- Executive Order 11990: Protection of Wetlands, May 24, 1977, 42 *Federal Register* 26961, as amended by Executive Order 12608, Sept. 9, 1987, 52 *Federal Register* 34617, [42 U.S.C. 4321], 3 *Code of Federal Regulations* 121 (Supp 177)
- Executive Order 11991: Protection and Enhancement of Environmental Quality
- Soil and Water Resources Conservation Act of 1977
- Bald and Golden Eagles Protection Act as amended, PL Chapter 28, 54 Stat 250, 16 USC §§668-668d
- Acid Precipitation Act of 1980, PL 96-294, 94 Stat. 770, 42 USC §8901 *et seq*.
- Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act, Environmental Statement Memorandum (E.S.) 80-3, 08/11/80, 45 *Federal Register* 59109
- Farmland Protection Policy Act of 1982, PL 97-98
- Rivers and Harbors Act of 1899, 33 U.S.C. Chapter 425, as amended by P.L. 97-332, October 15, 1982 and P.L. 97-449, 33 U.S.C. §§401-403
- Federal Cave Resources Protection Act of 1988, PL 94- 377, 102 Stat. 4546, 16 USC §4301
- Emergency Planning and Community Right-to-Know Act, PL 99-499, 100 Stat. 1725, 42 USC §1101
- Watershed Protection and Flood Prevention Act, PL 92-419, 68 Stat. 666, 16 USC §100186
- Migratory Bird Conservation Act, PL Chapter 257, 45 Stat. 1222, 16 USC §715 *et seq*.
- Clean Air Act as amended, PL Chapter 360, 69 Stat. 322, 42 USC §7401 *et seq*.
- Federal Water Pollution Control Act (commonly referred to as Clean Water Act), PL 92- 500, 33 USC §1251 *et seq*. as amended by the Clean Water Act, PL 95-217
- Federal Insecticide, Fungicide, and Rodenticide Act, PL 92-516, 86 Stat. 973, 7 USC §136 *et seq*.
- Safe Drinking Water Act, PL 93-523, 88 Stat. 1660, 42 USC §300f *et seq*., 42 USC §201 and 21 USC §349
- Executive Order 13112: Invasive Species, February 3, 1999, 64 *Federal Register* 6183
- Executive Order 13123: Greening the Government Through Efficient Energy Management, June 3, 1999, 64 *Federal Register* 30851
- Executive Order 13148: Greening the Government Through Leadership in Environmental Management, April 21, 2000, 65 *Federal Register* 24595
- Executive Order 13175: Consultation and Coordination with Indian Tribal Governments, November 6, 2000, 65 *Federal Register* 67249 [25 U.S.C. 450]
- National Park System Final Procedures for Implementing E.O. 11988 and 11990, 45 *Federal Register* (FR) 35916 as revised by 47 FR 36718)

Other

- Mining Law of 1872, 30 USC §22 *et seq*.
- Federal Power Act of 1920, PL Chapter 285, 41 Stat. 106, 16 USC §791a *et seq*.
- Federal Water Power Act, PL Chapter 285, 41 D 1063, 16 USC §823a, as amended 16 USC §797

- Mineral Leasing Act of 1920, 30 USC §181 *et seq.*, as amended
- Administrative Procedures Act (APA), June 11, 1946, 5 U.S.C. § 551-559, §§701-706, 60 Stat. 237
- Disposal of Materials on Public Lands (Material Act of 1947), 30 USC §§601-604
- Mineral Leasing Act for Acquired Lands of 1947, PL Chapter 681, 61 Stat. 681, 30 USC §351 *et seq*.
- Mineral Materials Disposal Act of 1947, 30 USC §601 *et seq*.
- Surface Resources Use Act of 1955, 30 USC §601 *et seq*.
- Outdoor Recreation Coordination Act of 1963, P.L. 88-29, 77 Stat. 49
- Wilderness Act, PL 88-577, 78 Stat. 890, 16 USC §§1131- 1136
- Concessions Policy Act of 1965, PL 89-249, 79 Stat. 969, 16 USC § 20 *et seq*.
- Land and Water Conservation Fund Act of 1965 as amended, PL 88-578, 78 Stat. 897, 16 USC §§460*l*-4 to 460*l*-11
- Department of Transportation Act of 1966, PL 89-670, 80 Stat. 931, 49 USC § 303
- Intergovernmental Cooperation Act of 1968, PL 90-577, 40 USC §§ 531-535 and 31 USC §§6501-6508
- Intergovernmental Coordination Act of 1969, 42 USC §§4101, 4231, 4233
- Occupational Safety and Health Act of 1970, 29 U.S.C. §651 through 678; P.L. 91-5969
- Noise Control Act of 1972 as amended, PL 92-574, 42 USC §4901 *et seq*.
- Energy Supply and Environmental Coordination Act of 1974
- Federal Coal Leasing Amendments Act of 1976, PL 94-377, 90 Stat. 1083, 30 USC §201
- Federal Land Policy and Management Act, PL 94-579, 90 Stat. 199, 43 USC §1714 *et seq*.
- Mining Activity within National Park Service Areas, PL 94-429, 90 Stat. 1342 16 USC §1901 *et seq*.
- Payment in Lieu of Taxes Act, PL 94-565, 90 Stat. 2662, 31 USC §6901 *et seq*.
- Revised Statute 2477, Right-of-way across Public Lands, Act of July 26, 1866, 43 USC §932 (1976), repealed by FLPMA §706(a) October 21, 1976
- Executive Order 11987: Exotic Organisms, 42 FR 26407
- Executive Order 11989 (42 FR 26959) and 11644: Offroad Vehicles on Public Lands
- Executive Order 12003: Energy Policy and Conservation, 3 CFR 134 (Supp. 1977), 42 USC § 2601
- Executive Order 12008: Federal Compliance with Pollution Control Standards
- Executive Order 12372: Intergovernmental Review of Federal Programs, 47 FR 30959
- Surface Transportation Assistance Act of 1982, 96 Stat. 2097, 23 U.S.C. §§101 and many others
- Aircraft Overflights Study Act of 1987, PL 101-91, 101 Stat. 674
- Surface Mining Control and Reclamation Act, PL 95-87, 91 Stat. 445, 30 USC § 1201 *et seq*.
- Wildfire Suppression Assistance Act, PL 101-11, 42 USC §1856m, 1856p
- Wildfire Disaster Recovery Act, PL 101-286

- Energy Policy Act of 1992, 42 U.S.C. 13201 through 13556; P.L. 102-486
- Federal Water Project Recreation Act, 79 Stat. 213, PL 89- 72, 16 USC §§ 460*l*-12 to 460*l*-21
- Government Performance and Results Act of 1993 (GPRA), 31 U.S.C. 1115 *et seq*. 4; P.L. 103-62
- Freedom of Information Act, PL 93-502, 5 USC §552 *et seq*.
- Forest and Rangeland Renewable Resources Planning Act, PL 95-307, 92 Stat. 353, 16 USC §1600 *et seq*.
- Sikes Act, P.L. 86-797, 74 Stat. 1052, 16 U.S.C. §670a-670o, as amended.
- National Trails System Act, PL 90- 543, 82 Stat. 919, 16 USC §§1241- 1251.

APPENDIX C: SERVICEWIDE REQUIREMENTS AND POLICIES

The alternatives considered in this document for both Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument incorporate and comply with the provisions of the following requirements and policies. Conditions prescribed by servicewide requirements and policies that are particularly important to this document are summarized below. These requirements and policies illustrate that a general management plan is not needed to decide, for instance, that it is appropriate to protect endangered species, control exotic species, protect archeological sites, provide for handicapped access, and conserve artifacts. Those and other things are already laws, requirements, or policies.

GOVERNMENT-TO-GOVERNMENT RELATIONS BETWEEN AMERICAN INDIAN TRIBES AND LAKE MEREDITH NATIONAL RECREATION AREA AND ALIBATES FLINT QUARRIES NATIONAL MONUMENT

GOVERNMENT-TO-GOVERNMENT RELATIONS BETWEEN AMERICAN INDIAN TRIBES AND LAKE MEREDITH NATIONAL RECREATION AREA AND ALIBATES FLINT QUARRIES NATIONAL MONUMENT Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	Source
The National Park Service and tribes traditionally associated with the parks maintain positive, productive, government-to-government relationships. Park managers and staff respect the viewpoints and needs of the tribes, continue to promptly address conflicts that occur, and consider American Indian values in park management and operation.	National Historic Preservation Act, Archeological Resources Protection Act, Native American Graves Protection and Repatriation Act, NPS *Management Policies 2006*
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to the parks' neighbors and other agencies:	
• Continue to cooperate with tribes in conducting ethnographic studies to better understand which tribes are culturally associated with the parks and identify culturally significant resources. Continue regular consultations with associated tribes to continue to improve communications and resolve any problems or misunderstandings.	

RELATIONS WITH PRIVATE AND PUBLIC ORGANIZATIONS, OWNERS OF ADJACENT LAND, AND GOVERNMENTAL AGENCIES

RELATIONS WITH PRIVATE AND PUBLIC ORGANIZATIONS, OWNERS OF ADJACENT LAND, AND GOVERNMENTAL AGENCIES

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

Desired Condition	Source
The national parks are managed as part of a greater ecological, social, economic, and cultural system. Good relations are maintained with adjacent landowners, surrounding communities, and private and public groups that affect, and are affected by, the parks. The parks are managed proactively to resolve external issues and concerns and ensure that park values are not compromised. Because the national parks are an integral part of a larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts, protect national park resources, and address mutual interests in the quality of life for community residents. Regional cooperation involves federal, state, and local agencies, Indian tribes, neighboring landowners, and all other concerned parties. As called for in the "Service First" initiative, park staff works with the U.S. Fish and Wildlife Service, U.S. Forest Service, and Bureau of Land Management whenever appropriate to: pool resources to design, develop and implement joint projects that benefit the public and resources; promote partnerships across agencies boundaries to address public land management issues; and collaboratively work together to develop joint solutions to common problems. As a result, there is improved customer service, increased operational efficiency, and enhanced land stewardship, resource protection and conservation at Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument.	NPS *Management Policies 2006;* Public Law 112-7

Actions

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to the parks' neighbors and other agencies:

- Continue to establish and foster partnerships with public and private organizations to achieve the mission and purposes of the national parks. Partnerships will be sought for resource protection, research, education, and visitor enjoyment.
- NPS staff will keep landowners, land managers, local governments, and the general public informed about national park management activities. Periodic consultations will occur with landowners and communities affected by national park visitors and management actions. The National Park Service will work closely with local, state, and federal agencies and tribal governments whose programs affect or are affected by activities in the parks. NPS staff will continue their regular consultations with such entities as the Texas state historic preservation office, the Texas Commission on Environmental Quality, American Indian tribes, Potter, Moore, and Hutchinson counties in Texas, the U.S. Fish and Wildlife Service, the Bureau of Land Management, the cities of Borger and Fritch in Texas, the Potter, Moore, and Hutchinson County Sheriff's Departments, the Texas Department of Public Safety, the Texas Department of Transportation, and the Texas Parks and Wildlife Department.
- Consultations will continue to take place with property owners.
- Continue to establish and foster partnerships with public and private organizations to achieve the purposes and mission of the parks. Partnerships will be sought for resource protection, research, education, and visitor enjoyment purposes.
- To foster a spirit of cooperation with neighbors and encourage compatible adjacent land uses, park staff will keep land owners, land managers, local governments, and the public informed about park management activities. Periodic consultations will occur with land owners and communities who are affected by, or potentially affected by park visitors and management actions. Park staff will respond promptly to conflicts that arise over their activities, visitor access, and proposed activities and developments on adjacent lands that may affect the parks. Park managers will seek agreements with landowners to encourage their lands to be managed in a manner compatible with park purposes. Park staff also will seek ways to provide land owners with technical and management assistance to address issues of mutual interest.
- Work closely with local, state, and federal agencies and tribal governments whose programs affect, or are affected by, activities in the parks. Park managers also will pursue cooperative regional planning whenever possible to integrate the parks into issues of regional concern.
- Park staff would meet with representatives of the U.S. Fish and Wildlife Service, U.S. Forest Service, and Bureau of Land Management as necessary to determine when, where, and how the agencies can work together under the Service First initiative.

NATURAL RESOURCE MANAGEMENT REQUIREMENTS

AIR QUALITY The parks are in a class II air quality area. Current laws and policies require that the following conditions be achieved in the parks:.	
Desired Condition	**Source**
Air quality in the park meets national ambient air quality standards for specified pollutants. The parks' air quality is maintained or enhanced with no significant deterioration. Nearly unimpaired views of the landscape both within and outside the parks are present. Scenic views are substantially unimpaired.	Clean Air Act, NPS *Management Policies 2006;* NPS-77, "Natural Resources Management Guidelines"
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to air quality:.	
Although the National Park Service has very little direct control over air quality in the air shed encompassing the parks, park managers will continue to cooperate with the Texas Commission on Environmental Quality and the U.S. Environmental Protection Agency to monitor air quality and ensure that air quality is not impaired. • Inventory the air quality-related values associated with the parks. • Monitor and document the condition of air quality and related values. • Evaluate air pollution impacts and identify causes. • Minimize air quality pollution emissions associated with park operations, including the use of prescribed fire and visitor use activities. • Conduct air quality monitoring in conjunction with other government agencies. • Conduct national park operations in compliance with federal, state, and local air quality regulations. • Ensure healthful indoor air quality at NPS facilities. • Participate in federal, regional, and local air pollution control plans and drafting of regulations and review permit applications for major new air pollution sources. • Reduce emissions associated with administrative and recreational uses.	

ECOSYSTEM MANAGEMENT Current laws and policies require that the conditions delineated below be achieved in the parks:	
Desired Condition	**Source**
The parks are managed holistically, as part of a greater ecological, social, economic, and cultural system.	NPS *Management Policies 2006* (1.5, 4, 4.1, 4.14, 4.41)
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to ecosystem management:	
• Continue to develop cooperative agreements, partnerships, and other feasible arrangements to set an example in resource conservation and innovation, and to facilitate research related to resources in the parks and their management.	

EXOTIC SPECIES Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
The management of populations of exotic plant and animal species, up to and including eradication, are undertaken wherever such species threaten park resources or public health and when control is prudent and feasible.	NPS *Management Policies 2006*; EO 13112, "Invasive Species"; NPS-77, "Natural Resources Management Guidelines"
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to exotic species:	

• Complete an inventory of plants and animals in the parks and regularly monitor the distribution and condition (including health and disease) of selected species that are (a) invasive exotics, (b) native species capable of creating resource problems (for example, habitat decline due to overpopulation).
• Develop a long-term program for reversing the destructive effects of exotic species. Study the environmental and ecological effects of exotic species invasion to assess threats and prioritize management actions.
• Develop methods to restore native species and stabilize eroding areas.
• Undertake research to assess the methods by which exotic species become established and spread into native plant communities so that strategies for preventing introduction and establishment can be developed and implemented.
• Manage exclusively for native plant species in everything but the developed management zone. In other management zones, limit planting of nonnative species to noninvasive plants that are justified by the historic scene or operational needs.
• Control or eliminate exotic plants and animals, exotic diseases, and pest species where there is a reasonable expectation of success and sustainability. Base control efforts on:
  • the potential threat to legally protected or uncommon native species and habitats
  • the potential threat to visitor health or safety
  • the potential threat to scenic and aesthetic quality
  • the potential threat to common native species and habitat
• Manage exotic diseases and pest species based on similar priorities.	

FIRE MANAGEMENT Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
Park fire management programs are designed to meet resource management objectives prescribed for areas of the parks and to ensure that the safety of firefighters and the public are not compromised. All wildland fires are effectively managed, considering resource values to be protected and firefighter and public safety, using the full range of strategic and tactical operations as described in an approved fire management plan. Prescribed fires are those fires ignited by managers to achieve resource objectives.	NPS *Management Policies 2006;* DO 41, "Wilderness Preservation and Management"; DO-18 and RM-18, "Fire Management Guidelines"
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to management of fire:	
• Maintain a current fire management plan to reflect changes in wildland fire policy, fire use applications, and the body of knowledge on fire effects within the parks' vegetation types. • Maintain a cooperative agreement for fire suppression with appropriate federal, tribal, state, and local agencies and organizations. • Provide information on whether specified objectives for prescribed fires are met. Monitoring programs are instituted for such fires to record fire behavior, smoke behavior, fire decisions, and fire effects. • Conduct research and monitor the effects of fire to ensure that resource objectives are met. • Use fire as a management tool to maintain native plant communities and control exotic species. • Provide visitors information so that they can learn the role of fire in the ecosystem.	

FLOODPLAINS Current laws and policies require that the conditions delineated below be achieved in the parks:	
Desired Condition	Source
Natural floodplain values are preserved or restored.	EO 11988 "Floodplain Management"; Rivers and Harbors Act; NPS *Management Policies 2006;* Special Directive 93-4 "Floodplain Management, Revised Guidelines for National Park Service Floodplain Compliance" (1993)
Long-term and short-term environmental effects associated with the occupancy and modification of floodplains are avoided.	DO 77-2, "Floodplain Management"; National Flood Insurance Program (44 CFR 60); Special Directive 93-4 "Floodplain Management, Revised Guidelines for National Park Service Floodplain Compliance" (1993)
When it is not feasible to locate or relocate development or inappropriate human activities to a site outside the floodplain or where the floodplain will be affected, the National Park Service: • Prepares and approves a statement of findings in accordance with DO 77-2. • Uses nonstructural measures as much as feasible to reduce hazards to human life and property while minimizing impacts on the natural resources of floodplains. • Ensures that structures and facilities are designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR 60).	NPS *Management Policies 2006*, Special Directive 93-4 "Floodplain Management, Revised Guidelines for National Park Service Floodplain Compliance" (1993)
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to floodplains:	
• Prepare a quantitative analysis of flood depth to allow park staff to develop appropriate mitigation measures for the flash flood prone areas. • Establish a flood awareness, preparedness and warning system to evacuate the most flood- and erosion-prone campgrounds at times of imminent danger. • Visitors including those hiking, parking, and picnicking in or near small channels would be made aware of hazards associated with flash flooding and informed of what to do when water is flowing in low-water road crossings.	

GENERAL NATURAL RESOURCES / RESTORATION Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
Native species populations that have been severely reduced in or extirpated from the park are restored where feasible and sustainable. Populations of native plant and animal species function in as natural condition as possible except where special considerations are warranted.	NPS *Management Policies 2006*; NPS-77, "Natural Resources Management Guidelines"
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to protection and restoration of native species:	
• Complete an inventory of plants and animals in the parks and regularly monitor the distribution and condition of selected species that are indicators of ecosystem condition and diversity. • Develop methods to restore native biological communities. • Research soil properties including nutrients, microorganisms, and soil crusts to learn how to restore native plant communities. • Determine source of soil nutrients and the effects of atmospheric pollution on soils and soil biological crusts. • Restore lands previously disturbed by human impact. • Prepare and update an integrated pest management plan to effectively manage pests and determine best practices.	

GEOLOGIC RESOURCES Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
The parks' geologic resources are preserved and protected as integral components of the parks' natural systems.	NPS *Management Policies 2006;* NPS-77, "Natural Resources Management Guidelines"
The service will try to avoid placing new visitor and other facilities in geologically hazardous areas. The service will protect geologic features from the unacceptable impacts of human activity while allowing natural processes to continue.	NPS *Management Policies 2006*
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to geologic resources:	
• Assess the impacts of natural processes and human-related events on geologic resources. • Maintain and restore the integrity of existing geologic resources. • Integrate geologic resource management into NPS operations and planning. • Interpret geologic resources for visitors. • Collect baseline information on surficial geology. • Update geologic map of the parks in digital format that can be used in the parks' geographic information system (GIS). • Update geologic interpretations of localities that are the subject of interpretive stops or displays. • Prepare a geologic inventory, including the identification of the significant geologic processes that shape the parks' ecosystems and the identification of the human influences on those geologic processes (for example "geoindicators"); identification of geologic hazards; inventory of type sections or type localities within the parks; inventory of "textbook" localities that provide particularly good or well-exposed examples of geologic features or events, and that may warrant special protection or interpretive efforts; and, identification of interpretive themes or other opportunities for interpreting the significant geologic events or processes that are preserved, exposed, or occur in the parks. • Manage the parks' geologic features in situ to the extent possible to protect specific features and maintain them in excellent condition.	

LAND PROTECTION The National Park Service will manage for protection of the lands within the parks.	
Desired Condition	**Source**
Land protection plans are prepared to determine and publicly document what lands or interests in land need to be in public ownership, and what means of protection are available to achieve the purposes for which the national park system unit was created.	NPS *Management Policies 2006*
Actions The National Park Service will take the following kinds of actions to comply with the policies mentioned above:	
• Prepare a land protection plan for the parks.	

LIGHTSCAPE MANAGEMENT / NIGHT SKY The parks' night sky is a feature that contributes to visitors' experiences. Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
Excellent opportunities to see the night sky are available. Artificial light sources both within and outside the parks do not unacceptably adversely affect opportunities to see the night sky.	NPS *Management Policies 2006*
Actions The National Park Service will take the following kinds of actions to comply with the policy mentioned above:	
• The National Park Service will cooperate with park visitors, neighbors, and local government agencies to find ways to prevent or minimize the intrusion of artificial light into the night scene in the parks. • In natural areas, artificial outdoor lighting will be limited to basic safety requirements and will be shielded when possible. • The park staff will evaluate the impacts on the night sky caused by park facilities. If light sources in the parks are affecting night skies, the staff will study alternatives such as shielding lights, changing lamp types, or eliminating unnecessary sources.	

NATIVE VEGETATION AND ANIMALS Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
The National Park Service will maintain as parts of the natural ecosystem, all native plants and animals in the parks.	NPS *Management Policies 2006;* NPS-77 "Natural Resources Management Guideline"
Migratory birds, their parts, nests, and eggs are protected.	Migratory Bird Treaty Act
Except under specified conditions, the taking, possession and sale of bald and golden eagles is prohibited.	Bald and Golden Eagle Protection Act
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to native wildlife and vegetation:	
• Complete inventory of the plants and animals in the parks and regularly monitor the distribution and condition of selected species that are indicators of ecosystem condition and diversity. • Develop methods to restore native biological communities. • Minimize human impacts on native plants, animals, populations, communities and ecosystems and the processes that sustain them. • Restore native plant and animal populations in the parks that have been extirpated by past human-caused action, where feasible. • Whenever possible, natural processes will be relied upon to maintain native plant and animal species, and to influence natural fluctuations in populations of these species. • Protect a full range of genetic types (genotypes) of native plant and animal populations in the parks by perpetuating natural evolutionary processes and minimizing human interference with evolving genetic diversity. • Complete vegetation maps for the parks.	

NATURAL SOUNDSCAPES An important part of the NPS mission is to preserve or restore the natural soundscapes associated with national park system units. The sounds of nature are among the intrinsic elements that combine to form the environment of our national park system units. Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
The National Park Service preserves the natural ambient soundscapes, restores degraded soundscapes to the natural ambient condition wherever possible, and protects natural soundscapes from degradation due to human-caused noise. Disruptions from recreational uses are managed to provide a high-quality visitor experience in an effort to preserve or restore the natural quiet and natural sounds.	NPS *Management Policies 2006,* DO 47, "Sound Preservation and Noise Management"
Noise sources are managed to preserve or restore the natural soundscape.	Executive memorandum signed by President Clinton on April 22, 1996
Actions The National Park Service will take the following kinds of actions to comply with the policies mentioned above:	
• Actions will be taken to monitor and minimize or prevent or minimize unnatural sounds that adversely affect the parks' resources or values or visitors' enjoyment of them. • Noise generated by NPS management activities will be minimized by strictly regulating administrative functions such as the use of motorized equipment. Noise will be a consideration in the procurement and use of equipment by the park staff. • Encourage visitors to avoid unnecessary noise, such as through the use of generators and maintaining quiet hours in the campgrounds.	

SOILS Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
The National Park Service actively seeks to understand and preserve the soil resources of the parks, and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.	NPS *Management Policies 2006;* NPS-77 "Natural Resources Management Guideline"
Natural soil resources and processes function in as natural a condition as possible, except where special considerations are allowable under policy.	NPS *Management Policies 2006;* NPS-77, "Natural Resources Management Guidelines"
Facilities are not sited where they can be damaged or destroyed by natural physical processes such as unstable soils. When soil excavation is an unavoidable part of an approved facility development project, the service minimizes soil excavation, erosion, and off-site soil migration during and after the development activity. At construction sites, ground disturbance and site management are carefully controlled to prevent undue damage to soils. To the maximum feasible extent, soils affected by construction are salvaged for use in site restoration. The National Park Service reestablishes natural functions and processes of soils, using the best available technology, within available resources, to restore this physical component of the ecosystem, accelerating recovery.	NPS *Management Policies 2006*

Actions

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to soils:

- Whenever possible, park staff would educate visitors about soils.
- Take actions to prevent — or if that is not possible, to minimize — adverse, potentially irreversible impacts on soils. Possibly implement soil conservation and soil amendment practices to reduce impacts, and import off-site soil or use soil amendments to restore damaged sites. Off-site soil normally is salvaged soil, not soil removed from pristine sites, unless the use of pristine site soil can be achieved without causing any unacceptable adverse impacts on the overall ecosystem.
- When use of a soil fertilizer or other soil amendment is an unavoidable part of restoring a natural landscape or maintaining an altered plant community, use is guided by a written prescription. The prescription ensures that such use of soil fertilizer or soil amendment does not unacceptably alter the physical, chemical, or biological characteristics of the soil, biological community, surface water, or groundwater.
- Minimize soil excavation, erosion, and off-site soil migration during and after any ground-disturbing activity.
- Survey areas of the parks with soil resource problems and take actions appropriate to the management zone to prevent or minimize further erosion, compaction, or deposition.
- Apply effective best management practices to problem soil erosion and compaction areas in a manner that stops or minimizes erosion, restores soil productivity, and reestablishes or sustains a self-perpetuating vegetative cover.

THREATENED AND ENDANGERED SPECIES Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
Federally listed and state-listed threatened and endangered species and their habitats are protected and sustained. Native threatened and endangered species populations that have been severely reduced in or extirpated from the park are restored where feasible and sustainable.	Endangered Species Act; equivalent state protective legislation; NPS *Management Policies 2006;* NPS-77, "Natural Resources Management Guidelines"
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to species of special concern:	
• Support research that contributes to management knowledge of rare and protected species and their habitat. • To protect rare or protected species and their habitat, complete an inventory of rare or protected plants and animals in the parks and regularly monitor the distribution and condition (including, health and disease). Modify management plans to be more effective based on the results of monitoring. • Cooperate with the U.S. Fish and Wildlife Service, as appropriate, to ensure that NPS actions comply with the Endangered Species Act. • Survey for, protect, and strive to recover all species native to the parks that are listed under the Endangered Species Act. • Participate in the recovery planning process when appropriate. • Manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for listed species. • To the greatest extent possible, inventory, monitor, and manage state and locally listed species in a manner similar to federally listed species.	

WATER RESOURCES Current laws and policies require that the conditions delineated below be achieved in the parks:	
Desired Condition	**Source**
Surface water and groundwater are protected and water quality meets or exceeds all applicable water quality standards.	Safe Drinking Water Act; Clean Water Act; Executive Order (EO) 11514 "Protection and Enhancement of Environmental Quality"; NPS *Management Policies 2006;* DO-77 and RM-77, RM-83 "Drinking Water; DO-83 "Public Health"; "Natural Resources Management Guidelines"
NPS and NPS-permitted programs and facilities are maintained and operated to avoid pollution of surface water and groundwater.	Clean Water Act; EO 12088, "Federal Compliance with Pollution Control Standards"; Rivers and Harbors Act; NPS *Management Policies 2006;* DO-77 and RM-77, "Natural Resources Management Guidelines"
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to water resources:	
• Work with appropriate governmental bodies to obtain the highest possible water quality standards available under the Clean Water Act. • Cooperate with other government agencies to maintain and/or restore quality of the parks' water resources. • Take all necessary actions to maintain or restore the quality of surface water and groundwater in the parks consistent with the Clean Water Act. • Promote water conservation by the National Park Service, concession contractors, visitors, and the parks' neighbors. • Apply best management practices to all pollution-generating activities and facilities in the parks, such as NPS maintenance and storage facilities and parking areas. • Minimize the use of pesticides, fertilizers, and other chemicals and manage them in keeping with NPS policy and federal regulations. • Promote greater public understanding of water resource issues at the parks.	

WETLANDS Current laws and policies require that the conditions delineated below be achieved in the parks:	
Desired Condition	**Source**
The natural and beneficial values of wetlands are preserved and enhanced.	Clean Water Act; EO 11990; "Protection of Wetlands"; NPS *Management Policies 2006;* DO 77-1, "Wetland Protection"; Rivers and Harbors Act;
The National Park Service implements a "no net loss of wetlands" policy and strives to achieve a longer-term goal of net gain of wetlands across the national park system through the restoration of previously degraded wetlands.	DO 77-1, "Wetland Protection"; EO 11514 "Protection and Enhancement of Environmental Quality"
The National Park Service avoids to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and avoids direct or indirect support of new construction in wetlands wherever there is a feasible alternative.	EO 11990; "Protection of Wetlands"
The National Park Service compensates for remaining unavoidable adverse impacts on wetlands by restoring wetlands that have been previously degraded.	"Protecting America's Wetlands: A Fair, Flexible, and Effective Approach," White House Office on Environmental Policy, 1993; NPS 77-1, "Wetland Protection"

Actions

Lake Meredith National Recreation Area has jurisdictional wetlands that occur within the canyons around Lake Meredith. In addition, transient wetlands develop within the inundation pool boundaries wherever suitable soil and hydrologic conditions exist. This plan recognizes that these wetlands do not have the same protection as jurisdictional wetlands; however, they are a valuable resource because they provide the same functions and values as jurisdictional wetlands within the national recreation area. Therefore, jurisdictional wetlands will be managed in accordance with laws and policies and the transient wetlands within the inundation pool will be managed to maximize their benefits on other natural resources.

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to wetland resources:

- Locate all facilities to avoid any wetlands if feasible. If avoiding wetlands was not feasible, other actions would be taken to comply with Executive Order 11990 ("Protection of Wetlands"), the Clean Water Act, and Director's Order 77-1 ("Wetland Protection").
- Prepare a statement of findings for jurisdictional wetlands if the NPS actions would result in adverse impacts on wetlands. The statement of findings would include an analysis of the alternatives, delineation of the wetland, a wetland restoration plan to identify mitigation, and a wetland functional analysis of the impact site and restoration site.
- Conduct or obtain parkwide jurisdictional wetland inventories to ensure proper planning, management, and protection of wetlands.
- Within the inundation pool, recognize that wetlands will be developing in different areas as lake levels vary. Control exotic species, such as saltcedar, ensure avoidance of high-value wetlands that develop when siting temporary facilities, such as camping areas in the semi-primitive zone.
- Enhance natural wetland values by using them for educational and scientific purposes that do not disrupt natural wetland functions.

CULTURAL RESOURCE MANAGEMENT REQUIREMENTS

ARCHEOLOGICAL RESOURCES Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
Archeological sites are identified and inventoried and their eligibility for the National Register of Historic Places is determined and documented. Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. When disturbance or deterioration is unavoidable, the site is mitigated and professionally documented and excavated for data recovery and the resulting artifacts, materials, and records are curated and conserved in the parks' museum collections and archives. Concurrence for mitigation is in consultation with the Texas state historic preservation officer (and American Indian tribes if applicable). Some archeological sites that can be adequately protected may be interpreted to the visitor.	National Historic Preservation Act of 1966; Archeological Resources Protection Act of 1979; the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation;* programmatic memorandum of agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (2008); NPS *Management Policies 2006*, DO 28 "Cultural Resource Management Guideline"

Actions

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to archeological sites:

- Survey and inventory archeological sites in both parks to determine and document their eligibility for inclusion in the National Register of Historic Places. The most critical area for study is park lands where development or visitor activity is planned.
- Determine which archeological sites should be entered in the Archeological Sites Management Information System (ASMIS) and which should be nominated for the National Register of Historic Places as eligible for listing.
- Continue to educate visitors on laws and regulations governing archeological resources and their prohibited removal and transport from the parks. Continue to educate visitors on laws and regulations governing archeological resources, including the penalties for illegal collection and removal of artifacts from the park under provisions of the Archeological Resources Protection Act.
- Continue to monitor archeological sites.
- Treat all archeological resources as eligible for listing in the National Register of Historic Places pending a formal determination of eligibility suggested by the National Park Service and concurred with by the state historic preservation officer, in consultation with American Indian tribes if they are associated with the resource.
- Protect all archeological resources eligible for listing or listed in the national register if disturbance to such resources is unavoidable, conduct formal consultation with the Texas Historical Commission (state historic preservation officer) and American Indian tribes in accordance with the National Historic Preservation Act and implementing regulations of the Advisory Council on Historic Preservation.

HISTORIC STRUCTURES Current laws and policies require that the following conditions be achieved for historic structures (including buildings, structures, roads, and trails):	
Desired Condition	**Source**
Historic structures are inventoried and their integrity and eligibility are evaluated under National Register of Historic Places criteria. The qualities that contribute to the listing or eligibility for listing of historic structures on the national register are protected in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* (unless it is determined through a formal process that disturbance or natural deterioration is unavoidable).	National Historic Preservation Act of 1966; Archeological and Historic Preservation Act of 1974; the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*; *Secretary of the Interior's Standards for the Treatment of Historic Properties*; programmatic memorandum of agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Council of State Historic Preservation Officers (2008); NPS *Management Policies 2006*, DO 28 "Cultural Resource Management Guideline."
Fire prevention, protection, and suppression will be primary considerations in the design, construction, rehabilitation, maintenance, and operation of all facilities. Structural fires will be suppressed to prevent the loss of human life and minimize damage to property and resources.	NPS *Management Policies 2006*

Actions

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to historic structures:

- Update and certify the list of classified structures (LCS), and complete a survey, inventory, and national-register eligibility evaluation of historic structures in concurrence with the state historic preservation officer.
- Determine and implement the appropriate level of preservation for each historic structure formally determined to be eligible for listing or listed in the National Register of Historic Places (subject to the *Secretary of the Interior's Standards*).
- Prepare historic preservation plans to guide maintenance.
- Document history through oral histories of individuals, groups, and others who have ties to the parks.
- Before modifying any historic structure on the National Register of Historic Places, such as the McBride House, the National Park Service will consult with the state historic preservation officer, as appropriate, and the Advisory Council for Historic Preservation.
- If necessary: Submit the inventory and evaluation results to the state historic preservation officer for review and comment. Forward the final nomination to the keeper of the national register with recommendations for eligibility to the national register.

ETHNOGRAPHIC RESOURCES Certain contemporary American Indian and other communities are permitted by law, regulation, or policy to pursue customary religious, subsistence, and other cultural uses of NPS resources with which they are affiliated. Recognizing that its resource protection requirement affects this human use and cultural context of the parks' resources, the National Park Service plans and executes programs in ways to safeguard cultural and natural resources while reflecting informed concern for contemporary peoples and cultures affiliated with them.	
Desired Condition	**Source**
Appropriate cultural anthropological research will be conducted in cooperation with groups associated with the parks.	National Historic Preservation Act of 1966 as amended; Advisory Council for Historic Preservation implementing regulations; NPS *Management Policies 2006*, DO 28 "Cultural Resource Management Guideline"
To the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, the National Park Service accommodates access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoids adversely affecting the physical integrity of these sacred sites."	EO 13007 on American Indian Sacred Sites (3 CFR 196 [1997]; American Indian Religious Freedom Act of 1978.
NPS general regulations on access to and use of natural and cultural resources in the national parks are applied in an informed and balanced manner that is consistent with national park purposes and does not unreasonably interfere with American Indian use of traditional areas or sacred resources and does not result in the degradation of national park resources.	EO 13007 on American Indian Sacred Sites; NPS *Management Policies 2006*
American Indians and other individuals and groups linked by ties of kinship or culture to ethnically identifiable human remains, sacred objects, objects of cultural patrimony, and associated funerary objects are consulted when such items may be disturbed or are encountered on park lands. Access to sacred sites and park resources by American Indians continues to be provided when the use is consistent with park purposes and the protection of resources. All ethnographic resources determined eligible for listing or listed in the national register are called traditional cultural properties and are protected through tribal consultation. If disturbance of such resources is unavoidable, formal consultation with the state historic preservation officer and the Advisory Council for Historic Preservation, if necessary, and as appropriate with American Indian tribes, is conducted.	NPS *Management Policies 2006;* Native American Graves Protection and Repatriation Act of 1978
All executive agencies are required to consult, to the greatest extent practicable and to the extent permitted by law, with tribal governments before taking actions that affect federally recognized tribal governments. These consultations are to be open and candid so that all interested parties may evaluate for themselves the potential impact of relevant proposals.	Presidential memorandum of April 29, 1994, on government-to-government relations with tribal governments; National Historic Preservation Act of 1966 as amended; Advisory Council for Historic Preservation implementing regulations
The identities of community consultants and information about sacred and other culturally sensitive places and practices will be kept confidential when research agreements or other circumstances warrant.	National Historic Preservation Act of 1966 as amended; NPS *Management Policies 2006*

ETHNOGRAPHIC RESOURCES (cont.)
Actions To accomplish the above goals, the National Park Service will do the following:
• Prepare an ethnographic overview and assessment. • Survey and inventory ethnographic resources and document their eligibility to the National Register of Historic Places as traditional cultural properties. • Treat all ethnographic resources as eligible for listing in the National Register of Historic Places pending a formal determination by the National Park Service and the state historic preservation officer as to their significance. • Conduct regular consultations with traditionally associated American Indian tribes to continue to improve communications and resolve any problems or misunderstandings that occur. • Continue to provide access to park resources by American Indians when the traditional use is consistent with park purposes and the protection of resources. • Provide for access to and use of natural and cultural resources in the parks and collections by American Indians that are consistent with the parks' purposes; do not reasonably interfere with American Indian use of traditional areas or sacred resources, and do not degrade park resources. • Protect all ethnographic resources determined eligible for listing or listed in the national register; if disturbance to such resources is unavoidable, conduct formal consultation with associated tribes and the state historic preservation officer, and, as appropriate, the Advisory Council on Historic Preservation, in accordance with the National Historic Preservation Act. • Conduct consultation with traditionally associated Indian tribes throughout the course of the planning process for this document. • Have tribes identify resources important to Indian tribes during the scoping process, and carefully incorporate this information into the design of all the alternatives so that these resources are protected under any alternative considered. • Document oral histories with individuals, groups, and tribes linked to the parks to establish cultural affiliation and obtain information necessary to better manage park ethnographic resources.

CULTURAL LANDSCAPES

According to the National Park Service's *Cultural Resource Management Guideline* (DO-28), a cultural landscape is

> a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions.

Current laws and policies require that the following conditions be achieved for cultural landscapes:

Desired Condition	Source
Cultural landscape inventories are conducted to identify landscapes potentially eligible for listing in the National Register of Historic Places, to assist in future management decisions for landscapes and associated resources, both cultural and natural. The management of cultural landscapes focuses on preserving the landscape's physical attributes, biotic systems, and use when that use contributes to its historical significance. The preservation, rehabilitation, restoration, or reconstruction of cultural landscapes is undertaken in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guideline's for the Treatment of Cultural Landscapes*.	National Historic Preservation Act of 1966, as amended (16 USC 470); Advisory Council on Historic Preservation's implementing regulations regarding the "Protection of Historic Properties" (36 CFR 800); *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes* (1996); National Park Service's *Management Policies 2006*; National Park Service's *Cultural Resources Management Guideline* (DO-28, 1998)

Actions

To accomplish the above goals, the National Park Service will do the following:

- Complete a survey, inventory, and national-register eligibility evaluation of cultural landscapes under national register criteria in concurrence with the state historic preservation officer.
- Submit the inventory and evaluation results to the state historic preservation officer and traditionally associated Indian tribes for review and comment; forward the final nomination form to the keeper of the national register with recommendations for eligibility to the national register.
- Determine, implement, and maintain the appropriate level of preservation for each landscape formally determined to be eligible for listing or listed on the national register, subject to the *Secretary of the Interior's Standards*.
- Prepare cultural landscape reports for cultural landscapes to determine historical significance, to support preservation needs, and guide the rehabilitation and maintenance of cultural landscapes.

MUSEUM COLLECTIONS Current laws and policies require that the following conditions be achieved in the parks for museum collections:	
Desired Condition	**Source**
All museum collections (objects, artifacts, specimens, and manuscript collections) are identified and inventoried, catalogued, documented, preserved, and protected, and provision is made for access to and use of these items for exhibits, research, and interpretation. Museum collections are managed under existing NPS curatorial policies with storage at the Panhandle-Plains Historical Museum. Inventory and monitoring activities do not contribute substantial numbers of additional specimens and artifacts requiring expanded curatorial storage. The qualities that contribute to the significance of collections are protected in accordance with established standards.	National Historic Preservation Act of 1966; Native American Graves Protection and Repatriation Act of 1990; DO 24 "NPS Museum Collections Management; NPS *Management Policies 2006*, NPS Museum Handbook; DO 28 "Cultural Resource Management Guideline"
Actions The parks' museum collections are properly stored and have adequate security and adequate fire protection conditions.	
• Because the parks' museum collections are properly stored, no additional actions have been identified.	

VISITOR USE AND EXPERIENCE AND PARK USE REQUIREMENTS

VISITOR USE AND EXPERIENCE AND PARK USE REQUIREMENTS Current laws, regulations, and policies leave considerable room for judgment about the best mix of types and levels of visitor use activities, programs, and facilities. For this reason, most decisions related to visitor use and experience are addressed in the alternatives. However, all visitor use of parks must be consistent with the following guidelines:	
Desired Condition	**Source**
Park resources are conserved "unimpaired" for the enjoyment of future generations. Visitors have opportunities for types of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. No activities occur that would cause derogation of the values and purposes for which the parks were established.	NPS Organic Act, National Park System General Authorities Act, NPS *Management Policies 2006*
For all zones, districts, or other logical management divisions within the parks, the types and levels of visitor use are consistent with the desired resource and visitor experience conditions prescribed for those areas.	National Park System General Authorities Act, NPS *Management Policies 2006*
Visitors to the parks will have opportunities to understand and appreciate the significance of the parks and their resources, and to develop a personal stewardship ethic.	NPS *Management Policies 2006*
To the extent feasible, programs, services, and facilities in the parks are accessible to and usable by all people, including those with disabilities.	Americans with Disabilities Act of 1990; 28 CFR 36 and Architectural Barriers Act Accessibility Guidelines; U.S. Access Board Draft Accessibility Guidelines for Outdoor Developed Areas of 1999; NPS *Management Policies 2006;* DO-42, *Accessibility for Visitors with Disabilities in NPS Programs, Facilities, and Services;* Rehabilitation Act of 1973; Secretary of the Interior's regulation 43 CFR 17, *Enforcement on the Basis of Disability in Interior Programs*

Actions

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to visitor understanding and use of the national park system units:

- Park staff will continue to monitor visitor comments on issues such as crowding, encounters with wildlife, trail safety issues, availability of campsites at busy times of the year, and availability of parking.
- Conduct periodic visitor surveys to stay informed of changing visitor demographics and desires to better tailor programs to visitor needs and desires.
- Pets must be crated, caged, restrained on a leash 6 feet long or less, or otherwise physically confined at all times. Pets are not allowed on park trails. 36 CFR 2.15
- Bicycles are prohibited in the national parks except on established public roads and parking areas. 36 CFR 4.30
- The use of off-road vehicles is prohibited except in designated areas within Lake Meredith National Recreation Area.
- For all zones, districts, or other logical management divisions in the parks, superintendents will identify visitor carrying capacities for managing public use. Superintendents will also identify ways to monitor for, and address, unacceptable impacts on park resources and visitor experiences. 1978 National Parks and Recreation Act (PL 95-625), NPS *Management Policies 2006*

COMMERCIAL VISITOR SERVICES

Commercial services are another way of providing for the visitor use and experience and park use requirements already described. Commercial operators are "partners" with the National Park Service to provide goods and services to visitors that are necessary and appropriate but not provided by NPS personnel. The Park Service manages commercial service levels and types to achieve the same resource protection and visitor experience conditions required by the NPS Organic Act, General Authorities Act, management policies, and other regulations and policies. In addition, commercial services must comply with the provisions of the NPS Concessions Management Improvement Act of 1998. By law, all commercial activities, concession contracts, commercial use authorizations, and leases in parks must be authorized in writing by the superintendent. A commercial activity is defined as any activity for which compensation is exchanged. It includes activities by for-profit and nonprofit operators. Commercial visitor services include concession contracts, commercial use authorizations, leases, cooperative agreements, and special use permits. All commercial visitor services must be managed. All commercial visitor services must be necessary and/or appropriate and achieve the resource protection and visitor use goals for the park unit.

Desired Condition	Source
Same as Visitor Use and Experience and Park Use Requirements, in addition to the following:.	Visitor Use and Experience and Park Use Requirements
All commercial services must be authorized, must be necessary and/or appropriate, and must be economically feasible. Appropriate planning must be done to support commercial services authorization.	NPS Concessions Management Improvement Act of 1998 NPS *Management Policies 2006*

Actions

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to commercial services:

- Establish and document that all commercial services in the park units are necessary and/or appropriate before they are authorized or reauthorized.
- Ensure that all necessary and/or appropriate commercial visitor activities in the park units are authorized in writing by the superintendent.
- Stop all unauthorized commercial activities in the park units.
- Use the most appropriate authorization tool (concession contracts, commercial use authorizations, leases, cooperative agreements, and special use permits) to manage the commercial services program effectively and efficiently.
- Ensure that all commercial activities in the park units provide high-quality visitor experiences while protecting important natural, cultural, and scenic resources.
- Ensure that new or modified concession contracts are economically feasible and that the operator has a reasonable opportunity to make a profit.
- Establish levels of commercial use that are consistent with resource protection and visitor experience goals. Ensure that all commercial services are safe and sustainable.
- Prepare a commercial visitor services plan as necessary.

NATIONAL PARK SERVICE OPERATIONS	
Desired Condition	Source
Necessary and appropriate visitor and administrative facilities consistent with the conservation of park resources and values are provided. Facilities are harmonious with park resources, compatible with natural processes, aesthetically pleasing, functional, energy- and water-efficient, cost effective, universally designed, and as welcoming as possible to all segments of the population. Facilities are developed within a park only after a determination has been made that the facility is necessary and appropriate, and that it would not be practicable for the facility to be developed, or the service provided, outside the park. Facilities within park boundaries are placed only in locations identified in an approved general management plan, or in implementation planning documents, as being suitable and appropriate. Management facilities are located outside park boundaries whenever the park can be adequately supported from such a location. When such facilities must be in the park, they will not adversely affect park resources or values, or detract from the visitor experience. A program of preventive and rehabilitative maintenance and preservation is conducted to protect the physical integrity of facilities and preserve or maintain facilities in their optimum sustainable condition. Park facilities and operations demonstrate environmental leadership by incorporating sustainable practices to the maximum extent feasible in planning, design, siting, construction, and maintenance, including preventive and rehabilitative maintenance programs.	NPS *Management Policies 2006*
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to commercial services:	
• Park staff will continue to monitor and maintain NPS facilities to ensure their integrity and sustainability. • New facilities within the parks will incorporate sustainable practices and designs. Existing facilities within the parks will use sustainable components to the maximum feasible extent.	

PUBLIC HEALTH AND SAFETY	
NPS *Management Policies 2006* states that the saving of human life will take precedence over all other management actions as the National Park Service strives to protect human life and provide for injury-free visits. Current laws and policies require that the following conditions be achieved in the parks:	
Desired Condition	**Source**
While recognizing that there are limitations on its capability and constraints imposed by the Organic Act to not impair resources, the service and its contractors and cooperators will seek to provide a safe and healthful environment for visitors and employees. The park staff will strive to identify recognizable threats to safety and health and protect property by applying nationally accepted standards. Consistent with requirements, the park staff will reduce or remove known hazards and/or apply appropriate mitigation measures, such as closures, guarding, gating, education, and other actions.	NPS *Management Policies 2006,* DO-50 and RM-50 "Safety and Health"; DO-58 and RM-58 "Structural Fire Management"; DO-83 and RM-83 "Public Health"; DO-51 and RM-51 "Emergency Medical Services"; DO-30 and RM-30 "Hazard and Solid Waste Management"; OSHA 29 CFR.

Actions

The National Park Service will take the following kinds of actions to meet legal and policy requirements related to public health and safety:

- Establish a documented Safety Program in the parks to address health and safety concerns and identify appropriate levels of action and activities.
- Ensure that all potable water systems and waste water systems in the parks meet state and federal requirements.
- Provide for interpretive signs and materials to notify visitors of potential safety concerns, hazards, and procedures to help provide for a safe visit to the parks and to ensure that visitors are aware of possible risks of certain activities.
- Establish a Structural Fire Program and maintain a structural fire brigade to provide prevention programs and protection of life and property.
- Develop an emergency preparedness program to maximize visitor and employee safety and protection of resources and property.
- Develop an emergency operations plan including a hazardous spill response plan to plan for and respond to spills.
- Provide a search and rescue program to make reasonable efforts to search for lost persons and rescue sick, injured, or stranded persons.
- Provide an emergency medical services program to provide for the care of the ill and injured, including emergency pre-hospital care and the emergency medical transport of sick and injured by ambulance to medical help.

SOCIOECONOMICS Current laws and policies require that the following conditions be achieved in the national parks:	
Desired Condition	**Source**
The National Park Service collaborates with industry professionals to promote sustainable and informed tourism that incorporates socioeconomic and ecological concerns and supports long-term preservation of park resources and quality visitor experiences. The National Park Service works cooperatively with others to address mutual interests in the quality of life of community residents, including matters such as compatible economic development. The national park is managed as part of a greater ecological, social, economic, and cultural system. Good relations are maintained with adjacent landowners, surrounding communities, and private and public groups that affect, and are affected by, the park. The park is managed proactively to resolve external issues and concerns and ensure that park values are not compromised. Because the national park is an integral part of a larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts, protect national park resources, and address mutual interests in the quality of life for community residents. Regional cooperation involves federal, state, and local agencies, Indian tribes, neighboring landowners, and all other concerned parties.	NPS *Management Policies 2006*
Actions • Park staff will continue to consult with neighboring communities, landowners, and partners to resolve conflicts and to share concerns and ideas.	

SUSTAINABLE DESIGN AND DEVELOPMENT	
Sustainability is the result achieved by managing units of the national park system in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices minimize the short- and long-term environmental impacts of developments and other activities through resource conservation, recycling, waste minimization, and the use of energy-efficient and ecologically responsible materials and techniques.	
Desired Condition	**Source**
NPS and concession contract visitor management facilities are harmonious with park resources, compatible with natural processes, aesthetically pleasing, functional, as accessible as possible to all segments of the population, energy-efficient, and cost-effective.	NPS *Management Policies 2006*; EO 13123, "Greening the Government through Efficient Energy Management"; EO 13101, "Greening the Government through Waste Prevention, Recycling, and Federal Acquisition"; NPS *Guiding Principles of Sustainable Design;* DO 13, "Environmental Leadership"; DO 90, "Value Analysis."
All decisions regarding park operations, facilities management, and development in the parks — from the initial concept through design and construction — reflect principles of resource conservation. Thus, all park developments and park operations are sustainable to the maximum degree possible and practical. New developments and existing facilities are located, built, and modified according to the *Guiding Principles of Sustainable Design* (NPS 1993) or other similar guidelines.	"Greening Federal Facilities: An Energy, Environmental, and Economic Resource Guide for Federal Facility Managers and Designers," 2nd ed. NPS Green Parks Plan
Management decision making and activities throughout the national park system should use value analysis, which is mandatory for all Department of the Interior bureaus, to help achieve this goal. Value planning, which may be used interchangeably with value analysis/value engineering/value management, is most often used when value methods are applied on general management or similar planning activities.	Director's Order 90: *Value Analysis*

Actions

The NPS *Guiding Principles of Sustainable Design* (1993b) directs NPS management philosophy. It provides a basis for achieving sustainability in facility planning and design, emphasizes the importance of biodiversity, and encourages responsible decisions. The guidebook articulates principles to be used in the design and management of tourist facilities that emphasize environmental sensitivity in construction, the use of nontoxic materials, resource conservation, recycling, and integrating visitors with natural and cultural settings. Sustainability principles have been developed and are followed for interpretation, natural resources, cultural resources, site design, building design, energy management, water supply, waste prevention, and facility maintenance and operations. The National Park Service also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology. Energy efficiency is incorporated into the decision-making process during the design and acquisition of buildings, facilities, and transportation systems emphasizing the use of renewable energy sources. The NPS Green Parks Plan further advances the agency's commitment to reducing environmental impacts and greenhouse gas emissions across all levels of the organization.

In addition to following these principles, the following also will be accomplished:

- Have NPS staff work with appropriate experts to make park facilities and programs sustainable. Perform value analysis and value engineering, including life cycle cost analysis, to examine the energy, environmental, and economic implications of proposed developments.
- Support and encourage suppliers, permittees, and contractors to follow sustainable practices.
- Address sustainable practices within and outside the national parks in interpretive programs.
- Promote the reduction, reuse, and recycling of materials; support the reuse of existing buildings and facilities over new construction; require new developments or modifications of existing facilities to be built using NPS sustainability guidelines.
- The parks use water and energy conservation technologies and renewable energy sources whenever possible. Biodegradable, nontoxic, and durable materials are used in the parks whenever possible. Park personnel promote the reduction, use, and recycling of materials and avoid as much as possible materials that are nondurable or environmentally detrimental or that require transportation from great distances.
- Promote and encourage modes of transportation other than the single-occupancy vehicles. Promote land use planning for transportation that can efficiently meet human needs and can be responsibly planned to conserve the finite resources.

TRANSPORTATION TO AND WITHIN THE PARKS Current laws and policies require that the following conditions be achieved in the national parks:	
Desired Condition	**Source**
Visitors have reasonable access to the parks, and there are connections from the parks to regional transportation systems as appropriate. Transportation facilities in the parks provide access for the protection, use, and enjoyment of park resources. They preserve the integrity of the surroundings, respect ecological processes, protect park resources, and provide the highest visual quality and a rewarding visitor experience.	"NPS Transportation Planning Guidebook," p. 1.
The National Park Service participates in all transportation planning forums that may result in links to parks or impacts on park resources. Working with federal, tribal, state, and local agencies on transportation issues, the National Park Service seeks reasonable access to parks, and connections to external transportation systems.	NPS *Management Policies 2006*
Where feasible, and after concurrence of the entity with road jurisdiction, non-NPS roads that are no longer needed will be closed or removed, and the area will be restored to a natural condition.	NPS *Management Policies 2006*
Actions The National Park Service will take the following kinds of actions to meet legal and policy requirements related to transportation to and in the national park system unit:	
• Work with gateway communities and local, regional, state, and federal agencies to develop a regional approach to transportation planning between local communities and the parks. • Work with the U.S. Department of Transportation, the Federal Highway Administration, the Texas Department of Transportation, and other sources to seek funding and staff to participate in and encourage effective regional transportation planning and enhancements, including both road and nonroad transportation needs (for example, bikeways, road signs, historic preservation, traffic calming devices, roadside rest area enhancements, and gateway community enhancements). • Avoid or mitigate (1) harm to individual animals, (2) the fragmentation of plant and animal habitats, and (3) the disruption of natural systems.	

UTILITIES AND COMMUNICATION FACILITIES Current laws and policies require that the following conditions be achieved in the national parks:	
Desired Condition	**Source**
Park resources or public enjoyment of the parks are not denigrated by nonconforming uses. Telecommunication structures are permitted in the park to the extent that they do not jeopardize the parks' mission and resources. No new nonconforming use or rights-of-way are permitted through the parks without specific statutory authority and approval by the director of the National Park Service or his representative, and are permitted only if there is no practicable alternative to such use of NPS lands.	Telecommunications Act; 16 USC 79; 23 USC 317; 36 CFR 14; NPS *Management Policies 2006;* DO 53A, "Wireless Telecommunications"; Reference Manual 53, "Special Park Uses."
Actions	
The Telecommunications Act of 1996 directs all federal agencies to assist in the national goal of achieving a seamless telecommunications system throughout the United States by accommodating requests by telecommunication companies for the use of property, rights-of-way, and easements to the extent allowable under each agency's mission. The National Park Service is legally obligated to permit telecommunication infrastructure in the parks if such facilities can be structured to avoid interference with park purposes. • Locate new or reconstructed utilities and communications infrastructures in association with existing structures and along roadways or other established corridors in developed areas. For reconstruction or extension into undisturbed areas, select routes that will minimize impacts on the parks' natural, cultural, and visual resources. • Place utility lines underground to the maximum extent possible. • Work with service companies, local communities, and the public to locate new utility lines so that there is minimal effect of park resources. • Follow NPS policies in processing applications for commercial telecommunications applications.	

APPENDIX D: CORRESPONDENCE

United States Department of the Interior
NATIONAL PARK SERVICE
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch. Texas 79036-1460

In reply refer to:
L3215 (LAMR)

April 15, 2009

Mr. Tom Cloud, Field Supervisor
U.S. Fish and Wildlife Service
711 Stadium Dr., Suite 252
Arlington, TX 76011

Dear Mr. Cloud:

The National Park Service is starting development of a General Management Plan for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument in Hutchinson, Potter, and Moore counties in Texas.

This long-term, comprehensive plan will define overall management goals and objectives, identify resources that need protection and prescribe general management actions for the national preserve. Specific resources or areas are managed under separate, more detailed plans based on the General Management Plan.

At this I am requesting a current list of federally listed plant and animal species that might occur in the vicinity of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, and designated critical habitat, if any, for such species.

This letter will serve as a record that the National Park Service is initiating consultation with your agency pursuant to the requirements of the Endangered Species Act and National Park Service management policies.

I appreciate your attention to this inquiry and look forward to working with your office throughout this planning effort. If you have any questions, please contact Arlene Wimer, Chief of Resource Management. She can be reached at (806) 857-0309.

Sincerely,

Cindy Ott-Jones
Superintendent

Enclosure: LAMR/ALFL GMP Newsletter#1

Cc:
Erin Flanagan, DSC

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
WinSystems Center Building
711 Stadium Drive, Suite 252
Arlington, Texas 76011

May 4, 2009

21420-2009-I-0235

Ms. Cindy Ott-Jones
NPS Lake Meredith National Recreation Area
P.O. Box 1460
Fritch, Texas 79036-1460

Dear Ms. Ott-Jones:

This responds to your April 15, 2009 letter requesting information on federally listed threatened and endangered species with regard to the proposed General Management Plan for Lake Meredith National Recreation Area (LMNRA) and Alibates Flint Quarries National Monument (AFQNM) in Hutchinson, Moore and Potter Counties, Texas.

The United States Fish and Wildlife Service's (Service) data indicates that the following endangered (E), threatened (T), delisted (DL), and candidate (C) species have been documented, or are known to occur in Hutchinson, Moore and Potter Counties:

bald eagle (*Haliaeetus leucocephalus*) – (DL) Hutchinson, Moore, Potter
lesser prairie-chicken (*Tympanuchus pallidicinctus*) – (C) Moore
whooping crane (*Grus americana*) – (E) Potter
Arkansas River shiner (*Notropis girardi*) – (T) Hutchinson, Potter
interior least tern (*Sterna antillarum*) – (E) Hutchinson

Candidate species are not afforded federal protection under the Endangered Species Act; however, we recommend that potential impacts to these species be considered during project planning. For information on the general biology of these species, as well as updated county by county species lists, visit our website at: http://fws.gov/southwest/es. Currently our records indicate that the lesser prairie-chicken does not occur near the project area, but an isolated population occurs in the southwestern corner of Moore County.

Our records also indicate that the LMNRA has had nesting bald eagles. Please be aware that the bald eagle (*Haliaeetus leucocephalus*) was removed from the federal threatened and endangered species list effective August 8, 2007. However, bald eagles are still afforded safeguards under the Migratory Bird Treaty Act and Golden Eagle Protection Act. We recommend all activities be conducted in accordance with the Service's National Bald Eagle Management Guidelines which

may be accessed at the following address:
http://www.fws.gov/migratorybirds/issues/baldeagle/nationalbaldeaglemanagementguidelines.pdf.

The Arkansas River shiner (ARS)(*Notropis girardi*) is limited to the Canadian River in the State of Texas. It occurs in the Canadian River upstream of Lake Meredith and may include protions of the LMNRA. The ARS also occurs in Hutchinson County such that activities within the LMNRA could affect downstream populations of the ARS.

The whooping crane (*Grus americana*) has historically been known to rest and feed around Lake Meredith during its migratory flights and have been seen in Potter County in the recent past. While the LMNWR does not occur in the whooping crane migratory corridor where 94% of migratory whooping cranes are spotted, there could be occasional individuals that utilize the region.

The interior least tern (*Sterna antillarum*) may use sandbars in the Canadian River downstream of the LMNRA in Hutchinson County. Although the least tern is unlikely to occur within the LMNRA, activities that affect downstream portions of the Canadian River could also potentially affect the interior least tern.

The Service recommends that the National Park Service be mindful of the potential presence of these listed species within the LMNRA, and in both upstream and downstream portions of the Canadian River, when developing the General Management Plan for the LMNRA and AFQMN.

Thank you for the opportunity to comment on the proposed project. If you have any questions please contact John Morse of my staff at (817) 277-1100.

Sincerely,

Tom Cloud

Thomas J. Cloud, Jr.
Field Supervisor

United States Department of the Interior
NATIONAL PARK SERVICE
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch, Texas 79036-1460

In reply refer to:
L3215 (LAMR)

April 15, 2009

Mr. Bobby Farquhar
Regional Director, Region 1
Texas Parks and Wildlife Department
3407-B S. Chadbourne
San Angelo, TX 76903

Dear Mr. Farquhar:

The National Park Service is starting development of a General Management Plan for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument in Hutchinson, Potter, and Moore counties in Texas.

This long-term, comprehensive plan will define overall management goals and objectives, identify resources that need protection and prescribe general management actions for the parks. Specific resources or areas are managed under separate, more detailed plans based on the General Management Plan.

At this time I am requesting a current list of state-listed or any other special status species that might occur in the Lake Meredith National Recreation Area and Alibates Flint Quarries and designated critical habitat, if any, for such species.

This letter will serve as a record that the National Park Service is initiating consultation with your agency pursuant to the requirements of the Endangered Species Act and National Park Service management policies.

I appreciate your attention to this inquiry and look forward to working with your office throughout this planning effort. If you have any questions, please contact Arlene Wimer, Chief of Resource Management. She can be reached at (806) 857-0309.

Sincerely,

Cindy Ott-Jones
Superintendent

Enclosure: LAMR/ALFL GMP Newsletter#1

Cc:
Erin Flanagan, DSC

United States Department of the Interior
NATIONAL PARK SERVICE
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch. Texas 79036-1460

In reply refer to:
L3215 (LAMR)

April 15, 2009

Mr. F. Lawerence Oaks, SHPO
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

Dear Mr. Oaks:

The National Park Service has initiated the preparation of a General Management Plan (GMP) for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument. The GMP will provide National Park Service managers a comprehensive planning framework for managing the preserve over the next 15 to 20 years. Consistent with the parks's purpose, significance, and legislative mandates, the plan will identify strategies for achieving desired resource conditions, visitor experiences, and the appropriate types and locations of potential future development. In compliance with the National Environmental Policy Act and NPS policy, the GMP will be combined with an environmental impact statement (EIS). The GMP/EIS will identify significant issues and concerns, present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative.

We wish to invite the participation of the Texas Historical Commission in the GMP planning process as we assess issues and explore alternative visions for long-term management of the preserve. We will continue to keep you informed as the planning effort progresses over the next few years, and welcome at any time your comments and advice on decisions regarding protection and preservation of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument's cultural resources and historic properties.

I appreciate your attention to this inquiry and look forward to working with your office throughout this planning effort. If you have any questions, please contact Arlene Wimer, Chief of Resource Management. She can be reached at (806) 857-0309.

Sincerely,

Cindy Ott-Jones
Superintendent

Enclosure: LAMR/ALFL GMP Newsletter#1

Cc:
Erin Flanagan, DSC

TEXAS HISTORICAL COMMISSION
real places telling real stories

May 13, 2009

Cindy Ott-Jones
Superintendent
Lake Meredith NRA
P.O. Box 1460
Fritch, Texas 79036-1460

Re: Project review under Section 106 of the National Historic Preservation Act of 1966, proposed General Management Plan for Lake Meredith NRA and Alibates Flint Quarries National Monument, Hutchinson County, Texas (NPS)

Dear Ms. Ott-Jones:

Thank you for your correspondence describing the above referenced project. This letter serves as comment on the proposed undertaking from the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission.

The review staff, led by Debra L. Beene, has completed its review. We look forward to receiving the draft as the effort moves forward to create a planning document for managing the park's significance cultural resources. Some of the most significant cultural resource sites in Texas are located within your park, including prehistoric rock art and Antelope Creek Phase settlements.

We are available to discuss issues as they arise and look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your assistance in this state review process, and for your efforts to preserve the irreplaceable heritage of Texas. **If you have any questions concerning our review or if we can be of further assistance, please contact Debra L. Beene at 512/463-5865.**

Sincerely,

for
F. Lawerence Oaks, State Historic Preservation Officer

cc: Arlene Wimer, Chief of Resource Management, Lake Meredith NRA

FLO/dlb

RICK PERRY, GOVERNOR • JON T. HANSEN, CHAIRMAN • F. LAWERENCE OAKS, EXECUTIVE DIRECTOR
P.O. BOX 12276 • AUSTIN, TEXAS • 78711-2276 • P 512.463.6100 • F 512.475.4872 • TDD 1.800.735.2989 • www.thc.state.tx.us

United States Department of the Interior
NATIONAL PARK SERVICE
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch. Texas 79036-1460

In reply refer to:
L3215
April 15, 2009

Mr. Reid Nelson
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue NW, Suite 803
Old Post Office Building
Washington, DC 20004

Dear Mr. Nelson:

The National Park Service has initiated the preparation of a General Management Plan (GMP) for Lake Meredith National recreation Area and Alibates Flint Quarries National Monument. The GMP will provide National Park Service managers a comprehensive planning framework for managing the preserve over the next 15 to 20 years. Consistent with the park's purpose, significance, and legislative mandates, the plan will identify strategies for achieving desired resource conditions, visitor experiences, and the appropriate types and locations of potential future development. In compliance with the National Environmental Policy Act and NPS policy, the GMP will be combined with an environmental impact statement (EIS). The GMP/EIS will identify significant issues and concerns, present a reasonable range of management alternatives for addressing these issues, and will analyze the environmental impacts of each alternative.

We wish to invite the participation of the Advisory Council in the GMP planning process as we assess issues and explore alternative visions for long-term management of the preserve. We will continue to keep you informed as the planning effort progresses over the next few years, and welcome at any time your comments and advice on decisions regarding protection and preservation of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument 's cultural resources and historic properties.

We look forward to working with your office throughout this planning effort. If you have any questions, please contact Arlene Wimer, Chief of Resource Management. She can be reached at (806) 857-0309.

Sincerely,

Cindy Ott-Jones
Superintendent

Enclosure: LAMR/ALFL GMP Newsletter#1

Cc:
Erin Flanagan, DSC

Preserving America's Heritage

May 19, 2009

Cindy Ott-Jones
Superintendent
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch, TX 79036-1460

REF: *Notification of Preparation of General Management Plan*
Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument, Fritch, Texas

Dear Ms. Ott-Jones:

The Advisory Council on Historic Preservation (ACHP) recently received your notification for the development of a General Management Plan for the Lake Meredith National Recreation Area and the Alibates Flint Quarries National Monument. Pursuant to Section 106 of the National Historic Preservation Act, we encourage the park to consult with the Texas State Historic Preservation Officer (SHPO) and interested Indian tribes, as well as other interested parties, to consider alternatives in the preparation of this plan to avoid, minimize or mitigate any potential adverse effects to historic properties.

Should the park determine, in consultation with the SHPO, tribes, and other consulting parties, that its preferred alternative may have an adverse effect on properties listed or eligible for listing on the National Register of Historic Places, we request that you notify us of the adverse effect and provide adequate documentation for our review. The ACHP's decision to participate in the consultation to resolve adverse effects to historic properties will be based on the applicability of the criteria in Appendix A of the ACHP's regulations, *Protection of Historic Properties* (36 CFR Part 800).

Thank you for providing us with this notification. If you have any additional questions or require the further assistance of the ACHP, please contact Kelly Yasaitis Fanizzo at (202) 606-8583, or by email at kfanizzo@achp.gov.

Sincerely,

Caroline D. Hall
Assistant Director
Federal Property Management Section
Office of Federal Agency Programs

United States Department of the Interior
NATIONAL PARK SERVICE
Lake Meredith National Recreation Area
Alibates Flint Quarries National Monument
P.O. Box 1460
Fritch, Texas 79036-1460

In reply refer to:
L3215 (LAMR)

April 15, 2009

Mr. David Manning, Chief of Regulatory
U.S. Army Corps of Engineers / Tulsa Dist.
1645 S. 101 E. Ave.
Tulsa, OK 74128-4609

Dear Mr. Manning:

The National Park Service is starting development of a General Management Plan for Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument in Hutchinson, Potter, and Moore counties in Texas.

This long-term, comprehensive plan will define overall management goals and objectives, identify resources that need protection and prescribe general management actions for the parks. Specific resources or areas are managed under separate, more detailed plans based on the General Management Plan.

At this time I am requesting a list of any Army Corps of Engineers projects that are currently being conducted or planned to take place within the vicinity of Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument.

This letter will serve as a record that the National Park Service is initiating consultation with your agency pursuant to the requirements of the National Environmental Policy Act and National Park Service management policies.

I appreciate your attention to this inquiry and look forward to working with your office throughout this planning effort. If you have any questions, please contact Arlene Wimer, Chief of Resource Management. She can be reached at (806) 857-0309.

Sincerely,

Cindy Ott-Jones
Superintendent

Enclosure: LAMR/ALFL GMP Newsletter#1

Cc:
Erin Flanagan, DSC

REFERENCES

American Farmland Trust

2009 "Farming on the Edge: Sprawling Development Threatens America's Best Farmland, Texas." Available on the Internet at http://www.farmland.org/resources/fote/pdfs/map_texas.pdf.

Archer, Steven R. and Katherine I. Predick

2008 "Climate Change and Ecosystems of the Southwestern United States." *Rangelands*, June. Society for Range Management.

Arizona State University

2004 *Visitor Study Final Technical Report: Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument*. Prepared for the National Park Service as part of Cooperative Agreement CA-1200-99-009 ASU-08/ Task Agreement J2011030737. August.

Bureau of Reclamation (BOR), U.S. Department of the Interior

2007 *Reclamation: Managing Water in the West*. Technical Memorandum No. 86-68260-07-01. Lake Meredith National Recreation Area, Alibates Flint Quarries National Monument, Texas. 2004–2006 Vegetation. Classification and Mapping, Remote Sensing and GIS Group, Technical Service Center. Denver, Colorado. Available on the Internet at http://biology.usgs.gov/npsveg/lamr_alfl/lamr_alflrpt.pdf.

Canadian River Municipal Water Authority

2005 *Arkansas River Shiner (Notropis girardi) Management Plan for the Canadian River from U. S. Highway 54 at Logan, New Mexico to Lake Meredith*. Sanford, TX: Available on the Internet at http://www.fws.gov/southwest/es/oklahoma/Documents/ARShinerManagement%20Plan-NM&WT-Final%20with%20MOA%20sigs%20and%20Sup%20Docs2%20Optimized.pdf.

2010 Information extracted from "History" and "Lake Meredith." Sanford, TX. Available on the Internet at http://www.crmwa.com/.

2011 *Lake Meredith Frequently Asked Questions*. Sanford, TX. Available on the Internet at http://www.crmwa.com/FAQ.htm.

Council on Environmental Quality (CEQ)

1978 "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act." *Code of Federal Regulations,* Title 40, Parts 1500–1508.

1980 "Analysis of Impacts on Prime and Unique Agricultural Lands in Implementing NEPA." *Federal Register* 45: 59189.

1981 "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations." *Federal Register* 46: 18026.

1997 *Environmental Justice Guidance under the National Environmental Policy Act*. Washington, D.C.: Executive Office of the President. Available on the Internet at http://www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_ceq1297.pdf.

Derrick, Randall

2007 *Canvas of Stone: An Overview of the Petroglyphs of Alibates National Monument*. Amarillo TX. Digital Plain Media Studios, Panhandle Nation. Available on the Internet at http://www.panhandlenation.com/history/prehistory/petroglyphs.html.

Diffenbaugh, Noah S., Filippo Giorgi, and Jeremy S. Pal

2008 "Climate Change Hotspots in the United States." *Geophysical Research Letters*, Vol. 35: L16709. Purdue University. Available on the Internet at http://www.eas.purdue.edu/earthsystem/Diffenbaugh_GRL_08.pdf.

Dunn, Roy Sylvan

2010 "Droughts." In *Handbook of Texas Online*. Austin TX: Texas State Historical Association. Available in the Internet at http://www.tshaonline.org/handbook/online/articles/ybd01.Federal Emergency Management Agency (FEMA)

2007 *Tornado Risks and Hazards in the Midwest United States*. Washington, DC: Department of Homeland Security, Tornado Recovery Advisory FEMA DR-1699-RA1. Available on the Internet at http://www.ksready.gov/PDF/May%202007%20Tornado%20Recovery%20Advisory.pdf.

Foster, Nichole Michelle

2008 "Abstract: Drought Evaluation Using Tree-Ring Based Reconstructed Streamflows for Rivers in New Mexico." El Paso, TX: Dissertation for completion of a master's degree, The University of Texas at El Paso. Publication Number AAT 1453860, ISBN 9780549588931. Available on the Internet at http://gradworks.umi.com/14/53/1453860.html.

Frissell, Sidney S.

1978 "Judging Recreation Impacts on Wilderness Campsites." *Journal of Forestry* 76: 481-483.

Intergovernmental Panel on Climate Change

2007a *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, UK, and New York, NY: Edited by S. Solomon, D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor, and H. L. Miller. Cambridge University Press. Available on the Internet at http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg1_report_the_physical_science_basis.htm.

2007b *Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Geneva, Switzerland: Core Writing Team, edited by R.K. Pachauri and A. Reisinger. Available on the Internet at http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm.

Leung,Y. F., and J.L. Marion

2000 "Recreation Impacts and Management in Wilderness: a State-of-Knowledge Review." Ogden, Utah: In *Proceedings: Wilderness Science in a Time of Change; Volume 5: Wilderness Ecosystems, Threats, and Management*. D.N. Cole, S.F. McCool, W.T. Borrie, and J.O'Loughlin, compilers. Proceedings RMRS-P-15-Volume 5. U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

Marion, J. L.

1991 *Developing a Natural Resource Inventory and Monitoring Program for Visitor Impacts on Recreation Sites: A Procedural Manual*. National Park Service Natural Resources Report NPS/NRVT/NRR-91/06.

Moss, Sue Winton

1999 *Communities Affiliated with Lake Meredith National Recreation Area*. Prepared for Lake Meredith National Recreation Area. Austin, TX. May 10.

National Climatic Data Center

2011 "Texas Climate Descriptions." Available on the Internet at http://web2.airmail.net/danb1/texas_climate_descriptions.htm.

National Oceanic and Atmospheric Administration (NOAA)

2011 "Amarillo Climate Notes." National Weather Service Weather Forecast Office, Amarillo, TX. Available on the Internet at http://www.srh.noaa.gov/ama/?n=rec_norm_ama

National Park Service (NPS), U.S. Department of the Interior

1973 *Lake Meredith National Recreation Area Master Plan*. Denver, CO. March.

1976 *Lake Meredith National Recreation Area Statement for Management*. Fritch, TX.

1996 *Resources Management Plan, Lake Meredith National Recreation Area, Alibates Flint Quarries National Monument*. December.

1998 *NPS-28: Cultural Resource Management Guideline*. Washington, DC. Available on the Internet at http://home.nps.gov/applications/npspolicy/DOrders.cfm.

2001 Director's Order 12 and Handbook: *Conservation Planning, Environmental Impact Analysis, and Decision Making*. Washington, DC.

2002a Director's Order 77-1: *Wetland Protection*. Washington, DC. Available on the Internet at http://home.nps.gov/applications/npspolicy/DOrders.cfm.

2002b *Oil and Gas Management Plan, Lake Meredith National Recreation Area, Alibates Flint Quarries National Monument, Texas*. December.

2002c *Final Oil and Gas Management Plan Environmental Impact Statement, Lake Meredith National Recreation Area, Alibates Flint Quarries National Monument, Texas*. April.

2004a Director's Order 28A: *Archeology*. Washington, DC. Available on the Internet at http://home.nps.gov/applications/npspolicy/DOrders.cfm.

2004b Procedural Manual 77-2: *Floodplain Management*. Available on the Internet at http://home.nps.gov/applications/npspolicy/DOrders.cfm.

2005 "Geology Fieldnotes, Alibates Flint Quarries National Monument. Washington, DC." Available on the Internet at http://www.nature.nps.gov/geology/parks/alfl/index.cfm.

2006a "2006 Recreation Visitors Ranked by Number of Visitors." Available on the Internet at <http://www2.nature.nps.gov/stats/ranked2006.pdf>.

2006b *Management Policies 2006*. Washington, DC. Available on the Internet at <http://www.nps.gov/policy/MP2006.pdf>.

2008a *Aerial Application of Herbicide for Saltcedar Eradication at Lake Meredith National Recreation Area, Environmental Assessment*. April.

2008b Director's Order 24: *NPS Museum Collections Management*. Washington, DC. Available on the Internet at http://home.nps.gov/applications/npspolicy/DOrders.cfm.

2008c *Fire Management Plan, Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument,Texas*. 2005 Version, updated in 2008.

2008d Procedural Manual 77-1: *Wetland Protection*. Denver CO: Natural Resource Program Center, Water Resources Division. Available on the Internet at http://home.nps.gov/applications/npspolicy/DOrders.cfm.

2009 "2009 Recreation Visitors Ranked by Number of Visitors." Available on the Internet at http://www.nature.nps.gov/stats/viewReport.cfm.

2010a Information extracted from "NPS Stats." Public Use Statistics Office, Washington, DC. Available on the Internet at http://www.nature.nps.gov/stats/park.cfm?parkid=496.

2010b *Lake Meredith National Recreation Area Multi-Use Trail Environmental Assessment*. Fritch, TX. Prepared for the NPS by The Louis Berger Group, Inc., Denver, CO. Available on the Internet at http://www.nps.gov/lamr/parknews/upload/LAMR_Multi_Use_Trail_EA_1-20-10%5B1%5D.pdf.

2010c National Park Service Climate Change Response Strategy. National Park Service Climate Change Response

Program, Fort Collins, Colorado.

2011a Alibates Flint Quarries National Monument Website. Available on the Internet at http://www.nps.gov/alfl/index.htm.

2011b Lake Meredith National Recreation Area Website. Available on the Internet at http://www.nps.gov/lamr. Accessed January 7, 2011.

2011c "NPS Stats." National Park Service Public Use Statistics Office. http://www.nature.nps.gov/stats/park.cfm. Accessed January 7, 2011.

2012a *Draft Lake Meredith National Recreation Area Off-Road Vehicle Management Plan / Environmental Impact Statement*. Fritch, TX. In preparation.

2012b National Park Service Green Parks Plan: Advancing our Mission through Sustainable Operations. Available online: http://www.nps.gov/greenparksplan Accessed July 27, 2012

No date "List of Classified Structures: McBride Ranch House." Available on the Internet at http://www.hscl.cr.nps.gov/insidenps/report.asp?state=TX&park=lamr&structure=&sort=&recordno=1.

Natural Resources Conservation Service (NRCS), U.S. Department of Agriculture

2010 "Part 622, Ecological and Interpretive Groups." Washington, DC: *National Soil Survey Handbook*, Amendment 19. Available on the Internet at http://soils.usda.gov/technical/handbook/contents/part622.html.

2011 "Web Soil Survey." Washington, D.C.: Interactive tool available on the Internet at http://websoilsurvey.nrcs.usda.gov/app/#.

NatureServe

2009 "NatureServe Explorer: An Online Encyclopedia of Life, Version 7.1." Arlington, VA: NatureServe. Available on the Internet at http://www.natureserve.org/explorer/.

Parsons

2010 *Lake Meredith National Recreation Area and Alibates Flint Quarries National Monument Choosing by Advantages Final Workshop Meeting Report*. December, Denver, Colorado.

Rosmarino, Nicole J.

2004 "Gunnison's Prairie Dog, *Cynomys gunnisoni*." Santa Fe, NM: Petition from Forests Guardians to the U.S. Fish and Wildlife Service to list the Gunnison's Prairie Dog as an Endangered or Threatened Species under the Endangered Species Act and to Designate Critical Habitat. Available on the Internet at http://www.fws.gov/mountain-prairie/species/mammals/gunnisonprairiedog/petition.pdf.

The Secretary of the Interior

1995 The Secretary of the Interior's Standards for the Treatment of Historic Properties: With Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings. By Kay D. Weeks

and Anne E. Grimmer. Washington, DC: National Park Service, Preservation Assistance Division, Cultural Resource Stewardship and Partnerships, Heritage Preservation Services.

Stynes, Daniel J.

2011 *Economic Benefits to Local Communities from National Park Visitation and Payroll, 2009*. East Lansing, MI: Prepared for the National Park Service, Natural Resource Program Center. Natural Resource Report NPS/NRPC/SSD/NRR–2011/281. Available on the Internet at http://www.nature.nps.gov/socialscience/docs/NPSSystemEstimates2009.pdf.

Texas Parks and Wildlife Department

2009a "Wildlife Fact Sheets: Black-Footed Ferret (*Mustela nigripes*)." Austin, TX. Available on the Internet at http://www.tpwd.state.tx.us/huntwild/wild/species/bfferret/.

2009b "Wildlife Fact Sheets: Slender Rush-Pea (*Hoffmannseggia tenella*)." Austin, TX. Available on the Internet at http://www.tpwd.state.tx.us/huntwild/wild/species/rushpea/.

Texas Water Development Board

2010a "2011 Regional Water Plan Population Projections for 2000-2060 for Cities, Utilities, and County–Other by Region by County." Available on the Internet at http://www.twdb.state.tx.us/wrpi/data/proj/popwaterdemand/2011Projections/Population/PopulationByRWPG/4PopulationA.pdf.

2010b "Statewide Drought Condition Update as of April 30, 2010." Available on the Internet at http://www.twdb.state.tx.us/data/drought/monthly_ppt/2010-04_a.pdf.

2011 "Reservoir Summary Report, Lake Meredith." Available on the Internet at http://wiid.twdb.state.tx.us/ims/resinfo/BushButton/lakeStatus.asp?selcat=3&slbasin=72.

U.S. Census Bureau, U.S. Department of Commerce

2010 "State and County Quick Facts." Available on the Internet at http://quickfacts.census.gov/qfd/states/48000.html.

U.S. Environmental Protection Agency (EPA)

1997 *Climate Change and Texas*. Office of Policy, Planning and Evaluation (2111). State and Local Climate Change Program. EPA 230-F-97-008qq.

1998 *Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses*. Available on the Internet at http://www.epa.gov/compliance/resources/policies/ej/ej_guidance_nepa_epa0498.pdf.

U.S. Fish and Wildlife Service (USFWS), Department of the Interior

1992 "Interior Least Tern (*Sterna antillarum*)." Available on the Internet at http://www.fws.gov/southwest/es/oklahoma/lestern.htm.

2005 "Endangered and Threatened Wildlife and Plants: Final Designation of Critical Habitat for the Arkansas River Basin Population of the Arkansas River Shiner (*Notropis girardi*)." *Federal*

Register 70: 59808-59846. Available on the Internet at http://www.fws.gov/southwest/es/oklahoma/Documents/FR%20Final%20CH%20ARS%2010-13-05.pdf.

2009 "Endangered and Threatened Wildlife and Plants: 12-Month Finding on a Petition to List the Black-tailed Prairie Dog as Threatened or Endangered." *Federal Register* 74: 63343-63366. Pierre SD: South Dakota Ecological Services Office. Available on the Internet at http://www.gpo.gov/fdsys/pkg/FR-2009-12-03/pdf/E9-28852.pdf.

2010 "Endangered and Threatened Wildlife and Plants: 12-Month Finding on a Petition to List the Sonoran Desert Population of the Bald Eagle as a Threatened or Endangered Distinct Population Segment." *Federal Register* 75: 8601-8621. Phoenix AZ: Arizona Ecological Services Office. Available on the Internet at http://www.gpo.gov/fdsys/pkg/FR-2010-02-25/pdf/2010-3794.pdf.

2011a "Northern Aplomado falcon (*Falco femoralis septentrionalis*)." Available on the Internet at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06V.

2011b "Whooping Crane (*Grus americana*) Species Profile." Available on the Internet at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B003.

2011c "Gray Wolf (*Canis lupus*) Species Profile." Available on the Internet at http://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A00D.

U.S. Fish and Wildlife Service and National Marine Fisheries Service (USFWS and NMFS)

1998 *Endangered Species Consultation Handbook. Procedures for Conducting Consultations and Conference Activities Under Section 7 of the Endangered Species Act*. Washington, DC. Available on the Internet at http://www.fws.gov/caribbean/es/PDF/Sec%207%20Handbook.pdf.

INDEX

As the nation's principal conservation agency, the Department of the Interior has the responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

NPS January 2013

National Park Service
U.S. Department of the Interior