National Park Service U.S. Department of the Interior

Chickasaw National Recreation Area Oklahoma

Chickasaw National Recreation Ar 1008 West Second Street Sulphur, OK 73086



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Draft General Management Plan/ Environmental Assessment March 2007

March 2007

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Draft General Management Plan/Environmental Assessment

Draft General Management Plan / Environmental Assessment Chickasaw National Recreation Area Murray County, Oklahoma

Chickasaw National Recreation Area was authorized by an act of Congress on March 17, 1976 (Public Law 94-235). Part of Chickasaw National Recreation Area was originally set aside as Sulphur Springs Reservation in 1902, and then renamed and redesignated as Platt National Park in 1906. In 1976, Platt National Park, Arbuckle National Recreation Area, and additional lands were combined to establish Chickasaw National Recreation Area (PL 94-235). A full legislative history is found in appendix A. The last comprehensive management plan for Chickasaw National Recreation Area was completed in 1979, with an amendment completed in 1994. Much has changed since then, with new facilities being constructed or under design. As a result, visitor use patterns and type have changed, and people continue to ask to introduce new recreational activities to Chickasaw National Recreation Area. Also, resource conditions continue to change and are impacted by visitation. Each of these changes has implications for how visitors access and use Chickasaw National Recreation Area, how the existing facilities need to be used to support those uses, how resources are managed, and how the National Park Service manages its operations. Consequently, a new plan is needed.

This plan examines three alternatives for managing Chickasaw National Recreation Area for the next 15–20 years. It also analyzes the impacts of implementing each of the alternatives. Alternative A (no action) consists of the continuation of existing Chickasaw National Recreation Area management and trends, and serves as the basis for evaluating the other alternatives. The concept for Chickasaw National Recreation Area management under alternative B (preferred) would be to improve selected natural and cultural resources while enhancing visitor facilities and interpretive opportunities. Management under alternative C would focus on the protection and restoration of natural and cultural resources. Alternative B is the NPS's preferred alternative.

This *Draft General Management Plan / Environmental Assessment* will be released to the public for a 60-day comment period. The NPS will determine whether the environmental consequences of the proposed action require preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

U.S. Department of the Interior • National Park Service

HOW TO COMMENT ON THIS PLAN

Comments on this general management plan (GMP) and Environmental Assessment (EA) are welcome and will be accepted for 60 days after its release. To respond to the material in this plan, comments may be submitted by any one of several methods as noted below:

Mail: Chickasaw National Recreation Area General Management Plan National Park Service Denver Service Center – PDS P.O. Box 25287 Denver, CO 80225

or

Chickasaw National Recreation Area Headquarters 1008 West Second Street Sulphur, OK 73086 E-mail: CHIC_GMP@nps.gov Website: <http://www.nps.gov/CHIC> Hand delivery: at public meetings to be announced in the media following release of this plan.

It is NPS practice to make comments, including the names and addresses of respondents, available for public review during regular business hours. Individual respondents may request that their address be withheld from the planning record, which will be honored to the extent allowable by law. NPS will make all submissions from organizations or businesses available for public inspection in their entirety.

SUMMARY

Chickasaw National Recreation Area was authorized by an act of Congress on March 17, 1976 (Public Law 94-235). Part of Chickasaw National Recreation Area was originally set aside as Sulphur Springs Reservation in 1902, and then renamed and redesignated as Platt National Park in 1906. In 1976, Platt National Park, Arbuckle National Recreation Area, and additional lands were combined to establish Chickasaw National Recreation Area (PL 94-235; see appendix A).

The last comprehensive management plan for Chickasaw National Recreation Area was completed in 1979, with an amendment completed in 1994. A new plan is needed to:

- Clearly define resource conditions and visitor experiences to be achieved in Chickasaw National Recreation Area.
- Provide a framework for NPS managers to use when making decisions about how to best protect national recreation area resources, how to provide a diverse range of visitor experience opportunities, how to manage visitor use, and what kinds of facilities, if any, to develop in Chickasaw National Recreation Area.
- Ensure that this foundation for decision making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action.

This Draft General Management Plan / Environmental Assessment presents three alternatives, including the NPS's preferred alternative, for future management of Chickasaw National Recreation Area. The alternatives, which are based on Chickasaw National Recreation Area's purpose, significance, and special mandates, present different ways to manage resources and visitor use, and improve facilities and infrastructure at Chickasaw National Recreation Area. The three alternatives, alternative A (no action), alternative B (preferred), and alternative C are summarized below.

ALTERNATIVE A (NO ACTION)

Under alternative A, the no-action alternative, the National Park Service would continue to manage Chickasaw National Recreation Area as it has since the approval of the 1979 *General Management Plan Supplement* and the 1994 amendment. There would be no major change in the management of Chickasaw National Recreation Area under this alternative. All facilities and resource programs would continue as they have. With the exception of the approved and funded visitor center near Vendome Well, no new facilities would be built.

The natural resource program would continue to focus on inventorying and monitoring resource protection and preservation, mitigation, and applied research efforts. The cultural resource program would continue to focus on protecting historic structures and landscapes. NPS staff would continue to foster partnerships with other agencies, primarily for resource stewardship, interpretive, and administrative purposes. The education programs would continue to focus primarily on schools in the region.

ALTERNATIVE B (PREFERRED)

The primary focus of alternative B would be on improving selected natural and cultural resources while enhancing visitor facilities and interpretive opportunities. Although opportunities for a diversity of experiences would be offered under alternative B, the NPS would continue to maintain and protect natural and cultural resources in Chickasaw National Recreation Area and not permit new developments that would be inappropriate for a park unit. Any new facilities, where possible, would be constructed in already disturbed areas. Disturbance to sensitive areas, such as threatened and endangered species habitat and archeological sites would also be avoided or mitigated whenever possible.

Specific actions under alternative B would include the following:

- Chickasaw National Recreation Area would actively encourage a partnership to identify approaches to manage the aquifer. This would include increased monitoring, additional studies, and protection of recharge areas.
- Enhance emphasis on preservation and protection of cultural resources (historic structures, cultural landscapes, archeological resources, ethnographic resources, and museum collections) would be provided. The *Cultural Landscape Report* would provide general guidance for the treatment of historic properties within the Platt Historic District.
- The bison pasture would be restored to prairie and the bison herd maintained at an appropriate size. A study would be completed to determine the possibility of introducing bison from the Platt District to the Upper Guy Sandy.
- The museum collections and archives that are currently housed at Chickasaw National Recreation Area in one of the maintenance area buildings would be moved to an appropriate site.

- The Travertine Nature Center would continue to focus on resource education, providing programs to school groups and the public, and there would be additional formal programs that more fully interpret primary interpretive themes.
- Up to two additional day use picnic shelters and the addition of shower facilities would be added to the Platt District.
- The National Park Service would manage the Vendome Well to reduce the discharge of groundwater during times when it is not being used or enjoyed by the public.
- There would be improvements made to the Cold Springs campground, including adding vegetation to buffer campsites, making road repairs, improving drainage, and upgrading the restroom facilities.
- The trail link to Flower Park would be reinstated.
- The Central campground and restroom facilities would be upgraded.
- New restrooms would be constructed and fishing dock facilities would be replaced at Veterans Lake. A trail link to the Rock Creek campground would be built and the universally accessible trail around the lake would be completed.
- The possibility of adding a recreational opportunity such as a horse camp, staging area, or group campsite at Veterans Lake would be considered.
- The maintenance operations would be relocated outside Chickasaw National Recreation Area or within Chickasaw National Recreation Area, but outside the historic district. The historic structures in the existing maintenance area would be adaptively rehabilitated and reused. Some

of the nonhistoric structures would be removed or replaced.

- The trail system in the Rock Creek Corridor would be maintained and upgraded. There would be additional work to address erosion problems.
- At the Lake of the Arbuckles Area, commercial operations such as boat tours, ecotours, boat rentals, bus tours, and lakeside cabin rentals may be provided if there is sufficient interest and demand. Picnic shelters and new restrooms would be added and efforts would be made to restore areas along the lake that have been adversely affected by erosion.
- The Point and Buckhorn campgrounds • would be maintained and operated with the current number of campsites. However, some of the sites that do not currently have utilities would be upgraded. There would be improvements to vegetative screening between campsites and trails in these areas. Parking within the campgrounds would be redesigned to better limit impacts. New restrooms at picnic areas near the lake would be constructed. A new restroom with showers would be constructed and the entrance road to the campground would be upgraded at the Point campground. The Buckhorn campground amphitheater and electrical service would also be upgraded.
- The Guy Sandy campground would be improved. Dock area restrooms would also be improved. A picnic shelter would be provided for day users.
- There would be no changes in management of the Goddard Youth Camp and the Upper Guy Sandy area would continue to be restored to natural conditions.

ALTERNATIVE C

The primary focus of alternative C would be on protecting and restoring natural and cultural resources. There would be a more narrow level of visitor use.

Of the alternatives considered, alternative C would provide the highest level of protection of natural landscapes and a high level of protection to cultural resources. There would be fewer facilities and a narrower range of visitor opportunities, although there would be a better opportunity to experience resources in relatively natural or recovering conditions. Some roads or trails would be removed and revegetated. Some new facilities would be built, but generally they would be placed outside Chickasaw National Recreation Area or in previously developed areas. Disturbance to sensitive areas such as threatened and endangered species habitat and archeological sites would also be avoided or mitigated whenever possible.

Specific actions under alternative C would include the following:

- Chickasaw National Recreation Area would actively encourage a partnership to identify approaches to manage the aquifer. This would include increased monitoring, additional studies, and protection of recharge areas.
- Enhanced emphasis on preservation and protection of cultural resources (historic structures, cultural landscapes, archeological resources, ethnographic resources, and museum collections) would be provided. The *Cultural Landscape Report* would provide general guidance for the treatment of historic properties within the Platt Historic District.
- The bison pasture would be restored to prairie and the bison herd maintained at

an appropriate size. A study would be completed to determine the possibility of introducing bison from the Platt District to the Upper Guy Sandy.

- The museum collections and archives that are currently housed at Chickasaw National Recreation Area in one of the maintenance area buildings would be moved to an appropriate site.
- The Travertine Nature Center would continue to focus on resource education, providing programs to school groups and the public. More specialized programs on resource preservation and conservation would be added.
- NPS would manage the Vendome Well to reduce the discharge of groundwater during times when it is not being used or enjoyed by the public.
- There would be improvements made to the Cold Springs campground, including adding vegetation to buffer campsites, making road repairs, improving drainage and upgrading the restroom facilities.
- The trail link to Flower Park would be reinstated.
- The Central campground and restroom facilities would be upgraded.
- About 12 campsites in the Rock Creek campground sites affecting Rock Creek's riparian resources would be modified or removed.
- The Chigger Hill portion of the campground would be closed and restored to natural conditions.
- There would be no new facilities at Veterans Lake. The area would continue to be managed as it has been.

- Maintenance operations would be relocated outside Chickasaw National Recreation Area. Staff offices also would be built at this site as needed. The historic structures in the maintenance area would be adaptively rehabilitated and reused. There would be removal of some of the nonhistoric structures.
- Increased attention would be devoted to restoring the riparian area along Rock Creek. The multiuse trail system would be maintained and drainage problems eliminated.
- Increased efforts would be made to restore areas along Lake of the Arbuckles that have been adversely affected by erosion. There would also be a study to determine if there is need to manage boat use to maintain high quality resource conditions and visitor experiences.
- Current management would continue at the Point and Buckhorn campgrounds. Some screening with vegetation would occur between campsites.
- The Guy Sandy campground would be removed and converted to a day use area. The boating facilities would be maintained and additional day use facilities, such as picnic tables, would be added. The restrooms also would be improved.
- There would be no changes in management of the Goddard Youth Camp.
- The Upper Guy Sandy area would continue to be restored to natural conditions.

THE NEXT STEPS

After the distribution of the *Draft General Management Plan / Environmental Assessment*, there will be a 60-day public review and

Summary

comment period after which the NPS planning team will evaluate comments from other federal agencies, tribes, organizations, businesses, and individuals regarding the draft plan, and incorporate appropriate changes into a *Final General Management Plan / Environmental Assessment*. The final plan may include letters from governmental agencies, any substantive comments on the draft document, and NPS responses to those comments. NPS will then determine whether the environmental consequences of the proposed action require preparation of an EIS or a FONSI.



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Chapter 1:

Introduction

INTRODUCTION, PURPOSE, AND NEED FOR THE PLAN

Why The National Park Service Does General Management Planning

The National Parks and Recreation Act of 1978 requires each unit of the National Park Service (NPS) to have a general management plan (GMP); and NPS *Management Policies 2001* states "[t]he Service will maintain an up-to-date management plan for each unit of the national park system" (2.3.1 General Management Planning). But what is the value, or usefulness, of general management planning?

The purpose of a GMP is to ensure that a national park system unit (park unit) has a clearly defined direction for resource preservation and visitor use to best achieve the NPS's mandate to preserve resources unimpaired for the enjoyment of future generations. In addition, general management planning makes the National Park Service more effective, collaborative, and accountable by:

- providing a balance between continuity and adaptability in decision making This defines the desired conditions to be achieved and maintained in a park unit provides a touchstone that allows NPS 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 — This helps NPS 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 within such a larger context are more likely to be successful over time
- affording everyone who has a stake in decisions affecting a park unit an opportunity to be involved in the planning process and to understand the decisions that are made park units are often the focus of intense public interest. Public involvement throughout the planning process provides focused opportunities for NPS managers and staff to interact with the public and learn about public concerns, expectations, and values. Public involvement also provides opportunities for NPS managers and staff to share information about the park unit's purpose and significance, as well as opportunities and constraints for the management of park unit lands

The ultimate outcome of general management planning for 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, and how those conditions can best be achieved and maintained over time.

INTRODUCTION

This *Draft General Management Plan / Environmental Assessment* presents and analyzes three alternatives for future direction of the management and use of Chickasaw National Recreation Area (see Vicinity map). Alternative B is the NPS's preferred alternative. The potential environmental impacts of all alternatives have been identified and assessed.

GMPs are intended to be long-term documents that establish and articulate a management philosophy and framework for decision making and problem solving in the parks. GMPs usually provide guidance for 15– 20 years.



Actions directed by GMPs or in subsequent implementation plans are accomplished over time. Budget restrictions, requirements for additional data or regulatory compliance, and competing national park system priorities prevent immediate implementation of many actions. Major or especially costly actions could be implemented 10 or more years into the future.

BRIEF DESCRIPTION OF CHICKASAW NATIONAL RECREATION AREA

Chickasaw National Recreation Area is in south-central Oklahoma, midway between Dallas, Texas and Oklahoma City, Oklahoma. Chickasaw National Recreation Area was originally authorized in 1902 as Sulphur Springs Reservation and was renamed and redesignated as Platt National Park in 1906. In 1976, Platt National Park, Arbuckle National Recreation Area, and additional lands were combined to establish Chickasaw National Recreation Area (PL 94-235; see appendix A).

From prehistoric times to the present, access to the combination of cool water, mineral springs, cool breezes, shade, and wildlife has created at Chickasaw National Recreation Area an experience that sets it apart from the surrounding environment.

The springs and streams in Chickasaw National Recreation Area originate within a region of Oklahoma characterized by complex geology. Intensive faulting, folding, and deformation associated with major uplift and subsequent erosion of the area have combined to form a land surface characterized by gently rolling hills dissected by streams. The springs and streams have had cultural, economic, and environmental significance throughout the history of the region.

Dating from the public works era of the 1930s, classic examples of Civilian Conservation Corps (CCC) work can be found in the Platt Historic District of Chickasaw National Recreation Area. This area is a unique and fascinating piece of CCC development that has kept its integrity. The site work and landscape structures are elaborate and of high quality. This district has also been identified as one the finest examples of CCC work in existence in terms of rustic design, the number and variety of structures, and construction techniques and materials.

Chickasaw National Recreation Area has a diversity of natural resources. These unique flora, fauna, waters, and geological formations have withstood the external pressures of human-made and natural changes. The combination of these resources has created an area unlike any in the surrounding territory.

Chickasaw National Recreation Area lies in a transition zone where the eastern deciduous forest and the western prairies meet. It has flora and fauna from both environments, and other flora and fauna specific to such transition areas. The view at Veterans Lake, especially beautiful at sunset, illustrates this transition.

Chickasaw National Recreation Area provides opportunities to experience a wide range of outdoor experiences — swimming, boating, fishing, hiking, observing nature, hunting, camping, and picnicking — reminding us of the rural character in the history of the American people. It adds measurably to the quality of life for visitors and area residents.

Chickasaw National Recreation Area has been the setting for generations of traditional family activity that represents part of the American heritage.

PURPOSE OF THE PLAN

The approved GMP will be the basic document for managing Chickasaw National Recreation Area for the next 15–20 years. The purposes of this GMP are as follows: CHAPTER 1: INTRODUCTION

- Confirm the purpose, significance, and special mandates of Chickasaw National Recreation Area
- Clearly define resource conditions and visitor uses and experiences to be achieved in Chickasaw National Recreation Area
- Provide a framework for national recreation area managers to use when making decisions about how to best protect national recreation area resources, how to provide quality visitor uses and experiences, how to manage visitor use, and what types of facilities, if any, to develop in/near Chickasaw National Recreation Area
- Ensure that this foundation for decision making has been developed in consultation with interested stakeholders and adopted by the NPS leadership after an adequate analysis of the benefits, impacts, and economic costs of alternative courses of action

Legislation establishing the National Park Service as an agency and governing its management provides the fundamental direction for the administration of Chickasaw National Recreation Area (and other units and programs of the national park system). This GMP will build on these laws and the legislation that established Chickasaw National Recreation Area to provide a vision for Chickasaw National Recreation Area's future. The later "Servicewide Mandates and Policies" section calls the reader's attention to topics that are important to understanding the management direction at Chickasaw National Recreation Area. The alternatives in this GMP address the desired future conditions that are not mandated by law and policy and must be determined through a planning process.

This GMP does not describe how particular programs or projects should be prioritized or implemented. Those decisions will be addressed in future more detailed planning efforts. All future plans will tier from the approved GMP.

NEED FOR THE PLAN

This new management plan for Chickasaw National Recreation Area is necessary because the last comprehensive planning effort for Chickasaw National Recreation Area was completed in 1979, and amended in 1994. Much has occurred since then — new facilities have been developed or are being developed, and patterns and types of visitor use continue to change. Each of these changes has implications for how visitors access and use the area, how these facilities need to be used to support those uses, how the area's resources are managed, and how the NPS manages its operations.

A GMP also is necessary to meet the requirements of the National Parks and Recreation Act of 1978, NPS *Management Policies 2001*, and NPS policy, which mandate development of a GMP for each unit in the national park system.

THE NEXT STEPS

After the distribution of the *Draft General Management Plan / Environmental Assessment*, there will be a 60-day public review and comment period, after which the NPS planning team will evaluate comments from other federal agencies, tribes, organizations, businesses, and individuals regarding the draft plan. After this public review, the plan may be approved with a Finding of No Significant Impact (FONSI), assuming there are no significant impacts identified during public review.

IMPLEMENTATION OF THE PLAN

The implementation of the approved plan will depend on future funding. The approval of a plan does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. Full implementation of the approved plan could be many years in the future.

The implementation of the approved plan also could be affected by other factors. Once the GMP has been approved, additional feasibility studies, and more detailed planning and environmental documentation, would be completed, as appropriate, before any proposed actions can be carried out. For example,

- Additional environmental documentation may need to be completed
- Appropriate permits would be obtained before implementing actions that would impact wetlands

- Appropriate federal and state agencies would be consulted concerning actions that could affect threatened and endangered species
- Native American tribes and the state historic preservation officer would be consulted

These more-detailed plans will tier from the approved GMP, describing specific actions managers intend to take to achieve desired conditions and long-term goals.



GUIDANCE FOR THE PLANNING EFFORT

PURPOSE AND SIGNIFICANCE

Purpose

Purpose statements are based on Chickasaw National Recreation Area's legislation and legislative history and NPS policies. The statements reaffirm the reasons for which the area was set aside as a park unit, and provide the foundation for the area's management and use.

The purpose of Chickasaw National Recreation Area is to:

protect the springs and waters; preserve areas of archeological or ethnological interest; provide outdoor recreation; protect scenic, scientific, natural, and historic values; and memorialize the Chickasaw Indian Nation.

Significance

Significance statements capture the essence of Chickasaw National Recreation Area's importance to our country's natural and cultural heritage. Significance statements do not inventory an area's resources; rather, they describe the area's distinctiveness and help place Chickasaw National Recreation Area within its regional, national, and international contexts. Significance statements answer questions such as: Why are Chickasaw National Recreation Area resources distinctive? What do they contribute to our natural/cultural heritage? Defining the area's significance helps managers make decisions that preserve the resources and values necessary to accomplish Chickasaw National Recreation Area's purpose.

The significance of Chickasaw National Recreation Area is as follows.

- Chickasaw National Recreation Area contains mineral and fresh water, which comes from one of the most complex geological and hydrological features in the United States.
- The cultural landscape of the Platt Historic District in Chickasaw National Recreation Area reflects the primary era of 1933–1940, when the Civilian Conservation Corps implemented National Park Service "rustic" designs. This is one of the most intact landscapes of that period.
- Recreational opportunities are available to experience a wide range of outdoor experiences swimming, boating, fishing, hiking, observing nature, hunting, camping, bicycling, horseback riding, family reunions, and picnicking all of which remind us of the rural character in the history of the American people.
- Chickasaw National Recreation Area is home to a transition zone where the eastern deciduous forest meets the western prairies, which is unique to the central part of the United States.
- The long history of Chickasaw National Recreation Area exemplifies the evolution of the American conservation movement and the national park system. The significance of naming the area "Chickasaw" is meant to memorialize the foresight that this Indian tribe showed when they agreed to protect the natural freshwater and mineral water resources of this area through public government ownership over private ownership.

PRIMARY INTERPRETIVE THEMES

Based on Chickasaw National Recreation Area's purpose, significance, and primary

resources, the following interpretive themes have been developed. Primary interpretive themes are the key stories, concepts, and ideas of a park unit. They are the groundwork that NPS staff will use for educating visitors about the park unit and for inspiring visitors to care for and about its resources. With these themes, visitors can form intellectual and emotional connections with a park unit's resources and experiences. These themes are as follows for Chickasaw National Recreation Area.

A — Chickasaw National Recreation Area's 500-million-year record of sedimentary deposition, complex hydrogeological system, and diverse flora and fauna foster enriched connections with the dynamic relationships among geology, water, and life.

B — The attractive and intimate scale of the landscape, the wide range of recreational opportunities, the history of the freshwater and mineral springs, and the comfortable, rustic-built environment of Chickasaw National Recreation Area invite an exploration of the concepts of personal and societal health and well being.

C — The eastern woodlands – western plains ecotone at Chickasaw National Recreation Area offers outstanding opportunities to appreciate the rich ecological relationships that nurture and sustain our civilization.

SERVICEWIDE LAWS AND POLICIES

This section identifies what must be done at Chickasaw National Recreation Area to comply with federal laws and policies of the National Park Service. Many of the area's management directives are specified in laws and policies guiding the National Park Service and are; therefore, not subject to alternative approaches. For example, there are laws and policies concerning managing environmental quality (such as the Clean Air Act, the Endangered Species Act, and Executive Order 11990 "Protection of Wetlands"); laws governing the preservation of cultural resources (such as the National Historic Preservation Act (NHPA) and the Native American Graves Protection and Repatriation Act); and laws regarding public services (such as the Americans with Disabilities Act) — to name only a few. In other words, a GMP is not needed to decide, for instance, that it is appropriate to protect endangered species, control exotic species, protect archeological sites, preserve the cultural landscape, conserve artifacts, or provide for handicap access. Laws and policies have already decided those and many other matters for us. Although attaining some of the conditions set forth in these laws and policies may have been temporarily deferred in Chickasaw National Recreation Area because of funding or staffing limitations, the National Park Service will continue to strive to implement these requirements with or without a new GMP.

Some of these laws and executive orders are applicable solely or primarily to units of the national park system. These include the 1916 Organic Act that created the National Park Service; the General Authorities Act of 1970; the Redwood Amendment Act of March 27, 1978 relating to the management of the national park system; and the National Parks Omnibus Management Act (1998). Other laws and executive orders have much broader application, such as the Endangered Species Act, the National Historic Preservation Act, and Executive Order 11990 addressing the protection of wetlands.

The NPS Organic Act (16 USC § 1) provides the following fundamental management direction for all units of the national park system:

[P]romote and regulate the use of the Federal areas known as national parks, monuments, and reservations . . . by such means and measures 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 wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

The National Park System General Authorities Act (16 USC § 1a-1 et seq.) affirms that while all park 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 National Park Service Organic Act and other protective mandates apply equally to all park units. Further, amendments state that NPS management of park units should not "derogat[e] . . . the purposes and values for which these various areas have been established."

The National Park Service also has established policies for all park units under its stewardship. These are identified and explained in a guidance manual titled NPS *Management Policies 2001*. The alternatives considered in this plan incorporate and comply with the provisions of these mandates and policies. To truly understand the implications of an alternative, it is important to combine the servicewide mandates and policies with the management actions described in an alternative.

Table 1 shows some of the most pertinent servicewide mandates and policy topics related to planning and managing Chickasaw National Recreation Area; across from each topic are the *desired conditions that the staff is striving to achieve* for that topic and thus that part of the table is written in the present tense. The strategies for achieving these desired conditions are also shown in the table. The alternatives in this GMP address the desired future conditions that are not mandated by law and policy, and that must be determined through a planning process.

WILDERNESS SUITABILITY

The Wilderness Act and NPS *Management Policies 2001* (§ 6.2.1, NPS 2000) require that all lands administered by the National Park Service be evaluated for their suitability for inclusion within the national wilderness preservation system. An assessment of wilderness suitability was done as part of the planning process. The outcome was that there were no lands suitable for wilderness designation due to size and the existing and planned land use of areas within Chickasaw National Recreation Area boundary.

TOPIC	Desired Cauditians and Studtonics for Children Netional Despection And
TOPIC	Desired Conditions and Strategies for Chickasaw National Recreation Area
Relations with Private and Public Organizations, Owners of Adjacent Land, and Governmental Agencies	Desired Conditions: Chickasaw National Recreation Area 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, Chickasaw National Recreation Area. The area is managed proactively to resolve external issues and concerns and ensure that area values are not compromised.
	Because Chickasaw National Recreation Area is a part of a larger regional environment, the National Park Service works cooperatively with others to anticipate, avoid, and resolve potential conflicts; protect the national recreational area's 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.
	<i>Strategies:</i> NPS staff will continue to establish and foster partnerships with public and private organizations to achieve the purposes of Chickasaw National Recreation Area. Partnerships will continue to 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, NPS staff will continue to keep landowners, land managers, local governments, and the public informed about Chickasaw National Recreation Area management activities. Periodic consultations will continue with landowners who might be affected by visitors and management actions. NPS staff will continue to respond promptly to conflicts that arise over NPS activities, visitor access, and proposed activities and developments on adjacent lands that could affect Chickasaw National Recreation Area. NPS staff may provide technical and management assistance to landowners to address issues of mutual interest.
	NPS staff will continue to work closely with local, state, and federal agencies; and tribal governments whose programs affect, or are affected by, activities in Chickasaw National Recreation Area. NPS managers will continue to pursue cooperative regional planning whenever possible to integrate Chickasaw National Recreation Area into issues of regional concern.
Relations with the Cities of Sulphur and Davis	Desired Conditions: NPS staff continues its close working relationships with the cities of Sulphur and Davis. NPS staff and city officials maintain a high level of trust and goodwill. Officials from the two cities feel they have an important stake in Chickasaw National Recreation Area, and NPS staff feel they have an important stake in Sulphur and Davis. NPS managers are familiar with local issues and concerns.
	<i>Strategies:</i> NPS staff will continue to regularly communicate and meet with city officials to identify problems and concerns facing the cities and Chickasaw National Recreation Area, and actions that can be taken to address these problems and concerns.
	NPS staff will continue to work with the cities in developing and updating their master plans.
	City officials will continue to be kept informed of planning and other actions in Chickasaw National Recreation Area that could affect the cities. NPS staff will continue to work with city law enforcement, emergency services, and community education programs.
	When appropriate, the NPS staff will provide technical and management assistance to the cities, including sharing information and resources, to address problems and issues of mutual interest; such as the spread of nonnative, invasive species. NPS staff will continue to be involved in community-based efforts.

TABLE 1: SERVICEWIDE MANDATES AND POLICIES PERTAINING TO CHICKASAW NATIONAL RECREATION AREA

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area
Government-to- Government Relations between American Indian Tribes and Chickasaw National Recreation Area	Desired Conditions: NPS staff and tribes culturally affiliated with Chickasaw National Recreation Area maintain positive and productive government-to-government relationships. National recreation area managers and staff respect the viewpoints and needs of the tribes, continue to promptly address conflicts that occur, and consider American Indian values in area management and operation.
	Chickasaw National Recreation Area is a good neighbor to the Chickasaw Nation, and to other traditionally associated American Indian tribes, by helping when asked in situations when joint cooperation might be appropriate about sharing research and knowledge on the resources, and about interpreting the resources of Chickasaw National Recreation Area.
	<i>Strategies:</i> NPS staff will continue to regularly meet and communicate with tribal officials to identify problems and issues of mutual concern and interest, and work together to take actions to address these concerns.
	Tribal officials will continue to be kept informed of planning and other actions in Chickasaw National Recreation Area that could affect the tribes.
	When appropriate, NPS staff will provide technical assistance to the tribes, including sharing information and resources, to address problems and issues of mutual concern.
	NPS staff will continue to recognize the past and present existence of native peoples in the region and the traces of their land use and occupation as an important part of the cultural environment to be researched, preserved, and, if appropriate, interpreted.
	NPS staff will consult with the Chickasaw Nation and other traditionally associated American Indian tribes to develop and accomplish the programs of Chickasaw National Recreation Area in a way that respects the beliefs, traditions, and other cultural values of the tribes with ties to national recreation area lands.
	NPS staff will accommodate access to traditional-use areas, once identified through further consultation and research, in ways consistent with national recreation area purposes and American Indian values and that avoid adversely affecting the physical integrity of such sites and resources.
	NPS staff will conduct appropriate ethnographic, ethnohistorical, or cultural anthropological research in conjunction with, and in cooperation with, American Indian tribes traditionally associated with Chickasaw National Recreation Area.
	Natural Resources
	NPS <i>Management Policies 2001</i> (§§ 1.5, 4, 4.1, 4.1.4, and 4.4.1) provides general direction for managing park units from an ecosystem perspective.
Ecosystem Management	Desired Conditions: Chickasaw National Recreation Area is managed holistically, as part of a greater ecological, social, economic, and cultural system. The National Park Service demonstrates leadership in resource stewardship and conservation of ecosystem values within and outside the recreation area. Chickasaw National Recreation Area is managed from an ecosystem perspective, where internal and external factors affecting visitor use, environmental quality, and resource stewardship goals are considered at a scale appropriate to their impact on affected resources. Natural processes, ecosystem dynamics, and population fluctuations occur with as little human intervention as possible, with the exception of hunting of game animals, stocking of fish, and integrated pest management. Recreation area resources and visitors are managed considering the ecological and social conditions of Chickasaw National Recreation Area and the surrounding area. NPS managers adapt to changing ecological and social conditions within and outside the recreation area and continue as partners in regional planning and land and water management. Chickasaw National Recreation Area is managed proactively to resolve external issues and concerns to ensure that the recreation area's values are not compromised.
	Strategies: NPS staff will continue to participate in and encourage ongoing partnerships with local, state, and federal agencies; educational institutions; and other organizations in programs that have importance within and beyond national recreation area boundaries. Cooperative agreements, partnerships, and other arrangements can be used to set an example in resource conservation and innovation, and to facilitate research related to recreation area resources and their management. Partnerships important to the long-term viability of natural and cultural resources include, but are not limited to, the following:

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TOPIC	Desired Conditions and Strategies for Chickasaw National Recreation Area
Ecosystem Management (cont.)	 inventorying, monitoring, and managing terrestrial resources with the Oklahoma Biological Survey, Oklahoma Department of Wildlife Conservation, Oklahoma State University, University of Oklahoma, U.S. Geological Survey (USGS), Goddard Youth Camp, U.S. Fish and Wildlife Service, and the Noble Foundation monitoring, enforcing regulations, and managing aquatic resources with the Oklahoma Department of Wildlife Conservation, U.S. Bureau of Reclamation, Oklahoma Conservation Commission, Oklahoma Water Resources Board, USGS, and U.S. Fish and Wildlife Service monitoring and managing federally threatened and endangered species with the U.S. Fish and Wildlife Service, Oklahoma Biological Survey, and the Oklahoma Department of Wildlife supporting scientific research and ecological monitoring to guide recovery/conservation efforts in collaboration with professionals from federal, tribal, and state agencies, academic institutions, museums, and research organizations approaching all resource management questions from an ecosystem standpoint, taking into account all biological interrelationships continuing long-term monitoring of the change in condition of natural resources and related human influences (see "Natural Resources Strategies" below)
Natural Resources (General)	Chickasaw National Recreation Area's natural resources are a key element in the use and management of the recreation area. Protection, study, and management of natural resources and processes are essential for achieving Chickasaw National Recreation Area's purposes. NPS <i>Management Policies 2001</i> (§ 4) and "NPS-77 Natural Resources Management Guideline" provide general direction on natural resources management for the recreation area.
	Desired Conditions: Chickasaw National Recreation Area retains its ecological integrity, including its natural resources and processes. The recreation area continues to be a dynamic, bio-diverse environment. The natural features of the recreation area remain unimpaired. The recreation area maintains a mosaic of native vegetation and wildlife. Native soils and the processes of soil genesis are preserved in a condition undisturbed by people to the extent possible. Soils are maintained in a condition to sustain plant and animal productivity, maintain or enhance water and air quality, support human health and habitation, and protect and preserve cultural resources and landscapes. Soils consistent with maintenance of associated historic practices are conserved. Sources of air, water, and noise pollution affecting Chickasaw National Recreation Area's resources are limited to the greatest degree possible. Potential threats to the recreation area's resources are identified early and proactively addressed. Visitors and staff recognize and understand the value of the recreation area's natural resources. NPS staff uses the best available scientific information and technology to manage the recreation area's natural resources. Chickasaw National Recreation Area is recognized and valued as an outstanding example of resource stewardship, conservation, education, and public use.
	General Strategies: Science-based, adaptive, decision making will continue to be followed, with the results of resource monitoring and research incorporated into all aspects of recreation area operations. NPS staff will continue to apply ecological principles to ensure that natural resources are maintained and not impaired. Integrated pest management procedures will continue to be used when necessary to control nonnative organisms or other pests.
	NPS staff and other scientists will continue to inventory recreation area resources to quantify, locate, and document biotic and abiotic resources in Chickasaw National Recreation Area and to assess their status and trends.
	NPS staff and other scientists will conduct long-term, systematic monitoring of resources and processes to discern natural and anthropogenically induced trends, document changes in species or communities, evaluate the effectiveness of management actions taken to protect and restore resources, and mitigate impacts on resources.
	NPS staff will expand monitoring programs to include geographic areas and resources that are not currently monitored. Partnerships with institutions, agencies, and scientists will be an important component of this endeavor.
	Future facilities will be built in previously disturbed areas with as small of a construction footprint as possible. NPS staff will also apply mitigation techniques to minimize the impacts of construction and other activities on recreation area resources.
	Actions that have the potential to result in significant soil disturbance will include appropriate mitigation to control erosion and allow revegetation of disturbed areas.

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area
Natural Resources (General) (cont.)	Scientific research will be encouraged. Cooperative basic and applied research will be encouraged through various partnerships and agreements to increase the understanding of Chickasaw National Recreation Area's resources, natural processes, and human interactions with the environment, or to answer specific management questions.
	NPS staff will continue to expand the data management system, including a geographic information system (GIS) and a research/literature database for analyzing, modeling, predicting, and testing trends in resource conditions.
	NPS managers will prepare and periodically update a "Resource Stewardship Strategy" that includes a comprehensive list of prioritized actions to achieve the desired resource conditions identified in the GMP.
Natural Resources Restoration	NPS <i>Management Policies 2001</i> (§ 4.4) call for the National Park Service to maintain natural ecosystems in parks and to restore native plant and animal populations. "NPS-77 Natural Resources Management Guideline" also provides general direction on the restoration of natural resources for the recreation area."
	Many of Chickasaw National Recreation Area's natural ecosystems have been altered by the activities of people and the introduction of nonnative species. More specifically, the condition of natural vegetation communities has declined in Chickasaw National Recreation Area due to the spread of red cedar, the expansion of other woody plants, and the spread of nonnative plant species. Fires have also been suppressed, which has lead to the decline of prairies in the recreation area. In recent years efforts have begun to restore Chickasaw National Recreation Area's prairie ecosystems with the application of prescribed burns and the clearing of red cedar.
	Desired Conditions: With the exception of culturally significant areas, Chickasaw National Recreation Area's prairies and forests are restored as nearly as possible to the conditions they would be in today had natural ecological processes not been altered. Vegetation is in a condition reminiscent of the period before Europeans began altering the recreation area. All federally and state threatened and endangered species are no longer in danger of extinction and are at least stable. The natural fire regime has been restored.
	<i>Strategies:</i> Active restoration efforts will continue throughout Chickasaw National Recreation Area, primarily focusing on eradication of nonnative (weed) species, red cedar control, revegetation of native plants, and restoration of native plants and animals, particularly prairie species.
	Red cedar will continue to be controlled in prairie restoration sites, hardwood forest areas, hazardous road intersections, and developed areas where the tree has become invasive. These areas include the Buffalo Pasture, Platt District, Rock Creek Corridor, South Lake, and Lower and Upper Guy Sandy areas. Mechanical equipment and prescribed burns will be used to remove or eliminate red cedar.
	Prairie restoration efforts will continue in old fields, such as the Upper Guy Sandy area. Herbicide and cultivation treatments will be required to eliminate dense stands of Johnson grass in some areas. Native prairie grass and forb seeding will then be done, followed by appropriate natural disturbance regimes (e.g., prescribed burns and buffalo grazing) to support and maintain native plant and animal species.
	Inventories and monitoring of invasive nonnative plant species will continue. Efforts will continue to control or eradicate nonnative plants that are particularly invasive and destructive pests, or have the potential to rapidly spread and dominate plant communities, such as Johnson grass and Chinese bush clover. Efforts will continue to remove feral mammals such as pigs, cats, dogs, and fallow deer from Chickasaw National Recreation Area, and exotic species such as red imported fire ants.
	Restoration of previously or newly disturbed areas will be done using native genetic materials (when available) from the local region to regain maximum habitat value. Should facilities be removed, the disturbed lands will be rehabilitated to restore natural topography and soils, and the areas will be revegetated with native species. Only plants that are not invasive and will remain within developed areas will be used.
	Historically, fire periodically occurred in Chickasaw National Recreation Area. However, in more recent times, fires have been suppressed, resulting in a build up of fuel. The current fire management plan (NPS 2003c) discusses and deals with these issues and will continue to be followed.

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ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
	The Arbuckle Mountains region, where Chickasaw National Recreation Area is located, is well known for its fossil resources. The recreation area is known to contain paleontological resources, particularly the southern part of Chickasaw National Recreation Area, which has formations that potentially contain fossils. However, there has not been a detailed paleontological inventory and assessment of Chickasaw National Recreation Area.				
	NPS <i>Management Policies 2001</i> (§ 4.8.2) and "NPS Natural Resource Management Reference Manual #77" provide direction for the protection and management of paleontological resources in park units.				
	Desired Conditions: Chickasaw National Recreation Area's paleontological resources, including both organic and mineralized remains in body or trace form, are protected and preserved in situ, with opportunities for public education, interpretation, and scientific research. Impacts to paleontological resources from human activities, including construction of facilities and illegal collecting, are minimized.				
	General Strategies: A paleontological research plan that directs future research efforts will be prepared and updated as needed.				
	A paleontological resource inventory and assessment will be conducted in Chickasaw National Recreation Area to determine their extent and scientific significance, and to ensure that these nonrenewable resources are not lost. Fossil localities and associated geologic data will be documented when specimens are collected. Paleontological resource stability indicators, covering such elements as rates of erosion and human activity, will be developed and monitored to establish vital signs and assess the conditions for fossil resources.				
	A variety of methods will be followed to protect resources, such as data recording; stabilization in the field; collection, preparation, and placement of specimens in a museum collection; or construction of shelters over specimens.				
Paleontological Resources	Paleontological resources will be managed and studied in their geologic context, which provides information about the ancient environment.				
	NPS staff will be a partner with other federal, state, and local agencies, and academic institutions to conduct paleontological research. The NPS staff will continue to expand opportunities for researchers to use Chickasaw National Recreation Area's fossil collection to further paleontological knowledge.				
	If destructive and preventable erosion occurs or ground-disturbing activities, such as construction of new trails, are proposed in areas with potential paleontological resources, a qualified paleontologist will survey the areas for paleontological resources, evaluate their significance, and specify whether data recording, stabilization, or specimen collection is necessary. New facilities will be avoided on areas that may yield fossils, or if necessary, the resource may be collected prior to the initiation of construction.				
	Management actions will be taken to prevent illegal collecting and may be taken to prevent damage from natural processes such as erosion. If important sites or areas are discovered, they will be patrolled to prevent theft and vandalism. Paleontological resources along high use trails and/or roads will be monitored, and actions taken to reduce impacts.				
	The NPS staff will exchange fossils only with other qualified museums and public institutions dedicated to the preservation and interpretation of natural heritage.				
	Interpretive and educational programs will continue to be developed to educate visitors and the public about paleontology. Fossils will be prepared, exhibited, and stored according to NPS museum standards.				
	NPS staff will work with the Goddard Youth Camp staff, teachers, and students to conduct programs on paleontological resources and ensure that their activities are consistent with NPS management policies and standards and the Goddard Youth Camp's general agreement with the National Park Service. Goddard staff may also assist the NPS staff in monitoring the area for potential impacts. Combining a resource protection and stewardship message with resource monitoring will help limit potential adverse impacts to paleontological resources.				
ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
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Air Quality	The Clean Air Act (42 USC 7401 et seq.) gives federal land managers the responsibility for protecting air quality and related values, including visibility, plants, animals, soils, water quality, cultural resources, and public health, from adverse air pollution impacts. NPS <i>Management Policies 2001</i> (§ 4.7), and "NPS Natural Resource Management Reference Manual #77" provide further direction on the protection of air quality and related values for park units.				
	Chickasaw National Recreation Area is classified as a Class II area under the Clean Air Act. This air quality classification is the second most stringent and is designed to protect the majority of the country from air quality degradation. Although air quality monitoring has not been done, air quality is thought to be good because of the rural character of the surrounding area.				
	Some air quality impacts probably occur due to pollution from metropolitan areas in the region, including Ardmore (30 miles south), Oklahoma City (90 miles north), and Dallas/Fort Worth (130 miles south). Air pollution sources in Chickasaw National Recreation Area include stationary sources such as campfires and generators. Motor vehicles and motorboats are mobile sources, and emissions primarily include carbon monoxide, nitrogen oxides, and hydrocarbons (or volatile organic compounds).				
	The basin that includes Chickasaw National Recreation Area is classified as being in attainment for ozone and particulate matter.				
	Desired Conditions: Good to excellent air quality is maintained. Scenic views, both day and night, are protected and unimpaired for the enjoyment of current and future recreation area visitors.				
	<i>Strategies:</i> NPS staff will continue to work with appropriate federal and state government agencies and nearby communities to maintain and improve recreation area regional air quality. NPS staff will participate in regional air quality planning, research, and the implementation of air quality standards.				
	Air quality in Chickasaw National Recreation Area will continue to be periodically monitored to gain baseline information and to measure any significant changes (improvement or deterioration) to Chickasaw National Recreation Area's airshed.				
	To minimize smoke impacts, controlled burns will occur only when favorable meteorological conditions are present. The vegetation to be burned shall be in a condition that will facilitate combustion and minimize the amount of smoke emitted during combustion.				
Water Quality	Water is a key resource in Chickasaw National Recreation Area, shaping the landscape and affecting plants, animals, and visitor use. The Clean Water Act strives to restore and maintain the integrity of U.S. waters, which includes waters found in Chickasaw National Recreation Area. NPS <i>Management Policies 2001</i> (§ 4.6.3) and "NPS Natural Resource Management Reference Manual #77" provide direction on the protection and management of surface and groundwater in Chickasaw National Recreation Area. The state of Oklahoma also has designated the waters within Chickasaw National Recreation Area as "Sensitive Public and Private Water Supplies." These waters are "prohibited from having any new point source discharge(s) for any pollutant or increased load of specified pollutants from existing point source discharge(s)."				
	Desired Conditions: Chickasaw National Recreation Area's water quality reflects natural conditions and supports native plant and animal communities, and administrative and recreational uses. All water in Chickasaw National Recreation Area meets applicable state standards. All human sources of water pollution, both within and outside the recreation area, that are adversely affecting Chickasaw National Recreation Area are eliminated, mitigated, or minimized.				
	<i>Strategies:</i> Surface water quality will continue to be monitored on a regular basis throughout Chickasaw National Recreation Area, focusing on bacterial and other organic contamination. Chemical contaminants, such as pesticides, will be periodically monitored. Groundwater monitoring should also be conducted to ensure the safety and quality of groundwater.				
	NPS staff will work with the city of Sulphur, adjacent landowners, and the Oklahoma Department of Environmental Quality to identify pollution sources outside Chickasaw National Recreation Area's boundaries that are affecting Chickasaw National Recreation Area, such as ranch lands and residential developments along Rock, Buckhorn, and Guy Sandy creeks.				
	A hazardous substance and spill contingency plan will be prepared to address contamination from hazardous materials (e.g., petroleum products, raw sewage, and agricultural chemicals).				

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
Water Quantity	NPS Management Policies 2001 (§§ 4.6.1 and 4.6.2) calls for the National Park Service to perpetuate surface and groundwater as integral components of park aquatic and terrestrial ecosystems. "NPS Natural Resource Management Reference Manual #77" provides further direction on the management of water quantity on parks, stating the National Park Service will manage and use water to protect resources, accommodate visitors, and administer park units within legal mandates.				
	Chickasaw National Recreation Area's water resources, including its well-known springs, are derived from a delicately balanced, complex hydrologic system. Although there is little information on the storage and flow characteristics of the Arbuckle-Simpson Aquifer that underlies Chickasaw National Recreation Area, it is known that water from this aquifer discharges into and supports Chickasaw National Recreation Area's streams and springs. It is also known that flows from the recreation area's springs have been significantly reduced since the recreation area was originally established in 1906, and that only 5 of 33 springs identified at that time continue to flow.				
	Desired Conditions: All documented springs and streams continue to flow and the flows are natural to the extent possible. Chickasaw National Recreation Area exhibits water quantity characteristics consistent with those that first attracted people to the area. The groundwater and quantity of water that underlies and shapes all of Chickasaw National Recreation Area's natural and cultural features, and which is vital to ensuring the continuing flow of the springs, is maintained and protected.				
	Strategies: Additional information is needed to understand this complex hydrologic system. Specifically, additional information is needed regarding the Arbuckle-Simpson Aquifer, groundwater and surface water interactions, recharge areas, flow paths of groundwater, and potential impacts of groundwater withdrawals, among other topics. The NPS will support research and studies to collect this information, such as a five-year hydrologic study of the aquifer being undertaken by the Bureau of Reclamation and Oklahoma Water Resources Board, and geologic mapping being undertaken by the USGS.				
	The relationship between precipitation, water levels, and spring discharge will be studied to provide more information on water levels in the aquifer and on aquifer recharge, and to improve understandir of the forces that influence spring flow levels, especially within Antelope and Buffalo springs.				
	NPS staff will continue to educate the public about the importance of groundwater for Chickasaw National Recreation Area and important groundwater management issues.				
	Flows of selected springs and water levels within Chickasaw National Recreation Area will continue to be monitored.				
	The "Water Resources Management Plan" (NPS 1998b) will be periodically updated to address new water issues as they arise. The project statements previously developed will be reviewed, and funding will be sought for the completion of the pending projects. An example of one project is the evaluation of flow regulation on Vendome Well for improved conservation of the aquifer.				
	NPS staff will work with federal and local government agencies and civic organizations to encourage the city of Sulphur to seek alternative water supplies.				
	To protect water resources within Chickasaw National Recreation Area, NPS staff will work with the city, state, landowners, Arbuckle Master Conservancy District, and other entities to monitor water use within and adjacent to the recreation area's boundaries. NPS staff will continue to monitor water rights applications, attend hearings, and protest applications if necessary.				
	NPS staff will continue to work with the state of Oklahoma to develop a comprehensive, unified approach to managing groundwater. The National Park Service will work within the state administrative process to provide protection to surface and groundwater resources in Chickasaw National Recreation Area.				
	NPS staff will encourage neighbors of Chickasaw National Recreation Area to prevent waste by voluntarily plugging private wells. The state also will be requested to encourage landowners to cap abandoned artesian wells within the aquifer.				
	NPS staff will strive to conserve water in all recreation area operations. Examples of actions that could be taken include installing low-flow fixtures such as toilets and showers, or installing self-contained, evaporative toilets.				

TOPIC	Desired Conditions and Strategies for Chickasaw National Recreation Area				
Floodplains	Floodplains exist along Guy Sandy, Rock, and Travertine creeks. Floods can occur due to thunderstorms, posing a risk to structures, visitors, and employees. Floodplains are protected and managed in accordance with Executive Order 11988 ("Floodplain Management"), NPS Director's Order 77-2 and its accompanying procedural manual, and NPS <i>Management Policies 2001</i> (§ 4.6.4).				
	Desired Conditions: Natural floodplain values are preserved or restored. Long- and short-term impacts associated with the occupancy and modification of floodplains are avoided. Hazardous conditions associated with flooding that could affect visitor safety are minimized.				
	<i>Strategies:</i> Whenever possible, new developments will be located on sites outside floodplains. If it is not possible to avoid locating a new development on a floodplain or to avoid a management action that would affect a floodplain, the National Park Service will:				
	 prepare and approve a statement of findings in accordance with Director's Order 77-2 use nonstructural measures as much as practicable to reduce hazards to human life and property while minimizing impacts on the natural resources of floodplains ensure 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) 				
	Mitigation measures will be required as part of construction to avoid any potential indirect effects on floodplains. Before initiating any ground-disturbing projects, further investigation will be conducted to determine if floodplain resources would be affected. Floodplains will be addressed at the project level to ensure that projects are consistent with NPS policy and Executive Order 11988.				
	Visitor interpretive and education efforts will emphasize the hazards that exist when flash flooding occurs in Chickasaw National Recreation Area, and appropriate responses.				
	Chickasaw National Recreation Area does not have extensive wetlands. Although there is not a detailed wetlands inventory for the recreation area, small wetlands are located in the vicinity of seeps and springs, along the streams, and near Lake of the Arbuckles. Wetlands are protected and managed in accordance with Executive Order 11990 "Protection of Wetlands," NPS Director's Order 77-1 and its accompanying procedural manual, and NPS <i>Management Policies 2001</i> (§ 4.6.5).				
	Desired Conditions: The natural values of wetlands are maintained and protected. When practicable, natural wetland cultural values are enhanced by using them for educational, recreational, scientific, and similar purposes that do not disrupt natural wetland functions.				
	Strategies: A recreation-area-wide wetland inventory, condition assessment, and functional evaluation will be done to help ensure proper management and protection of wetland resources. More detailed wetland mapping will be done in areas that are proposed for development or are otherwise susceptible to degradation or loss due to human activities.				
Wetlands	NPS staff will be trained on identifying wetlands to ensure that operational activities do not inadvertently drain or alter wetlands, including ephemeral (seasonal) wetlands.				
	The construction of new developments in wetlands will be avoided. If it is not possible to avoid locating a new development in a wetland or to avoid a management action that would adversely affect a wetland, the National Park Service will comply with the provisions of Executive Order 11990, the Clean Water Act, and Director's Order 77-1. All practicable measures (including the Best Management Practices described in appendix 2 of the "NPS Procedural Manual #77-1: Wetland Protection") will be included in the proposed action to minimize harm to wetlands. The loss of any wetlands will be compensated.				
	A statement of findings for wetlands will be prepared (according to the guidelines defined in the NPS Procedural Manual #77-1) if the action would result in an adverse impact on a wetland. 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.				

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
Threatened and Endangered Species	Under the Endangered Species Act, the National Park Service is mandated to promote the conservation of all federal threatened and endangered species and their critical habitats within park unit boundaries. NPS <i>Management Policies 2001</i> (§ 4.4.2.3) also call for the agency to survey for, protect, and strive to recover all species native to park units that are listed under the Endangered Species Act. In addition, the National Park Service is directed to inventory, monitor, and manage state-listed species in a manner similar to the treatment of federally listed species, to the greatest extent possible.				
	Only a few threatened and endangered species have been recorded at Chickasaw National Recreation Area, and other than bald eagles, none are known to regularly use the recreation area. However, there is the possibility that threatened and endangered species, such as the endangered American burying beetle, whooping crane, and interior whooping crane occur in the recreation area but have not yet been documented as being present.				
	Desired Conditions: Chickasaw National Recreation Area contributes to the overall recovery and eventual delisting of all listed species and species proposed for listing. Essential habitats that support these species are all protected.				
	General Strategies: The NPS staff will continue to work with the U.S. Fish and Wildlife Service, Oklahoma Biological Survey, and the Oklahoma Department of Wildlife Conservation to ensure that National Park Service actions help state and federally listed species recover. If any state or federally listed, or proposed threatened or endangered species, were found in areas that would be affected by construction, visitor use, or restoration activities proposed under any of the alternatives in this plan, Chickasaw National Recreation Area staff would first consult informally with the above agencies. The NPS staff will then take action to address any potential adverse impacts on state or federally listed species. Should it be determined through informal consultation that an action might adversely affect a federally listed or proposed species, NPS staff would initiate formal consultation under section 7 of the Endangered Species Act.				
	NPS staff will cooperate with the above agencies in inventorying, monitoring, protecting, and perpetuating the natural distribution and abundance of all state and federally listed species and their essential habitats. These species and their required habitats will be specifically considered in ongoing planning and management activities. If appropriate, surveys for threatened and endangered species will be undertaken before permitting ground-disturbing activities or developments.				
Hunting	Hunting is a permitted use under the enabling legislation for Chickasaw National Recreation Area (P.L. 94-235, §3). The legislation also provides for the designation of zones and periods when no hunting is permitted for reasons of public safety, administration, wildlife management, or public use and enjoyment. NPS <i>Management Policies 2001</i> (§ 4.4.3), and "NPS-77 Natural Resources Management Guideline" provide further guidance on hunting in park units.				
	Desired Conditions: High quality public opportunities continue to be available to hunt native species in natural habitats and in natural concentrations.				
	Strategies: NPS staff will work with the Oklahoma Department of Wildlife Conservation, monitoring wildlife populations and enforcing state and federal regulations, to ensure that harvest levels are on a sustained yield basis and do not adversely affect Chickasaw National Recreation Area's wildlife populations, and to ensure that visitors have a safe, quality experience.				
	Wildlife surveys specific to game species will be continued, and population trends will be analyzed.				

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
Fishing	Fishing is a permitted use under the enabling legislation for Chickasaw National Recreation Area (P.L. 94-235, §3). The legislation also provides for the designation of zones and periods when no fishing is permitted for reasons of public safety, administration, fish management, or public use and enjoyment. NPS <i>Management Policies 2001</i> (§ 4.4.3), "NPS-77 Natural Resources Management Guideline," and 36 Code of Federal Regulations 2.3 provide further guidance on fishing in park units.				
	Desired Conditions: High quality public opportunities continue to be available for fishing in Chickasaw National Recreation Area.				
	<i>Strategies:</i> NPS staff will continue to work with the Oklahoma Department of Wildlife Conservation in Lake of the Arbuckles, monitoring fish populations and enforcing state regulations, to ensure that harvest levels do not adversely affect Chickasaw National Recreation Area's fish populations.				
	To ensure that a quality recreational fishery is maintained in Chickasaw National Recreation Area, the NPS staff will develop a fisheries management plan, in cooperation with the state, to identify long-range goals, management objectives, information needs, and staffing and budgetary requirements.				
	The NPS staff will work with the state to determine if fishing tournaments should be limited. The state will be encouraged to provide an opportunity for NPS staff to participate in decisions regarding stocking Lake of the Arbuckles and to notify NPS staff when the state is stocking the lake.				
	Populations of nonnative fish and other animals will be managed whenever such species threaten recreation area resources or public health and when control is prudent and feasible.				
Lightscape Management/ Night Sky	NPS policy recognizes that Chickasaw National Recreation Area's night sky is a feature that contributes to the visitor experience. The policy further states that the NPS staff will seek to minimize the intrusion of artificial light into the night scene. In natural areas, artificial outdoor lighting will be limited to meet basic safety requirements and will be shielded when possible.				
	Desired Conditions: Opportunities to view the night sky are available. Artificial light sources within Chickasaw National Recreation Area do not impair night sky viewing opportunities or adversely affect wildlife populations.				
	<i>Strategies:</i> Impacts on the night sky caused by facilities such as campgrounds within Chickasaw National Recreation Area will be evaluated. To the extent possible, the staff will work within a regional context to protect night sky quality. Chickasaw National Recreation Area will also work with the Bureau of Reclamation to reduce the impact of the security lights on the dam.				
	If it is determined that light sources within Chickasaw National Recreation Area affect views of the night sky, alternatives to existing lighting sources will be studied, such as shielding lights, changing lamp types, or eliminating unnecessary sources.				
Natural Soundscape	NPS Management Policies 2001 (§ 4.9) and NPS Director's Order 47, "Sound Preservation and Noise Management" requires park managers to strive to preserve the natural soundscape (natural quiet) associated with the physical and biological resources (i.e., the sounds of the wind in the trees). The concept of natural quiet was further defined in the <i>Report on Effects of Aircraft Overflights on the National Park System</i> (NPS 1995):				
	What is <i>natural quiet</i> ? Parks and wildernesses offer a variety of unique, pristine sounds <i>not</i> found in most urban or suburban environments. They also offer a complete absence of sounds that <i>are</i> found in such environments. Together, these two conditions provide a very special dimension to a park experience — quiet itself. In the absence of any discernible source of sound (especially man- made), quiet is an important element of the feeling of solitude. Quiet also affords visitors an opportunity to hear faint or very distant sounds, such as animal activity and waterfalls. Such an experience provides an important perspective on the vastness of the environment in which the visitor is located, often beyond the visual boundaries determined by trees, terrain, and the like. In considering natural quiet as a resource, the ability to clearly hear the delicate and quieter intermittent sounds of nature, the ability to experience interludes of extreme quiet for their own sake, and the opportunity to do so for extended periods of time, is what natural quiet is all about.				
	The primary sources of noise in Chickasaw National Recreation Area are due to watercraft on Lake of the Arbuckles and land-based sources such as motor vehicles.				

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area			
	Desired Conditions: Visitors have opportunities in Chickasaw National Recreation Area to experience natural sounds in an unimpaired condition. The sounds of civilization are generally confined to developed areas and specific hours of the day.			
	Strategies: The existing quiet hours in campgrounds will be maintained.			
Natural	Enforcement of the decibel regulations for boats will be improved.			
(cont.)	NPS managers will minimize noise generated by management activities by strictly regulating NPS administrative use of noise-producing machinery such as motorized equipment. Noise will be a consideration when procuring and using NPS equipment.			
	NPS staff will work with the Department of Defense to develop a process to address the occasional problems that arise from military flights over Chickasaw National Recreation Area.			
	Cultural Resources			
Archeological Resources	Desired Conditions: Archeological sites are protected in an undisturbed condition unless it is determined through formal processes that disturbance or natural deterioration is unavoidable. Archeological sites are identified and inventoried, and their significance is determined and documented.			
	<i>Strategies:</i> When disturbance or deterioration is unavoidable, the site will be professionally documented and excavated and the resulting artifacts, materials, and records will be curated and conserved in consultation with the Oklahoma state historic preservation office and, if necessary, American Indian tribes. Some archeological sites that can be adequately protected might be interpreted to the visitor.			
	Archeological surveys will be sponsored so that the whole national recreation area is eventually covered systematically. That includes the Platt Historic District and the Arbuckle District.			
Historic Structures	Desired Conditions: Structures individually eligible for the National Register of Historic Places, or identified as contributing to the National Historic Landmark significance of the Platt Historic District's cultural landscape, are managed to ensure their long-term preservation and protection of character-defining features.			
	Strategies: Appropriate preservation treatments for historic structures will be carried out in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties</i> . As required, historic structures requiring more intensive rehabilitation or restoration treatments will receive further investigation and documentation (e.g., historic structure reports) to inform management of decisions and ensure protection of historic fabric and architecturally significant features. Preservation of historic structures will be emphasized as a critical component of Chickasaw National Recreation Area's ongoing maintenance and resource protection programs. There would be consideration given for acquisition of historic structures, springs, or wells adjacent to or nearby the recreation area if they become available.			
	Desired Conditions: Appropriate cultural anthropological research is conducted in cooperation with groups associated with Chickasaw National Recreation Area.			
	NPS staff 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.			
Ethnographic Resources	NPS general regulations on access to and use of natural and cultural resources in the area are applied in an informed and balanced manner that is consistent with recreation area purposes, and does not unreasonably interfere with American Indian use of traditional areas or sacred resources, and does not result in the degradation of area resources.			
	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 area lands.			
	All ethnographic resources determined eligible as traditional cultural properties for listing or listed in the National Register of Historic Places are protected. If disturbance of such resources is unavoidable, consultation is conducted as appropriate with the relevant American Indian tribes, tribal historic preservation officers, European American families or groups, and the Oklahoma state historic preservation officer. This consultation is in accordance with NHPA, as amended, and the implementation of regulations of the Advisory Council on Historic Preservation.			

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
Ethnographic Resources (cont.)	<i>Strategies:</i> All agencies are required to consult with tribal governments before taking actions that could 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.				
	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.				
	NPS staff will conduct appropriate ethnographic, ethnohistorical, or cultural anthropological research in conjunction with, and in cooperation with, American Indian tribes traditionally associated with Chickasaw National Recreation Area.				
	NPS staff will strive to involve the Chickasaw Nation and other American Indian tribes traditionally associated with Chickasaw National Recreation Area in the interpretation program to promote the accuracy of information presenting Chickasaw Indian cultural history and other American Indian cultural values, and to enhance public appreciation of those values.				
	NPS staff will seek to participate as possible partners, and certainly as good neighbors, with the Chickasaw Nation and any other interested traditionally associated American Indian tribes. Seek to participate in planning for and conducting projects and initiatives that enhance the quality of the experiences of visitors to Chickasaw National Recreation Area and that enhance the levels of public appreciation of Chickasaw National Recreation Area's resources and values.				
Cultural Landscapes	Desired Conditions: Character-defining features and attributes contributing to the national register or National Historic Landmark significance of the Platt Historic District as a designated cultural landscape are appropriately preserved and restored. Additional inventories on other park areas are used to identify other cultural landscape resources potentially eligible for the National Register of Historic Places.				
	Strategies: Treatment recommendations identified in the <i>Cultural Landscape Report</i> (Hohmann and Grala 2004) for the Platt Historic District will serve as guidance in accordance with the <i>Secretary of the Interior's Standards for the Treatment of Historic Properties (with Guidelines for the Treatment of Cultural Landscapes)</i> to ensure long-term preservation objectives. Cultural landscape preservation will be emphasized as a critical component of Chickasaw National Recreation Area's ongoing maintenance and resource protection programs.				
Museum Collections	Desired Conditions: All museum collections and archives and their component artifacts, objects, specimens, documents, photographs, maps, plans, and manuscripts are properly inventoried, accessioned, catalogued, curated, documented, protected, and preserved; and adequate provision is made for their access by national recreation area staffers and other researchers and for their use in exhibits, interpretation, and research.				
	Strategies: Chickasaw National Recreation Area will prepare a museum collection plan that will examine all opportunities and options to house the collection. Some items to be considered include the retrieval of some museum artifacts and specimens that are on loan to other institutions; accommodation of donated historic artifacts, photographs, and papers being sought from public; and to provide secure and comfortable work and storage space that meets museum standards. The plan would be consistent with <i>Museum Collection Facilities Strategy, Intermountain Region</i> (NPS 2005).				
	The qualities that contribute to the significance of collections will be protected in accordance with established standards.				

TOPIC	Desired Conditions and Strategies for Chickasaw National Recreation Area			
Visitor Use And Experience				
	Desired Conditions: Area resources are conserved "unimpaired" for the enjoyment of future generations. Visitors have opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in Chickasaw National Recreation Area; opportunities continue to be provided for visitors to understand, appreciate, and enjoy Chickasaw National Recreation Area. The types and levels of visitor use in all of Chickasaw National Recreation Area's management areas are consistent with the desired resource and visitor experience conditions prescribed for those areas. No activities occur that would cause derogation of the values and purposes for which the recreation area has been established.			
	Opportunities for high quality hunting and fishing experiences continue to be provided in Chickasaw National Recreation Area.			
	Area visitors have opportunities to understand and appreciate the significance of Chickasaw National Recreation Area and its resources, and to develop a personal stewardship ethic.			
	To the extent feasible, programs, services, and facilities in Chickasaw National Recreation Area are accessible to and usable by all people, including those with disabilities.			
Visitor Use and Experience	Strategies: NPS staff will continue to enforce the regulations governing visitor use and behavior in Title 36 of the <i>Code of Federal Regulations</i> (36 CFR) and in Chickasaw National Recreation Area's Superintendent's Compendium.			
	All of Chickasaw National Recreation Area's programs and facilities will be evaluated on a regular basis to ensure that they are accessible to the extent feasible.			
	Visitor surveys will be periodically conducted to determine visitor satisfaction with Chickasaw National Recreation Area facilities, NPS management, and the experiences they are having.			
	NPS staff will periodically meet with managers from other recreation areas in the region, such as Turner Falls, to improve visitor trip planning, information and orientation; and enrich interpretation and education opportunities for Chickasaw National Recreation Area visitors.			
	To meet the requirements of the 1978 National Parks and Recreation Act and NPS management policies, NPS staff will identify implementation commitments for visitor-carrying capacities for all areas of Chickasaw National Recreation Area. Facility capacities (e.g., parking, picnicking, and campsite availability) have been the primary factor in determining Chickasaw National Recreation Area's carrying capacity. NPS staff will continue to monitor visitor comments on issues such as crowding and availability of parking spaces and campsites at busy times of the year, and will monitor for resource impacts caused by visitors. Should any of the trends increase to levels unacceptable to managers, the NPS staff will consider what actions to take, such as undertaking detailed planning to establish visitor-carrying capacity strategies and monitoring programs. Studies will determine what levels of visitation will be consistent with the preservation of Chickasaw National Recreation Area's resources and the experiences that visitors desire. Additional information on user capacity can be found in the alternatives section.			
	Desired Conditions: Visitors in the backcountry (e.g., Upper Guy Sandy and the Rock Creek corridor areas) have high-quality experiences and have minimal impacts on resources.			
Backcountry	<i>Strategies:</i> Backcountry use will be managed in accordance with a backcountry management plan (or other plan addressing backcountry uses) that is designed to avoid unacceptable impacts on recreation area resources or adverse affects on visitor enjoyment of appropriate recreational experiences.			
	NPS staff will seek to identify acceptable limits of impacts, monitor backcountry use levels and resource conditions, and take prompt, corrective action when unacceptable impacts occur.			

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
Commercial Services	A commercial activity is defined as any activity for which compensation is exchanged. It includes activities by for-profit and nonprofit operators. Commercial services are more than just concessions. They include concession contracts, commercial use authorizations, leases, cooperative agreements, rights-of-way, and special use permits. Levels of commercial use are consistent with resource protection and visitor experience goals for Chickasaw National Recreation Area and do not unduly interfere with the independent visitor's ability to participate in the same activity. They are also safe and sustainable.				
	Desired Conditions: If commercial services are identified as being necessary and appropriate in Chickasaw National Recreation Area, the operators provide high-quality visitor experiences while protecting important resources. They add to visitor enjoyment of Chickasaw National Recreation Area, and mesh well as partners with NPS staff and programs. The commercial services comply with the provisions of the NPS Concessions Management Improvement Act of 1998.				
	<i>Strategies:</i> All commercial services must be authorized, must be necessary and/or appropriate, and must be economically feasible. Appropriate planning will be done to support commercial services authorization, and appropriate commercial permits may or will be granted.				
	If commercial services are offered in Chickasaw National Recreation Area, they will be periodically evaluated to ensure that they are providing satisfactory services in an efficient and effective manner, and that they are safe, sustainable, and compatible with recreation area resources.				
	Other Topics				
Sustainable Design/ Development	Sustainability can be described as doing things in ways that do not compromise the environment or its capacity to provide for present and future generations. Sustainable practices consider local and global consequences to minimize the short- and long-term environmental impacts of human actions and developments through resource conservation, recycling, waste minimization, and the use of energy-efficient and ecologically responsible materials and techniques.				
	Over the past several years, the federal government has been emphasizing the adoption of sustainable practices. In particular, Executive Order 12873 mandates federal agency recycling and waste prevention; and Executive Order 12902 mandates energy efficiency and water conservation at federal facilities.				
	Desired Conditions: Chickasaw National Recreation Area is a leader in sustainable practices. All decisions regarding operations, facilities management, and development in the recreation area — from the initial concept through design and construction — reflect principles of resource preservation. Thus, all recreation area developments and operations are sustainable to the maximum degree possible and practical. New developments and existing facilities are located, built, and modified according to the <i>Guiding Principles of Sustainable Design</i> (NPS 1993) or other similar guidelines. Chickasaw National Recreation Area has state-of-the-art water systems for conserving water, and energy conservation technologies and renewable energy sources whenever possible. Biodegradable, nontoxic, and durable materials are used in the recreation area whenever possible. The reduction, use, and recycling of materials is promoted, while materials that are nondurable, environmentally detrimental, or that require transportation from great distances are avoided as much as possible.				
	Strategies: NPS staff will work with experts both inside and outside the National Park Service to make Chickasaw National Recreation Area's facilities and programs sustainable. Partnerships will be sought to implement sustainable practices in the recreation area. NPS staff also will work with stakeholders and business partners to augment NPS environmental leadership and sustainability efforts.				
	NPS managers will perform value analysis and value engineering, including life cycle analysis, to examine the energy, environmental, and economic implications of proposed developments.				
	NPS staff will support and encourage the service of suppliers and contractors that follow sustainable practices.				
	Energy-efficient practices and renewable energy sources will be promoted wherever possible.				
	Chickasaw National Recreation Area's interpretive programs will mention sustainable and nonsustainable practices. Visitors will be educated on the principles of environmental leadership and sustainability through exhibits, media, and printed material.				
	NPS employees will be educated to have a comprehensive understanding of their relationship to environmental leadership and sustainability.				
	NPS managers will measure and track environmental compliance and performance. Audits will ensure environmental compliance, emphasize best management practices, and educate employees at all levels about environmental management responsibilities.				

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area				
Transportation to and within Chickasaw National Recreation Area	Desired Conditions: Visitors have reasonable access to Chickasaw National Recreation Area, and there are connections from the recreation area to regional transportation systems as appropriate. Transportation facilities in the recreation area provide access for the protection, use, and enjoyment of recreation area resources. They preserve the integrity of the surroundings, respect ecological processes, and provide the highest visual quality and a rewarding visitor experience.				
	Strategies: NPS staff will participate in all transportation planning forums that may result in links to areas or impact recreation area resources. Working with federal, tribal, state, and local agencies on transportation issues, NPS staff will seek reasonable access to areas in Chickasaw National Recreation Area and connections to external transportation systems.				
Utilities and Communication Facilities	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 park units if such facilities can be structured to avoid interference with park unit purposes.				
	Desired Conditions: Recreation area resources or public enjoyment of Chickasaw National Recreation Area are not denigrated by nonconforming uses. Telecommunication structures are permitted in the recreation area to the extent that they do not jeopardize the recreation area's resources. No new nonconforming use or rights-of-way are permitted through the recreation area without specific statutory authority and approval by the director of the National Park Service or his/her representative, and are permitted only if there is no practicable alternative to such use of NPS lands.				
	<i>Strategies:</i> New or reconstructed utilities and communications utilities, and communications infrastructures will be located in association with existing structures and along roadways or other established corridors in developed areas. For reconstruction or extension into undisturbed areas, routes will be selected that would minimize impacts on Chickasaw National Recreation Area's natural, cultural, and visual resources.				
	Utility lines will be placed underground to the maximum extent possible.				
	NPS staff will work with service companies, local communities, and the public to locate new utility lines so that there is minimal effect on recreation area resources.				
	NPS policies will be followed in processing applications for commercial telecommunications applications.				
Dam and Streamflow Control Structures	Desired Conditions: All dams and streamflow control structures in Chickasaw National Recreation Area are adequately maintained and managed according to NPS policy, and do not present hazards to visitors, NPS staff, nearby residents, businesses, or properties. The operation and maintenance of all dams and control structures satisfy the standards and requirements in Director's Order 40 (<i>Dams and</i> <i>Appurtenant Works</i>), NPS Special Directive 87-4 ("Dams and Appurtenant Works — Desk Reference Manual for Maintenance, Operation and Safety" 1987), and "Standing Operating Procedures Guide for Dams, Reservoirs, and Power Facilities" (BuRec, Denver 1996). Dams and control structures outside of Chickasaw National Recreation Area also do not pose hazards to the recreation area.				
	Strategies: All dams and streamflow control structures in Chickasaw National Recreation Area are regularly monitored and annual safety inspections are conducted. NPS staff work with the Bureau of Reclamation and other agencies to ensure that all dams in the recreation area are adequately maintained.				
	An emergency action plan (which describes procedures to reduce the loss of life or property should a dam failure become likely) is regularly reviewed and updated for dams in Chickasaw National Recreation Area that pose high or significant downstream hazard potential. Potential hazards posed by dams outside the recreation area also are identified.				

ΤΟΡΙϹ	Desired Conditions and Strategies for Chickasaw National Recreation Area			
	Official inspection reports are prepared for all NPS dams, and obtained for non-NPS dams, such as the Lake of the Arbuckles Dam, operated by the Bureau of Reclamation. These reports are submitted to the NPS Maintenance, Operation, and Safety of Dams (MOSD) program coordinator.			
Dam and Streamflow Control Structures (cont.)	Prompt corrective actions are taken to address deficient dams within Chickasaw National Recreation Area that pose significant hazards. The National Park Service will also alert the owners of dams outside the recreation area that are seriously deficient and pose high hazards to the recreation area, such as the Lacy Lake Dam; and work with the owners and other appropriate parties to correct these deficiencies. All of the existing dams and streamflow control structures in Chickasaw National Recreation Area contribute to the cultural, natural, and recreational resource bases of the area. However, if in the future a structure(s) is determined to not positively contribute to the recreation area's resources and uses, and/or poses unacceptable maintenance costs, once appropriate environmental compliance documentation has been completed, it will be removed.			



SPECIAL MANDATES AND ADMINISTRATIVE COMMITMENTS

In addition to the general law and policies previously discussed, there are several specific mandates and administrative commitments that refer to Chickasaw National Recreation Area. The legal requirements and formal administrative agreements listed below can be considered as "givens" for the *Chickasaw National Recreation Area General Management Plan*, and apply to all of the alternatives.

- The legislation establishing Chickasaw National Recreation Area (Public Law 94-235) mandates that the total acreage of Chickasaw National Recreation Area cannot exceed 10,000 acres.
- Section 3 of Public Law 94-235 mandates that the National Park Service work with the Oklahoma Department of Fish and Wildlife on management of hunting and fishing in Chickasaw.
- Under a 2001 memorandum of understanding, the state of Oklahoma maintains U.S. Highway 177, including the roadway, signs, and guardrails.
- The Arbuckle Master Conservancy and U.S. Army Corps of Engineers manage the water level of Lake of the Arbuckles, while the Bureau of Reclamation maintains the reservoir dam.
- A series of rights-of-way, easements, and memoranda of understanding provide for the city of Sulphur to access and operate its wastewater treatment plant on city-owned land within Chickasaw National Recreation Area, as well as maintain underground pipes that pass through the recreation area.
- The National Park Service has a June 2000 memorandum of understanding with the Goddard Youth Camp giving the camp permission to operate its facility within Chickasaw National Recreation Area's boundary. The camp

was established as an environmental education facility for the exclusive use of nonprofit youth organizations.

- A series of rights-of-ways, easements, and memoranda of agreement provide for a variety of utility lines to cross through Chickasaw National Recreation Area, including city waterlines and sewerlines; phone and gas lines that go through the Platt District; and phone, gas, and powerlines that pass through the Guy Sandy, the Point, and Buckhorn areas.
- There are some agreements (special use permits) for road access across federal lands to private houses and lots. The National Park Service also has an agreement to maintain a segment of this road to provide access to the landowners.

RELATIONSHIP OF OTHER PLANNING EFFORTS TO THIS GENERAL MANAGEMENT PLAN

Chickasaw National Recreation Area is in Murray County, Oklahoma. Properties surrounding Chickasaw National Recreation Area are mostly privately owned residential and agricultural lands. There are also commercial-, city-, and state-owned parcels adjacent to the recreation area.

Several plans have influenced, or would be influenced by, the approved *General Management Plan* for Chickasaw National Recreation Area. These plans have been prepared, or are being prepared, by NPS staff. Some of these plans are described briefly herein, along with their relationship to this GMP.

Business Plan (2005)

The Business Plan's purpose is to improve the abilities of parks to more clearly communicate their financial status with principal stakeholders. Chickasaw National Recreation Area's Business Plan was completed in 2004 for the Fiscal Year of 2003. The Management Team conducted analysis of the financial historical data, along with defining operational standards; developed priorities; determined strategies for reducing costs; developed strategies for increasing nonappropriated funding; and allocated resources differently using "Core Operations" criteria. The completed Business Plan for Chickasaw National Recreation Area has provided a "Poster Child" example to other parks for finding immediate sustainable solutions within their own budgets through the process of "Core Operations." Chickasaw National Recreation Area is confident that it can meet its priorities and needs through implementing strategies and continued evaluation of its internal procedures and resource allocations. The lessons learned from the business plan process will guide Chickasaw National Recreation Area toward sustainable operations and improve the protection of park resources.

Comprehensive Interpretive Plan (2005)

NPS policy states that each park shall have a *Comprehensive Interpretive Plan* that includes a long-range vision of the interpretive program, an annual component to implement the vision, and a reference database. Completion of all three sections is critical to ensuring that interpretive resources are coordinated and focused on achieving management's vision for Chickasaw National Recreation Area. The three principle sections of the *Comprehensive Interpretive Plan* are titled:

- Long-Range Interpretive Plan
- Annual Implementation Plan
- Interpretive Database

The three-part *Comprehensive Interpretive Plan* is intended to define and guide the parkwide interpretive program consistent with the achievement of Chickasaw National Recreation Area's goal for interpretation, as described in Chickasaw National Recreation Area's Strategic Plan: Increasing People's Understanding and Appreciation of the Significances of Chickasaw National Recreation Area. The Comprehensive Interpretive Plan (CIP) is the implementation plan that defines the parkwide interpretive program. All interpretive activities are based on and coordinated by the CIP. The resulting parkwide interpretive program communicates — in the most effective and efficient way — Chickasaw National Recreation Area's significances and meanings while promoting the protection and preservation of Chickasaw National Recreation Area resources.

"Superintendent's Compendium" (2006)

This is a list of designations, closures, permit requirements, and other restrictions on uses in Chickasaw National Recreation Area promulgated under the discretionary authority of the superintendent. The compendium covers visitor hours, public use limits, closures and area designations for specific uses or activities, a list of activities that require a NPS permit; and general regulations regarding preservation of natural and cultural resources, wildlife protection, hunting and fishing, camping, boating, pets, and use of bicycles, among other topics. The compendium will be modified as necessary to reflect any changes resulting from implementation of the General Management Plan

Resource Management Plan (1999)

The *Resources Management Plan* is Chickasaw National Recreation Area's plan for the longrange management of its resources and a tactical plan identifying short-term projects. The plan identifies and describes specific inventory, monitoring, research, restoration, and mitigation actions that are currently active or that are needed to perpetuate natural

processes and resources and preserve cultural resources in Chickasaw National Recreation Area. The *Resource Management Plan* will be replaced with a "Resource Stewardship Strategy" as needed to incorporate the management directions presented in this plan.

Strategic Plan for Chickasaw National Recreation Area (2005 – 2008)

The strategic plan describes the long-term goals for Chickasaw National Recreation Area and how it contributes to nationwide NPS goals. The plan includes an objective, quantified, measurable, long-term goals. Also included in the document are a description of strategies and operational processes and resources required to meet the goals, an identification of key factors external to the recreation area that could significantly affect the achievement of general goals, and a discussion of measuring results. The desired conditions, goals, and strategies included in the strategic plan will be updated to reflect the management directions presented in the approved General Management Plan.

Annual Performance Plan (2006)

This annual plan identifies goals for the recreation area in the context of its parent mission and long-term goals for fiscal year 2003 (October 1, 2002 — September 30, 2003). Each annual goal is outcomeoriented, objective, quantified, and measurable, with performance measures built into each goal statement. Each goal has a brief background explanation, an overview of how the goal will be accomplished, and a statement of how accomplishment will be measured. Future annual performance plans will tier off the management directions presented in this *General Management Plan*.

Statement for Management (June 1995)

The "Statement for Management" discusses different influences that affect management of Chickasaw National Recreation Area, including legislative and administrative requirements, resource conditions, land uses and trends, visitor uses and trends, and facilities. Major issues facing the recreation area were identified, including land protection, alien species, restoration of native ecosystems, external threats, and access. General management objectives were identified for natural ecosystems, cultural resources, visitor use, and facility development and staffing. Although no longer being prepared by the National Park Service, the "Statement for Management" was used as a foundation document in preparing this plan.

Amendment to the General Management Plan (1994)

This plan focuses on the development of the new visitor center near Vendome Well and Chickasaw Nation Cultural Center. It proposed development of the visitor center near Vendome Well and the Chickasaw Nation Cultural Center near the Rock Creek area. These projects are being developed at the time of preparation of this *General Management Plan* and are "givens" in the development of GMP alternatives. This amendment also provided guidance for the administrative offices and maintenance facilities.

Water Resources Management Plan (1998)

This plan serves as a tool to manage water resources-related planning activities at Chickasaw National Recreation Area for 5–10 years. The plan includes an overview of Chickasaw National Recreation Area's resources, resource management objectives, and critical water resource issues. A recommended management program is outlined that includes a set of project statements prepared following guidelines established by the National Park Service.

Cultural Landscape Report (Hohmann and Grala 2004)

This report documents the physical evolution and existing conditions of the Platt District's cultural landscape, describes character-defining features, and analyzes landscape significance and integrity. It further presents recommended treatment guidelines and strategies appropriate for the preservation and rehabilitation of the district's cultural landscape resources.

Regional Plans

Currently Chickasaw National Recreation Area continues to participate with two ongoing regional planning organizations. They are the Arbuckle Mountain Area Tourism Association and the Murray County Long Range Planning Commission.



PLANNING ISSUES/CONCERNS

INTRODUCTION

NPS staff; representatives from other county, state, and other federal agencies and organizations; and members of the public identified various issues and concerns during the scoping (early information gathering) period for this GMP. An issue 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 Chickasaw National Recreation Area's website (see the "Consultation and Coordination" chapter).

Comments received during scoping demonstrated that there is much that the public likes about Chickasaw National Recreation Area its management, use, and facilities. The issues and concerns generally involve determining the appropriate visitor use, types and levels of facilities, services, and activities while remaining compatible with desired resource conditions. The GMP alternatives provide strategies for addressing the issues within the context of Chickasaw National Recreation Area's purpose, significance, and special mandates.

ISSUES

Water Rights, Water Withdrawals, and Groundwater Management

The use and management of the Arbuckle-Simpson aquifer that underlies Chickasaw National Recreation Area is a major concern to the National Park Service and other agencies, groups, businesses, and individuals in the region. Concerns have been raised that overuse of the aquifer that sustains the recreation area's springs and streams may be responsible for the disappearance of some of the springs. Recent applications have been filed to appropriate groundwater outside Chickasaw National Recreation Area, which could have significant effects on the recreation area.

The GMP generally addresses water quantity and groundwater issues, providing desired conditions and general strategies. However, the plan does not go into detail on these issues. In 2003, the state of Oklahoma, U.S. Bureau of Reclamation, and USGS began a five-year study of the aquifer. This study will determine how the aquifer is managed and how much water can be pumped out of the aquifer on an annual basis. Once the study is finished, NPS staff will work with the state of Oklahoma to ensure that Chickasaw National Recreation Area's springs and streams are maintained and protected.

Surface Water Quality

Water quality is an important issue for Chickasaw National Recreation Area, both for visitors and NPS staff. Although the recreation area's water quality is generally considered to be good, swimming waters often test above allowable limits for contaminants, although the source of these contaminants is not known. Rock Creek and Lake of the Arbuckles are included on the Oklahoma 303(d) list of impaired waters because of elevated nutrients, siltation, and salinity. Beginning in the summer 2003, the National Park Service posted advisory notices along Travertine Creek because bacterial levels had exceeded NPS standards.

The 1998 Water Resources Management Plan (NPS 1998b) focuses on water quality issues and identifies specific actions that will be taken. The GMP generally addresses surface water quality, sets desired conditions, and describes strategies for obtaining them.

Spread of Nonnative (Exotic) Species and Red Cedar

Many species of invasive nonnative plants have become established throughout much of Chickasaw National Recreation Area and threaten native species. This is principally because of past use of the area. In time, these aggressive exotic plants can greatly expand their populations; alter forest, prairie, and wildlife habitats; and change scenery by smothering and displacing native species. These effects, which are already occurring in some areas of the recreation area, will worsen substantially if left untreated. A sustained effort is needed to control these internal threats to the native species and their natural habitats.

Eastern red cedar is a native species, but due largely to the suppression of fire, it is rapidly spreading throughout most of Chickasaw National Recreation Area and has become a pest, affecting many other plants and animals. It also poses a potential public safety threat to the recreation area and surrounding area due to the potential for wildfires.

The GMP provides general guidance for natural resources restoration by setting desired conditions (see table 1). These issues are addressed in depth in Chickasaw National Recreation Area's "Vegetation Management Plan" (Hoagland and Johnson 2000) and "Fire Management Plan" (NPS 2003c).

Use and Types of Visitor Use Facilities

About 1.6 million visitors recreate in Chickasaw National Recreation Area each year. Most times of the year recreation area facilities can handle visitor use levels. But during the peak summer season, particularly weekends and holidays, facilities are full. Parking also is not available. Questions have been raised about whether additional facilities, such as parking areas, trails, picnic shelters, and campgrounds, should be provided in the recreation area.

Although several of Chickasaw National Recreation Area's campground facilities were recently upgraded, people have advocated expanding the facilities, including increasing parking and campsite spaces; upgrading electrical power for recreational vehicles; providing showers in the Platt District; increasing equine trails; and providing camping opportunities for horseback riders. Decisions need to be made on what, if any, new facilities and/or facility improvements, or what management actions should be made in the recreation area to manage visitor use

Maintenance and Administrative Facilities

Chickasaw National Recreation Area has outdated maintenance facilities. The site is too small to meet recreation area needs, it does not meet modern safety and health standards, and it is not energy efficient. In addition, other administrative facilities are lacking or may be inadequate in the future. Although the administrative offices are now in a leased space in the city of Sulphur, there is no room for additional offices if the staff was to expand, and there are limited facilities for natural resource management needs. The GMP needs to determine what the future for the maintenance facility is and what administrative facilities are needed.

User Capacity

In recent years there has been an increased pressure on visitor facilities within Chickasaw National Recreation Area. Campground sites and parking, as well as boat launches and their associated parking lots, can become congested during the summer weekends particularly over holidays. In chapter 2 the GMP describes a brief strategy by suggesting potential indicators that can be monitored to help guide management actions to protect desired resources conditions and visitor experiences.

ISSUES NOT ADDRESSED IN THE GENERAL MANAGEMENT PLAN

One issue that is not being addressed in this GMP is the use of personal watercraft on Lake of the Arbuckles. Personal watercraft use was banned at Chickasaw National Recreation Area after November 6, 2002, in compliance with a NPS regulation prohibiting personal watercraft use in most park units and a subsequent court settlement. On March 10, 2003, the National Park Service released an environmental assessment that analyzed the impacts associated with personal watercraft use on Lake of the Arbuckles (NPS 2003a). The preferred alternative allowed personal watercraft use on the lake with some user restrictions (e.g., launch, areas of use, wake, equipment, emission, and safety/operating restrictions). A 30-day public comment period on the draft environmental assessment concluded on April 8, 2003. The National Park Service prepared a special regulation allowing personal watercraft use, which was approved on September 2, 2004. Most of Lake of the Arbuckles is now open to personal watercraft use.

DECISION POINTS

Decision points identify the key decisions that remain to be made after consideration of all the laws, policies, and mandates. As with any decision-making process, there are key decisions that, once made, will dictate the direction of subsequent decisions. Based on public comments and issues and NPS concerns, five decision points were identified. This GMP focuses on alternative ways of addressing these decision points. The decision points listed below are not listed in any order of priority or importance.

- 1. What outdoor recreation and visitor enjoyment opportunities should be provided at Chickasaw National Recreation Area, given that people, water resources, and other natural and cultural resources must be protected?
- 2. How can the National Park Service balance the needs of competing and/or complementary uses?
- 3. What facilities and lands are needed to meet the National Park Service and recreation area goals (recreation, resource protection, education/interpretation, safety, maintenance, and administration, etc.)?
- 4. What are the appropriate cultural and natural landscapes throughout Chickasaw National Recreation Area and how should they be managed?
- 5. What partnerships and other cooperative actions are needed with national recreation area neighbors, agencies, and others to resolve issues facing Chickasaw National Recreation Area over the next 20 years?

IMPACT TOPICS — RESOURCES AND VALUES AT STAKE IN THE PLANNING PROCESS

An important part of planning is seeking to understand the consequences of making one decision over another. To this end, National Park Service GMPs are typically accompanied by an environmental impact statement. In the case of the Chickasaw National Recreation Area GMP, a waiver was granted from the requirement to prepare an environmental impact statement. It was determined that an environmental assessment would suffice because few public comments were received in the scoping process and there is a lack of potentially significant environmental issues or impacts associated with the plan. Environmental assessments, like environmental impact statements, identify the anticipated impacts of possible actions on resources and on national recreation area visitors and neighbors. Impacts are organized by topic, such as "impacts on the visitor

experience" or "impacts on vegetation and soils." Impact topics serve to focus the environmental analysis and to ensure the relevance of impact evaluation. The impact topics identified for this GMP are outlined in the following table 2; they were identified based on federal laws and other legal requirements, Council on Environmental Quality (CEQ) guidelines, NPS management policies, staff subject-matter expertise, and issues and concerns expressed by the public and other agencies early in the planning process (see "Planning Issues/Concerns" section). Also included is a discussion of some impact topics that are commonly addressed, but that are not addressed in this plan for the reasons given.



Impact Topic	Retained or Dismissed	Rationale	Relevant Law, Regulation, or Policy
Natural Resource Impact Topics			
Paleontological Resources	Retained	Paleontological resources are another geologic resource that the Organic Act and NPS <i>Management</i> <i>Policies 2001</i> mandate to be protected. Chickasaw National Recreation Area is known to contain paleontological resources, although they are not well studied. Some of the actions in the alternatives could increase the potential for impacts on paleontological resources. Changes to this resource caused by visitors or new facilities would affect Chickasaw National Recreation Area's scientific values and would be of concern to scientists, NPS managers, and the public.	NPS Management Policies 2001
Soils	Retained	Chickasaw National Recreation Area's soils are a critical element that help determine what vegetation and wildlife occur in Chickasaw National Recreation Area, and that affect the area's productivity, drainage patterns, and erosion. Soils also provide structural support to buildings and other developed facilities in the recreation area. Proposed developments, the presence of nonnative plants and animals, and ecosystem restoration efforts in the alternatives would affect the recreation area's soils. Any impacts that would adversely affect these resources would be of concern to NPS managers and the public.	NPS Management Policies 2001
Vegetation	Retained	Chickasaw National Recreation Area supports a high habitat and plant diversity, with many vegetative communities. Actions in the alternatives could beneficially or adversely affect these resources, which would be of concern to many people, as well as NPS managers. A major concern of managers is eastern red cedar, which is spreading throughout the recreation area, crowding out native hardwoods, and taking over native prairie grasslands. The spread of nonnative species, such as Johnson grass, also is a problem in parts of the recreation area.	NPS Organic Act and NPS Management Policies 2001
Wildlife	Retained	Chickasaw National Recreation Area supports a diverse wildlife population, including insects, birds, reptiles, amphibians, and mammals. The recreation area's wildlife populations are an important resource and are one of the attractions that add to the quality of the visitor experience. Changes in wildlife habitat or in wildlife populations due to the alternatives would be of concern to visitors, the public, and NPS managers.	NPS Organic Act; enabling legislation; NPS <i>Management Policies</i> 2001

TABLE 2: IMPACT TOPICS RETAINED OR DISMISSED

Impact Topics — Resources and Values at Stake in the Planning Process

Impact Topic	Retained or	Rationale	Relevant Law,
	Dismissed		Regulation, or Policy
Water Quality	Retained	One of the reasons Chickasaw National Recreation Area was originally established, and one of the purposes of Chickasaw National Recreation Area, is to protect the area's springs and waters. The state of Oklahoma also has designated the waters within Chickasaw National Recreation Area as "Sensitive Public and Private Water Supplies." Water is a key resource, affecting the vegetation, wildlife, and public uses of the recreation area. Changes in water quality can adversely affect wildlife populations and visitors. Several water quality parameters have been exceeded in the past on Rock Creek. Swimming waters in Chickasaw National Recreation Area often test above the allowable limits for contaminants. Potential water pollution threats include both recreational users and outside sources, such as the city of Sulphur sewage treatment plant and runoff from adjacent ranch lands and residential septic systems. The alternatives could result in increased development and/or increased use, which could affect water quality. This would be of concern to visitors, the state, and NPS managers.	Clean Water Act; Executive Order 12088; NPS Management Policies 2001
Water Quantity Associated with Chickasaw National Recreation Area's Springs and Vendome Well	Retained	The presence of mineral and fresh water springs was a primary purpose for the establishment of Chickasaw National Recreation Area. In the past century, the flows of several of Chickasaw National Recreation Area's springs have decreased or ceased altogether. With past and existing groundwater withdrawals from the Arbuckle-Simpson Aquifer that underlies Chickasaw National Recreation Area, and the possibility of additional withdrawals in the future, there are major concerns that flows of the springs and the Vendome Well in Chickasaw National Recreation Area could be adversely affected. Any changes in flows or disruptions of the springs or Vendome Well would adversely affect Chickasaw National Recreation Area's natural and cultural resources and people, and would be a major concern to visitors, the local public, and NPS managers. One of the priorities for the GMP is to ensure that the springs and their discharges continue to be protected in the future.	NPS Management Policies 2001
Endangered and Threatened Species and Critical Habitats (Bald Eagles)	Retained	Bald eagles regularly use Chickasaw National Recreation Area. Although no nesting has been documented in Chickasaw National Recreation Area, the eagles are common winter residents, from November through March, roosting by and foraging on Lake of the Arbuckles. The U.S. Fish and Wildlife Service lists the bald eagle as threatened, while the state of Oklahoma lists the bird as endangered. While boats on Lake of the Arbuckles could disturb eagles, there is little likelihood of such use occurring during the period when the eagles are wintering. However, it is possible that some of the proposed actions in the alternatives could affect the eagles using the recreation area. Any actions that would adversely affect the birds would be of concern to the U.S. Fish and Wildlife Service, NPS managers, state of Oklahoma, and the public.	Endangered Species Act; NPS <i>Management Policies</i> 2001

Impact Topic	Retained or	Rationale	Relevant Law,
Soundscape Management	Retained	NPS Management Policies 2001 and Director's Order 47: "Soundscape Preservation and Noise Management" (NPS 2000) recognize that natural soundscapes are a recreation area resource and call for the National Park Service to preserve, to the greatest extent possible, the park unit's natural soundscapes. The policies and director's order further states that NPS staff will restore degraded soundscapes to the natural condition whenever possible, and will protect natural soundscapes from degradation due to noise (undesirable human-caused sound). Noise can adversely affect, directly and indirectly, the natural soundscape and other recreation area resources. It can also adversely impact the visitor experience. Now, visitors have opportunities to experience tranquility in an environment of natural sounds in many parts of Chickasaw National Recreation Area. Actions in the alternatives that could potentially increase noise levels in parts of the recreation area, such as increased motorboat and recreational vehicle use, could be of concern to some visitors, the public, and NPS managers.	NPS Management Policies 2001
Air Quality	Dismissed	Chickasaw National Recreation Area is a Class II area under the Clean Air Act. Because of the rural character of the surrounding area, air quality is considered to be good. Some air pollution from vehicles in the recreation area and sources from metropolitan areas in the region may affect the recreation area's air quality. The city of Sulphur also may slightly affect air quality. However. no actions are being proposed in the alternatives for this GMP that would measurably affect the recreation area's air quality. Construction of new facilities would have a short-term negligible impact on the airshed. Use levels might increase under the alternatives, but the increase is not expected to be substantial and the emissions from additional vehicles would be negligible compared to current levels.	Clean Air Act; NPS <i>Management Policies</i> 2001
Surface Water Quantity	Dismissed	The flow of surface water is a key resource in Chickasaw National Recreation Area. Any disruptions or major changes in surface water flows would affect the cultural and natural landscape, as well as visitors, and would be a major concern to visitors, the public, and NPS managers. No new developments, uses, or actions are being proposed in the GMP that would measurably change the surface water flows through the recreation area. Under all of the alternatives, surface water flows would continue to be protected. Thus, there is no need to address this impact topic in further detail.	NPS Management Policies 2001

Impact Topics — Resources and Values at Stake in the Planning Process

Impact Topic	Retained or	Rationale	Relevant Law,
Subsurface Water Quality	Dismissed	Chickasaw National Recreation Area's springs and Vendome Well are one of Chickasaw National Recreation Area's most important resources. The water from these springs is clean. Any pollution of the area's groundwater and the Arbuckle-Simpson aquifer could affect the recreation area's springs, which would be a major concern. However, under all of the alternatives being considered in this GMP, the springs would be protected. None of the actions being proposed in the alternatives would result in water pollution, including the discharge of contaminants that would likely affect the recreation area's groundwater or springs. Mitigation measures would be applied to ensure that any water pollution from construction of facilities would be negated.	Clean Water Act; Executive Order 12088; NPS Management Policies 2001
Aquatic Vegetation	Dismissed	Aquatic vegetation, such as near-shore emergent vegetation (e.g., sedges and rushes) and submerged and floating-leaved macrophytes (e.g., water lily, duckweed, and various species of pondweed) occur in Lake of the Arbuckles and Veterans Lake. Although there could be increased boat use of Lake of the Arbuckles under some of the alternatives being considered in this plan, the increase in use would be expected to have no more than a negligible effect on the types, quantity, and distribution of aquatic plants growing in the lake.	NPS Management Policies 2001
Fish	Dismissed	Fishing is one of Chickasaw National Recreation Area's most popular activities, with recreational fishing occurring most days of the year. Chickasaw National Recreation Area's waters support a rich diversity and relative abundance of fish. Lake of the Arbuckles, Veterans Lake, and the recreation area's streams and ponds support a wide variety of fish, including shad, catfish, carp, shiner, bass, sunfish, bullhead, drum, gar, and crappie. White bass, largemouth bass, smallmouth bass, spotted bass, crappie, sunfish, channel catfish, and flathead catfish are all popular sport fish with largemouth bass being the most sought-after game fish. Several state records have been set for fish caught in the recreation area. The Oklahoma Department of Wildlife Conservation continues to stock nongame and game fish in Chickasaw National Recreation Area, such as Florida bass. None of the actions proposed in the alternatives would adversely affect fish populations found in the recreation area. Increased sport fishing might occur with slightly increased recreational use in some areas under the alternatives, but it is expected that NPS monitoring and the Oklahoma Department of Wildlife Conservation's regulation of the fisheries would adverse impacts on the recreation area's fish populations.	NPS Management Policies 2001

Impact Topic	Retained or	Rationale	Relevant Law,
	Dismissed		Regulation, or Policy
Floodplains and Wetlands	Dismissed	Chickasaw National Recreation Area contains small wetlands along streams, springs, and other water bodies. All wetlands in park units are protected and managed in accordance with Executive Order 11990 "Protection of Wetlands"; NPS Director's Order 77-1, "Wetland Protection" and its accompanying handbook (2002); and NPS <i>Management Policies 2001</i> (§ 4.6.5, NPS 2000). This guidance requires the National Park Service to protect and enhance natural wetland values, and requires the examination of impacts on wetlands. It is NPS policy to avoid affecting wetlands and to minimize impacts when they are unavoidable. Under all of the alternatives in this plan, facilities proposed for development would be sited to avoid wetlands. With one exception, no new developments in the alternatives would be proposed in areas known to contain wetlands. Areas that might have wetlands would be mapped and delineated before construction of developments to ensure that these areas are avoided. Any impact would be minimized to a negligible level with the use of siltation fencing or similar mitigation. In one alternative a trail would cross through wetlands along Veterans Lake. However, this trail would be used for recreational purposes and is an exempted action under section 4.2A1a in <i>Procedural Manual #77-1, Wetlands Protection</i> (1998).	Executive Order 11988; Executive Order 11990, Clean Water Act; NPS Management Policies 2001
		Most of the developments in Chickasaw National Recreation Area are not in the Rock Creek and Travertine Creek floodplains. No actions are being proposed in the alternatives in this plan that would affect the protection, management, and use of the floodplains. No new developments in this plan would be placed in the floodplains. (Because the Travertine Nature Center would remain in the floodplain under this plan, a floodplains statement of findings is included as appendix B in this plan.) Under all of the alternatives, NPS staff would continue to protect natural floodplains values and take appropriate action to avoid safety risks to visitors and employees, as required under Executive Order 11988 and NPS Director's Order 77-2 ("Floodplain Management"). Therefore, floodplains and wetlands were dismissed as impact topics in this plan.	

Impact Topic	Retained or	Rationale	Relevant Law,
Threatened and Endangered Species (Whooping Crane and Least Tern)	Dismissed	Besides the bald eagle, the U.S. Fish and Wildlife Service lists two other endangered species, the whooping crane and interior least tern, that occur in Murray County <http: ifw2es.fws.gov="" okla<br="">homa/ctylist.htm>. The state of Oklahoma also lists these two species as endangered <http: www.wildlife<br="">department.com/endanger.htm>. However, neither of these species is known to use regularly Chickasaw National Recreation Area. Whooping cranes occasionally stop briefly in the recreation area during migrations. Interior least terns also occur in the county and have been seen on Lake of the Arbuckles, but there is no known suitable nesting habitat in the recreation area that terns would regularly use. There likely is some feeding/foraging habitat on Lake of the Arbuckles, but the birds have rarely been documented feeding there. No actions are being proposed in the alternatives, such as new developments or new visitor activities, which would affect the cranes or terns if and when they are present in the recreation area. If nesting areas were observed for either species in the future, the NPS, in consultation with the U.S. Fish and Wildlife Service, would protect these areas from human disturbance. Thus, the GMP would have no impact on these endangered species.</http:></http:>	Regulation, or Policy Endangered Species Act; NPS Management Policies 2001
Lightscape Management	Dismissed	NPS <i>Management Policies 2001</i> state that the National Park Service will preserve, to the greatest extent possible, the natural lightscapes of park units, including natural darkness. The National Park Service strives to minimize the intrusion of artificial light into the night scene by limiting the use of artificial outdoor lighting to basic safety requirements, shielding the lights when possible, and using minimal impact lighting techniques. The actions proposed in the alternatives could result in new facilities, some of which could necessitate some night-time lighting. However, the effects of this lighting would be localized and minimized by the mitigation techniques described above. Only a small area would be affected by the facilities at Chickasaw National Recreation Area. It is expected that these few developments would have a negligible impact on the night sky. Thus, lightscape was dismissed as an impact topic.	NPS Management Policies 2001
Natural or Depletable Resource Requirements and Conservation Potential	Dismissed	None of the alternatives being considered would result in the extraction of resources from Chickasaw National Recreation Area. Under all of the alternatives, ecological principles would be applied to ensure that the recreation area's natural resources were maintained and not impaired.	NPS Management Policies 2001

Impact Topic	Retained or	Rationale	Relevant Law,
	Dismissed		Regulation, or Policy
Prime and Unique Farmland	Dismissed	Prime farmlands are defined as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and are also available for these uses. Prime farmlands have the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. They are permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they either do not flood frequently or are protected from flooding (<i>Soil Survey Manual, USDA Handbook</i> <i>No. 18</i> , October 1993).	Council on Environmental Quality 1980 memorandum
		Unique farmlands are lands other than prime farmland that are used for the production of specific high value food and fiber crops. They have the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods.	
		Prime agricultural soils exist within Chickasaw National Recreation Area. At least four prime farmland soils are in the recreation area, primarily along or near drainages such as Rock Creek and Guy Sandy Creek. None of the alternatives being considered would adversely affect areas with these soils. No new developments would be proposed in these areas — only restoration activities would occur. If necessary, areas with prime farmland soils could be returned to farmland in the future. Thus, there is no need to evaluate the impacts of the alternatives on this topic.	
Water Supply	Dismissed	None of the alternatives have any actions that would result in actions that would increase impacts on the water supply above a negligible level. Therefore this topic was dismissed.	Clean Water Act; NPS Management Policies 2001
Energy Requirements and Conservation Potential	Dismissed	None of the alternatives presented in this management plan would result in a major change in energy consumption, energy availability, or costs compared to current conditions. The National Park Service would pursue sustainable practices whenever possible in all decisions regarding national recreation area operations, facilities management, and development in Chickasaw National Recreation Area. Whenever possible, the National Park Service would use energy conservation technologies and renewable energy sources.	NPS Management Policies 2001
Wilderness	Dismissed	A suitability assessment for wilderness has been prepared, and no lands in Chickasaw National Recreation Area are suitable for wilderness. Therefore, impacts on wilderness are not discussed further.	Wilderness Act, NPS Management Policies 2001

 ${\it Impact Topics-Resources and Values at Stake in the Planning Process}$

Impact Topic	Retained or	ined or Rationale F	
	Dismissed	Culturel Descure laure at Tenier	Regulation, or Policy
Archeological Resources	Retained	Ground disturbance associated with proposed development actions have the potential to disturb currently unidentified archeological resources.	Section 106 of NHPA, as amended; Director's Order 28; Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation; NPS Management Policies 2001, National Environ- mental Policy Act (NEPA)
Ethnographic Resources	Retained	There is a potential for ethnographic resources associated with traditional use activities of Native American and Euro–American neighbors and/or other visitors in Chickasaw National Recreation Area. More in-depth understanding of the nature of these resources might be obtained through further investigations, enabling the recreation area staff to properly protect and manage these resources as future development proposals or policy decisions arise.	Section 106 of NHPA, as amended; Executive Order 13007; Director's Order 28; NPS <i>Management</i> <i>Policies 2001;</i> NEPA
Museum Objects	Retained	Museum objects, including artifacts, photographs, documents, files, records, human remains, and floral and faunal specimens could be affected by proposed measures for the management or relocation of Chickasaw National Recreation Area's collections.	Department of the Interior Manual on Museum Property Management 411 DM; NPS <i>Museum</i> <i>Handbook</i> ; Director's Orders 24 and 28; NPS Special Directives 80-1 and 87-3; 36 CFR 79: Curation of Federally Owned Archeological Collections; NPS <i>Management Policies</i> 2001, NEPA
Historic Structures/ Cultural Landscapes	Retained	Current management actions and management alternative proposals have the potential to affect character-defining features of Chickasaw National Recreation Area's Platt District and other potential cultural landscapes. The Platt District (the area corresponding to the former Platt National Park) is recognized as a nationally significant designed cultural landscape, with notable examples of CCC-constructed buildings and structures built in the "NPS rustic" style characteristic of the 1930s. Therefore, this topic has been retained as an impact topic.	Section 106 of NHPA, as amended; Director's Order 28; NPS Management Policies 2001; Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes and NEPA
		Visitor Use And Experience Impact Topics	
Visitor Experience and Use Levels	Retained	Visitor experience and use levels are important issues that would be affected under the alternatives. Therefore, this topic has been retained.	Organic Act; NPS Management Policies 2001
		Socioeconomic Impact Topics	
Socioeconomic Environment	Retained	The local economy and most businesses within the communities adjacent to Chickasaw National Recreation Area are based on professional services, construction, tourism, and light industry. There are actions in the alternatives that could have an impact on the local socioeconomic environment. Therefore, regional economy was retained as an impact topic in this plan.	NEPA

Impact Topic	Retained or	Rationale	Relevant Law,
Indian Trust Resources	Dismissed	Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by Department of the Interior agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.	Secretarial Order 3175
		A definition of American indian tribal trust resources is "those natural resources, either on or off Indian lands, retained by, or reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by fiduciary [trust] obligation on the part of the United States" (Subsection B, Section 3, Secretarial Order 3206, Bruce Babbitt, Secretary of the Interior, June 5, 1997). None of the lands of Chickasaw National Recreation Area are trust resources according to this definition. Also, any Indian titles to such lands now within Chickasaw National Recreation Area have been extinguished through cession or sale. Therefore, this topic was dismissed from further analysis.	
Environmental Justice	Dismissed	Executive Order 12898, "General Actions to Address Environmental Justice in Minority Populations and Low- Income Populations," requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. No actions in any of the alternatives would have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency's "Draft Environmental Justice Guidance" (July 1996). Therefore, this topic will not be addressed further.	Executive Order 12898
	Natio	nal Recreation Area Administration Impact Topics	1
Operations	Retained	Operations would be affected by the proposed actions.	NPS Management Policies 2001
Staffing	Retained	The alternatives would affect recreation area staffing.	NPS Management Policies 2001



Chapter 2:

Alternatives, Including the Preferred Alternative

INTRODUCTION

Many aspects of the desired future condition of Chickasaw National Recreation Area are defined in the establishing legislation, Chickasaw National Recreation Area's purpose and significance statements, and the servicewide mandates and policies that were described earlier. Within these parameters, the National Park Service solicited input from the public, NPS staff, governmental agencies, tribal officials, and other organizations regarding issues and desired conditions for Chickasaw National Recreation Area. Planning team members gathered information about existing visitor use and the condition of Chickasaw National Recreation Area's facilities and resources. They considered which areas of the recreation area attract visitors, and which areas have sensitive resources.

Using the above information, the planning team developed a set of four management prescriptions and three management alternatives to reflect the range of ideas proposed by Chickasaw National Recreation Area staff and the public.

This chapter describes the management prescriptions (see table 3) and the alternatives for managing Chickasaw National Recreation Area for the next 15–20 years. It includes tables that summarize the key differences between the alternatives (see table 8) and the key differences in the impacts (see table 9) that would be expected from implementing each alternative. (The summary of impacts table is based on the analysis in chapter 4, "Environmental Consequences"). This chapter also describes mitigation measures that would be used to reduce or avoid impacts, and the environmentally preferable alternative. Also discussed are two actions the planning team considered but dismissed.

It should be noted that under all alternatives, the planned and approved visitor center near

Vendome Well is a "given." This facility was approved in the 1994 Amendment to the general management plan (GMP) and has been planned to be constructed in the near future. The visitor center near Vendome Well has been shown as an action under each alternative.

MANAGEMENT PRESCRIPTIONS AND ALTERNATIVES

The building blocks for reaching an approved plan for managing a park unit are the management prescriptions and the alternatives. All are developed within the scope of the park unit's purpose, significance, mandates, and legislation.

Management prescriptions are descriptions of desired conditions for resources and visitor experiences in different areas of the park unit. Management prescriptions are determined for each park unit; however, the management prescriptions for one unit will likely not be the same for any other park unit (although some might be similar). The management prescriptions identify the widest range of potential appropriate resource conditions, visitor experiences, and facilities for the park unit that fall within the scope of the unit's purpose, significance, and special mandates. Four management prescriptions have been identified for Chickasaw National Recreation Area. It may help to think of the management prescriptions as the colors an artist has in front of him with which to paint a picture.

The alternatives in this GMP are the different pictures that could be painted with the colors (management prescriptions) available. Each of the alternatives has an overall management concept and a description of how different areas of Chickasaw National Recreation Area would be managed (management prescriptions and related actions). The concept for each alternative gives the artist (or in this case the planning team) the idea for what the picture (alternative) is going to look like.

This Draft General Management Plan / Environmental Assessment presents three alternatives, including the NPS preferred alternative (alternative B), for future management of Chickasaw National Recreation Area. Alternative A, the "noaction" alternative, presents a continuation of current management direction and is included as a baseline for comparing the consequences of implementing each alternative. The "action" alternatives are alternative B (preferred) and alternative C. These action alternatives present different ways to manage resources and visitor use and improve facilities and infrastructure at Chickasaw National Recreation Area. These three alternatives embody the range of what the public and NPS staff want to see accomplished with regard to natural resource conditions, cultural resource conditions, visitor use and experience conditions, and management at Chickasaw National Recreation Area. The actual configurations for each alternative were developed by overlaying the management prescriptions (described later) on a map of Chickasaw National Recreation Area.

As noted above in the "Guidance for Planning" section, the National Park Service would continue to follow existing agreements and servicewide mandates, laws, and policies regardless of the alternatives considered in this plan. These mandates and policies are not repeated in this chapter.

FORMULATION OF THE ALTERNATIVES

The alternatives focus on *what* resource conditions and visitor uses and experiences/ opportunities should be at Chickasaw National Recreation Area rather than on details of *how* these conditions and uses/experiences should be achieved. Thus, the alternatives do not include many details on resource or visitor use management.

More detailed plans or studies will be required before most conditions proposed in the alternatives are achieved. The implementation of any alternative also depends on future funding and environmental compliance. This plan does not guarantee that funding will be forthcoming. The plan establishes a vision of the future that will guide day-to-day and year-to-year management of Chickasaw National Recreation Area, but full implementation could take many years.

USER CAPACITY

GMPs are required to include identification of and implementation commitments for visitor user capacities for areas of the unit. Visitor user capacity is the type and level of visitor use that can be accommodated while sustaining the desired resource conditions and social conditions and visitor experience that complement the purposes of Chickasaw National Recreation Area. It is not necessarily a set of numbers or limits, but rather a process involving monitoring, evaluation, actions (managing visitor use), and adjustments to ensure park values are protected. At the GMP level of decision making, management zones include a qualitative description of desired resource conditions and visitor opportunities.

The strategy of addressing user capacity at Chickasaw National Recreation Area is a tiered approach that would keep a general eye on broad trends while focusing more specific monitoring and management on areas where action is most likely needed to achieve desired conditions. General information would continue to be collected such as trail counts, numbers of incidental business permits, and trailhead parking numbers. This information would be systematically analyzed to watch for trends. If trends raise some concerns, specific indicators would be established to monitor the condition of natural and cultural resources and visitor experiences in areas of concern. Indicators might include the condition of some key resources (e.g., soils, vegetation cover, historic resources, archeological sites, water quality, and natural soundscape) visible impacts (i.e., density of social trails), or visitor experiences (i.e., perceived solitude). Standards would be developed which would serve as trigger points that define when conditions become unacceptable for a zone or area. If conditions are unacceptable or conditions are approaching the standards, management actions may be needed to address deteriorating conditions. These management actions could include expanding education (especially "leave no trace" ethics), restoring disturbed sites, improving trail delineation, establishing a permit system, and establishing use limits.

As identified above, there are a number of potential indicators and standards and a range of management actions that may be needed to achieve or retain desired conditions. Additional visitor surveys will determine social indicators and standards that would achieve desired conditions for visitor experiences in the various zones. Staff and other experts will be needed to establish indicators and standards for natural and cultural resources. More detailed planning for visitor experience and resource management would be needed to guide management actions. Some additional user needs would be met with the facility improvements proposed in this GMP.

IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The development of a preferred alternative involves evaluating the alternatives with the use of an objective analysis process called "choosing by advantages" or CBA. Using this process, the planning team identified and compared the relative advantages of each alternative according to a set of factors. The benefits or advantages of each alternative are compared for each of the following CBA factors:

- protecting natural resources
- protecting cultural resources
- providing orientation and education for visitors
- improving national recreation area operational efficiency

The relationships between the advantages were used to combine the best attributes of the three initial alternatives into the preferred alternative. This alternative gives the National Park Service the greatest overall benefits for each point listed above for the most reasonable cost.

POTENTIAL FOR BOUNDARY ADJUSTMENTS

The National Parks and Recreation Act of 1978 requires GMPs to address whether boundary modifications should be made to park units. The enabling legislation of Chickasaw National Recreation Area limits its size to 10,000 acres (see appendix A). The current area of 9,889 acres allows for small additions of lands that surround Chickasaw National Recreation Area. The recreation area staff actively looks for land parcels adjacent to the boundary that enhance Chickasaw National Recreation Area's natural, cultural, and scenic resource values as they become available. Thus, this GMP does not propose any specific land additions to Chickasaw National Recreation Area. Although there are no immediate needs to consider boundary adjustments, this plan does not prohibit small additions that may be identified in the future by other land planning processes such as land for administrative use.

IMPLEMENTATION OF THE PLAN

Once the GMP-planning process is completed and approved, the selected alternative (i.e., the GMP) will be implemented over 15–20 years in phases. Chickasaw National Recreation Area's business plan was completed in the fall of 2004. The business plan, as well as annual work plans and Chickasaw National Recreation Area's strategic plan, will help develop priorities on how best to implement the GMP.

The implementation of the facility development proposed within the GMP is dependent upon funding available at the time of need. The approval of the GMP does not guarantee that the funding and staffing needed to implement the plan will be forthcoming. Implementation of facility development would be phased as needed and as funds are available over a 20-year period.

In addition to funding, the implementation of any proposed action also could be affected by other factors. Additional feasibility studies and more detailed planning and environmental documentation would be completed, as appropriate, before any proposed actions can be carried out.

Personnel needs for each alternative are expressed as "full-time equivalents" (FTE). One FTE equals one person year of work. FTEs are typically filled by a federal employee. However, they may be filled by volunteers and contracted services.



MANAGEMENT PRESCRIPTIONS

Management prescriptions define specific resource conditions and visitor experiences to be achieved and maintained in each particular area of Chickasaw National Recreation Area under each of the two action alternatives. Each prescription includes the types of activities and facilities that are appropriate in that management prescription. The management prescriptions were developed as a result of this planning effort and therefore are not applied to the noaction alternative and map.

In formulating the alternatives, the management prescriptions were placed in different locations or configurations on a map of Chickasaw National Recreation Area according to the overall concept of each of the alternatives. That is, the alternatives represent different ways to apply the management prescriptions to Chickasaw National Recreation Area. For example, an alternative whose overall concept includes having more emphasis on preservation/ conservation will have more of the preservation/conservation management prescription areas than an alternative whose overall concept is to increase visitor opportunities to the entire recreation area.

The management prescriptions for Chickasaw National Recreation Area are presented below. Visitor experiences, resource conditions, and appropriate activities and facilities are described for each management prescription.



Chapter 2: Alternatives, Including the Preferred Alternative

Management Prescription	Resource Conditions	Visitor Experience	Facilities
Recreation The purpose of the recreation prescription is to provide concentrated recreation, education, orientation, and other structural activities.	 Natural resources are managed and modified to support visitor activities, with minimum impacts on resources. Sensitive natural resources occurring in Chickasaw National Recreation Area are protected. Human-caused habitat fragmentation is mitigated to the extent possible. Cultural resources are preserved, rehabilitated, and adaptively reused as feasible for visitor support or operational purposes. 	 Higher levels of visitor recreational activity are accommodated in this prescription. Recreational activities may include hiking, bicycling, horseback riding, hunting, fishing, tournaments, boating, picnicking, camping, swimming, auto touring, nature study, and special events such as family reunions, school functions, and weddings, in designated areas as appropriate. Experiences may range from quiet, personal activities to large group events. Occurrences of human interactions may be high. Educational and orientation opportunities may include guided tours, media presentations, nonpersonal interpretive media, interpretive programs, and special events. (Special events include living history, special interpretive programs, and public celebrations.) 	 Development may include a range of campgrounds from primitive, partially developed, to full-service campgrounds that accommodate recreational vehicles and trailers and provide water, toilets, showers, and campground host sites. Swimming facilities, picnic areas, amphitheaters, or campfire circles for interpretive presentations, and other facilities deemed appropriate also may be provided. Commercial visitor services may be offered, subject to further study and justification. Resources are protected with site-hardening devices, such as boardwalks, fencing, and paved pathways.
Preservation/ Conservation <i>Within this</i> <i>management</i> <i>prescription, the</i> <i>natural landscape</i> <i>would be undergoing</i> <i>long-term (up to 75</i> <i>years) restoration</i> <i>and/or conservation</i> <i>plans for natural</i> <i>resource needs.</i>	 Focus is on preserving and conserving natural resources, and rehabilitating and restoring specific landscapes toward prairie or woodland conditions to before European American settlement times. Efforts would also be made to restore springs, streams, wetlands, and riparian areas. Cultural resources would continue to be protected, although the treatment of specific cultural resources would be determined on a case-by-case basis. 	 Visitors could be allowed in this prescription but access would not be encouraged. Appropriate activities may include hiking, hunting, fishing, nature observation, and visitor participation in restoration activities in designated locations. There would be oppor- tunities for solitude, natural quiet, and undirected discovery; the areas in this prescription would provide for a contemplative experience. Visitors could experience presettlement vegetation patterns. 	 Enclosures (repair and/or rehabilitate structures) may be built. Minimal facilities provided for resource protection.

TABLE 3: MANAGEMENT PRESCRIPTIONS
Management Prescriptions

Management Prescription	Resource Conditions	Visitor Experience	Facilities
Historic/Cultural The recreation area's cultural resources and history are featured, with traditional activities and facilities being preserved.	 In this prescription, historic buildings, structures, and other landscape elements and features are preserved or rehabilitated to document the evolution of the cultural landscape over time. Buildings and structures in the prescription may be rehabilitated for adaptive uses, which is preferable to new construction. Resources may be used for interpretive and/or compatible operational purposes by the NPS or their partners. Nonhistoric development and activities that are necessary for visitor and operational support may occur so long as the overall character of the cultural landscape is not compromised. Natural resources that have been identified as important to the cultural landscape. The treatment of natural resources within the prescription is determined on a case-by-case basis 	 The primary experience in this prescription is visiting and learning about cultural resources and their evolution over time. Appropriate activities may include automobile touring, bicycling, walking, hiking, hunting, fishing, and other activities in designated areas to the extent they are compatible with the cultural resources in the prescription. Visitation is maintained at moderate levels to allow some opportunities for discovery, occasional solitude, and enjoyment of the cultural setting with only moderate noise. Interpretation is important to the experience, but is unobtrusive and does not compromise the cultural landscape character. Additional information and orientation may be offered off-site. Camping could be permitted, but site design and usage will be compatible with the cultural landscape. 	 Modest development is permitted, if necessary, to support visitor and operational activities. Developments may include interpretive media, walkways, trails, small picnic areas, restrooms, and campgrounds. All developments are compatible with the cultural landscape. Facilities are fully accessible to the extent feasible without compromising the cultural character.
Administrative The purpose of areas in this prescription is to provide for the recreation area's operational needs.	 Because these areas are highly used and developed, this prescription is only located in previously disturbed areas, areas of low resource potential, or areas with relatively resilient resources that can be modified, with acceptable impacts, for recreational area operational purposes. 	 There is generally no visitor use in this prescription, but these areas are managed to be congruent with visitor expectation. Areas are highly used by NPS staff, volunteers, partners, and others engaged in recreation area operations and administration. Efficiency, safety, and convenience are important components of the prescription. High noise may be expected at times. 	 Facilities that may be included in this prescription include administrative offices, maintenance facilities, employee housing, and other major facilities needed to support recreation area operations.

ALTERNATIVE A (NO ACTION)

CONCEPT

This alternative would provide a baseline for evaluating changes and impacts in the other alternatives. Under the no-action alternative, the National Park Service would continue to manage Chickasaw National Recreation Area as it has been managed since the approval of the 1979 General Management Plan Supplement and the 1994 Amendment. There would be no major change in the management of Chickasaw National Recreation Area. All facilities and resource programs would continue as they have. With the exception of the approved and funded visitor center near Vendome Well, no new facilities would be built. The natural resource program would continue to focus on inventorying and monitoring, resource protection and preservation, mitigation, and applied research efforts. The cultural resource program would continue to focus on protecting historic structures and landscapes. The Cultural Landscape *Report* would provide general guidance for cultural landscape treatments on an as-funding permit basis. NPS staff would continue to foster partnerships with other agencies, primarily for resource stewardship, interpretive, and administrative purposes. The educational programs would continue to focus primarily on schools in the region.

DETAILED DESCRIPTION

Resource Management

Current management of natural and cultural resources with guidance of approved documents would continue. The *Cultural Landscape Report* would provide general guidance for cultural landscape treatments on a limited basis. The portions of Chickasaw National Recreation Area's museum collections and archives would continue to be housed at Chickasaw National Recreation Area in one of the buildings in the maintenance area.

Platt District (Including the Travertine Nature Center)

The Travertine Nature Center would continue to focus on resource education, providing programs to school groups and the public. The cultural landscape would continue to be rehabilitated, with the emphasis continuing to be on the management of red cedar and nonnative vegetation. The bison pasture would be restored to prairie, and the herd size would be maintained at a size appropriate to the current enclosure. Bison would be managed as prescribed in the "Resource Management Plan" (NPS 1999).

Antelope and Buffalo Springs Area. In this area, management efforts would continue to focus on continuing to maintain the trail system and the trail to Antelope Springs, rehabilitating the cultural landscape (primarily focusing on maintaining trails and structures and removing hazardous trees), and continuing the existing levels of interpretive activities.

Cold Springs Campground. No changes would occur here.

Central Campground. No changes would occur here.

Vendome Well/ Flower Park. The planned and approved visitor center would be constructed adjacent to Vendome Well. This center would serve as the primary facility for orientation and information on Chickasaw National Recreation Area. **Rock Creek Campground.** No changes would occur here.

Veterans Lake Area. No changes would occur to facilities or visitor activities in the Veterans Lake area under this alternative.

Maintenance Area

The maintenance area in the Platt District would continue to be maintained and operate as it has in the past. There would be no changes in the facilities or operations under this alternative, including the collections facility which is now located within the maintenance area.

Rock Creek Corridor

The trail system in this area would continue to be maintained, and historic structures in this area would be preserved.

Lake of the Arbuckles Area

Current operations and management would continue in this area.

The Point Campground. The campground would continue to operate and be maintained at current levels.

Buckhorn Campground. The campground would continue to operate and be maintained at current levels.

Guy Sandy Campground. No changes would occur to the Guy Sandy campground in this alternative.

Goddard Youth Camp. The Goddard Youth Camp at the south end of the Lake of the Arbuckles has operated under a general agreement since 1965. The camp provides week-long environmental/educational opportunities for 5th and 6th graders from Dallas/Ft. Worth to Oklahoma City. This area includes a children's museum, cafeteria, cabins, administration buildings, and boating facilities. Under current management, there would be no changes to the existing operations as defined in the agreement

Upper Guy Sandy

The Upper Guy Sandy area would continue to be restored to natural conditions, which are prairie and forest.

ESTIMATED COSTS

Development

Alternative A would continue the current level of facilities and no additional development beyond the approved visitor center near Vendome Well would be done under this alternative. Discussion of the costs associated with development and a comparison of alternatives follows the alternatives description in this document.

Staff and Operations

As of 2006, the existing recreation area's staff is comprised of 47 FTEs.

Chickasaw National Recreation Area's annual operation budget is currently at \$3.4 million per year (in 2006 dollars) (see table 4).

TABLE 4: ESTIMATED COSTS, ALTERNATIVE A

Recurring Costs			
NPS Operations \$3.4 million/year			
One-time Capital Costs			
Visitor Center \$3.0 million			

Costs shown here are not for budgetary purposes; rather they are only intended to provide a general comparison between the alternatives. They have an accuracy of $\pm 20\%$.





Alternative A (No Action)

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ALTERNATIVE B (PREFERRED)

CONCEPT

Alternative B would improve visitor opportunities with enhanced visitor facilities and provide additional interpretive opportunities.

It is important to stress that although opportunities for a diversity of experiences would be offered under alternative B, the National Park Service would continue to maintain and protect natural and cultural resources in Chickasaw National Recreation Area and not permit new developments that would be inappropriate for a park unit.

The remainder of this section describes how different areas of Chickasaw National Recreation Area would be managed and what actions the National Park Service would take under this alternative. These actions are believed most likely to take place over the next 15-20 years in Chickasaw National Recreation Area, given the alternative concept, management prescriptions, the conditions that already exist in the area, and the area's environmental constraints. Under this alternative, where possible, any new facilities would be constructed in already disturbed areas. Disturbance to sensitive areas such as threatened and endangered species habitat and archeological sites would also be avoided or mitigated whenever possible. (See the "Mitigation" section.)

DETAILED DESCRIPTION

Resource Management

Chickasaw National Recreation Area would actively encourage a partnership to identify approaches to manage the aquifer. This would include increased monitoring, additional studies, and protection of recharge areas. In addition, best land management practices would be utilized within the recreation area and encouraged outside the recreation area to protect the water quantity and quality.

Enhanced emphasis on preservation and protection of cultural resources (historic structures, cultural landscapes, archeological resources, ethnographic resources, and museum collections) would be provided. The *Cultural Landscape Report* would provide general guidance for the treatment of historic properties within the Platt Historic District.

The bison pasture would be restored to prairie and the bison herd maintained at an appropriate size. A study would be completed to determine the possibility of introducing bison from the Platt District to the Upper Guy Sandy.

The museum collections and archives that are currently housed at Chickasaw National Recreation Area in the one of the maintenance area buildings would be moved to an appropriate site(s) in accordance with the *Museum Collection Facilities Strategy*, *Intermountain Region* (NPS 2005).

Platt District (Including the Travertine Nature Center)

The Travertine Nature Center would continue to focus on resource education, providing programs to school groups and the public, and there would be additional formal programs that more fully interpret Chickasaw National Recreation Area's primary interpretive themes. The cultural landscape would continue to be rehabilitated. Up to two additional day use picnic shelters and the addition of shower facilities would be added to the Platt District. Under alternative B the cultural landscape around the Antelope and Buffalo springs area would continue to be preserved and rehabilitated in accordance with recommendations in the *Cultural Landscape Report*. The *Cultural Landscape Report* would provide general guidance for improvements to the three campgrounds. The existing levels of interpretation would be maintained within the area.

In this alternative, the National Park Service would manage the Vendome Well to reduce the discharge of groundwater during times when it is not being used or enjoyed by the public. Two options would be to shut off the well at night or reduce the flow.

Cold Springs Campground. There would be restoration and improvements made to the Cold Springs campground, including adding vegetation to buffer campsites, making road repairs, improving drainage and upgrading the restroom facilities.

Central Campground. There would be a reinstatement of the trail link to Flower Park and thinning of red cedar within the area, as well as upgrades to the campground's restroom facilities and limited utilities.

Vendome Well/Flower Park. The planned and approved visitor center would be constructed adjacent to Vendome Well. This center would serve as the primary facility for orientation and information on Chickasaw National Recreation Area.

Rock Creek Campground. Rock Creek campground would have some rehabilitation work and upgrades of the campground's restrooms.

Veterans Lake Area. This alternative would provide for new restrooms and replacement of the fishing dock facilities at Veterans Lake. The universally accessible trail around Veterans Lake would be completed in addition to a trail link to the Rock Creek campground. The possibility of adding a recreational opportunity such as a horse camp, staging area, or group campsite would be considered after further study to determine where best to develop to limit impacts on resources in the area.

Maintenance Area

Under alternative B the maintenance operations would be relocated outside Chickasaw National Recreation Area or within the recreation area but outside the historic district. Additional evaluation, Section 106, and NEPA compliance would be prepared to determine where this facility would be located. Staff offices also would be added as needed. The historic structures in the existing maintenance area would be adaptively rehabilitated and reused. Some of the nonhistoric structures would be removed or replaced.

Rock Creek Corridor

The trail system in this area would be maintained and upgraded with improved signs, clearly delineating trails and eliminating drainage problems. Historic structures would be preserved and archeological sites protected within this area. There would be restoration of the areas along Rock Creek to address erosion problems.

Lake of the Arbuckles Area

Alternative B would provide an increase in visitor opportunities. Commercial operations such as boat tours, ecotours, boat rentals, bus tours, and lakeside cabin rentals may be provided if there is sufficient interest and demand. A commercial service feasibility study would be prepared to examine the range of services. In addition, Section 106 and NEPA compliance would be prepared if the decision was made to add these opportunities. Additional picnic shelters and new restrooms would be added in select picnic areas.

Increased efforts would be made to restore areas along the Lake of the Arbuckles that have been adversely affected by erosion.

Additional sustainable and accessible restrooms would be provided at the day use areas in the district.

There would be an increase in rangerinterpreter presence in the area and in the number of guided and self-guided interpretive opportunities using existing staff.

The Point and Buckhorn Campgrounds.

These campground areas would be maintained and operated with the current number of campsites. However, some of the sites that do not currently have utilities (water, electrical, and sewer services) would be upgraded to include these utilities. There would be improvements to vegetative screening between campsites and trails in these areas. Parking within the campgrounds would be redesigned to better limit impacts. New restrooms at picnic areas near the lake would be constructed. A new restroom with showers would be constructed and the entrance road to the campground would be upgraded at the Point campground. The Buckhorn campground amphitheater and electrical service would also be upgraded.

Guy Sandy Campground. The area would be improved with upgrades to the campground better delineating sites and improving restrooms. Dock area restrooms would also be improved. A picnic shelter would be provided for day users.

Goddard Youth Camp. There would be no changes in management of this area under alternative B. The National Park Service would continue to manage this area under a special use permit that recognizes compliance with NPS standards.

Upper Guy Sandy

The Upper Guy Sandy area would continue to be restored to natural conditions, which are prairie and forest. In the future, a study would be prepared to determine the possibility of establishing an additional bison herd in this area.

ESTIMATED COSTS

Costs shown here are not for budgetary purposes; they are only to show a very general comparison between the alternatives. Note that these costs do not include the costs for the additional plans and studies needed. Discussion of the costs associated with development and a comparison of alternatives follows the alternatives description in this document.

Development

Alternative B would consist of the improvements below to facilities and structures within Chickasaw National Recreation Area. The estimated development cost is \$18.2 million (in 2006 dollars).

Staff and Operations

This alternative would be implemented with the current staffing levels plus three additional FTE employees for resource management. The total costs would be \$3.4 million per year (in 2006 dollars) to operate and staff Chickasaw National Recreation Area (see table 5).

TABLE 5: ESTIMATED COSTS, ALTERNATIVE B

Recurring Costs			
NPS Operations	\$3.4 million/year		
One-time Capital C	osts		
Visitor Center	\$3.0 million		
Construct maintenance facility	\$4.2 million		
Construct administrative offices	\$3.4 million		
Rehabilitate Rock Creek	\$3.2 million		
campground			
Rehabilitate Point campground	\$1.4 million		
Other actions	\$3.0 million		
Total Capital Costs	\$18.2 million		

Costs shown here are not for budgetary purposes; rather they are only intended to provide a general comparison between the alternatives. They have an accuracy of $\pm 20\%$.





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ALTERNATIVE C

CONCEPT

There would be fewer facilities and a more limited range of visitor opportunities under alternative C, although there would be a better opportunity to experience resources in relatively natural or recovering conditions. Some roads or trails would be removed and revegetated. Some new facilities would be built, but generally they would be placed outside Chickasaw National Recreation Area or in previously developed areas. As in alternative B, the National Park Service would continue to maintain and protect natural and cultural resources in Chickasaw National Recreation Area and not permit new developments that would be inappropriate for a park unit.

The remainder of this section describes how different areas of Chickasaw National Recreation Area would be managed and what actions the National Park Service would take under this alternative. These actions are believed most likely to take place during the next 15-20 years in Chickasaw National Recreation Area, given this alternative's concept, management prescriptions, the conditions that already exist in the area, and the area's environmental constraints. Disturbance to sensitive areas such as threatened and endangered species habitat and archeological sites would also be avoided or mitigated whenever possible. (See the "Mitigation" section.)

DETAILED DESCRIPTION

Resource Management

Increased management of natural and historic cultural resources would be accomplished by:

- focusing funding on resource restoration and preservation
- removing some facilities that impact resources

Chickasaw National Recreation Area would actively encourage a partnership to identify approaches to manage the aquifer. This would include increased monitoring, additional studies, and protection of recharge areas. In addition, best land management practices would be utilized within Chickasaw National Recreation Area and encouraged outside the recreation area to protect the water quantity and quality.

Enhanced emphasis on preservation and protection of cultural resources (historic structures, cultural landscapes, archeological resources, ethnographic resources, and museum collections) would be provided. The *Cultural Landscape Report* would provide general guidance for the treatment of historic properties within the Platt Historic District.

The bison pasture would be restored to prairie and the bison herd maintained at an appropriate size. A study would be completed to determine the possibility of introducing bison from the Platt District to the Upper Guy Sandy.

The museum collections and archives that are currently housed at Chickasaw National Recreation Area in the one of the maintenance area buildings would be moved to an appropriate site(s) in accordance with the Museum Collection Facilities Strategy, Intermountain Region (NPS 2005).

Platt District (Including the Travertine Nature Center)

The Travertine Nature Center would continue to focus on resource education, providing programs to school groups and the public, and more specialized programs on resource preservation and conservation would be added. The cultural landscape would continue to be rehabilitated as funding permits.

In this alternative, the National Park Service would manage the Vendome Well to reduce the discharge of groundwater during times when it is not being used or enjoyed by the public. One possibility would be to shut off the well at night.

Cold Springs Campground. There would be restoration and improvements made to the Cold Springs campground, including adding vegetation to buffer campsites, making road repairs, improving drainage, and upgrading the restroom facilities.

Central Campground. There would be a reinstatement of the trail link to Flower Park, and thinning of red cedar within the area, as well as upgrades to the campground's restroom facilities.

Vendome Well/ Flower Park. The planned and approved visitor center would be constructed adjacent to Vendome Well. This center would serve as the primary facility for orientation and information on Chickasaw National Recreation Area.

Rock Creek Campground. About 12 campsites in the Rock Creek campground have the potential to adversely affect Rock Creek's riparian natural resources. These sites would be modified or removed. The Chigger Hill portion of the campground would be closed and restored to natural conditions.

Veterans Lake Area. There would be no new facilities at Veterans Lake. The area would continue to be managed as it has been.

Maintenance Area

In alternative C, maintenance operations would be relocated outside Chickasaw National Recreation Area. Staff offices also would be built at this site as needed. The historic structures in the maintenance area would be adaptively rehabilitated and reused. There would be removal of some of the nonhistoric structures.

Rock Creek Corridor

Increased attention would be devoted to restoring the riparian area along Rock Creek in alternative C. The multiuse trail system would be maintained and drainage problems eliminated. Historic structures would be preserved and archeological sites protected within this area. There would be restoration of the areas along Rock Creek to address erosion problems.

Lake of the Arbuckles Area

Increased efforts would be made to restore areas along the lake that have been adversely affected by erosion.

There would also be a study to determine if there is need to manage boat use to maintain high quality resource conditions and visitor experiences.

The Point and Buckhorn Campgrounds. Current conditions would continue at these campground; however, improved screening between campsites would be achieved through additional vegetation management.

Guy Sandy Campground. The Guy Sandy campground would be removed and converted to a day use area. The boating facilities would be maintained and additional day use facilities, such as picnic tables, would be added. The restrooms also would be improved.

Goddard Youth Camp. There would be no changes in management of this area under alternative C. The National Park Service would continue to manage this area under a special use permit that recognizes compliance with NPS standards.

Upper Guy Sandy

The Upper Guy Sandy area would continue to be restored to natural conditions, which are prairie and forest. A study also would be prepared to determine the possibility of closures to some of the dirt roads in this area to protect resources.

ESTIMATED COSTS

Costs shown here are not for budgetary purposes; they are only to show a general comparison between the alternatives. Note that these costs do not include the costs for the additional plans and studies needed. Discussion of the costs associated with development and a comparison of alternatives follows the alternatives description in this document.

Development

Alternative C would consist of the improvements below to facilities and structures within Chickasaw National Recreation Area. The estimated development cost is \$12.4 million (in 2006 dollars).

Staff and Operations

This alternative would be implemented with the current staffing levels plus three additional FTE employees for resource management. The total costs would be \$3.4 million per year (in 2006 dollars) to operate and staff Chickasaw National Recreation Area (see table 6).

TABLE 6: ESTIMATED COSTS, ALTERNATIVE C

Recurring Costs			
NPS Operations	\$3.4 million/year		
One-time Capital Costs			
Visitor Center	\$3.0 million		
Construct maintenance facility	\$4.2 million		
Construct administrative offices	\$3.4 million		
Other actions	\$1.8 million		
Total Capital Costs	\$12.4 million		

Costs shown here are not for budgetary purposes; rather they are only intended to provide a general comparison between the alternatives. They have an accuracy of $\pm 20\%$.



DEVELOPMENT OF COST ESTIMATES

NPS decision makers and the public must consider an overall picture of the complete costs and advantages of various alternatives, including the no-action alternative, to make wise planning and management decisions for Chickasaw National Recreation Area. It is important that the cost estimates contain the same elements and that they be developed with the same assumptions so there can be consistency and comparability among alternatives.

In estimating costs of the alternatives, differing types of costs need to be taken into account, including one-time costs, recurring or replacement costs, and life-cycle costs.

Initial one-time costs include:

- new development (including NPS infrastructure costs)
- major rehabilitation or restoration of existing facilities
- interpretive media (e.g., audiovisual materials, exhibits, waysides, and publications)
- resource management and visitor service costs (e.g., resource and visitor inventories, implementation planning, and compliance)

Recurring or replacement costs are significant anticipated costs that recur at intervals (other than annually) within the 25year period considered in calculating lifecycle costs. Examples might be a situation when the National Park Service is supplying interpretive displays or utility systems that will be replaced every 8 to 15 years or repaying parking areas every 10 years.

Examples of recurring annual costs include:

• annual national recreation area operating costs (e.g., staff salary and benefits, shuttle

rental fees, maintenance, utilities, monitoring, and contract services)

 ongoing repair and rehabilitation of facilities (i.e., the projection of past trends and known future needs into an annual estimate)

Life-cycle costing is an economic assessment of different alternatives, considering all major costs over a specified period, expressed in equivalent dollars. Life-cycle costs reflect the aggregated initial one-time costs and recurring costs into the future over a period. A period of 25 years is considered a reasonable time for evaluating the life-cycle costs of alternatives in this GMP. The development of life-cycle costs provides a way to combine one-time and recurring costs (such as annual operating costs) into comparable numbers. Comprehensive life-cycle cost estimates were a key factor, along with the impacts and advantages of the various alternatives, in the selection of the preferred alternative.

The following Class C cost estimates are intended to provide a relative comparison of the costs of the alternatives. These figures are not intended to be used for budgetary purposes or to implement funding requests.

TABLE 7: COST COMPARISON OF THE ALTERNATIVES INCLUDING LIFE-CYCLE COSTS

Cost Category	No Action - Alternative A	Alternative B	Alternative C
Initial one- time costs*	\$3.0 million	\$18.2 million	\$12.4 million
Annual costs	\$3.4 million	\$3.4 million	\$3.4 million
Annual costs over 25 years	\$39.6 million	\$39.6 million	\$39.6 million
Total life-cycle costs**	\$34.1 - 51.1 million	\$46.2 - 69.4 million	\$41.4 - 62.4 million

* total costs of the alternative's actions; see specific alternatives for the cost breakdown ** this represents the total annual costs over 25 years and

** this represents the total annual costs over 25 years and the initial one-time costs with an accuracy of $\pm 20\%$

MITIGATION MEASURES COMMON TO ALL ACTION ALTERNATIVES

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" (NPS Organic Act, 16 USC 1). As a result, NPS staff 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 protects unimpaired 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. The National Park Service would prepare appropriate environmental review (i.e., those required by NEPA, NHPA, and other relevant legislation) for these future actions. As part of the environmental review, the National Park Service would avoid, minimize, and mitigate adverse impacts when practicable. The implementation of a compliance-monitoring program would be within the parameters of NEPA and NHPA compliance documents, U.S. Army Corps of Engineers Section 404 permits, etc. The compliance-monitoring program would oversee these mitigation measures 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. These measures would apply to all alternatives.

NATURAL RESOURCES

General

• Chickasaw National Recreation Area's resources, including air, water, soils,

vegetation, and wildlife, would be inventoried and monitored to provide information needed to avoid or minimize impacts of future development. Any museum collections generated by such activities would be managed according to NPS policies.

- Whenever possible, new facilities would be built in previously disturbed areas or in carefully selected sites with as small a construction footprint as possible. During design and construction periods, NPS natural resource staff would identify areas to be avoided.
- Fencing or other means would be used to protect sensitive resources adjacent to construction areas.
- Construction activities would be monitored by resource specialists as needed.
- Construction materials would be kept in work areas, especially if the construction takes place near streams, springs, natural drainages, or other water bodies.
- All food-related items or rubbish would be removed.
- Visitors would be informed on the importance of protecting Chickasaw National Recreation Area's natural resources (including paleontological resources) and leaving these resources undisturbed for the enjoyment of future generations.

Air Quality

 A dust abatement program would be implemented. Standard dust abatement measures could include: watering or otherwise stabilizing soils, covering haul trucks, employing speed limits on unpaved roads, minimizing vegetation clearing, and revegetating after construction.

Soils

- New facilities would be built on soils suitable for development. Soil erosion would be minimized by limiting the time soil is left exposed and by applying other 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. Once work was completed, construction areas would be revegetated with native plants in a timely period.
- To minimize soil erosion on new trails, best management practices for trail construction would be used. Examples of best management practices could include installing water bars, check dams and retaining walls, contouring to avoid erosion, and minimizing soil disturbance.

Paleontological Resources

- Site-specific surveys would be undertaken before any ground disturbance occurs in areas believed likely to contain fossils. If important paleontological resources were identified, the National Park Service would attempt to avoid, relocate, or otherwise mitigate impacts from the actions being taken. Any specimens found and collected during construction activities would be managed according to NPS museum collection policies.
- To the extent possible, efforts would be undertaken to inform and educate visitors, students, teachers, and the public about Chickasaw National Recreation Area's paleontological resources, the reasons for protecting these resources, and the laws regarding the collection of fossils from NPS lands.

Water Resources (including Floodplains and Wetlands)

- To prevent water pollution during construction, erosion control measures would be used, discharges to water bodies would be minimized, and construction equipment would be regularly inspected for leaks of petroleum and other chemicals.
- Best management practices, such as the use of silt fences, would be followed to ensure that construction-related effects were minimal and to prevent long-term impacts on water quality, wetlands, and aquatic species.
- Caution would be exercised to protect water resources from activities with the potential to damage water resources, including damage caused by construction equipment, erosion, and siltation. Measures would be taken to keep fill material from escaping work areas, especially near streams, springs, natural drainages, wetlands, and lakes.
- For new facilities, such as campgrounds, and to the extent practicable for existing facilities, stormwater management measures would be implemented to reduce nonpoint source pollution discharge from parking lots and other impervious surfaces. Such actions could include oil/sediment separators, street sweeping, infiltration beds, and use of permeable surfaces; and vegetated or natural filters to trap or filter stormwater runoff.
- Chickasaw National Recreation Area's spill prevention and pollution control program for hazardous materials would be followed and updated on a regular basis. Standard measures could include hazardous materials storage and handling procedures; spill containment, cleanup, and reporting procedures; and limitation of refueling and other hazardous activities to upland / nonsensitive sites.
- Wetlands potentially affected by new facilities would be delineated by qualified

NPS staff or certified wetland specialists and clearly marked before construction work. All new facilities would be sited to avoid wetlands, or if that is not practicable, to otherwise comply with Executive Order 11990 ("Protection of Wetlands") and regulations of the Clean Water Act.

• New structures would be located outside of floodplains whenever possible. A statement of findings for floodplains would be prepared if a new facility must be located in a floodplain.

Vegetation

- Areas used by visitors (e.g., trails) would be monitored for signs of native vegetation disturbance. Public education, revegetation of disturbed areas with native plants, erosion control measures, and barriers would be used to control potential impacts on plants from trail erosion or social trailing.
- Proposed sites for new trails, campsites, and other facilities would be surveyed for sensitive species before construction. If sensitive species were present, new developments would be relocated to avoid impacts.
- Revegetation plans would be developed for disturbed areas. Revegetation plans should specify such features as seed/ plant source, seed/plant mixes, soil preparation, fertilizers, and mulching. Salvage vegetation, rather than new planting or seeding, would be used to any extent possible. To maintain genetic integrity, whenever possible native plants that grow in the project area or the region would be used in restoration efforts. Use of nonnative species or genetic materials would be considered only where deemed necessary to maintain a cultural landscape or to prevent severe resource damage, and would be approved by Chickasaw National Recreation Area's natural resource specialist. Restoration activities

would be instituted immediately after construction was completed. Monitoring would occur to ensure that revegetation was successful, plantings were maintained, and unsuccessful plant materials were replaced.

• Whenever possible, specimen trees would be retained and protected from construction-related damage. Trees removed during construction would be used in trail construction, mulch, or other construction material, or would remain on-site as habitat.

Exotic Species

- Special attention would be devoted to preventing the spread of noxious weeds and other nonnative plants. Standard measures could include the following elements: ensure construction-related equipment arrives on-site free of mud or feed-bearing material, certify all seeds and straw material as weed-free, identify areas of noxious weeds before construction, treat noxious weeds or noxious weed topsoil before construction (e.g., topsoil segregation, storage, herbicide treatment), and revegetate with appropriate native species.
- If horses are permitted to stay overnight in Chickasaw National Recreation Area, they would be required to eat certified weed-free fodder.
- Efforts to control introduction and spread of nonnative animals would be implemented.

Wildlife

• To the extent possible, new or rehabilitated facilities would be sited to avoid sensitive wildlife habitats, including feeding and resting areas, major travel corridors, nesting areas, and sensitive amphibian habitat.

Mitigation Measures Common to All Action Alternatives

- Construction activities would be timed to avoid sensitive periods, such as nesting or spawning seasons. Ongoing visitor use and NPS operational activities could be restricted if their potential level of damage or disturbance warranted doing so.
- Measures would be taken to reduce the potential for wildlife to get food from humans. Wildlife-proof garbage containers would be required in developed areas (including visitor centers, picnic areas, trails, interpretive waysides, and campgrounds). Signs would continue to educate visitors about the need to refrain from feeding wildlife.
- Other visitor impacts on wildlife would be addressed through such techniques as visitor education programs, restrictions on visitor activities, and ranger patrols.

Threatened and Endangered Species and Species of Concern

Conservation measures would occur during normal operations as well as before, during, and after construction to minimize long-term immediate impacts on rare, threatened, and endangered species. These measures would vary by specific project and the affected area of Chickasaw National Recreation Area. Many of the measures listed above for vegetation and wildlife would also benefit rare, threatened, and endangered species by helping to preserve habitat. Conservation measures specific to rare, threatened, and endangered species would include the following:

 Surveys would be conducted for special status species, including rare, threatened, and endangered species, before deciding to take any action that might cause harm. In consultation with the U.S. Fish and Wildlife Service and Oklahoma Department of Wildlife Conservation, measures would be taken to protect any sensitive species whether identified through surveys or presumed to occur.

- If breeding or nesting areas for threatened and endangered species were observed in Chickasaw National Recreation Area, these areas would be protected from human disturbance.
- New facilities and management actions would be located and/or designed to avoid adverse effects on rare, threatened, and endangered species. If avoidance is infeasible, for adverse effects on rare, threatened, and endangered species appropriate conservation measures would be taken in consultation with the appropriate resource agencies.
- Restoration and/or monitoring plans would be developed as warranted. Plans should include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.
- Measures would be taken to reduce adverse effects of nonnative plants and wildlife on rare, threatened, and endangered species.
- No trees would be removed that are being used by bald eagles for roosting.

Noise Abatement

- Standard noise abatement measures would be followed during construction. Standard noise abatement measures could include the following elements: a schedule that minimizes impacts on adjacent noisesensitive resources, 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 resources as possible.
- Facilities would be located and designed to minimize objectionable noise.
- Personal watercraft users would be encouraged to use the new quieter vehicles currently being produced.

CULTURAL RESOURCES

All projects with the potential to affect historic properties would be carried out in compliance with Section 106 of NHPA to ensure that the effects are adequately addressed. All reasonable measures would be taken to avoid, minimize, or mitigate adverse effects in consultation with the Oklahoma state historic preservation officer and, as necessary, the Advisory Council on Historic Preservation and other concerned parties, including American Indian tribes. In addition to adhering to the legal and policy requirements for cultural resources protection and preservation, the National Park Service would also undertake the following measures as required to further protect or mitigate resources potentially at risk of disturbance because of implementing proposed actions:

- All areas selected for construction would • be surveyed to ensure that cultural resources (e.g., archeological, historic, ethnographic, and cultural landscape resources) in the area of potential effects are adequately identified and protected. Compliance with the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) would apply in the unlikely event that human remains believed to be Native American would be discovered inadvertently during construction. Prompt notification and consultation with the tribes traditionally associated with Chickasaw National Recreation Area would occur in accordance with NAGPRA. If such human remains were believed to be non-Indian, standard reporting procedures to the proper authorities would be followed, as would all applicable federal, state, and local laws.
- Archeological documentation would be done in accordance with the Secretary's Standards for Archeological Documentation.
- New facilities would be constructed in previously disturbed areas. Archeological

surveys and/or monitoring, as appropriate, would precede any construction to ensure that potential impacts to archeological resources would be avoided or minimized to the greatest extent.

- As necessary, archeological monitoring would accompany ground-disturbing construction activities in areas of high resource probability or sensitivity to assist with the identification and protection of discovered resources.
- Should construction unearth previously unknown archeological resources, work would stop in the area of discovery until the resources were properly recorded by the National Park Service and evaluated under the eligibility criteria of the National Register of Historic Places in accordance with Section 106 procedures. Data recovery excavations and/or other mitigating measures would be carried out where site avoidance is not possible.
- New construction and/or alterations and rehabilitation of historic structures would be sensitively carried out in accordance with the Secretary of the Interior's Standards for Archeology and Historic Preservation to ensure that character-defining features are protected.
- Vegetation screening and sensitive topographic and/or other site selection criteria would be used to minimize the visual intrusion of new construction on historic viewsheds or in historic areas.
- Ethnographic resources would be protected and mitigated by such means as identifying and maintaining access for recognized groups to traditional, spiritual/ceremonial, or resource gathering and activity areas. As practical, new developments would be screened from these areas, and conflicting uses would be relocated or timed to minimize disruptions.
- Cultural landscape rehabilitation measures might include vegetation thinning, removal of exotic species, removing noncontributing or nonhistoric

Mitigation Measures Common to All Action Alternatives

structures and landscape features, and incorporating compatible designs for new construction.

- Further background research, resource inventories, and National Register of Historic Places evaluation of historic properties would be carried out where management information is lacking. The results of these efforts would be incorporated into site-specific planning and compliance documents.
- All options for preserving historic properties would be considered and evaluated. However, if historic buildings, structures, or landscapes could not be reasonably preserved, historical and architectural documentation would be completed in accordance with the standards of the Historic American Buildings Survey (HABS), the Historic American Engineering Record (HAER), and/or the Historic American Landscapes Survey (HALS). The nature and scope of these mitigation measures would be developed in consultation with the Oklahoma state historic preservation officer, Advisory Council on Historic Preservation, and other concerned parties.
- No national-register-listed or eligible structure would be removed or allowed to decay naturally (molder) without prior review by recreation area and regional cultural resource specialists, including approval by the regional director and consultation with the Oklahoma state historic preservation office. Before a national-register-listed or eligible structure is removed or allowed to molder, appropriate documentation recording the structure would be prepared in accordance with Section 110(b) of NHPA and the documentation submitted to the HABS/HAER/HALS program.
- Visitors would be educated on the importance of protecting Chickasaw National Recreation Area's historic properties and leaving these undisturbed for the enjoyment of future visitors.

- Artifacts and cultural materials would be carefully protected according to NPS guidelines and policies to minimize the risk of loss, theft, and/or disturbance.
- New facilities would be constructed in previously disturbed areas. However, archeological surveys and/or monitoring, as appropriate, would precede any construction to ensure that potential impacts to archeological resources would be avoided or minimized to the greatest extent possible.

VISITOR SAFETY AND EXPERIENCES

- A traffic control plan would be implemented, as warranted. Standard measures would include strategies to maintain safe and efficient traffic flow during road construction periods.
- Measures to reduce adverse effects of construction on visitor safety and experience would be implemented.
- Visitor safety concerns would be integrated into interpretative and educational programs. Directional signs and education programs to promote understanding among visitors would continue.
- An accessibility study would be conducted to understand barriers to recreation area programs and facilities. Based on this study, a strategy to provide the maximum level of accessibility would be implemented.

SCENIC RESOURCES

Mitigation measures are designed to minimize visual intrusions. These include the following:

- Where appropriate, facilities such as boardwalks and fences would be used to route people away from sensitive natural and cultural resources, while still permitting access to important viewpoints.
- Facilities would be designed, sited, and constructed to avoid or minimize visual

intrusion into the natural and/or landscape.

• Vegetative screening would be provided, where appropriate.

SUSTAINABLE DESIGN AND AESTHETICS

- Projects would avoid or minimize adverse impacts on natural and cultural resources.
- Development projects (e.g., buildings, facilities, utilities, roads, bridges, and trails, etc.) or reconstruction projects (e.g., road reconstruction, building rehabilitation, and utility upgrades) would be designed to work in harmony with the surroundings, particularly in historic districts.
- Projects would reduce, minimize, or eliminate air and water nonpoint source pollution.

 Projects would be sustainable whenever practicable by recycling and reusing materials, minimizing materials, minimizing energy consumption during the project, and minimizing energy consumption throughout the lifespan of the project.

SOCIOECONOMIC ENVIRONMENT

- During the future planning and implementation of the approved management plan for Chickasaw National Recreation Area, NPS staff would work with local communities and county governments 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.
- Partnerships would be pursued to improve the quality and diversity of community amenities and services.



ENVIRONMENTALLY PREFERABLE ALTERNATIVE

The environmentally preferable alternative is defined as "the alternative that will promote national environmental policy as expressed in Section 101 of the National Environmental Policy Act." Section 101 states that it is the continuing responsibility of the federal government to . . .:

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

The environmentally preferable alternative is the NPS preferred alternative for Chickasaw National Recreation Area in this GMP. This alternative satisfies the national environmental goals: the alternative provides a high level of protection of natural and cultural resources while concurrently providing for a wide range of neutral and beneficial uses of the environment. The alternative maintains an environment that supports a diversity and variety of individual choices, and it integrates resource protection with an appropriate range of visitor uses and understanding.

The preferred alternative (alternative B) surpasses the other alternatives in realizing the full range of the Section 101 national environmental policy goals. The no-action alternative does not provide as much resource protection as the preferred alternative more resource impacts would be expected in the no-action alternative. Thus, compared to the preferred alternative, the no-action alternative does not meet the following national environmental policy goals either:

- attain the widest range of beneficial uses of the environment without degradation
- preserve important natural aspects and maintain an environment that supports diversity and variety of individual choice
- achieve a balance between population and resource use

Alternative C provides for higher levels of natural resource protection; however, there would be reduced visitor use in Chickasaw National Recreation Area compared with the preferred alternative.

ALTERNATIVES AND MANAGEMENT ACTIONS CONSIDERED BUT DISMISSED

The planning team considered including the two following actions in the management alternatives, but decided not to include these actions in the alternatives.

The team considered moving U.S. Highway 177 out of Chickasaw National Recreation Area. This would reduce traffic and noise in the recreation area and eliminate several public safety problems. However, the team decided this was not reasonable or feasible to do, and the question of where the highway would be relocated could not be answered. The team also considered eliminating bison in the recreation area. Chickasaw National Recreation Area is a very small area to maintain a bison herd. Given Chickasaw National Recreation Area's size and location, a free-roaming herd is not feasible. Thus, animals have to be periodically culled or removed due to resource constraints. However, the team decided to retain the bison in all of the alternatives. The bison have an educational value. They are native to Chickasaw National Recreation Area, are important for restoration efforts, and are part of the cultural landscape. In addition, no herd in a park unit is truly free roaming.



Торіс	Alternative A (No Action)	Alternative B (Preferred)	Alternative C
CONCEPT	 Continue current management, guided by current planning documents. Current management would provide for existing interpretive, educational, and recreational opportunities 	 Management would focus on: Expanding visitor opportunities with enhanced visitor facilities, greater interpretive opportunities, and more ranger-guided programs and events Improving natural and cultural resources 	 Management would focus on: Protecting and restoring natural and cultural resources and landscape Providing for a narrower level of visitor use
RESOURCE MANAGEMENT PARKWIDE	 Continue current management of natural and cultural resources with guidance of approved documents Continue to house collections in the maintenance area building under adequate museum standards for temperature and humidity control but needing improvements in fire detection and overall building security 	 Enhanced emphasis on preservation and protection of cultural resources (historic structures, cultural landscapes, archeological resources, ethnographic resources, and museum collections) would be provided. The <i>Cultural Landscape Report</i> would provide general guidance for the treatment of historic properties within the Platt Historic District. Encourage a partnership to identify approaches to manage the aquifer. This should include increased monitoring, additional studies, and protection of recharge areas Natural resource management would continue to use the best available science to make decisions on an ecosystem level Utilize best land management practices within Chickasaw National Recreation Area and encourage best land management outside the recreation area to protect Chickasaw National Recreation Area's waters Restore bison pasture to prairie and maintain the bison herd at an appropriate size to maintain vegetation; study the possibility of introducing bison from the Platt District to the Upper Guy Sandy The museum collections and archives that are currently housed at Chickasaw National Recreation Area in one of the maintenance area buildings would be moved to an appropriate site(s) in accordance with the <i>Museum Collection Facilities Strategy,</i> <i>Intermountain Region</i> (NPS 2005) 	 Management of natural and historic cultural resources would be accomplished with actions as in alternative B but to a higher level by: focusing funding on resource restoration and preservation removing some facilities that impact resources As in alternative B natural resources management would be focused on increased use of best management practices that protect water quality and quantity and increased protection of natural areas Encourage a partnership to identify approaches to manage the aquifer. This should include increased monitoring, additional studies, and protection of recharge areas Natural resource management would continue to use the best available science to make decisions on an ecosystem level Utilize the best land management practices to protect Chickasaw National Recreation Area's waters, including shoreline and riparian rehabilitation Move the collections to new quarters outside Chickasaw National Recreation Area at an approved site as recommended by the NPS Intermountain Regional Curatorial Collections Plan The museum collections and archives currently housed at Chickasaw National Recreation Area in one of the maintenance area buildings would be moved to an appropriate site(s) in accordance with the <i>Museum Collection Facilities Strategy,</i> <i>Intermountain Region</i> (NPS 2005) Restore bison pasture to prairie and maintain the bison herd at an appropriate size to maintain the vegetation; study the possibility of introducing bison from the Platt District to the Upper Guy Sandy

TABLE 8: SUMMARY OF ALTERNATIVES

Торіс	Alternative A (No Action)	Alternative B (Preferred)	Alternative C
PLATT DISTRICT	 Continue existing level of interpretation Continue to protect historic buildings, landscapes, and archeological sites Continue efforts to reduce red cedar and nonnative vegetation Continue current bison management in the existing enclosure Maintain the trail system Continue existing interpretive activities 	 Use the <i>Cultural Landscape Report</i> as guidance for improvements Manage water flows at Vendome Well Provide shower facilities within the Platt District Provide additional day use facilities (picnic tables and shelters) Increase park ranger-interpreter presence in the district and the number of guided and self-guided interpretive opportunities using existing staff levels 	 Use the <i>Cultural Landscape Report</i> as guidance for improvements Manage water flows at Vendome Well
Cold Springs Campground	Continue current conditions	• Use the <i>Cultural Landscape Report</i> as guidance for improvements such as repairing roads, improving drainage in the campground, and restoring and protecting vegetation to improve campsites, and upgrading restroom facilities	• Use the Cultural Landscape Report as guidance for improvements
Central Campground	Continue current conditions	 Continue the current levels of camping Use the <i>Cultural Landscape Report</i> as guidance for improvements such as building a pedestrian walkway and thinning red cedar Upgrade restroom facilities 	 Continue the current levels of camping Use the <i>Cultural Landscape Report</i> as guidance for improvements
Rock Creek Campground	Continue current conditions	• Use the <i>Cultural Landscape Report</i> as guidance for improvements such as rehabilitating the campground and providing some electrical and water hookups	 Use the <i>Cultural Landscape Report</i> as guidance for improvements; the same as alternative B but remove some campsites (up to 12) that have potential adverse effects on riparian habitat along the creek Close Chigger Hill portion of campground and restore area
Veterans Lake	 Maintain current facilities and visitor activities in the area 	 Complete the universally accessible trail around Veterans Lake Connect Veterans Lake to Rock Creek campground by trail Replace existing dock facilities Study the possibility of providing recreational opportunities such as a horse camp, staging area, or group campsites 	 Maintain current facilities and visitor activities in the area
MAINTENANCE AREA	Continue to maintain and use the maintenance complex	 Relocate maintenance operations either inside of Chickasaw National Recreation Area (outside the historic district) or outside of the recreation area; provide additional staff offices if needed Rehabilitate historic buildings for appropriate use. Replace or remove some nonhistoric structures 	 Relocate maintenance operations outside Chickasaw National Recreation Area; provide staff offices if needed Rehabilitate historic structures for adaptive reuse Rehabilitate historic buildings for adaptive reuse. Removal of some nonhistoric structures
ROCK CREEK CORRIDOR	 Maintain the multiuse trail system Protect archeological sites 	 Maintain and upgrade the trail system by improving signs, clearly delineating the trail, and eliminating drainage problems Restore areas along Rock Creek corridor Protect archeological sites 	 Maintain the multiuse trail system and eliminate drainage problems Restore areas along Rock Creek corridor Protect archeological sites

Торіс	Alternative A (No Action)	Alternative B (Preferred)	Alternative C
LAKE OF THE ARBUCKLES AREA	Maintain current level of operations to sustain current visitor use	 Prepare a commercial services feasibility study to determine the possibility of providing commercial operations such as boat tours, boat rentals, and cabin rentals within and outside Chickasaw National Recreation Area Provide sustainable and accessible restrooms at the day use areas Restore shoreline Increase park ranger-interpreter presence in the district and the number of guided and self-guided interpretive opportunities using existing staff levels 	 No commercial operations Study lake use to determine if management of boat use is needed Restore shoreline
The Point Area	• Maintain and operate at current level	 Maintain and operate the current number of campsites and provide water, electrical, and sewer services to some sites without utilities Improve privacy screening between campsites Improve trails Redesign parking to reduce impacts Construct new restroom with showers and upgrade the entrance road to campground Construct new restrooms at picnic areas 	 Maintain and operate the current number of campsites Improve privacy screening through vegetation management
Buckhorn Area	Maintain and operate at current level	 Maintain and operate the current number of sites and convert some nonutility sites to utilities Improve privacy screening between campsites Provide upgrades for the campground's electrical service and amphitheater Improve trails Redesign parking to reduce congestion Construct new restrooms at picnic areas 	 Maintain and operate the current number of sites Improve privacy screening through vegetation management
Guy Sandy Area	Continue current conditions	 Improvements to the campground and day use area including restrooms Improve restrooms at the boat launch area Add a picnic shelter 	 Convert campground to day use area and retain boat use Improve day use areas and improve restrooms
UPPER GUY SANDY	Continue to restore prairie and forest	Continue to restore prairie and forest	Continue to restore prairie and forestConsider some dirt road closures
VENDOME WELL/FLOWER PARK	 Continue current condition with the addition of a new visitor center adjacent to Vendome Well 	Construct a new visitor center adjacent to Vendome Well	Construct a new visitor center adjacent to Vendome Well

	Alternative A (No Action)	Alternative B (Preferred)	Alternative C	
Natural Resources				
Paleontological Resources	Long-term minor adverse impacts potentially due to visitors illegally collecting fossils.	Same as alternative A.	Same as alternative A.	
Soils	 Soils would be lost or altered due to soil erosion from increased visitor use in developed areas, such as along trails or near water sources, and from continued erosion of soil at the Cold Springs camp- ground. These adverse impacts would likely be long-term and minor. Bank erosion along Lake of the Arbuckles would continue due to wave action, resulting in long-term minor to moderate adverse impacts to soils in local areas. 	 Soils would be lost or altered due to the construction of new developments, and to soil erosion from increased visitor use in developed areas such as along trails or near water sources. With more ground disturbance due to a number of new developments and likely increased use in those areas, more areas would experience soil impacts. Improvements to trails and the Cold Springs campground and shoreline restoration work around Lake of the Arbuckles would reduce soil erosion, resulting in a long-term minor to moderate beneficial impact. Both long-term minor beneficial and adverse soil impacts in localized areas in Chickasaw National Recreation Area. 	 Soil erosion from increased visitor use would occur in developed areas such as along trails or near water sources. Long-term beneficial impacts, including drainage improvements to the Rock Creek corridor trail; the removal and restoration of the Guy Sandy campground, the Chigger Hill portion of the Rock Creek campground, and some campsites at the Rock Creek campground; and the shoreline stabilization efforts along Lake of the Arbuckles. Long-term minor to moderate beneficial impacts in local areas. 	
Water Quantity Associated with Chickasaw National Recreation Area's Springs	• Long-term adverse impact of unknown magnitude on the flows of Chickasaw National Recreation Area's springs, due to the continued unrestricted flow of the Vendome Well.	• Long-term beneficial impact of unknown magnitude on the flows of Chickasaw National Recreation Area's springs due to a reduction in the flow of the Vendome Well and increased cooperation with other partners to manage the aquifer.	• Same as alternative B.	
Surface Water Quality	Long-term minor to moderate adverse impact on water quality in localized areas, primarily due to added waste from increased visitor use.	 Long-term minor adverse impact on water quality in local areas, primarily due to an increase in wastes from increased visitor use. The proposed actions proposed would not substantially affect Chickasaw National Recreation Area's water quality. Several long-term negligible to minor beneficial impacts in local areas due to trail improvement work, shoreline restoration work along Lake of the Arbuckles, and the adoption of best management practices. 	 Same as alternative B. Long-term minor beneficial impact on Chickasaw National Recreation Area's water quality would occur because some actions could reduce the runoff of sediments in local areas. 	

TABLE 9: SUMMARY OF KEY IMPACTS OF IMPLEMENTING THE ALTERNATIVES

	Alternative A (No Action)	Alternative B (Preferred)	Alternative C
Vegetation	 Long-term negligible to minor adverse impacts would occur in local areas due to increased visitor use. Vegetation restoration efforts would likely have a long-term moderate beneficial impact in local areas. 	 Long-term negligible to minor adverse impacts would occur in local areas due to proposed new developments and increased visitor use levels. Vegetation restoration efforts would likely have long-term minor to moderate beneficial impacts in much of Chickasaw National Recreation Area. 	 Long-term negligible to minor adverse impacts would occur in local areas due to increased visitor use levels and construction work (e.g., shoreline stabilization efforts). Vegetation restoration efforts would likely have a long-term minor to moderate beneficial impact Chickasaw National Recreation Area.
Wildlife	 Most wildlife habitat in Chickasaw National Recreation Area would not change. Actions would not affect areas known to be important for breeding, nesting, foraging, or key migration routes. Actions would not interfere with feeding, reproduction, or other activities necessary for the survival of a wildlife population. Long-term negligible adverse impacts would continue to occur due to continued visitor use of Chickasaw National Recreation Area. Long-term minor to moderate beneficial impacts on some wildlife populations due to the continuing efforts to restore prairie and forest in the Upper Guy Sandy area. 	 Most wildlife habitat in Chickasaw National Recreation Area would not change. Actions would not adversely affect areas known to be important for breeding, nesting, or foraging, or key migration routes. Actions would not interfere with feeding, reproduction, or other activities necessary for the survival of a wildlife population. Short-term negligible adverse impacts would occur to wildlife populations in local areas due to the construction of new developments. Long-term minor adverse impacts would continue to occur due to continuing visitor use. Long-term minor to moderate beneficial impacts on some wildlife populations due to continuing efforts to restore prairie and forest in the Upper Guy Sandy area. 	 Most wildlife habitat in Chickasaw National Recreation Area would not change. Actions would not adversely affect areas known to be important for breeding, nesting, foraging, or key migration routes. Actions would not interfere with feeding, reproduction, or other activities necessary for the survival of a wildlife population. Long-term minor adverse impacts would continue to occur due to visitor use of Chickasaw National Recreation Area. Long-term minor to moderate beneficial impacts on some wildlife populations would occur due to continuing efforts to restore prairie and forest in the Upper Guy Sandy area; the closure and restoration of the Guy Sandy campground and some Rock Creek campground campsites; and shoreline stabilization and restoration efforts around Lake of the Arbuckles.
Threatened & Endangered Species (Bald Eagles)	 May affect, but not likely to adversely affect, bald eagles. If visitor use levels increase in the future, there is a slight chance bald eagles roosting by Lake of the Arbuckles might be disturbed. 	 May affect, but not likely to adversely affect, bald eagles. There is a possibility that visitors could disturb eagles roosting or feeding on Lake of the Arbuckles, but this short-term effect would not likely adversely affect bald eagles. 	 May affect, but not likely to adversely affect, bald eagles. If visitor use levels increase in the future, there is a slight chance bald eagles roosting by Lake of the Arbuckles might be disturbed.

	Alternative A (No Action)	Alternative B (Preferred)	Alternative C
Soundscape	 Parts of Chickasaw National Recreation Area would continue to be relatively quiet, such as the Upper Guy Sandy area and the Rock Creek multiuse trail area. Long-term minor to moderate adverse impacts on the natural soundscape would likely continue due to maintenance, restoration activities and visitor use. Most of these adverse impacts would occur during high-use periods and in high- use areas, including campgrounds, picnic areas, roads, boat ramps, the springs, Travertine Creek, and the Travertine Nature Center. 	 Parts of Chickasaw National Recreation Area would continue to be relatively quiet most of the time, such as the Upper Guy Sandy area. More areas would experience long-term minor to moderate adverse impacts on the natural soundscape due to construction and restoration. Most of these adverse impacts would occur in high use areas, including campgrounds, trails, picnic areas, roads, boat ramps, Buffalo and Antelope springs, Travertine Creek, and Travertine Nature Center. 	 Parts of Chickasaw National Recreation Area would continue to be relatively quiet most of the time, such as the Upper Guy Sandy area and the Rock Creek corridor trail area. Long-term minor to moderate adverse noise impacts would occur in local areas from maintenance, restoration activities, and increased visitor use levels. Most adverse noise impacts would occur as they do now during high-use periods and in high-use areas, including campgrounds, trails, picnic areas, roads, boat ramps, the Buffalo and Antelope springs area, Travertine Creek, and Travertine Nature Center.
	C	ultural Resources	
Archeological Resources	 No adverse impacts would be anticipated. 	 No adverse effects would be anticipated. Some ground-disturbing activities would continue, such as the planned construction of the Chickasaw Nation Cultural Center adjacent to Chickasaw National Recreation Area, which could result in future adverse impacts. 	 No adverse effects would be anticipated. Some ground-disturbing activities would continue, such as the planned construction of the Chickasaw Nation Cultural Center adjacent to Chickasaw National Recreation Area, which could result in future adverse impacts.
Ethnographic Resources	 Water-monitoring impacts to the springs as potential ethnographic resources for European Americans and American Indians would occur. These impacts would be long- term beneficial and minor, depending upon what is learned and implemented from the monitoring. Few adverse impacts to the Monkey Tree as a potential ethnographic resource are anticipated. Impacts of management actions on the trails as ethnographic resources would be long-term, minor, and beneficial because access would continue along with trail maintenance. 	 Water-monitoring impacts to the springs as potential ethnographic resources for European Americans and American Indians would occur. These impacts would be long- term and beneficial and range from minor to moderate, depending upon what is learned and implemented from the monitoring. Few adverse impacts to the Monkey Tree as a potential ethnographic resource are anticipated. Impacts of management actions on the trails as ethnographic resources would be long-term, moderate, and beneficial because access would be maintained and substantially improved through widening, better drainage configuring, and new construction. 	 Water-monitoring impacts to the springs as potential ethnographic resources for European Americans and American Indians would occur. These impacts would be long- term and beneficial and range from minor to moderate, depending upon what is learned and implemented from the monitoring, further research, and partnering. Few adverse impacts to the Monkey Tree as a potential ethnographic resource are anticipated. Long-term minor beneficial effects would be expected to preserve it as long as possible for more generations of children to climb and play. Impacts of management actions on the trails as ethnographic resources would be long-term, minor, and beneficial because access would essentially be maintained along with certain improvements.

	Alternative A (No Action)	Alternative B (Preferred)	Alternative C
Museum Collections and Archives	 Museum collections and archives would continue to be housed under adequate temperature and humidity conditions, but would continue to be at risk from theft, vandalism, and fire. If such events should occur, impacts would be long-term and adverse and range from minor to moderate. 	 Negligible impacts on museum collections and archives would be expected because of the short-term low risk involved in packing and moving. Long-term moderate beneficial effects would result from providing or arranging for more museum-standard space. Long-term minor to moderate adverse impacts would occur due to the change in location away from Chickasaw National Recreation Area resulting in inconvenience to Oklahoma researchers and Chickasaw National Recreation Area staff. Long-term moderate beneficial impacts would occur because of the greater prevalence of curation and storage conditions meeting museum standards and because of the cultural, historical, and scientific soundness resulting from the increased ease of comparison with related collections. 	• Same as alternative B.
Cultural Landscapes and Historic Structures	No adverse effects.	No adverse effects.	No adverse effects.
	Visito	r Use and Experience	
	 Negligible impacts on the visitor experience because there would be minimal changes in visitor opportunities. 	 Minor to moderate beneficial effects for visitors looking for additional opportunities in Chickasaw National Recreation Area would occur. Minor adverse impacts as a result of increased visitation related to crowding and noise would occur. 	 Long-term minor beneficial impacts on visitors looking for a more natural, better-preserved recreation area would occur. Minor adverse impacts due to the loss of a few campsites at Rock Creek campground and some additional crowding would occur. A long-term moderate beneficial impact on visitor experience in the region would occur.
	Socioe	conomic Environment	
	• Negligible effects.	 Both beneficial and adverse effects on the regional socioeconomic conditions from enhanced visitor opportunities and an associated increase in visitation would result. These effects would likely be negligible in intensity in the context of the broader regional socioeconomic conditions. 	 Short-term negligible beneficial effects on the regional socioeconomic environment from associated construction spending would result, but would possibly result in long- term negligible adverse impacts due to a possible reduction in visitation associated with somewhat decreased visitor opportunities.

	Alternative A (No Action)	Alternative B (Preferred)	Alternative C
National Recreation Area Operations			
	 Would continue to be adversely impacted in a minor to moderate way under the no- action alternative because of limited maintenance operations and separate administrative and maintenance areas. 	 Would be beneficially impacted in a minor to moderate way. 	Same as alternative B.




Chapter 3:

Affected Environment

INTRODUCTION

This chapter is not a complete description of Chickasaw National Recreation Area's environment. Rather, it provides an overview of resource conditions and trends; the key recreation area resources, uses, and facilities; and the socioeconomic characteristics that might be affected by implementing any of the alternatives. For additional information on the area's natural and human environment, see the Chickasaw National Recreation Area home page (<http://www.nps.gov/chic>). Other sources of information include:

Chickasaw National Recreation Area General Management Plan (NPS 1979)

Platt National Park: Environment and Ecology (Barker and Jameson 1975)

Oklahoma Oasis: From Platt National Park to Chickasaw National Recreation Area (Boeger 1987)

Chickasaw National Recreation Area (Parent 1993)

"Water Resources Management Plan. Chickasaw National Recreation Area, Oklahoma" (NPS 1998b)

"Resource Management Plan for Chickasaw National Recreation Area" (NPS 1999)

"Cultural Landscape Report, Platt Historic District. Chickasaw National Recreation Area, Oklahoma" (Hohmann and Grala 2004)



NATURAL RESOURCES

PALEONTOLOGICAL RESOURCES

Much of the information in this section was provided by Dr. Steve Westrop and Roger Burkhalter at the University of Oklahoma / Oklahoma Museum of Natural History.

Chickasaw National Recreation Area's paleontological resources have not been well studied. Information on paleontological resources from geologic formations exposed within the recreation area is summarized in a 2003 report from the NPS Southern Plains Inventory and Monitoring Network (NPS 2003(d)). The main part of the Platt District is located on Quaternary alluvium, recent to Quaternary carbonate (travertine), and the Upper Pennsylvanian Vanoss Formation. These rocks are not yet known to contain fossils within the park, although the Vanoss Formation has produced fossils northeast of the recreation area (Morgan 1924). The southern part of Chickasaw National Recreation Area, particularly along the southern and eastern sides of Lake of the Arbuckles, and in the eastern reaches of the recreation area near the city of Sulphur, has Middle Ordovician through Lower Devonian carbonates that can be very fossiliferous. Fossils have been exposed in road cuts south of the Lake of the Arbuckles.

The area south of the Lake of the Arbuckles, near the Goddard Youth Camp, has received some study. A well-known site east of the Goddard Youth Camp was found to have several formations that contained fossils. Indeed, Amsden (1960) considered this area one of the best collecting localities in the Arbuckle Mountains region. Collection records at the Sam Noble Oklahoma Museum of Natural History indicate that specimens collected from four formations in this locality have been illustrated and/or discussed in several scientific publications (University of Oklahoma, S. Westrop and R. Burkhalter, pers. comm. 2003a).

The oldest geological formation in Chickasaw National Recreation Area is the Middle Ordovician Bromide Formation of the Simpson Group, which contains many marine invertebrate fossils. Brachiopods, echinoderms, trilobites, pelycopods, bryozoans, graptolites, and ostracodes have all been discovered in Chickasaw National Recreation Area (NPS 2003d). Just south of Chickasaw National Recreation Area's boundary, and southeast of Sulphur, a new bryozoan reef was discovered in the Bromide Formation (Cuffey and Cuffey 1994). Type locality for a Bromide Formation echinoderm, as well as a Viola Group trilobite, is located just outside the recreation area (University of Oklahoma, R. Burkhalter, pers. comm. 2003b).

The rocks in the southern part of Chickasaw National Recreation Area, south of Lake of the Arbuckles, range in age from the late Ordovician to late Pennsylvanian Periods, about 440–290 million years ago. The oldest rocks in this area are from the late Ordovician Viola Group, which is exposed in several areas in the recreation area, and contains deepwater fauna, trilobites, and graptolites (sticklike, colonial, marine invertebrates) in particular. Although fossils have not been reported from the Viola Group in the recreation area, individuals living near the recreation area have reported finding Viola Group fossils.

Overlying the Viola Group is the Siluran Sylvian Shale, a siliceous shale that has produced only a few fossils. Although there are limited exposures of this shale in Chickasaw National Recreation Area, fossil graptolites have been discovered from these deposits. The Sylvian Shale is overlain by the Hunton Group, from the Siluran–Devonian Periods (440–360 million years ago), which includes the Haragan Formation. This was the fossil-rich formation that was found by Amsden in the recreation area. The formation contains several types of marine invertebrate fossils including brachiopods, trilobites, crinoids, corals, snails, clams, and bryozoans.

Overlying the Hunton Group are the Woodford Shale (Devonian Period) and the Caney Shale (Mississippian Period, 360–325 million years ago). The Caney Shale contains fossils in this area, and a nearly complete fossil fish was collected at a site now covered by the lake (Zidek 1972, 1975).

In the past, some illegal fossil collecting probably occurred in Chickasaw National Recreation Area due to the accessibility of sites with fossils — a road on the south side of Lake of the Arbuckles passes through an area where fossils have been discovered, and fossils are present in some road cuts. However, the extent and significance of fossils that may have been removed is not known. It is not known whether illegal fossil collecting is still occurring in Chickasaw National Recreation Area.

SOILS

Chickasaw National Recreation Area was mapped as part of the soils survey for Murray County by the Soil Conservation Service (SCS 1984). Three major general soil types are present in the recreation area. Garvin-Elandco soils are found along the floodplain of Rock Creek and Guy Sandy Creek. These soils are deep, nearly level, and very gently sloping, moderately well-drained and well-drained, clayey and loamy soils that formed in alluvium. They are subject to occasional or frequent periods of flooding. They also contain hydric soils that may support wetlands.

Kiti-rock outcrop-Rayford soils make up much of the Platt District and the uplands adjacent to Rock Creek. These soils are gravelly or cobbly, shallow and very shallow, very gently sloping to steep, well-drained soils that formed from colluvium and residual materials from limestone bedrock. They are found on side slopes and ridgetops.

Surrounding most of Lake of the Arbuckles are Chigley-Travertine-Naru soils. These are deep to shallow, very gently sloping to steep, moderately well-drained and well-drained soils that formed from colluvium and residual materials from shale or siltstone bedrock. These soils tend to be found on side slopes of uplands and on ridgetops.

At the eastern edge of the reservoir there are Clarita-Durant-Burleson soils. These are deep, nearly level to strongly sloping, moderately well-drained, clayey and loamy soils that formed in clayey sediments. They are found on nearly level to strongly sloping soils on side slopes and low upland ridgetops.

Many of the soils in Chickasaw National Recreation Area have been disturbed and altered. The causes of these changes include changes in vegetation, cultivation practices, grazing by nonnative animals, and the construction of roads, residences, and other structures. Natural and human-caused soil erosion also has likely affected the area's soils.

Most of the soils in Chickasaw National Recreation Area have limitations for building and recreational development. The Garvin-Elandco soils have limitations due to flooding, high shrink-swell potential, very low permeability, and clayey texture. The Kit-rock outcrop-Rayford soils have restrictions due to the depth to rock, surface stones, rock outcrops, and high shrink-swell potential. The Chigley-Travertine-Naru soils have limitations due to the shallow depth to bedrock and high shrink-swell potential. The Clarita-Durant-Burleson soils have restrictions because of their clavev texture. very slow permeability, and high shrink-swell potential.

Some erosion has occurred along trails due to water running down the trails, and some shoreline erosion has occurred along Lake of the Arbuckles due to waves and wakes from motorboats; particularly near camping areas and boat launches, and at private properties where landowners moor watercraft (NPS 2003a).

Soils in Chickasaw National Recreation Area have a high water holding capacity and nutrient levels. These soil conditions, combined with a long growing season, make reestablishment of vegetation relatively straightforward.

Water Quantity Associated with Chickasaw National Recreation Area's Springs

One of the primary purposes of Chickasaw National Recreation Area is to protect its fresh and mineral water springs - one of only two units in the NPS system that were established for this purpose (the other being Hot Springs National Park) (NPS 1998c). These springs and their flows are one of the area's fundamental resources, contributing to the area's natural and cultural significance. The springs in the Platt District are well known for their recreational and medicinal qualities, and also are used by the Chickasaw Tribe for cultural purposes. The water sustains a diversity of fauna and flora. Wild and domestic animals also have frequently relied on the springs as water sources. Today, the springs continue to be a primary visitor attraction, particularly Antelope and Buffalo springs.

Altogether, there are two freshwater springs (Antelope and Buffalo) and three groups of mineralized springs (Pavilion, Hillside, and Black Sulphur) that flow in the Platt District of Chickasaw National Recreation Area. Highly mineralized spring flow (Bromide and Medicine springs) has essentially ceased within Chickasaw National Recreation Area. The two most prominent springs, Antelope and Buffalo, account for most spring discharge within the recreation area, with an estimated average discharge of 5 million gallons per day (NPS 1998c). A 1988 study recorded a combined discharge from the two springs of 3,431 gallons per minute, while the discharge from the three groups of mineralized springs was about 158 gallons per minute — less than 5% of the total spring water discharged within Chickasaw National Recreation Area (Hanson and Cates 1988). Beginning in 2004, more detailed spring discharge data are being recorded in the recreation area.

In addition to the springs, Vendome Well, an artesian well in Vendome/Flower Park, is an important cultural feature of Chickasaw National Recreation Area. This well was drilled in 1922 and has long served as a tourist attraction for the city of Sulphur and the recreation area. Outflow from the Vendome Well was measured by the USGS during 1986, 1987, and 1988. The mean annual discharge from the well was about 583 gallons per minute during this period.

The Arbuckle-Simpson aquifer, a highly conductive limestone/sandstone formation, is the source of spring flows, base flow to streams, and artesian well flow in Chickasaw National Recreation Area. The aquifer outcrops over an area about 500 square miles between Ada and Ardmore, but extends over a larger, but unknown, subsurface area. The aquifer is estimated to be approximately 3,500 feet thick and is recharged by precipitation infiltration at a rate of about 128,000 acrefeet/year (Fairchild et al. 1990). The Vanoss Formation, a tightly cemented conglomerate, acts as a confining layer to the Arbuckle-Simpson aguifer in the vicinity of Chickasaw National Recreation Area (Hanson and Cates 1994). Freshwater springs in Chickasaw National Recreation Area occur along fractures and fissures in the Vanoss Formation, which allow groundwater from the underlying aquifer to reach the surface. Wells drilled through this confining

formation, such as the Vendome Well and numerous wells drilled in the city of Sulphur into the aquifer, are artesian and flow freely at the surface without pumping.

The hydrogeology of the Arbuckle-Simpson aquifer is complex. The movement of groundwater through the aquifer is determined by a large number of variables, including rates of surface recharge, topography of the land surface, and the thickness and conductivity of rock layers within the aquifer. Movement of groundwater also is affected by numerous faults and folds in the aquifer.

The primary source of recharge to the Arbuckle-Simpson aquifer is precipitation that infiltrates the land surface. Some recharge also occurs through streambeds. The recharge to the aquifer appears to occur largely east of Chickasaw National Recreation Area (Barthel 1985; Hanson and Cates 1994). Discharge from the aquifer occurs as spring flows, base flow to streams, artesian well flow, and evapotranspiration.

The depth to water in the aquifer varies with location and season. Fluctuations in groundwater levels have been recorded from 20 to 30 feet to as much as 50 feet on an annual basis (NPS Water Resources, J. Back, pers. comm. 2004). Available data indicates that variations in the discharges at Antelope and Buffalo springs correspond to changes in local groundwater levels (Hanson and Cates 1994).

The flows of the springs in Chickasaw National Recreation Area have naturally fluctuated over time. Groundwater levels and spring flows vary in response to changes in precipitation. During periods of drought in the 1930s, 1950s, and 1980s, spring flows in Chickasaw National Recreation Area were greatly diminished or ceased. Researchers have suggested that these periods of reduced spring flows are associated with three or more consecutive years of below normal rainfall (Hanson and Cates 1994).

Relatively small quantities of water are currently withdrawn from the Arbuckle-Simpson aquifer. Water from the aquifer is used for local public water supply, irrigation, industry, mining, and agriculture. In 2000, permit holders reported pumping about 5,000 acre-feet of groundwater, of which 62% was for municipal use and 25% for irrigation (OWRB 2003). In 2004, the City of Sulphur pumped 877 acre-feet (over 285 million gallons) of groundwater. (OWRB, pers. comm. 2005)

Available data indicates that local groundwater withdrawals, uncontrolled artesian well flows, and natural variations in precipitation have affected local groundwater levels and spring and streamflows. Because of these changes, the number of flowing springs and artesian wells, and the flow volume of spring and artesian wells have declined since the early 20th century in the area.

In the Platt District, both the number of springs and the spring flows have decreased. In 1906, a survey of the area (then called Sulphur Springs Reservation) recorded 33 springs (6 freshwater and 27 mineralized springs), while the most recent inventory of springs in 1988 found only about 16 springs — 17 of the original 33 springs could not be found or were too small to measure (NPS 1998c). In part this difference may be due to the difficulty in identifying springs discharging through streambeds and streambanks. Two of the most mineralized springs, Bromide and Medicine, ceased to flow in the 1970s. Today, only five groups of springs still flow through Chickasaw National Recreation Area: Antelope, Buffalo, Pavilion, Hillside, and Black Sulphur. In addition, the total discharge of the springs in the area dropped, from approximately 3,700 gallons per minute in 1906 to approximately 3,400 gallons per minute in 1988 (Hanson and Cates 1994).

The artesian wells in the area also have experienced declines in flows. In 1939, the discharge from 16 artesian wells in the vicinity of Chickasaw National Recreation Area was measured and totaled about 10,325 gallons per minute; in 1988, the discharge from these same artesian wells totaled about 1,542 gallons per minute (Hanson and Cates 1988). Within Chickasaw National Recreation Area, the Vendome Well discharge dropped from an estimated 2,500 gallons per minute in 1922, when the well was drilled, to an average of 583 gallons per minute between 1986 and 1989 (Hanson and Cates 1994).

Questions have been raised regarding the effects of groundwater withdrawals and uncontrolled artesian well flows on spring and streamflows. Many artesian wells were drilled in the area in the 1920s and 1930s and subsequently have been abandoned, but the wells have never been sealed (NPCA 1993). It is believed that groundwater withdrawals from flowing wells and these abandoned wells probably are affecting the artesian pressure that sustains spring and well flows (Hanson and Cates 1994; NPS 1998).

Concerns have been expressed about future increases in groundwater withdrawals, the effects on groundwater levels, and spring and streamflows in the area, including Chickasaw National Recreation Area. In 2002, a coalition of local landowners sought permits to pump and export up to 138,000 acre-feet per year from the Arbuckle-Simpson aquifer to supplement water supplies in central Oklahoma (OWRB 2003a). About 70,000 acrefeet per year represented new permits, and about 68,000 represented existing temporary permits that have not been used. The proposed export of groundwater would increase groundwater usage to well over 100% of estimated annual recharge to the aquifer. (The proposed export applications are currently pending before the Oklahoma Water Resources Board and will not be acted upon until a hydrologic study of the aquifer is completed.)

Many questions remain regarding the effects of groundwater withdrawals from the Arbuckle-Simpson aquifer on Chickasaw National Recreation Area's springs, including groundwater flow paths and rates of flow, the source of mineralized water, the influence of geologic controls on water storage and movement, spring flows, and the locations of recharge areas (NPS 1998c; Back 2004). Current information is inadequate to understand the effect of new groundwater withdrawals on springs and spring flow (OWRB 2003).

In 2003, the Oklahoma Water Resources Board began a five-year study to characterize the Arbuckle-Simpson aquifer and the area's surface hydrology, among other objectives. This study will be the most intensive analysis of surface and groundwater relationships ever conducted in Oklahoma. The results of the study are intended to provide decision makers with necessary information to determine how best to use water resources in the region while still protecting area springs and streams (OWRB 2003).

SURFACE WATER QUALITY

Five principal streams, two major lakes, numerous small ponds, and many fresh and mineral springs are found within Chickasaw National Recreation Area. Water quality plays a major role in the importance of Chickasaw National Recreation Area's water resources; water quality is essential for pubic health and the protection of the natural environment. Many visitors swim and wade in the area's streams and lakes. Lake of the Arbuckles provides drinking water for thousands of area residents, and the spring waters are consumed by recreation area visitors.

Most of the streams in Chickasaw National Recreation Area originate from the discharge of springs associated with the Arbuckle-Simpson aquifer. Consequently, the quality of stream water during low-flow periods is similar to that of springs (NPS 1998b). For example, the water quality of Travertine Creek is much the same as its primary sources, Antelope and Buffalo springs. Water quality in the streams also varies seasonally.

Although Chickasaw National Recreation Area's water quality is generally considered to be good, based on water quality monitoring that has been done largely between 1967 and 1994, surface water quality in the recreation area has been affected by human activities. Swimming waters often test above allowable limits for contaminants, although the source of these contaminants is not known. Rock Creek has exceeded Environmental Protection Agency (EPA) standards for several water quality parameters as well as standards established by the Oklahoma Water Resources Board for designated beneficial uses of the stream (NPS 1998b). Lake of the Arbuckles is included on the Oklahoma 303(d) list of impaired waters because of reports of nutrients, siltation, and salinity (Oklahoma Dept. of Environmental Quality Data Viewer. Available at: <http://www.deq.state.us/>. Accessed on May 19, 2004).

Fecal coliform, dissolved oxygen, copper, and chloride are the parameters that exceed standards most often in Chickasaw National Recreation Area and may be associated with water quality problems (NPS 1998b). Sediments from external sources are another source of concern. Potential anthropogenic sources of pollution include municipal and industrial wastewater discharges, stormwater runoff, agricultural fields, livestock, fish hatchery operations, oil and gas development, residential development, quarrying operations, recreational use, and atmospheric deposition (NPS 1998b).

The presence of fecal coliform bacteria is the water quality parameter of most concern in Chickasaw National Recreation Area. Monitoring of Travertine and Rock creeks indicate that water in these streams is periodically contaminated by these bacteria. Of 526 observations made between 1967 and 1977, 135 had fecal coliform levels that equaled or exceeded the allowable EPA coliform levels. Of those observations that exceeded the standard, 80% were associated with stations in the northeastern portion of Chickasaw National Recreation Area. This most likely occurs due to the location of several swimming areas along Travertine Creek (NPS 1998b). In the summer of 2003, Travertine Creek had high coliform counts. The National Park Service subsequently posted advisory notices along the creek that bacterial levels had exceeded NPS standards for beach recreational use and that swimming in the stream was not advised due to the increased risk of contracting an illness. The cause of these high bacterial levels is not known, but is probably related to high rainfall levels and high numbers of people in the stream. Also in the summer of 2003 about 10,000 gallons of raw domestic sewage was discharged from a sewer leak into Rock Creek 0.5 to 1 mile above Chickasaw National Recreation Area's boundary. As a result, Rock Creek was closed to all swimming until cleaner levels were obtained.

Dissolved oxygen is a parameter that did not meet acceptable water quality standards in numerous observations. Of 1,585 observations, 242 (or 15%) were less than or equal to the 4 milligrams/liter EPA standard. About 65% of the cases exceeding the standard were reported near Travertine Creek and at Buffalo and Antelope springs (NPS 1998b).

Copper is another element associated with water quality problems in Chickasaw National Recreation Area. Copper concentrations were measured 115 times between 1969 and 1995, 65 of which exceeded allowable levels (or 57%) (NPS 1998b).

Another contaminant that has been found to exceed water quality standards is chloride. Of 197 observations made between 1951 and 1995, chloride concentrations exceeded acceptable levels 53 times (or 27%) of the total observations (NPS 1998b).

There are potential water pollution sources both within and outside Chickasaw National Recreation Area. Within the recreation area, human waste is one source of pollution. Each year thousands of visitors participate in a variety of water-related activities. This level of human presence can negatively affect surface water quality through increased erosion due to visitors and horses walking into streams, increasing sediment loads, and the deposition of human waste. Swimming has an impact on the fecal coliform levels of surface water, especially in streams (NPS 1998b).

The city of Sulphur's sewage treatment plant, which treats both the city and Chickasaw National Recreation Area's sewage, is in the recreation area boundary. During severe storms, the city of Sulphur's sanitary sewer system can become overloaded by stormwater, causing sewage to flow into surrounding drainages in the recreation area. On at least five occasions in 1994, the city of Sulphur's sewage system allowed sewage to flow into Chickasaw National Recreation Area's creeks. This discharge resulted in fecal coliform levels that exceeded state water quality standards for direct bodily contact in Travertine Creek and parts of Rock Creek (which in turn led to the closure of Chickasaw National Recreation Area's waters to public contact); and large algal blooms in Lake of the Arbuckles (NPS 1998b).

Other potential sources of water pollution in Chickasaw National Recreation Area include runoff and spills of fuel, oil, or other hazardous materials on the state highways that run through the area or on county roads that border the recreation area; spills from boats and tow vehicles on the heavily used launch ramps; discharge of petroleum products by motorized watercraft in Lake of the Arbuckles; and leaks from domestic sewerlines that run through the area. Many potential water pollution sources also exist outside Chickasaw National Recreation Area's boundaries. In general, these point and nonpoint sources pose the greatest threat to the recreation area's water quality (NPS 1998b). Although the water quality of Lake of the Arbuckles is generally excellent, algal blooms from undetermined pollution sources have periodically occurred in the past. The water quality of Rock Creek, which is the largest stream in Chickasaw National Recreation Area, which is fed by an area largely outside of the recreation area, has been affected by adjacent land uses. Runoff from agricultural lands such as croplands, cattle ranching, and poultry operations, can increase sediments and elevate levels of nitrogen and phosphorus in Guy Sandy Creek, Rock Creek, and the other streams in the recreation area. Runoff from nearby residences (e.g., fertilizer, pesticides, and herbicides) and from city streets; leaks from regulated storage tanks; and unauthorized disposal of domestic solid wastes in streambeds all can potentially impact Chickasaw National Recreation Area's water quality. Summer home development on the west side of Lake of the Arbuckles may impact water quality by increasing construction-related erosion and through higher waste discharge levels that will require new treatment and septic systems.

Several industrial sources along Rock Creek, upstream of Chickasaw National Recreation Area, also can potentially affect the recreation area's water quality (NPS 1998b). Another potential threat is oil exploration and development activities. (Oil seeps are evident along a portion of Rock Creek, although it is unknown whether this is due to natural sources or past oil drilling activity.)

TERRESTRIAL PLANT COMMUNITIES AND VEGETATION

Chickasaw National Recreation Area lies in a transitional zone between the eastern deciduous forest and the mixed grass or mid-

grass prairie/grassland. The area is a mosaic of forest and woodland, with scattered grasslands and old fields. A vegetation map of Chickasaw National Recreation Area was produced in 1998 (Hoagland et al. 1998). A total of 21 different vegetative cover types were mapped within the recreation area, including disturbed habitats. These cover types can be grouped into grasslands, woodlands, upland and bottomland forests, and old fields. Post oak/blackjack oak forests and woodlands (also referred to as "cross timbers") was once the most common woody vegetation community in Chickasaw National Recreation Area. Red cedar is now a major component of all of these communities.

Vegetation Communities

Grasslands. Grasslands (prairie) cover about 30% of Chickasaw National Recreation Area, although many of the recreation area's prairie areas have been invaded by red cedar. These grasslands occur mostly on uplands and hilltops throughout the recreation area. The Upper Guy Sandy area is a mixture of pockets of prairie merging with cross timbers, and is the best area to see prairie remnants in the recreation area. Other pockets of prairie are on the south and north sides of Lake of the Arbuckles. Little bluestem is a dominant species in many of these grasslands. (See appendix C for the species' scientific names for plants and animals in this section.) Other common species include Indian grass, big bluestem, sideoats grama, hairy grama, purple threeawn, hairy tall dropseed, and switchgrass. Seep muhly grassland is only found in a few areas in Chickasaw National Recreation Area, primarily in areas with seeps (wet places that are poorly drained) and along the sides of ravines with highly calcareous soils.

Woodlands. Red cedar woodlands are another common plant community, covering about 30% of Chickasaw National Recreation Area. These upland communities have more open areas than forests, and the canopies are not continuous. Red cedar is the dominant tree, while in the open areas little bluestem and prickly pear are common.

About 20% of Chickasaw National Recreation Area is covered by post oak–red cedar woodlands. These woodlands are similar to red cedar woodlands.

Upland Forests. Chickasaw National Recreation Area's upland forests are scattered, on southern- and western-facing slopes on hillsides and dry areas. These upland forests cover about 10% of Chickasaw National Recreation Area. Predominant trees in the upland forest areas include post oak, blackjack oak, and red cedar. However, the upland forests also include a diversity of trees. Common species include Shumard oak, red elm, Chinkapin oak, winged elm, Texas oak, Texas ash, black hickory, pecan, rough-leaf dogwood, redbud, and ash juniper.

Bottomland Forests. Bottomland forests are found along the area's streams and springs. They include American elm/sugar berry and green ash forests and occupy about 5% of Chickasaw National Recreation Area. Other common trees along waterways include cottonwood, southern hackberry, sycamore, and black willow.

Old Fields. Two types of old fields are found in Chickasaw National Recreation Area, Johnsongrass and broomsedge. Johnsongrass is much more common. Old fields cover less than 1% of the recreation area and are primarily found along the Upper Guy Sandy Creek, the south shore of Lake of the Arbuckles, and south of Veterans Lake along Rock Creek.

Botanical Studies and Plant Composition

Being in a transition zone, Chickasaw National Recreation Area has a relatively high habitat and plant species diversity. A 1998 vegetation study of Chickasaw National Recreation Area identified 589 taxa of vascular plants, divided into 101 families and 364 genera (Hoagland et al. 1998). The researchers believed that the actual number of plant species in Chickasaw National Recreation Area probably exceeds 600. Indeed, when the above taxa are combined with results from previous studies, a total of 717 taxa in 397 genera and 105 families have been identified in Chickasaw National Recreation Area (Hoagland and Johnson 2001). The families with the greatest number of species were Asteraceae (or Composites, 110 taxa); Fabaceae (legumes, 69 taxa); and Poaceae (grasses, 87 taxa).

Rare Plant Species

Nine rare plant species occur in Chickasaw National Recreation Area: woodland sedge, whitesheath sedge, black dalea, pincushion cactus, lace cactus, Oklahoma beardtongue, short lobe oak, Ozark dropseed, and rock scurf-pea (Hoagland et al. 1998). The Oklahoma Natural Heritage Inventory lists all of these plants as species of special concern.

VEGETATION AND PEOPLE

People have substantially changed the natural vegetation of Chickasaw National Recreation Area over time. The early Woodlands people, around AD 1000, practiced rudimentary agriculture in the area. In the late 1800s, settlers cultivated fields, planted orchards, grazed livestock, and built residences in and around Chickasaw National Recreation Area. The amount of woody vegetation decreased, particularly in the northern part of the recreation area, including the area around Pavilion Springs, where buildings and roads were built. Much of the "grassland" vegetation in the area is thought to be the result of land clearing begun in the late 19th century (Hoagland and Johnson 2000). Native grassland habitats were most extensive

adjacent to and west of Guy Sandy Creek. However, all areas designated as grassland in an 1871 General Land Office survey had been converted to agricultural fields. These fields remained in agricultural use until 1977 when the area became part of Chickasaw National Recreation Area. However, haying operations have continued on several of the old fields.

Since the 1930s, vegetation in the Platt District has been deliberately manipulated, with the planting of trees, shrubs, and turf grasses, and by the construction of pools and waterfalls. More than 500,000 trees, mostly native and evergreens, were planted in the Platt District in the 1930s. Vegetation also has been altered in places due to the construction of roadways, utility lines, campgrounds, picnic areas, and buildings. There are mowed lawns along many of these facilities. The construction of Veterans Lake in 1933 and Lake of the Arbuckles in 1964–1965 also obviously altered the vegetation in these areas. Because of these actions, virtually all of Chickasaw National Recreation Area's terrestrial plant communities and related biotic associations have been altered to some extent.

In general, the trend in recent times has been toward the expansion of woody plants, with a corresponding decrease in natural grasses and forbs. This is probably largely due to the planting of woody plants and the suppression of fire. To a lesser degree, the removal of native grazing mammals such as bison also has affected the distribution of plants in Chickasaw National Recreation Area. If this trend continues, over time trees such as red cedar, oaks, plum, and sumac, will likely replace the original grasses (NPS 1998b).

Although eastern red cedar is native to Chickasaw National Recreation Area, in the past it was not a major component of Chickasaw National Recreation Area's vegetation. However, in the past 20 years it has been rapidly spreading throughout the area at an apparent unnatural rate. This expansion is due to past disturbance of the landscape and suppression of fires inside and outside Chickasaw National Recreation Area. Many eastern red cedars also were planted in the recreation area by the Civilian Conservation Corps (CCC) between 1933 and 1940.

As of 1998, the red cedar was a dominant or codominant species in 36% of Chickasaw National Recreation Area (Hoagland et al. 1998). Red cedar is now estimated to cover about 7,000 acres of Chickasaw National Recreation Area. It has spread into the buffalo pasture, Rock Creek corridor, South Lake, and the Guy Sandy and Upper Guy Sandy areas. The dense crown of red cedar is shading out the understory grasses and forbs in grassland areas and therefore is taking over native prairie grasslands. In wooded areas, the cedar also is shading out hardwood seedlings and crowding out small- to medium-sized hardwoods.

If no actions are taken, many areas will be overrun by red cedar. Red cedars have been cleared along Chickasaw National Recreation Area's boundary segments as a fire break, and prescribed fires have eliminated cedars in a few areas. Some red cedars also have been removed for safety reasons (primarily to reduce fuel) and to restore prairies.

Since 2000, increased attention has been devoted to restoring prairies in Chickasaw National Recreation Area. Although no prairie vegetation has been planted, several prescribed fires have been completed in the Upper Guy Sandy and the Point areas to restore grasses and reduce fire hazards. These prairies are in better condition than they have in years. Additional prairie restoration efforts are planned.

NONNATIVE PLANTS

Chickasaw National Recreation Area has many nonnative plant species, many of which were planted in the recreation area. Hoagland and Johnson (2001) listed 87 nonnative species, from 29 families, of which the greatest number were in the legume and grass families. Wheat covers several agricultural fields in the Upper Guy Sandy area and is periodically harvested. Bermuda grass was planted in landscaped areas and along roads and has subsequently spread through Chickasaw National Recreation Area.

Johnsongrass is a nonnative species of special concern. This grass is a noxious perennial weed that invades riverbank communities and disturbed areas, particularly fallow fields and forest edges. Johnsongrass crowds out native species and slows succession (Hohmann and Grala 2004). Monocultures of this weed dominate old fields in Chickasaw National Recreation Area. It also occurs within mixed grassland types where it has reduced natural plant diversity.

Japanese honeysuckle is the most abundant nonnative plant in the Platt District (Hohmann and Grala 2004). This fastgrowing, ground cover plant invades woodlands and disturbed areas. It creates dense, continuous cover at the forest edge and over the forest floor, and reduces the establishment and growth of native plants. It also contributes to the risk of wildfires because it significantly increases forest density.

Two other invasive, nonnative species that pose significant threats to native species and natural processes are the mimosa tree and king ranch bluestem. The mimosa tree is found throughout the Platt District, particularly along roadsides and trails, but also in campgrounds, picnic areas, and woodlands. It is visible in the Buffalo and Antelope springs area and Travertine Island (Hohmann and Grala 2004).

Privet and tree-of-heaven are less commonly found nonnative species growing in the Platt District. Privet is primarily found in floodplain forest. Tree-of-heaven occurs in and around the Rock Creek campground (Hohmann and Grala 2004).

Other invasive, noxious weeds in Chickasaw National Recreation Area include Russian thistle, and a recent introduction of crown vetch in the Thedford Pond area. This is due in part to plantings at several residences. White-tailed deer spread the seed widely through ingestion.

WILDLIFE

A variety of wildlife species occupy Chickasaw National Recreation Area's woodlands and grasslands, including ungulates and other mammals, birds, reptiles, amphibians, and invertebrates. More wildlife species tend to be found in the wetter lowland forested areas than in the drier uplands.

More than 100 species of birds have been recorded in Chickasaw National Recreation Area. The numbers and types of birds vary seasonally. Some are year-round residents, while others are migrants. The diversity of habitats in Chickasaw National Recreation Area is largely responsible for the diversity of birds found here. The most common birds are the northern cardinal, blue jay, American robin, American crow, wild turkey, northern bobwhite quail, mourning dove, greater roadrunner, downy woodpecker, painted bunting, indigo bunting, great-crested flycatcher, tufted titmouse, blue-gray gnatcatcher, carolina wren, white-throated sparrow, and turkey vulture. Common raptors include the red-tailed hawk, American kestrel, and barred owl. A variety of ducks and geese are commonly seen during spring and fall migrations, including mallard, blue-winged teal, gadwall, and Canada goose (NPS 1998b).

Several bird species of special interest occur in Chickasaw National Recreation Area. Bald eagles are winter residents, from November through March, roosting by and foraging on Lake of the Arbuckles. Whooping cranes occasionally stop briefly in Chickasaw National Recreation Area during migrations. Wild turkeys, commonly sought by hunters, are also flourishing in the recreation area.

Chickasaw National Recreation Area supports 19 known species of amphibians and 57 species of reptiles (NPS 2003b). Most of the amphibian species - frogs, toads, and salamanders — occur in lowland areas in or near streams and water bodies. They include such species as bullfrog, southern leopard frog, and small mouthed salamander. Twelve different turtle species have been documented in Chickasaw National Recreation Area. The alligator snapping turtle, the largest freshwater turtle in the world, and a rare species in Murray County, is known to occur in the recreation area. Although there have not been any recent confirmed sightings, the turtle's likely habitat area is in the vicinity of Guy Sandy Creek (NPS 2003b). This species is listed by the Oklahoma Natural Heritage Inventory as a state species of special concern.

Chickasaw National Recreation Area supports a large number of snakes. Thirty-three snake species have been identified. Common snake species include eastern hognose snake, milk snake, prairie king snake, coachwhip, and garter snake. Several of Chickasaw National Recreation Area's snakes are venomous, including the copperhead, western cottonmouth, western diamondback rattlesnake, timber rattlesnake, and pygmy rattlesnake.

Forty-two native mammal species are known to occur in Chickasaw National Recreation Area (NPS 2003b). Common mammals include white-tailed deer, nine-banded armadillo, Virginia opossum, eastern cottontail, black-tailed jackrabbit, beaver, raccoon, fox squirrel, striped skunk, northern short-tailed shrew, and eastern mole. Predators include bobcat, coyote, and gray fox, which emerge at night to hunt. Another state species of special concern that occurs in Chickasaw National Recreation Area is the Texas horned lizard.

One mammal of special interest in Chickasaw National Recreation Area is the bison. Since 1920 Chickasaw National Recreation Area has maintained a small captive bison herd. The herd once had as many as 12 animals, but now consists of 5 animals in a fenced-off pasture. (One of the animals is a calf that was born in March 2004.) The poor quality and loss of grass due to increases in woody plants makes supplemental feeding of the animals necessary. Viewing the captive herd is a popular visitor activity, although it is difficult to see the bison due to the large number of trees blocking views.

Chickasaw National Recreation Area's deer population also is of special interest to hunters. The deer population is increasing, based on the number of deer being taken by hunters, and may pose a problem in the future (i.e., more frequent vehicle/deer collisions).

WILDLIFE AND PEOPLE

Like the vegetation, people have substantially changed the composition and abundance of wildlife in Chickasaw National Recreation Area over time. Changes in the vegetation, through agriculture and the planting of trees, shrubs, and turf grasses all have affected the area's wildlife, as has the continuing spread of eastern red cedar. Several species have been extirpated from Chickasaw National Recreation Area — the prairie dog, mountain lion, pronghorn antelope, black-capped vireo, elk, black bear, gray wolf, and river otter to name a few. Increased presence of people and developments in and near the recreation area also have affected wildlife populations.

A number of nonnative animals have been introduced by people into Chickasaw National Recreation Area, or have spread from surrounding areas into Chickasaw National Recreation Area, including feral cats, dogs, pigs, European fallow deer, Norway rat, and several species of fish. Red imported fire ants also have spread into Chickasaw National Recreation Area.

In recent years Chickasaw National Recreation Area's wildlife habitat has been affected by two factors. The spread of invasive species (primarily red cedar) throughout the recreation area has altered wildlife habitat structure, composition, distribution, and sizes. The patchwork of habitats that once was present has diminished, which in turn has affected the recreation area's wildlife populations. In addition, Chickasaw National Recreation Area is like an island largely surrounded by farmlands and urban developments. This has fragmented wildlife habitats in the area, with barriers that prevent in- and out-migration for some wildlife species (e.g., bison). Habitat fragmentation has created a threat to nesting areas of migratory birds (NPS 1998b). Habitat fragmentation and the creation of edge habitat generally has been shown to change songbird diversity and abundance, reduce bird nesting success, and affect the abundance and behavior of some mammals, reptiles, and amphibians (Rosenfield et al. 1991).

On the other hand, some tolerant species, such as the mourning dove, flicker, and coyote, can increase their use of these areas.

Hunting (archery, rifle, and shotgun) is a popular activity in Chickasaw National Recreation Area with deer, turkey, bobwhite quail, rabbit, squirrel, raccoon, and other upland game species all being sought. Substantial numbers of migratory bird hunters also hunt duck, geese, dove, rail, and gallinules. Some reptile hunting also occurs. Deer and turkey are two of the most soughtafter species. Deer harvest numbers are trending upwards. In 2001, 29 deer were taken, while in 2002, 64 deer were taken. Most hunting occurs in the Upper Guy Sandy area and along the Rock Creek corridor between Veterans Lake and Lake of the Arbuckles. Hunting is regulated by the Oklahoma Department of Wildlife Conservation, in cooperation with the National Park Service, and harvest levels are not believed to have adversely affected Chickasaw National Recreation Area's wildlife populations.

THREATENED AND ENDANGERED SPECIES (BALD EAGLE)

Bald eagles are not known to nest in Chickasaw National Recreation Area, although they potentially could use the area for nesting. But as noted above, they are winter residents, from November through March, roosting on trees along Lake of the Arbuckles and foraging on fish. They also have occasionally been seen on Veterans Lake. On average about five mature bald eagles are observed in Chickasaw National Recreation Area per year in the winter (Chickasaw National Recreation Area, S. Burrough, pers. comm. 2004).

Large numbers of visitors are not usually near the bald eagle roost trees in the winter, and NPS staff is not aware of visitors disturbing the eagles. The areas where the eagles roost are not frequented by off-season visitors. Some eagle hikes are lead by NPS staff, but visitors are kept a distance from the eagles to avoid disturbing them.

SOUNDSCAPES

Soundscapes include both natural and human components. Natural soundscapes would include all naturally occurring sounds such as waves on the shoreline, running water, bird calls, wind blowing through trees, or thunder. It also includes "natural quiet" that occurs in the absence of natural or human-caused sound. The opportunity to experience natural sounds/quiet is an enjoyable part of some visitor experiences at Chickasaw National Recreation Area. Noise is generally defined as unwanted or intrusive sound. Sounds are described as noise if they interfere with an activity or disturb the person hearing them. Many factors affect how an individual responds to noise. Primary acoustical factors include the level, frequency, and duration of the sound (and other timerelated factors, such as how often it occurs and timing sensitivity). Secondary acoustical factors include the spectral complexity, sound level fluctuations, frequency fluctuation, risetime of the noise, and localization of the noise source (Mestre Greve Associates 1992). Nonacoustical factors also play a role in how an individual responds to sounds. Nonacoustical factors vary from the experience and adaptability of an individual to the predictability of when a noise will occur. The listener's activity will also affect how he/she responds to noise.

Although there is little sound data for Chickasaw National Recreation Area, much of the recreation area is considered to be a relatively quiet place. Common humancaused sounds include engines from personal watercraft and other vessels, vehicle noise, human voices, radios, and other sounds generated by people picnicking and camping. Human sounds are not unexpected or inappropriate at Chickasaw National Recreation Area, but are part of the overall soundscape in an area where water activities, picnicking, camping, and other recreational uses are part of the purposes of the recreation area (NPS 2003a).

One of the major sources of noise in Chickasaw National Recreation Area is vehicles on the paved and unpaved roads that cross through the recreation area. In particular, traffic on U.S. Highway 177 and on Broadway Avenue in the city of Sulphur generates loud noise at times. The traffic mix includes recreational vehicles of all sizes, commercial trucks, and residents' cars. Other sound disruptions are created by visitors talking and shouting, and NPS administrative operations. In addition to road corridors, the primary developed areas where these sounds would be heard include visitor and administrative facilities, such as at the Travertine Nature Center, and The Point and Buckhorn picnic areas and campgrounds. Military flights can frequently be heard and can be intrusive during low flyovers of Chickasaw National Recreation Area. Occasionally sounds may be heard from activities outside the recreation area, such as agricultural operations, the shooting range near the recreation area, and activities in the city of Sulphur (depending upon the wind direction).

Aside from highway traffic, probably the loudest and most common source of noise is motorboats and personal watercraft on Lake of the Arbuckles. Much of the following information is taken from a recent environmental assessment on personal watercraft use in Chickasaw National Recreation Area (NPS 2003a). Noise related to personal watercraft, as well as other motorized craft, and sounds related to human activity are typically highest during the summer, especially at The Point and Buckhorn developed areas where most personal watercraft users launch (NPS 2003a). On busy summer weekends nearly half the vessels on the water at Chickasaw National Recreation Area are personal watercraft, and their use has become an expected part of the soundscape for many visitors. Personal watercraft and outboard motors are similar in the noise level they generate (in terms of decibels), which is generally around 80 decibels (dB) or less at 50 feet (U.S. EPA 1974). However, the noise level can range from below 80 dB to as much as 102 dB (Sea-Doo 2000; Bluewater Network 2001). For comparison, a power lawnmower or a diesel truck at 25 feet can generate 100 dB, which is

considered by many to be very loud. Unlike motorboats, personal watercraft are highly maneuverable and are used for stunts and acrobatics, often resulting in quickly varying noise levels and change in sound frequency (pitch) due to changes in acceleration and exposure of the jet exhaust when crossing waves. The frequent change in pitch and noise levels, especially if operated closer to land, make the noise from personal watercraft more noticeable to human ears (Asplund 2001). Some recreation area visitors may consider the irregular noise from personal watercraft to be more annoying than that of a standard motorboat cruising along the shoreline, even though the maximum noise levels may be similar. Additionally, visitors who expect to experience natural quiet may consider the irregular noise of personal watercraft more annoying, especially if the craft is operating in one location for extended periods of time. Specific places in Chickasaw National Recreation Area where activities may be sensitive to noise include campgrounds, picnic areas, and hiking trails, including The Point and Buckhorn campgrounds and the Fishing Rock and Lake View trails. Noise-sensitive activities that may occur throughout the lake and immediate area include boat and shoreline fishing and wildlife watching. The Point and Buckhorn picnic and camping areas are locations where human-caused noises are most evident (NPS 2003a).

Away from Lake of the Arbuckles, roads, NPS facilities, and the city of Sulphur, most of the sounds heard in the interior of Chickasaw National Recreation Area is probably due to the wind blowing through trees and wildlife calls (e.g., birds). Occasional human voices are also heard in the backcountry.

CULTURAL RESOURCES

OVERVIEW

"Peaceful Valley of Rippling Waters" is nomenclature traditionally attributed to American Indians during the Historic period to describe important features of the area now known as Chickasaw National Recreation Area; but more particularly referring to the Platt District, formerly Platt National Park (Western National Parks Association 1999d). Access to cool waters and cold springs, including mineral springs, in a sylvan setting with some picturesque hilly grasslands has motivated humans to come here from prehistoric times to the present.

Although no Paleo-Indian sites have been found within what is now Chickasaw National Recreation Area, humans are thought to have been frequenting it for the past 7,000 years (NPS 2003a:63). This means that human occupation goes back into Paleo-Indian times (circa 10000 to 5000 BC) with a subsistence emphasis on the migratory, nomadic hunting of Pleistocene megafauna. The next period the Archaic (circa 5000 BC to AD 600) refers to a nonagricultural way of life also, but consists of more specialized local or regional hunting, fishing, and gathering adaptations depending upon the particular ecology of an area after the extinction of the big game of the Pleistocene. The Archaic period includes the subsistence practice of bison hunting that persisted into historic times.

The Woodland period (circa AD 600 to 1500) follows, marked by pottery making and food collecting that changed into food growing with harvesting that became agriculture. The Proto-historic period (circa AD 1500 to 1700) and the Historic period (circa AD 1700 to present) are marked by cultural change, including in the 1830s, the forced removal of southeastern Indian tribes to Indian Territory, which became the state of Oklahoma in 1907. The federal policy of removing American Indian peoples from southeastern lands in the United States, stemming from the Indian Removal Act of 1830 (influenced by President Andrew Jackson), eventually brought the Chickasaws and Choctaws to what is now Oklahoma, along with the Creeks, the Seminoles, and the Cherokees, all of whom were known collectively as the Five Civilized Tribes. What became Platt National Park was situated in country relevant to the Chickasaw and Choctaw Nations in Indian Territory (or Oklahoma). Both nations had interests in the "Peaceful Valley of Rippling Waters."

When the Chickasaw Tribe arrived from Mississippi in 1837, settlement was directed to the southwestern part of Choctaw territory, the Choctaw Tribe having arrived in 1831 from Alabama and Tennessee to settle on assigned lands south of the Canadian River. The Chickasaw settled south of the Washita River. Choctaw territory became defined as south of the Canadian River and north of the Washita River. The springs and streams that became Platt National Park were clearly situated in the Chickasaw Nation lands (Wray and Roberts in NPS 2001b:17). Apparently both the Chickasaws and Choctaws received compensation, at first \$20 an acre for the initial 629 acres of the reserve conveyed to the federal government, out of 640 acres authorized. The 1902 conveyance instrument of Chickasaw land to the federal government states that "the two tribes" of Chickasaw and Choctaw Indians were

absolutely and unqualifiedly relinquishing, ceding, and conveying: unto the United States a tract or tracts of land at and in the vicinity of the village of Sulphur, in the Chickasaw Nation, of not exceeding six hundred and forty acres, to be selected, under the direction of the Secretary of Interior... to embrace all the natural springs in and about said village . . . (Wray and Roberts in NPS 2001b:17).

In 1904, the Sulphur Springs Reservation was expanded to 848 acres, with the Chickasaw and Choctaw Indian Nations compensated in the amount of \$60 an acre (Wray and Roberts 1998:69).

Before European contact, indigenous peoples such as the Apache, Caddo, Comanche, Kiowa, Pawnee, and Wichita who frequented the region also visited and set up camps in the Platt District (formerly Platt National Park) within what is now Chickasaw National Recreation Area:

supported by small game and small herds of elk, bison, and horses Although it was good hunting territory, both the Wichita and Caddo lived in settled villages on major rivers and relied on agriculture for their primary subsistence (Kidwell in NPS 2001b:141).

The American Indian tribes considered traditionally associated with Chickasaw National Recreation Area are as follows, and are mentioned elsewhere in this plan in the section on Native American consultations:

- Apache Tribe of Oklahoma, Anadarko, Oklahoma
- Caddo Tribe of Oklahoma, Binger, Oklahoma
- Chickasaw Nation, Ada, Oklahoma
- Choctaw Nation of Oklahoma, Durant, Oklahoma
- Comanche Tribe of Oklahoma, Lawton, Oklahoma
- Pawnee Nation of Oklahoma, Pawnee, Oklahoma
- Wichita and Affiliated Tribes, Anadarko, Oklahoma.

The city of Sulphur developed around the springs in the late 19th and early 20th centuries by way of European American "early settlers [who] began to build hotels and bath houses to capitalize on the medicinal qualities of the mineral waters with visions of the area becoming a health resort" (Western National Parks Association 1999d:3). In 1902 the city of Sulphur centered around what was then known as Seven Springs — now known as Pavilion Springs in Chickasaw National Recreation Area's Platt Historic District.

On November 19, 1902, Congress set aside the Sulphur Springs Reservation [which had been authorized on July 1, 1902] and established its boundaries expressly to preserve and protect the springs from contamination, preserve and protect Sulphur [now known as Travertine Creek] and Rock Creeks, reserve space for public passage and comfort in connection with the waters, and preserve the beauty of the surrounding grounds, forest, and landscape . . . (Wray and Roberts 1998:69).

On June 29, 1906, Congress changed the name from Sulphur Springs Reservation to Platt National Park in honor of the late Senator Orville Hitchcock Platt (1827–1905). Platt had represented Connecticut in the U.S. Senate from 1879 to 1905 and had been a member of the Senate Committee on Indian Affairs and the Senate Committee of the Five Civilized Tribes (Cherokee, Chickasaw, Choctaw, Creek, and Seminole). Platt was also a relative through marriage of the first official superintendent of the reserve/park, Joseph F. Swords, who followed the very first administrator, Special Inspector Frank C. Churchill of the Indian Service. Swords served from 1903 to 1907 and secured the support and influence of President Theodore Roosevelt for the name change to Platt National Park (NPS 2001b:10).

What is now the Arbuckle District of Chickasaw National Recreation Area stems from the Arbuckle Project of the Bureau of Reclamation, U. S. Department of the Interior, which in 1961 constructed Lake of the Arbuckles and Arbuckle National Recreation Area. On March 17, 1976, Congress combined the latter with Platt National Park and additional lands to form Chickasaw National Recreation Area, containing almost 10,000 acres. Even though no longer designated a national park, the human use and appreciation of Chickasaw National Recreation Area's water resources has been a continuing and consistent theme (NPS 1989:4) of importance since the early 20th century recognition by some American Indians and non-Indians alike of "the idea of preserving the springs as a National Park and the springs being assessable to all people for all time" (Western National Parks Association 1999d:3).

ARCHEOLOGICAL RESOURCES

Murray County, Oklahoma, where Chickasaw National Recreation Area is located, has not been well studied archeologically, so the local sequence of cultures, peoples, and periods from prehistory into history is not well known in detail (Bussey 1989:7). No archeological sites are known to be of the Paleo-Indian period, but it is believed that Paleo-Indian material could indeed be present. Sites of the Archaic and Woodland periods have been identified, as has "one site believed to be ancestral Wichita" of the Proto-Historic or Historic period (Bussey 1989:7). The Wichita and Kitsai tribes mainly occupied an area that includes what is now Chickasaw National Recreation Area, as the Proto-Historic period turned into the Historic period, with the Wichita relatively soon absorbing the Kitsai (Newcomb 2001; Parks 2001).

Archeological investigation and survey in relation to what is now Chickasaw National Recreation Area is traced back at least to 1938 and 1940 when H. R. Antle did field work in Platt National Park and reported it (NPS 1942). In January 1947, David Wenner of Roberts / Schornick and Associates, Norman, Oklahoma, recorded a prehistoric campsite on a knoll with lithics consisting of projectile points and scrapers (Wenner 1947). As recently as January 2004, Annie Moerbe found one prehistoric archeological site and seven historic archeological sites potentially eligible for the National Register of Historic Places (subject to further investigation) (Moerbe 2004). There are about 120 prehistoric and historic archeological sites known in what is now Chickasaw National Recreation Area. Because Chickasaw National Recreation Area has not been systematically surveyed for archeological resources, these sites have become known through a relatively small number of surveys to meet legal compliance for site-specific development projects. The archeological references mentioned above are an example of the compliance literature. Probably no more than 10%–15% of Chickasaw National Recreation Area has been archeologically surveyed.

The types of prehistoric archeological sites found in Chickasaw National Recreation Area include short- and long-term habitation sites. The short-term sites are regarded as seasonal or temporary places to camp for hunting and gathering, often on ridge or hilltops with a view of streams or springs below that would draw game. The long-term sites are called villages, and three sites have been suggested to have functioned as villages with people living there rather than just camping for a while. Village status is implied from the greater accumulation of lithic debris over time. A variety of stone tools and flakes have been found, including sizeable flakes that served as knives and scrapers. Smaller flakes served as projectile points. Some of the debris shows evidence of primary, secondary, and tertiary flaking in creating the tools. At both campsites and village sites, burned rock has been found indicating campfires or hearths.

So-called "stone-tool factory" sites have been found at places where chert and chalcedony have been quarried and worked by hammering, chipping, and pressure flaking lithic cores into tools like the knives and scrapers mentioned above. Other places apparently functioned as workshops where chert and chalcedony or other core materials were brought to a habitation site, say from a lithic procurement area, for later formation into tools. It has been suggested that at some workshop sites, specialized activities took place that apparently included the manufacture of awls made of bone and wood that served to make holes to bind together pieces of animal skin for clothing and pouches. Some sites occur at the juncture of two drainages where that setting seemingly enhanced subsistence hunting and gathering opportunities.

Historic archeological sites include farmsteads and associated structures and features, such as a farmhouse, stone foundations for farm buildings, and cellar depressions. Two remnant brick kilns have been found as part of two farmsteads, apparently to manufacture stoneware ceramic pottery in one instance and to make bricks in the other. The so-called stoneware-kiln-farm site has been dated to the early 20th century. Trash dumps with farm and domestic trash have been found associated with some of the farmsteads. In one case, artifacts of automobile parts, including a fender along with china ceramics, tin cans, and Atlas-brand galvanized canning jar lids were found, suggesting a time range between the 1920s and the 1950s. Buried remains of a historic, public swimming pool known as the Vendome "Plunge Pool" have been identified. It provided people an opportunity to bathe in and enjoy the mineral waters.

Some of the farm sites have been classified as ranch sites because historical research correlated with archeological evidence suggests that cattle were raised there. One ranch site contains glass predating 1880 and bricks that were "only produced after 1902," and collaborative historical research involving historic land records shows "Choctaw ownership between 1902 and 1908" (Raab et al. 2003b:7-1). It is interesting to note that the historic archeological sites are Choctaw associated, Chickasaw associated, or European American associated. No archeological sites are listed in the National Register of Historic Places, but some 13 prehistoric and historic archeological sites are potentially eligible for listing — some with lithic scatters/ artifacts and some representing late 19th or early 20th century farmsteads. In each instance, subsurface materials are present with the potential to learn more about the local or regional prehistory or history of the human occupation and settlement of the area. It is important to note that undiscovered archeological resources may exist, associated with cultural landscapes, ethnographic resources, and historic structures, as well as with the city of Sulphur's late 19th and early 20th centuries' first location.

ETHNOGRAPHIC RESOURCES

Ethnographic resources relate to particular places or areas that contemporary peoples, groups, or families link to their traditional way of life and cultural heritage. The formal definition of ethnographic resource is as follows:

[An ethnographic resource is] a 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 1998a:181).

A study involving interviewing and ethnohistorical research, "Ethnohistory of the Associated Park Use and Values," has been conducted and drafted to document human use over time correlated with certain cultural values associated with Chickasaw National Recreation Area (NPS 2001b). It focuses upon European American family and group activities (Wray and Roberts in NPS 2001b) and includes an appendix on American Indian occupation and use (Kidwell in NPS 2001b) that discounts the possibility of any: contemporary tribes of Oklahoma, especially the Chickasaw within whose territory the springs lay... [of having any] long standing traditions of use of the springs . . . [because] the United States government acquired this territory as part of the Louisiana Purchase in 1803 and resettled tribes from east of the Mississippi River after 1830 (Kidwell in NPS 2001b:140).

The resettled tribes would have brought "other traditions" with them in the 19th century, emphasizing that traditional sites associated with origin stories and other sacred matters would relate to areas other than those of relocation, mostly those left behind (Kidwell in NPS 2001b:153). Rather than spiritual associations, Chickasaw and Choctaw use of the national park / national recreation area falls into the same European American category of use — that of traditional family and group activities for the old Platt National Park, now the Platt Historic District (Kidwell in NPS 2001b:140).

The tribes living in the area at European contact, such as the Caddo and Wichita, did not consistently remain there and "have experienced such significant cultural change that cultural meanings [once] associated with the springs" have changed as well (Kidwell in NPS 2001b:140). The implication is that if the indigenous early inhabitants of the region had persisted in place historically and Indian removal had not occurred to resettle southeastern Indians there with other traditions, we might be able to identify some ethnographic resources linking contemporary American Indian peoples to particular places of continuing importance to their social identity and cultural heritage.

There may be ethnographic resources involving the more recent American Indian occupants. For the Wallace family of the Chickasaw people, "all the trails in the park [national recreation area]" (Kidwell in NPS 2001b:164) are an ethnographic resource. This is because: the trails are walked regularly today by family members; a trans-generational element exists because trail walking is being passed down between different generations of the family; and trail walking is important to the culture and heritage of this family, which relates to enjoying the resources and appreciating the Chickasaw pride in the tribe's role in preserving for all the public what was once called Platt National Park; and lending the Chickasaw name to the expanded national recreation area that includes Chickasaw National Recreation Area as a historic district.

Chickasaw National Recreation Area has been the setting for generations of traditional family and group activities of both European Americans and American Indians representing a wide range of outdoor experiences such as picnicking, swimming in so-called swimming holes, frolicking in the springs and streams, walking and hiking, and observing nature. Camping is both historic and modern. Historically through seasonal and other temporary encampments, it is associated with an American Indian subsistence base of hunting, fishing, and gathering. More recently, it includes European American recreational hunting and fishing often coupled with various forms of boating in certain areas of Chickasaw National Recreation Area.

Such traditional family and group activities, as mentioned above, took place among the natural springs and streams before the work of the Civilian Conservation Corps, whose planned park landscape alterations from 1933 to 1940 in the then Platt National Park are said today to be among the finest, classic examples of CCC rustic architectural craftsmanship and ingenuity, including stone picnic tables, rustic stone picnic shelters, stone circles creating shallow decorative pools surrounding and highlighting their springs, stone and concrete dams that produced bathing pools and swimming holes, and stone water fountains.

The period of significance for the proposed Platt Historic District extends from 1902 to

1932 and the 1932 development of the first master plan for Platt National Park to the end of CCC activities at the park in 1940. Additional periods and dates might convey other themes of singular national significance through the complex layers of Platt National Park history, but the primary period of significance relies upon the most visible and physical characteristics of the park's historically designed landscape of 1932–1940 (Hohmann and Grala 2004:252).

Following the CCC period, this designed landscape then was the setting for traditional family and group activities in what is now the Platt Historic District, blending harmoniously with the natural environment and with some earlier cultural landscaping such as the 1909 Lincoln Bridge over Travertine Creek (formerly Sulphur Creek) near its confluence with Rock Creek. For further details about these structures, see the section below describing historic structures and cultural landscapes.

It is interesting to note that in 1939 American Indians were observed visiting the springs. Platt National Park Superintendent William E. Branch wrote in an annual report:

Indians still visit the area for the purpose of using the medicinal waters, and during the past year members of several tribes were noted including the Chickasaw, Creek, Seminole, Choctaw, Cherokee, shawnee [sic] and Pawnee tribes (NPS 1939).

Implications of this observation are that more tribes than the Chickasaw and Choctaw in the area or region were using the then national park, and that this American Indian use coincided with how European Americans were drawn to "using the medicinal waters" as mentioned above.

Ethnographic resources eligible for listing in the National Register of Historic Places are called traditional cultural properties (TCPs) and defined in the NPS *Management Policies* 2001:

Traditional cultural property — a property 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. Traditional cultural properties are ethnographic resources eligible for listing in the national register.

No traditional cultural properties of American Indian origin or European American origin have been identified for eligibility evaluation and possible nomination to the national register. That does not mean that none exist. Perhaps as part of the draft nomination of the Platt Historic District to the national register as a national historic landmark (NHL) that is now underway, some potential ethnographic resources might be identified as contributing elements to be evaluated for traditional cultural property eligibility in their own right or as ethnographic components to already identified historic cultural landscapes (NPS 2002).

An example of a potential ethnographic resource mentioned in the draft national historic landmark nomination is the Monkey Tree (a large Osage orange tree), which, as noted in other sections in this plan, is a popular landmark because its flexible and inviting branches have been climbed by several generations of children. The Monkey Tree is in Walnut Grove, which is along Rock Creek and Perimeter Road, west of Black Sulphur Springs, and northeast of Bromide Springs. Walnut Grove consists of about 25 acres that serves as a day-use area for visitors to picnic, take walks, and gather in small groups for fun and recreation. Links to the Monkey Tree by certain families as a focus for family picnics and reunions in Walnut Grove could be a basis to evaluate the area, not only for ethnographic-resource status, but also for

potential national register eligibility as a traditional cultural property. Through more work in considering the Monkey Tree in Walnut Grove as an ethnographic resource, the families or other groups associated with it would need to be identified. In addition, trans-generational learning would need to be demonstrated on the value and practice of children playing on the tree. A cultural link would need to be shown between the Monkey Tree and its importance to the family's or group's heritage.

Ethnographic resources may abound in Chickasaw National Recreation Area, but more research needs to be conducted to identify and establish the necessary links of contemporary use with specific places and their possible meanings for both American Indian and European American families and groups. Topics for further research include baptismal spots and plant gathering areas. Both American Indian and European American church groups have been known in the past to conduct baptisms in Chickasaw National Recreation Area. Do they do so today amid a context of continuity of place and cultural importance? Because certain plants in the area have become part of the Chickasaw Nation's traditional knowledge, is there a Chickasaw contemporary desire to gather plants having related medicinal and consumptive values associated with particular areas in Chickasaw National Recreation Area?

The fine NPS ethnohistory study mentioned above by cultural anthropologists Jacilee Wray, Alexa Roberts, and Clara Sue Kidwell (NPS 2001b; NPS 2004c) is the only study related to Chickasaw National Recreation Area that emphatically employs an ethnographic approach as part of its methodology. Nonetheless, it stops short of researching and documenting the details that would specifically link contemporary cultural use of particular places in Chickasaw National Recreation Area over time back from the present to the cultural heritage and social identity of certain tribes, communities, groups, or families. While it would be very useful for further ethnographic research, this study neither specifically identifies ethnographic resources as such, nor evaluates their significance as ethnographic resources that might be eligible for listing in the National Register of Historic Places as traditional cultural properties.

MUSEUM COLLECTIONS AND ARCHIVES

Museum Collections and Archives

Chickasaw National Recreation Area's museum collections and archives for cultural history regarding archeology, ethnography, and history, including historic photographs, is currently housed at Chickasaw National Recreation Area in a Bally building in the maintenance area, which is inadequate and does not conform to museum standards. Although temperature regulation exists, humidity can be monitored but not controlled. Improved security from theft and vandalism is needed for the building, as is an automatic fire detection and suppression system in lieu of the handheld fire extinguishers now in place.

CULTURAL LANDSCAPES AND HISTORIC STRUCTURES

Information primarily comes from two sources. The first is the draft national historic landmark nomination by James Steely, Julene Adams, Kurt Korfmacher, Nesta Anderson, and Heather Brandon of the former Platt National Park, now the Platt Historic District of Chickasaw National Recreation Area, as a national historic landmark (Steely et al. 2002). The second is the *Cultural Landscape Report* of the Platt Historic District by Heidi Hohmann and Katarzyna Grala (Hohmann and Grala 2004).

Platt District

The Platt District of Chickasaw National Recreation Area is characterized by a wide array of structures and natural/cultural features that reflect the legacy of designed development and patterns of human use associated primarily with the area's renowned springs and creeks. Established in 1906 as Platt National Park, the district (adjacent to and south of the city of Sulphur) is recognized as a nationally significant cultural landscape. Congress originally set the area aside in 1902 as the Sulphur Springs Reservation, a 640-acre parcel acquired by the U.S. Department of the Interior's Indian Service from the Chickasaw and Choctaw Nations (Steely et al. 2002). The reservation's boundaries were intended to:

embrace all the natural springs in and about said village [of Sulphur Springs] and so much of Sulphur (now Travertine) Creek, Rock Creek, Buckhorn Creek, and the lands adjacent to said natural springs and creeks as may be deemed necessary ... for the proper utilization and control of said springs and the water of said creeks..." (Steely et al. 2002:4).

Some notable examples of early park structures (e.g., the Lincoln Bridge built in 1909) remain in the Platt District. However, perhaps most strikingly evident is the imprint of CCC construction as part of President Franklin D. Roosevelt's New Deal public works programs of the 1930s. The National Park Service relied on CCC labor to undertake an ambitious program of development at Platt National Park, in conformance with the park's 1932 Master Plan. Carried out in the "NPS rustic" style of park architecture then prevalent throughout the country, CCC laborers and craftsmen skillfully incorporated local materials, predominantly stone and wood, into park structures to enhance their rustic appearance and blend them with their natural settings. Among the park's planned construction at this time were spring pavilions, trails, picnic areas, campgrounds,

restrooms, low dams across Travertine Creek to create swimming areas, and the formal and informal landscapes arranged to enhance the experience of visitors circling the park along the 6.5 mile-long Perimeter Road. CCC workers also planted more than half a million trees.

The national significance of the Platt District as a designed cultural landscape is recognized in a draft National Historic Landmark nomination that identifies the years between 1902 to 1940 as Platt District's periods of significance. These dates encompass the issuance of the park's Master Plan (1932) and the plan's fulfillment by CCC Company 808 over the ensuing years until the Civilian Conservation Corps left the park in 1940. The district retains a high degree of integrity relating to location, design, setting, materials, workmanship, feeling and association. Within the larger Platt District, the following ten component landscapes have been identified with important contributing resources highlighted (Steely et al. 2002).

Bromide Springs/Bromide Hill (along Perimeter Road south of the 12th Street entrance). This component landscape is further divided into the flat floodplain of the springs area and the rocky, higher elevations of Bromide Hill to the south across Rock Creek. Historically, visitors often camped by the springs and obtained the bromide spring water for its curative properties. CCCconstructed development in the 1930's reflected a planned shift to visitor day-use activities (e.g., picnicking, strolling, and more vigorous hiking along trails leading up 1,073foot Bromide Hill). A road and parking area were constructed near the top of Bromide Hill at Robber's Roost. The character of the area reflected a rustic parkscape with the addition of structures such as the stone entrance piers, the fountain centered on 12th Street, the Bromide Springs Pavilion, Pavilion Pond, and restroom #22. Two vernacular-style buildings remain in the area that were constructed before the CCC era: the community house

(now the Resource Lab) and the caretaker's residence (now a residence). Small-scale features include culverts, retaining walls, road and sidewalk curbing, and low-water bridges.

Walnut Grove (along Rock Creek and Perimeter Road west of Black Sulphur Springs and northeast of Bromide Springs).

Walnut Grove is about 25 acres, historically serving as a day-use area for picnics, walks, and small-scale gatherings. The Monkey Tree (a large Osage orange tree) is a popular landmark, and its flexible branches have been climbed by several generations of children. Although CCC Company 808 bivouacked at Walnut Grove, the Civilian Conservation Corps carried out little formal project work here, and it remains a largely intact, unimproved day-use area. There are no historic buildings in the area, and only four CCC-constructed fireplaces remain from the period of significance.

Buffalo Pasture/Prairie Uplands (a 392-acre

area in the central part of the Platt District). This large component landscape has varied topography, consisting of wooded ravines and high, open prairies. U.S. Highway 177 (formerly Buckhorn Road) bisects the area, with the western section comprised of the 90acre Buffalo Pasture and superintendent's residence, and an open prairie uplands area on the east side of the highway.

Before the CCC work of the 1930s, display paddocks were established for deer and mules, later enclosing buffalo and elk by the 1920s. The buffalo pasture, altered to reflect a more natural setting during the CCC period, continues to enclose a herd of five buffalo. A nine-hole golf course on the east side of Highway 177 was removed in 1937. Highway 177 and Perimeter Road retain the primary historic pattern of circulation through the area. The stucco finished wood-frame superintendent's residence and garage are contributing landscape elements, as are several small-scale features such as the buffalo fence, earthen dam and pond in the buffalo pasture, culverts, headwalls, and designed landscape elements around the superintendent's residence. Some of the formerly open viewsheds in the area are currently compromised by the heavy growth of woody vegetation and invasive cedars.

Pavilion Springs/Hillside Springs/ Headquarters and Maintenance Area (a 48acre area in the center of the Platt District bisected by U.S. Highway 177). Part of the city of Sulphur Springs was here from the mid-1880s until 1904 when town buildings were relocated north of the current recreation area boundaries. The Leeper House (built in 1894 with rough stone exterior and steeply pitched shingle roof and Civilian Conservation Corps addition of the museum) served as park/recreation area headquarters from 1904 to 2002. With headquarters relocated to the city of Sulphur, the building now serves as a NPS ranger station.

Historically, the natural springs in this area were used by early Native Americans, and later residents and visitors for the health benefits of the mineral waters. The Pavilion Springs pavilion was built in 1936-37 with a distinctive composition of concrete, stone, and wood timbers that dramatically link it to its natural surroundings. In 1935 the Civilian Conservation Corps replaced an original pagoda-style pavilion at neighboring Hillside Springs with a stone retaining wall and spring basin beneath an arch. The NPS maintenance area is near the Leeper House, consisting of a CCC-constructed truck shed, warehouse (mule barn), and maintenance office. Among the additional contributing properties in this area are two NPS staff residences and their respective garages, trails, stone steps, footbridge, parking areas, and the Pavilion Springs pedestrian underpass. The topography varies from the wooded lowland ravine by Pavilion Springs to the open Upland Prairie ridge by the headquarters and maintenance area.

Flower Park/Black Sulphur Springs (on the north side of the Platt District along Perimeter Road and bordered on the north by Broadway Avenue). As one of the oldest developed areas in Chickasaw National Recreation Area, this landscape is characterized by a mix of building styles and landscape elements. An early resort-style character is reflected in the classically inspired design of the Black Sulphur Springs Pavilion, constructed in 1929. Vendome Well is in the vicinity, just south of Broadway Avenue, but this once privately owned artesian sulphur well (purchased by the National Park Service in 1979) was historically outside the boundary of Platt National Park and is not included in the draft national historic landmark nomination for the Platt District. Rock Creek and Travertine Creek merge near Black Sulphur Springs, and these water courses have strongly influenced this area's landscape development. The Civilian Conservation Corps replaced the large, formal flowerbeds of Flower Park with more natural landscaping, but retained the grass lawns. Native vegetation from the period of significance is largely intact and is an important contributing landscape element. The Lincoln Bridge (1909) over Travertine Creek is another pre-CCC structure, constructed of rough limestone to emulate a medieval appearance with crenellated turrets at each corner. Restroom #25 is a well-crafted example of CCC rustic architecture. Trails, stone curbing, and stairways further contribute to the cultural landscape.

Central Campground (a 15-acre area in the north-central section of Chickasaw National Recreation Area between the city of Sulphur and Travertine Creek, and accessed by Perimeter Road). This open, wooded area, the smallest of Chickasaw National Recreation Area's three overnight camping areas, was originally part of the city of Sulphur Spring's East Central Park. It was historically used for large gatherings including traveling Chautauqua entertainment. NPS rustic designs were incorporated into buildings (notably restroom #26), picnic areas, stream dams, swimming areas, and retaining walls that enhance waterfall features along Travertine Creek. Camping and group-use facilities are clustered in a circular fashion about two oval areas, an arrangement retained from the 1930s.

Cold Springs Campground (a 22-acre area of heavily wooded, flat terrain in the eastcentral section of the Platt District along *Perimeter Road*). The campground is on the north side of Travertine Creek. The creek's freshwater springs have been traditionally used by visitors as swimming pools formed behind low man-made rock dams. The popularity of the area, first as a leisurely picnic area and later (1913) as an unplanned camping area, led to overuse and resource damage. The Civilian Conservation Corps planted new trees and undertook measures to restore vegetation, and the campground was closed to the public between 1934 and 1939 for vegetation recovery. At this time, the Civilian Conservation Corps also graded and drained the campground and undertook other improvements to accommodate more visitors and enhance the visitor experience. The layout of the campground and access road/pedestrian circulation patterns were formalized during the CCC area. The campground's 63 campsites and two large group sites are arranged into four sections accessed by a central road and outer loop roads. A hiking trail to Antelope Springs winds along the southern bank of Travertine Creek. CCC-constructed rustic-style buildings include restrooms #29 and #30 (1935), and the checking station (1937). The wood frame community house, constructed in the 1920s before the Civilian Conservation Corps, reflects a regional vernacular style.

Travertine Island/Little Niagara Falls (in the northeastern section of the Platt District, about .5 mile northeast of Cold Springs Campground). This 22-acre heavily wooded "island" is between the confluence of Travertine and Limestone creeks and retains a

high degree of integrity from 1932 to 1940. The area's natural landscape has attracted generations of picnickers and swimmers seeking more of an isolated "wilderness" experience. Rustic CCC-built facilities catering to these day-use activities include the rock dams in the Little Niagara Falls area, stepping stones for pedestrian stream crossings, stone bench/tables, and restroom #31 with its rough-sawn rafters and battered limestone walls. A later Mission 66-era restroom (#37) is considered a noncontributing resource.

Antelope Springs/Buffalo Springs and Nature Center (a 142-acre area in the easternmost section of the Platt District; bordered on the north by the city of Sulphur and by private landholdings to the east and south). The heavily wooded area is accessed by Perimeter Road, which leads to a parking area at the Travertine Nature Center, and by pedestrian trails leading from the nature center to Antelope and Buffalo springs. These springs supply the headwaters for Travertine Creek, which flows westerly through the area. The area was designated as an Environmental Study Area in 1969 as part of a Department of Health, Education and Welfare special initiative to raise awareness of the consequences of human actions on the environment. The area was popular during the first half of the last century for walking, picnicking, and carriage rides. The Civilian Conservation Corps extended Perimeter Road around the springs, undertook landscape improvements around the springs, and placed massive stone slab tables in the picnic area.

In 1969 the National Park Service altered the focus from light recreational use of the Antelope and Buffalo springs area to a more formal natural resources-based education program, by constructing the Travertine Nature Center, removing picnic and parking areas, and abandoning Perimeter Road beyond the nature center. Hiking on the loop trail to the springs remains a popular visitor activity. CCC-constructed contributing buildings and structures include rustic restroom #32, the circular pool and flagstonelined deck around Buffalo Springs, the arched stone-faced footbridge along the trail connecting Buffalo Springs with the former picnic area, low-water crossings, fire pits, and culverts.

Rock Creek Campground (a 67-acre area on the western edge of the Platt District, bounded on the east by Perimeter Road and on the west and north by Rock Creek). This campground is the largest in the Platt District. The campground is divided into a northern unit (consisting primarily of pull-through campsites accessed by concentric loop roads), and the southern Chigger Hill unit (which includes additional campsites on a slope accessed by a spur loop road). A canopy of native trees characterizes the portion of the northern unit's campground along the creek terrace, while the vegetation of the Chigger Hill area is more open with clumps of cedars and deciduous trees interspersed with grassy areas.

Two 1950s clay tile block restrooms are in the northern portion of the campground, and a Mission 66 restroom in the Chigger Hill area is similar but of concrete block and wood construction. Development of the Rock Creek campground began in 1950 (outside the 1932-1940 period of significance of the Platt District), and consequently the campground is not considered a contributing component of Platt District's National Historic Landmark designation. However, the Rock Creek campground may be potentially eligible for the National Register of Historic Places in its own right as a designated cultural landscape at the local level of significance (Ruhnke, pers. comm. 2004).

Potential Cultural Landscapes

Systematic cultural landscape inventories have not been conducted for other areas outside of the Platt District, but the possibility exists that subtle landscape features associated with early homestead/ ranching operations (e.g., building foundations, historic trash dumps, etc.) may be found in these areas that could promote understanding of late 19th and early 20th century settlement patterns.

The site of Veteran's Lake (at the southwestern boundary of the Platt District) represents another potential cultural landscape meriting study and evaluation, although it is not considered as contributing to the significance of the Platt District. The 344-acre landscape associated with the lake was constructed by the Works Progress Administration in 1938, but was owned by the city of Sulphur until 1983 when the city donated it to the National Park Service as part of a land exchange (Steely et al. 2002). The most notable historic features include an earthen dam with integral stone lined drainage channel.

Potential ethnographic landscapes associated with traditional cultural activities may also be identified through further investigations, perhaps involving Native American and subsequent European American use of Chickasaw National Recreation Area's mineral and freshwater springs and creeks.



VISITOR USE

OVERVIEW

Springs, steams, and lakes — whatever its form — water has always been the main attraction at Chickasaw National Recreation Area. Mineral springs have long been sought for medicinal qualities. Chickasaw National Recreation Area's creeks beckon waders and swimmers, while its lakes provide opportunities for fishing, boating, water skiing, and swimming. Other recreational uses - camping, hiking, and wildlife viewing have grown up around Chickasaw National Recreation Area's aquatic draw. Chickasaw National Recreation Area also gets significant backyard-type recreational use by residents who hike, run, walk their dogs, or go for a drive in the recreation area.

Visitor Use — Numbers and Seasonality

Recreation area visitation statistics are consistently available since 1976 when Arbuckle Recreation Area and Platt National Park were joined as Chickasaw National Recreation Area. Visitation is divided into recreational visits and nonrecreational visits, and is maintained in a database by the NPS Public Use Statistics Office in Denver (NPS 2003e). Nonrecreational visits (commuter and through traffic) are estimated by a traffic counter on State Highway 177. Recreational visits are counted by the sum of traffic counters installed in various other districts in Chickasaw National Recreation Area. Visitation to the recreation area is relatively stable at 1.4 million recreational visitors per year (see table 10), with slight declines in the last few years predicted to continue into the future. The forecast recreational visitation is based on a simple linear regression that looks at the previous five years of visitation and forecasts that line two years into the future.

The planned visitor center near Vendome Well, previously described in the 1994 *General Management Plan Amendment*, will not likely have an impact on overall visitation statistics. The visitor center near Vendome Well will primarily serve as an orientation function and thus is not likely to attract additional visitors. However, it may change the way visitors experience Chickasaw National Recreation Area and increase the quality of visitor experience.

The planned Chickasaw Nation Cultural Center, being constructed on Chickasaw National Recreation Area boundary, may slightly increase visitation by attracting more or different types of visitors to the Sulphur, Oklahoma area. Future recreation area use will also likely be affected by a variety of factors including weather, publicity, the national and state economy, the price of gas, and homeland security issues; and is likely to fluctuate from year to year.

Seasonality/Time of Visitor Use

Visitor use varies seasonally in a predictable fashion. Recreational visitation is greatest during May, June, July, and August. Visitation in these months consistently accounts for 53-57% of the overall annual visitation. Visitation is slowest in December, January, and February when the weather is colder, but begins to pick up as the weather warms, and with school groups in March and April. School groups also visit in the fall, generally in October and November. Table 11 gives the statistics for 2002 to show seasonal trends.

Year	Recreational Visits	Nonrecreational Visits	
1950	1,291,828	N/A	
1979	1,434,484	2,559,581	
1980	1,927,044	2,270,048	
1985	2,129,513	4,012,050	
1990	1,600,628	1,444,524	
1991	1,453,032	1,373,924	
1992	1,385,386	1,410,919	
1993	1,370,475	1,653,248	
1994	1,446,711	1,510,306	
1995	1,686,136	1,457,379	
1996	1,551,574	1,588,030	
1997	1,572,079	1,670,443	
1998 1,615,577 1		1,646,375	
1999 1,602,065 1,77		1,770696	
2000	2000 1,389,537 1,610,823		
2001	1,608,792	1,536,787	
2002 1,510,019		1,555,562	
2003	1 391 33/	1 654 492	

TABLE 10: RECREATIONAL AND NONRECREATIONAL VISITS, 1950–2003

There has been no formal study of visitation to Chickasaw National Recreation Area, so all information about visitors is based on staff observation. NPS staff observes that visitation is greatest on the weekends, with many visitors arriving on Fridays and leaving on Sundays, or Mondays of holiday weekends. Tuesdays, Wednesdays, and Thursdays tend to be the slowest days for visitation. Visitation reaches its peak during summer holiday weekends (Memorial Day, 4th of July, and Labor Day).

1,275,733

1,702,181

2004

Some visitors stay less than an hour, while others camp in one of Chickasaw National Recreation Area's campgrounds for the maximum of 14 days. Both day and overnight visitation tends to be weekend-based. According to the 1994 *General Management Plan Amendment*, day use in 1994 accounted for 75% of all users, and weekend use accounts for 75% of total use. Visitation statistics are based on recreational visitors staying 2.5 hours and boat visitors staying 3 hours.

Recreation area visitation seems to be primarily local and regional, with the most visitors coming from Oklahoma and northern Texas. The 1994 *General Management Plan Amendment* states that more than 85% of recreation area users are from the local and regional area. It is commonly said that many of Chickasaw National Recreation Area's visitors are repeat visitors. Although this is probably true, staff feels that the visitation patterns seem to be including new groups of visitors who are finding their way to the recreation area, then becoming repeat visitors themselves or spreading the word to new first-time visitors.

TABLE 11: VISITATION FOR 2002

2004	Recreational Visits	Nonrecreational Visits	
January	52,598	135,825	
February	44,540	105,289	
March	101,102	170,826	
April	88,139	122,623	
May	138,065	152,550	
June	165,226	158,791	
July	214,252	153,648	
August	120,628	132,635	
September	140,243	158,170	
October	108,276	152,159	
November	53,683	133,355	
December	48,981	126,310	
TOTAL	1,275,733	1,702,181	

VISITOR ACCESS, CIRCULATION, AND ACTIVITIES

Visitors get information about Chickasaw National Recreation Area from local merchants, tourism bureaus, the NPS (Internet, phone, or publications), word of mouth, or from previous experience at the recreation area. Almost all visitors arrive in their personal vehicles or in school buses or group vans. Some visitors find their way to the Travertine Nature Center in Chickasaw National Recreation Area or to recreation area headquarters in the city of Sulphur for recreation area information. About 100,000 people visit Travertine Nature Center per year, less than 10% of the recreation area's annual visitation. When the planned visitor center near Vendome Well is completed near Vendome Well, it will provide the main NPS

orientation and information presence, and will be the starting point for many first-time and some repeat visitors. Many visitors will stop there for an orientation to Chickasaw National Recreation Area and its activities and to learn about the recreation area's primary interpretive themes. Others may go directly to their destination in the recreation area. There are more than 10 access routes into the recreation area, so visitors who do not stop at the Chamber of Commerce Visitor Information Center or the Travertine Nature Center do not receive an orientation to the recreation area.

Visitors fan out into Chickasaw National Recreation Area depending upon their planned activities, whether hiking, waterbased recreation, viewing nature, or touring in a vehicle. Chickasaw National Recreation Area offers three different levels of waterbased recreation. In the protected zone upstream from the nature center, visitors can enjoy the beauty of the natural springs and streams as a visual resource. Activities include visiting the Travertine Nature Center, participating in guided educational activities, hiking to Antelope and Buffalo springs, viewing scenery and wildlife, and enjoying the CCC-era cultural landscape. No vehicles are allowed upstream from the nature center, providing a quiet and contemplative visitor experience. However, during busy summer weekends, the nature center parking lot can be full and there can be a perception of crowding on the trails behind the nature center.

Veteran's Lake offers a park-like atmosphere, where use is restricted to a slower pace and relatively quiet activities. Primary activities here include fishing, swimming, canoeing and kayaking, no-wake boating, hiking the trail around the lake, and looking at scenery and wildlife. Picnic areas are available, and camping is available at the nearby Rock Creek campground (105 campsites and 1 group site). The campground usually fills on summer weekends. At the Lake of the Arbuckles, visitors can engage in a full range of activities, including boating, water skiing, using personal watercraft in designated areas, swimming, and fishing. Campgrounds and picnic areas are available at several sites around the lake, which mainly support water-based recreational activities. The Point and Buckhorn campgrounds provide organized camping with some electrical sites. There are also boat launch ramps, ranger contact stations, picnic areas, no-vessel areas to protect swimmers, and short trails in both areas. Buckhorn campground has 134 sites on four loops. The Point has 56 campsites. Water and restrooms are available at both campgrounds. Both campgrounds fill during some summer weekends, and the sites with electrical hookups usually fill during the summer. The facilities at both areas tend to be crowded during summer weekends. Traffic counters show that Buckhorn is the most visited area in Chickasaw National Recreation Area. Ranger programs are provided seasonally at the Buckhorn campground. The Guy Sandy campground provides a more rustic camping experience in a more remote location; but still provides water, restrooms, a boat launch, and picnic area. There are 39 campsites, and the campground is open Memorial Day through Labor Day. A small boat launch ramp is located at Upper Guy Sandy.

As part of the environmental assessment for personal watercraft use (NPS 2003a), NPS staff documented visitor use data for July 2002 at the three major boat launch locations in Chickasaw National Recreation Area (see table 12).

TABLE 12: VISITOR USE DATA FOR JULY 2002

		PWC		
Location	PWC	Users	Boats	Boaters
Guy Sandy	226	452	925	3,700
Buckhorn	464	759	1,387	6,108
The Point	312	620	1,212	4,844
TOTAL	1,002	1,831	3,524	14,652

The other popular destination is the Platt District, which contains many historic features from the early 20th century, as well as portions of Rock Creek and Travertine Creek. Popular visitor activities include enjoying scenic drives, hiking trails, and mineral springs; viewing buffalo; camping in the Central and Cold Springs campgrounds; and swimming/wading in creeks. Campgrounds, picnic areas, and vehicle pullouts are usually full during the summer weekends. Central campground is used for group camping (10 group campsites for groups over 10 people). Cold Springs campground has 63 sites and 2 group sites. A cultural landscape report is currently being completed for the district.

Elsewhere in the more remote sections of Chickasaw National Recreation Area around Lake of the Arbuckles, visitors hunt in designated areas, hike, view wildlife, or fish. Several multiuse trails run from the Veteran's Lake area to Lake of the Arbuckles. Visitors hike, ride mountain bikes, or ride horses on the multiuse trail. There is no backcountry camping allowed anywhere in the recreation area.

The Goddard Youth Camp operates on 160 acres on the south side of Lake of the Arbuckles under a cooperative agreement with the National Park Service. This camp provides primarily residential youth environmental education programs, as well as a few day-use programs. The camp does not cater to the public on a drop-in basis.

Currently there are no concession operations or active incidental business permits at Chickasaw National Recreation Area.

FACTORS IMPACTING QUALITY OF VISITOR EXPERIENCE

Condition of Natural Resources

Throughout most of Chickasaw National Recreation Area, visitors experience a natural landscape modified by human intervention. In general, years of fire suppression have changed the natural vegetation around Chickasaw National Recreation Area, creating more dense vegetation, reduced natural prairies, and increased eastern red cedar density. The relationship between the eastern woodlands and western prairie ecosystems has changed. Visitors do not experience the landscape in its natural condition, but most visitors do not know this. NPS staff is currently implementing some landscape restoration and prescribed fire in small areas throughout Chickasaw National Recreation Area, providing visitors with an opportunity to see a more natural landscape. These management activities are not generally well interpreted. Water quality in the recreation area is generally good in Lake of the Arbuckles, but of varying quality in the creeks. Visitors drink from the springs and swim in creek waters. Swimming waters in Travertine Creek often test above the allowable National Park Service limits for fecal coliform. When this happens, warning signs are posted, but this does not seem to have an appreciable effect on swimming and wading. Water quantity varies seasonally and from year to year. Some springs have dried up, and creeks have either experienced reduced flows from overuse of the aquifer or reduced precipitation. This affects visitors' opportunities to enjoy these natural features.

Visitor Understanding

Most visitors do not get an adequate orientation to Chickasaw National Recreation Area and its themes. Currently, visitors must locate the Travertine Nature Center or the recreation area headquarters to find a brochure, talk with NPS staff, or learn about recreation area themes; and less than 10% of visitors do so. Wayside exhibits and bulletin boards are scattered throughout the recreation area, but generally do not adequately introduce themes. Ranger-led activities occur mostly during the summer, or by appointment for special groups, but reach a small percentage of visitors. The new visitor center near Vendome Well will increase visitor's orientation to Chickasaw National Recreation Area and will provide some thematic information, but is designed to be a short-stay, orientation-type facility. In general there are low to moderate levels of opportunities for education, interpretation, and information.

Crowding, Noise, and Solitude

During the times of highest visitation (holiday weekends during the summer) visitors may experience crowding in campgrounds, launch ramps, and parking lots. Visitors may also experience crowding at picnic areas on spring weekends. All group pavilions and campsites will be reserved on long weekends in the summer. All campgrounds are typically full over long weekends in the summer, but some campsites remain available most other weekends. Campsites with electrical hookups next to the lake are in high demand and are full every weekend during the summer. Overall, campgrounds run at 75% occupancy during the summer.

Conflicts in visitor use occur occasionally at Chickasaw National Recreation Area, mostly between motorized watercraft and nonmotorized watercraft, motorized watercraft and swimmers, or anglers and other boaters.

Noise levels can be high at certain points and times on the lake when there are many motorboaters and personal watercraft users, which can impact some visitors' ability to enjoy the natural sounds and quiet. Noise is typically highest during the summer, especially at the Point and Buckhorn developed areas. Generators are allowed in recreation area campgrounds except during quiet hours, which may impact other campers' or visitors' experiences. There are opportunities for solitude in the remote and less-developed areas of Chickasaw National Recreation Area. During peak season, there are minimal opportunities for solitude around the recreation area's developed areas.

OTHER NEARBY RECREATIONAL SITES

Understanding visitation, visitation trends, and demographics at other regional recreational destinations that offer similar experiences to Chickasaw National Recreation Area may help planners forecast trends for Chickasaw National Recreation Area visitation, or understand how the actions proposed at Chickasaw National Recreation Area might impact these other sites. NPS staff came up with a list of other nearby recreational areas that may attract similar types of visitors as Chickasaw National Recreation Area. Staff at these sites were interviewed about their visitation, visitation trends, and visitor demographics.

Lake Murray State Park. Lake Murray is a 6,000-acre lake in a 12,000-acre park managed by Oklahoma State Parks, 40 miles from Chickasaw National Recreation Area. Lake Murray State Park has 8 campgrounds including 400 campsites (mostly recreational vehicle/trailer use). Visitation statistics are based on best guess and on campground revenue. Park staff estimates they have about 1.5 million visits per year and that visitation has steadily increased over the last decade at a rate of 2%-8% per year. It is believed this is due to increases in population in the Dallas/Ft. Worth area and periodic flooding of Lake Texoma, which closes campgrounds there and displaces visitors to Lake Murray. Lake Murray's facilities fill, at least during the summer and on weekends.

Lake Texoma State Park. Lake Texoma is a 93,000-acre lake managed by Oklahoma State Parks that is about 35 miles from Chickasaw

National Recreation Area. Current visitation is 1.1–1.3 million visitors per year, topping 1.3 million last year and this year. Visitation is up slightly since 2001. Visitor surveys consistently show that the main draw to Chickasaw National Recreation Area is fishing, although water sports are popular as well. Chickasaw National Recreation Area has 250 campsites with electrical hookups and 100-150 tent sites. Park managers estimate campgrounds run at 50%-65% capacity in the spring, are quiet from July 4 to Labor Day (due to heat), and are at 40%-55% capacity in the fall. Chickasaw National Recreation Area receives a large number of senior citizens in the spring and fall. Recreation area staff has noticed a major increase in Hispanic visitation, particularly as day users. There are also a significant number of Vietnamese visitors.

Turner Falls. This is a 1,500-acre site managed by the city of Davis, Oklahoma. Annual visitation last year was 225,000. They believe visitation is increasing slightly, but is somewhat limited by their one-lane entrance and exit. Main visitor activities are swimming, camping, and picnicking. About 65% of use is day use. Visitation is highest in the summer and on weekends. They estimate that 65% of their visitors are from northern Texas, and believe this percentage is increasing. The rest tend to be from Oklahoma and Kansas. They estimate 80% of the visitors from Texas are of Hispanic origin. When Turner Falls is full, visitors are often directed to go to Chickasaw National Recreation Area.

Tishomingo National Wildlife Refuge. This is a 16,464-acre refuge on the upper arm of Lake Texoma. They have not had a traffic counter for the last three years, so their visitation statistics are estimates. They conservatively estimate 180,000 visitors per year and think this number is growing slightly, perhaps due to increased publicity about the national wildlife refuge system due to its centennial. Most of their visitors are local; some come from Dallas area. They see an increasing number of visitors interested in bird watching and wildlife viewing.

Wichita Mountains National Wildlife

Refuge. This refuge is 20 miles northwest of Lawton, Oklahoma. This refuge contains 59,030 acres, including two wilderness areas, and is managed by the U.S. Fish and Wildlife Service. About 62% of this refuge is not open to visitors unless they are with a guide. Current visitation is about 1.6 million visitors per year. Visitation declined about 15 years ago, but has climbed back up, especially in last few years. Visitation is currently stable to only slightly rising, perhaps due to rising fuel costs and/or fear of travel keeping visitors closer to home. The site is not experiencing a change in demographics; it still receives visitors from all over. Primary visitor activities are wildlife observation and hiking. Their greatest visitation is in April, May, and October.

SOCIOECONOMIC ENVIRONMENT

The primary geographic study area selected for the socioeconomic baseline is comprised of Murray County, Oklahoma. (The entire 12,500-acre Chickasaw National Recreation Area is contained within the county's borders.) Although Chickasaw National Recreation Area's socioeconomic influence certainly extends beyond the county's borders, it appears that most of the recreation area's demographic and economic effects occur locally, within communities adjacent to and close to the recreation area, including, in particular, the communities of Sulphur, which is the county seat; and Davis (a small portion of Davis extends into neighboring Garvin County). The executive director of the Murray County Industrial Authority, Ms. Cindi Bisset, corroborated this determination.

POPULATION AND DEMOGRAPHICS

Table 13 summarizes the estimated population of Murray County from 1950 through 2002. The table indicates that during this 50 plusyear period the county's population grew at an average cumulative annual growth rate (CAGR) of about 0.5%, inter-year variation aside. The county's average population CAGR for the more recent 10 plus-year period of 1990 through 2002 was slightly lower, at 0.4%. These growth rates are less than the average population CAGRs for Oklahoma as a whole for the same two periods, which were 1.4% and 0.9%, respectively. The table also shows that the county's population peaked during the early- to mid-1980s. Population growth in Murray County throughout the 1970s and into the early 1980s was driven largely by regional expansion of oil industry activities. Subsequent contraction of that industrial sector and recession in the 1980s resulted in population declines, which were actually less significant in Murray County than many of its neighboring counties.

Year	Population
1950	10,775
1960	10,622
1970	10,629
1980	12,147
1985	12,997
1990	12,042
1995	11,969
2000	12,623
2002	12,600
CAGR* 1950–2002	0.5%
CAGR* 1990-2002	0.4%

Sources: University of Virginia, Oklahoma Department of Commerce, U.S. Census Bureau. Note: (The highest recorded population of the county since 1950 was 13,431 in 1983.) * CAGR = cumulative annual growth rate.

Table 14 summarizes historical population estimates for the county's primary incorporated communities of Sulphur and Davis. The population of Sulphur, despite steadily increasing during the 1970s and early 1980s, was actually lower in 2000 than it was in 1970. The city of Davis, however, whose population also peaked in the early 1980s, has experienced overall population growth since 1970 and during the past decade; reporting a population in 2000 that was about 15% higher than was recorded in 1970 (albeit still lower than in the early 1980s).

Table 15 summarizes recent population projections for Oklahoma, Murray County, and the cities of Sulphur and Davis developed by the Oklahoma Department of Commerce. The table reveals that during the next 30 years the populations for Murray County as a whole, and its two primary incorporated communities of Sulphur and Davis, are projected to grow slightly faster than the population statewide. A comparison of tables 14 and 15 reveals that future population growth in the county, as well as the

TABLE 13: SUMMARY OF MURRAY COUNTY POPULATION, 1950–2002
communities of Sulphur and Davis, is expected to exceed historical rates.

TABLE 14: HISTORICAL POPULATION ESTIMATES FOR DAVIS AND SULPHUR

Year	Sulphur Population	Davis Population
1970	5,158	2,223
1980	5,516	2,782
1990	4,824	2,543
2000	4,794	2,610
CAGR* 1970-2000	(0.2%)	0.5%
CAGR* 1990-2000	(0.1%)	0.3%

* CAGR refers to cumulative annual growth rate.

TABLE 15: POPULATION PROJECTIONS FOR OKLAHOMA, MURRAY COUNTY, SULPHUR, AND DAVIS

	ОК	Murray	Sul-	
	Pop.	County	phur	Davis
Year	(000s)	Pop.	Pop.	Pop.
2000 ¹	3,451	12,623	4,794	2,610
2010	3,707	13,800	5,240	2,850
2020	3,964	15,000	5,700	3,100
2030	4,192	16,400	6,230	3,390
CAGR*	0.65%	0.88%	0.88%	0.88%
2000-				
2030				

¹Actual

* CAGR refers to cumulative annual growth rate.

ECONOMY

For a rural county, the economy of Murray County is fairly diversified. Historically, the county's economic base derived largely from regional oil, agricultural, and manufacturing activities. More recently; however, while manufacturing activity in the county has held steady (actually increasing slightly), the oil and agricultural sectors have withdrawn significantly, and the local economy has become increasingly dependent on the service sector, particularly healthcare/medical, recreation, and public administration activities.

HOUSING TRENDS

A canvas of local real estate agents and a Murray County homeowner's association identified a few distinct trends amid a wide range of opinions on the local housing market. Although new residential development has been relatively flat in Sulphur and Davis, there has been a trend toward people purchasing or building second homes by Lake of the Arbuckles. In addition, there appears to be a slight trend of Sulphur residents relocating to less expensive homes near the lake. (According to a local real estate agent, vacation homes in Murray County tend to be substantially more expensive than permanent homes.) Area real estate agents hold a wide range of opinions on the trend in the number of second homes in the region; some believe there has been little new residential construction near Lake of the Arbuckles. while others noted an upward trend of nonresidents acquiring vacation properties in the area. According to two local real estate agents, only about 10% of the homes near Lake of the Arbuckles are second homes. Another real estate agent contrarily reported that very few Murray County residents can afford homes near Lake of the Arbuckles, and accordingly there are few residents living in that area.

A property association of about 150 homes and 250 currently empty lots between Lake of the Arbuckles and Chickasaw National Recreation Area reported that about half of their homes are permanent homes and the other half are vacation homes. In this specific development, both the number of total owners and the breakdown of resident/ nonresident owners have remained about the same over the past three years. Although it is difficult to accurately characterize the county's current housing market, it appears that second homes near Lake of the Arbuckles play a crucial role in the local area real estate market.

TRANSPORTATION

Murray County is in south-central Oklahoma. It is crossed east to west by State Highway 7, which provides access between the cities of Sulphur and Davis. Interstate 35 runs north to south in the county and is about 12 miles west of Sulphur. U.S. 177 also connects the county from north to south and passes through Sulphur and Chickasaw National Recreation Area. The nearest commercial airport is 80 miles away in Oklahoma City, and there is no passenger rail or bus service available in Murray County.

TOURISM TRENDS

This section provides a description of the tourism market in Chickasaw National Recreation Area. Although the socioeconomic influence of the recreation area certainly extends beyond Murray County, recreation area visitors primarily patronize food and beverage and lodging establishments in the cities of Sulphur and Davis. For this reason, the discussion focuses on the commercial services available to recreation area visitors in these two cities, as well as the financial reliance of these establishments on recreation area visitors.

The Sulphur area, directly adjacent to Chickasaw National Recreation Area. provides numerous food and beverage and lodging options to recreation area visitors. Sulphur has about 18 restaurants within about a mile of the recreation area entrance. These restaurants provide a range of dining experiences, from fast food to fine dining. Sulphur also has an ice cream store and many grocery and convenience stores selling various food items. Sulphur has about 15 retail stores selling apparel and gifts, as well as a Wal-Mart, a hardware store, and two pharmacies. In terms of lodging, Sulphur has six motels and inns plus three recreational vehicle resorts and numerous cabins available for rent. Most of these food, lodging, and retail businesses

are within blocks of Chickasaw National Recreation Area entrance.

The city of Davis, about six miles west of Chickasaw National Recreation Area, offers additional food and beverage and lodging resources for recreation area visitors. There are about 11 food and beverage establishments in Davis, ranging from a bakery to fast food to sit-down fine dining. Additionally there are about seven grocery and convenience stores selling food, two pharmacies, and at least 15 retail stores selling items such as gifts, antiques, and apparel. Lodging in Davis includes about six inns and motels, one recreational vehicle resort, and two cabin resorts.

Visitors to Chickasaw National Recreation Area clearly patronize the commercial services in both Sulphur and Davis; according to numerous retail proprietors in both towns, Sulphur and Davis are "tourist towns." However, research also revealed that the economic reliance of local businesses on the recreation area is not uniform. First, commercial services in the city of Sulphur demonstrate more financial reliance on the recreation area than those in Davis, as Davis attracts tourists who are primarily visiting Turner Falls Park. Turner Falls is in Davis and provides visitors with swimming, hiking, caving, and tent and recreational vehicle camping opportunities.

Economic reliance on Chickasaw National Recreation Area varies somewhat even within each of the county's largest towns. In Sulphur, very few commercial services report near total dependence on recreation area-related patronage.

The manager of the Sulphur Springs Inn reported that *all* of the Inn's patrons are tourists, most of whom visit Chickasaw National Recreation Area during their stay in Sulphur. (He could not estimate the ratio of tourists primarily visiting the recreation area to those who primarily visit Turner Falls.) Sulphur Springs Inn also remains open yearround but sees business drop off considerably from November until March.

On the other hand, a number of the commercial service enterprises in Sulphur report little or no dependence on recreation area tourists. According to the manager of the Main Street Boutique (about one mile from a recreation area entrance), her apparel and gift shop derives only a very small portion of its receipts from recreation area visitors. She admitted that a few tourists enter her shop in the summer, but not a substantial number. She further noted that the shop is generally no less busy during the winter low-tourist season than during the summer.

Most Sulphur commercial services; however, fall in the middle of these two extremes. These businesses reported some seasonal dependence on Chickasaw National Recreation Area, but maintained they do not depend on the recreation area for survival. For example, the Fillin' Station is a restaurant in Sulphur that serves breakfast and lunch and sells some grocery items. The Fillin' Station manager reported that the restaurant's revenues double in the summer, but that they remain financially viable because of a constant stream of regular customers. Similarly, Jimmy's Motel and the Town Motel are much busier in the summer tourist season than in the winter, but both attract predominantly business travelers. According to the manager of these two motels, the recreation area tourists that patronize Sulphur motels are often elderly, as younger visitors prefer to camp in Chickasaw National Recreation Area.

Jewell's Restaurant estimated that about 45% of their customers are recreation area tourists, another 15% are visiting Turner Falls or the Arbuckle Wilderness, and the remaining 40% are residents.

In Davis, the commercial services seem similarly varied in their reliance on tourists. However, most tourists seeking services in Davis are in the area to visit Turner Falls; Davis is therefore generally less financially dependent on Chickasaw National Recreation Area than Sulphur. This noted, Davis businesses still benefit from tourism spending associated with Chickasaw National Recreation Area visitation. Some local businesses appear not to rely on tourists at all, including Turner Falls visitors. An example is Dougherty's Diner, whose manager reported that their business consists of regular customers only.

Most Davis commercial services reported that they are seasonally dependent on tourists, but also have a steady stream of business visitors and locals. The Arbuckle Mountain Motel reported that they cater to both tourists and business visitors, but that Turner Falls, and not Chickasaw National Recreation Area, is the primary destination of their tourist patrons. The 77 Grill also reported that their summer clientele is made up predominantly of Turner Falls tourists.

Among managers of commercial service enterprises in Davis, there seemed to be a consensus that many tourists visiting Davis are not aware of Chickasaw National Recreation Area and the recreation opportunities available there. For example, the manager of the Sundown Motel in Davis reported that despite Davis' proximity to Chickasaw National Recreation Area, very few Turner Falls tourists have ever heard of Chickasaw National Recreation Area.

In conclusion, the restaurants, lodging, and retail stores in the two towns near Chickasaw National Recreation Area report varying degrees of financial dependence on recreation area visitors. Commercial services in both Sulphur and Davis are open year-round, and few commercial services in either location claimed total financial dependence on recreation area visitors. However, most businesses realize a large share of their revenues during the summer season as compared to the rest of the year, and reported CHAPTER 3: AFFECTED ENVIRONMENT

some degree of financial reliance on Chickasaw National Recreation Area tourists. As would be expected, the city of Sulphur is much more financially dependent on recreation area visitors than Davis due to Sulphur's relative proximity to Chickasaw National Recreation Area.



NATIONAL RECREATION AREA OPERATIONS

OFFICE OF THE SUPERINTENDENT

The office of the superintendent provides the leadership and management direction for the overall operations of Chickasaw National Recreation Area. Partnerships, community involvement, and public information are of great importance, and these activities originate from the office of the superintendent. The management team for the recreation area consists of the superintendent and division chiefs, who through collaborative efforts provide direction and set goals for the recreation area. Administrative staff provides technical and administrative support for management and operations. The staff ensures that supplies and materials are available so other divisions can accomplish their work, and provides information technology services. The administrative staff also provides many other services, such as finance management, contract services, and human resources management, which keep operations running smoothly.

INTERPRETATION AND EDUCATION DIVISION

The area's interpreters and educators consist of a base of year-round permanent employees. These employees are supplemented by volunteers and seasonal employees through the summer months.

The area's interpretive, information and education efforts have traditionally centered at the Travertine Nature Center. An information desk, interpretive displays, and book sales are also at the Travertine Nature Center. Once the new visitor center near Vendome Well is open, the information efforts and some interpretive programs will shift to this facility. Evening programs are presented during the summer months at amphitheaters at the Point and Buckhorn campgrounds. Currently the Chamber of Commerce in Sulphur operates a visitor information station that provides information on Chickasaw National Recreation Area to visitors.

Informational signs, maps, and bulletin boards, as well as wayside exhibits, are found throughout Chickasaw National Recreation Area.

PROTECTION DIVISION

Visitor and resource protection rangers conduct patrols throughout Chickasaw National Recreation Area. Ranger stations are located at both Buckhorn and the Point. These employees perform law enforcement, wildland fire suppression, structural fire prevention monitoring, building and fire security, emergency medical services, and search-and-rescue operations.

RESOURCE MANAGEMENT DIVISION

Resource management division employees strive to increase understanding of the natural and cultural resources of Chickasaw National Recreation Area and devise strategies for the public to interact with those resources in a manner that ensures their preservation for future generations. The staff monitors Chickasaw National Recreation Area's wildlife, vegetation, and air and water quality. They assess the historic and cultural sites in the recreation area for historic significance and make recommendations for their preservation. They add to knowledge and understanding of the recreation area's natural and cultural resources by performing historical research and scientific studies and assist cooperators who are interested in performing their own research. This knowledge is then applied, with the assistance

CHAPTER 3: AFFECTED ENVIRONMENT

of other divisions, in a variety of restoration projects. Resource management staff also educates other recreation area staff on current issues affecting recreation area resources and perform NEPA and NHPA compliance.

Resource management staff consists of a resource manager and hydrologist, supplemented by a small number of temporary or volunteer technicians.

FACILITY MANAGEMENT DIVISION

Facility management staff cares for an enormous variety of recreation area developments and cultural resources. Facility management crews build and maintain hiking trails and campsites, and maintain a wide variety of grounds, utility systems, and other visitor use facilities throughout Chickasaw National Recreation Area.

Skilled in a variety of crafts and trades, facility management staff consists of permanent employees supplemented by temporary employees in the summer.





Chapter 4:

Environmental Consequences

INTRODUCTION

NEPA requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, any adverse environmental effects that cannot be avoided if a proposed action is implemented, and any requirements to mitigate adverse impacts. In this case, the proposed federal action would be the adoption of a GMP for Chickasaw National Recreation Area. The following portion of this plan analyzes the environmental impacts of implementing the three alternatives on natural resources, cultural resources, the visitor experience, the socioeconomic environment, and park operations. The analysis is the basis for comparing the beneficial and adverse effects of implementing the alternatives.

Because of the general, conceptual nature of the actions described in the alternatives, the impacts of these actions are analyzed in general qualitative terms. Thus, this Environmental Assessment should be considered a programmatic analysis. For the purposes of analysis, in the Environmental Assessment it is assumed that all of the specific actions proposed in the alternatives would occur during the life of the plan, with the exceptions noted below.

This Environmental Assessment generally analyzes several actions, such as the development of utility lines, restrooms, and new trails or trail improvements, and the construction of a rehabilitated or new collections facility. If and when site-specific developments or other actions are proposed for implementation subsequent to the approved *General Management Plan*, appropriate detailed environmental and cultural compliance documentation will be prepared in accordance with NEPA and NHPA requirements. Several possible actions presented in alternatives B and C are not evaluated in this Environmental Assessment because there is not sufficient detailed information on the proposed actions. Actions not evaluated include:

- the future management of bison in the Platt District and the possible establishment of a herd in Upper Guy Sandy;
- the relocation of the maintenance facility either within or outside Chickasaw National Recreation Area;
- the possible management of boat use on Lake of the Arbuckles;
- the possibility of providing new recreational opportunities at Veterans Lake (such as a horse camp, staging area, and group campsites); and
- the possibility of providing commercial operations (such as boat tours, and boat and cabin rentals) within the Arbuckle District.

If the National Park Service decides to proceed with any of these actions, additional NEPA compliance documents would be prepared prior to the actions occurring.

This chapter begins with a description of the methods and assumptions used for each topic. Impact analysis discussions are organized by alternative and then by impact topic under each alternative. The existing conditions for all of the impact topics that are analyzed were identified in the "Affected Environment" chapter. All of the impact topics are assessed for each alternative. For each impact topic, there is a description of the positive (beneficial) and negative (adverse) effects of the alternative. Each alternative discusses cumulative impacts when this project is considered in conjunction with other actions occurring in the region, and is followed by a conclusion statement. At the end of each

alternative there is a brief discussion of unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and the relationship of short-term uses of the environment and the maintenance and enhancement of long-term productivity. The impacts of each alternative are briefly summarized at the end of the "Alternatives, Including the Preferred Alternative" chapter.

CUMULATIVE IMPACT ANALYSIS

A cumulative impact is described in the Council on Environmental Quality's regulation 1508.7 as follows:

Cumulative impacts are incremental impacts of the action when added to other past, present, and reasonably foreseeable actions, regardless of what agency (federal or nonfederal) or person undertakes such other action. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over time.

To determine potential cumulative impacts, *other* projects within and surrounding Chickasaw National Recreation Area were identified. The area included Murray County, Oklahoma. Projects were identified by discussions with the NPS staff, federal land managers, and representatives of county and town governments. Potential projects identified as cumulative actions included any planning or development activity that was currently being implemented, or would be implemented in the future. Impacts of past actions were also considered in the analysis.

These actions are evaluated in conjunction with the impacts of each alternative to determine if they have any cumulative impacts on a particular natural, cultural, or socioeconomic resource or visitor use. Because most of these cumulative actions are in the early planning stages, the qualitative evaluation of cumulative impacts was based on a general description of the project.

Potential cumulative impacts were considered in about a 10-mile area surrounding Chickasaw National Recreation Area, which encompasses most of the Rock Creek watershed. This area includes the communities of Sulphur and Davis, Turner Falls Park, and much of Murray County. Projects and actions that could contribute to cumulative impacts include ongoing and planned actions and projects in Chickasaw National Recreation Area, communities, and Murray County. These actions and projects are listed below.

Planned Visitor Center near Vendome Well

The facility will include an outdoor entry plaza, restrooms, sales/contact information counter, exhibit area, video/projection area, interpretive staff work and support areas, and building support areas. The building will incorporate sustainable design concepts using energy efficient systems for passive solar heating, cooling, and lighting. Building materials will be compatible with existing CCC-era stone and timber buildings. There will be parking for 90 vehicles (autos, recreational vehicles, and buses); rehabilitation of the existing Vendome Well and parking area; access roads and walks; improvements to the south side of Highway 7 (e.g., curbs, walks, lighting, underground utilities, benches, trees, and planters); and the rehabilitation of Chickasaw National Recreation Area entrance featured at the Highway 177-7 intersection.

Chickasaw Nation Cultural Center

Concurrent with the Chickasaw Nation's mission to enhance the overall quality of life of the Chickasaw people, the Chickasaw Nation Cultural Center is conceived as a campus, in which facilities, personnel, and resources support core programs. Attributes of the Chickasaw Nation Cultural Center location are as follows:

- 109-acre site
- approximately 141 miles from the Dallas/Ft. Worth metroplex
- roughly 20 miles from I-35
- centered within the 13 counties of original Chickasaw Territory
- about 1 mile from the north entrance to Chickasaw National Recreation Area and planned visitor center near Vendome Well

Turner Falls Management Plan

Turner Falls is just west of Interstate 35 about 20 miles from Chickasaw National Recreation Area. This area attracts many visitors. Currently the area is developing a new management plan to address future needs and how to manage newly acquired lands.

City of Sulphur Plan

The city of Sulphur is currently developing a new plan on how best to manage the city.

Chickasaw Nation Lodging and Casino

In addition to the planned Chickasaw Nation Cultural Center, the Chickasaw Nation continues to develop an area at the intersection of Interstate 35 and Highway 7 for casino, lodging, and convention facilities.

No actions are being taken under all of the alternatives being considered that would affect use of Lake of the Arbuckles. Thus, for purposes of this section, boat use on Lake of the Arbuckles is only considered under the cumulative impacts analysis for each of the impact topics being evaluated.

IMPAIRMENT OF NATIONAL RECREATION AREA RESOURCES

In addition to determining the environmental consequences of implementing the alternatives, NPS *Management Policies 2001* (§ 1.4) requires analysis of potential effects to determine whether proposed actions would impair Chickasaw National Recreation Area's resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on resources and values. However, the laws give the National Park Service the management discretion to allow impacts on resources and values when necessary and appropriate to fulfill the purposes of the area, as long as the impact does not constitute impairment of the affected resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within a unit, that discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2001*, § 1.4.5). An impact on any resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent it affects a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the area;
- key to the natural or cultural integrity of the area or to opportunities for enjoyment of the area; or
- identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the area, visitor activities, or activities undertaken by concessioners, contractors, and others operating in Chickasaw National Recreation Area. A determination on impairment is made in the "Environmental Consequences" section in the "Conclusion" section for each required impact topic related to the recreation area's resources and values. An evaluation of impairment is not required for topics related to visitor use and experience (unless the impact is resource based), NPS operations, or the socioeconomic environment. When it is determined that an action(s) would have a moderate to major adverse effect, a justification for nonimpairment is made. Impacts of only negligible or minor intensity would by definition not result in impairment.



METHODS AND ASSUMPTIONS FOR ANALYZING IMPACTS

The planning team based the impact analysis and the conclusions in this chapter mostly on the review of existing literature and studies, information provided by experts in the NPS, other agencies, and staff insights and professional judgment. The team's method of analyzing impacts is further explained below. It is important to remember that all the impacts have been assessed assuming that mitigating measures have been implemented to minimize or avoid impacts. If mitigating measures described in the "Alternatives Including the Preferred Alternative" chapter were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

Director's Order 12, "Conservation Planning, Environmental Impact Analysis, and Decision Making," presents an approach to identifying the duration (short- or long-term), type (adverse or beneficial), and intensity or magnitude (e.g., negligible, minor, moderate, or major) of the impact(s), and that approach has been used in this plan.

The impacts of the action alternatives describe the *difference between* implementing the noaction alternative and implementing the action alternatives. To understand a complete "picture" of the impacts of implementing any of the action alternatives, the reader must also take into consideration the impacts that would occur under the no-action alternative.

NATURAL RESOURCES

Analysis of natural resources was based on research, knowledge of the area's resources, and the best professional judgment of planners, biologists, hydrologists, and botanists who have experience with similar types of projects. Information on the area's natural resources was gathered from several sources. As appropriate, additional sources of data are identified under each topic heading.

CULTURAL RESOURCES

Cultural Resources Listed, or Eligible to be Listed, in the National Register of Historic Places

Potential impacts to cultural resources (archeological resources, prehistoric or historic structures, cultural landscapes, and traditional cultural properties) either listed in, or eligible to be listed in, the National Register of Historic Places were identified and evaluated in accordance with the Advisory Council on Historic Preservation's regulations implementing § 106 of the National Historic Preservation Act (36 CFR 800, Protection of Historic Properties) by: (1) determining the areas of potential effects; (2) identifying cultural resources present in the areas of potential effects that are National Register listed or eligible; (3) applying the criteria of adverse effect to affected resources; and (4) considering ways to avoid, minimize, or mitigate adverse effects.

Under the Advisory Council's regulations, a determination of adverse effect or no adverse effect must be made for affected National Register listed or eligible cultural resources. An adverse effect occurs whenever an action directly or indirectly alters any of the characteristics of a cultural resource that qualify it for inclusion in the National Register (i.e., diminishing the integrity, which is the extent to which a resource retains its historic appearance) of the resource's location, design, setting, materials, workmanship, feeling, or association. Adverse effects also include reasonably foreseeable effects caused by the alternatives that would occur later in time, be farther removed in distance, or be cumulative (36 CFR 800.5(a)(1)). A determination of no

adverse effect means there is an effect, but the effect would not meet the criteria of adverse effect (36 CFR 800.5(b)).

In this GMP, the criteria for characterizing the severity or intensity of impacts to National Register listed or eligible archeological resources, prehistoric, or historic structures, and cultural landscapes (there are no cultural resources designated traditional cultural properties in Chickasaw National Recreation Area) are the § 106 determinations of effect: adverse effect or no adverse effect.

Ethnographic Resources and Museum Collections

Ethnographic resources that are not traditional cultural properties and museum collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens), which are generally ineligible for listing in the National Register, are not subject to § 106 of the National Historic Preservation Act. In this GMP, potential impacts to ethnographic resources and museum collections are described in terms of context (whether the effects are site-specific, local, or even regional), duration (whether the effects are short-term - lasting less than a year, long-term - lasting more than a year, or permanent), and intensity (whether the degree or severity of effects are negligible, minor, moderate, or major). The definitions of impact intensity for museum collections and ethnographic resources are listed in table 16.

VISITOR USE AND EXPERIENCE

This impact analysis considers various aspects of visitor use and experience at Chickasaw National Recreation Area, including the following: the effects on visitors' ability to experience the recreation area's primary resources and their natural and cultural settings (including vistas, natural sounds and smells, and wildlife); overall visitor access to Chickasaw National Recreation Area; the freedom to experience the resources at one's own pace; opportunities for recreational activities; and opportunities for people with disabilities. The analysis is based on how visitor use and experiences would change with the way management prescriptions were applied in the alternatives. The analysis is primarily qualitative rather than quantitative due to the conceptual nature of the alternatives.

Impacts on visitor use and experience were determined considering the best available information regarding visitor use and experience.

SOCIOECONOMIC ENVIRONMENT

The potential impacts on the socioeconomic environment of implementing the alternatives under consideration would be expected to be both short-term and long-term. For the analysis, short-term socioeconomic impacts are defined as the socioeconomic effects expected to occur over a several-year period and then end. These impacts may derive directly from the specific habitat restoration and facility development/redevelopment activities necessary for implementation of the management prescriptions stipulated in each alternative (Implementation Phase).

Long-term socioeconomic impacts are defined as the socioeconomic effects expected to occur following the completion of plan implementation activities that would derive from associated changes to recreation area visitor access and opportunities (Operations Phase). Long-term effects are presumed to continue indefinitely absent changes at Chickasaw National Recreation Area, which may reverse or reduce such effects.

Conclusions regarding potential general management plan-related socioeconomic impacts depend as much on the absolute level of those impacts as the benchmark or baseline against which the impacts are compared for purposes of assessing their relative intensity. For this analysis, impact intensities are defined in table 16.

NPS OPERATIONS AND FACILITIES

The impact analysis evaluated the effects of the alternatives on the following aspects of

Methods and Assumptions for Analyzing Impacts

recreation area operations such as staffing, infrastructure, visitor facilities, and services.

The analysis was conducted in terms of how recreation area operations and facilities might vary under the different management alternatives. The analysis is qualitative rather than quantitative because of the conceptual nature of the alternatives. Consequently, professional judgment was used to reach reasonable conclusions as to the intensity, duration, and type of potential impact.



	Impact Threshold Definition			
Impact Topic and Duration	Negligible	Minor	Moderate	Major
Paleontological ResourcesShort term: The effect would be temporary, lasting a 	Fossils would not be affected or the effects would be below or at lower levels of detection.	Fossils might be lost through illegal collecting, or there would be a low probability of effects from a ground- disturbing activity because (a) the activity would be in a geologic layer not known to contain extensive fossils but the volume of bedrock disturbance would be low, or (b) the activity would be in a fossil-rich geologic layer, but the volume of bedrock disturbed would be nearly indiscernible. Monitoring would be likely to detect fossils, and the loss of fossils and/or associated contextual information would be minimal.	Fossils might be lost through illegal collecting, or there would be a possibility of effects from a ground- disturbing activity because (a) the activity would be in a geologic layer not known to contain extensive fossils, but the volume of bedrock disturbance would be large, or (b) the activity would be in a fossil-rich area, and the area of bedrock disturbance would be small. Most fossils uncovered probably would be found by monitoring, but some fossils and/or associated contextual information could be lost.	Many fossils could be lost through illegal collecting, or there would be a high probability of effects from a ground-disturbing activity because the activity would be in a geologic layer of high fossil richness and the volume of bedrock disturbance would be large. Even with monitoring, many fossils and/or associated contextual information likely would be lost.
Soils Short term: The effect would be temporary, lasting a year or less, such as effects associated with construction. Long term: The effect would last more than one year and could be permanent.	An impact that may result in a change in a soil, but the change would be at the lowest level of detection, and highly localized. The effects on the soil productivity would be slight.	An impact that would result in a detectable change, but the change would be slight and localized. Effects on soil productivity would be slight. There could be changes in a soil's profile in a relatively small area, but the change would not noticeably increase the potential for erosion.	An impact that would result in a clearly detectable change in the soil character and properties over a relatively wide area The effect on soil productivity would be apparent. The potential for erosion to remove small quantities of additional soil would noticeably increase or decrease.	An impact that would result in a substantial change in the soil character and soil productivity over a large area. There would be a strong likelihood that erosion would remove large quantities of additional soil or erosion would be substantially reduced
Surface Water Quality Short term: The effect would be temporary, lasting a year or less, such as effects associated with construction. Long term: The effect would last more than one year and could be permanent.	Changes would be either barely detectable or would have effects that would be considered slight and localized.	An action would have measurable effects on water quality. Water quality effects could include increased or decreased loads of sediment, debris, chemical or toxic substances, or pathogenic organisms.	An action would have clearly detectable effects on water quality and potentially would affect organisms or natural ecological processes. Alternatively, an impact would be visible to visitors.	An action would have substantial effects on water quality and potentially would affect organisms or natural ecological processes. Alternatively, an impact would be easily visible to visitors.

TABLE 16: IMPACT THRESHOLD DEFINITION

	Impact Threshold Definition			
Impact Topic and Duration	Negligible	Minor	Moderate	Major
Water Quantity Associated with Chickasaw National Recreation Area's Springs Short term: The effect would be temporary, lasting a year or less. Long term: The effect would last more than one year and could be permanent.	Impacts to groundwater levels and artesian pressure would be imperceptible or, if detected, would be considered slight and localized. Barely measurable changes could occur to the flows of Chickasaw National Recreation Area's springs and wells.	Measurable changes in groundwater levels and/or artesian pressure would occur, although the changes would be small and effects would be localized. Small changes could occur to the flows of Chickasaw National Recreation Area's springs and wells.	Changes in groundwater levels and/or artesian pressure would be apparent, and have the potential to become larger, although the changes still would be fairly localized in area. Noticeable changes could occur to the flows of Chickasaw National Recreation Area's springs and wells.	Substantial, highly noticeable changes in groundwater levels and/or artesian pressure would be evident, which could be regional in scope. One or more of the groups of springs and wells in Chickasaw National Recreation Area could cease flowing, or Antelope or Buffalo springs or Vendome Well could drop to minimal flows. Alternatively, springs that ceased flowing would flow again.
Vegetation and Wildlife Short term: The effect would be temporary, lasting a year or less, such as effects associated with construction. Long term: The effect would last more than one year and could be permanent.	The action might result in a change in vegetation or wildlife, but the change would not be measurable or would be at the lowest level of detection.	The action might result in a detectable change, but the change would be slight and have a local effect on a population. This could include changes in the abundance or distribution of individuals in a local area, but not changes that would affect the viability of local populations. Changes to local ecological processes would be minimal.	The action would result in a clearly detectable change in a population and could have an appreciable effect. This could include changes in the abundance or distribution of local populations, but not changes that would affect the viability of regional populations. Changes to local ecological processes would be of limited extent.	The action would be severely adverse or exceptionally beneficial to a population. The effects would be substantial and highly noticeable, and they could result in widespread change and be permanent. This could include changes in the abundance or distribution of a local or regional population to the extent that the population would not be likely to recover (adverse) or would return to a sustainable level (beneficial). Significant ecological processes would be altered, and "landscape-level" (regional) changes would be expected.
Threatened and Endangered Species (Bald Eagle) The following impact intensities apply. These definitions are consistent with the language used to determine effects on threatened and endangered species under the Endangered Species Act.	<i>No effect:</i> The action would cause no effect on the species or critical habitat if present.	Not likely to adversely affect: The action would be expected to result in insignificant and discountable effects on a species or critical habitat (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated), or it would be completely beneficial.	<i>Likely to adversely affect:</i> The action would result in a direct or indirect adverse effect on a species or critical habitat, and the effect is measurable and likely to occur.	<i>Likely to adversely affect:</i> The action would result in a direct or indirect adverse effect on a species or critical habitat, and the effect is measurable and likely to occur.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

	Impact Threshold Definition			
Impact Topic				
and Duration	Negligible	Minor	Moderate	Major
Natural Soundscape Short term: The effect would be temporary, lasting a year or less, such as effects associated with construction. Long term: The effect would last more than one year and could be permanent.	The natural sound environment might be affected, but the effects would be at or below the level of detection, or changes would be so slight they would not be of any measurable or perceptible consequence to the wildlife or visitors.	There would be a detectable change in the natural sound environment, but the effects would be small, local, and of little consequence to the wildlife or visitors.	A change in the natural sound environment would be readily detectable, affecting the behavior of wildlife or visitors in a large area.	A severely adverse or exceptionally beneficial change in the natural sound environment would be obvious and would affect the health of wildlife or visitors; or cause a substantial, highly noticeable change in the behavior of wildlife or visitors in a local or regional area.
Ethnographic Resources <i>A short-term impact</i> <i>would last less than</i> <i>one year.</i> <i>A long-term impact</i> <i>would last more</i> <i>than one year and</i> <i>would be more</i> <i>permanent in</i> <i>nature.</i>	Impact(s) would be barely perceptible and would neither alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs.	Adverse impact — impact(s) would be slight but noticeable, but would neither appreciably alter resource conditions, such as traditional access or site preservation, nor the relationship between the resource and the affiliated group's body of practices and beliefs. Beneficial impact — would allow access to and/or accommodate a group's traditional practices or beliefs.	Adverse impact — impact(s) would be apparent and would alter resource conditions. Something would interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group's practices and beliefs, even though the group's practices and beliefs would survive. Beneficial impact — would facilitate traditional access and/or accommodate a group's practices or beliefs.	Adverse impact — impact(s) would alter resource conditions. Something would block or greatly affect traditional access, site preservation, or the relationship between the resource and the affiliated group's body of practices and beliefs, to the extent that the survival of a group's practices and/or beliefs would be jeopardized. Beneficial impact — would encourage traditional access and/or accommodate a group's practices or beliefs.
Museum Collections	Impact is at the lowest levels of detection — barely measurable with no perceptible consequences, either adverse or beneficial, to museum collections.	Adverse impact — would affect the integrity of few items in the museum collection, but would not degrade the usefulness of the collection for future research and interpretation. Beneficial impact — would stabilize the current condition of the collection or its constituent components to minimize degradation.	Adverse impact — would affect the integrity of many items in the museum collection and diminish the usefulness of the collection for future research and interpretation. Beneficial impact — would improve the condition of the collection or protect its constituent parts from the threat of degradation.	Adverse impact — would affect the integrity of most items in the museum collection and destroy the usefulness of the collection for future research and interpretation. Beneficial impact — would secure the condition of the collection as a whole or its constituent components from the threat of further degradation.

Methods and Assumptions for Analyzing Impacts

	Impact Threshold Definition			
Impact Topic				
and Duration	Negligible	Minor	Moderate	Major
Visitor Use and Experience	Visitors would not be affected or changes	Changes in visitor use and/or experience	Changes in visitor use and/or experience would be readily	Changes in visitor use and/or experience would be readily
A short-term impact would last less than one year and would affect only one season's use by visitors.	experience would be below or at the level of detection. The visitor would not likely be aware of the effects.	although the changes would be slight. The visitor would be aware of the effects, but the effects would be slight.	be aware of the effects and would be able to express an opinion about the changes.	important consequences. The visitor would be aware of the effects and likely would express a strong opinion about the changes.
A long-term impact would last more than one year and would be more permanent in nature.				
Socioeconomic Environment	The impact would be barely detectable or	The impact would be small but detectable	The impact would be readily apparent and widespread	The impact would be readily apparent and would
A short-term impact would last less than one year and would affect only one season's use by visitors.	would not occur within the primary socioeconomic resource areas potentially affected.	within the primary socioeconomic resource areas affected.	within the primary socio- economic resource areas affected.	substantially change the primary socioeconomic resource areas affected.
A long-term impact would last more than one year and would be more permanent in nature.				
Recreation Area Operations	Recreation area operations would not	The effects would be detectable, but would	The effects would be readily apparent and would result in	The effects would be readily apparent and would result in
A short-term impact would last less than one year and would affect only one season's use by visitors. A long-term impact would last more than one year and would be more permanent in nature.	be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on recreation area operations.	be of a magnitude that would not have an appreciable effect on recreation area operations.	a change in recreation area operations in a manner noticeable to staff and the public.	a substantial change in recreation area operations in a manner noticeable to staff and the public and be markedly different from existing operations.

CONSEQUENCES OF ALTERNATIVE A (NO ACTION)

NATURAL RESOURCES

Paleontological Resources

Analysis. No new developments or grounddisturbing activities would occur in areas known to have paleontological resources under this alternative.

Some fossils might be illegally collected by visitors in the southern part of Chickasaw National Recreation Area. It is not known if or how many fossils are being taken, or what the significance is of the resources being taken. However, the lands south of Lake of the Arbuckles do not receive a high level of use, and exposed fossils are probably not apparent to most visitors. (Although large groups from the Goddard Youth Camp use the area, assuming efforts are made to inform teachers and students that it is illegal to take fossils from Chickasaw National Recreation Area, and with monitoring of the area, these groups would not adversely impact the resource.) If recreation area use levels increase in the future as expected, there is the potential for some additional illegal fossil collecting to occur. But there is no reason to expect that there would be a noticeable increase in the numbers of fossils being illegally collected most visitors would stay in developed areas or on the Lake of the Arbuckles and would not be in areas known to have fossils.

Overall, under alternative A there likely would continue to be a long-term minor adverse impact on Chickasaw National Recreation Area's paleontological resources due to visitor collection of fossils.

Cumulative Impacts. Paleontological resources are likely present in the area south of Chickasaw National Recreation Area, although their extent, locations, and importance are mostly unknown. Fossils probably are collected on private lands near

Chickasaw National Recreation Area. Rock quarries in the area could expose and destroy fossils. When the likely effects of continued public use of the recreation area in this alternative A are added to the effects outside Chickasaw National Recreation Area, there could be a long-term adverse cumulative impact of unknown magnitude on area fossils. However, visitors illegally collecting fossils in the recreation area would likely be a small part of the cumulative impacts on the area's paleontological resources.

Conclusion. Alternative A would be expected to have a long-term minor adverse impact on Chickasaw National Recreation Area's paleontological resources, potentially due to a few visitors illegally collecting fossils. There could be a long-term adverse cumulative impact of unknown magnitude on area fossils. This level of impact would not be anticipated to constitute an impairment of the recreation area's resources or values.

Soils

Analysis. No soils would be altered due to the construction of new recreation area facilities under alternative A. Maintenance of existing facilities would probably result in some erosion and/or alteration of soil properties, resulting in a negligible to minor long-term adverse impact in localized areas.

Soils in Chickasaw National Recreation Area would likely continue to be compacted and eroded in local areas by hikers, mountain bikers, and horseback riders, such as along trails and at picnic areas and campsites. In some areas, "social trails" would continue to form, particularly in developed areas with high visitor numbers. In sloped areas, these social trails would continue to result in increased soil erosion from stormwater runoff. Higher levels of visitor use also might result in more visitors walking along and down banks along Rock and Travertine creeks and Lake of the Arbuckles from developed areas, increasing soil erosion in a few areas. Some soil would continue to be eroded due to runoff in the Cold Springs campground, and along trails in Chickasaw National Recreation Area (including the Rock Creek multiuse trail and trails in the Point and Buckhorn areas. All of these long-term adverse visitor impacts would likely be minor and limited to popular use areas.

Wave action due to winds on Lake of the Arbuckles also has eroded the shoreline, particularly on the south shore of the lake and in the vicinity of the Point, Buckhorn and Guy Sandy areas. Wakes from boats have exacerbated bank erosion in places. This would continue to result in long-term minor to moderate impacts to soils in localized areas around Lake of the Arbuckles.

Cumulative Impacts. Soils in most of the area surrounding Chickasaw National Recreation Area have been altered by past agricultural practices and developments. In the future, some soils would likely be eroded and lost and/or soil properties altered by new developments in the area, including the visitor center near Vendome Well and the Chickasaw Nation Cultural Center. The loss and alteration of soils due to past land uses, and future external actions, added to the potential effects from increased visitation in the recreation area, would increase soil erosion and alteration in the region, resulting in a long-term minor to moderate adverse cumulative impact on area soils. However, the actions in alternative A would contribute a very small increment to the overall impact.

Conclusion. Most of Chickasaw National Recreation Area's soils would not be affected by the actions under alternative A. However, some soils would be eroded and lost and/or soil properties altered due to increased visitor use in developed areas such as along trails or near water sources, and from continued erosion of soil at the Cold Springs campground. These adverse impacts would likely be minor and long-term in extent. Bank erosion along Lake of the Arbuckles also would continue due to wave action, resulting in long-term minor to moderate adverse impacts to soils in local areas. When the impacts inside Chickasaw National Recreation Area under this alternative A are added to impacts from past land uses, and future developments outside the recreation area, plus increases in motorboat use on Lake of the Arbuckles, there would be the potential for a long-term minor to moderate adverse cumulative impact on area soils — although the actions in the current management alternative would add a very small increment to this overall impact. No impairment to Chickasaw National Recreation Area's resources and values would result from soil impacts under this alternative.

Water Quantity Associated with Chickasaw National Recreation Area's Springs

Analysis. No new actions would be taken in Chickasaw National Recreation Area under this alternative that would affect the aquifer and the flows of the area's springs and Vendome Well. Chickasaw National Recreation Area would continue to use city of Sulphur water, which comes from wells, to meet the needs of visitors and staff. However, the quantity of groundwater being withdrawn for recreation area purposes is relatively small compared to other uses, and is not expected to substantially grow during the life of this plan. More importantly, the Vendome Well would continue to operate as it has in the past. Uncontrolled flows from this well in the past may have affected the flow of springs in Chickasaw National Recreation Area (NPS 1998c). If the well continues to operate as it has in the past, and if the well is in fact affecting the aquifer, there could be a longterm, adverse impact of unknown magnitude on the flow of some of Chickasaw National Recreation Area's springs. There is no data to

be able to determine the extent the Vendome Well has affected spring flows, which springs might be affected, or accurately predict the level of the impact the well would have on the springs in the future. No information is currently available that indicates this well is directly responsible for the cessation or substantial reduction in spring flows in Chickasaw National Recreation Area. Thus, at this time there is no data that indicates the present operation of the Vendome Well is resulting in an impairment of the recreation area's resources and values.

Cumulative Impacts. As noted in "Affected Environment," a number of wells in the area surrounding Chickasaw National Recreation Area are withdrawing water from the Arbuckle-Simpson aquifer. In 2002 an application was submitted to the state to pump and export approximately 138,000 acrefeet of water from the aquifer. It is likely that additional permits will be sought to drill wells in the aquifer over the next 15-20 years. If new permits were to be granted, the groundwater that would be withdrawn added to existing uses, would likely approach or exceed the annual recharge of the aquifer (about 128,000 acre-feet per year) (Fairchild et al. 1990). Even if no new permits were granted for water withdrawals, existing wells may have affected the artesian pressure of the area. There has been an apparent decrease in artesian pressure in the aquifer, most likely due to unregulated discharge. These impacts could continue in the future. When the possible impacts of new and existing sources outside of Chickasaw National Recreation Area are added to the possible impacts of continued operation of the Vendome Well in the recreation area, there is the potential for a long-term, adverse cumulative impact of unknown magnitude on the aquifer and the flows of Chickasaw National Recreation Area's springs. The increment added by the Vendome Well to the overall cumulative impact is unknown due to a lack of data and studies. Also, until further studies are completed, it is not possible to predict the

extent of the cumulative impact on the flow of the springs.

Conclusion. Alternative A could have a longterm, adverse impact of unknown magnitude on the flows of Chickasaw National Recreation Area's springs, due to the continued unrestricted flow of the Vendome Well. Although it is not presently possible to predict the extent of the impact, there is presently no information that indicates the operation of the well is resulting in an impairment of Chickasaw National Recreation Area's resources and values. However, when the unrestricted flows from the Vendome Well are added to withdrawals and artesian flows from existing and new wells outside the recreation area, there would be the potential for a long-term cumulative adverse impact on the flows of the springs. The magnitude of this overall adverse cumulative impact cannot presently be predicted due to a lack of information concerning the aquifer, the impacts of current withdrawals on the aquifer, and the extent of future groundwater withdrawals that may occur.

Surface Water Quality

Analysis. Water quality impacts have occurred in the past in Travertine and Rock creeks (see the "Affected Environment" chapter). Visitors swimming and wading in the creeks most likely add food, trash, and human waste. These wastes contribute to the degradation of water quality, increasing nutrients and bacteria levels. With visitor use levels likely increasing in the future, the potential for water quality impacts also would increase. Minor to moderate adverse impacts would be expected in local areas, particularly in popular swimming/wading areas in the creeks, Lake of the Arbuckles, and Veterans Lake. Although these water quality impacts would be relatively short-term, occurring primarily during the peak summer period, they would continue through the life of the plan. Thus, the impacts would be long term.

Some negligible to minor adverse water quality impacts also could occur in a few local areas due to increased erosion from continued visitor access to the creeks or lakes. Longterm minor adverse impacts would continue due to sediments being carried into Travertine Creek from the Cold Springs campground.

Because no developments or improvements would occur under the current management alternative that are close to water bodies, water quality impacts due to construction activities would not occur.

Cumulative Impacts. There are many potential sources of water pollutants both within and outside Chickasaw National Recreation Area, as noted in the "Affected Environment." These sources, including runoff from agricultural lands, nearby residences, and city streets; disposal of wastes in streambeds; construction-related erosion from new developments; spills of materials on highways; discharges of sewage from the city of Sulphur's water treatment plant; and leaks from municipal sewerlines, can all adversely affect water quality of streams and lakes in the area. Although it is not known when, where, and how many pollutants from all these sources would enter water bodies, it is likely that adverse water quality impacts would occur in Chickasaw National Recreation Area during the life of the plan. Most of these impacts likely would be minor to moderate in magnitude. In addition, motorboats on Lake of the Arbuckles can discharge fuel and add wastes into the lake. With motorboat use expected to increase, the potential for water quality impacts also would likely increase. Benzene, in particular, was noted to be a potential moderate water quality impact in local areas in the future (NPS 2003a).

When the negligible to moderate adverse water quality impacts of alternative A are added to the above potential impacts, it is possible that a long-term, minor to moderate cumulative impact could occur to Chickasaw National Recreation Area's water quality over the life of this plan. However, the actions in alternative A would add a very small increment to this cumulative water quality impact.

Conclusion. Alternative A would likely result in a long-term minor to moderate adverse impact on water quality in localized areas, primarily due to an increase in wastes from increased visitor use. There also could be a long-term adverse minor to moderate cumulative impact on water quality when the impacts of this alternative area are added to the impacts of other actions within and outside Chickasaw National Recreation Area — although alternative A would add a very small increment to this overall impact. No impairment to Chickasaw National Recreation Area's resources and values would occur as a result of the water quality impacts from this alternative.

Vegetation

Analysis. No impacts on vegetation would occur due to development or improvement of facilities in this alternative.

Visitor use of Chickasaw National Recreation Area, including hiking, camping, bicycling, and horseback riding, also affects the recreation area's vegetation. With increased use levels, some vegetation would likely be lost due to the continuing formation of social trails in popular use areas such as campgrounds and picnic areas. Shoreline vegetation along Lake of the Arbuckles might be damaged in places when visitors walk down to the lake. Some plants also are probably lost through visitors walking along and down to the lake, or walking through shoreline vegetation, thereby eroding streambanks in places. With increased use levels over time, more native vegetation might be adversely affected in local areas. None of these impacts would affect the integrity, distribution, or presence of native plant communities in Chickasaw National

Recreation Area. Thus, visitor use would likely continue to have a long-term negligible to minor adverse impact on the recreation area's native vegetation in local areas.

As noted in the "Affected Environment," the spread of nonnative plants is a problem in Chickasaw National Recreation Area. Mitigation efforts (i.e., replanting disturbed areas as soon as possible with native plants) should help prevent the spread of nonnative species in the areas where ground is being disturbed. However, increased visitor use throughout the recreation area, particularly the use of horses, would increase the potential for the spread of nonnative species. Even with education efforts, some nonnative plants could be introduced or spread by visitors in Chickasaw National Recreation Area. Although it is difficult to determine the impact on native species due to the uncertainties about the type of species that might be introduced in the future, and the locations and frequencies of introductions, it is likely with adequate monitoring and weed control efforts, that these impacts would be minor and long-term in localized areas, such as along trails.

Some actions under alternative A would have a positive impact on Chickasaw National Recreation Area's native vegetation. Continuing efforts to restore prairies and forests in the Upper Guy Sandy area would enable these native plant communities to expand. Similarly, continuing efforts to control red cedar would result in the expansion of native grasses, forbs, ferns, and trees that are being shaded and crowded out. These restoration efforts, taken as a whole, would have a long-term moderate beneficial impact on the recreation area's native vegetative communities.

Cumulative Impacts. Actions both within and outside Chickasaw National Recreation Area would likely continue to affect the area's native vegetation. Increases in personal watercraft and motorboat use on Lake of the Arbuckles could result in short- and longterm negligible to minor adverse impacts on shoreline vegetation due to wave erosion and operators landing their craft and walking on shore. These impacts would occur mostly near camping areas and boat launch areas, private properties where landowners moor their craft, and in shallow areas and small arms of the lake, such as Rock Creek (NPS 2003a). Erosion could affect plants in areas where boat operators park their boats along shorelines.

Outside Chickasaw National Recreation Area, over time, most native prairie and forest communities have disappeared or been substantially altered by human activities such as agricultural operations, housing, and other developments. New developments such as the Chickasaw Nation Cultural Center might result in the loss of some additional native vegetation.

When the adverse and beneficial impacts of alternative A are added to actions that have occurred and are likely to occur in the area surrounding Chickasaw National Recreation Area, there would be a major long-term adverse cumulative impact on the area's native vegetation. However, the actions in this alternative would add both a modest positive and small negative increment to this overall impact, given how much change has already occurred to the vegetative communities once present.

Conclusion. Under alternative A there would be both beneficial and adverse impacts on Chickasaw National Recreation Area's native vegetation. Some long-term negligible to minor adverse impacts would occur in local areas due to increased visitor use levels. On the other hand, continuing vegetation restoration efforts would likely have a longterm moderate beneficial impact in local areas. When the effects of this alternative are added to the historical changes in native vegetation that have occurred in the area surrounding the recreation area, there would be a major longterm adverse cumulative impact on native vegetation. However, the actions under the current management alternative would add only a modest positive and small negative increment to this overall impact. None of the vegetation impacts that would occur under this alternative would be sufficient to result in an impairment of Chickasaw National Recreation Area's resources and values.

Wildlife

Analysis. Few actions in this alternative would affect Chickasaw National Recreation Area's wildlife populations or habitats. Wildlife populations and habitats already have been altered by visitors and employees, as have wildlife habits and movements, and this would continue. The human use of the recreation area is concentrated on Lake of the Arbuckles, in developed areas such as campgrounds, on trails, and in the Platt District. Animals sensitive to human activities already avoid these areas when people are present. Wildlife that occupy these developed areas, such as squirrels, raccoons, rabbits, mice, and white-tailed deer, are mostly adapted to the presence of people and would not be noticeably affected by the actions being taken in alternative A.

Some animals would continue to occasionally be injured or killed by motor vehicles driving on roads. Some animals also probably would continue to be attracted by visitors feeding them or to areas where food and garbage are left out. However, the adverse effects on wildlife from these activities would be localized and negligible, resulting in no measurable changes to Chickasaw National Recreation Area's wildlife populations.

With the increase in the regional human population, and a lack of public hunting areas, hunting would likely increase in Chickasaw National Recreation Area over the life of this plan. Higher numbers of game animals, such as deer and turkey, would be harvested over time in the recreation area. But with careful regulation of hunting by the state and the National Park Service, the increase in harvest levels should not substantially affect wildlife populations in Chickasaw National Recreation Area. The increase in hunting would have a long-term negligible to minor adverse impact on a few game species.

Continued efforts to restore prairie and forest in the Upper Guy Sandy area would have a beneficial impact on wildlife populations that depend on these habitats. In particular, efforts to control the spread of red cedar and restore prairie would benefit species that require open areas or an open understory, such as bobwhite quail, wild turkey, and a wide variety of reptiles. Restoring prairie also would possibly allow the reintroduction of other species that once were found in Chickasaw National Recreation Area (e.g., bison, prairie chicken, and pronghorn antelope). However, it is expected that wildlife habitats in a relatively small part of the recreation area would be improved over the life of this plan. With an increase in habitat for prairie wildlife species, there would be an increase in the diversity of the recreation area's wildlife populations and habitats, resulting in a long-term minor to moderate beneficial impact.

Cumulative Impacts. Like vegetation, most wildlife populations surrounding Chickasaw National Recreation Area have been substantially altered by human activities, including farming and developments, resulting in fewer numbers of native wildlife. Thus, past actions have had a major adverse impact on native wildlife surrounding the recreation area. No current or reasonably foreseeable actions are likely to change this. When the beneficial and adverse impacts of alternative A are added to the impacts that have occurred in the vicinity of the recreation area, there would be a long-term major adverse cumulative impact on the area's wildlife populations and habitats. However, alternative A would contribute a very small

negative increment to this overall cumulative impact, as well as a small beneficial increment by continuing to provide an area where wildlife habitat continues to be managed and protected.

Conclusion. Alternative A would have some adverse, but also some beneficial, impacts on Chickasaw National Recreation Area's wildlife populations and habitats. Most wildlife in the recreation area would not change as a result of the actions in this alternative. No actions would affect areas known to be important for breeding, nesting, foraging, or key migration routes. No actions would interfere with feeding, reproduction, or other activities necessary for the survival of wildlife species. Long-term negligible adverse impacts would continue to occur due to continuing visitor use of the recreation area. On the other hand, there would be long-term minor to moderate beneficial impacts on some wildlife populations due to the continuing efforts to restore prairie and forest in the Upper Guy Sandy area.

When the beneficial and adverse impacts of alternative A are added to the impacts that have occurred in the vicinity of Chickasaw National Recreation Area, there would be a long-term major adverse cumulative impact on the area's wildlife populations and habitats. However, the actions under alternative A would contribute only a small beneficial increment and a very small adverse increment to this impact. None of the wildlife impacts resulting from alternative A would constitute an impairment of the recreation area's resources and values.

Threatened and Endangered Species (Bald Eagle)

Analysis. As noted in "Affected Environment," several bald eagles roost in trees along Lake of the Arbuckles in the winter. Although no new developments or other actions are being taken in alternative A that would affect the eagles when they are roosting in Chickasaw National Recreation Area, there is a chance that with increased use levels in the future, some visitors might deliberately or accidentally disturb the birds while they are roosting or feeding on the lake. Any disturbance would likely be minimal and would not cause eagles to stop using the recreation area. Consequently, visitors might affect, but would not likely adversely affect, bald eagles in the recreation area.

The bald eagle population is expanding, and it is possible that in the future bald eagles could nest in Chickasaw National Recreation Area. If this were to occur, the nesting area(s) would be monitored. Visitors also would be informed about the eagles and kept away from the nesting site(s) to avoid disturbing the birds. People in the area might affect, but would not likely adversely affect, nesting eagles; provided they are kept an adequate distance from the nests.

Cumulative Impacts. Bald eagles are found across this region, and there are several large roosting and foraging sites near Chickasaw National Recreation Area. No actions are known to be adversely affecting the eagles and their habitat outside the recreation area. It is possible that off-season personal watercraft and other motorboat use on Lake of the Arbuckles could occasionally affect the birds when they are feeding in the area. When these effects are added to the effects of the alternative A, there is a slight chance that there could be a cumulative impact. However, this effect would not likely adversely affect bald eagles in the area and any disturbance would be minimal and highly localized, and would not be expected to deter the eagles from using the area or affect population numbers or their habitat.

Conclusion. Overall, alternative A might affect, but would not be likely to adversely affect, bald eagles. If use levels in Chickasaw National Recreation Area increase in the future, there is a slight chance that visitors

might disturb some bald eagles roosting by Lake of the Arbuckles. There is also a slight chance that there could be a cumulative adverse effect if off-season personal watercraft or motorboat use on the lake were to disturb the eagles. Although visitors might temporarily affect the eagles, none of the actions under alternative A would likely adversely affect bald eagles in Chickasaw National Recreation Area or general area. None of these impacts would result in an impairment of the recreation area's resources and values.

Soundscape

Analysis. Noise would continue to be generated by vegetation restoration efforts in the Upper Guy Sandy area. Although the noise from some equipment in these operations would be substantial, it would be temporary and local and would occur at different times and places. Noise from NPS maintenance activities, such as trail maintenance, grass mowing, and garbage removal, would also continue to be heard occasionally. Most noise from these activities would be in or near developed areas that are already exposed to noise from vehicles, motors, and visitors. Thus, noise from ongoing maintenance and restoration activities would have a minor to moderate adverse impact on the natural soundscape in local areas, depending upon the activity, presence of other facilities and people, vegetation, and wind. Although the impacts would be of short duration, because they would occur over the life of the plan the impact would be long-term.

Under alternative A there would continue to be high levels of noise, mostly during the peak-use season due to visitors and their vehicles, primarily in developed areas, including campgrounds, picnic areas, roads, boat ramps, parking areas, trails, the Travertine Nature Center, and the Goddard Youth Camp. These impacts would be brief, but would increase in intensity and duration during holidays and weekends when high numbers of visitors are present. Thus, there would continue to be long-term minor to moderate, adverse noise impacts in local areas throughout Chickasaw National Recreation Area. Although visitor use levels would likely continue to increase over the life of the plan, the resulting increase in noise levels would not be expected to rise beyond a moderate level. Most impacts on the natural soundscape would continue to be mostly confined to developed portions of Chickasaw National Recreation Area, and popular use areas such as Lake of the Arbuckles, Veterans Lake, Travertine Creek, and Antelope and Buffalo springs.

Cumulative Impacts. Being adjacent to the city of Sulphur, noise from machinery, people's voices, and vehicles on highways and roads would be heard in the Platt District. Noise from residences near Lake of the Arbuckles and other areas near Chickasaw National Recreation Area would also continue to be audible, as well as agricultural operations and low-flying military craft. These adverse noise impacts would be minor to moderate (depending upon the type of noise and location), intermittent, and long-term — occurring every year.

On Lake of the Arbuckles and the immediate surrounding area there would also be minor to moderate seasonal long-term adverse impacts due to noise from personal watercraft and motorboats (NPS 2003a).

When all of these impacts are added to the continuing impacts of alternative A, there would be the potential for a long-term moderate adverse cumulative impact on the natural soundscape. However, these cumulative impacts would usually occur at certain times, such as at peak-use periods like weekends and holidays, and be mostly confined to high-use areas such as Lake of the Arbuckles, developed areas along Rock and Travertine creeks, and other areas close to Chickasaw National Recreation Area boundary where there are roads, residences, businesses, and other developments.

Conclusion. Parts of Chickasaw National Recreation Area would continue to be relatively quiet under alternative A, such as the Upper Guy Sandy area and the Rock Creek multiuse trail area. Long-term minor to moderate adverse impacts on the natural soundscape would likely continue due to maintenance and restoration activities and visitor use under this alternative. Most of these adverse impacts would occur during high use periods and in high use areas, including campgrounds, picnic areas, roads, boat ramps, the springs, Travertine Creek, and the Travertine Nature Center. There would also be the potential for a long-term moderate adverse cumulative impact when the noise resulting from implementing this alternative is added to noise from activities outside Chickasaw National Recreation Area, as well as motorboat use on Lake of the Arbuckles. None of these noise impacts; however, would be sufficient to result in an impairment of the recreation area's resources and values.

CULTURAL RESOURCES

Archeological Resources

Analysis. Archeological resources adjacent to or easily accessible to visitors from trails, roads, picnic shelters, campgrounds, docks, boat launching ramps, or from such places as the periphery of the bison pasture, the mineral or freshwater springs; or along Chickasaw National Recreation Area's lakeshores, creeks, and streams, could be vulnerable to surface disturbance, inadvertent damage, and vandalism.

Deterioration of cultural remains could result by way of a loss of surface archeological materials, alteration of artifact distribution, or a reduction of contextual evidence. Any adverse impacts on archeological resources would be long-term and negligible to minor in intensity. However, continued ranger patrolling and emphasis on visitor education would discourage vandalism and inadvertent destruction of cultural remains; and any adverse impacts are expected to be minimal, if any.

Archeological surveys would precede any ground disturbance associated with construction of the approved visitor center near Vendome Well and any ground disturbance associated with trail maintenance. Important archeological resources would be avoided to the greatest extent possible, and no adverse effects would be anticipated. In the unlikely event that such resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the Oklahoma state historic preservation officer.

Cumulative Impacts. Past development in Chickasaw National Recreation Area such as the 1909 construction of Lincoln Bridge over Travertine Creek (formerly Sulphur Creek), the 1933–1940 construction of rustic architectural facilities by the Civilian Conservation Corps, the construction of carriage ways, and later automobile roads, and two sets of railroad tracks; may have resulted in the disturbance and loss of some archeological resources during excavation and construction activities. In addition, agricultural practices, the development of the historic city of Sulphur in the late 19th and early 20th centuries and its relocation near by to the north, the formation of Lake of the Arbuckles in 1961 by the Bureau of Reclamation, and the more recent growth and expansion of residential areas impinging upon Chickasaw National Recreation Area, are all examples in and near Chickasaw National Recreation Area of actions that may also have previously disturbed archeological resources. Some of these types of activities continue, such as the planned construction of a Chickasaw Nation Cultural Center adjacent to Chickasaw National Recreation Area, and could also result in future adverse impacts to archeological resources. The continued level of management actions under alternative A

would contribute no adverse impacts to the adverse impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would remain adverse.

Conclusion. Continued management actions under the no-action alternative would include little new construction, and no adverse impacts to archeological resources are anticipated. In the unlikely event that impacts to national register eligible archeological resources could not be avoided, a memorandum of agreement, in accordance with 36 CFR Part 800.6, Resolution of Adverse *Effects*, would be negotiated between Chickasaw National Recreation Area and the Oklahoma state historic preservation officer (and/or the Advisory Council on Historic Preservation, if necessary). The memorandum of agreement would stipulate how the adverse effects would be mitigated.

The continued level of management actions under alternative A would contribute no adverse impacts to the adverse impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would remain adverse.

There would be no impairment of Chickasaw National Recreation Area's resources or values. Because important archeological resources would be avoided during grounddisturbing activities, there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents.

Ethnographic Resources

Note: an ethnographic resource is defined as the identification of a specific contemporary human group or family using a particular place over time in a way relevant to that group's traditional cultural heritage and social identity.

Analysis. Continued management actions under alternative A would include some hydrological monitoring over time. Not much is known about the spring water. (The patterns of groundwater flow that influence and recharge the springs in the Platt Historic District are the subject of the analysis of impacts to natural resources elsewhere in this plan.) If a particular spring should stop flowing, as has happened at Bromide and Medicine springs, such a spring would lose its physical and cultural importance as a perceived aid to health and recreation to those European American and American Indian families who regularly use the springs. However, the hydrological monitoring over time could help the National Park Service protect and preserve the springs' sources of water by contributing to a database for local and regional comparison. Water-monitoring impacts under alternative A on the springs as a potential ethnographic resource for European Americans and American Indians would be minor, beneficial, and long-term depending upon what is learned through the monitoring and what preservative measures might be implemented.

Using the *Cultural Landscape Report* for the Platt Historic District (Hohmann and Grala 2004) as general guidance, the historic Osage orange tree in Walnut Grove known as the Monkey Tree would be preserved by balancing its traditional social and cultural use as a tree on which children climb and play, and which "according to oral histories, was extant at the end of the period of significance [1940]" (Hohmann and Grala 2004:222), with biological nurture. An example of the former is to: retain dead branches for [children's] bouncing. Trim potentially hazardous branches.

An example of the latter is as follows:

If compaction around base of tree becomes severe, a mulch of hardwood chips two to four inches deep may be applied around the base of the tree (Hohmann and Grala 2004:334).

The *Cultural Landscape Report* recognizes that playing on the tree could injure it. It also concludes that since such children's play is traditional, it should be continued (Hohmann and Grala 2004:334). Therefore, because continued access would be allowed, management under alternative A would mean a long-term minor beneficial impact on the Monkey Tree as a potential ethnographic resource for the children of European American and American Indian families.

Access to "all the trails in the recreation area" as a collective ethnographic resource would be continued. By providing continued enjoyment to the Wallace family of the Chickasaw people, and to other families and persons, both American Indian and European American, who seek trail experiences, impacts on trails as ethnographic resources by national recreation area management actions under alternative A would be long-term, minor, and beneficial.

Cumulative Impacts. Past residential, commercial, and agricultural development in the region around Chickasaw National Recreation Area that draws drinking water and other water uses from the Arbuckle-Simpson Aquifer may have influenced changes in the groundwater-flow pattern, perhaps in turn influencing the cessation of water flow at Bromide and Medicine springs in Chickasaw National Recreation Area. A current proposal for certain ranchers drawing upon the Arbuckle-Simpson Aquifer to sell and pump water north, as the water supply for Oklahoma City is under hydrological study by the Oklahoma Board of Water Resources. Any disturbance reducing the flow of the springs would be adverse.

Past visitation involving children playing on the Monkey Tree may have adversely impacted the tree by damaging it. Current anticipation is for visitation to increase from the adjacent Chickasaw Nation Cultural Center and from overflow crowds from neighboring parks such as Turner Falls Park of the city of Davis and Lake Murray State Park during warm weather holidays constituting peak recreation periods. Increased visitation would lead to more risk of damage to the tree. Any damage would be adverse.

The past trail development and maintenance found in Chickasaw National Recreation Area and in neighboring parks such as Turner Falls Park of the city of Davis and Lake Murray State Park would continue in varying ways into the future and benefit trail users by providing better walking and hiking conditions. The trail experience could become more crowded because the current expectation is for visitation to increase from the adjacent Chickasaw Nation Cultural Center, and from overflow crowds from neighboring parks like Turner Falls Park and Lake Murray State Park during warm weather holidays constituting peak recreation periods. Crowding would adversely affect trail enjoyment.

Implementation of this alternative would contribute both adverse and beneficial effects to the overall adverse impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. Nonetheless, cumulative impacts would be beneficial and implementation of alternative A would be a substantial component of the overall beneficial cumulative impact for ethnographic resources. *Conclusion.* Alternative A calls for monitoring the water conditions of the springs, and would impact the springs as potential ethnographic resources for European Americans and American Indians in a beneficial, long-term range from negligible to minor, depending upon what is learned and implemented from the monitoring.

Since alternative A calls for the preservation of the Monkey Tree while permitting continued children's play on its branches, few adverse impacts to the Monkey Tree as a potential ethnographic resource are anticipated. Rather, long-term minor beneficial effects would be expected to preserve it as long as possible for more generations of children to climb and play.

For members of the Wallace family of the Chickasaw people and others like them who seek the enjoyment of walking the trails, impacts of management actions on the trails as ethnographic resources under alternative A would be long-term, minor, and beneficial because access would continue along with trail maintenance.

Implementation of this alternative would contribute both adverse and beneficial effects to the overall adverse impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. Nonetheless, cumulative impacts would be beneficial and implementation of alternative A would be a substantial component of the overall beneficial cumulative impact having to do with ethnographic resources.

There would be no impairment of Chickasaw National Recreation Area's resources or values. Because important ethnographic resources would be avoided during grounddisturbing activities, there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area, or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents.

Museum Collections and Archives

Analysis. Under alternative A, as with alternatives B and C, change would occur. The portions of Chickasaw National Recreation Area's museum collections and archives that are currently housed in a Bally building in the maintenance area would continue to be housed there under adequate museum standards for temperature control, but needing improvements in humidity control, fire detection and suppression, and overall building security. Other parts of Chickasaw National Recreation Area's museum collections and archives are housed under adequate museum standards for all variables of museum conditions at different museum institutions. Improved security from theft and vandalism would continue to be needed, as would an automatic fire detection and suppression system, in lieu of the handheld, manually activated fire extinguishers now in place. It must be assumed that the integrity of items targeted in any theft or vandalism would be diminished, from destruction or mishandling. Any items damaged from fire would be similarly diminished. Impacts on museum collections and archives would range from minor to moderate; depending upon the number of items affected, and would be adverse and long-term. There would be no change in location and thus no impact upon the convenience of Chickasaw National Recreation Area staffers and outside researchers who use the museum collections and archives.

Cumulative Impacts. Because the existing conditions for the current management of museum collections and archives at

Chickasaw National Recreation Area would remain unchanged under the no-action alternative, this alternative would not contribute to the impacts of other actions. Consequently, no cumulative impacts on museum collections and archives would result from implementing the no-action alternative.

Conclusion. Museum collections and archives would continue under adequate temperature and humidity conditions but would continue to be at risk from theft, vandalism, and fire, which impacts, if such events occur, would range from minor to moderate and be adverse and long-term. No change in location means no impact upon the convenience of Chickasaw National Recreation Area staffers and outside researchers.

Because there would be no major adverse effects on a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Chickasaw National Recreation Area; (2) key to its natural or cultural integrity or opportunities for its enjoyment; or (3) identified as a goal in its GMP or other relevant NPS planning documents, there would be no impairment of Chickasaw National Recreation Area's resources or values.

Cultural Landscapes and Historic Structures

Analysis. NPS managers have long supported a tradition of careful maintenance and preservation of cultural landscape features and structures in the Platt Historic District. Under current management objectives, this ongoing tradition would be further enhanced using the recent *Cultural Landscape Report* (Hohmann and Grala 2004) as general guidance for proposed treatments. These actions include a wide array of preservation measures, such as trail rehabilitation, fountain and masonry repairs, tree plantings/ replacement, pavilion repairs, and removal of nonhistoric features. Some limited new construction may be undertaken, including picnic shelters at the Bromide Springs and Walnut Grove areas, that would be designed to be obviously contemporary, but in keeping with the historic architecture of these areas. Removal of woody vegetation and invasive cedars from the enclosed buffalo pasture, and rehabilitation of the cultural landscape in the Buffalo and Antelope springs area would better preserve and retain the historic landscape character of these areas.. The Buffalo Springs restroom would be stabilized. The small buffalo herd at the existing pasture would be retained, which would assist management efforts to rehabilitate the pasture as a contributing component of the cultural landscape.

The *Cultural Landscape Report* would provide general guidance for actions to be phased in over an extended period based on funding availability and priorities, in some cases requiring separate Section 106 and NEPA compliance. All work would be carried out in accordance with the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation*, and consequently would be expected to result in no adverse effect to historic properties.

Cumulative Impacts. Although the Platt Historic District retains an overall high level of historic integrity, some alterations have occurred since the 1932-1940 period of significance. For instance, some structures have lost original masonry and historic fabric due to weathering and other factors. A 1.75mile-long section of Perimeter Road around Buffalo and Antelope springs was removed in 1969, log and wood plank trail bridges have been replaced, and some roads and parking areas have been reconfigured and paved. Vegetation patterns have dramatically changed in some areas as well, evidenced by dense stands of woody vegetation and red cedars encroaching into formerly more open areas and obscuring viewsheds. Mission 66 restrooms and other small-scale constructed

features from that period do not contribute to the cultural landscape significance of the Platt Historic District. These factors have adversely affected the current condition and integrity of the cultural landscape and historic structures of the Platt Historic District. Despite these adverse impacts to landscape features:

[T]he overall configuration of the district has remained remarkably constant, with little change or loss of integrity occurring at the levels of design, layout, setting and organization. All of the original component landscapes present in 1940 remain substantially intact today (Hohmann and Grala 2004:250).

Within the boundaries of Chickasaw National Recreation Area (but outside the Platt Historic District), potential historic structural remains and cultural landscape features may be identified through future investigations. These features and remains, should they exist, are likely to have been adversely impacted by natural weathering and other disturbances over an extended period.

Proposed construction of Chickasaw National Recreation Area's new visitor center near Vendome Well is a foreseeable action with the greatest likelihood of contributing cumulative impacts on the cultural landscape of the Platt Historic District. The visitor center near Vendome Well would be seen by visitors approaching along Broadway Avenue toward Chickasaw National Recreation Area's main north entrance. To minimize the visual impacts, the building's design would incorporate appropriate scale and materials to ensure overall compatibility with the existing CCC-era buildings and structures of the Platt Historic District, and other character-defining elements specific to the Vendome Well site. However, the site is not in the boundaries of the National Historic Landmark nomination for the Platt Historic District. Although the visitor center near Vendome Well would introduce a newly constructed element near the periphery of the district, with sensitive

design it would be expected to have no adverse effects on the landscape's overall integrity.

As described above, the impacts associated with implementation of alternative A (the noaction alternative) would result in no adverse effects to Chickasaw National Recreation Area's historic structures and cultural landscapes. Consequently, alternative A would contribute no adverse effects to the overall adverse cumulative impact of other past, present, and reasonably foreseeable actions, both within and outside the recreation area. As the proposed cultural landscape rehabilitation measures of alternative A are implemented over time, the no adverse effects associated with the actions would become an increasingly larger component of the present adverse cumulative impacts.

Conclusion. Proposed actions would follow the Secretary of the Interior's Standards for the Treatment of Archeology and Historic Preservation and would enhance NPS preservation objectives for the Platt Historic District and other potential cultural landscapes. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative A would result in a determination of no adverse effect to the cultural landscape and contributing historic structures. Alternative A would also contribute no adverse effects to the overall adverse cumulative impact of other past, present, and reasonably foreseeable actions.

Because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents, there would be no impairment of Chickasaw National Recreation Area's resources or values.

VISITOR USE AND EXPERIENCE

Analysis. The current trend in visitation is slightly down, perhaps due to the economy, terrorism threats, or gas prices. As the population grows in the local area, as well as the Dallas and Oklahoma City metropolitan areas, visitation would likely increase slightly. Visitation would continue to fluctuate seasonally, rising in the summer and on weekends, and peaking on summer holiday weekends. Visitation would continue to be primarily local and regional.

Visitors would continue to get most of their information from Chickasaw National Recreation Area headquarters in Sulphur (until the planned visitor center near Vendome Well is constructed). Many visitors, particularly repeat visitors, would continue to go directly to other destinations in the recreation area.

Using the *Cultural Landscape Report* as general guidance, visitors would find cultural and natural resources in better condition around the Travertine Nature Center. Visitors would continue to hike on the trails behind the nature center and join in interpretive activities associated with the nature center.

Visitors would continue to engage in the same recreational activities on Lake of the Arbuckles. Visitors to the more remote sections of Chickasaw National Recreation Area would continue to have opportunities to hunt, fish, or hike, but would still not have the opportunity to camp overnight in the backcountry. Visitors desiring to rent boats or have guided concession activities would still not have these opportunities. Educational opportunities would continue to be available to limited audiences at the Goddard Youth Camp.

Occasional poor water quality and decreased water quantity would continue to negatively impact visitor experiences, and incidences of both would likely occur with greater frequency as the population around Chickasaw National Recreation Area increases.

Most visitors would continue to lack a full understanding of recreation area resources and themes. Most visitors would still have minimal contact with recreation area staff and/or facilities for educational purposes.

There would be a continued high potential for crowding during the peak weekends, with accompanying resource degradation and decreased quality of visit. As visitation increases, recreation area visitation could peak on more weekends or increase in the shoulder seasons. This situation has created conflict between visitor uses, which could continue.

Noise levels would increase slightly with the expected small increases to boat use and personal watercraft use. Noise would continue to be highest at the Point and Buckhorn developed areas. There would continue to be opportunities for solitude in the remote and less developed areas of Chickasaw National Recreation Area. During the peak season, there would continue to be minimal opportunities for solitude around the recreation area's developed areas.

Cumulative Impacts. The planned new visitor center near Vendome Well would contribute to a minor beneficial long-term cumulative impact on visitor use and understanding of Chickasaw National Recreation Area. Combined with the minimal actions proposed under no-action, the cumulative impacts on visitor experience in the region would be minor to moderate,

mainly because of the planned visitor center near Vendome Well and the Chickasaw Nation Cultural Center (outside Chickasaw National Recreation Area). The actions proposed under the no-action alternative would contribute only an incremental portion of this impact.

Conclusion. Overall, the current management alternative would result in negligible impacts on the visitor experience in Chickasaw National Recreation Area because there would be minimal changes in visitor opportunities.

SOCIOECONOMIC ENVIRONMENT

Analysis. If the no-action alternative were implemented, recreation area facilities, access, and visitor opportunities would generally be maintained at their existing levels. Thus, it is expected that under this alternative Chickasaw National Recreation Area would continue to have slightly increased visitation (see discussion of visitation above), and the region would realize slightly increased visitor spending. However, these effects would be negligible.

Cumulative Impacts. Current and future plans that might have an effect on the regional economy include the new visitor center near Vendome Well, Chickasaw Nation Cultural Center, continued planning and development at Turner Falls, and casino and associate conference and lodging developments within the county.

In addition, over the next 25 years, Murray County population is expected to grow slightly faster than both the projected statewide population and county historical rates. County population is expected to reach 16,400 people by 2030 for an increase of 30%. The socioeconomic environment around Chickasaw National Recreation Area would be affected by this growth. The cumulative impact on the regional economy, resulting from increased tourism and population growth in the area, would likely be beneficial and minor to moderate. The overall impact analyzed above as a result of continuing existing management would be a small component of the overall cumulative impact.

Conclusion. Any socioeconomic impacts on the region under this alternative would be negligible in effect, although there probably would be both adverse and beneficial cumulative impacts on the regional socioeconomic conditions from anticipated continued regional growth and associated development.

NATIONAL RECREATION AREA OPERATIONS

Analysis. In this alternative the maintenance area/function would remain in Chickasaw National Recreation Area. In general, buildings and facilities in the maintenance area do not meet current needs for space and function, do not meet NPS standards, are in fair condition, and are not universally accessible. Such facility problems have longterm moderate adverse impacts on recreation area operations.

Currently the administrative and maintenance functions of Chickasaw National Recreation Area are separate, which has a long-term minor adverse impact on recreation area operation because of the loss of efficiency.

Cumulative Impacts. Current and future plans that might impact operations are the visitor center near Vendome Well and Chickasaw Nation Cultural Center. Both of these actions could require additional staffing, which in combination with the actions in this alternative, would be a minor beneficial impact. *Conclusion.* Recreation area operations would continue to be adversely impacted in a minor to moderate way under the no-action alternative because of limited maintenance operations and separate administrative and maintenance areas. There would be an overall minor to moderate beneficial cumulative impact; however the actions proposed in this alternative would contribute a small increment to these overall cumulative impacts.

UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are defined as impacts that cannot be fully mitigated or avoided. Under the no-action alternative, some paleontological resources may be lost, potentially due to visitors illegally collecting fossils. Increased education, interpretation, and outreach efforts would help minimize, but not eliminate, the likelihood of this potential impact. Some soils and vegetation would continue to be lost or altered in developed areas due to soil erosion from increased visitor use. Minor adverse impacts also would continue to occur to water quality, primarily due to an increase in waste from visitors. Long-term minor to moderate adverse impacts would continue to the natural soundscape due to visitor use, primarily in high-use areas and during high-use periods. Some long-term minor adverse impacts would likely occur to archeological resources due to visitor use in developed areas and around lakeshores. Finally, NPS operations would continue to experience minor to moderate adverse impacts due largely to the separation of administrative and maintenance areas.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No new actions would be taken that would either result in the consumption of nonrenewable natural or cultural resources, or in the use of renewable resources that would preclude other uses for a period. Because it takes so long for soils to form, the loss of soils due to visitor use in localized areas, and erosion of soil in places within Chickasaw National Recreation Area would be an irreversible commitment of resources.

THE RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Most of Chickasaw National Recreation Area would be protected in its current, relatively natural state and would maintain its long-term productivity. The primary short-term uses of Chickasaw National Recreation Area would continue to be recreational use. Continuing adverse impacts on the area's soils, water quality, vegetation, and wildlife due to visitor use, could reduce the productivity of the area's natural resources in localized areas over time, although overall there would be no measurable effect on the recreation area's long-term productivity. On the other hand, continuing efforts to restore natural prairie and forest vegetation would increase longterm productivity of the environment in localized areas.

ENERGY REQUIREMENTS AND CONSERVATION

Under current management, private vehicles would be the primary means of transportation to and throughout Chickasaw National Recreation Areas. Additional energy requirements (gasoline consumption and fuel for heating and lighting visitor facilities) would be expected only as a direct result of increased visitation. The retrofitting of existing facilities would result in more energy consumption; however, the projects would follow NPS policies concerning sustainability and energy conservation to minimize the overall energy requirements.
CONSEQUENCES OF ALTERNATIVE B (PREFERRED)

NATURAL RESOURCES

Paleontological Resources

Analysis. Most of the new developments or ground-disturbing activities under alternative B (including construction of new restrooms and utility lines in the Veterans Lake area and the Point and Buckhorn campgrounds; the improvements to the Guy Sandy campground; upgrading/construction of trails, and rehabilitation work in the Rock Creek campground) would not occur in areas known to have paleontological resources. To ensure that impacts would be avoided, site-specific surveys would be undertaken before any ground disturbance occurs in areas thought likely to contain fossils. Thus, the construction of new facilities in alternative B would be expected to have a negligible long term adverse impact on Chickasaw National Recreation Area's paleontological resources.

Like alternative A, in alternative B some fossils might be illegally collected by visitors in the southern part of Chickasaw National Recreation Area. However, the lands south of Lake of the Arbuckles are not expected to receive a high level of public use, and exposed fossils are probably not apparent to most visitors. (Although large groups from the Goddard Youth Camp use the area, assuming efforts are made to inform teachers and students that it is illegal to take fossils from the recreation area, and with monitoring of the area, these groups would not be expected to adversely impact the resource.) If recreation area use levels increase in the future, there is the potential that some illegal fossil collecting could occur. But there is no reason to expect that there would be a noticeable increase in the numbers of fossils being illegally collected - most visitors would stay in developed areas in the Platt and Arbuckle districts or be on the Lake of the Arbuckles and would not be in areas known to have fossils. Thus, compared

to the current management alternative, alternative B would have the same potential for a minor long-term adverse impact on Chickasaw National Recreation Area's paleontological resources.

Cumulative Impacts. As in the previous alternative, some fossils may be lost if future developments or other ground disturbance occurs south of the Goddard Youth Camp, outside of Chickasaw National Recreation Area, although the extent and significance of the fossils that would be lost is unknown. Some fossils also likely would continue to be collected on private lands near Chickasaw National Recreation Area. When the likely effects of continued public use of the recreation area in alternative B are added to the effects outside the recreation area, there could be a long-term adverse cumulative impact of unknown magnitude on area fossils.

Conclusion. Compared to the current management alternative, alternative B would be expected to have a long-term negligible adverse impact on Chickasaw National Recreation Area's paleontological resources. There could be a long-term adverse cumulative impact of unknown magnitude on area fossils. This level of impact would not be anticipated to constitute an impairment of the recreation area's resources or values.

Soils

Analysis. Some soils would be lost to erosion and/or substantially altered in local areas where ground disturbance occurs due to new or improved facilities, including development of an amphitheater and shower facility in the Platt Historic District, development of restrooms and utility lines at the Point, Buckhorn, and Guy Sandy campgrounds; and construction of trails in the Central campground and the Veterans Lake areas. Site preparation and landscaping work would disturb soils in all of these areas, and soils would be paved over and lost in the footprint of several of these facilities. Construction equipment also would likely disturb and compact soils in the project areas. However, it is likely that many of these developments would be in already disturbed areas where the soils have been altered by past activities. With mitigation efforts, such as installing erosion matting and silt fences, the local adverse effects on soils in these areas would likely be long-term minor to moderate.

As in the current management alternative, soils in Chickasaw National Recreation Area would continue to be compacted and eroded in local popular use areas by hikers, bicyclists, and horseback riders. New social trails could form in popular use areas with increased visitor numbers. In sloped areas, these social trails could result in increased soil erosion occurring from stormwater runoff. Most of these long-term minor adverse impacts would be limited to popular use areas, such as visitors walking along and down the banks of Rock and Travertine creeks.

The shoreline restoration work around Lake of the Arbuckles might result in some shortterm minor impacts in local areas due to construction equipment disturbing the area and increasing erosion. But in the long term, the shoreline restoration work should help reduce or prevent additional bank erosion and soil loss due to waves, boat wakes, and lake flooding, resulting in a minor to moderate beneficial impact on soils in local areas.

Improving trails to reduce drainage and erosion problems in the Point and Buckhorn campgrounds, and the Rock Creek corridor would help avoid future erosion problems and have a long-term minor beneficial impact on soils in local areas. Improving drainage from the Cold Springs campground also would reduce soil erosion in this area, resulting in a minor beneficial long-term impact. Cumulative Impacts. Alternative B would have about the same potential for cumulative impacts as alternative A. Soils in most of the area surrounding Chickasaw National Recreation Area have been altered by past agricultural practices and developments. In the future, soils would likely be eroded and lost and/or soil properties altered by new developments in the area, including the visitor center near Vendome Well and the Chickasaw Nation Cultural Center. The erosion and/or alteration of soil properties due to past land uses, new developments outside the recreation area, added to the potential impacts from new developments and improvements under alternative B, and from higher use levels in parts of Chickasaw National Recreation Area, would increase soil erosion and alteration in the region, resulting in a longterm minor to moderate adverse cumulative impact on area soils. However, the actions under alternative B would add a very small increment to this overall impact.

Conclusion. Most of Chickasaw National Recreation Area's soils would not be affected by the actions under alternative B. Some soils would be eroded and lost and/or soil properties altered due to the construction of new developments and increased visitor use in developed areas, such as along trails or near water sources. With more ground disturbance due to a number of new developments and likely increased use in those areas, more areas would experience soil impacts in alternative B than in alternative A. On the other hand, the improvements to trails and the Cold Springs campground and shoreline restoration work around Lake of the Arbuckles would reduce soil erosion, resulting in a long-term minor to moderate beneficial impact. Overall, compared to the current management alternative, alternative B would be expected to result in both minor beneficial and long-term adverse soil impacts in localized areas in Chickasaw National Recreation Area. When the impacts inside the recreation area under alternative B are added to impacts from past and future developments outside the

recreation area, there would be the potential for a long-term minor to moderate adverse cumulative impact on area soils — although alternative B would contribute a very small increment to this overall impact. No impairment to Chickasaw National Recreation Area's resources and values would result from soil impacts under this alternative.

Water Quantity Associated with Chickasaw National Recreation Area's Springs

Analysis. With few exceptions, no new actions would be taken in alternative B that would affect the aquifer and the flow of the area's springs. As in alternative A, the National Park Service would continue to use water from the city of Sulphur wells to meet recreation area needs. But the quantity of groundwater being withdrawn for recreational area purposes would be relatively small compared to other uses and would not be expected to substantially grow during the life of this plan.

Under alternative B, the National Park Service would increase its cooperation with adjacent landowners, cities, the state of Oklahoma, and other partners in managing the aquifer, including protecting recharge areas, conducting studies and monitoring. This should have a long-term beneficial impact on water quantity in Chickasaw National Recreation Area, although without knowing what actions might be taken, it is not possible to estimate the magnitude of the impact.

In this alternative, the National Park Service would control flows from Vendome Well, possibly shutting off flows at night. With less groundwater being withdrawn, it would be less likely that the well would affect spring flows. Compared to alternative A, alternative B would likely have a long-term beneficial impact on the flow of Chickasaw National Recreation Area's springs. However, due to a lack of information on the aquifer and the impact of the Vendome Well on the aquifer, it is not possible to predict the extent of the beneficial impact. (It is possible that even with a decrease in the flows from the Vendome Well, there still could be an adverse impact in the future flows of some springs, albeit a smaller impact than in alternative A.) As in alternative A, there is no information to indicate that continued operation of the well would result in an impairment of recreation area resources and values.

Cumulative Impacts. As in alternative A, it is likely under alternative B that additional permits will be sought to drill wells in the aquifer over the next 15-20 years. If new permits were to be granted, the groundwater that would be withdrawn, added to existing uses, would likely approach or exceed the annual recharge of the aquifer (about 128,000 acre-feet per year) (Fairchild et al. 1990). Even if no new permits were granted for water withdrawals, existing wells may already have affected the artesian pressure of the area. These impacts could continue in the future. When the possible impacts of new and existing sources outside of Chickasaw National Recreation Area are added to the possible impacts of operation of the Vendome Well in Chickasaw National Recreation Area, even with a lower withdrawal, there is the potential for a long-term, adverse cumulative impact of unknown magnitude on the aquifer and the flows of Chickasaw National Recreation Area's springs. The changes in the operation of the Vendome Well would add a beneficial increment of unknown magnitude to the overall cumulative adverse impact. The extent of the increment is unknown due to a lack of information regarding the aquifer, the impacts existing withdrawals are having on the aquifer, the likely impacts of future withdrawals, and the importance of Vendome Well flow relative to other discharges. Also, until further studies are completed, it is not possible to predict the extent of the overall cumulative adverse impact on the flow of the springs.

Conclusion. Compared to alternative A, alternative B could have a long-term, beneficial impact of unknown magnitude on the flows of Chickasaw National Recreation Area's springs due to a reduction in the flow of the Vendome Well and increased cooperation with other partners to manage the aquifer. Although it is not possible to predict the extent of the impact, there is no information to indicate that the continued operation of the well would result in an impairment of Chickasaw National Recreation Area's resources and values. However, under alternative B there would be the potential for a long-term, cumulative, adverse impact on the aquifer and the flows of the springs when the reduced flows from the Vendome Well are added to existing and new wells outside the recreation area. The changes in the operation of the Vendome Well would add a beneficial increment of unknown magnitude to this overall adverse cumulative impact. The magnitude of the overall adverse cumulative impact cannot be predicted at present due to a lack of information concerning the aquifer, the impacts existing withdrawals are having, and the extent of future groundwater withdrawals that may occur.

Surface Water Quality

Analysis. Under alternative B, as in all the alternatives, there would be long-term minor to moderate adverse impacts on water quality in portions of Travertine and Rock creeks from increased numbers of visitors swimming and wading in the creeks (particularly in popular swimming/wading areas), and from swimmers in Lake of the Arbuckles and Veterans Lake. Some negligible to minor adverse water quality impacts also could occur in a few local areas due to increased erosion from people accessing the creeks or lakes.

In this alternative most of the new developments and improvements would not be close to water bodies, and thus should have a negligible effect on water quality. The improvement of trails in Chickasaw National Recreation Area to address drainage and erosion problems, and the improvement of drainage in the Cold Springs campground, should result in a reduction in the deposition of sediments in streams, and thus have a longterm minor beneficial impact on water quality.

The shoreline restoration work around Lake of the Arbuckles might result in some shortterm minor impacts on water quality in local areas due to construction equipment disturbing the area and increasing erosion. But in the long term, the restoration work would reduce erosion and sediments in the water and thus have a minor beneficial impact in localized areas.

The completion of the trail around Veterans Lake would have the potential to result in some sediments escaping from construction areas and running off into the lake during storms. With the application of mitigation measures, such as sediment traps, any impacts on water quality would likely be short-term and negligible to minor in local areas.

The replacement of the floating dock at Veterans Lake would have no effect on water quality.

Improving drainage and reducing runoff from the Cold Springs campground would reduce sediments being carried into Travertine Creek. Likewise, the improvement of trails in Chickasaw National Recreation Area to address drainage and erosion problems would result in less sediment being carried into nearby water courses and lakes. This would likely have a long-term negligible to minor beneficial impact on the recreation area's water quality.

Cumulative Impacts. The same potential for sources of water pollution both within and outside Chickasaw National Recreation Area described under alternative A would be true for alternative B (e.g., runoff from agricultural

lands, nearby residences, and city streets, construction-related erosion from new developments, spills of materials on highways, and leaks from municipal sewerlines). Although it is not known when, where, and how many pollutants from all these sources would enter water bodies, it is likely that adverse water quality impacts would occur in the area during the life of the plan. Most of these impacts likely would be minor to moderate in magnitude. In addition, increased use of motorboats on Lake of the Arbuckles would likely discharge more fuel and add more wastes into the lake, resulting in potentially moderate water quality impacts in local areas in the future.

When the negligible to minor adverse and beneficial water quality impacts of alternative B are added to the above potential impacts, it is possible that a long-term minor to moderate adverse cumulative impact could occur to the area's water quality over the life of this plan. However, the actions in alternative B would add a very small increment to this cumulative water quality impact.

Conclusion. As in the current management alternative, alternative B overall would likely result in a long-term minor adverse impact on water quality in local areas, primarily due to an increase in wastes from increased visitor use. None of the actions being proposed would substantially affect Chickasaw National Recreation Area's water quality. Alternative B would have several long-term negligible to minor beneficial impacts in local areas due to trail improvement work, shoreline restoration work along Lake of the Arbuckles, and the adoption of best management practices. There also could be a minor to long-term moderate adverse cumulative impact on water quality when the impacts of alternative B are added to the impacts of other actions within and outside Chickasaw National Recreation Area - although alternative B would add a very small increment to this cumulative impact. Water quality impacts that would occur as a result of alternative B would not be at a level

that would result in an impairment of Chickasaw National Recreation Area's resources and values.

Vegetation

Analysis. Under alternative B vegetation in most areas of Chickasaw National Recreation Area would not be affected.

The new facilities in alternative B, including the improvements in the campgrounds, and the trail improvements in the Rock Creek corridor, would be built within the existing footprints of disturbed areas in which the vegetation already has been substantially altered. The new amphitheater and shower facility in the Platt District also would likely be built in areas where native vegetation has already been altered. Therefore, little additional native vegetation would be affected from construction of these facilities. Given previous vegetation disturbance and the use of appropriate mitigation measures (e.g., ensuring that equipment stays within project area boundaries, revegetating disturbed areas, and taking steps to avoid the spread of nonnative plants), the long-term adverse effects on native vegetation from the new developments would be negligible to minor.

The construction of the new trail from Veterans Lake to the Rock Creek campground and the pathway from the Central campground to Flower Park also would run for short distances and occur in already disturbed areas, resulting in long-term negligible to minor adverse impacts to vegetation.

The completion of the trail around the north shore of Veterans Lake would result in the loss of native vegetation, including wetland vegetation. However, the use of mitigation measures, such as constructing a floating boardwalk or elevated boardwalks in areas, would help minimize these impacts. Thus, the new trail would likely have a long-term minor adverse impact on vegetation in this area.

As in alternative A, the spread of nonnative plants would be a problem in Chickasaw National Recreation Area. Mitigation efforts (e.g., replanting disturbed areas as soon as possible with native plants) would help prevent the spread of nonnative species in the areas where ground is being disturbed for new developments. But increased visitor use throughout the recreation area would increase the potential for the spread of nonnative species. Even with educational efforts, some nonnative plants could be introduced or spread by visitors. Although it is difficult to determine the impact on native species, due to the uncertainties about the type of species that might be introduced and the locations and frequencies of introductions, it is likely, with adequate monitoring and weed control efforts, that impacts on native vegetation would range from minor to moderate in local areas such as along the Rock Creek trail system.

Several actions under alternative B would have a positive impact on Chickasaw National Recreation Area's native vegetation. As in alternative A, continuing efforts to restore prairies and forests and reduce having operations in the Upper Guy Sandy area would result in the expansion of native vegetative communities in this area. The Cultural Landscape Report would provide general guidance for improvements in the Buffalo and Antelope springs area (particularly the control of red cedar) that would result in the expansion of native grasses, forbs, ferns, and trees that are being shaded and crowded out. Rehabilitation of the Rock Creek campground would restore some vegetation and provide additional protection to riparian habitat along the creek. Restoration of vegetation in the Cold Springs campground, and additional planting of native vegetation to screen campsites in the Point and Buckhorn campgrounds, would also beneficially affect native vegetation.

Improvements to the Rock Creek trail system would help reduce impacts from people walking or riding around muddy areas and trampling vegetation. In addition, under alternative B efforts to stabilize and restore the shoreline around Lake of the Arbuckles would result in the loss of some vegetation in the short term due to the use of construction equipment, but in the long term would help expand native vegetation. Taken as a whole, all of the restoration efforts would have a long-term minor to moderate, beneficial impact on Chickasaw National Recreation Area's native vegetative communities.

Cumulative Impacts. Alternative B would have about the same potential for cumulative impacts as alternative A. Even with the shoreline stabilization work under alternative B, increases in personal watercraft and motorboat use on Lake of the Arbuckles could result in long-term negligible to minor adverse impacts on shoreline vegetation due to people anchoring their boats along the shoreline and walking back and forth to the shore. These impacts would likely occur mostly near camping areas and boat launch areas, private properties where landowners moor their craft, and in shallow areas and small arms of the lake, such as Rock Creek (NPS 2003a).

Outside Chickasaw National Recreation Area, most native prairie and forest communities have disappeared or have been substantially altered by human activities such as agricultural operations and housing and other developments. New developments such as the Chickasaw Nation Cultural Center might result in the loss of some additional native vegetation.

When the adverse and beneficial impacts of alternative B are added to actions that have occurred, and are likely to occur, in the area surrounding Chickasaw National Recreation Area, there would be a major, long-term, adverse cumulative impact on the area's native vegetation. However, the actions in this alternative would add both a small positive increment and a small negative increment to this overall impact, given how much change has already occurred to the vegetative communities once present.

Conclusion. As in the current management alternative, alternative B would result in both beneficial and adverse impacts on Chickasaw National Recreation Area's native vegetation. Some long-term negligible to minor adverse impacts would occur in local areas due to proposed new developments and increased visitor use levels. On the other hand, vegetation restoration efforts would likely have long-term minor to moderate beneficial impacts in a relatively large part of the recreation area. When the effects of this alternative are added to past changes in native vegetation that have occurred in the area surrounding Chickasaw National Recreation Area, there would be a major long-term adverse cumulative impact on native vegetation. However, the actions under alternative B would add both small positive and negative increments to this overall cumulative impact. None of the vegetation impacts that would occur under this alternative would be sufficient to result in an impairment of Chickasaw National Recreation Area's resources and values.

Wildlife

Analysis. As noted in the previous alternative, Chickasaw National Recreation Area's wildlife populations and habitats have been altered over time by people. The human use of the recreation area is concentrated on Lake of the Arbuckles, in developed areas such as campgrounds, on trails, and in the Platt District. Animals sensitive to human activities already avoid these areas when people are present. Wildlife that occupies these developed areas such as raccoons, armadillos, squirrels, rabbits, and mice are mostly adapted to the presence of people and would not be noticeably affected by the actions in alternative B. As in all of the alternatives, some animals would continue to occasionally be injured or killed by motor vehicles driving on Chickasaw National Recreation Area's roads. Some animals also probably would continue to be attracted by visitors feeding them or to areas where food and garbage are left out. But the adverse effects on wildlife from these activities in alternative B would be the same as those in alternative A: local and negligible, resulting in no measurable changes to the recreation area's wildlife populations.

Increased hunting would likely occur in Chickasaw National Recreation Area over the life of the plan, as in all of the alternatives, which would result in higher numbers of game animals, such as deer and turkey, being harvested over time. However, with careful regulation of hunting by the state and National Park Service, the increase in harvest levels would have the same effect as alternative A: a long-term negligible to minor adverse impact on a few game species.

The proposed new trails, new amphitheater and restrooms, and other improvements to developed areas such as the utility improvements in the campgrounds in alternative B, would occur in areas that have already been disturbed. Wildlife remaining in these areas have adapted to the presence of people. Although increased noise and human activity during the construction periods could temporarily displace some animals, the impact on wildlife populations and habitats in these areas would be short-term and negligible.

Under alternative B, as in alternative A, efforts to restore prairie and forest in the Upper Guy Sandy area would continue. These actions would increase the diversity and size of wildlife habitat and benefit wildlife populations that are found in these habitats. Efforts to control the spread of red cedar and restore prairie would benefit species that require open areas or an open understory, such as bobwhite quail, wild turkey, and a wide variety of reptiles. Restoring prairie would possibly allow the reintroduction of other species that once were found in Chickasaw National Recreation Area (e.g., bison, prairie chicken, and pronghorn antelope). Efforts to control red cedar in the Platt District also would increase habitat diversity and benefit species like white-tailed deer. These actions would have the same effect as the no-action alternative: a long-term minor to moderate beneficial impact on the recreation area's wildlife populations and habitats.

Also under alternative B efforts would be undertaken to restore the vegetation and parts of the shoreline around Lake of the Arbuckles. Depending upon the extent and nature of the restoration efforts, this effort could expand habitat for native wildlife and have a longterm minor beneficial impact on wildlife populations.

Cumulative Impacts. Like vegetation, most wildlife populations near Chickasaw National Recreation Area have been substantially altered by human activities, including farming and developments, resulting in fewer numbers of native wildlife. Thus, past actions have had a major adverse impact on native wildlife outside the recreation area. No current or reasonably foreseeable actions are likely to change this. When the beneficial and adverse impacts of alternative B are added to the impacts that have occurred in the vicinity of the recreation area, there would be a longterm major adverse cumulative impact on the area's wildlife populations and habitats. However, alternative B would contribute a very small negative increment to this overall impact, as well as a small beneficial increment by continuing to provide an area where wildlife habitat continues to be managed and protected.

Conclusion. Alternative B would have some adverse but also some beneficial impacts on Chickasaw National Recreation Area's wildlife populations and habitats. Most wildlife in the recreation area would not

change as a result of the actions in this alternative. No actions would adversely affect areas known to be important for breeding, nesting, or foraging, or key migration routes. No actions would occur that would interfere with feeding, reproduction, or other activities necessary for the survival of a wildlife population.

Some short-term negligible adverse impacts would occur to wildlife populations in local areas due to the construction of new developments in Chickasaw National Recreation Area. As in all of the alternatives, long-term minor adverse impacts also would continue to occur due to continuing visitor use of the recreation area. On the other hand, there would be long-term minor to moderate beneficial impacts on some wildlife populations due to continuing efforts to restore prairie and forest in the Upper Guy Sandy area. When the beneficial and adverse impacts of alternative B are added to the impacts that have occurred in the vicinity of Chickasaw National Recreation Area, there would be a long-term major adverse cumulative impact on the area's wildlife populations and habitats. However, the actions under alternative B would contribute very small beneficial and adverse increments to this cumulative impact. None of the wildlife impacts resulting from alternative B would constitute an impairment of Chickasaw National Recreation Area's resources and values.

Threatened and Endangered Species (Bald Eagle)

Analysis. Under alternative B none of the actions being proposed would be expected to affect bald eagles in Chickasaw National Recreation Area. None of the proposed developments would be built where the bald eagles roost in the winter in the Lake of the Arbuckles area.

Under alternative B, as in alternative A, there is a chance that with increased use levels in the future, some visitors might deliberately or accidentally disturb the birds while they are roosting or feeding on the lake. Any disturbance would likely be minimal and would not cause eagles to stop using Chickasaw National Recreation Area. Consequently, visitors might affect, but would not likely adversely affect, bald eagles in the recreation area.

The bald eagle population is expanding, and it is possible that in the future bald eagles could nest in Chickasaw National Recreation Area. If this were to occur, the nesting area(s) would be monitored. Visitors also would be informed about the eagles and kept away from the nesting site(s) to avoid disturbing the birds. People in the area might affect, but would not likely adversely affect, nesting eagles; provided they are kept an adequate distance from the nests.

Cumulative Impacts. Bald eagles are found across this region, and there are several large roosting and foraging sites near Chickasaw National Recreation Area. No actions are known to be adversely affecting the eagles and their habitat outside of the recreation area. It is possible that off-season personal watercraft and other motorboat use on Lake of the Arbuckles could occasionally affect the birds when they are feeding in the area. When these effects are added to the effects of alternative B, there is a slight chance that there could be a cumulative impact. However, this effect would not likely adversely affect bald eagles in the area and any disturbance would be minimal, highly localized, and would not be expected to deter the eagles from using the area or affect population numbers or their habitat

Conclusion. Overall, alternative B may affect, but would not be likely to adversely affect, bald eagles. As in the no-action alternative there is a possibility that visitors could disturb eagles roosting or feeding on Lake of the

Arbuckles, but this short-term effect would not likely adversely affect bald eagles in Chickasaw National Recreation Area. There is a slight chance that there could be a cumulative impact if off-season personal watercraft or motorboat use on the lake were also to disturb the eagles, although again this would not be likely to adversely affect the eagles. None of these impacts would result in an impairment of Chickasaw National Recreation Area's resources and values.

Soundscape

Analysis. Facility construction and improvement projects would affect Chickasaw National Recreation Area's soundscape in local areas. Construction workers and equipment would generate noise during the construction of the new amphitheater and shower facility in the Platt District; in rehabilitating the Rock Creek campground; in improving the Cold Springs, Central, Buckhorn and Point campgrounds. Noise also would be generated through vegetation restoration efforts in the Upper Guy Sandy area and around Lake of the Arbuckles. In some of these areas, the noise from construction equipment (e.g., chainsaws) would be substantial, but it would be temporary and local and would occur at different times and places throughout Chickasaw National Recreation Area. As in alternative A noise from NPS maintenance activities such as maintaining trails, mowing grass, and removing garbage, would also continue to be occasionally heard, primarily in developed areas. Overall, noise from construction, maintenance, and restoration activities would have a short-term minor to moderate adverse impact on the natural soundscape in local areas, depending upon the activity, presence of other facilities and people, vegetation, and wind. More areas would experience these noise impacts under alternative B than in alternative A.

As in all of the alternatives, under alternative B there would continue to be high levels of noise, mostly during the peak-use season, due to visitors and their vehicles, primarily in developed areas, including campgrounds, picnic areas, roads, boat ramps, parking areas, trails, the Travertine Nature Center, and the Goddard Youth Camp. These impacts would be transitory, but would increase in intensity and duration during summer holidays and weekends when high numbers of visitors were present. Thus, there would be long-term minor to moderate adverse noise impacts in local areas through Chickasaw National Recreation Area. Although visitor use levels would likely continue to increase over the life of the plan, the resulting increase in noise levels would not be expected to rise beyond a moderate level in localized areas. Most impacts on the natural soundscape would continue to be mostly confined to developed portions of the recreation area, and popular use areas like Lake of the Arbuckles, Veterans Lake, the Buffalo and Antelope springs area, and Travertine Creek.

Cumulative Impacts. Being adjacent to the city of Sulphur, noise from vehicles on highways and roads, machinery, and peoples' voices, would be heard in the Platt District. Noise from residences near Lake of the Arbuckles and other areas near Chickasaw National Recreation Area would also continue to be heard, as well as agricultural operations and occasional low-flying military craft. These adverse noise impacts would be minor to moderate, depending upon the type of noise and location, and intermittent and long-term — occurring every year.

On Lake of the Arbuckles and the immediate surrounding area there would also be minor to moderate seasonal long-term adverse impacts due to noise from personal watercraft and motorboats (NPS 2003a).

When all of these impacts are added to the impacts of implementing alternative B, there would be the potential for a long-term minor

to moderate adverse cumulative impact on the natural soundscape. However, these cumulative impacts would usually occur at certain times, such as at peak-use periods like weekends and holidays, and be mostly confined to local high use areas, such as Lake of the Arbuckles, developed areas along Rock and Travertine creeks, and other areas close to Chickasaw National Recreation Area's boundary where there are roads, residences, businesses, and other developments. Alternative B consequently would add a small increment to the overall cumulative impact.

Conclusion. Parts of Chickasaw National Recreation Area would continue to be relatively quiet most of the time under alternative B, such as the Upper Guy Sandy area. But compared to alternative A, more areas would experience long-term minor to moderate adverse impacts on the natural soundscape due to construction and restoration activities under alternative B. Most of these adverse impacts would occur in high use areas, including campgrounds, trails, picnic areas, roads, boat ramps, Buffalo and Antelope springs, Travertine Creek, and Travertine Nature Center. There would also be the potential for a long-term minor to moderate adverse cumulative impact when the noise resulting from the alternative is added to noise from activities outside Chickasaw National Recreation Area, as well as motorboat use on Lake of the Arbuckles (although alternative B would add a small increment to this overall cumulative impact). None of these noise impacts; however, would be sufficient to result in an impairment of Chickasaw National Recreation Area's resources and values.

CULTURAL RESOURCES

Archeological Resources

Analysis. Archeological resources adjacent to or easily accessible to visitors from trails, roads, picnic shelters, campgrounds, docks, or boat

launching ramps; or from such places as the periphery of the bison pasture of the Platt District, or that of a new bison pasture in the Upper Guy Sandy area to periodically rotate the bison between it and the current pasture; or the mineral or freshwater springs; or along Chickasaw National Recreation Area's lakeshores, creeks, and streams; could be vulnerable to surface disturbance, inadvertent damage, and vandalism.

Deterioration of cultural remains could result by way of a loss of surface archeological materials, alteration of artifact distribution, or a reduction of contextual evidence. Any adverse impacts on archeological resources would be long-term and negligible to minor in intensity. However, continued and even increased ranger patrolling and emphasis on visitor education under this alternative, would discourage vandalism and inadvertent destruction of cultural remains; and any adverse impacts are expected to be minimal, if any.

Archeological surveys would precede any ground disturbance associated with construction of the approved visitor center near Vendome Well for the possible installation of wayside exhibits; and for several trail changes to widen, harden, relocate, or improve drainage, as well as new trail construction in some cases. Important archeological resources would be avoided to the greatest extent possible, and no adverse effects would be anticipated. In the unlikely event that such resources could not be avoided by the called-for construction of new trails, restrooms, docks, or campgrounds, an appropriate mitigation strategy would be developed in consultation with the Oklahoma state historic preservation officer.

Cumulative Impacts. Past development in Chickasaw National Recreation Area such as the 1909 construction of Lincoln Bridge over Travertine Creek (formerly Sulphur Creek), the 1933–1940 construction of rustic architectural facilities by the Civilian Conservation Corps, the construction of carriage ways, and later automobile roads, and two sets of railroad tracks; may have resulted in the disturbance and loss of some archeological resources during excavation and construction activities. In addition, agricultural practices, the development of the historic city of Sulphur in the late 19th and early 20th centuries and its relocation nearby to the north, the formation of Lake of the Arbuckles in 1961 by the Bureau of Reclamation, and the more recent growth and expansion of residential areas impinging upon Chickasaw National Recreation Area, are all examples in and near Chickasaw National Recreation Area of actions that may also have previously disturbed archeological resources. Some of these types of activities continue, such as the planned construction of a Chickasaw Nation Cultural Center adjacent to Chickasaw National Recreation Area, and could also result in future adverse impacts to archeological resources. Alternative B would contribute no adverse impacts to the impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would remain adverse.

Conclusion. Avoidance of national register eligible archeological resources during the ground disturbances of construction would result in no adverse impacts to these resources. In the unlikely event disturbance of such archeological resources could not be avoided, a memorandum of agreement, in accordance with 36 CFR Part 800.6, *Resolution* of Adverse Effects, would be negotiated between Chickasaw National Recreation Area and the Oklahoma state historic preservation officer (and/or the Advisory Council on Historic Preservation, if necessary). The memorandum of agreement would stipulate how the adverse effects would be mitigated.

Because efforts to the greatest extent possible would be taken to avoid important archeological resources, no adverse effects would be anticipated from alternative B. Nevertheless, some ground-disturbing activities would continue, such as the planned construction of a Chickasaw Nation Cultural Center adjacent to Chickasaw National Recreation Area, which could result in future adverse impacts to archeological resources. Alternative B would contribute no adverse impacts to the impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would remain adverse.

There would be no impairment of Chickasaw National Recreation Area's resources or values. Because important archeological resources would be avoided during grounddisturbing activities, there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents.

Ethnographic Resources

Note: an ethnographic resource is defined as the identification of a specific contemporary human group or family using a particular place over time in a way relevant to that group's traditional cultural heritage and social identity.

Analysis. Management actions under alternative B would include not only some hydrological monitoring over time but also additional hydrological studies, as well as regional watershed partnering. Not much is known about the spring water. (The patterns of groundwater flow that influence and recharge the springs in the Platt Historic District are the subject of the analysis of impacts to natural resources elsewhere in this plan.) If a particular spring should stop flowing, as has happened at Bromide and Medicine springs, such a spring would lose its physical and cultural importance as a perceived aid to health and recreation to those European American and American Indian families who regularly use the springs. However, the hydrological monitoring, further research, and regional watershed partnering called for over time under alternative B could help the National Park Service protect and preserve the springs' sources of water by contributing to a data and research base for local and regional comparison. Water-monitoring impacts under alternative B on the springs as a potential ethnographic resource for European Americans and American Indians could range from minor to moderate and be beneficial, and long-term depending upon what is learned through the monitoring, research, and watershed partnering, and what preservative measures might be implemented.

Using the *Cultural Landscape Report* for the Platt Historic District (Hohmann and Grala 2004) as general guidance, the historic Osage orange tree in Walnut Grove known as the Monkey Tree would be preserved by balancing its traditional social and cultural use as a tree on which children climb and play, and which "according to oral histories, was extant at the end of the period of significance [1940]" (Hohmann and Grala 2004:222), with biological nurture. An example of the former is to:

retain dead branches for [children's] bouncing. Trim potentially hazardous branches.

An example of the latter is as follows:

If compaction around base of tree becomes severe, a mulch of hardwood chips two to four inches deep may be applied around the base of the tree (Hohmann and Grala 2004:334). The *Cultural Landscape Report* recognizes that playing on the tree could injure it. It also concludes that since such children's play is traditional, it should be continued (Hohmann and Grala 2004:334). Therefore, because continued access would be allowed, management under alternative B would mean a long-term minor beneficial impact on the Monkey Tree as a potential ethnographic resource for the children of European American and American Indian families.

Access to "all the trails in the recreation area" as a collective ethnographic resource would be continued and substantial new trail segments created. By providing continued enjoyment to the Wallace family of the Chickasaw people, and to other families, both American Indian and European American, who seek trail experiences, impacts on trails as ethnographic resources by national recreation area management actions under alternative B would be long-term, moderate, and beneficial.

Cumulative Impacts. Past residential, commercial, and agricultural development in the region around Chickasaw National Recreation Area that draws drinking water and other water uses from the Arbuckle-Simpson Aquifer may have influenced changes in the groundwater-flow pattern, perhaps in turn influencing the cessation of water flow at Bromide and Medicine springs in Chickasaw National Recreation Area. A current proposal for certain ranchers drawing upon the Arbuckle-Simpson Aquifer to sell and pump water north, as the water supply for Oklahoma City is under hydrological study by the Oklahoma Board of Water Resources. Any disturbance reducing the flow of the springs would be adverse.

Past visitation involving children playing on the Monkey Tree may have adversely impacted the tree by injuring it. Current anticipation is for visitation to increase from the adjacent Chickasaw Nation Cultural Center and from overflow crowds from neighboring parks such as Turner Falls Park of the city of Davis and Lake Murray State Park during warm weather holidays constituting peak recreation periods. Increased visitation would lead to more risk of damage to the tree. Any damage would be adverse.

The past trail development and maintenance found in Chickasaw National Recreation Area and in neighboring parks such as Turner Falls Park of the city of Davis and Lake Murray State Park would continue in varying ways into the future and benefit trail users by providing better walking and hiking conditions. The trail experience could become more crowded because the current expectation is for visitation to increase from the adjacent Chickasaw Nation Cultural Center, and from overflow crowds from neighboring parks like Turner Falls Park and Lake Murray State Park during warm weather holidays constituting peak recreation periods. Crowding would adversely affect trail enjoyment.

Implementation of alternative B would contribute both adverse and beneficial impacts to the impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would be beneficial and implementation of alternative B would be a more substantial component of the overall beneficial cumulative impact than alternative A.

Conclusion. Alternative B, the preferred alternative, calls for monitoring and conducting further research on the hydrological conditions of the springs, as well as watershed partnering, and would impact the springs as potential ethnographic resources for European Americans and American Indians in a beneficial long-term range from negligible to minor to moderate, depending upon what is learned and implemented from the monitoring, further research, and partnering.

Since alternative B calls for the preservation of the Monkey Tree while permitting continued children's play on its branches, few adverse impacts to the Monkey Tree as a potential ethnographic resource are anticipated. Rather, long-term, minor, and beneficial effects would be expected to preserve it as long as possible for more generations of children to climb and play.

For members of the Wallace family of the Chickasaw people and others like them who seek the enjoyment of walking the trails, impacts of management actions on the trails as ethnographic resources under alternative B would be long-term, moderate, and beneficial because access would not only be maintained, but also substantially improved through widening, better drainage configuring, and new construction.

Implementation of alternative B would contribute both adverse and beneficial impacts to the impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would be beneficial and implementation of alternative B would be a more substantial component of the overall beneficial cumulative impact than alternative A.

There would be no impairment of Chickasaw National Recreation Area's resources or values. Because important ethnographic resources would be avoided during grounddisturbing activities, there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area, or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents.

Museum Collections and Archives

Analysis. Under alternative B, as with alternatives A and C, change would occur; and under alternatives B and C, the same changes would occur. Chickasaw National Recreation Area's collections would be divided between (1) cultural history collections and archives and (2) natural history collections. The collections would be moved to different locations outside Chickasaw National Recreation Area. The concept is regionalization, by way of moving collections to centralized locations. The cultural history collections and archives would be moved, but the location for Chickasaw National Recreation Area has not yet been determined. It could possibly be to an Oklahoma repository in a new partnership to emphasize regional ties within the state. Within the National Park Service, it could be to Bents Old Fort National Historic Site, La Junta, Colorado, or to the Western Archeological and Conservation Center of the National Park Service in Tucson, Arizona.

The natural history collections could be moved to an Oklahoma repository such as the Sam Noble Oklahoma Museum affiliated with the University of Oklahoma at Norman (NPS 2006a; NPS 2006b), which already is taking care of some of Chickasaw National Recreation Area's natural history collections. The moves, when completed, would be consistent with NPS's Museum Collection Facilities Strategy, Intermountain Region (NPS 2005), which calls for regionalization by establishing centralized locations for collections. The moves would also be consistent with the policy of the Southern Plains Inventory and Monitoring Network of the National Park Service for park units to make their own natural history repository arrangements (NPS 2005b; NPS 2006c). The possible locations mentioned would meet all aspects of museum standards for the curation and storage of collections. These moves would mean that long-term moderate beneficial effects would result from providing improved space meeting museum standards in a repository away from Chickasaw National Recreation Area for both the cultural history museum collections, including the archives, and the natural history collections to conduct future curation, storage, and research on such collection materials as Chickasaw National Recreation Area's artifacts, specimens, documents, and photographs.

During the anticipated moves to their different repository locations, both the cultural history and natural history collections would be subject to damage. However, the packing and handling of museum archives, artifacts, and specimens is done for maximum protection. Therefore, negligible impacts on museum collections and archives would be expected because of the low, short-term risk involved in packing and moving.

The impact on access to collections of (1)moving the cultural history collections and archives to a centralized repository out of Chickasaw National Recreation Area, but in Oklahoma, or to Colorado or Arizona, and of (2) moving the natural history collections away from Chickasaw National Recreation Area to a centralized repository in Oklahoma would mean long-term minor to moderate adverse inconvenience to local researchers. Such researchers would have to travel a greater distance to Colorado or Arizona for cultural materials or, to a lesser extent, to elsewhere in Oklahoma for cultural materials and biological specimens. The same inconvenience would exist for national monument staffers who needed to use the original collections. However, centralizing these collections would be scientifically sound for the ease of comparison of related collections. That is, it would make scientific comparison, in general, and archeological, biological, historical, and ethnographic comparison, in particular, more readily achievable with related collections housed in the relevant centralized repositories and would mean long-term minor to moderate

beneficial impacts regarding collection centralization for scientific purposes.

Cumulative Impacts. Development of space, meeting all the variables of museum standards in the past has occurred at Bents Old Fort National Historic Site, La Junta, Colorado; and at the Western Archeological and Conservation Center, Tucson, Arizona; by the National Park Service establishing a curation and storage facility at each of these places. Any repository selected for cultural history or natural history collections in Oklahoma would also meet all the variables of museum standards. The Sam Noble Oklahoma Museum of Natural History, for example, opened on the campus of the University of Oklahoma at Norman on May 1, 2000. This new museum building is contributing new space that meets all the variables of museum standards and is where Chickasaw National Recreation Area could arrange for the curation and storage of the remainder of its natural history collections. That would be in addition to those natural history collections of Chickasaw National Recreation Area that the Sam Noble Oklahoma Museum is currently curating and storing. This museum was founded in 1899 as the Stovall Museum of Science and History, and became the Oklahoma Museum of Natural History by an act of the Oklahoma legislature in 1987.

The trend to provide space for collections meeting museum standards is expected to continue as part of a NPS plan to centralize cultural history collection facilities under the approved NPS Museum Collection Facilities Strategy, Intermountain Region (NPS 2005), by moving and concentrating collections from park units into such collection facilities that will provide centralized space under museum standards for curation, storage, and research for archeological, ethnographic, historic artifacts, and archives including historic photographs. More centralized space is anticipated to become available for park units like Chickasaw National Recreation Area to relocate their cultural collections, resulting in

a long-term moderate beneficial intensity that will meet museum standards, and that will benefit cultural collections and archives. The long-term moderate beneficial effects of alternatives B and C would contribute to the impacts of other past, present, and reasonably foreseeable actions as a small component to other long-term moderate beneficial centralized museum-standard spaces in the NPS Intermountain Region. The overall cumulative impact would be beneficial.

Conclusion. Negligible impacts on museum collections and archives would be expected because of the low, short-term risk involved in packing and moving cultural history and natural history items to be relocated. Overall, moderate beneficial and long-term effects would result from providing or arranging for more museum-standard space. The change in location away from the maintenance area of Chickasaw National Recreation Area would result in long-term minor to moderate adverse impacts resulting in inconvenience to Oklahoma researchers and Chickasaw National Recreation Area staff to travel to Colorado or Arizona. However, the concentration and centralization of both Chickasaw National Recreation Area's cultural history collections, including archives; and natural history collections, albeit in different locations, would mean long-term moderate beneficial impacts to museum collections and archives because of the greater prevalence of curation and storage conditions meeting museum standards and because of the cultural, historical, and scientific soundness resulting from the increased ease of comparison with related collections.

More space is anticipated in different locations of a long-term moderate beneficial intensity that will meet museum standards and that will benefit Chickasaw National Recreation Area's cultural history collections and archives, and natural history collections in the Intermountain Region by providing or arranging for centralized facilities for curation, storage, and research. Centralization will contribute to the overall cumulative impact of alternatives B and C that would be beneficial, moderate and long-term for museum collections and archives.

There would be no impairment of Chickasaw National Recreation Area's resources or values for the following reason. There would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents. There would be no impairment of Chickasaw National Recreation Area's resources or values.

Cultural Landscapes and Historic Structures

Analysis. Under alternative B, Chickasaw National Recreation Area's long-standing tradition of historic preservation within the Platt Historic District would be enhanced using the recent Cultural Landscape Report (Hohmann and Grala 2004) as general guidance for proposed treatments. These actions include a wide array of preservation measures, such as trail rehabilitation, fountain and masonry repairs, tree plantings/ replacement, pavilion repairs, and removal of nonhistoric features. Some limited new construction may be undertaken, including picnic shelters at the Bromide Springs and Walnut Grove areas, that would be designed to be obviously contemporary, but in keeping with the historic architecture of these areas. Removal of woody vegetation and invasive cedars from the enclosed buffalo pasture, and rehabilitation of the cultural landscape in the Buffalo and Antelope springs area would better preserve and retain the historic landscape character of these areas.

Management efforts to rehabilitate the buffalo pasture as a contributing component of the cultural landscape would be assisted by retaining the small buffalo herd at this location, and undertaking a study to determine optimal herd size. Implementation of these actions would result in no adverse effect to historic structures and cultural landscape features.

With sensitive designs that ensure the preservation and protection of historic structures and the character of the cultural landscape, other proposed measures, such as construction of a small-scale amphitheater, additional picnic shelters, and shower facilities in the Platt Historic District; and various improvements for the Cold Springs, Central, and Rock Creek campgrounds (e.g., road, trail, restroom, and drainage system upgrades) would similarly result in no adverse effect to historic structures and contributing features of the cultural landscape. Opening a former access road to the Buffalo and Antelope springs area as a pedestrian trail and administrative access route would not diminish the integrity of the cultural landscape in this area. It would enhance opportunities for visitor and community connections to, and appreciation of, the cultural landscape.

As necessary, additional investigations and preservation measures would be undertaken to identify and protect a diverse array of cultural landscapes throughout Chickasaw National Recreation Area. For example, investigations would precede proposed development at Veterans Lake (e.g., new trails, a horse camp, and campsites, etc.), to ensure that potential cultural landscape features associated with Work Progress Administration activities during the 1930s are adequately taken into consideration and protected. Additional investigations may be implemented to more fully document vernacular cultural landscapes associated with historic land use in other areas of Chickasaw National Recreation Area, such as those

associated with early homesteading and ranching activities. Documentation of these resources would provide further baseline data, yielding a more complete understanding of regional cultural history prior to establishment of the recreation area, and would inform preservation undertakings.

Proposed rehabilitation and adaptive use of the existing maintenance area structures would help ensure the long-term preservation of these contributing CCC-built structures. Construction of a new maintenance complex would occur at a yet-to-be-determined location outside of Chickasaw National Recreation Area (or within the recreation area but outside of the Platt Historic District) selected to minimize intrusion on historic viewsheds and the integrity of the district. No adverse effects to historic structures or cultural landscape features are anticipated from these measures.

Implementation of the above actions would be phased in over an extended period based on funding availability and priorities; in some cases requiring separate Section 106 and NEPA compliance. New construction, additions, or alterations to the cultural landscape would be undertaken in a manner that does not diminish character-defining features of the cultural landscape. Such undertakings would be compatible with the massing, scale, and other qualities contributing to the NHL significance of the Platt Historic District. All work would be carried out in accordance with NPS Management Policies and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, and consequently would be expected to result in no adverse effect to historic properties.

All work would be carried out in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, and consequently would be expected to result in no adverse effect to historic properties.

Cumulative Impacts. Although the Platt Historic District retains an overall high level of historic integrity, some alterations have occurred since the 1932-1940 period of significance. For instance, some structures have lost original masonry and historic fabric due to weathering and other factors. A 1.75mile-long section of Perimeter Road around Buffalo and Antelope springs was removed in 1969, log and wood plank trail bridges have been replaced, and some roads and parking areas have been reconfigured and paved. Vegetation patterns have dramatically changed in some areas as well, evidenced by dense stands of woody vegetation and cedars encroaching into formerly more open areas and obscuring viewsheds. Mission 66 restrooms and other small-scale constructed features from that period do not contribute to the cultural landscape significance of the Platt Historic District. These factors have adversely affected the current condition and integrity of the cultural landscape and historic structures of the Platt Historic District. Despite these adverse impacts to landscape features:

[T]he overall configuration of the district has remained remarkably constant, with little change or loss of integrity occurring at the levels of design, layout, setting and organization. All of the original component landscapes present in 1940 remain substantially intact today (Hohmann and Grala 2004:250).

Within the boundaries of Chickasaw National Recreation Area (but outside the Platt Historic District), potential historic structural remains and cultural landscape features may be identified through future investigations. These features and remains, should they exist, are likely to have been adversely impacted by natural weathering and other disturbances over an extended period.

Proposed construction of Chickasaw National Recreation Area's new visitor center near Vendome Well is a foreseeable action with the greatest likelihood of contributing cumulative impacts on the cultural landscape of the Platt Historic District. The visitor center near Vendome Well would be seen by visitors approaching along Broadway Avenue toward Chickasaw National Recreation Area's main north entrance. To minimize the visual impacts, the building's design would incorporate appropriate scale and materials to ensure overall compatibility with the existing CCC-era buildings and structures of the Platt Historic District, and other character-defining elements specific to the Vendome Well site. However, the site is not in the boundaries of the National Historic Landmark nomination for the Platt Historic District. Although the visitor center near Vendome Well would introduce a newly constructed element near the periphery of the district, with sensitive design it would be expected to have no adverse effects on the landscape's overall integrity.

As described above, the impacts associated with implementation of alternative B would result in no adverse effects to Chickasaw National Recreation Area's historic structures and cultural landscapes. Consequently, alternative B would contribute no adverse effects to the overall adverse cumulative impact of other past, present, and reasonably foreseeable actions, both within and outside the recreation area. Over time, as more of the proposed cultural landscape rehabilitation measures are completed, the no adverse effects associated with implementing these actions under alternative B would become an increasingly larger component of the cumulative impacts on these resources.

Conclusion. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR Part 800.5, *Assessment* of Adverse Effects), the National Park Service concludes that implementation of alternative B would result in no adverse effects to the cultural landscape and contributing historic structures. Alternative B would also contribute no adverse effects to the overall adverse cumulative impact of other past, present, and reasonably foreseeable actions. Proposed actions would follow approved standards and guidelines and would enhance NPS preservation objectives for the Platt Historic District and other potential cultural landscapes.

Because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents, there would be no impairment of the recreation area's resources or values.

VISITOR USE AND EXPERIENCE

Analysis. Overall recreation area visitation would likely increase under this alternative B due to increased opportunities for recreational activities. The length of the shoulder season (spring and fall) might also increase, and the average length of stay might increase if there is the perception or reality that there is more to do at Chickasaw National Recreation Area. The likelihood of crowding during peak weekends would be high, and the recreation area might be at this peak visitation for longer periods or more weekends during the summer. Visitation, while still primarily local and regional, might expand to attract new audiences from farther away if increased recreational activities and overnight accommodations were provided by concessioners.

There would be an increase in the variety of recreational activities available at Chickasaw National Recreation Area. This includes the possibility of concession-operated activities (boat tours, boat rentals, and bus tours, etc.), backcountry camping, improved trail systems, hiking a new trail around the lake, and horse camping opportunities. These changes would have a positive impact on visitors wanting to participate in structured recreational activities, or wanting greater access to the recreation area's remote areas. This would also provide visitors with increased opportunities to come into contact with, or deeper contact with, recreation area resources and opportunities to increase their knowledge of and appreciation for the recreation area.

Visitors would continue to get most of their information about Chickasaw National Recreation Area from the new planned visitor center near Vendome Well. However, they would have additional opportunities to get information and orientation from recreation area concessioners and to increase visitor enjoyment and their knowledge of, and appreciation for, recreation area resources.

Using the Cultural Landscape Report as general guidance, visitors would find cultural and natural resources in better condition around the Travertine Nature Center. Paving the trail to Buffalo and Antelope springs would provide increased access for visitors with disabilities. Reopening the restroom in the Buffalo and Antelope springs area would provide additional amenities to recreation area visitors and not require them to return to the Travertine Nature Center to use restroom facilities. However, paving the trail would create a less rustic and less historically accurate experience. Increased interpretive programs at the Travertine Nature Center would have a positive impact on visitor understanding and appreciation for recreation area resources.

Veteran's Lake would continue to provide a park-like atmosphere with relatively quiet activities. New restroom and dock facilities would allow visitors to experience improved facilities. A possible horse camp and staging area near Veterans Lake would provide increased recreational opportunities. However, a horse camp might cause visual, noise, and odor impacts that might detract from other visitors' experiences of this area. Visitors who enjoy electrical and water hookups would have this opportunity at Rock Creek campground after its rehabilitation. Those visitors who enjoy a more rustic experience might be disappointed.

Visitors would have expanded opportunities to engage in the more diverse recreational activities on Lake of the Arbuckles. Concession activities such as boat tours, boat rentals, bus tours, and cabin rentals would encourage more visitors to get out to the lake and enjoy its resources. Visitors interested in hiking would have additional opportunities with the creation of a trail around the lake and boat-accessible trails. Visitors interested in more extensive, overnight hiking experiences would have the opportunity to enjoy this type of activity with the addition of small backcountry campsites for boaters and backpackers.

Visitors to the Point would experience new restrooms and a shower house, providing minor benefits to those visitors who enjoy these types of facilities. The relocated and improved Guy Sandy campground would offer a better experience to visitors who prefer campgrounds with more amenities, and more privacy. Those visitors who prefer a more rustic experience might be disappointed. The existing campground site, when converted to a picnic area, would provide visitors who like to picnic with adequate facilities on the west side of the lake.

Using the *Cultural Landscape Report* as general guidance, visitors to the Platt District would find the district's cultural and natural resources in better condition. Visitors would also be able to see the bison in a more restored, natural landscape, increasing the interpretive and educational value of the herd. Additional interpretive programs or signs would help visitors appreciate the herd. Visitors to the more remote sections of Chickasaw National Recreation Area would have more opportunities to access the recreation area via additional trails and would have the opportunity to camp overnight in the backcountry. This would expand the "backcountry"-type opportunities at the recreation area, providing a positive impact for those visitors who value this type of experience.

Educational opportunities would continue to be available to limited audiences at the Goddard Youth Camp.

An overall increase in the variety of recreational opportunities available might get more first-time visitors to Chickasaw National Recreation Area, or might get visitors to engage in activities they would not have otherwise done, increasing visitor exposure to, and understanding of, recreation area resources. Visitors to Chickasaw National Recreation Area would have opportunities to interact with concessioner staff in activities such as boat or bus tours, increasing their opportunities for educational experiences at the recreation area. This increased exposure to recreation area resources and educational programs would likely increase visitor enjoyment of, and appreciation for recreation area resources.

There would be a continued high potential for crowding during the peak weekends, with the added possibility of resource degradation and decreased quality of visit.

Conflicts in visitor use might increase as the variety of visitor uses (concessions, tours, and horse camps, etc.) increases. These conflicts would likely reduce the quality of some visitors' experiences.

Noise levels at Chickasaw National Recreation Area might rise if there are increases to boat and personal watercraft use due to increased recreational opportunities (boat rental, boat tours, and trails accessible to boaters). Noise would continue to be highest at the Point and Buckhorn developed areas. There would continue to be opportunities for solitude in the remote and less-developed areas of Chickasaw National Recreation Area, but these opportunities would be harder to find given likely increases in backcountry use, with additional trails and backcountry campsites. During the peak season, there would continue to be minimal opportunities for solitude around the recreation area's developed areas.

Cumulative Impacts. The planned visitor center near Vendome Well and Chickasaw Nation Cultural Center, along with other new and improved visitor opportunities in the region, would likely provide a moderate beneficial impact on visitor experiences in the region. The addition of activities and experiences in Chickasaw National Recreation Area would add to this regional experience.

Conclusion. The result of this alternative overall would be minor to moderately beneficial for visitors looking for additional opportunities in Chickasaw National Recreation Area. However, there would be some minor adverse impacts as a result of increased visitation related to crowding and noise.

SOCIOECONOMIC ENVIRONMENT

Analysis. Alternative B includes the designation of several management prescriptions and the establishment of commercial services to Chickasaw National Recreation Area, which would likely impact recreation area visitation and visitor use patterns, and subsequently affect the regional socioeconomic environment compared to the no-action alternative. These specific prescriptions include the following:

• introduction of commercial operations to the Lake of the Arbuckles area, including

boat tours, boat rentals, ecotours, bus tours, and possibly lakeside cabin rentals

- the addition of a few campsites for boaters and backpackers in various areas throughout Chickasaw National Recreation Area and of trails that are accessible to boaters
- reopening of a restroom in the Buffalo and Antelope springs area and increased access to Antelope springs
- possible introduction of a horse camp and staging area at Veterans Lake
- addition of interpretation and more formal programs in the Platt District
- further restoration/rehabilitation of existing facilities and trails throughout Chickasaw National Recreation Area

Given the current absence of commercial services at Chickasaw National Recreation Area, the addition of boat rentals, bus and boat tours, ecotours, and lakeside cabin rentals, would represent a meaningful change to the visitor opportunities in the recreation area. The addition of boat rentals and tours, diversified campsites, increased interpretation and programs, and increased access might result in an increase in visitation compared to the no-action alternative. An increase in visitation would likely result in a beneficial effect on the regional socioeconomic environment because of increased visitor spending on food and lodging in the region. Commercial services in the region vary in their economic dependence on recreation area visitors from scarcely to extremely dependent. Most regional lodging, food, and beverage businesses have some financial reliance on Chickasaw National Recreation Area.

The addition of cabins would possibly attract visitors to Chickasaw National Recreation Area who would not otherwise be interested in overnight visits to the recreation area's campsites, the only other lodging currently offered in the recreation area. However, without further details of the scale, configuration (bunkhouse versus private), seasonality (heated versus summer-only), or conditions (rustic versus upscale) of the proposed lake cabins, it is difficult to assess the socioeconomic impact of this addition to Chickasaw National Recreation Area. This new visitor opportunity might increase visitation to the recreation area, in which case the region would realize positive economic effects. However, the introduction of cabin lodging in the recreation area might simply attract those originally intending to visit the recreation area, but who would otherwise have lodged outside the recreation area. In that case, the lodging facilities in Sulphur and Davis might be adversely affected. Nonetheless, due to a likely small scale of the proposal, effects of such a development on net recreation area visitation, and thus the regional socioeconomic environment, would likely be negligible in intensity.

Cumulative Impacts. Current and future plans that might have an effect on the regional economy include the new visitor center near Vendome Well, Chickasaw Nation Cultural Center, continued planning and development at Turner Falls, and casino and associated conference and lodging developments within the county.

In addition, over the next 25 years, Murray County population is expected to grow slightly faster than both the projected statewide population and county historical rates. County population is expected to reach 16,400 people by 2030 for an increase of 30%. The socioeconomic environment around Chickasaw National Recreation Area would be affected by this growth.

The cumulative impact on the regional economy resulting from increased tourism in the area, would likely be beneficial and minor to moderate. The overall impact analyzed above as a result of actions in alternative A would be a small, but larger than current management, component of the overall cumulative impact. *Conclusion.* Alternative B would most likely result in both beneficial and adverse effects on the regional socioeconomic conditions from enhanced visitor opportunities and an associated increase in visitation. However, these effects would likely be negligible in intensity in the context of the broader regional socioeconomic conditions.

NATIONAL RECREATION AREA OPERATIONS

Analysis. In this alternative the maintenance and administrative functions would be relocated to an area in Chickasaw National Recreation Area. The new facility(ies) would meet projected needs for space and function, and meet NPS standards. These facilities would provide minor to moderate beneficial impacts on recreation area operations because of increased efficiency.

Cumulative Impacts. Current and future plans that might impact operations that are not part of the alternative include the visitor center near Vendome Well and Chickasaw Nation Cultural Center. Both of these actions could require additional staffing needs, which in combination with the actions in this alternative, would be a minor to moderate beneficial impact on recreation area operations.

Conclusion. Recreation area operations would be beneficially impacted in a minor to moderate way under alternative B. There would be overall minor to moderate beneficial cumulative impacts; however, the actions proposed in alternative B would be a small increment of this cumulative impact.

UNAVOIDABLE ADVERSE IMPACTS

Alternative B would result in several unavoidable adverse impacts to natural and cultural resources, and to visitors. There could be a loss of paleontological resources due to visitors illegally collecting fossils. Increased education, interpretation, and outreach efforts would help minimize, but not eliminate, the likelihood of this potential impact. Some soils and vegetation would be lost or altered due to the construction of new developments and to soil erosion from increased visitor use. There would likely be a minor adverse impact on water quality in local areas, primarily due to an increase in waste from visitors. A smaller portion of Chickasaw National Recreation Area would be quiet under alternative A, with more areas experiencing minor to moderate adverse impacts due to visitor use. Minor to moderate adverse impacts would occur to archeological resources due to construction/rehabilitation efforts and visitor use. Some visitors would probably experience more crowding, which would have a minor adverse impact on their experience in Chickasaw National Recreation Area.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

New actions would be taken that would either result in the consumption of nonrenewable natural or cultural resources, or in the use of renewable resources that would preclude other uses for a period of time. In the construction of new facilities, including buildings and trails, limited amounts of nonrenewable resources would be used. These resources would be essentially irretrievable once they were committed.

THE RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Most of Chickasaw National Recreation Area would be protected in its current, relatively natural state and would maintain its long-term productivity. The primary short-term uses of Chickasaw National Recreation Area would continue to be recreational use. Disturbance of the area's soils, water quality, vegetation, and wildlife, due to visitor use and construction of new facilities, would reduce the long-term productivity of the recreation area in localized areas, although overall there likely would only be a small effect on the recreation area's long-term productivity. On the other hand, efforts to restore natural prairie and forest vegetation would increase long-term productivity of the environment in localized areas.

ENERGY REQUIREMENTS AND CONSERVATION

Under alternative B, the National Park Service would construct and operate new facilities, and energy use by Chickasaw National Recreation Area also would increase. To maintain, operate, and protect the facilities, NPS travel would also increase and the increased travel would increase energy consumption. The design and construction of new facilities would follow NPS policies concerning sustainability and energy conservation to minimize the overall energy requirements.

CONSEQUENCES OF ALTERNATIVE C

NATURAL RESOURCES

Paleontological Resources

Analysis. Alternative C would have the same effects on paleontological resources as the current management alternative. No new developments or ground-disturbing activities under alternative C would occur in areas that are known to have paleontological resources. To ensure that impacts are avoided, sitespecific surveys would be undertaken before any ground disturbance occurs in areas that might contain fossils.

As in all of the alternatives, some fossils might be illegally collected by visitors in the southern part of Chickasaw National Recreation Area. However, the lands south of Lake of the Arbuckles do not receive a high level of use, and exposed fossils are probably not apparent to most visitors. (Although large groups from the Goddard Youth Camp use the area, assuming efforts are made to inform teachers and students that it is illegal to take fossils from Chickasaw National Recreation Area, and with monitoring of the area, these groups would not be expected to adversely impact the resource.) If recreation area use levels increase in the future, there is the potential that some illegal fossil collecting could occur. There is no reason to expect that there would be a noticeable increase in the number of fossils being illegally collected most visitors would stay in developed areas in the Platt and Arbuckle districts or be on the Lake of the Arbuckles, and would not be in areas known to have fossils. Thus, compared to the current management alternative, alternative C would have the same potential for a long-term minor adverse impact on Chickasaw National Recreation Area's paleontological resources.

Cumulative Impacts. Like the other alternatives, some fossils might be lost if

future developments or other ground disturbance occurs south of the Goddard Youth Camp, which is outside of Chickasaw National Recreation Area, although the extent and significance of the fossils that might be lost is unknown. Some fossils also would likely continue to be collected on private lands near the recreation area. When the likely effects of continued public use of the recreation area in alternative C are added to the effects outside the recreation area, there could be a long-term adverse cumulative impact of unknown magnitude on area fossils.

Conclusion. Compared to the current management alternative, alternative C would be expected to have the same long-term minor adverse impact on Chickasaw National Recreation Area's paleontological resources, potentially due to a few visitors illegally collecting fossils. There could be a long-term, adverse cumulative impact of unknown magnitude on area fossils. This level of impact would not be anticipated to constitute an impairment of the recreation area's resources or values.

Soils

Analysis. Alternative C would have several beneficial impacts on soils in Chickasaw National Recreation Area. Removing the Guy Sandy campground, closing the Chigger Hill portion of the Rock Creek campground, and restoring these areas would reduce soil erosion and have a minor to long-term moderate beneficial impact in these areas.

Repairing drainage problems on the Rock Creek corridor trails, would reduce soil erosion in places. In addition, removing campsites at the Rock Creek campground could reduce some soil erosion that occurs from people walking down to the creek. These actions would have a long-term minor beneficial impact on soils in local areas.

The shoreline restoration work around Lake of the Arbuckles might result in some short term minor impacts in local areas due to construction equipment disturbing the area and increasing erosion. However, in the long term, the shoreline restoration work should help reduce or prevent additional erosion of soils due to waves, boat wakes, and lake flooding, resulting in a minor to moderate beneficial impact on soils in local areas.

Under alternative C, as in alternative A, soils in Chickasaw National Recreation Area would continue to be compacted and eroded in local popular use areas by hikers, bicyclists, and horseback riders. Additional social trails could form in popular use areas with increased visitor numbers. In sloped areas, these social trails could result in increased soil erosion occurring from stormwater runoff. Long-term minor adverse impacts would likely occur in popular use areas, such as visitors walking along and down the banks of Rock and Travertine creeks.

Cumulative Impacts. Alternative C would have about the same potential for cumulative impacts as alternative A. Soils in most of the area surrounding Chickasaw National Recreation Area have been altered by past agricultural practices and developments. In the future, some soils would likely be eroded and lost and/or soil properties altered by new developments in the area, including the visitor center near Vendome Well and the Chickasaw Nation Cultural Center. If motorboat use increases, this impact could also increase. The erosion and/or alteration of soils properties due to past land uses, new developments outside the recreation area, are added to the potential beneficial and adverse impacts from the actions under alternative C, and from higher use levels in parts of Chickasaw National Recreation Area, would slightly increase soil erosion and alteration in the region, resulting in a long-term minor to

moderate adverse cumulative impact on area soils. However, the actions under alternative C would add a very small increment to this cumulative impact.

Conclusion. As in all of the alternatives, most of Chickasaw National Recreation Area's soils would not be affected by the actions proposed under alternative C. Some soil erosion from increased visitor use would occur in developed areas such as along trails or near water sources. However, several actions in alternative C would have a long-term beneficial impact, compared to alternative A, including drainage improvements to the Rock Creek corridor trail, the removal and restoration of the Guy Sandy campground, the Chigger Hill portion of the Rock Creek campground, and some campsites at the Rock Creek campground, and the shoreline stabilization efforts along Lake of the Arbuckles. Overall, compared to the current management alternative, alternative C would be expected to result in long-term minor to moderate beneficial impacts in local areas. When the impacts inside Chickasaw National Recreation Area under alternative C are added to impacts from past land uses, developments outside the recreation area, there still would be the potential for a long-term minor to moderate adverse cumulative impact on area soils, although alternative C would add a very small increment to this overall cumulative impact. No impairment to Chickasaw National Recreation Area's resources and values would result from soil impacts under this alternative.

Water Quantity Associated with Chickasaw National Recreation Area's Springs

Analysis. Alternative C would have the same effects on the flows of Chickasaw National Recreation Area's springs as alternative B. With the exception of changes in the operation of the Vendome Well, no new actions would be taken in alternative C that would affect the aquifer and the flow of

Chickasaw National Recreation Area's springs. As in all of the alternatives, the National Park Service would continue to use water from the city of Sulphur wells to meet recreation area needs. However, the quantity of groundwater being withdrawn for recreational area purposes would be relatively small compared to other uses and would not be expected to substantially grow during the life of this plan.

Under alternative C the National Park Service would work with adjacent landowners, cities, the state of Oklahoma, and other partners to manage the aquifer, including protecting recharge areas, conducting studies, and monitoring. This should have a long-term beneficial impact on water quantity in Chickasaw National Recreation Area, although without knowing what actions might be taken, it is not possible to estimate the magnitude of the impact.

With a reduction in the flows from the Vendome Well in alternative C compared to alternative A, less groundwater would be withdrawn, making it less likely that the well would affect groundwater levels and spring flows. Consequently, compared to alternative A, alternative C would likely have a long-term, beneficial impact of unknown magnitude on the flow of Chickasaw National Recreation Area's springs. Due to a lack of information on the aquifer and the past impact of the Vendome Well on the aquifer, it is not possible to predict the extent of the beneficial impact. (It is possible that even with a decrease in the flows from the Vendome Well, there still could be an adverse impact in the future flows of some springs, albeit a smaller impact than in alternative A.) As in the other alternatives, there is no information to indicate that continued operation of the well would result in an impairment of recreation area resources and values.

Cumulative Impacts. As in alternative A, it is likely that additional permits will be sought to drill wells in the aquifer over the next 15–20

years. If new permits were to be granted, the groundwater that would be withdrawn, added to existing uses, would likely approach or exceed the annual recharge of the aquifer. Even if no new permits were granted for water withdrawals, existing wells may have affected the artesian pressure of the area. These impacts could continue in the future. When the possible impacts of new and existing sources outside Chickasaw National Recreation Area are added to the possible impacts of operation of the Vendome Well in the recreation area, even with a lower flow, there is the potential for a long-term, adverse cumulative impact of unknown magnitude on the aquifer and the flows of Chickasaw National Recreation Area's springs. The changes in the operation of the Vendome Well would add a beneficial increment of unknown magnitude to the overall cumulative adverse impact. The extent of the increment is unknown due to a lack of data regarding the aquifer, the impacts existing withdrawals are having on the aquifer, the likely impacts of future withdrawals, and the importance of the Vendome Well flow relative to other discharges. Until further studies are completed, it is not possible to predict the extent of the overall cumulative adverse impact on the flow of the springs.

Conclusion. Compared to alternative A, alternative C would have a long-term, beneficial impact of unknown magnitude on the flows of Chickasaw National Recreation Area's springs, due to a reduction in the flow of Vendome Well and increased cooperation with partners to manage the aquifer. Although it is not possible to predict the extent of the impact, there is currently no information to indicate that the continued operation of the well would result in an impairment of Chickasaw National Recreation Area's resources and values. However, under alternative C there would be the potential for a long-term cumulative adverse impacts on the aquifer and the flows of the springs when the reduced flows from the Vendome Well are added to existing and new wells outside

Chickasaw National Recreation Area. The changes in the operation of the Vendome Well would add a beneficial increment of unknown magnitude to this overall adverse cumulative impact. The magnitude of the overall adverse cumulative impact is not possible to predict, due to a lack of information on the aquifer, the impacts existing withdrawals are having on the aquifer, and the extent of future groundwater withdrawals that may occur.

Surface Water Quality

Analysis. Alternative C would have mostly the same effects on water quality as alternative A. With an expected increase in the number of visitors swimming and wading in the creeks in the future, particularly in popular swimming/wading areas; and with increased numbers of swimmers in Lake of the Arbuckles and Veterans Lake, there likely would be long-term minor to moderate adverse impacts on water quality in portions of Travertine and Rock creeks and in the lakes. Some negligible to minor adverse water quality impacts could occur in a few local areas due to increased erosion from people accessing the creeks or lakes.

Improving drainage in the Rock Creek trail corridor and removing some campsites from the Rock Creek campground would reduce runoff of sediments into Rock Creek and Lake of the Arbuckles. This would likely have a long-term negligible to minor beneficial impact on water quality in the creek.

The shoreline restoration work around Lake of the Arbuckles might result in some shortterm minor impacts in local areas due to construction equipment disturbing the area and increasing erosion. However, in the long term, the restoration work would reduce erosion and sediments in the water and thus have a minor beneficial impact in localized areas. Cumulative Impacts. The same potential for sources of water pollution both within and outside Chickasaw National Recreation Area described under alternative A would be true for alternative C (e.g., runoff from agricultural lands, nearby residences, and city streets; construction-related erosion from new developments; spills of materials on highways; and leaks from municipal sewerlines). Although it is not known when, where, and how many pollutants from all these sources would enter water bodies, it is likely that adverse water quality impacts would occur in the area during the life of the plan. Most of these short-term impacts likely would be minor to moderate. In addition, increased use of motorboats on Lake of the Arbuckles would likely discharge more fuel and add more wastes into the lake, resulting in potentially moderate water quality impact in local areas in the future.

When the minor adverse and beneficial water quality impacts of alternative C are added to the above potential impacts, it is possible that a long-term minor to moderate adverse cumulative impact could occur to the area's water quality over the life of this plan. However, the actions in alternative C would add a very small increment to this cumulative water quality impact.

Conclusion. None of the actions being proposed in alternative C would substantially affect Chickasaw National Recreation Area's water quality. As in all of the alternatives, there would be the potential for a long-term minor adverse impact on water quality in local areas, primarily due to an increase in wastes from increased visitor use. Compared to alternative A, alternative C overall would have a long-term minor beneficial impact on the recreation area's water quality, mostly because some actions could reduce the runoff of sediments in local areas. There could be a long-term minor to moderate adverse cumulative impact on water quality when the impacts of alternative C are added to the impacts of other actions within and outside

the recreation area, although alternative C would add a very small increment to this cumulative impact. Water quality impacts that would occur as a result of alternative C would not be at a level that would result in an impairment of Chickasaw National Recreation Area's resources and values.

Vegetation

Analysis. Most of the actions under alternative C would have a positive impact on Chickasaw National Recreation Area's native vegetation. As in alternative A, efforts to restore prairies and forests in the Upper Guy Sandy area, and efforts to restore native forest vegetation as part of the cultural landscape in the Buffalo and Antelope springs area (particularly actions to control red cedar), would result in the expansion of native grasses, forbs, ferns, and trees in these areas.

Alternative C would have several other beneficial impacts. Removing and restoring the Guy Sandy campground would result in the expansion of native vegetation in this area. Eliminating campsites in the Rock Creek campground to better protect the riparian area would help restore native vegetation along the creek. Repairing drainage problems on the Rock Creek corridor trail would help reduce impacts from people walking or riding around muddy areas and trampling vegetation. Additional planting of native vegetation to screen campsites in the Point and Buckhorn campgrounds would beneficially affect vegetation in these areas. In addition, under alternative C, efforts to stabilize and restore the shoreline around Lake of the Arbuckles would result in the loss of some vegetation in the short term due to the use of construction equipment, but in the long term would help expand native vegetation in this area. Taken as a whole, all of these restoration efforts would have a longterm minor to moderate beneficial impact on Chickasaw National Recreation Area's native vegetation.

As in all of the alternatives, visitor use in alternative C would affect Chickasaw National Recreation Area's vegetation. Some vegetation would likely be lost due to the formation of additional social trails in popular-use areas such as campgrounds and picnic areas. Some plants would probably be lost through visitors walking along and down and eroding streambanks in places, or walking through shoreline vegetation. With increases in visitor use, these impacts could intensify. However, none of the visitor impacts would be expected to affect the integrity, distribution, or presence of native plant communities in the recreation area. Thus, visitor use under alternative C would likely have the same localized, long-term negligible to minor adverse impact on Chickasaw National Recreation Area's native vegetation as alternative A.

As in alternative A, the spread of nonnative plants would be a problem in Chickasaw National Recreation Area under alternative C. If visitor use in the recreation area increases in the future, the potential for the spread of nonnative species would increase. Although it is difficult to determine the impact on native species due to the uncertainties about the type of species that might be introduced in the future, and the locations and frequencies of introductions, it is likely with adequate monitoring and weed control efforts, that the impacts on native vegetation would be minor in localized areas, such as along trails.

Cumulative Impacts. Alternative C would have the same potential for cumulative impacts on vegetation as alternative A. Even with the shoreline stabilization work under alternative C, increases in personal watercraft and motorboat use on Lake of the Arbuckles could result in long-term negligible to minor adverse impacts on shoreline vegetation due to people anchoring their boats along the shoreline and walking back and forth to the shore. These impacts would most likely occur near camping areas and boat launch areas, on private properties where landowners moor their craft, and in shallow areas and small arms of the lake, such as Rock Creek (NPS 2003a).

Outside of Chickasaw National Recreation Area, most native prairie and forest communities have disappeared or have been substantially altered by human activities such as agricultural operations, housing, and other developments. New developments such as the Chickasaw Nation Cultural Center might result in the loss of some additional native vegetation.

When the adverse and beneficial impacts of implementing alternative C are added to actions that have occurred, and are likely to occur in the area surrounding Chickasaw National Recreation Area, there would be a major long-term adverse cumulative impact on the area's native vegetation. However, implementing this alternative would add only small positive and negative increments to this overall impact, given how much change has already occurred to the vegetative communities that once were present in the region.

Conclusion. As in all of the alternatives, alternative C would result in both beneficial and adverse impacts on Chickasaw National Recreation Area's native vegetation. Some long-term negligible to minor adverse impacts would occur in local areas due to increased visitor use levels and construction work (e.g., shoreline stabilization efforts). On the other hand, vegetation restoration efforts would likely have a long-term minor to moderate beneficial impact in much of the recreation area. When the effects of implementing this alternative are added to the changes in native vegetation that have occurred in the area surrounding Chickasaw National Recreation Area, there would be a major long-term adverse impact on native vegetation. However, the actions under alternative C would add only small positive and negative increments to this overall impact. None of the vegetation impacts that would occur under

this alternative would be sufficient to result in an impairment of Chickasaw National Recreation Area's resources and values.

Wildlife

Analysis. Alternative C would have many of the same impacts described in the previous alternatives. Some animals would continue to occasionally be injured or killed by motor vehicles driving on recreation area roads. Some animals also probably would continue to be attracted by visitors feeding them or to areas where food and garbage are left out. However, the adverse effects on wildlife from these activities would be the same as alternative A: local and negligible, resulting in no measurable changes to Chickasaw National Recreation Area's wildlife populations.

Increased hunting would likely occur in Chickasaw National Recreation Area over the life of the plan, as in all of the alternatives, which would result in higher numbers of game animals, such as deer and turkey, being harvested over time. As in alternative A, with careful regulation of hunting by the state and the National Park Service, the increase in harvest levels would have a long-term negligible to minor adverse impact on a few game species.

Like the other alternatives, under alternative C, efforts to restore prairie and forest in the Upper Guy Sandy area would continue. These actions would increase the diversity and size of wildlife habitat and benefit wildlife populations that are found in these habitats. In particular, efforts to control the spread of red cedar and restore prairie would benefit species that require open areas or an open understory, such as bobwhite quail, wild turkey, and a wide variety of reptiles. Restoring prairie would possibly allow the reintroduction of other species that once were found in Chickasaw National Recreation Area (e.g., bison, prairie chicken, and pronghorn antelope). Efforts to control red cedar in the

Platt District also would increase habitat diversity and benefit species like white-tailed deer. These actions would have a long-term minor to moderate beneficial impact on Chickasaw National Recreation Area's wildlife populations and habitats.

The closure and restoration of vegetation in the Guy Sandy campground, and of some campsites in the Rock Creek campground, would provide additional habitat for wildlife in those areas. This would likely have a minor beneficial long-term impact on wildlife populations in those areas.

Also under alternative C, efforts would be undertaken to restore the vegetation and parts of the shoreline around Lake of the Arbuckles. Depending upon the extent and nature of the restoration efforts, this effort could expand habitat for native wildlife and have a longterm minor beneficial impact on wildlife populations.

Most of the improvements to existing facilities in alternative C would occur in areas that have already been disturbed and have little wildlife value, resulting in a long-term negligible adverse impact.

Cumulative Impacts. Like vegetation, most wildlife populations in the vicinity of Chickasaw National Recreation Area have been substantially altered by human activities, including farming and developments, resulting in fewer numbers of native wildlife. Thus, past actions have had a major adverse impact on native wildlife outside the recreation area. No current or reasonably foreseeable actions are likely to change this. When the beneficial and adverse impacts of alternative C are added to the impacts that have occurred in the vicinity of the recreation area, there would be a long-term major adverse cumulative impact on the area's wildlife populations. Alternative C would add a very small negative increment to this overall impact and a small beneficial increment by continuing to provide an area where wildlife

habitat continues to be managed and mostly protected.

Conclusion. As in the previous alternatives, alternative C would have some adverse and beneficial impacts on Chickasaw National Recreation Area's wildlife populations and habitats. Most wildlife in the recreation area would not change as a result of the actions in this alternative. No actions would adversely affect areas known to be important for breeding, nesting, foraging, or key migration routes. No actions would occur that would interfere with feeding, reproduction, or other activities necessary for the survival of a wildlife population. As in all of the alternatives, long-term minor adverse impacts would continue to occur due to visitor use of the recreation area.

On the other hand, there would be long-term minor to moderate beneficial impacts on some wildlife populations due to continuing efforts to restore prairie and forest in the Upper Guy Sandy area, the closure and restoration of the Guy Sandy campground, and some Rock Creek campground campsites; and shoreline stabilization and restoration efforts around Lake of the Arbuckles. When the impacts of alternative C are added to the impacts that have occurred to wildlife populations and habitats in the vicinity of Chickasaw National Recreation Area, there would be a major longterm adverse cumulative impact, mostly due to past human activities. However, the actions under alternative C would contribute a small beneficial increment and a very small adverse increment to this overall cumulative impact. None of the wildlife impacts resulting from alternative C would constitute an impairment of Chickasaw National Recreation Area's resources and values.

Threatened and Endangered Species (Bald Eagle)

Analysis. Alternative C would have the same effects on bald eagle as alternative A. No new

actions are being proposed that would affect bald eagles in Chickasaw National Recreation Area. However, as in the other alternatives, there is a chance that with increased use levels in the future, some visitors might deliberately or accidentally disturb the birds while they are roosting or feeding on the lake. Any disturbance would likely be minimal and would not cause eagles to stop using the recreation area. Consequently, visitors might affect, but would not likely adversely affect, bald eagles in the recreation area.

The bald eagle population is expanding and it is possible that in the future bald eagles could nest in Chickasaw National Recreation Area. If this were to occur, the nesting area(s) would be monitored. Visitors also would be informed about the eagles and kept away from the nesting site(s) to avoid disturbing the birds. People in the area may affect, but would not likely adversely affect, nesting eagles; provided they are kept an adequate distance from the nests.

Cumulative Impacts. Bald eagles are found across this region, and there are several large roosting and foraging sites near Chickasaw National Recreation Area. No actions are known to be adversely affecting the eagles and their habitat outside the recreation area. It is possible that off-season personal watercraft and other motorboat use on Lake of the Arbuckles could occasionally affect the birds when they are feeding in the area. When these effects are added to the effects of alternative C, there is a slight chance that there could be a cumulative impact. However, this effect would not likely adversely affect bald eagles in the area and any disturbance would be minimal, highly localized, and would not be expected to deter the eagles from using the area or affect population numbers or their habitat.

Conclusion. Overall, alternative C might affect, but would not be likely to adversely affect, bald eagles. None of the actions under alternative C would likely adversely affect

bald eagles in Chickasaw National Recreation Area. If use levels increase in the future in the recreation area, there is a slight chance under alternative C that visitors might disturb some bald eagles roosting by Lake of the Arbuckles. There is also a slight chance that there could be a cumulative adverse effect if off-season personal watercraft or motorboat use on the lake were to disturb the eagles. None of these impacts would result in an impairment of the recreation area's resources and values.

Soundscape

Analysis. As in alternative B, facility improvement projects would affect Chickasaw National Recreation Area's soundscape in local areas, although less so in alternative C, because there would be less development. Noise would be generated due to vegetation restoration efforts in the Upper Guy Sandy area and around Lake of the Arbuckles, and removing Guy Sandy campground and campsites at Rock Creek campground. In some of these areas, the noise from equipment (e.g., chainsaws) would be substantial, but it would be temporary and local and would occur at different times and places throughout Chickasaw National Recreation Area. As in the previous alternatives, noise from regular NPS maintenance activities such as grass mowing and garbage removal, would also continue to be occasionally heard, primarily in developed areas. Overall, noise from maintenance and restoration activities would have a long-term minor to moderate adverse impact on the natural soundscape in local areas, depending upon the activity, presence of other facilities and people, vegetation, and wind.

As in all of the alternatives, under alternative C there would continue to be high levels of noise, mostly during the peak-use season, due to visitors and their vehicles, primarily in developed areas, including campgrounds, picnic areas, roads, boat ramps, parking areas, trails, the Travertine Nature Center, and the Goddard Youth Camp. These impacts would be transitory, but would increase in intensity and duration during holidays and weekends when high numbers of visitors are present. Overall, there would be long-term minor to moderate adverse noise impacts in local areas of Chickasaw National Recreation Area. Although visitor use levels would likely continue to increase over the life of the plan, the resulting increase in noise levels would not be expected to rise beyond a moderate level in localized areas. Most impacts on the natural soundscape would continue to be confined to developed portions of Chickasaw National Recreation Area and popular-use areas like Lake of the Arbuckles, Veterans Lake, the Buffalo and Antelope springs area, and Travertine Creek.

Cumulative Impacts. Alternative C would have the same potential for cumulative impacts as the previous alternatives. Being adjacent to the city of Sulphur, noise from vehicles on highways and roads, machinery, and peoples' voices would be heard in the Platt District. Noise from residences near Lake of the Arbuckles and other areas near Chickasaw National Recreation Area also would continue to be heard, as well as agricultural operations and occasional lowflying military craft. These adverse noise impacts would be minor to moderate, depending upon the type of noise and location, and intermittent and long-term occurring every year.

On Lake of the Arbuckles and the immediate surrounding area, there would also be longterm minor to moderate adverse impacts due to noise from personal watercraft and motorboats (NPS 2003a).

When all of these impacts are added to the impacts of implementing alternative C, there would be the potential for a long-term moderate adverse cumulative impact on the natural soundscape. However, these cumulative impacts would occur primarily during peak-use periods like weekends and holidays, and be mostly confined to local high-use areas, such as Lake of the Arbuckles, developed areas along Rock and Travertine creeks, and other areas close to Chickasaw National Recreation Area's boundary where there are roads, residences, businesses, and other developments. Alternative C would add a very small increment to this overall adverse cumulative impact.

Conclusion. Parts of Chickasaw National Recreation Area would continue to be relatively quiet most of the time under alternative C, such as the Upper Guy Sandy area and the Rock Creek corridor trail area. Long-term minor to moderate adverse noise impacts would occur in local areas from maintenance, restoration activities, and increased visitor use levels. Most adverse noise impacts would occur as they do now during high-use periods and in high-use areas, including campgrounds, trails, picnic areas, roads, boat ramps, the Buffalo and Antelope springs area, Travertine Creek, and Travertine Nature Center. There would also be the potential for a long-term moderate adverse cumulative impact when the noise resulting from the alternative is added to noise from activities outside Chickasaw National Recreation Area, as well as motorboat use on Lake of the Arbuckles (although alternative C would contribute a small increment to this overall cumulative impact). None of these noise impacts; however, would be sufficient to result in an impairment of the recreation area's resources and values.

CULTURAL RESOURCES

Archeological Resources

Analysis. Archeological resources adjacent to or easily accessible from trails, roads, picnic shelters, campgrounds, docks, boat launching ramps; or from such places as the bison pasture of the Platt District or that of a possible additional bison pasture in the Upper Guy Sandy area; or the mineral or freshwater

springs; or along Chickasaw National Recreation Area's lakeshores, creeks, and streams could be vulnerable to surface disturbance, inadvertent damage, and vandalism. A loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result. However, continued and even substantially increased ranger patrolling and emphasis on visitor education under this alternative, would discourage vandalism and inadvertent destruction of cultural remains; and any adverse impacts are expected to be minimal, if any.

Closure of the Chigger Hill portion of the Rock Creek campground and the removal of the Guy Sandy campground would be beneficial in that the vulnerability to chance encounters with archeological resources would be reduced. Archeological surveys would precede any ground disturbance associated with construction of the approved visitor center near Vendome Well, for a new facility to be constructed outside of Chickasaw National Recreation Area's boundaries to house the museum collections and archives, for the trail maintenance that would include improving the drainage of trails, and for the planting and management of vegetation for enhanced privacy screening at individual campsites. Important archeological resources would be avoided to the greatest extent possible, and no adverse effects would be anticipated. In the unlikely event that such resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the Oklahoma state historic preservation officer.

Cumulative Impacts. Past development in Chickasaw National Recreation Area such as the 1909 construction of Lincoln Bridge over Travertine Creek (formerly Sulphur Creek), the 1933–1940 construction of rustic architectural facilities by the Civilian Conservation Corps, the construction of carriage ways, and later automobile roads, and two sets of railroad tracks; may have resulted in the disturbance and loss of some archeological resources during excavation and construction activities. In addition, agricultural practices, the development of the historic city of Sulphur in the late 19th and early 20th centuries and its relocation nearby to the north, the formation of Lake of the Arbuckles in 1961 by the Bureau of Reclamation, and the more recent growth and expansion of residential areas impinging upon Chickasaw National Recreation Area, are all examples in and near Chickasaw National Recreation Area of actions that may also have previously disturbed archeological resources. Some of these types of activities continue, such as the planned construction of the Chickasaw Nation Cultural Center adjacent to Chickasaw National Recreation Area, and could also result in future adverse impacts to archeological resources. Alternative C would contribute no adverse impacts to the adverse impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would remain adverse.

Conclusion. Avoidance of national register eligible archeological resources during the ground disturbances of construction would result in no adverse impacts to these resources. In the unlikely event disturbance of such archeological resources could not be avoided, a memorandum of agreement, in accordance with 36 CFR Part 800.6, *Resolution* of Adverse Effects, would be negotiated between Chickasaw National Recreation Area and the Oklahoma state historic preservation officer (and/or the Advisory Council on Historic Preservation, if necessary). The memorandum of agreement would stipulate how the adverse effects would be mitigated.

Because efforts to the greatest extent possible would be taken to avoid important archeological resources, no adverse effects would be anticipated from alternative C. Nevertheless, some ground-disturbing activities would continue, such as the planned construction of a Chickasaw Nation Cultural Center adjacent to Chickasaw National Recreation Area, which could result in future adverse impacts to archeological resources. Alternative C would contribute no adverse impacts to the impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would remain adverse.

There would be no impairment of Chickasaw National Recreation Area's resources or values. Because important archeological resources would be avoided during grounddisturbing activities, there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents.

Ethnographic Resources

Note: an ethnographic resource is defined as the identification of a specific contemporary human group or family using a particular place over time in a way relevant to that group's traditional cultural heritage and social identity.

Analysis. Management actions under alternative C would include not only some hydrological monitoring over time, but also additional hydrological studies, as well as regional watershed partnering. Not much is known about the spring water. (The patterns of groundwater flow that influence and recharge the springs in the Platt Historic District are the subject of the analysis of impacts to natural resources elsewhere in this plan.) If a particular spring should stop flowing, as has happened at Bromide and Medicine springs, such a spring would lose its physical and cultural importance as a perceived aid to health and recreation to those European American and American Indian families who regularly use the springs. However, the hydrological monitoring, further research, and regional watershed partnering called for over time under alternative C could help the National Park Service protect and preserve the springs' sources of water by contributing to a data and research base for local and regional comparison. Water-monitoring impacts under alternative C on the springs as a potential ethnographic resource for European Americans and American Indians could range from minor to moderate beneficial and longterm depending upon what is learned through the monitoring, research, watershed partnering, and what preservative measures might be implemented.

Using the *Cultural Landscape Report* for the Platt Historic District (Hohmann and Grala 2004) as general guidance, the historic Osage orange tree in Walnut Grove known as the Monkey Tree would be preserved by balancing its traditional social and cultural use as a tree on which children climb and play, and which "according to oral histories, was extant at the end of the period of significance [1940]" (Hohmann and Grala 2004:222), with biological nurture. An example of the former is to:

retain dead branches for [children's] bouncing. Trim potentially hazardous branches.

An example of the latter is as follows:

If compaction around base of tree becomes severe, a mulch of hardwood chips two to four inches deep may be applied around the base of the tree (Hohmann and Grala 2004:334).

The *Cultural Landscape Report* recognizes that playing on the tree could injure it. It also concludes that since such children's play is traditional, it should be continued (Hohmann and Grala 2004:334). Therefore, because continued access would be allowed, management under alternative C would mean a long-term minor beneficial impact on the Monkey Tree as a potential ethnographic resource for the children of European American and American Indian families.

Access to "all the trails in Chickasaw National Recreation Area" as a collective ethnographic resource would be continued with trail maintenance. By providing continued enjoyment to the Wallace family of the Chickasaw people, and to other families and persons, both American Indian and European American, who seek trail experiences, impacts on trails as ethnographic resources by national recreation area management actions under alternative C would be long-term, minor, and beneficial.

Cumulative Impacts. Past residential, commercial, and agricultural development in the region around Chickasaw National Recreation Area that draws drinking water and other water uses from the Arbuckle-Simpson Aquifer may have influenced changes in the groundwater-flow pattern, perhaps in turn influencing the cessation of water flow at Bromide and Medicine springs in Chickasaw National Recreation Area. A current proposal for certain ranchers drawing upon the Arbuckle-Simpson Aquifer to sell and pump water north, as the water supply for Oklahoma City is under hydrological study by the Oklahoma Board of Water Resources. Any disturbance reducing the flow of the springs would be adverse.

Past visitation involving children playing on the Monkey Tree may have adversely impacted the tree by damaging it. Current anticipation is for visitation to increase from the adjacent Chickasaw Nation Cultural Center and from overflow crowds from neighboring parks such as Turner Falls Park of the city of Davis and Lake Murray State Park during warm weather holidays constituting peak recreation periods. Increased visitation would lead to more risk of damage to the tree. Any damage would be adverse.

The past trail development and maintenance found in Chickasaw National Recreation Area and in neighboring parks such as Turner Falls Park of the city of Davis and Lake Murray State Park would continue in varying ways into the future and benefit trail users by providing better walking and hiking conditions. The trail experience could become more crowded because the current expectation is for visitation to increase from the adjacent Chickasaw Nation Cultural Center, and from overflow crowds from neighboring parks like Turner Falls Park and Lake Murray State Park during warm weather holidays constituting peak recreation periods. Crowding would adversely affect trail enjoyment.

Implementation of alternative C would contribute both adverse and beneficial impacts to the impacts of other past, present, and reasonably foreseeable actions occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would be beneficial and implementation of alternative C would be a substantial component of the overall beneficial cumulative impact as in alternative A.

Conclusion. Alternative C, calling for monitoring and conducting further research on the hydrological conditions of the springs, as well as watershed partnering, would impact the springs as potential ethnographic resources for European Americans and American Indians in a beneficial, long-term range from negligible to minor to moderate, depending upon what is learned and implemented from the monitoring, further research, and partnering.

Since alternative C calls for the preservation of the Monkey Tree while permitting continued children's play on its branches, few adverse impacts to the Monkey Tree as a potential ethnographic resource are anticipated. Rather, long-term minor beneficial effects would be expected to preserve it as long as possible for more generations of children to climb and play.

For members of the Wallace family of the Chickasaw people, and others like them, who seek the enjoyment of walking the trails, impacts of management actions on the trails as ethnographic resources under alternative C would be long-term, minor, and beneficial because access would essentially be maintained along with certain improvements.

Implementation of alternative C would contribute both adverse and beneficial impacts to the impacts of other past, present, and reasonably foreseeable actions, occurring both within and outside Chickasaw National Recreation Area. However, the overall cumulative impact would be beneficial, and implementation of alternative C would be a substantial component of the overall beneficial cumulative impact as in alternative A.

There would be no impairment of Chickasaw National Recreation Area's resources or values because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents.

Museum Collections and Archives

Analysis. Under alternative C, as with alternatives A and B, change would occur; and under alternatives B and C, the same changes

would occur. Chickasaw National Recreation Area's collections would be divided between (1) cultural history collections and archives and (2) natural history collections. The collections would be moved to different locations outside Chickasaw National Recreation Area. The concept is regionalization, by way of moving collections to centralized locations. The cultural history collections and archives would be moved, but the location for Chickasaw National Recreation Area has not yet been determined. It could possibly be to an Oklahoma repository in a new partnership to emphasize regional ties within the state. Within the National Park Service, it could be to Bents Old Fort National Historic Site, La Junta, Colorado, or to the Western Archeological and Conservation Center of the National Park Service in Tucson, Arizona.

The natural history collections could be moved to an Oklahoma repository such as the Sam Noble Oklahoma Museum affiliated with the University of Oklahoma at Norman (NPS 2006a; NPS 2006b), which already is taking care of some of Chickasaw National Recreation Area's natural history collections. The moves, when completed, would be consistent with NPS's Museum Collection Facilities Strategy, Intermountain Region (NPS 2005), which calls for regionalization by establishing centralized locations for collections. The moves would also be consistent with the policy of the Southern Plains Inventory and Monitoring Network of the National Park Service for park units to make their own natural history repository arrangements (NPS 2005b; NPS 2006c). The possible locations mentioned would meet all aspects of museum standards for the curation and storage of collections. These moves would mean that moderate beneficial longterm effects would result from providing improved space meeting museum standards in a repository away from Chickasaw National Recreation Area for both the cultural history museum collections, including the archives, and the natural history collections to conduct
future curation, storage, and research on such collection materials as Chickasaw National Recreation Area's artifacts, specimens, documents, and photographs.

During the anticipated moves to their different repository locations, both the cultural history and natural history collections would be subject to damage. However, the packing and handling of museum archives, artifacts, and specimens is done for maximum protection. Therefore, negligible impacts on museum collections and archives would be expected because of the low, short-term risk involved in packing and moving.

The impact on access to collections of (1) moving the cultural history collections and archives to a centralized repository out of Chickasaw National Recreation Area, but in Oklahoma, or to Colorado or Arizona, and of (2) moving the natural history collections away from Chickasaw National Recreation Area to a centralized repository in Oklahoma would mean long-term minor to moderate adverse inconvenience to local researchers. Such researchers would have to travel a greater distance to Colorado or Arizona for cultural materials or, to a lesser extent, to elsewhere in Oklahoma for cultural materials and biological specimens. The same inconvenience would exist for national monument staffers who needed to use the original collections. However, centralizing these collections would be scientifically sound for the ease of comparison of related collections. That is, it would make scientific comparison, in general, and archeological, biological, historical, and ethnographic comparison, in particular, more readily achievable with related collections housed in the relevant centralized repositories and would mean minor to moderate beneficial long-term impacts regarding collection centralization for scientific purposes.

Cumulative Impacts. Development of space, meeting all the variables of museum standards in the past has occurred at Bents Old Fort

National Historic Site, La Junta, Colorado; and at the Western Archeological and Conservation Center, Tucson, Arizona; by the National Park Service establishing a curation and storage facility at each of these places. Any repository selected for cultural history or natural history collections in Oklahoma would also meet all the variables of museum standards. The Sam Noble Oklahoma Museum of Natural History, for example, opened on the campus of the University of Oklahoma at Norman on May 1, 2000. This new museum building is contributing new space that meets all the variables of museum standards and is where Chickasaw National Recreation Area could arrange for the curation and storage of the remainder of its natural history collections. That would be in addition to those natural history collections of Chickasaw National Recreation Area that the Sam Noble Oklahoma Museum is currently curating and storing. This museum was founded in 1899 as the Stovall Museum of Science and History, and became the Oklahoma Museum of Natural History by an act of the Oklahoma legislature in 1987.

The trend to provide space for collections meeting museum standards is expected to continue as part of a NPS plan to centralize cultural history collection facilities under the approved NPS Museum Collection Facilities Strategy, Intermountain Region (NPS 2005), by moving and concentrating collections from park units into such collection facilities that will provide centralized space under museum standards for curation, storage, and research for archeological, ethnographic, historic artifacts, and archives including historic photographs. More centralized space is anticipated to become available for park units like Chickasaw National Recreation Area to relocate their cultural collections, resulting in a moderate beneficial long-term intensity that will meet museum standards, and that will benefit cultural collections and archives. The long-term moderate beneficial effects of alternatives B and C would contribute to the impacts of other past, present, and reasonably

foreseeable actions as a small component to other long-term moderate beneficial centralized museum-standard spaces in the NPS Intermountain Region. The overall cumulative impact would be beneficial.

Conclusion. Negligible impacts on museum collections and archives would be expected because of the low, short-term risk involved in packing and moving cultural history and natural history items to be relocated. Overall, moderate beneficial and long-term effects would result from providing or arranging for more museum-standard space. The change in location away from the maintenance area of Chickasaw National Recreation Area would result in long-term minor to moderate adverse impacts resulting in inconvenience to Oklahoma researchers and the Chickasaw National Recreation Area staff to travel to Colorado or Arizona. However, the concentration and centralization of both Chickasaw National Recreation Area's cultural history collections, including archives; and natural history collections, albeit in different locations, would mean long-term moderate beneficial impacts to museum collections and archives because of the greater prevalence of curation and storage conditions meeting museum standards and because of the cultural, historical, and scientific soundness resulting from the increased ease of comparison with related collections.

More space is anticipated in different locations of a long-term moderate beneficial intensity that will meet museum standards and that will benefit Chickasaw National Recreation Area's cultural history collections and archives, and natural history collections in the Intermountain Region by providing or arranging for centralized facilities for curation, storage, and research. Centralization will contribute to the overall cumulative impact of alternatives B and C that would be beneficial, moderate and long-term for museum collections and archives. There would be no impairment of Chickasaw National Recreation Area's resources or values for the following reason. There would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents. There would be no impairment of Chickasaw National Recreation Area's resources or values.

Cultural Landscapes and Historic Structures

Analysis. Under alternative C, Chickasaw National Recreation Area's long-standing tradition of historic preservation within the Platt Historic District would be enhanced using the recent Cultural Landscape Report (Hohmann and Grala 2004) as general guidance for proposed treatments. These actions include a wide array of preservation measures, such as trail rehabilitation, fountain and masonry repairs, tree plantings/replacement, pavilion repairs, and removal of nonhistoric features. Removal of woody vegetation and invasive cedars from the enclosed buffalo pasture, and rehabilitation of the cultural landscape in the Buffalo and Antelope springs area, would better preserve and retain the historic landscape character of those areas. Management efforts to rehabilitate the buffalo pasture as a contributing component of the cultural landscape would be assisted by retaining the small buffalo herd at this location, and undertaking a study to determine optimal herd size. Implementation of these actions would result in no adverse effect to historic structures and cultural landscape features.

Removal of some campsites at the Rock Creek campground that are impacting riparian habitat would to a limited degree, diminish the cultural landscape of the Rock Creek campground by altering the campground's designed spatial organization and pattern of circulation that have been in place from the 1950s. However, the emphasis of this alternative on providing fewer new facilities and removing some nonhistoric facilities and features (such as nonhistoric trails and structures in the Buffalo and Antelope springs area), would be expected to have overall beneficial impacts on preserving historic resources.

As funding allows, additional investigations and preservation measures would be undertaken to identify and protect a diverse array of cultural landscapes throughout Chickasaw National Recreation Area. For example, investigations at Veterans Lake would document potential cultural landscape features associated with WPA activities during the 1930s, and would ensure that these features are adequately taken into consideration and protected. Additional investigations may be implemented to more fully document vernacular cultural landscapes associated with historic land use in other areas of Chickasaw National Recreation Area, such as those associated with early homesteading and ranching activities. Documentation of these resources would provide further baseline data yielding a more complete understanding of regional cultural history prior to establishment of the recreation area, and would inform preservation undertakings.

Proposed rehabilitation and adaptive use of the existing maintenance area structures would help ensure the long-term preservation of these contributing CCC-built structures. Construction of a new maintenance complex would occur at a yet-to-be-determined location outside of Chickasaw National Recreation Area selected to minimize intrusion on historic viewsheds and the integrity of the Platt Historic District. No adverse effects to historic structures or cultural landscape features are anticipated from these measures.

Implementation of the above actions would be phased in over time based on funding availability and priority needs, in some cases requiring separate Section 106 and NEPA compliance. New construction, additions, or alterations to the cultural landscape would be undertaken in a manner that does not diminish character-defining features of the cultural landscape. Such undertakings would be compatible with the massing, scale, and other qualities contributing to the NHL significance of the Platt Historic District. All work would be carried out in accordance with NPS Management Policies and the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, and consequently would be expected to result in no adverse effect to historic properties. All work would be carried out in accordance with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation, and consequently would be expected to result in no adverse effect to historic properties.

Cumulative Impacts. Although the Platt Historic District retains an overall high level of historic integrity, some alterations have occurred since the 1932-1940 period of significance. For instance, some structures have lost original masonry and historic fabric due to weathering and other factors. A 1.75mile-long section of Perimeter Road around Buffalo and Antelope springs was removed in 1969, log and wood plank trail bridges have been replaced, and some roads and parking areas have been reconfigured and paved. Vegetation patterns have dramatically changed in some areas as well, evidenced by dense stands of woody vegetation and cedars encroaching into formerly more open areas and obscuring viewsheds. Mission 66 restrooms and other small-scale constructed features from that period do not contribute to the cultural landscape significance of the Platt Historic District. These factors have adversely affected the current condition and integrity of the cultural landscape and historic structures of the Platt Historic District. Despite these adverse impacts to landscape features,

[T]he overall configuration of the district has remained remarkably constant, with little change or loss of integrity occurring at the levels of design, layout, setting and organization. All of the original component landscapes present in 1940 remain substantially intact today (Hohmann and Grala 2004:250).

Within the boundaries of Chickasaw National Recreation Area (but outside the Platt Historic District), potential historic structural remains and cultural landscape features may be identified through future investigations. These features and remains, should they exist, are likely to have been adversely impacted by natural weathering and other disturbances over an extended period.

Proposed construction of Chickasaw National Recreation Area's new visitor center near Vendome Well is a foreseeable action with the greatest likelihood of contributing cumulative impacts on the cultural landscape of the Platt Historic District. The visitor center near Vendome Well would be seen by visitors approaching along Broadway Avenue toward Chickasaw National Recreation Area's main north entrance. To minimize the visual impacts, the building's design would incorporate appropriate scale and materials to ensure overall compatibility with the existing CCC-era buildings and structures of the Platt Historic District, and other character-defining elements specific to the Vendome Well site. However, the site is not in the boundaries of the National Historic Landmark nomination for the Platt Historic District. Although the visitor center near Vendome Well would introduce a newly constructed element near the periphery of the district, with sensitive design it would be expected to have no

adverse effects on the landscape's overall integrity.

As described above, the impacts associated with implementation of alternative C would, for the most part, result in no adverse effects to Chickasaw National Recreation Area's historic structures and cultural landscapes. Some proposed actions (such as closure of a portion of the Rock Creek campground) could contribute a small component to the overall adverse cumulative impacts of other past, present, and reasonably foreseeable actions, both within and outside the recreation area. Over time, as more of the proposed cultural landscape rehabilitation measures are completed, the no adverse effects associated with implementing these actions under alternative C would become an increasingly larger component of the cumulative impacts on these resources.

Conclusion. After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR Part 800.5, Assessment of Adverse Effects), the National Park Service concludes that implementation of alternative C would result in no-adverse effects to the cultural landscape and contributing historic structures. As proposed cultural landscape rehabilitation measures are completed over time, the no adverse effects associated with implementing these actions would become an increasingly larger component of the cumulative impacts on these resources. Proposed actions would follow approved standards and guidelines and would enhance NPS preservation objectives for the Platt Historic District and other potential cultural landscapes.

Because there would be no adverse impacts to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing legislation of Chickasaw National Recreation Area; (2) key to the natural or cultural integrity of Chickasaw National Recreation Area or to opportunities for enjoyment of Chickasaw National Recreation Area; or (3) identified as a goal in the Chickasaw National Recreation Area GMP or other relevant NPS planning documents, there would be no impairment of Chickasaw National Recreation Area's resources or values.

VISITOR USE AND EXPERIENCE

Analysis. The current trend in visitation is slightly down, perhaps due to the economy, terrorism threats, or gas prices. As the population grows in the local area, as well as the Dallas and Oklahoma City metropolitan areas, visitation could increase slightly. Visitation would continue to fluctuate seasonally, rising in the summer and on weekends and peaking on holiday weekends. Visitation would continue to be primarily local and regional. Visitation from special interest groups (wildlife viewing and bird watching, etc.) might increase.

Visitors would continue to get most of their information from Chickasaw National Recreation Area's new visitor center near Vendome Well. Many visitors, particularly repeat visitors, would continue to go directly to other destinations in the recreation area.

Visitors would experience natural resources in better condition in the Buffalo and Antelope springs area once the natural landscape is restored. There could be slightly less hiking opportunities because minor trails would be removed if necessary to protect resources.

Visitors would continue to experience the existing interpretive activities in and associated with the Travertine Nature Center, as well as additional formal programs on resource preservation and conservation. These actions would provide minor positive impacts on those visitors who are interested in experiencing and learning about Chickasaw National Recreation Area's resources. Veteran's Lake would continue to provide a park-like atmosphere with relatively quiet activities. Fewer campsites would be available at the Rock Creek campground after the riparian area is restored. This would provide minor positive impacts for those visitors who enjoy a more rustic experience. However, with fewer campsites there might be a minor adverse impact on visitors.

Visitors would continue to engage in the same recreational activities on Lake of the Arbuckles; and Buckhorn and the Point campgrounds would be operated with their current level of facilities. The Guy Sandy campground would be improved and consolidated to provide a better camping experience (albeit to fewer campers). Overall, these changes would provide minor positive impacts for those visitors who enjoy a more rustic camping experience.

Using the *Cultural Landscape Report* as general guidance, visitors would find cultural and natural resources in better condition. By moving the bison herd to the more remote Upper Guy Sandy area, the number of visitors likely to see the bison would be reduced, although the bison would be viewed in a more restored, natural landscape. This would likely reduce the number of visitors who benefit from seeing the bison, but provide a more natural experience for those who do see the bison.

Visitors to the more remote sections of Chickasaw National Recreation Area would continue to have opportunities to hunt, fish, or hike, and would enjoy some improved trails and limited backcountry camping opportunities. This would have a minor positive impact on visitors who desire backcountry type experiences.

Educational opportunities would be available to limited audiences at the Goddard Youth Camp.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Using the *Cultural Landscape Report* as general guidance, visitors would find cultural and natural resources in better condition, including the restoration of the prairie and forest around Upper Guy Sandy, and restoration of natural landscapes in other areas of Chickasaw National Recreation Area. Experiencing these resources in better, more historically accurate conditions would increase visitor understanding and enjoyment of these resources.

There would be some potential for crowding during the peak weekends, with accompanying resource degradation and decreased quality of visit. If visitation increases, Chickasaw National Recreation Area could hit peak on more weekends, or visitation could increase in the shoulder seasons.

Noise levels would stay about the same, depending mostly on whether there are increases in boat and personal watercraft use. Noise would be highest at the Point and Buckhorn developed areas. There would be opportunities for solitude in the remote and less-developed areas of Chickasaw National Recreation Area. During the peak season, there would be minimal opportunities for solitude around the recreation area's developed areas.

Visitors might experience increased noise associated with the operation of the new maintenance and administrative facility(ies), to be located outside Chickasaw National Recreation Area. The exact impacts would depend on where this facility was located.

Cumulative Impacts. As in alternative A, the planned new visitor center near Vendome Well and Chickasaw Nation Cultural Center, along with other new and improved visitor opportunities in the region, would likely provide a long-term moderate beneficial impact on visitor experience in the region. There would be a minimum of additional activities and experiences offered in Chickasaw National Recreation Area that

would add to the regional visitor experience. The overall beneficial cumulative impacts would be long-term and moderate; the actions proposed in alternative C would contribute a very small increment to these cumulative impacts.

Conclusion. There would be some long-term minor beneficial impacts on visitors looking for a more natural, better preserved recreation area. There would be some minor adverse impacts due to the loss of a few campsites at Rock Creek campground and some additional crowding. There would be a long-term moderate beneficial impact on visitor experience in the region, with a minimum of additional activities and experiences offered in Chickasaw National Recreation Area that would add to the regional visitor experience. The overall beneficial cumulative impacts would be long term and moderate; the actions proposed in alternative C would contribute a very small increment to these cumulative impacts.

SOCIOECONOMIC ENVIRONMENT

Analysis. Alternative C includes the designation of management prescriptions focused on protecting the cultural and natural landscapes that could possibly impact recreation area visitation and visitor use patterns, and subsequently have associated effects on the regional socioeconomic environment. These focus on resource protection and include the following:

- modifications and possible removals of sites/facilities in some other areas in Chickasaw National Recreation Area
- improvement of the trail system in the Rock Creek corridor and provision of two or three backcountry campsites

It would be expected that visitation would likely remain stable or increase slightly with population growth in the region. The actions proposed in alternative C would not be as likely to increase visitation in Chickasaw National Recreation Area as some of the other alternatives. There would likely be negligible beneficial socioeconomic effects of implementing this alternative because of the slight increase in visitor spending. Short-term regional socioeconomic effects of implementing planned habitat restoration/stabilization and facility rehabilitation activities under alternative C would be expected to be beneficial but negligible in their intensity.

Cumulative Impacts. Current and future plans that might have an effect on the regional economy include the new visitor center near Vendome Well, Chickasaw Nation Cultural Center, continued planning and development at Turner Falls, and casino and associated conference and lodging developments within the county.

In addition, over the next 25 years, Murray County population is expected to grow slightly faster than both the projected statewide population and county historical rates. County population is expected to reach 16,400 people by 2030 for an increase of 30%. The socioeconomic environment around Chickasaw National Recreation Area would be affected by this growth.

The cumulative impact to the regional economy resulting from increased tourism in the area would likely be beneficial and minor to moderate. The overall impact analyzed above as a result of actions in alternative C would be a very small component of the overall cumulative impact.

Conclusion. Alternative C would result in short-term negligible beneficial effects on the regional socioeconomic environment from associated construction spending, but would possibly result in long-term negligible adverse impacts due to a possible reduction in visitation associated with somewhat decreased visitor opportunities. Overall, this alternative would be expected to have a negligible

cumulative impact on the regional socioeconomic environment.

NATIONAL RECREATION AREA OPERATIONS

Analysis. In this alternative the maintenance and administrative functions/facilities would be relocated to a new facility (or facilities) outside Chickasaw National Recreation Area. The new facility(ies) would meet projected needs for space and function, and meet NPS standards. These facilities would provide a minor to moderate beneficial impact on recreation area operations because of increased efficiency.

Cumulative Impacts. Current and future plans that might impact operations that are not part of the alternative include the visitor center near Vendome Well and Chickasaw Nation Cultural Center. Both of these actions could require additional staffing, which in combination with the actions in this alternative, would be a minor to moderate beneficial cumulative impact.

Conclusion. Recreation area operations would be beneficially impacted in a minor to moderate way under alternative C. There would be a minor to moderate beneficial cumulative impact on; however, the actions proposed in alternative C would add a small increment to these cumulative impacts.

UNAVOIDABLE ADVERSE IMPACTS

Alternative C would result in a number of unavoidable adverse impacts on resources and visitors. Some paleontological resources potentially may be lost due to visitors illegally collecting fossils. Increased education, interpretation, and outreach efforts would help minimize, but not eliminate, the likelihood of this potential impact. Some soils and vegetation would be lost or altered in developed areas due to soil erosion from increased visitor use, and possibly from the development of a new maintenance facility outside of Chickasaw National Recreation Area. Minor adverse impacts would occur to water quality, primarily due to an increase in waste from visitors. Long-term minor to moderate adverse impacts would continue to the natural soundscape due to visitor use, primarily in high-use areas and during highuse periods, and to the construction of new facilities. Long-term minor to moderate adverse impacts would likely occur to archeological resources due to construction/ rehabilitation efforts and to visitor use in developed areas and around lakeshores. Removing or relocating trails would result in minor adverse impacts on ethnographic resources. Alternative C would also result in adverse impacts on some visitors due to increased crowding in local areas and to the loss of a few campsites in the Rock Creek campground.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

New actions would be taken that would either result in the consumption of nonrenewable natural or cultural resources, or in the use of renewable resources that would preclude other uses for a period of time. In the construction of new facilities, including buildings and trails, limited amounts of nonrenewable resources would be used. These resources would be essentially irretrievable once they were committed.

RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Most of Chickasaw National Recreation Area would be protected in its current, relatively natural state and would maintain its long-term productivity. The primary short-term uses of Chickasaw National Recreation Area would continue to be recreational use. Disturbance of the area's soils, water quality, vegetation, and wildlife, due to visitor use would reduce the long-term productivity of the recreation area in localized areas, although overall there would likely only be a small effect on the recreation area's long-term productivity. On the other hand, increased efforts to restore natural prairie and forest vegetation, rehabilitate disturbed areas, and reintroduce species that have disappeared would increase long-term productivity of the environment in localized areas.

ENERGY REQUIREMENTS AND CONSERVATION

Under alternative C, the National Park Service would construct and operate new facilities, and energy use by Chickasaw National Recreation Area would increase. To maintain, operate, and protect the facilities, NPS travel would also increase, and the increased travel would increase energy consumption. The design and construction of new facilities would follow NPS policies concerning sustainability and energy conservation to minimize the overall energy requirements.



Chapter 5:

Consultation and Coordination

PUBLIC AND AGENCY INVOLVEMENT

The Draft General Management Plan / Environmental Assessment for Chickasaw National Recreation Area represents thoughts of National Park Service and recreation area staff and the public. Consultation and coordination among the agencies and the public were vitally important throughout the planning process. The public had three primary avenues by which it participated during the development of the plan: participation in public meetings, responses to newsletters, and comments on Chickasaw National Recreation Area's website.

PUBLIC MEETINGS AND NEWSLETTERS

Public meetings and newsletters were used to keep the public informed and involved in the planning process for Chickasaw National Recreation Area. A mailing list of about 400 names was compiled, consisting of members of governmental agencies, organizations, businesses, legislators, local governments, and interested citizens.

The notice of intent to prepare an environmental impact statement was published in the *Federal Register* on September 23, 2002.

The first newsletter, issued in fall 2002, described the planning effort. Public meetings were held during October 2002 at Chickasaw National Recreation Area (October 5 and 9), Oklahoma City (October 7), and Fort Worth, Texas (October 10); and total attendance was about 50 people. The National Park Service also met with city, county, and state agencies during this scoping period. The planning team met with staff from the Oklahoma Department of Wildlife Conservation, Oklahoma Water Resources Board, the state historic preservation office, and the Oklahoma Tourism and Recreation Department on October 7, 2002. On October 8, 2002 a meeting was held with representatives of the Chickasaw Nation, and on October 16, 2002 a public meeting was held with the Sulphur and Davis chambers of commerce.

The National Park Service received comments in the meetings and in the response to the first newsletter. A total of 10 written comments were received in response to the newsletter. These comments were considered/ incorporated into the issues for the plan.

A second newsletter, distributed in September 2003, described preliminary alternatives for managing Chickasaw National Recreation Area. A total of nine written comments were received in response to that newsletter. Given the very small number of responses, it was not possible to draw any conclusions concerning what the public thought about the preliminary alternatives or which alternative would be preferred. Of the people who commented, three individuals liked the range of alternatives and three took issue with the range of alternatives. There was no agreement among the commenters on which alternative was preferred.

CONSULTATION WITH OTHER AGENCIES/ OFFICIALS AND ORGANIZATIONS (TO DATE)

Section 7 Consultation

During the preparation of this plan, NPS staff coordinated informally with the U.S. Fish and Wildlife Service's Tulsa Office. A list of threatened and endangered species for Murray County was compiled using the U.S. Fish and Wildlife Service's website <http: //ifw2es.fws.gov/Oklahoma/ctylist.htm>.

In accordance with the Endangered Species Act and relevant regulations at 50 CFR

Part 402, the National Park Service determined that the GMP is not likely to adversely affect any federally threatened or endangered species and sent a copy of this draft management plan to the U.S. Fish and Wildlife Service with a request for written concurrence with that determination.

In addition, the National Park Service has committed to consult on future actions conducted under the framework described in this management plan to ensure that future actions are not likely to adversely affect threatened or endangered species.

Section 106 Consultation

Federal agencies that have direct or indirect jurisdiction over historic properties are required by Section 106 of NHPA, as amended (16 USC 270, et seq.) to take into account the effect of their undertakings on properties either listed in, or eligible for listing in, the National Register of Historic Places. To meet the requirements of 36 CFR 800 (regulations of the Advisory Council on Historic Preservation implementing Section 106), the National Park Service sent letters to the Oklahoma state historic preservation officer and the Advisory Council on Historic Preservation on September 25, 2002, inviting their participation in the planning process. Both offices were sent all the newsletters with a request for comments. However, no comments were received by the planning team.

Under the terms of stipulation VI.E of the 1995 programmatic agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers, the National Park Service,

"...in consultation with the SHPO [state historic preservation office], will make a determination about which undertakings are programmatic exclusions under IV.A and B, and for all other undertakings, whether there is sufficient information about resources and potential effects on those resources to seek review and comment under 36 CFR 800.4-6 during the plan review process."

Consultation with Native Americans

The National Park Service recognizes that indigenous peoples may have traditional interests and rights in lands now under NPS management. Related Native American concerns are sought through Native American consultations. The need for government-togovernment Native American consultations stems from the historic power of Congress to make treaties with American Indian tribes as sovereign nations. Consultations with American Indians and other Native Americans, such as Native Hawaiians and Alaska Natives, are required by various federal laws, executive orders, regulations, and policies. They are needed, for example, to comply with Section 106 of NHPA, as amended. Implementing regulations of the Council on Environmental Quality for NEPA also call for Native American consultations.

Chickasaw individuals were contacted in 1998 by Clara Sue Kidwell, an Oklahoma anthropologist on contract to the National Park Service, as part of an ethnographic and ethnohistorical study relevant to Chickasaw National Recreation Area (Kidwell in NPS 2001b:164). Letters were sent to the following Native American groups on September 25, 2002 to invite their participation in the general management planning process:

- Apache Tribe of Oklahoma, Anadarko, Oklahoma
- Caddo Tribe of Oklahoma, Binger, Oklahoma
- Chickasaw Nation, Ada, Oklahoma
- Choctaw Nation of Oklahoma, Durant, Oklahoma

- Comanche Tribe of Oklahoma, Lawton, Oklahoma
- Pawnee Nation of Oklahoma, Pawnee, Oklahoma
- Wichita and Affiliated Tribes, Anadarko, Oklahoma

Meetings were also held with officials of the Chickasaw Nation on October 8, 2002 and June 25, 2003, by way of a briefing on the scope of the GMP and the preliminary alternatives by newsletter and follow-up telephone calls soliciting comments.

From the meetings and ethnographic interviewing, the following concerns and suggestions were made for Chickasaw National Recreation Area:

- maintain the trails better because they are walked regularly
- provide more abundant and clearer orientation and map information at all entrances
- allow gathering of certain plants having medicinal and consumptive values on or off the trails
- look for different ways to emphasize the special history and relationships with the Chickasaw people
- study and try to restore the water flow to certain springs
- preserve the water flow of the springs that are still flowing
- install more restrooms to make Chickasaw National Recreation Area more user friendly
- remain free and never charge an entrance fee to the public
- proceed with the three-draft GMP alternatives because they are acceptable
- research and interpret plants that are culturally important to the Chickasaw
- research and interpret Chickasaw individuals like Guy Sandy
- research and interpret the geology and hydrology of the area

Follow-up letters were sent to the tribes on September 9, 2003. Other tribes had no comments at this time other than the Pawnee Nation. The superintendent of Chickasaw National Recreation Area received a letter dated October 15, 2002 from the Pawnee Nation showing deference to the Wichita Tribe on matters relating to what is now the Chickasaw National Recreation Area. Because of this deference to the Wichita Tribe, the Pawnee Nation said that it desires no further communication with Chickasaw National Recreation Area and requested that the Pawnee Nation be removed from the list of tribes to be contacted.

The Chickasaw Nation further commented that with additional consultation, the elders might possibly identify some ethnographic resources as traditional cultural properties for special protection and evaluation for eligibility to the National Register of Historic Places. Also, interpretation of the Chickasaw National Recreation Area should include American Indian viewpoints in cooperation with the Chickasaw Nation Cultural Center being built adjacent to Chickasaw National Recreation Area.

The tribes will have an opportunity to review and comment on this draft plan. Conversations have been ongoing throughout the planning process to inform the tribes about the progress of the plan, to invite their comments, and to identify how and to what extent they would like to be involved. The National Park Service will continue to inform the tribes of opportunities for input on the GMP, such as the forthcoming opportunity to return written comments on the draft document and/or to meet with the Chickasaw National Recreation Area superintendent if such a meeting is desired.

FUTURE COMPLIANCE REQUIREMENTS

NPS determinations of how those individual undertakings relate to the 1995 programmatic agreement in relation to cultural resources.

In table 17 the specific undertakings of the preferred alternative are listed. Listed are the

TABLE 17: FUTURE COMPLIANCE REQUIRED FOR IMPLEMENTATION OF SPECIFIC ACTIONS

Action	Compliance Requirement
Routine preservation, maintenance, and limited rehabilitation measures; archeological monitoring and testing; investigations of historic structures and cultural landscapes for research and inventory purposes.	These items are anticipated to be programmatically excluded from future Section 106 review outside of the NPS.
The <i>Cultural Landscape Report</i> (Hohmann and Grala 2004) would provide general guidance for cultural landscape treatments that entail more than routine preservation maintenance or limited rehabilitation. Other proposed undertakings with the potential to impact historic properties (e.g., facility development at Veterans Lake, and rehabilitation of the CCC-constructed maintenance buildings, etc.).	Future Section 106 review would likely be required before construction at the project implementation planning and/or design stages.



PUBLIC OFFICIALS, AGENCIES, ORGANIZATIONS, AND INDIVIDUALS RECEIVING A COPY OF THIS DOCUMENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation Department of Agriculture **U.S.** Forest Service McClellan Creek/Black Kettle National Grassland Natural Resources Conservation Service Department of Defense Army Corps of Engineers Department of the Interior Bureau of Land Management **Tulsa** District Bureau of Reclamation National Park Service Ft. Smith National Historic Site Oklahoma City National Memorial Washita Battlefield National Historic Site U.S. Fish and Wildlife Service Deep Forth National Wildlife Refuge Salt Plains National Wildlife Refuge Sequoyah/Ozark Plateau National Wildlife Refuge Tishomingo National Wildlife Refuge Washita/Optima National Wildlife Refuge Wichita Mountains National Wildlife Refuge U.S. Geological Survey General Services Administration (GSA) Greater Southwest Region U.S. Environmental Protection Agency U.S. Postmaster Veterans Administration Oklahoma Veterans Center

U.S. SENATORS AND REPRESENTATIVES

Honorable James M. Inhofe, U.S. Senator Honorable Tom Coburn, U.S. Senator Honorable Dan Boren, U.S. Representative Honorable Tom Cole, U.S. Representative Honorable Ernest J. Istook, U.S. Representative Honorable Frank Lucas, U.S. Representative

STATE AGENCIES

Lake Murray State Park Oklahoma Academy of Science Oklahoma Biological Survey Oklahoma Geology Survey **Oklahoma Conservation Commission** Oklahoma Dept. of Environmental Quality Oklahoma Dept. of Wildlife Conservation Murray County Game Warden Oklahoma Dept. of Tourism and Recreation Oklahoma Department of Agriculture Oklahoma Department of Transportation Oklahoma Geological Survey Oklahoma School for the Deaf Oklahoma State University Cooperative Fish and Wildlife Research Unit State Extension Services Oklahoma Water Resources Board State Historic Preservation Office

STATE OFFICIALS

Honorable Brad Henry, Governor of Oklahoma Honorable Wes Hilliard, State Representative Honorable Johnnie Crutchfield, State Senator

AMERICAN INDIAN TRIBES WITH CULTURAL AFFILIATION WITH CHICKASAW

Apache Tribe of Oklahoma Caddo Tribe of Oklahoma Chickasaw Nation Choctaw Nation of Oklahoma Comanche Tribe of Oklahoma Wichita and Affiliated Tribes

LOCAL AND REGIONAL GOVERNMENTS

Arbuckle Master Conservancy District City of Davis City Manager Mayor Fire and Police Departments **Public Schools Turner Falls Park** City of Sulphur City Council City Manager Fire and Police Departments Mavor **Cooperative Extension Service** Murray County Associate District Judge Murray County Commissioners Murray County District Attorney Murray County District Judge Murray County EMS Murray County Industrial Authority Murray County Sheriff's Office Sulphur School System

ORGANIZATIONS AND BUSINESSES

Airgas-Midsouth American Fisheries Society American Legion Arbuckle Emporium Arbuckle Memorial Hospital Arbuckle Sports Center Arbuckle Wilderness Ardmore Chamber of Commerce Artists of the Arbuckles Bailey's Glass BancFirst Barbara's Flowers/Raggedy's Billy Cook Saddles Bob Howe Cameron University The Charles B. Goddard Foundation Chickasaw Foundation Chickasaw Telephone Company **Cooper's Auto Parts** Dance Studio Davis Chamber of Commerce Diacon Hardware Dolls, Etc. Don's Garage Drumb's Haircuts East Central University **Eidson Chevrolet** First Christian Church The Fillin' Station Flower Bluff Residence Flowers Heating & Air Fob Jones George Miksch Sutton Avian Research Center, Inc The Getting Place Goddard Youth Camp Golden Lin Chinese Restaurant Gordon White Lumber Great Plains Coca-Cola Haskell Indian Nations University (Environmental Research Studies Center) Headhunters Hill's Heating & Air Hurst & McNeil **J**&H Janitorial II's New & Used Landmark Bank Larry's Pharmacy Lifestyle Center of America Lions Local Oklahoma Bank Main Street Boutique Meridian Aggregates Company The Muffler Shop Murray County Abstract Murray County Historical Society Murray County Kiwanis Murray State College National Parks and Conservation Association The Nature Conservancy Oklahoma Chapter Northwestern University (Environmental Program)

Oklahoma Association of Conservation Districts Oklahoma Audubon Council Oklahoma B.A.S.S. Chapter Federation Oklahoma Gas & Electric **Oklahoma Native Plant Society** Oklahoma Natural Gas Oklahoma Ornithological Society Oklahoma Wildlife Federation The Oklahoma Woodland Owners Association **O'Reilly Auto Parts** P&M Wrecker Pitmon Oil Company Quality Cleaner Rotary The Samuel Roberts Noble Foundation Sierra Club Oklahoma Chapter Small Engine Repair Snak Shak West Sooner Foods Southeastern Oklahoma State University Southern Oklahoma Memorial Foundation Spirit Walker St. Gregory's University Sulphur Chamber of Commerce Sulphur Community Bank Sulphur Kiwanis Sulphur Main Street Sulphur Springs Inn Super 8 Motel Thackerville Welcome Center Tractors Inc. T&T Wrecker Tulip Garden Club University of Tulsa Walker Tire Western Rock

LIBRARIES

Ardmore Public Library Chickasaw Library System Davis Public Library Hugh Warren Memorial Library Johnston County Public Library Mary E. Parker Memorial Library Nora Sparks Warren Public Library Wynnewood Public Library

MEDIA

Ada Evening News Ada Chamber of Commerce The Daily Ardmoreite The Associated Press Bonham Daily Favorite Cable One Chickasaw Times The Daily Oklahoman Dallas Morning News Duncan Banner Durant Daily Democrat The Davis News The Herald Democrat KADA-AM/FM Radio KFOR-TV **KICM Radio** KIXO RadioSouthern Leader KKAJ AM & FM Radio KOCO-TV 5 Alive News KTEN TV-10 **KTLS** Radio **KVSO** Radio KWTV-TV Ch 9 KXII TV-12 The Lawton Constitution Norman Transcript **OETA-TV** Oklahoma Today Pauls Vallev Democrat Pottsboro Press Purcell Register Shawnee Morning Star Southern Leader Sulphur Times Democrat Tulsa World Wynnewood Gazette

INDIVIDUALS

Walter Allen Lyman Bearden Melanie Berg Nancy Binderim Mr. & Mrs. Leon Blagg Mr. & Mrs. Dick Blasdel Art Boss Sue Braumiller Mrs. Bunny Burnside Steve Burrough Mr. & Mrs. Tom Carr Mr. & Mrs. Darryl Carter Mr. Terry Church Mrs. Ruby Colbert Mrs. Retha Condriff Ms. Anita Eddy **Dewayne Edwards** Albert Faria **Bill Fields** Randy Fehr Mr. Paul Franks Pete Graves Mike Griffis Mr. & Mrs. Loyd Gurley Mr. & Mrs. Vern Hendren Mr. & Mrs. Butch Hill Mrs. Henry Hood Mr. & Mrs. Bob Howard Mrs. Lawrence Howell Mr. & Mrs. Cliff Hughes Tim Jarrell Charlie Johnson Ms. Glenda Kahlor **Iudv Kahlor** Don Keck Mrs. Susie Kendall Mr. & Mrs. Fuzz Kennedy Luis Krug Mrs. Harold Lannom Gerry Laxton Mike Manning Gail McCurry Mrs. Clark McLemore Marsha Mears Mrs. Dick Morton Mr. & Mrs. Steve Miller Mr. & Mrs. Paul Moore

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Appendixes, Selected Bibliography, Preparers and Consultants, and Index

APPENDIX A: LEGISLATION

7. Platt National Park

Excerpt from act of July 1, 1902, ratifying and confirming an agreement with the Choctaw and Chickasaw Indian tribes to cede certain lands to 118 making appropriation for fulfilling treaty stipulations with various tribes 119 of Indians, etc ... Excerpt from act of June 16, 1906, to enable people of Oklahoma and Indian Territory to form a constitution and State government, etc., retaining exclusive jurisdiction over Sulphur Springs Reservation, etc... Joint resolution of June 29, 1906, directing that Sulphur Springs Reserva-tion be named "Platt National Park" 121 121

Excerpt from "An Act To ratify and confirm an agreement with the Choctaw and Chickasaw tribes of Indians, and for other purposes," approved July 1, 1902 (32 Stat. 655)

Page

Five Civil lard Tribes. Ratification of

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following agreement, made by the Commission to the Five Civilized Tribes with the commissions representing the Choctaw and Chickasaw tribes of etaw and Indians on the twenty-first day of March, nineteen hundred and two, be, and the same is hereby, ratified and confirmed, to wit:

64. The two tribes hereby absolutely and unqualifiedly

Sulphur Springs, Cession of adja-cent lands,

Vol. 30, p. 508. Vol. 31, p. 237.

relinquish, cede, and convey unto the United States a tract or tracts of land at and in the vicinity of the village timit of screage of Sulphur, in the Chickasaw Nation, of not exceeding six hundred and forty acres, to be selected, under the direction of the Secretary of the Interior, within four months after the final ratification of this agreement, and to embrace all the natural springs in and about said village and so much of Sulphur Creek, Rock Creek, Buckhorn Creek, and the lands adjacent to said natural springs and creeks as may be deemed necessary by the Secretary of the Interior for the proper utilization and control of said springs and the waters of said creeks, which lands shall be so selected as to cause the least interference with the contemplated town site at that place consistent with the purposes for which said cession is made, and when selected the ceded lands shall be held, owned, and controlled by the United States absolutely and without any restriction, save that no part thereof shall be platted or disposed of for town-site purposes during the existence of the two tribal governments. Such other lands as may be embraced in a town site at that point shall be disposed 118

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of in the manner provided in the Atoka agreement for the disposition of town sites. Within ninety days after the selection of the lands so ceded there shall be deposited in the Treasury of the United States, to the credit of the two tribes, from the unappropriated public moneys of the United States, twenty dollars per acre for each acre of urbea. so selected, which shall be in full compensation for the lands so ceded, and such moneys shall, upon the dissolution of the tribal governments, be divided per capita among the members of the tribes, freedmen excepted, as Improvementa are other funds of the tribes. All improvements upon the lands so selected which were lawfully there at the time of the ratification of this agreement by Congress shall be appraised, under the direction of the Secretary of the Interior, at the true value thereof at the time of the selection of said lands, and shall be paid for by warrants drawn by the Secretary of the Interior upon the Treasurer of the United States. Until otherwise provided by law the Secretary of the Interior may, under the et water, rules prescribed for that purpose, regulate and control the use of the water of said springs and creeks and the temporary use and occupation of the lands so ceded. No person shall occupy any portion of the lands so ceded, or carry on any business thereon, except as provided in said rules, and until otherwise provided by Congress the laws of the United States relating to the introduction, possession, sale, and giving away of liquors or intoxi- sale, etc., of ta-cants of any kind within the Indian country or Indian biosen, reservations shall be applicable to the lands so ceded, and said lands shall remain within the jurisdiction of the United States court for the southern district of Indian Territory: Provided, however, That nothing con-tained in this section shall be construed or held to commit the Government of the United States to any expenditure of money upon said lands or the improvements thereof, except as provided herein, it being the intention of this provision that in the future the lands and improvements herein mentioned shall be conveyed by the United States to such territorial or state organization as may exist at the time when such conveyance is made. (U.S.C., title 16, sec. 151.)

Excerpt from "An Act Making appropriations for the current and contingent expenses of the Indian Department and for fulfiling treaty stipulations with various Indian tribes for the facal year ending June 30, 1905, and for other purposes," approved April 21, 1904 (33 Stat. 220)

SEC. 18. That the Secretary of the Interior is hereby ^{Belphur, Indian} authorized and directed to withhold from sale or other Additional has disposition the irregular tract of land containing seventy- for reservation. eight and sixty-eight one-hundredths acres, more or less, lying in the northwest quarter of section two and the northeast quarter of section three, township one south, range three east, and being within the exterior bound-

LAWS FOR NAT. PARK SERVICE, PARKS, & MONUMENTS

aries of the proposed town site of Sulphur, in the Chickasaw Nation, Indian Territory, and excluded from said town site by order of the Secretary of the Interior, of October twentieth, nineteen hundred and three, and also to withdraw and withhold from disposition the tract of land within the exterior boundaries of said proposed town site, lying south of and adjacent to the tract above mentioned, containing in the aggregate one hundred and thirty-eight acres, more or less, and mentioned in the report of Gerard H. Matthes, of December twentyseventh, nineteen hundred and three, to F. H. Newell, Chief Engineer United States Geological Survey, and shown upon the map accompanying said report by a yellow line.

Price per acre.

Vol. 33, p. 655. (See p. 118.)

Vol. 32, p. 665. (See p. 118.)

Management, control, etc.

Vol. 32, p. 655. (See p. 118.)

Provisos, Enforcement regulations,

Sale of im-

(Amended by Stat. 153, as amended. See p. 12.) The land hereby reserved shall be paid for by the United States at the rate of sixty dollars per acre and in the same manner as the land acquired in accordance with paragraph sixty-four of the act of Congress approved July first, nineteen hundred and two, entitled "An act to ratify and confirm an agreement with the Choctaw and Chickasaw tribes of Indians, and for other purposes," and such money as may be necessary to carry out this provision is hereby appropriated, from any money in the United States Treasury not otherwise appropriated, and made immediately available.

All improvements upon said land, at the passage of this act, shall be appraised and paid for as provided in said paragraph sixty-four of the act of July first, nineteen hundred and two.

The land hereby reserved shall, immediately upon payment therefor by the United States, be and become a part of the reservation heretofore established at the said vil-lage of Sulphur, and shall be subject to all the provisions of said section sixty-four of the act of July first, nineteen hundred and two, respecting the care, control, direction, use, and occupancy thereof, as if they had been included in the original segregation : Provided, That the Secretary of the Interior is hereby authorized, in the absence of other provisions for the care and management thereof, to designate an officer or employee of his department to take charge of the land, whether acquired under said section sixty-four of the act of July first, nineteen hundred and two, or under this act, and to enforce rules and regulations for the control and use thereof, and of the waters of the springs and creeks within the reservation: Provided further, That the Secretary of the Interior is hereby authorized, in his discretion, to sell or dispose of any buildings upon the land hereby reserved and upon the land originally reserved, and all money received from such sales, as well as all money heretofore received or that may hereafter be realized for the use of said waters or for the use and occupancy of the land or the buildings thereon, through leases, permits, or otherwise. may be expended under the

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direction of the Secretary of the Interior for the care and management of said lands, and the preservation of the improvements thereon: And provided further, That if *Violation of* any person, firm, or corporation shall willfully violate any of the rules and regulations prescribed by the Secretary of the Interior relative to the use of the waters of said springs and creeks and the use and occupation of the lands in said reservation, such person, firm, corporation, or members or agents thereof, shall be deemed guilty of a misdemeanor, and upon conviction shall be fined not less than five dollars and not more than one hundred dollars, and may be imprisoned for a term of not more than six months for each offense. (U.S.C., title 16, sec. 152.)

Excerpt from "An Act To enable the people of Oklahoma and of the Indian Territory to form a constitution and State government, etc.," approved June 16, 1906 (34 Stat. 267)

Szc. 7.1 . . Provided, That nothing in this act Provise. Sorting contained shall repeal or affect any act of Congress relat- and other reasing to the Sulphur Springs Reservation as now defined vations rearry or as may be hereafter defined or extended, or the power of the United States over it or any other lands embraced in the State hereafter set aside by Congress as a national park, game preserve, or for the preservation of objects of archæological or ethnological interest; and nothing contained in this act shall interfere with the rights and ownership of the United States in any land hereafter set aside by Congress as national park, game preserve. or other reservation, or in the said Sulphur Springs Reservation, as it now is or may be hereafter defined or extended by law; but exclusive legislation, in all cases metaulve juris-whatsoever, shall be exercised by the United States, diction re-whatsoever, shall be exercised by the United States, diction are which shall have exclusive control and jurisdiction over Berries et the sector of the same; but nothing in this proviso contained shall be construed to prevent the service within said Sulphur Springs Reservation or national parks, game preserves, and other reservations hereafter established by law, of civil and criminal processes lawfully issued by the authority of said State, and said State shall not be entitled internity to select indemnity school lands for the thirteenth, six- from parks, etc. teenth, thirty-third, and thirty-sixth sections that may be embraced within the metes and bounds of the national park, game preserve, and other reservation or the said Sulphur Springs Reservation, as now defined or may be hereafter defined. (U.S.C., title 16, sec, 153.)

Joint Resolution Directing that the Sulphur Springs Reservation be named and hereafter called the "Platt National Park," approved June 29, 1906 (34 Stat. 837)

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, Sulphur Springer That the Secretary of the Interior be, and he is hereby, Reservation.

¹The above provision was substantially covered by the State constitution of Okiahoma, adopted July 16, 1907, as art. 1, sec. 3.

LAWS FOR NAT. PARK SERVICE, PARKS, & MONUMENTS

Name changed is Platt Na-tional park in bosor of the late connecticut. Manuel Antipart in the State of Oklahoma, formerly in the Indian Terri-tory, so that said reservation shall be named and here-after called the "Platt National Park," in honor of Orville Hitchcock Platt, late and for twenty-six years a Senator from the State of Connecticut, and for many years a member of the Committee on Indian Affairs, in recognition of his distinguished services to the Indians recognition of his distinguished services to the Indians and to the country. (U.S.C., title 16, sec. 151.)

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Public Law 94-235 94th Congress

An Act

To establish the Chickman National Recreation Area in the State of Okłaboms, and for other purposes.

Re it enacted by the Secule and Honse of Representatives of the United States of America in Congress assembled. That in order to provide for public outdoor recreation use and enjoyment of Arbuckle Reservoir and hard adjacent thereto, and to provide for more efficient. administration of other adjacent area containing scenic, scientific, natural, and historic values contributing to public enjoyment of the men and to designate the area in such manner as will constitute a fitting memorialization of the Chickasaw Indian Nation. there is hereby established the Chicka-aw National Recreation Area therein: after referred to as the "recreation area") consisting of lands and interests in hands within the area as generally depicted on the drawing entitled "Boundary Mop. Chickasaw National Recreation Area," numbend 107-20004 Å and dassl February 1974, which shall be no file and available for inspection in the offices of the National Park Service, Department of the Interior, The Secretary of the Interior (hereinafter (covered to as the "Secretary") may from time to time revise the boundaries of the recreation area by publication of a map or other boundary description in the Federal Register, but the total forcage of the recevation area may not exceed too thousand acres.

SEC. 2. (a) The Secretary may acquire hand or interests in lands. Land sequisition. within the boundaries of the remation area by domition, parchase with donated or appropriated funds, or exchange. When any tract of land is only partly within such boundaries, the Secretary only nequire all or may portion of the land outside of such boundaries in order to minimize the payment of severance costs. Land so acquired ontside of the boundaries may be exchanged by the Secretary for non-Federal hords within the boundaries, and any land so acquiroù and not arilized for exchange shall be reported to the General Services Administration for disposal earler the Federal Property and Administrative Services Act of 1949 (63 Stat, 377), as amended, Any Federal property located -40 USC 471 note. within the boundaries of the recreation area may be transferred without consideration to the administrative jurisdiction of the Secretary for the purposes of the recreation area, hands within the boundaries of the recreation area owned by the State of Oklahopoa, or any political subdivision thereof, may be acquired only by domation: Provided, That the Secretary may also acquire lands by exchange with the city of Sulphur, utilizing therefor only such hands as muy be excluded from the recreation area which were formerly within the Platt National Park.

(b) With respect to improved residential property acquired for Residential the purposes of tids Act, which is beneficially owned by a natural person and which the Secretary determines can be continued in that use for a limited period of time without undue interference with the administration, development, or public use of the recreation area, the owner thereof may on the date of its acquisition by the Secretary retain a right of use and occupancy of the property for nuccommetcial residential purposes for a term, as the owner may clock ending either (1) at the death of the owner or his spouse, whichever

Mar. 17, 1976 [H.R. 4979]

Chickasaw Satjonal Recordsteen Area, Okla. Establishment. 16 USC 4606N.

Publication in Federal Hegister.

16 USC 460Eb-1.

property.

"Improved residential property."

Henting and fishing, 16 USC 460hb-2.

Administration. 16 USC 460Nh-3.

Repral. 16 USC 40055-8.

Publication in Federal Register, 16 USC 460hh-5. occurs later, or (2) not more than twenty-five years from the date of sequisition. Any right so retained may, during its existence, be transferred or assigned. The Secretary shall pay to the owner the fair market value of the property on the date of such acquisition, less the fair market value on such date of the right retained by the owner.

(c) As used in this Act, "improved residential property" means a single-family year-round dwelling, the construction of which began before March 1, 1975, and which serves as the owner's permanent place of abode at the time of its requisition by the United States, together with not more than three acres of land on which the dwelling and appartenant holidings are located that the Secretary finds is reasonably necessary for the name's continued use and occupancy of the dwelling: *Provided*. That the Secretary may exclude from improved residential property any waters and adjoining land that the Secretary decays is necessary for public access to such waters.

(d) The Secretary may retainate a right to use and orequarcy retained pursuant to this section upon his deterministion that such use and occupancy is being exercised in a manner bot consistent with the purposes of the Act, and upon tender to the holder of the right an amount equal to the fair market value of that portion of the right which remains an expired on the date of termination.

Sec. 3. The Secretary shall permit locating and fishing on lands and waters within the recreation area in accordance with applicable Erdenal and State lows: *Provided*. That he may designate zones where, and establish periods when, no hunting or fishing will be permitted for reasons of public safety, administration, fish or wildlife management, or public use and enjoyment. Except in emergencies, any regulations issued by the Secretary pursuant to this section shall be put into effect only after consultation with the appropriate State agency responsible for hunting and fishing activities.

Sec. 4. (a) Except as otherwise provided in this Act, the Secretary shall administer the recreation area in accordance with the provisions of the Act of August 25, 1916 (39 Stat. 535; 16 U.S.C. I. 2.4), as uncoded and supplemented.

(b) Nothing contained in this Art shall affect or interfere with the authority of the Secretary by the Act of August 24, 1962 (76 Stat. 395), to operate the Arbachle Dam and Reservoir in accordance with and for the purposes set forth in that Act.

SEC. 5. The Act of June 20, 1906 (34 Stat. 837), which directed that certain hands now included by this Act in the recreation area be designated as the Platt National Park, is hereby repealed, and such lands shall hereafter be considered and known as an integral part of the Chickasaw National Recreation Area: *Provided*, That within such area the Secretary may cause to be erected suitable markers or plaques to honor the memory of Orville Hitcherick Platt and to commemorate the original establishment of Platt National Park.

SEC. 6. Notwithstanding the provisions of section 7 of the Act of June 16, 1906 (34 Stat. 272), which retain exclusive jurisdiction in the United States, upon notification in writing to the Secretary by the appropriate State officials of the secreptance by the State of Oklahoma of concurrent legislative jurisdiction over the lands formerly within the Platt National Park, the Secretary shall publish a notice to that effect in the Federal Register and, upon such publication, concurrent legislative jurisdiction over such hands is hereby ceded to the State of Oklahoma: *Provided*, That such cession of jurisdiction shall not occur until a written agreement has been reached between the State of Oklahoma and the Secretary providing for the exercise of concurrent

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jurisdiction over all other lands and waters within the Chickasaw National Recreation Area.

SEC. 7. There are hereby authorized to be appropriated such sums Appropriation as may be necessary to carry out the purposes of this Act, but not to exceed \$1,600,000 for the acquisition of lands and interests in lands, ¹⁶ USC 460hh-5, and \$4,557,000 for development.

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Approved March 17, 1976.

LEGISLATIVE HISTORY:

HOUSE REPORT No. 94-803 (Comm. on Interior and Insular Affairs). SENATE REPORT No. 94-678 (Comm. on Interior and Insular Affairs). CONGRESSIONAL RECORD, Vol. 122 (1976): Sel: 2. considered and and second Views.

Feb. 2. considered and passed flouse. Mar. 3. considered and passed Senate.

APPENDIX B: STATEMENT OF FINDINGS

STATEMENTS OF FINDINGS FOR EXECUTIVE ORDER 11988 FLOODPLAIN MANAGEMENT CHICKASAW NATIONAL RECREATION AREA GENERAL MANAGEMENT PLAN / ENVIRONMENTAL ASSESSMENT

Recommended	1:	
	Superintendent, Chickasaw National Recreation Area	Date
Companya		
Concurred:	Chief Water Resources Division	Date
	Chief, water resources Division	Date
Approved:		
	Director, Intermountain Region	Date

APPENDIXES, SELECTED BIBLIOGRAPHY, PREPARERS AND CONSULTANTS, AND INDEX

INTRODUCTION

In accordance with Executive Order 11988 — Floodplain Management and National Park Service (NPS) guidelines for implementing the order, the National Park Service has reviewed the flood hazards in Chickasaw National Recreation Area, and has prepared this statement of findings (SOF).

In examining the recreation area, the only structure identified to be within a regulatory floodplain was the Travertine Nature Center. No other structures within a regulatory floodplain require a flood hazard assessment. The Buckhorn and Point campgrounds are subject to flooding due to high water levels in Lake of the Arbuckles. However, flooding of these campgrounds is due to a regulated reservoir, and does not pose a threat to human life or contribute to the degradation of natural floodplain values. Any flooding that does occur is gradual – there would be sufficient time to evacuate and close sites that are flooded. The campgrounds are thus not considered to be subject to the NPS floodplain guidelines.

This statement of findings focuses on evaluating the flood hazards for the Travertine Nature Center in the Travertine Creek floodplain. As a part of the effort to develop a general management plan (GMP) for Chickasaw National Recreation Area, the statement of findings describes the flood hazard, alternatives, and mitigation measures for the continued use of this area. Additional detail regarding Chickasaw National Recreation Area, future actions to be taken in the area, and environmental impacts may be found in the GMP/EIS.

Most of the following text is based on a 2004 trip report on the area prepared by the NPS Water Resources Division (NPS 2004).

Description of the Site

Travertine Creek, a tributary of Rock Creek, originates in the Buffalo and Antelope springs area and runs for approximately 1.5 miles. It drains much of the Platt Historic District in Chickasaw National Recreation Area. The watershed area is approximately 3.5 square miles, but the area above the nature center is only about 0.6 square miles. The streambed profile is very steep along Travertine Creek, and there are several pool areas along the creek. The springs result in a steady flow through most of the year.

Travertine Creek has a long history of human occupation. A number of public use facilities are along the creek: the Travertine Nature Center, two picnic areas (Travertine Island and Little Niagara), and two campgrounds (Central and Cold Springs) near the Travertine Creek floodplain. In addition, the Chickasaw National Recreation Area road closely parallels the creek and there are two low-water crossings of the creek. During storms, this road may be closed due to high water.

The Travertine Nature Center, built in 1969, is an L-shaped building with one wing located directly over Travertine Creek. The entire structure is within the regulatory 100-year floodplain as mapped by Harp et al. (1984).

General Characterization of Floodplain Values, Nature of Flooding, and Associated Floodplain Processes in the Area

Travertine Creek's natural floodplain values have been altered by past human habitation and uses. However, the floodplain includes the recreation area's Environmental Study Area, and it still has many natural values. The floodplain is largely covered by a riparian forest and provides habitat for a variety of wildlife species. The nature center has altered some of these floodplain values, such as the depth and extent of some flows, although the overall effect on the creek's floodplain values is probably not measurable.

Travertine Creek is subject to periodic floods, some of which can be large events, although there are no long-term data on the frequency of flooding. (Rock Creek, which Travertine Creek flows into, had 22 major floods between 1924 and 1943, with other major floods in 1953 and 1970 (NPS 1998b). Harp et al. (1984) noted that floods on several occasions had resulted in the loss of life on Travertine Creek. Reportedly, flows in the creek have reached the nature center's foundation at least twice since 1969 with one of those events reaching the window level on the upstream side (NPS 2004).

Based on historical precipitation records, the spring and fall are the wettest times of the year in this area (NPS 1998b). This region of the United States may be subject to heavy summer thunderstorms, which can produce large flows. However, floods can occur at any of time of year due to precipitation from severe thunderstorms. Major floods have occurred in the recreation area in January, May, and October. The most damaging flood recorded at Chickasaw National Recreation Area occurred on October 8, 1970, when the area received 11.61 inches — the highest daily precipitation total ever recorded (NPS 1998b).

JUSTIFICATION FOR USE OF THE FLOODPLAIN

Description of the Preferred Alternative and Why Facilities Would be Retained in the Floodplain

The preferred alternative in the GMP is to retain the Travertine Nature Center in its present location. As noted above, all of the structure is in the 100-year floodplain.

The Travertine Nature Center could be moved out of the floodplain. However, this is a very popular educational/recreational site and is one of Chickasaw National Recreation Area's major visitor use areas. Moving the facility would be extremely costly and is not currently economically feasible. Moving the facility also would result in adverse impacts and the loss of other natural resources in the area. In addition, the area is part of a cultural landscape that is listed on the National Register of Historic Places. Moving the facility would adversely affect this landscape. Thus, no alternative locations were considered in the *General Management Plan* that would move the nature center from the floodplain.

DESCRIPTION OF SITE-SPECIFIC FLOOD RISK

In addition to being within the 100-year floodplain, part of the building is located on an arch span across the channel, the abutments of which are below the top of the banks. This encroachment on

the floodplain will increase the depth of flooding and result in a greater frequency of flooding – any flows that approach bank full level will be restricted by the structure and a backwater effect will result in raising the level of the flood (NPS 2004).

Harp et al. (1984) estimated the flows of the 100- and 500-year floods on Travertine Creek to be 1,300 and 1,700 cubic feet per second (cfs), respectively. The modeled depth of the 100-year flood is about six feet without accounting for the backwater effect of channel encroachment. This flow would be sufficient to surround and flood the building. The flow also would likely undermine the building's foundation, which would result in its wholesale loss. Furthermore, the steepness of the channel may produce substantial velocities, and the small size of the watershed will result in a time to peak flow of less than one hour (45 minutes). Consequently, a flood of this magnitude would result in dangerous conditions with little warning and could pose a threat to people in the nature center (NPS 2004). Thus, mitigation measures need to be taken to minimize the risk to human life from flooding.

FLOOD MITIGATION MEASURES

The best mitigation measure would be to move the structure out of the floodplain, but as noted above, this option is not currently feasible. However, if the existing structure reaches its usable lifespan, or if a future flood event results in severe damage, then the facility should be relocated.

Structural mitigation to reduce flood hazard is not feasible. Construction of a "flood overflow" channel was reportedly proposed by the authors of the flood study (NPS 1998b). However, such a channel does not appear to be a viable option. The modeled 100-year flood completely fills the valley bottom, affording no location for a diversion channel short of a cross-basin conveyance. Furthermore, the amount of land disturbance and complexity of design and maintenance would render the proposal prohibitive (NPS 2004).

The only currently viable mitigation measure for the nature center is the implementation of an evacuation plan. A planned evacuation would require vigilance on the part of NPS staff but should be feasible. In the case of a severe flood, the modeled 100-year flood indicates that all of the valley bottom would be inundated to a depth of six feet. This would make the access road impassable. However, the NPS staff should have the opportunity to evacuate any visitors by foot to high ground about two hundred feet south of the building. The NPS staff should be fully aware of the hazard posed by flooding and know the criteria and procedures for evacuating visitors. In particular, the NPS staff should know where the highest and most accessible area is near the nature center. Signs also would be placed in the building informing visitors and staff of the flood risk and suggested actions in the event of flooding (i.e., an evacuation route). In addition, a communication system could be developed with the National Weather Service, which would give advance warning to the NPS staff of approaching major storms. On-site NPS staff should assume an "alert status" during periods of heavy rain and monitor water levels in the creek. If a substantial rise is observed, evacuation information should be provided to visitors and relocation out of the most hazardous areas should begin.

Due to the short response time of the watershed, extensive removal of display items and office records will probably not be possible. Consequently, no irreplaceable records, archaeological artifacts, or museum collections should be kept in the nature center – anything kept in the building should be considered expendable.

One other action that can slightly reduce the risk to life or property is to regularly remove debris that collects on the upstream side of the arch span of the nature center. (If sediments accumulate on the upstream side of the span and were determined to be a problem, then they may also be removed, although a Section 404 permit would be required from the U.S. Army Corps of Engineers before this could occur.) This action will help prevent floods from some flows if the span is blocked or partially obstructed, although it will not prevent damage and risk to life from flood flows that approach bank full level.

As a final note to continued occupation of the nature center, previous high flows may have reached the foundation and compromised the building's structural integrity. Consequently, it is recommended that the building's foundation be inspected by a structural engineer as soon as possible. This inspection should also assess the potential for wholesale loss of the building during a high magnitude flood.

SUMMARY

The National Park Service has determined that there is no practicable alternative to maintaining the Travertine Nature Center within the floodplain of Travertine Creek. This determination was based on the decision to continue to use the nature center as a primary visitor use area within the recreation area and the substantial cost of moving the facility out of the floodplain. The primary flood mitigation measure is to develop an evacuation plan for the nature center and keep all NPS staff informed of the plan. Although the nature center is within an area subject to flooding, there would be time to warn staff and visitors using the facility to evacuate the area. If a flood occurs, visitors and NPS staff can evacuate to high ground south of the building. The building's foundation also should be inspected as soon as possible for structural integrity problems.

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APPENDIX C: PLANT AND ANIMAL SPECIES MENTIONED IN THE PLAN

Plant and Animal Species Mentioned in the Plan		
Common Name	Scientific Name	
Pla	nts	
American elm	Ulmus Americana	
ash juniper	Juniperus ashei	
Bermuda grass	Cynodon dactylon	
big bluestem	Andropogon gerardi	
black dalea	Dalea frutescens	
black hickory	Carya texana	
black willow	Salix nigra	
blackjack oak	Quercus.marilandica	
broomsedge	Andropogon virginicus	
Chinkapin oak	Quercus muehlenbergii	
cottonwood	Populus deltoides	
crown vetch	Coronilla varia	
green ash	Fraxinus pennsylvanica	
hairy grama	Bouteloua gracilis	
hairy tall dropseed	Sporobolus asper	
Indian grass	Sorghastrum nutans	
Japanese honeysuckle	Lonicera japonica	
Johnsongrass	Sorghum halpense	
king ranch bluestem	Andropogon ischaemum songaricus	
lace cactus	Echinocereus reichenbachii	
little bluestem	Andropogon scoparius	
mimosa tree	Albizia julibrissin	
Oklahoma beardtongue	Penstemon oklahomensis	
Ozark dropseed	Sporobolus ozarkanus	
pecan	Carya illinoensis	
pincushion cactus	Escobaria vivipara	
post oak	Quercus stellata	
privet	Ligustrum vulgare	
purple threeawn	Aristida purpurea	
red cedar	Juniperus virginiana	
	Olmus rubra	
	Pediomelum reversionii	
rough lost dogwood	Corpus drummondii	
Russian thistle	Salsola iberica	
	Muhlanbargia ravarchanii	
Sericea lespedeza		
short lobe oak	Ouercus durandii var, breviloba	
Shumard oak	Quercus durandii var. Dreviloba	
sideoats grama	Bouteloua curtinendula	
southern hackberry	Celtis Jaevigata	
sugar berry	Celtis laevigata	
switchgrass	Panicum virgatum	
svcamore	Platanus occidentalis	
Texas ash	Fraxinus texensis	
Texas oak	Quercus bucklevi	
tree-of-heaven	Ailanthus altissima	
whitesheath sedge	Carex hyaline	
winged elm	Ulmus alata	
woodland sedge	Carex cephalophora	
Birds		
American crow	Corvus brachyrhynchos	
American kestrel	Falco sparverius	
American robin	Turdus migratorius	
bald eagles	Haliaeetus leucocephalus	
barred owl	Strix varia	
blue jay	Cyanocitta cristata	
blue-gray gnatcatcher	Polioptila caerulea	

Plant and Animal Species Mentioned in the Plan		
Common Name	Scientific Name	
blue-winged teal	Anas discors	
Canada goose	Branta canadensis	
carolina wren	Thryothorus Iudovicianus	
downy woodpecker	Picoides pubes cens	
gadwall	Anas strepera	
great-crested flycatcher	Myiarchus crinitus	
greater roadrunner	Geococcyx californianus	
indigo bunting	Passerina cyanea	
mallard	Anas platyrhynchos	
mourning dove	Zenaida macroura	
northern bobwhite guail	Colinus virginianus	
northern cardinal	Cardinalis cardinalis	
painted bunting	Passerina ciris	
red-tailed hawk	Buteo jamaicensis	
tufted titmouse	Parus bicolor	
turkey vulture	Cathartes aura	
black-capped vireo	Vireo atricapillus	
white-throated sparrow	Zonotrichia albicollis	
whooping cranes	Grus americana	
wild turkey	Meleagris gallopavo	
Mam	imals	
beaver	Castor canadensis	
bison	Bison bison	
black bear	Ursus americanus	
black-tailed jackrabbit	Lepus californicus	
bobcat	Lynx rufus	
coyote	Canis latrans	
eastern cottontail	Sylvilagus fioridanus	
eastern mole	Scalopus aquaticus	
elk	Cervus elaphus	
fox squirrel	Sciurus niger	
gray fox	Urocyon cinereoargenteus	
gray wolf	Canis lupus	
nine-banded armadillo	Dasypus novemcinctus	
northern short-tailed shrew	Blarina brevicauda	
raccoon	Procyon lotor	
river otter	Ultra condenses	
striped skunk	Mephitis mephitis	
Virginia opossum	Dideiphis virginiana	
white-tailed deer	Odocoileus virginianus	
Reptiles and Amphibians		
alligator snapping turtle	Macroclemys temminckii	
bullfrog	Rana catesbeiana	
coachwhip	Masticophis flagellum	
copperhead	Agkistrodon contortrix	
eastern hognose snake	Heterodon platyrhinos	
garter snake	Thamnophis sirtalis	
milk snake	Lampropeltis triangulum	
prairie king snake	Lampropeltis calligaster calligaster	
pygmy rattlesnake	Sistrurus miliarius streckeri	
small mouthed salamander	Ambystoma texanum	
southern leopard frog	Rana sphenocephala	
Texas horned lizard	Phrynosoma cornutum	
timber rattlesnake	Crotalus horridus	
western cottonmouth	Agkistrodon piscivorus	
western diamondback rattlesnake	Crotalus atrox	

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NPS D-126 March 2007 This plan was printed on recycled paper.