

final environmental impact statement

general management plan

july 1980

F E S 80 - 22

CHICKASAW

NATIONAL RECREATION AREA / OKLAHOMA





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ERRATA SHEET FOR ALL CHANGES IN TEXT

New Cover

New signature page

Page i - new page inserted

Page v - add new appendix

"Public Comments and National Park Service Response 154 "

Page 8 - B.1.a.#2, add to second paragraph the following sentence:

"In the case of waterfowl hunting, compliance with Federal and State mandates will be provided."

Page 11 - g.#2, change entire paragraph to read:

"#2. Any activities in the NRA in the exercise of rights to oil and gas not owned by the United States will be in accordance with 36 CFR Part 9, Subpart B. These regulations are designed to prevent or minimize damage to the environment and to insure to the extent feasible that all units of the National Park System are left unimpaired for the enjoyment of future generations."

Page 14 - #3, change third paragraph, second sentence to read:

"In the past, camping demand has been managed with a reservation system."

Page 45 - change first two agreements to read:

"3/31/78 Bureau of Reclamation (now the Water and Power Resources Service)	Directs that administration, planning and development of lands and facilities at Arbuckle Recreation Area will not interfere with operation of Arbuckle Reservoir for its primary purposes. Establishes procedure for oil and gas leases."
--	--

"8/22/79 Oklahoma Department
of Wildlife Conserva-
tion

Assigns specific re-
sponsibilities for man-
agement of the game
and fish in Chickasaw
National Recreation
Area."

Page 47 - 3., change second permit number to read:

"Permit No. 7076-6-0002."

Page 47 - C. I., change second paragraph, third sentence to read:

"Other year-round structures include four employee residences (one also serves as staff offices), a ranger station, and the maintenance area with office, garage, yard and storage building."

Page 55 - change 500 year flood control contour to read:

"500-year flood
control contour 891.2"

add below this:

"100-year flood
control contour 885.85"

Page 75 - Table 22, change title to read:

"Quality Data for Chickasaw National Recreation Area"

Page 84 - b., change second paragraph, starting with third sentence to read:

"Northern pike and walleye, nonnative species, were introduced into the Lake of the Arbuckles in the 1950s and 1960s. The northern pike has not been observed since 1975, the walleye is reproducing. Fish in the lake have direct access to the Rock Creek Corridor and Travertine Districts by stream."

Page 84 - b., change fourth paragraph, first sentence to read:

"Pronghorn (antelope) were once common to the area, but are not presently found closer than 200 miles to the northwest."

change fourth paragraph, last sentence to read:

"Whitetail deer are present."

Page 85 - c., add the following sentences:

"It is expected that the bald eagle (Haliaeetus leucocephalus) and the peregrine falcon (Falco peregrinus anatum) could occur in the area at least as migrants or transients. Park records show that since 1926 there have been no sightings of the peregrine falcon and three of the bald eagle, (2-14-72, 12-1-78, 12-4-78)."

Page 99 - B., add to the second paragraph, the following sentence:

"Because of limited sightings and the minimal development planned, no effect is expected on threatened or endangered species."

Page 134- insert new page

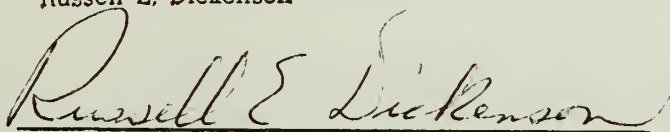
Page 138- Bibliography, change the citation beginning KERR, ROBERT S. to read:

"1968 Arbuckle Reservoir Monitoring Project, Proposal for 1968 Research (preliminary draft). Ada, Oklahoma: U.S. Department of Interior, Federal Water Pollution Control Administration, Water Quality Research Program, Robert S. Kerr Water Research Center"

Page 154- insert appendix entitled - "Public Comments and National Park Service Response"

Prepared by the Denver Service Center
United States Department of the Interior
National Park Service

Russell E. Dickenson

A handwritten signature in cursive script that reads "Russell E. Dickenson". The signature is written in dark ink and is positioned above a horizontal line.

Director, National Park Service

Chickasaw National Recreation Area/Oklahoma
FINAL ENVIRONMENTAL STATEMENT
GENERAL MANAGEMENT PLAN

SUMMARY

() Draft (X) Final ENVIRONMENTAL STATEMENT

Department of the Interior, National Park Service, Southwest Region

1. Type of Action: (X) Administrative () Legislative

2. Brief Description of Action: The National Park Service proposes coordinated facility development, visitor use programs, and resources management actions for Chickasaw National Recreation Area through a general management plan. This Recreation Area was established in 1976 by joining the former Platt National Park with the former Arbuckle National Recreation Area by means of a connecting corridor of land. New facilities are proposed to realize the recreational opportunities offered by the larger area; these include a visitor center/headquarters adjacent to the city of Sulphur, a 9.5-mile biking/hiking trail, a 6.5-mile hiking trail, a net of 32 additional campsites (adding 59 and deleting 27), three comfort stations, a campground sewage collection system, and 11 small structures for park protection and maintenance. A shallow overflow channel will be constructed to provide a floodwater bypass around Travertine Nature Center. An artesian well will be capped so that its flow may be regulated, decreasing the volume if feasible. Research is proposed into vegetative mosaics, water management, wildlife studies, flood conditions, and visitor use/resource preservation relationships. Carrying capacities are provisionally established for camping use (468 individual and 20 group sites) and for boat use (600 at one time), within the general level of 2 million visitors, to be monitored and adjusted by management as visitor preferences and resources factors are measured.

3. Summary of Environmental Impact and Adverse Environmental Effect:

The proposal will provide visitor experiences of varied character and at differing use intensities in designated parts of the recreation area. Resources will be restored, to the degree research indicates is feasible, to more parklike conditions. Should these situations induce restoration of visitor travel to former numbers, the regional economy could receive added tourist spending. Construction activities will cover 19.05 acres of soil with impervious surfaces, removing the biological resources thereon. In addition, there will be 8.43 acres of undisturbed land converted to camping use, with partial impacts to plants and animals due to increases in visitor use locally. A landscaped overflow channel 250 feet long and 12 feet wide (.07 acres) will be constructed. Animal behavior patterns will be altered by new trails. Local modification of topographic landform--on a maximum scale of 3 feet vertically--will occur along new trails and at building sites.

4. Alternatives Considered: Five (2 related to capacity and 3 to development) alternatives were considered: No Action, Increase Facility Capacity to Terrain Capacity, Develop Bicycle Trail from Travertine District to The Point, Relocate U.S. Highway 177 and Redesign Circulation in Travertine District, and No Visitor Center.

5. Comments have been requested from the following: (see following page)

6. Date draft and final statements made available to EPA and the public:

Draft - November 6, 1979

Final - AUG 22 1980

5. Comments have been requested from the following:

Federal Agencies

Advisory Council on Historic Preservation
Department of Agriculture
 Soil Conservation Service
 Forest Service
Department of Defense
 Army Corps of Engineers
Department of Housing and Urban Development
Department of the Interior
 Bureau of Land Management
 Fish and Wildlife Service
 Bureau of Indian Affairs
 Bureau of Reclamation
 Bureau of Mines
 Geological Survey
 Heritage Conservation and Recreation Service
Department of Transportation
 Federal Highway Administration
Environmental Protection Agency

State and Local Agencies

State Historic Preservation Officer
Oklahoma Department of Transportation
Oklahoma Department of Wildlife Conservation
Office of Community Affairs and Planning, State Grant-In-Aid
 Clearinghouse (State Clearinghouse)
Southern Oklahoma Development Association
 (Areawide Clearinghouse)
Arbuckle Master Conservancy District
Chickasaw Nation
Interested Agencies, Organizations and Individuals

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DESCRIPTION OF THE PROPOSAL

I. DESCRIPTION OF THE PROPOSAL

A. Overview

1. The Region

Chickasaw National Recreation Area is a unit of the National Park System lying in south-central Oklahoma. The accompanying map shows the regional road network, communities, and parks and reservoirs. There are three state park/resort areas within the region of Chickasaw National Recreation Area, these are Arrowhead, Lake Murray, and Lake Texoma. All provide camping with hookups optional at nominal charge, plus lodging and restaurant facilities. A full range of outdoor recreational opportunities and camp amenities are provided. Turner Falls, about 9 miles southwest of the recreation area, is a municipal park operated by the City of Davis for outdoor recreation and enjoyment of the natural features, supplying 200 fee campsites with another 200 overflow sites available.

The "home" county for Chickasaw National Recreation Area is Murray County, and the nearest city (lying along the northern boundary) is Sulphur. The City of Davis is about 9 miles west.

Chickasaw NRA fulfills an important need in its area, as public land for open space is generally not abundant in its region. It therefore provides its region with opportunities for diverse outdoor experiences--recreational to nature study.

2. Background

The establishment and rapid settlement of the town of Sulphur within the Chickasaw Indian Nation and around an area of springs valued by the Choctaw and Chickasaw Tribes for their curative powers, prompted an agreement between these tribes and the United States, which, by an act of Congress, established Sulphur Springs Reservation, July 1, 1902 (32 Stat. 655). The original act directed the Secretary of the Interior to select certain lands, not to exceed 640 acres, embracing all natural springs in and about the town of Sulphur, and as much of Sulphur and Rock Creeks as necessary for the proper utilization and control of the springs and waters of the creeks, with the restriction that, once established, no part of the tract could be platted or disposed of for townsite purposes.

Legislation subsequent to this initial enablement is briefly as follows:

The act of April 21, 1904 permitted addition of certain lands to the reservation, comprising 218.89 acres.

The act of June 16, 1906, provided for exclusive jurisdiction over the area by the National Park Service.

← ??



OKLAHOMA

OKLAHOMA CITY

To Amarillo
179 Miles

To Wichita
160 Miles

To Tulsa
126 Miles

To Little Rock
306 Miles

Lake Eufaula
Arrowhead State Park

Chickasha

Pauls Valley

Ada

Lawton

Ft. Arbuckle

Davis

Sulphur

Arbuckle Mountains

Duncan

CHICKASAW
N.R.A.

Turner Falls

Ardmore

Lake Murray State Park

Durant

TEXAS

Red River

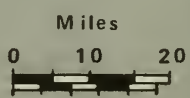
Lake Texoma
State Park

THE REGION

CHICKASAW
CHICKASAW NATIONAL RECREATION AREA

FORT WORTH

DALLAS



The act of June 29, 1906, directed that the Sulphur Springs Reservation be renamed Platt National Park in honor of Orville H. Platt, early Connecticut Senator and member of the Committee on Indian Affairs.

On July 16, 1907, Oklahoma recognized the exclusive jurisdiction of the National Park Service over Platt National Park.

The act of July 18, 1940, permitted the addition of certain lands, amounting to 63.75 acres.

With the authorization for construction by the Bureau of Reclamation of the Arbuckle Reservoir Project in 1962 (Public Law 87-594), the National Park Service focused on the recreation potential of the reservoir. Following an investigation by the National Park Service's Southwest Regional Office staff members in 1962, the Service (in 1965) assumed responsibility for administering certain lands and waters of the Arbuckle Reservoir for public recreation.

A master plan study for the combined Platt National Park/ Arbuckle Recreation Area was initiated by the National Park Service in September 1968. Following a limited regional distribution of a working draft of the proposed master plan, a public hearing was held at Platt in October 1970. The plan was reviewed in depth, and comments were solicited. At this hearing, Mr. George Bourland, Chairman of the Chickasaw Tribe Advisory Council, read an intriguing resolution and proposed that the name of the area be changed to Chickasaw National Recreation Area to commemorate the Indian tribe upon whose lands the proposed recreation area is located. As a result of this hearing, the master plan was revised.

Redrafting of the plan continued for several years as a variety of alternative boundaries and development concepts were explored. For instance, additional units were considered, including Turner Falls and other nearby park areas. Larger acreages--up to 15,000--for the basic area that eventually became Chickasaw National Recreation were considered. Expansion of development was also studied, with analyses of such things as concessioner-operated marinas at Arbuckle Lake; renovation, relocation, and expansion of campgrounds; a regional governmental/cultural/visitor center; roads between Travertine and Lake Districts; recreational development of Veterans Lake; an overpass above Travertine District to reroute U.S. Highway 177 traffic; and a transportation study that would perhaps introduce a supplementary bus system into the park circulation.

On March 17, 1976, an act (Public Law 94-235) was approved "To establish the Chickasaw National Recreation Area..." This combined the two formerly separate units, memorialized the Chickasaw Indian Nation with the designation, established a boundary subject to minor revision by the Secretary of the Interior

within a 10,000-acre limit, and provided means whereby lands and interests therein could be acquired. It provided procedures for permitting hunting and fishing in appropriate areas, placed the unit under the provisions of the August 25, 1916 act that established the National Park Service, repealed the act of June 29, 1906 that established Platt National Park, authorized a memorial to Senator Platt, arranged for jurisdictional transfers between the state of Oklahoma and the United States, and specified a ceiling of \$1,600,000 for the acquisition of lands and interests in lands and \$4,567,000 for development.

Following this most recent legislation the National Park Service did a preliminary analysis of development requirements, determined the need for minor boundary revisions, and acquired all the land within these revised boundaries except for that owned by the City of Sulphur (including Veterans Lake), which can be acquired only by donation or exchange for lands formerly included within Platt National Park.

3. The Area's Needs

Chickasaw National Recreation Area consists of two former National Park System units--Platt National Park and Arbuckle Recreation Area--now joined by lands included in 1976 legislation when the combined area was established. Each of the formerly separate areas (now called Travertine District and Lake District, respectively) already had planning needs of its own. Now there is also the need to provide for facilities and management actions in the corridor (called Rock Creek Corridor) connecting them. Additionally, whereas the two were and still are managed by one superintendent, there were formerly two separate authorities for the two areas; now there is one Act of Congress that applies to both, requiring adjustments in management practices and inter-agency agreements.

Thus, although in one sense a "new" area, the resources therein have long been devoted to park use and have been generally protected from development. Preferred user activities are therefore mainly understood. However, two considerations have recently developed.

1) Over the years there has been a general growth in visitation to the area, yet in the last few years dramatic declines have occurred (to about half the former use level).

2) Resource deterioration, after accumulating slowly, has suddenly become apparent.

It is not known whether the visitor decline is caused by the resource deterioration. Furthermore, it is not even known in all cases what is causing the various types of resource deterioration, or how to correct them.

In such a context, expansive programs of park development would appear out of order. Nevertheless there are apparent development needs even now.

Travertine District lacks a visitor center, and the administrative function is scattered in several buildings miles apart. Through-traffic on U.S. Highway 177 in Travertine District conflicts with park traffic and needs to be separated. Capacity problems have occurred with respect to parking for picnic areas along Travertine Creek and Rock Creek. There are more entrances into the park than are needed for visitor access or from the standpoint of park protection and administration.

Trails connecting the two formerly separated units would provide longer-distance hiking opportunities and possibly the chance for some backcountry camping. The legislation was passed in the context of including an extensive system of bicycle trails in this corridor; however, the popularity of such a system is uncertain, as is the economy of building it on the comparatively dissected relief available within the boundary.

Lake District operates without benefit of planned and constructed protection and operational facilities; instead, trailer-offices prevail. Although this district's main recreational feature - Arbuckle Lake - is developed for boating and camping, appropriate levels of various types of uses need to be established in order to determine a capacity. Likewise, facilities need to be arranged so that levels of use can be managed to stay within the capacity level.

Over the area, there are now situations of resource deterioration that affect the very essence of the park experience. Fresh-water springs in Travertine District have diminished in flow or dried up; water quality in the streams has become too polluted to allow swimming; many of the mineral springs have ceased to flow; fishing success in Arbuckle Reservoir has fallen off; vegetational changes have occurred with the result of a brushier environment that is apparently less appealing to park use. Although the effects of these resource changes can often be measured and observed even casually, the causes of them are more obscure and it will take management-oriented research to find them.

Resources management in the area has often been without a long-term objective, and not closely based on the particular characteristics of the resources. For instance, policies have included: extinguish all fires, encourage desired game species, and--by default--allow use of almost any level. Such practices however, no longer fit National Park Service management policies or the increasing sophistication of resource management concepts.

Although the area is called a recreation area, and is used as such, NPS policy now calls for parks to be further categorized by resource type and use into management zones, to which national policies apply. The legislation also provides that the National Park Service Act of 1916, the agency's organic act, applies. This is different from many recreation areas. Thus, there is the need for a new approach to natural resources management in the area, with new directions and even entirely new programs. These needs of Chickasaw can be separated into two kinds--those required at present to provide necessary improvements to the visitor experience and to provide for resources management at NPS standards, and those that might be needed in the future should use rise to former levels.

B. Resources Management

1. Natural Resources Management Proposals

a. Proposals Related to Hunting and Fishing Management

The legislation of 1976 extended the Service's authority for natural resources management into all parts of the Lake District (except the dam area) and rendered obsolete the former management agreement between the Bureau of Reclamation and the Oklahoma Department of Wildlife Conservation. Therefore, the proposals are:

#1. Develop a staff for the purpose of resources management and initiate needed research into situations potentially requiring management solutions.

#2. Negotiate a new agreement between NPS and the Oklahoma Department of Wildlife Conservation to continue their management of the fishery in Arbuckle Reservoir and of the hunting in the Lake District and Rock Creek Corridor, subject to periodic renewal at agency discretion under stated conditions.

(Hunting will not be permitted in Travertine District, nor around Buckhorn, The Point, Guy Sandy, Goddard Youth Camp, the dam, and other developed areas.) Such an agreement will include provisions that assure management in accord with National Park Service policies, for instance, excluding introduction of any exotic species or gross artificial manipulations of animal or plant species mosaics. Hunting seasons and closure areas will be according to State laws and regulations and subject to NPS approval.

#3. Employ programs to keep exotic fish species from moving upstream into natural environments.

The goal for hunting will be sustained-yield cropping of native species that have grown up in a natural

environment on the land where hunted. The goal for fishing in Arbuckle Reservoir will be sustained-yield harvest of suitable fish types, without stocking except to introduce new species or to correct imbalances.

b. Proposals Related to Vegetation Management

There is uncertainty as to what the natural vegetative mosaics throughout the recreation area would be had there not been townsite development, grazing, exclusion of fire, and concentrated visitor use at various locations. Therefore the proposals are:

#1. Initiate research to reveal what the flora was at various periods (including the present) in different parts of the area. This will reveal what the "natural" compositions were that occurred in the late aboriginal period, and so allow determination of the successional stages that should be restored or preserved. Extraneous influences not present in the natural setting will also be determined (such as introduced grasses, drainage devices, animals introduced or extirpated, and the frequency and effect of fire).

#2. Establish experimental test areas to determine the effects of various manipulative techniques and observe and record the results for ultimate use in designing a program of resources management geared to the selected goals. Generally the resource type that will be selected will be that prevailing at the start of the historic period; however, in certain spots, such as around public use areas, other vegetational situations may be selected.

#3. Discontinue agriculture throughout the area and allow the vegetation to succeed to a more nearly natural state. Where wildlife cropping has been practiced under permit with the Oklahoma Department of Wildlife Conservation, consideration will be given to gradually phasing out such cropping to minimize disruption of any species dependent upon it.

c. Proposals Related to Faunal Management

#1. Perpetuate native species, remove exotics to the extent practical, and introduce none.

Allow animals to interact with their habitat in natural settings. An exception would be the limited indoor display of live specimens at Travertine Nature Center.

#2. Provide special attention to unusual species for the area, including those threatened regionally (none are on Federal lists of threatened and endangered species).

#3. Initiate studies to determine extirpated species and the feasibility of reintroducing any to the free-roaming state; the pronghorn is one such example.

d. Proposals Related to the Management of the Environmental Study Area

#1. Maintain the environmental study area in Travertine District without vehicular access, with foot trails developed for interpretive use. Intrusions such as the road abandoned when this study area was designated will be allowed to revert to natural conditions.

#2. Develop a shallow, landscaped bypass channel to route flood flows around the Nature Center building (it spans the stream, serving also as a pedestrian bridge) rather than through it.

e. Proposals Related to Water Management

#1. Continue research to more clearly determine the relationship between eutrofication of Arbuckle Reservoir and the pollutants that Rock Creek brings to it from upstream farmlands, recreational homesites, and municipal and industrial uses.

#2. Continue research to more clearly determine the relationships between aquifer utilization by the City of Sulphur and Oklahoma Gas and Electric Company and the decline or disappearance of flow volume of Buffalo and Antelope Springs, as well as the mineral springs in Travertine District.

#3. Diminish the flow of artesian sulphurous water from Vendome Well into Flower Park in Travertine District, now that this well is owned by the National Park Service. Flow will not be shut off here, however, until such action is proved to be feasible and it is also determined that there will be no significant impacts on organisms in the outflow stream.

#4. Recommend to the City of Sulphur that flow of its wells be shut off when not needed for municipal purposes rather than shunted back to Travertine Creek; this will leave the water in the ground where it may help keep the water table and artesian pressure levels up and thus cause the park's springs to flow more often. Ultimately, studies might suggest that the problem can be further alleviated by discontinuing the City's use of the artesian water and relying instead on its rights to water stored in Arbuckle Reservoir, now unutilized.

#5. Make a study of flooding patterns for Rock Creek and Travertine Creek and establish criteria for development, as well as an emergency flood operations plan.

#6. Determine the effects of pollutants on Rock Creek from City dumping grounds south of the Travertine District (water from the dump flows via Veterans Lake--the City's emergency water supply--into Rock Creek above Arbuckle Reservoir).

f. Proposals Related to Land Exchange

#1. If City lands inside the recreation area are offered for donation or in exchange for NPS surplus lands nearby, continue present land uses, where compatible with park uses, through special-use permits should the City wish.

#2. Include a proviso for Veterans Lake in association with any such transfer that an engineering inspection of the dam, spillway, and reservoir area be first conducted, as well as an investigation of the quality of the water the lake holds, and a cleanup/restoration of the upslope dump area.

g. Proposals Related to Minerals Exploitation

#1. Manage the leasing of Federally owned minerals on land originally acquired by the Bureau of Reclamation in accord with Federal policies and as provided for in the agreement with the Bureau. Oil or gas extraction may also occur on lands where such rights were retained by owners, again essentially those lands originally purchased by the Bureau.

#2. Require minimal interference from these activities on surface developments and settings.

2. Cultural Resources Management Proposals

a. Proposals Related to Historic Resources

#1. Prepare preservation plans for the Leeper House and Lincoln Bridge to guide management and maintenance of these two structures on the NPS List of Classified Structures. Work undertaken prior to the completion of these plans will be in accord with existing NPS standards and policies, and under the guidance of a qualified historical architect.

#2. Utilize the Leeper House for park-wide resources management and the Travertine District Protection operational center once overall park administration is relocated to the visitor center; continue use of the Lincoln Bridge as a pedestrian crossing of Travertine Creek.

b. Proposal Related to Prehistoric Resources

#1. Prepare an archeological base map, annotated as to the types of resources found. All projects involving land disturbance in new areas will be subject to the review of a qualified archeologist.

c. Proposal Related to Park Collections

#1. Store only original objects directly pertinent to the area in the park, and then only if no other institution will accept the responsibility. Study aids for use in interpretation and staff work will be retained on site and indexed as needed, but will not become listed on the park's property records.

C. Interpretation and Visitor Use

1. Interpretive and Visitor Activities Theme Proposal

Chickasaw National Recreation Area has as its highest purpose the provision of diversified outdoor recreational opportunities to the population within its region. Therefore, the proposal is:

#1. Develop a visitor use program to provide diversified outdoor recreational opportunities to the population within the region, and provide many types of activities. Emphasis will differ in the three sections of the park.

2. Travertine District Interpretation and Visitor Use Proposals

#1. Orient use of the Travertine District to the casual visitor interested in a pleasant outing and yet moderately interested in the stories behind what he sees.

Visitors are mainly expected to be picnickers, walkers (not hikers), nature enthusiasts such as bird-watchers and plant identifiers, automobile tourers, family groups who may assemble as much or more to be together than to be in the park, and people with casual but nonetheless sincere interest in the area's features. These same types will comprise the overnight campers. Thus, the Travertine District visitors are expected to be somewhat more responsive to interpretive activities, and hence a fuller program will be developed here. There will be no strict limitation on the interpretive theme or directions interpretation might take; however, programs will in the main have relevance to the natural and cultural resources contained within the park and to environments and traditions representative of south-central Oklahoma.

#2. Special emphasis and interest will be accorded the springs, their geologic occurrence, and the history of their use. The traditions of the Chickasaw Indian Tribe and earlier Indian groups will also figure more prominently in the overall effort than some other subjects. The settlement history of the park area, and how Chickasaw NRA came to be excluded from that pattern, will be pertinent.

#3. The primary function of a visitor center to be located near the entrance to the Travertine District will be presentation of these two topics--the springs and the local Chickasaw Indian History--along with visitor orientation to the area. Interpretation at wayside points such as spring pavilions and roadside pullouts will reinforce the general messages introduced at the visitor center. Recognition of Orville Hitchcock Platt's work on early Congressional Indian Committees and the original designation of the area in his honor will be made in the Travertine District.

#4. Utilize the Travertine Nature Center, out of the main stream of visitor travel, and at the entrance to the non-road environmental area, for nature study and environmental education drawing on the resources present and tailored both for individual parties and organized groups. Continue use of the self-guiding interpretive trails.

#5. Continue use of the self-guiding automobile interpretive tour on the park loop road.

3. Lake District/Rock Creek Corridor Interpretation and Visitor Use Proposals

#1. Orient use of the Lake District to water and land recreation--water skiing, boating, fishing, swimming, camping, and hunting.

#2. Provide for hiking and biking on trails in the Rock Creek Corridor.

Interpretive services will respond to the needs of recreational users to the degree they themselves respond to the programs offered. Such programs will be oriented to visitors' recreational activities, for instance instructing them in the life histories, cooking methods, and fishing/hunting methods of the species they seek. Safety will be an important function, with presentation of rules of behavior. Courtesy will be stressed, and resource protection. Visitor contact points will be primarily at launching ramps.

4. User Fees Proposals

#1. Consider fees for entrance by vehicle into Travertine District when access from through roads and via secondary entrances is controlled and there is only one entrance point. This situation will not occur until a future phase of development.

#2. Continue to collect camping fees in the Travertine District.

#3. Continue to collect camping fees in the Lake District; entry fee collection will not be practical here because of an excess of entry points.

D. Development Concept

1. Parkwide Carrying Capacity Proposals

#1. Generally maintain the capacities that existing facilities provide, as it has not been indicated that the park is in need of significant facility expansion at this time.

#2. Offer new facilities in terms of additional activities within present use levels rather than as a means to increase capacity.

#3. Establish capacities for facilities to standards of use density on the acreage basis.

Existing use in the recreation area is primarily weekend outings in the six warmer months of the year. During the period 1973 to 1977, these resulted in annual visitation figures that fluctuated narrowly in the 2 million range. This use level is being taken for the purposes of this plan as the "base." (The strong decline that occurred in 1978--primarily in the Travertine District--is assumed here either to be an anomaly or caused by factors that this plan will begin correcting.) Within the overall level of visitation there have been approximately 135,000 campers and 23,500 boaters per year.

Judging by general visitor reaction and by staff attitudes, the park is able to "absorb" this much use and still provide varied experiences when wanted. ~~Camping demand has been managed with a reservation system.~~ However, typically there have been only two or three times in the summer season when visitors hoping to engage in a specific activity (camping or boating) have been turned away because the facility providing the activity had physically reached its capacity. These times have been primarily the second day of a threeday holiday weekend.

While systematic means of measuring resource parameters to indicate change are in the early stages of conception, excessive resource degradation from visitor wear is generally not apparent in the park. (The area has sufficient rainfall and length of growing season to be comparatively hardy in terms of vegetative regeneration.) The significant resource deterioration that has been observed has been traced more to factors external to the park rather than to its visitors.

2. District Carrying Capacity Proposals

a. Proposals Related to Travertine District Carrying Capacity

#1. Retain the present capacity of the Travertine Nature Center.

Presently, Travertine Nature Center is the only building capable of providing interpretation/information services. It has 98 single parking spaces and 25 bus or trailer spaces, giving a maximum parking capacity of 774 persons. This compares favorably with the observed building capacity of 750 per hour. Building use should certainly continue to fit within demand once the proposed visitor center is completed and some of the functions now being fulfilled by the nature center are transferred to the visitor center.

#2. Provide a visitor center/headquarters with instantaneous indoor capacity of some 200 persons (based on 2200 square feet of public use space).

It will provide the information/interpretation function for the park. Similar parking capacity will be provided for 40 cars and 4 buses. It is projected that length of stay here will be 15 minutes, and thus the center is expected to be able to accommodate 800 per hour well over 5,000 people daily, a number that is expected to handle demand for this facility.

#3. Retain the present picnicking capacity in Travertine District of approximately 250 tables.

The only difficulty noted in connection with this activity to date is that of excessive parking along the road through this area. Yet it is not proposed to add parking areas, in the belief that the area is already adequately developed considering its size. Should parking congestion recur in the future, and yet picnic areas not be fully utilized, a circulation system study would be in order to consider transportation alternatives to developing more parking lots.

Standards for "instantaneous" use have been developed for certain visitor activities by various research groups, taking into account resource tolerance and user preferences, and these can be applied to both existing and proposed facilities and activities at Chickasaw. (We use here the 1977 report done for the Bureau of Outdoor Recreation, Optimum Recreation Carrying Capacity.) The following chart shows how the acreage devoted to existing activities in the Travertine District compares with the "optimum" capacities from the report. (Note that "optimum" is not necessarily "maximum" where quality of experience is a goal.)

ACTIVITY	"OPTIMUM" CAPACITY (according to BOR, 1977)	EXISTING CAPACITY		PROPOSED CAPACITY	
		per unit	total sites	per unit	total sites
CAMPING (Tent/Trailer)					
Cold Springs	7 sites/acre	5 sites/acre	62	No change	62
Rock Creek	7 sites/acre	<u>6 sites/acre</u>	<u>106</u>	<u>No change</u>	<u>106</u>
		total existing	168	total proposed	168
CAMPING (group)					
Central	20 people/acre	36 people/acre	18	No change	18
Cold Springs	20 people/acre	<u>28 people/acre</u>	<u>2</u>	<u>No change</u>	<u>2</u>
		total existing	20	total proposed	20
PICNICKING	13 tables/acre	<u>11 tables/acre</u>	<u>250</u>	<u>No change</u>	<u>250</u>
		total existing	250	total proposed	250

b. Proposals Related to Rock Creek Corridor Carrying Capacity

#1. Provide hiking and bicycling according to standard acceptable densities.

Rock Creek Corridor will be reserved as a part of Chickasaw National Recreation Area where low density concentrations of use will prevail. The only developments for visitor use will be bicycling and hiking trails, as follows:

<u>ACTIVITY</u>	<u>"OPTIMUM" CAPACITY (according to BOR, 1977)</u>	<u>EXISTING CAPACITY</u>		<u>PROPOSED CAPACITY</u>	
		<u>per mile</u>	<u>total</u>	<u>per mile</u>	<u>total</u>
BICYCLING	18 cyclists/mile	none	none	18	124 cyclists
HIKING	21 hikers/mile	none	none	21	191 hikers

c. Proposals Related to Lake District Carrying Capacity

#1. Retain developments at Lake District much as at present, with some shifts in capacity to alleviate particular resource deterioration problems, to disperse use around the lake more evenly, and to provide more efficient management operations, in accordance with the following summary:

ACTIVITY	"OPTIMUM" CAPACITY (accordng to BOR, 1977)	EXISTING CAPACITY		PROPOSED CAPACITY	
		per unit	total sites	per unit	total sites
CAMPING (Tent/Trailer)					
Buckhorn					
-loop A	7 sites/acre	6 site/acre	27	No change	27
-loop C	7 sites/acre	5 sites/acre	28	No change	28
-loop D	7 sites/acre	5 sites/acre	51	No change	51
-loop E	7 sites/acre	17 sites/acre	71	Decrease by 27 sites to 10 sites/acre	44
The Point	7 sites/acre	3 sites/acre	52	Increase by 48 sites to 5 sites/acre	100
Guy Sandy	7 sites/acre	6 sites/acre	39	Increase by 11 sites to 8 sites/acre	50
		<u>total existing</u>	<u>268</u>	<u>total proposed</u>	<u>300</u>
PICNICKING					
	13 tables/acre	<u>11 tables/acre</u>	<u>108</u>	<u>No change</u>	<u>108</u>
		<u>total existing</u>	<u>108</u>	<u>total proposed</u>	<u>108</u>

From the chart it is apparent that the majority of Chickasaw's campgrounds already have a lower site density than the "optimum" standard. Management experience indicates that most of the campgrounds do not show evidence of visitor wear and do provide satisfactory visitor experiences. At Buckhorn, however, the campsites at Loop E not only show on the chart to be too dense (at 17 sites per acre) but also show evidence of erosion; consequently, the plan will decrease density here to 10 sites per acre, with a net loss in the Buckhorn area of 27 sites. Campgrounds at The Point and Guy Sandy are proposed for increases of 48 and 11 sites respectively. In the case of The Point, this would raise the density to 5 sites per acre and also provide better distribution of the camping opportunity at Arbuckle Lake among the three developed areas. At Guy Sandy, terrain is more restricted but will still allow an increase in sites to more effectively use this smallest of the three developed areas. Thus there would be a total of 300 campsites at the Lake, 150 at Buckhorn, 100 at The Point, and 50 at Guy Sandy.

Theoretically, it is possible to develop more campsites at Arbuckle Lake, as terrain exists. However, as most campers here also wish to boat on the Lake, and as there are also day visitors who wish to boat, a certain limit to development is obviously desirable. This plan relates that limit to the boating capacity of the lake and finds no purpose in adding camping capacity in that the lake is not big enough to handle added demand.

#2. Initiate a capacity of approximately 600 boats at one time on Arbuckle Lake. Minor fluctuations of this number may be instituted as resource conditions and management experience dictate.

A chart for comparing existing boat use on Arbuckle Lake with the Bureau of Outdoor Recreation "optimum" standard is complicated by the possibility of future increases in lake level fluctuations, the actual percentages of different types of boat use and the ways they vary, and the factor of available parking and launch capacity.

The available acreage of water surface at Lake Arbuckle is taken for the basic carrying capacity calculation to be that occurring at the top of the conservation pool, or elevation 872.0, a total of 2,260 acres. "Optimum" standards for each of the three boating categories (water skiing, general boating, and boat fishing) as given in the 1977 BOR report, and the capacities proposed in this plan for Arbuckle Lake are as follows:

<u>ACTIVITY</u>	<u>"OPTIMUM" STANDARD</u>	<u>NUMBER OF BOATS POSSIBLE ON ARBUCKLE LAKE (AT 2260 ACRES)</u>	<u>PROPOSED NUMBER OF BOATS acres</u>	<u>boats</u>
Water Skiing	10 acres per boat	226	753	75
General Boating	5 acres per boat	452	753	151
Boat Fishing	2 acres per boat	<u>1130</u>	<u>753</u>	<u>377</u>
	(average)	603	2259	603
		(say 600)		(say 600)

If the lake surface were arbitrarily divided equally among these three types of use, there could be 600 boats on the lake at one time. Figures of 500700 boats on the lake at one time have variously been cited in the past as the level at which "chaos" begins to develop. The existing launch ramps and trailer parking sites provide access for less boats than this (231 double parking sites with an average turnover rate from the 1977 BOR standards) of 2.16 per day gives 498 as the daily launching capacity. However, there are 122 single parking spaces adjacent to the three launch ramps that conceivably could add another 132 boats to the lake. (This assumes 122 single spaces equals 61 double spaces times 2.16 turnover per day) This would increase, theoretically, the parking capacity to 630 boats per day--slightly higher than the water surface capacity itself. Thus the lake launching capacity is already developed slightly beyond the "optimum" boating capacity. During high boating demand times, then, it is apparent that there may be conflicts among the higher speed boaters and between them and the slower speed boaters. Or competition for parking between boaters and nonboaters may occur.

#3. Chickasaw NRA will manage Arbuckle Lake to resolve user conflicts.

The surface may be apportioned for differing boating speeds or activity types, either by surface area or by times of day or week. Or, launching capacity may be restricted to the "optimum" capacity of 600 boats per day, thus allotting the remaining parking to nonboaters. (There is also some parking capacity for lake use in addition to the parking adjacent to the launch ramps.)

This calculated boat carrying capacity of the lake, as noted earlier, is for the conservation pool acreage of 2,260 acres. At lesser acreages, there will be proportionately lower boat

capacities. As a rule of thumb, a reduction in lake area of 10% would also result in a lowering of boating capacity by 10%, or from 600 to 540. Management experience will eventually replace such rules of thumb, as situations may develop during lower water stands where shoreline configurations or water depths preclude or allow boating uses in a proportion differing from the even one-third allotments assumed for each of the three types of boat use.

#4. Provide sufficient designated entry points and parking facilities for small game and deer hunters in the Guy Sandy Creek area so as to allow optimum utilization of the area.

Small game and deer hunting is planned for the Lake District and has typically occurred in the area surrounding the northern Guy Sandy Creek arm. In the latter area three designated entry points with unpaved roadways of minimum standard will provide access and dispersal for hunters. Four small unpaved parking areas totaling approximately 80 vehicle spaces will be installed. The land area served by these accesses is some 1,000 acres, and the "optimum" 1977 BOR standard is 10 acres/hunter group with 1.2 hunters per group. Thus the area can accommodate 83 such hunter groups. During nonhunting seasons, these areas will be available for primitive hikers, fishermen, or nature enthusiasts who prefer such minimally developed areas and the consequent low density of users.

3. General Character of Use and Areawide Concept Proposal

Geographically and in terms of recreational offerings there are three distinct portions of the park: Travertine, Lake and Rock Creek Corridor.

The Travertine District is highly developed recreationally, provides administrative functions, and focuses on the stream and mineral springs environment.

The Lake District is of medium recreational density, emphasizes camping, swimming, boating, fishing, and hunting and focuses on the flat water recreation potential of the reservoir.

The Rock Creek Corridor joining the other two districts is of low recreational density, and will emphasize hiking and bicycling and focuses on the rolling hill environment.

In terms of management objectives and staff assignments, the park is divided into two areas: Travertine management district and Lake management district (which includes the corridor along Rock Creek).

The areawide concept for development at Chickasaw National Recreation Area is shown on the General Development Concept Map. This graphic, because of scale, displays only the major elements of the plan for Chickasaw. Detail for specific structures and facilities is provided on the Development Concept Maps for Travertine District and for Rock Creek Corridor and the Lake District, in the text and on the summary chart.

The major features of overall development for Chickasaw include a new visitor center/park headquarters building adjacent to Sulphur, retention of the Travertine Nature Center and all campgrounds and picnic areas along Travertine and Rock Creeks, and new trails connecting north and south sections of the park (hiking on the west side of Rock Creek and bicycle/hiking on the east side). At Arbuckle Reservoir, the three existing development nodes would continue to provide lake access for boats, and camping, picnicking, swimming, and fishing.

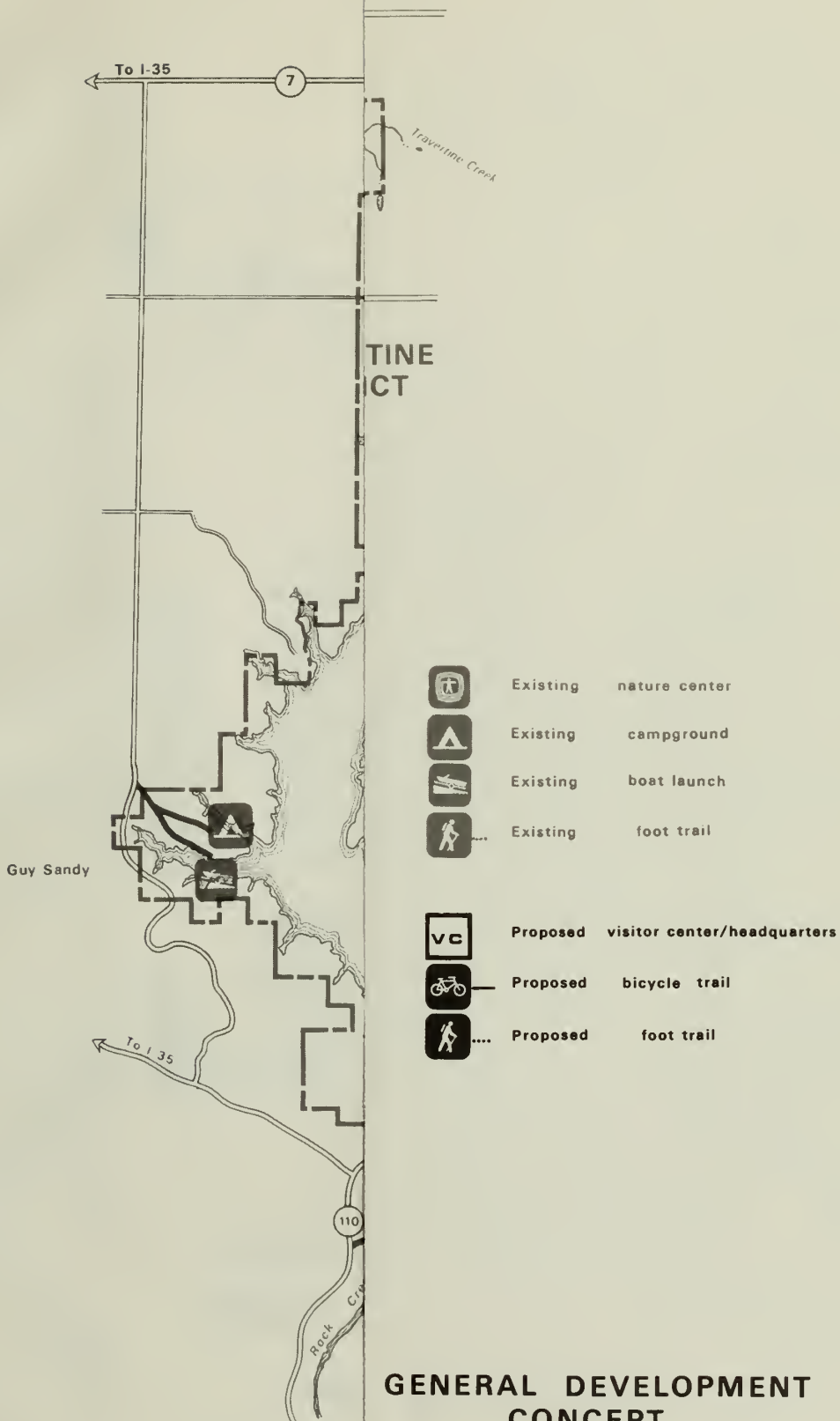
4. Development Concepts Individual Districts Proposals
a. Development Proposals Related to the Travertine District

A new park headquarters/visitor center will be constructed on the south side of the State Highway 7 access route to the park, a principal street of Sulphur, and also the park boundary. This building will provide office, administrative, visitor contact, and information-interpretation space in a location easily identifiable to the public while reinforcing the recreation area's close ties to the City of Sulphur. This structure will encompass approximately 3,500 square feet and require parking for about 40 cars and four buses. The structure itself will incorporate energy-efficient heating/cooling design.

With the relocation of the headquarters function (superintendent, administration, and chiefs of other divisions), the present headquarters building (Leeper House) will be used as office space for resources management and to house Travertine District protection operations. These uses will not impair the local historical significance of the present headquarters building (as an example of an early Oklahoma ranch house) and will help ensure its continued maintenance and upkeep. District interpretation will operate from Travertine Nature Center.

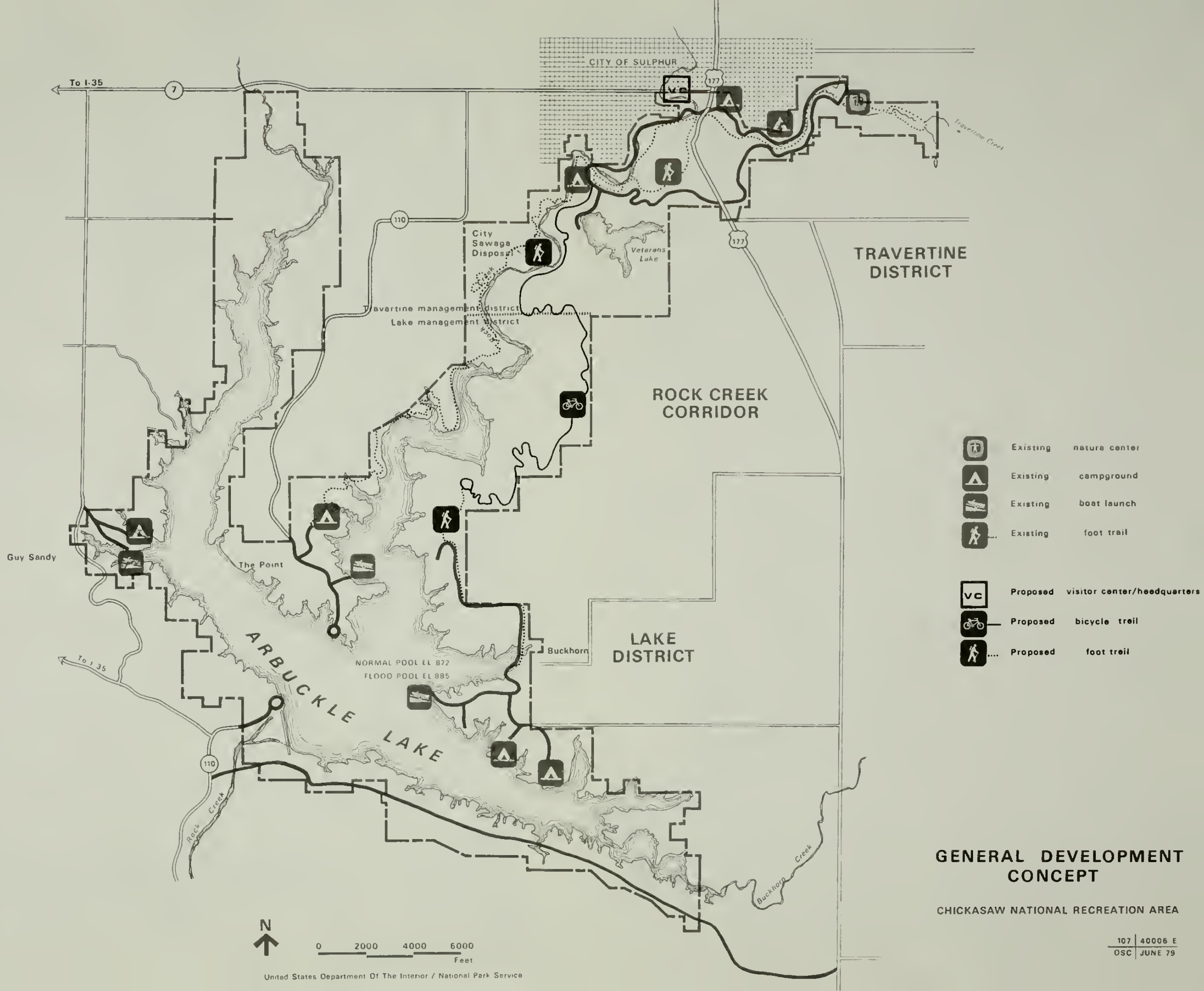
With the transfer of district ranger functions to the ranch house, the present ranger station at Bromide Springs will be used for on-site visitor contact and interpretation.

The Travertine Nature Center will remain unchanged with one exception. Because the center was constructed partly as a bridge over Travertine Creek it has been subject to flooding. An unobtrusive stream bypass channel will be



GENERAL DEVELOPMENT CONCEPT

CHICKASAW NATIONAL RECREATION AREA





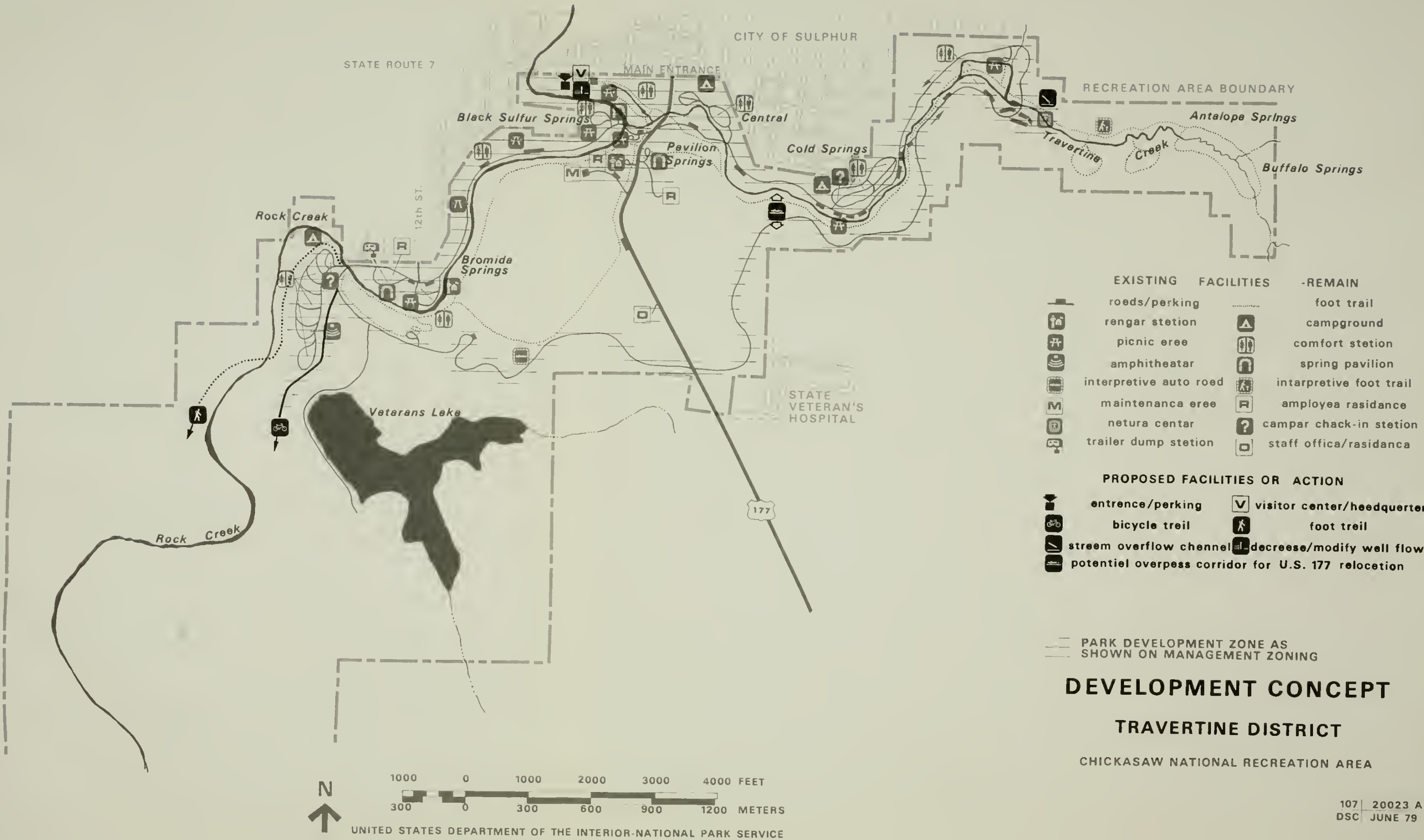
EXISTING FACILITIES		-REMAIN	
	roads/parking		foot trail
	ranger station		campground
	picnic area		comfort station
	amphitheater		spring pavilion
	interpretive auto road		interpretive foot trail
	maintenance area		employee residence
	nature center		camper check-in station
	trailer dump station		staff office/residence
PROPOSED FACILITIES OR ACTION			
	entrance/parking		visitor center/headquarters
	bicycle trail		foot trail
	stream overflow channel		decrease/modify well flow
	potential overpass corridor for U.S. 177 relocation		

PARK DEVELOPMENT ZONE AS
 SHOWN ON MANAGEMENT ZONING

DEVELOPMENT CONCEPT

TRAVERTINE DISTRICT

CHICKASAW NATIONAL RECREATION AREA

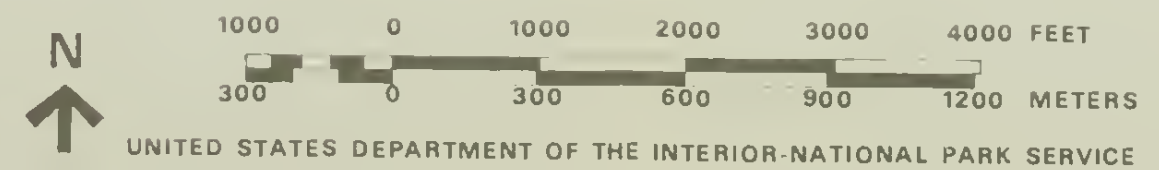


- | EXISTING FACILITIES | | -REMAIN |
|-------------------------------|---|-----------------------------|
| | roads/perking | foot trail |
| | rengar station | campground |
| | picnic area | comfort station |
| | amphitheater | spring pavilion |
| | interpretive auto road | interpretive foot trail |
| | maintenance area | employee residence |
| | natura center | campsite check-in station |
| | trailer dump station | staff office/residence |
| PROPOSED FACILITIES OR ACTION | | |
| | entrance/perking | visitor center/headquarters |
| | bicycle trail | foot trail |
| | stream overflow channel | decrease/modify well flow |
| | potential overpass corridor for U.S. 177 relocation | |
- PARK DEVELOPMENT ZONE AS SHOWN ON MANAGEMENT ZONING

DEVELOPMENT CONCEPT

TRAVERTINE DISTRICT

CHICKASAW NATIONAL RECREATION AREA



constructed in order to divert flood stage waters around the building. This will be surfaced in such a manner as to allow low vegetative growth to minimize visual impact and preclude erosion.

The Bromide Springs area will be the starting point for a proposed hiking trail to The Point and a proposed bicycle/hiking trail to Buckhorn. This will allow utilization of existing parking facilities and proximity to public contact personnel if trail users need information or safety messages.

Circulation by vehicle will remain as now until U.S. 177 is relocated. A corridor for a potential overpass to accomplish this relocation is designated in the Cold Springs area so that development will not foreclose this option. However, other alternatives will be considered. When the relocation option has been selected, environmental analysis will be required. Also, a traffic study will determine the feasibility of designating the southern part of the park loop road one way and eliminating the secondary entrance at Bromide Springs. Access to the City of Sulphur-owned Veteran's Lake will remain off the park road.

All other facilities in the Travertine District will remain with their locations and capacities unchanged.

b. Development Proposals Related to the Rock Creek Corridor

The corridor will be a low-density recreational area and provide non-motorized connections between the Travertine and Lake Districts. It will also provide foot access to Rock Creek and the Rock Creek arm of Arbuckle Lake.

Proposed in the corridor is a bicycle trail, 8 feet wide and hard-surfaced, which will run 6.9 miles from Bromide Springs on the park loop road in Travertine District and terminate at an overlook to the lake in the Corridor. The bicycle trail will generally follow the ridges or higher points away from the creek, however short foot trail spurs will extend to creekside or a lake overlook at certain points along the trail. This will enable cyclists to obtain long-range views of the creek valley without leaving their bicycles unattended for long. A foot trail will proceed another 2.6 miles from the overlook terminus to Buckhorn in the Lake District and will provide an adaptive route for future extension of the bicycle trail.

On the opposite side of the creek from the bicycle trail is proposed a hiking trail connecting the foot trail in Travertine with the road system in The Point area of the Lake District. This trail will be 6.5 miles long, soft-surfaced, marked, and because of its narrow width, can parallel the creek in certain areas and provide access for fishing to those on foot.

Both trails can utilize portions of old roadbeds which may ease construction and lessen impact.

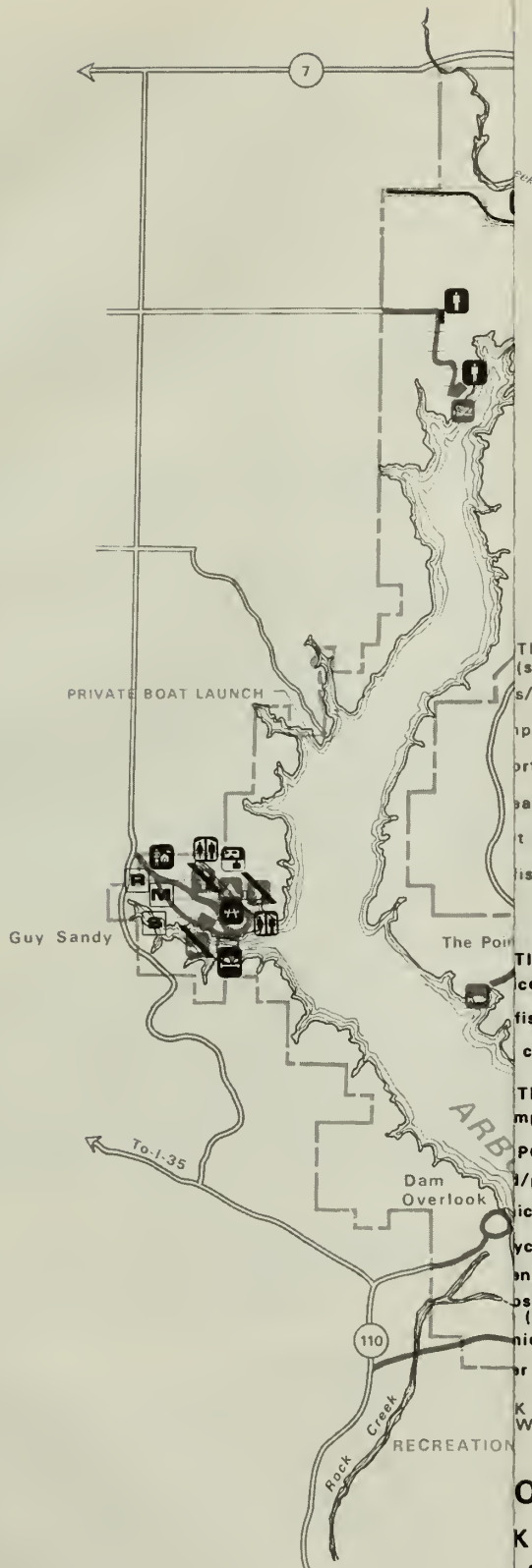
c. Development Proposals Related to the Lake District

Guy Sandy - The recreational facilities at Guy Sandy are proposed for expansion. The campground will be enlarged by 11 sites to bring the number of available sites to 50. Two comfort stations will be constructed to replace the chemical toilets presently in operation. One station will serve the campground and the other the boat launch. In order to upgrade the protection of this isolated area and its visitors, an employee residence is proposed near the park boundary. A small maintenance yard with storage building will be provided.

The existing boat launching ramp and parking area will remain unchanged. A ranger station will be located between the park boundary and campground entrance road. This will allow it to absorb the camper check-in function. The temporary camper check station at the campground will be removed. A trailer sewage dump station will be provided. A small fishing dock is proposed adjacent to the launch ramp parking area. A fish-cleaning station will be provided and a small picnic area.

All the expanded and new construction in the Guy Sandy area is dependent on provision of a sewer system. Proposed is a series of central collection tanks which will require pumping and removal of the waste by truck to the Sulphur City Plant for disposal. Four tanks will be required to handle the estimated gallonage. Two 6,000 gallon tanks will be pumped bi-weekly (residence and ranger station) and two 20,000 gallon tanks will be pumped weekly (comfort stations), during periods of high visitor use. Additional operational costs will be incurred for provision of a pump truck or contracting that service and any fees charged by the City of Sulphur for disposal. This system, while not optimal, will not raise the cost of total development above the ceiling imposed in the 1976 enabling legislation. Should that ceiling be raised in the future, a reanalysis of the best system for Guy Sandy will be made. Also, the possibility may exist in the future of joint construction of a pressure sewer line with the City of Sulphur or with Murray County. To the extent homeowners hooked in, this would aid in reducing the number of septic leach fields in the vicinity of Arbuckle Lake, and which are suspected of contributing pollution to the lake. Because the length of such a pressure line could be 6 or 7 miles, it is not feasible for the park to undertake the project alone.

The Point - At The Point the emphasis will be on expansion and replacement of existing facilities. The campground there will be expanded by 48 new sites and a comfort



EXISTING FACILITIES-REMAIN-EXPAND-REPLACE (see text for exact action)

- | | | |
|--------------------|--|----------------------------|
| campground | | ranger station |
| port station | | picnic area |
| employee residence | | amphitheater |
| boat launch | | maintenance area |
| fishing area | | swimming area |
| | | park water treatment plant |
| | | camper check-in station |

EXISTING FACILITIES -REMOVE

- cell toilets
- fishing area
- check-in station

EXISTING -DECREASE CAPACITY

- campground

PROPOSED FACILITIES

- | | | |
|---------------------|--|----------------------|
| camp/parking | | comfort station |
| cell toilet | | fishing dock |
| bicycle trail | | foot trail |
| employee area | | employee residence |
| used boat (NPS use) | | sewage system |
| picnic area | | trailer dump station |
| port station | | |

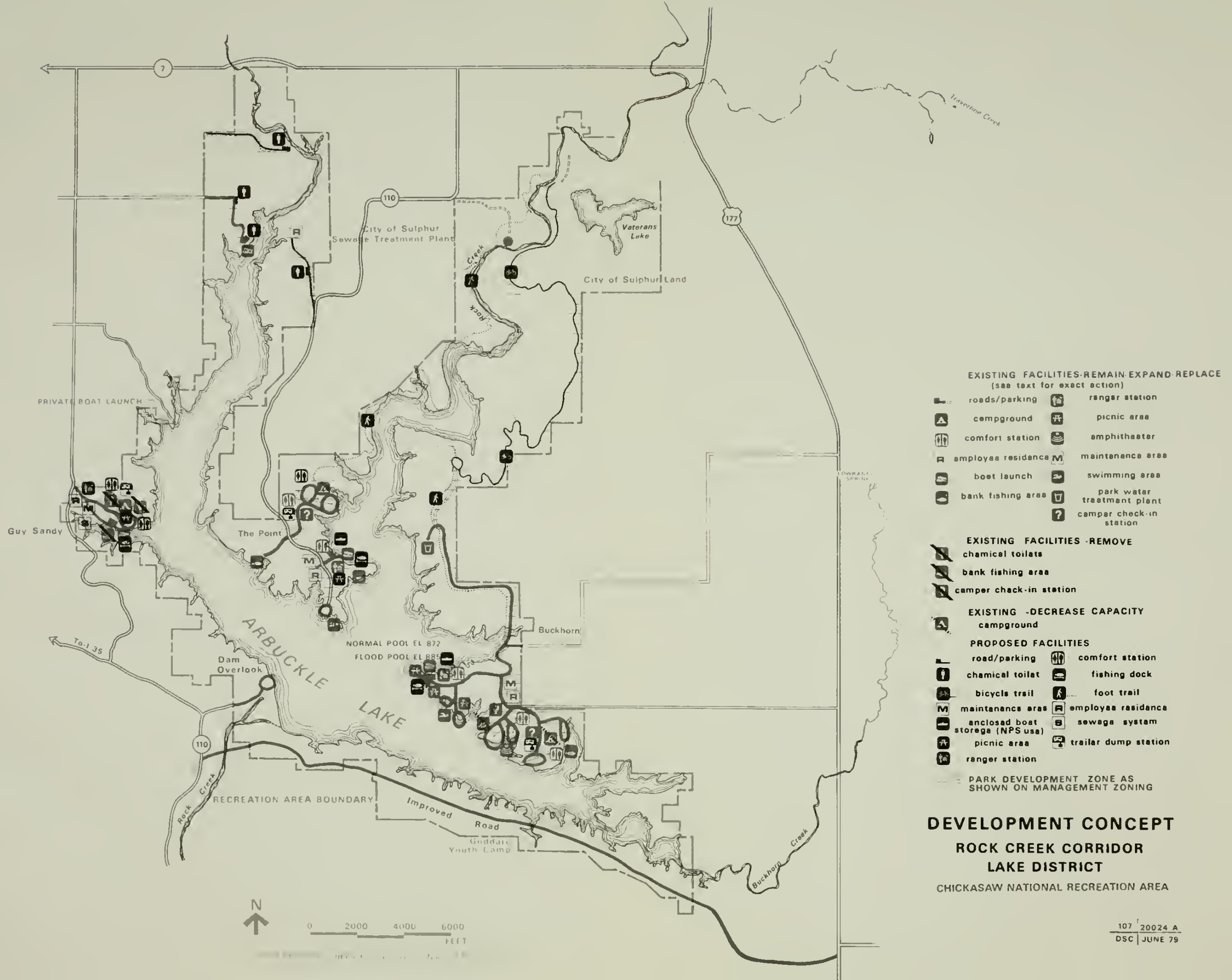
DEVELOPMENT ZONE AS SHOWN ON MANAGEMENT ZONING

DEVELOPMENT CONCEPT

ROCK CREEK CORRIDOR

LAKE DISTRICT

WITHIN NATIONAL RECREATION AREA



station to bring the number of available sites in that area to 100. Camper check-in functions for all sites will remain in the present facility. A trailer sewage dump station will be provided. A permanent ranger station is proposed to replace the present trailer next to the launch ramp. The launch ramp and parking area at The Point will remain unchanged; however, a fishing dock will be constructed in that area. A fish cleaning station will also be provided, and a small picnic area. An enclosed, securable NPS boat storage facility will be constructed at the administrative boat dock. This facility will provide space for two boats and hoist capability for repair or protection.

A permanent residence is proposed to replace the mobile home in The Point area, as is a permanent storage building to replace the various sheds in the maintenance area.

The swimming area at the southernmost cove will be improved by removing stumps and debris.

Buckhorn - Temporary facilities housed in trailers (a ranger station and an employee residence) will be replaced by permanent structures. The ranger/visitor contact station is adjacent to the boat launch area, where a storage facility for NPS boats will be constructed. This boat storage facility will be similar to that proposed at The Point. A permanent storage building is proposed for the existing maintenance area to provide better security, protection, and efficiency.

The campgrounds in the Buckhorn area will be slightly decreased in capacity by eliminating 27 sites, leaving 150 sites. The sites removed and revegetated will be those exhibiting signs of excessive erosion or providing insufficient space for a quality camping experience. A trailer sewage dump station will be provided. The swimming area adjacent to the Buckhorn picnic areas will be improved by removing stumps and debris. A fishing dock and fish-cleaning station will be provided.

Other existing facilities (picnic areas, launch ramp, etc.) in the Buckhorn area will remain with their localities and capacities unchanged.

It should be noted that development near Arbuckle Lake will be situated above the level of the 100 year flood pool. This includes all new or replacement structures--with the exception of launch ramps and fishing docks. This is at 885.85 feet elevation, 13.85 feet above the normal conservation pool level of 872.0. All existing applicable structures in the Lake District meet this criterion with the exception of the two temporary ranger stations (these are proposed to be replaced with permanent structures). The ranger station site at The Point is within 5 feet

of this elevation in its present location and therefore can be adapted in design and construction. The proposed Guy Sandy station will be located near the boundary, thus placing it above even the 500 year flood line. The Buckhorn station is situated approximately 7 feet below the 100 year flood pool elevation and may require both a slight change in location plus some site or design adaptation for the new structure.

Other areas in the Lake District which are zoned for development include a small portion of the land surrounding the northern arm of Guy Sandy Creek and the Goddard Youth Camp area.

The northern Guy Sandy Creek area will provide low-density recreational opportunities, primarily small boat launching and small game and deer hunting. The only facilities provided will be unpaved designated roadways and small unpaved parking areas in order to allow access to various portions of the arm. A chemical toilet (pump out) will be provided at each of these parking areas and a small concrete boat launch exists at one. An employee residence exists in the area and will remain.

The Goddard Youth Camp area is situated on the south bank of Arbuckle Lake and operates under a special use permit. The foundation's facilities presently fulfill their purposes.

SUMMARY OF

ACTIONS

AREA

Parking	Entrance	VC/Headquarters	Ranger Station/Hdq.	Ranger Station	Spring Pavilion	Nature Center	Employee Residence	Office/Residence	Maintenance Area	Comfort Station	Chemical Toilet	Campground	Group Campground	Picnic Area	Amphitheater	Camper Check-in	Trailer Dump	Boat Launch	NPS Boat Storage	Auto Interp. Trail	Foot Interp. Trail	Foot Trail	Bicycle Trail	Bank Fishing Area	Fishing Dock	Fish Cleaning Station	Swimming Area	Sewer System	Stream Flood Channel	Modify Well Flow	Potential Overpass	Corridor
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TRAVERTINE DISTRICT

State Route 7

Black Sulphur

Bromide

Rock Creek

Pavilion

Present Headquarters

Central

Cold Springs

Travertine Creek

U.S. Highway 177

ROCK CREEK CORRIDOR

LAKE DISTRICT

Guy Sandy

The Point

Buckhorn

Guy Sandy Creek Arm

ACTION

□ EXISTING - NO CHANGE

☆ EXISTING - EXPAND

○ EXISTING - REPLACE

■ EXISTING - CHANGE IN FUNCTION

★ EXISTING - REMOVE OR DECREASE

CAPACITY

● PROPOSED

E. Summary of Proposed Development Projects

1. Current-year Cost Estimates for Capital Improvements

Construction Cost

Travertine District	\$ 814,000
Rock Creek Corridor	1,010,000
Lake District	<u>1,252,000</u>

Net construction cost \$3,076,000

+ 46% - 15% project planning	
15% project supervision	
16% contingencies	<u>\$1,415,000</u>

Gross Amount \$4,491,000

TRAVERTINE

Visitor Center/Headquarters	
3,500 sq. ft. @ \$125/sq. ft.	\$ 438,000
solar heating and cooling @	
\$35/sq. ft.	123,000
Utility connections	20,000
site development and landscape	
planting (15%)	66,000
Parking - 40 cars/4 buses	
48 spaces @ \$1,000 each	48,000
Reduce spring well flow	20,000
Construct stream bypass - 250' x 12' =	
3,000 sq. ft. 350 sq. yd. @	
\$70/sq. yd.	25,000
Miscellaneous construction/development	
(10%)	<u>74,000</u>
Construction Cost	\$ 814,000

ROCK CREEK

Hiking trail 6.5 miles @ \$12,000/mile	\$ 78,000
Hiking trail 2.6 miles @ \$30,000/mile	78,000
Bike trail (paved) 6.9 miles @	
\$100,000/mile	690,000
Bridges 15' x 8' (5) = 600 sq. ft.	
50' x 8' (3) = 1,200 sq. ft.	
1,800 sq. ft. @ \$40/sq. ft.	\$ 72,000
Miscellaneous construction/development	
(10%)	<u>92,000</u>
Construction Cost	\$1,010,000

LAKE

Grade/Gravel existing 12'-14' roadway (minimum construction) 2.5 miles @ \$50,000/mile	\$ 125,000
Grade/gravel existing parking areas (3) 30 spaces @ \$200/space	6,000
Construct ranger stations (3) 500 sq. ft./each = 1,500 sq. ft. @ \$80/sq. ft.	120,000
Utility connections for ranger stations	10,000
Site development/landscape planting for ranger stations (15%)	18,000
Remove/revegetate 27 campsites @ \$200/each	5,000
Construct 11 new campsites in existing campground @ \$600 each	7,000
Construct new campground - 48 sites @ \$4,000/site includes sites, parking, roads, comfort station and utilities within area	192,000
Construct 2 comfort stations @ \$45,000 each	90,000
Maintenance building/storage (3) 600 sq. ft./each = 1,800 sq. ft. @ \$60/sq. ft.	108,000
Construct sewer system - 2 6,000 gallon tanks @ \$8,000 each	16,000
2 20,000 gallon tanks @ \$30,000 each	60,000
connections and piping	24,000
Enclosed 2 slip boat storage 2 @ \$28,000/each	56,000
Construct 3 residences @ \$60,000 each	180,000
Obtain/install chemical toilets 4 @ \$7,000/each	28,000
Construct 3 trailer sewage dump stations @ \$10,000 each	30,000
Construct small fishing docks (3) 60' x 6' = 1080 sq. ft. @ \$30/sq. ft.	33,000
Construct 3 fish cleaning stations @ \$10,000 ea.	30,000
Miscellaneous construction/development (10%)	<u>114,000</u>
Construction Cost	\$1,252,000

2. Current-year Cost Estimates for Operations;Staffing Requirements

Staff (full-time positions are underlined; others are not.)						
Plan Phase	Park Budget	Supt. & Admin.	Resources Management	Visitor Protec.	Interpre-tation	Mainte-nance
Operate existing programs (present fiscal year)	\$1,100,000	<u>5</u> , 1	0	<u>7</u> , 25	<u>4</u> , 4	<u>15</u> , 10
Design (DSC) proposed facilities; initiate resources management research	1,150,000	<u>5</u> , 1	<u>2</u>	<u>7</u> , 25	<u>4</u> , 4	<u>15</u> , 10
Construction; resources manage-ment program formulation	1,160,000	<u>5</u> , 1	<u>2</u> , 1	<u>7</u> , 25	<u>4</u> , 4	<u>15</u> , 10
Operation of new facilities and programs (visitor center, bike/hike trail, campground expansions, resources management operations)	1,390,000	<u>5</u> , 1	<u>3</u> , 4	<u>7</u> , 28	<u>5</u> , 7	<u>16</u> , 15

3. Schedule for Proposed Management Actions

(other than planning and development projects; e.g., research projects, special studies, recreational programs, etc.) to the extent known.

	<u>Date to Initiate</u>
Establish a resources management unit on the park staff.	12/79
Complete new agreement with Oklahoma Department of Wildlife Conservation for managing fish and game in Lake District and Rock Creek Corridor.	10/79
Initiate liaison with regional water users in conservation-management of ground water resource and clean-up of surface waters to state standards.	10/79
Explore with county/city feasibility of pro-rating costs to develop sewer line to serve west shore of Guy Sandy arm-- both NPS and private facilities.	1/80
Analyze economic feasibility of campground registration/reservation system	8/79
Produce areawide vegetation surveys	6/80
Produce faunal survey	6/80
Monitor visitor uses and indicated preferences for various experiences and degrees of visitor concentrations.	3/80

F. Coordination and Phasing

This general management plan will provide overall coordination of the recreation area's programs, providing varying levels of facility development and internal circulation to assure that there is variety in the density levels of visitors and consequently a diversity of park experience available. Also, the capacity of developments at both Travertine District and Lake District will be correlated to acceptable levels of use-acceptable both from the standpoints of resources protection and the visitor experience. It is a conclusion of this plan that adequate development now exists within the constraints of resource/experience considerations, and even if demand should rise above present maximum capacities (about 2-1/2 million visitors a year) in the future, any increase in use that would be allowed to occur would be in day use. Additional day-use at Travertine, should it occur, can probably best be accommodated

by providing an external parking area (possibly at the visitor center) with a transportation system rather than developing more parking in the interior of the park. Additional day-use at Lake District, should it occur, can probably best be accommodated by zoning the lake's surface to provide more areas for slow-speed boating only. Management experience and monitoring of public opinion as to the types of experiences preferred, and their proportions, as well as research observations of the resources will further define these preliminary judgements.

An improved circulation system is an apparent need for Travertine District should visitation rise again in the future; this would include a visitor center for orientation purposes (with administrative headquarters), through-road relocation, closure of extraneous entrances, erection of fee collection stations (where necessary), potentially a bus system, and establishing one-way interpretive roads. Obviously, not all elements need to be provided immediately; in fact, only the visitor center/headquarters is presently proposed. If and when use rises again, a study will be necessary to correlate the remaining elements.

Second in the plan's priority is the development of a trail system through the Rock Creek Corridor to connect the north and south ends of the newly combined area, including, experimentally, a bicycle trail section.

Third is the provision of improvements to camping and contact/protection facilities throughout Lake District, with due attention to resolving any resource deterioration now experienced because of these activities. Along with this would go the installation of some 11 new sites at Guy Sandy to bring that area up to an efficient operating size and to provide additional facilities at this one site where development is minimal.

Another need, which however, will be met concurrently with the preceding ones is the establishment of a general resources management program including the research for its basis.

The plan establishes the capacities of all facilities in accordance with standard densities and prior observations of use. The figure of 2 million annual visitors is used; this reflects the almost constant level of demand from 1973 through 1977, when visitation fluctuated between 1,884,000 and 2,068,000, and rejects the anomalous 1978 year when visitation plunged to 1,145,000.

The time frame for implementing all these proposals is 5 years from the plan's approval date, and the park will submit programming requests accordingly so that funding will follow in orderly fashion. It is believed that with conservative design all construction items can be accomplished within the applicable

legislative ceiling (\$4,567,000). Non-plan items that would exceed the ceiling include relocating the through-road (estimated at 2½ million dollars), expansion of the visitor center into a cultural mall/governmental building as once conceived, reconstruction of campgrounds and boat-launch ramps, and installation of a bus system. These items are therefore relegated for reconsideration to a later period of time. These possible future actions will require additional planning, design, environmental analysis, and other compliance procedures prior to their adoption.

A further word should be said about the long-term proposal to relocate U.S. Highway 177 so as not to interfere with park use in the Travertine District. This project would require coordination with the Oklahoma Department of Transportation, including sharing of construction costs in some ratio. There is a history of such liason, although the project is not currently listed on an official program by either agency.

Likewise, the installation of any bus system or the provision of a cultural mall or joint office complex with other agencies, also as once envisioned, would require a redetermination of interests among local entities in participating.

Following the plan's approval there is the need for comprehensive design plans for each of the principal use areas, including Travertine District, Buckhorn, The Point, and Guy Sandy, each of which will include environmental analysis. An interpretive prospectus will be required for the visitor center, and a wayside interpretive plan is needed for the area as a whole.

G. Interrelationships with Other Projects

Arbuckle Lake was authorized for the principal purposes of storing, regulating, and furnishing water for municipal and industrial use; for controlling floods; for conserving and developing fish and wildlife resources; and for enhancing recreational opportunities. The reservoir's water resources are controlled by the Arbuckle Master Conservancy District in accordance with its contract with the Bureau of Reclamation. National Park Service operates the recreational function on the lake but is required by law to do so compatibly within the scope of the reservoir's primary operation. By agreement, all plans must be submitted to the Bureau of Reclamation for review, and close cooperation must also be maintained with the Oklahoma Department of Wildlife Conservation with regard to Arbuckle Reservoir and the Lake District lands.

The Oklahoma Department of Transportation (DOT) maintains U.S. Highway 177 as a throughtransportation corridor in the region. This route passes through the Travertine District. Eventual relocation is a goal of both DOT and National Park Service.

DESCRIPTION OF THE ENVIRONMENT

II. DESCRIPTION OF THE ENVIRONMENT

A. Lands

The legislation of 1976 provides that the boundaries for Chickasaw National Recreation will be as generally shown on map 107-20004-A dated February 1974 and may not exceed 10,000 acres. Administrative adjustments within these parameters are permitted to the Secretary of the Interior, so long as notice of same is published in the Federal Register, under certain procedures. A minor boundary adjustment was made and published on March 9, 1978. Thus the new boundary is shown on the Boundary/Ownership map. The total acreage inside the boundary thus shown is 9,491.36 acres, as follows:

Federal Lands (9,142.41 acres)

<u>Acres</u>	<u>Ownership Rights</u>	<u>Location</u>	<u>Uses</u>
2,116.94	All rights	Travertine Dist. & Rock Creek Corridor	national rec- reation area
6,835.47	All surface, variable mineral	Lake District	" "
190.00	All surface, variable mineral	Lake District	damsite

Non-Federal Lands (348.95)

<u>Size</u>	<u>Location</u>	<u>Use</u>
4.50 acres	southwestern part of Travertine District	City sewage treatment plant (including Chickasaw NRA sewage)
0.70 acres	in Travertine District just south of City of Sulphur and State Route 7	not in use
343.75 acres	south of Travertine District (Veterans Lake and surrounding lands)	platted streets and alleys for a subdivision (never built and lots now acquired by NPS), and damsite and reservoir for emergency water supply for the City of Sulphur; open to limited recreational use; includes City permits for buildings.

As provided for in the legislation of 1976, City of Sulphur lands may not be purchased by the National Park Service. The Service may accept them only by donation or by exchange for other lands it holds (see below). Subsurface mineral rights of variable nature remain under some of the lands originally acquired by the Bureau of Reclamation, in the Lake District.

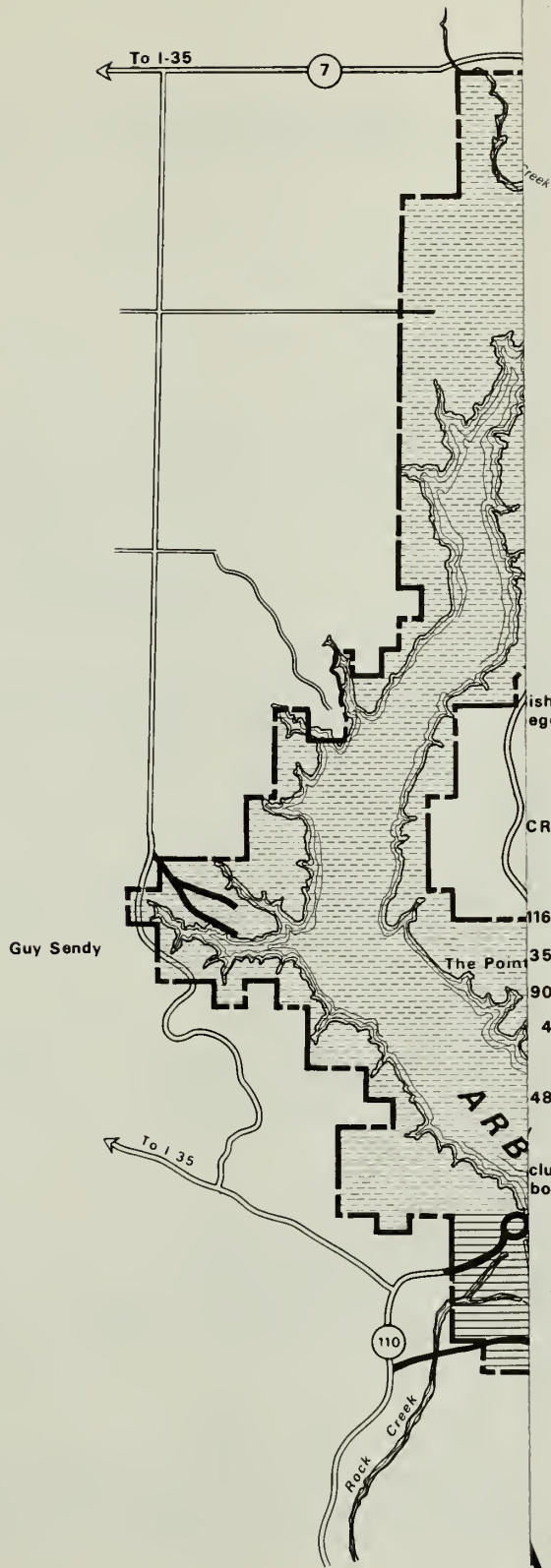
The National Park Service owns and has available for transfer or other disposal certain surplus lands outside the recreation area boundary. This situation came about because of boundary adjustments contained in the 1976 legislation and one case where a nearby lot outside the park was purchased as part of a parcel inside the boundary. These lands are as follows:

<u>Size</u>	<u>Location</u>	<u>Use</u>
4.11 acres	north of Travertine District along Rock Creek	City park and school athletic field; under NPS Special- use permit
0.64 acres	south of Travertine District, east of Veterans Lake	not used; acquired along with parcel inside boundary

B. Cooperative Agreements

1. Interagency Agreements

The National Park Service has entered into the following cooperative agreements with other agencies in the Chickasaw NRA vicinity.



BOUNDARY

Established in Federal Register on March 9, 1978
(see within-9491.36)

OWNERSHIP

CRES	MANAGED BY	ACQUIRED BY	RIGHTS OWNED
116.94	NPS*	NPS	all surface, all mineral
35.47	NPS	BR*	all surface, variable mineral
90.00	AMCD*	BR	deposited
4.75	surplus NPS land		
48.95	City of Sulphur		
included above	NPS / City of Sulphur plotted land		

- * NPS- National Park Service
- BR- Bureau of Reclamation
- AMCD- Arbuckle Master Conservancy District

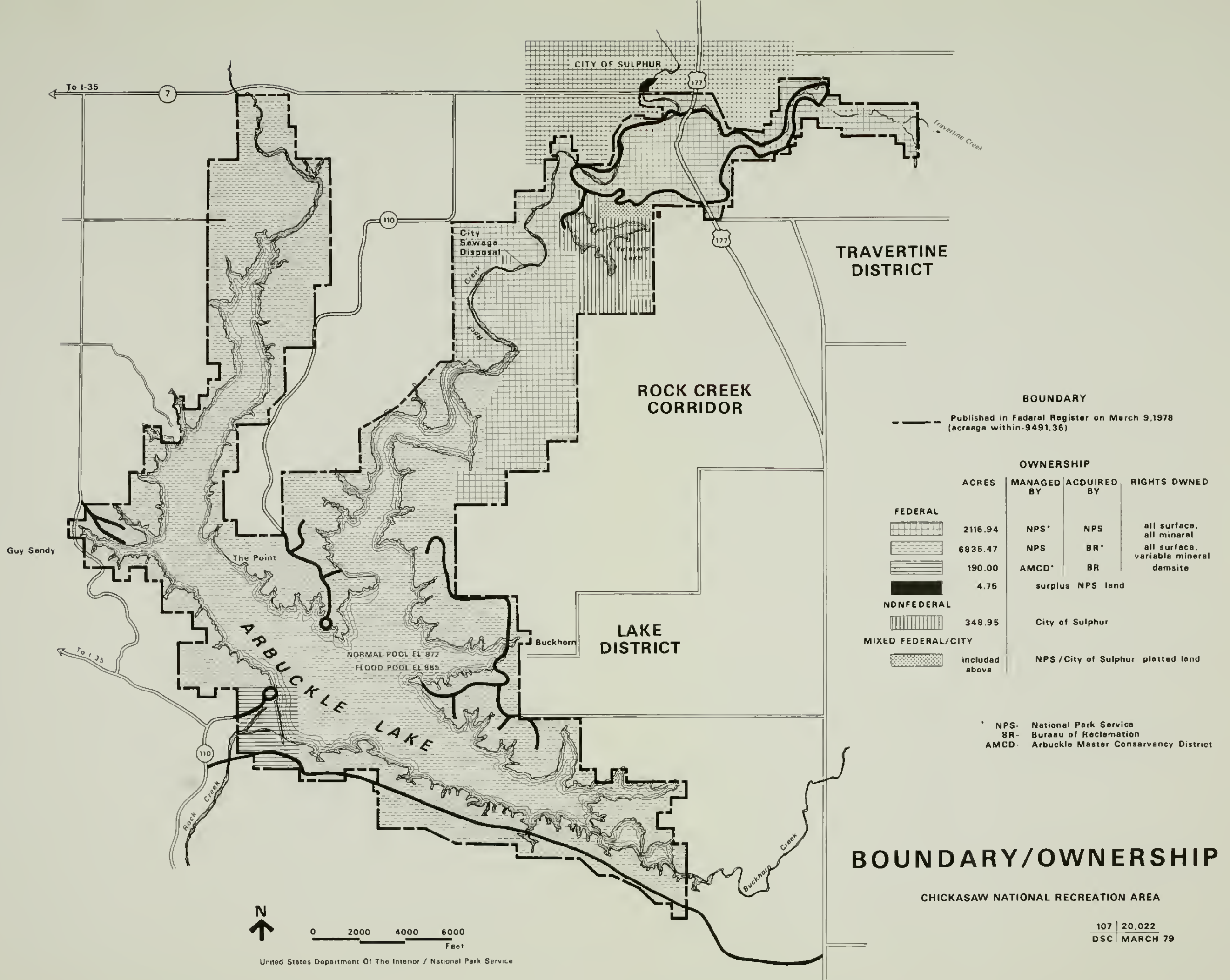
ARY/OWNERSHIP

AW NATIONAL RECREATION AREA



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Date	Cooperating Agencies	Terms of Agreement
3/17/78	Bureau of Reclamation	Directs that administration, planning, and development of lands and facilities at Arbuckle Recreation Area will not interfere with operation of Arbuckle Reservoir for its primary purposes. Establishes procedure for oil and gas leases.
11/4/65 (became obsolete with Act of 3/17/76; being redrawn)	Oklahoma Department of Wildlife Conservation	Assigned specific responsibility for managing and protecting habitat and wildlife for recreation purposes in the Lake District. This included the former Arbuckle Public Hunting Area. (Guy Sandy Creek arm of Arbuckle Lake).
12/17/68	City of Sulphur	Details a cooperative plan for fire suppression within the Platt National Park, Arbuckle Recreation Area, and portions of the City of Sulphur.
12/11/68	Murray County Sheriff's Department	Spells out law enforcement and search and rescue responsibilities, and provides for mutual assistance in these fields.
6/29/73	Oklahoma Department of Public Safety	Provides for mutual assistance in underwater search and rescue.

2. Special Use Permits

These are authorizations granted by the National Park Service to individuals and/or corporations for specific limited uses. Their locations are shown on the maps of Existing Conditions.

Permit No. PLAT 2-64. Issued to Sulphur Independent School District No. 1. Permits athletic running track and baseball outfield for Sulphur High School. This NPS land is outside the park and is available for exchange with the City of Sulphur for lands the City owns within the boundary.

Permit No. PLAT 2-62. Issued to State of Oklahoma - Oklahoma Highway Commission. Permits entrance road

to Oklahoma State Veterans Hospital from U.S. 177 at south park entrance.

Permit No., PLAT I-62. Issued to State of Oklahoma - Oklahoma Highway Commission. Permits maintaining and using NPS lands outside the park boundary where State Highway 7 bridges Rock Creek in Sulphur for public highway purposes.

Permit No. 14-10-330-3. Issued to Sulphur Telephone Company. Permits establishing and maintaining aerial telephone cable systems in Travertine District.

Permit No. 14-10-133-142. Issued to Oklahoma Highway Commission. Permits right of way for State Highway 18A (U.S. 177) north-south through Travertine District.

Permit No. 3:619:1597. Issued to Goddard Youth Foundation. Permits Foundation to construct and operate youth camp to be used by Oklahoma and Texas school systems for environmental study and appreciation.

Permit No. 3:619:1602. Issued to Rural Water District No. 1, Murray County, Oklahoma. Permits installation and maintenance of water line.

Permit No. 3:619:1610. Issued to Chickasaw Telephone Company. Permits installation and maintenance of underground and underwater telephone cable.

Permit No. 3:619:1611. Issued to Chickasaw Telephone Company. Permits installation and maintenance of underground and underwater telephone cable.

Permit No. J7510:1667. Issued to an individual. Permits construction and maintenance of private road in the Lake District.

Permit No. J7510:1668. Issued to an individual. Permits grazing and pasture of 7 cows in Rock Creek Corridor.

Permit No. J7510:1669. Issued to an individual. Permits grazing and pasture of twenty cows in Rock Creek Corridor.

Permit No. 14:10:0333-1572. Issued to Oklahoma Gas and Electric Company. Permits erection and maintenance of electrical transmission lines.

In addition, there are many utility lines running through Chickasaw National Recreation Area that are not covered by special use permits.

3. Concession Permits

Permit No. 7076-9-0001. Issued to Hicks' Service to provide camping equipment for use at Chickasaw National Recreation Area.

Permit No. 3:107:1656. Issued to Oklahoma Publishing Company to install and service newspaper vending racks.

C. Existing Park Development

Existing development in Chickasaw is described by district. Locations of facilities are shown on the Existing Conditions maps (following pages).

1. Travertine District

The Travertine District contains a two-lane paved loop road approximately 6.4 miles in length with pulloff and drive-through parking areas associated with specific facilities.

Major structures include the Travertine Nature Center (built in part over Travertine Creek); in the eastern part of the District, this contains exhibit, office, library and storage space and an auditorium. The present headquarters building, in the central part of the district, serves the superintendent and administrative division. Other year-round structures include four employee residences (one also serves as staff offices), a ranger station which handles the park's campground reservation system, and the maintenance area with office, garage, yard, and storage building. Structures that may be closed part of the year, generally in the winter, include 13 sewer comfort stations and 2 camper check-in stations.

Three pavilions (structures open on the sides) shelter the spring areas of Bromide, Black Sulphur, and Pavilion--two are in the western half of the District, Pavilion is just east of U.S. 177. Signboards at each state the chemical analyses of the waters.

Other facilities include three campgrounds and numerous picnic areas. The three campgrounds are Rock Creek with 106 individual sites and 1 group site, Cold Springs with 62 individual sites and 2 group sites and Central with 18 group sites. This provides a total of 168 individual and 21 group campsites in the Travertine District. These sites are equipped with tables, fire grates, and access to comfort stations. There is one sanitary trailer dump station in the district, in the Bromide area. There are approximately 250 picnic sites in the Travertine District, with many arranged to handle large groups. Tables, fire grates, and comfort stations are provided at the picnic areas.

In addition to these park developments and facilities, U.S. Route 177 bisects the Travertine District north-south. Two on-grade intersections exist with the park loop road, with Route 177 having the right of through traffic. Access to the City of Sulphur-owned Veteran's Lake tract and a few private residences is also provided off the park loop road.

2. Rock Creek Corridor

At present, the newly acquired Rock Creek Corridor has no park development facilities. It does contain the City of Sulphur's sewage treatment plant and the unpaved access road thereto. Some unpaved vehicle tracks have been inherited from prior uses in the corridor but these are neither open to the public nor used for routine management access.

3. Lake District

The Lake District contains three developed areas on the shores of Arbuckle Lake's three arms, and limited facilities in the northern part of the reservoir's westernmost Guy Sandy Creek arm.

In the northern Guy Sandy Creek section are numerous unpaved roads, one employee residence and a small-boat launching ramp.

The Guy Sandy developed area is on the west side of the Guy Sandy Creek Arm of Arbuckle Lake. Development consists of paved access roads (less than 1 mile), boat launching ramp and breakwater and a paved parking area with 11 double spaces and 10 single spaces. Facilities include a campground with a temporary camper check-in station and 39 individual campsites. The campsites are provided with a table and fire grate and have access to chemical toilets.

Another developed area on Arbuckle Lake is The Point, situated between the Guy Sandy Creek and Rock Creek arms. Development consists of approximately 2 miles of paved road, a boat launching ramp with a paved parking area of 104 double spaces and 32 single parking spaces. Structures include 4 sewered comfort stations (1 at the launch area), a temporary ranger station housed in a trailer and an employee residence in a mobile home. Facilities include a small maintenance yard (with no permanent structures) and a campground with a summer-operated, temporary, check-in station. The campground consists of 52 individual campsites provided with a table and fire grate plus access to comfort stations. There is a partly developed swimming beach.

The third developed area is Buckhorn, on the east side of Arbuckle Lake, situated on a ridge that divides the Buckhorn Creek and Rock Creek arms. Development here consists



FACILITIES

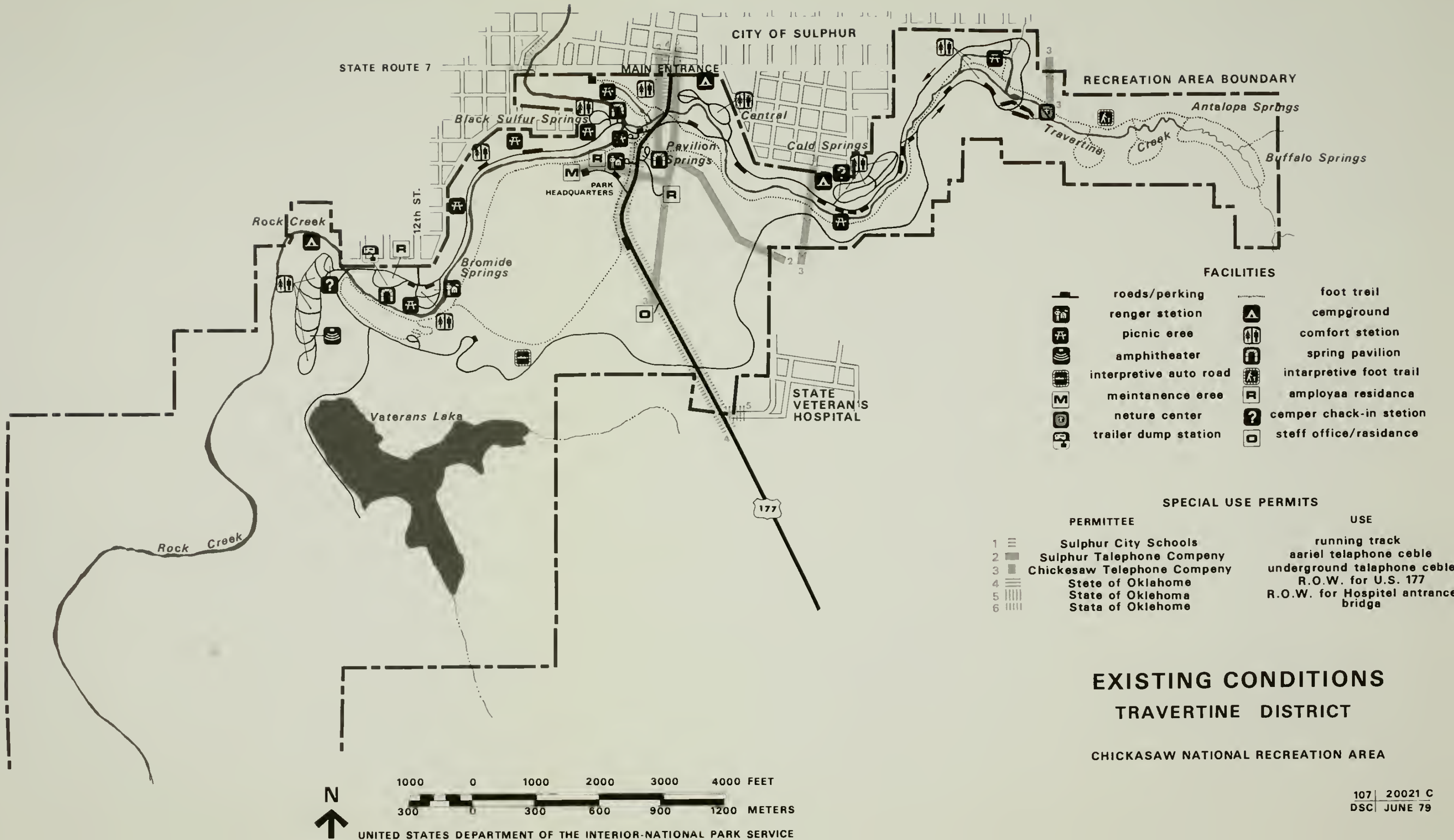
	roads/parking		foot trail
	ranger station		campground
	picnic area		comfort station
	amphitheater		spring pavilion
	interpretive auto road		interpretive foot trail
	maintenance area		employee residence
	nature center		camper check-in station
	trailer dump station		staff office/residence

SPECIAL USE PERMITS

PERMITTEE	USE
Sulphur City Schools	running track
Sulphur Telephone Company	aerial telephone cable
Chickasaw Telephone Company	underground telephone cable
State of Oklahoma	R.O.W. for U.S. 177
State of Oklahoma	R.O.W. for Hospital entrance
State of Oklahoma	bridge

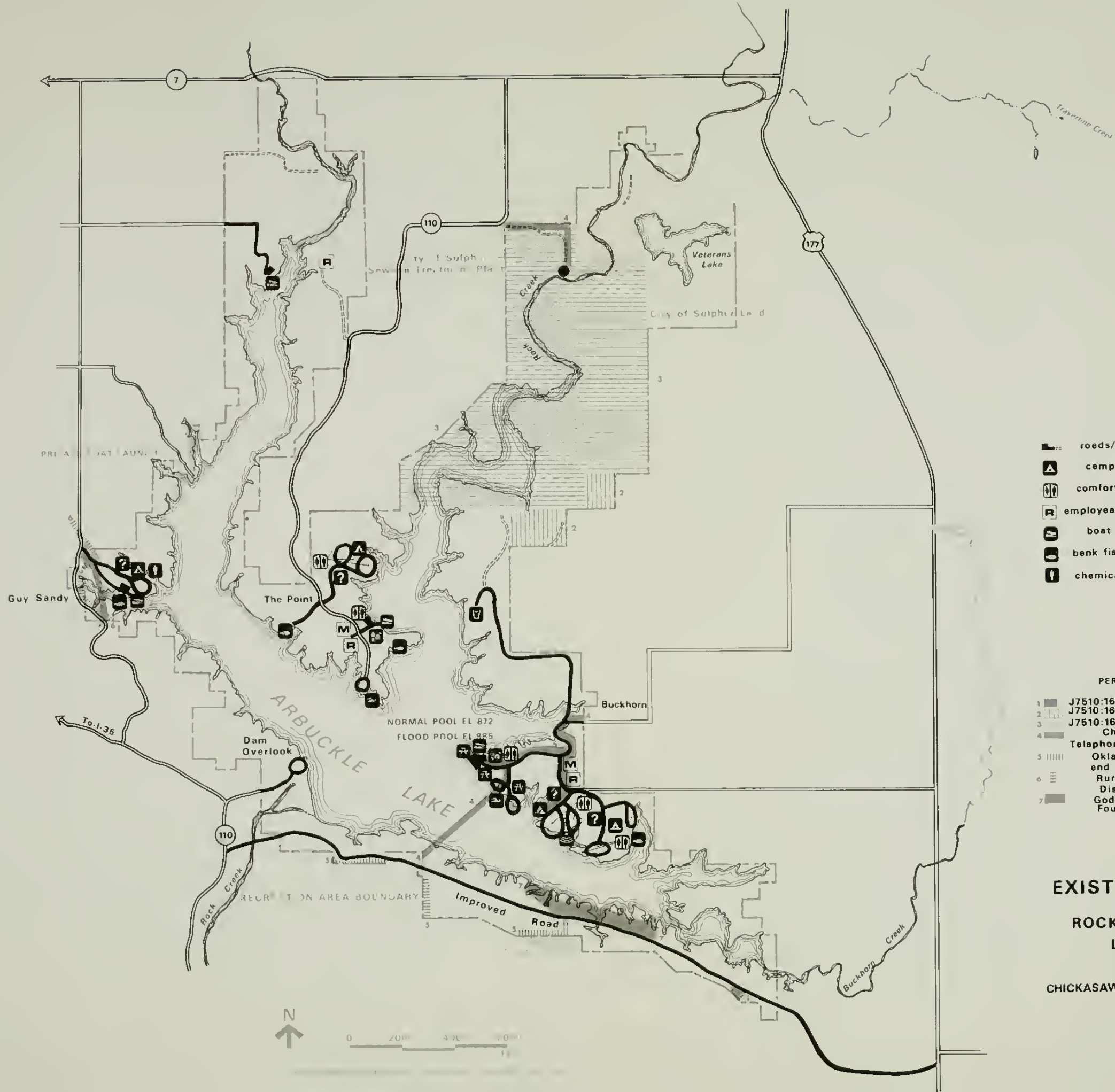
EXISTING CONDITIONS TRAVERTINE DISTRICT

CHICKASAW NATIONAL RECREATION AREA



EXISTING CONDITIONS
TRAVERTINE DISTRICT

CHICKASAW NATIONAL RECREATION AREA



FACILITIES

	roads/perking		ranger station
	campground		picnic area
	comfort station		amphitheater
	employee residence		maintenance area
	boat launch		swimming area
	bank fishing area		park water treatment plant
	chemical toilets		camp check-in station

SPECIAL USE PERMITS

PERMITTEE	USE
1 J7510:1667 (individual)	private road
2 J7510:1668 (individual)	grazing
3 J7510:1669 (individual)	grazing
4 Chickesew Telephone Company	underground/underwater telephone cable
5 Oklahoma Gas and Electric	aerial power line
6 Rural Water District #1	water line
7 Goddard Youth Foundation	non-profit youth camp

EXISTING CONDITIONS

ROCK CREEK CORRIDOR LAKE DISTRICT

CHICKASAW NATIONAL RECREATION AREA

of approximately 3.5 miles of paved road, a boat launching ramp with 2 paved parking areas totalling 116 double spaces and 80 single parking spaces. Structures include 6 sewer comfort stations (1 at the boat launch), a summer-operated, temporary, ranger station housed in a trailer and an employee residence in a mobile home. Facilities include a small maintenance yard with no permanent structures, a water treatment plant served by a non-paved management road and approximately 100 picnic sites, the majority with fire grates. Four campground loops with a total of 177 individual sites and 2 group sites are provided, with approximately 160 having a table and fire grate; an amphitheater is provided. All campsites have access to comfort stations. There is a partly developed swimming area.

In the 190 acre Arbuckle Master Conservancy District tract (which includes the damsite), an overlook, with road and shelter, is provided.

The existing conditions maps show the access and circulation roads in the entire area, and the entrances for visitors. Three of these entrances are into the Travertine District, with the remainder into the Lake District.

Total available recreational facilities for Chickasaw include 4 launch ramps, 7 campgrounds with 456 sites and approximately 358 picnic sites, 3 spring pavilions, hiking and interpretive trails, a nature center, and 2 amphitheaters.

Utilities in the recreation area also differ by district:

Travertine District is served by the City of Sulphur, water system with three chlorinators within and provided by the park. Sewage from Travertine is removed by gravity flow to the City of Sulphur treatment plant which is within the Rock Creek Corridor. From this plant the treated effluent is exported by pipeline from the watershed.

The Rock Creek Corridor has no water or sewer systems.

Two areas in the Lake District, The Point and Buckhorn, are connected by a pressure system to the City of Sulphur sewage treatment plant. These same two areas are served by a park water system taking raw water from Arbuckle Lake and treating it. The Guy Sandy developed area is connected to the Rural Water District #1 of Murray County for drinking water which is chlorinated on-site. Guy Sandy has no sewage disposal connection.

D. Natural Resources

1. Hydrology

a. Surface Water

The entire Chickasaw National Recreation Area is contained within the Rock Creek watershed, a drainage basin of 170.4 square miles tributary to the Washita River. Main tributaries of Rock Creek are Guy Sandy Creek and Buckhorn Creeks. Travertine Creek through Travertine District is another, lesser tributary, drawing its waters from Antelope and Buffalo Springs, large freshwater springs (occasionally dry, however). Travertine District includes a number of cold-water mineral springs; most of these are sulfur, but two are bromide springs.

Rock Creek and its tributaries now flow into Lake of the Arbuckles, a reservoir of 108,000 acre-feet capacity that was created in 1966. This captures flow from 126 square miles of the Rock Creek drainage basin. The project was constructed by the Bureau of Reclamation for the purpose of flood control, water supply, recreation, and fish and wildlife benefits; the water control functions are now operated by the Arbuckle Master Conservancy District under a contract with the Bureau. The National Park Service, however, is primarily responsible for recreational use of the water surface as well as adjacent lands. The following tables indicate the reservoir's characteristics for various lake levels, and the allotments of water to various entities. Although the lake level has generally been maintained at a high stand of 872.0 feet (bottom of the flood control pool and also top of the conservation pool), it remains possible for extensive drawdowns (to the 800.0 foot level) to be made should the users increase their consumption. Also, during floods water may be held back until the level reaches the 885.3 foot crest of the "glory hole" spillway. There is also the situation where flood waters may rise above this level; the 100-year flood control contour, for instance, is at 885.85 feet. This potential zone of fluctuation is a factor to be included in design of recreational facilities.

Sedimentation of 7,500 acre-feet by the year 2063 was projected to occur when the reservoir was designed, leaving a total capacity for water storage at that time of 101,339 acre-feet.

ELEVATIONS, AREAS, AND STORAGE

<u>Feature</u>	<u>Elevation</u>	<u>Area (Acres)</u>	<u>Storage (Acre-feet)</u>
Top of dam	920.0		
Maximum pool	914.2	5,600	232,000
500-year flood control contour	885.85		
Top of flood control pool (1)	885.3	3,130	108,800
5-year flood control contour	877.6		
Top of conservation pool	872.0	2,350	72,400
Average annual minimum pool	circa 860.0		
Top of fish and wildlife pool	827.0	610	9,800
Top of dead pool	800.0	120	780
Streambed	778.0		
Flood control storage	872.0-885.3	--	36,400 (2)
Conservation storage	827.0-872.0	--	62,600
Fish and wildlife storage	800.0-827.0	--	9,050
Dead storage	778.0-800.0	--	780

(1) Spillway crest

(2) Contains 350 acre-feet for sediment storage.

Apportionment of Available Water Supply

<u>Participant</u>	<u>Estimated Annual Reservoir Yield</u>	
	<u>Million gallons daily</u>	<u>Acre-feet per year</u>
<u>Arbuckle Master</u>		
<u>Conservancy District</u>		
Sulphur	1.21 (1)	1,359
Davis	1.32	1,485
Wynnewood	<u>0.70</u>	<u>780</u>
	3.23	3,624
Water Service Contracts (2)		
Industrial Use	(1.50)	(1,680)
Dougherty	<u>(0.10)</u>	<u>(112)</u>
Total District Water	3.23	3,624
<u>State of Oklahoma</u>	18.19 (1)	20,376
Total water available	21.42 (3)	24,000

-
- (1) Available at the reservoir (not being utilized at present).
 - (2) To be supplied from surplus water allocated to cities as long as sufficient surplus water exists. Thereafter, water would be provided to water service contracts through acquisition of storage held in escrow by the State.
 - (3) Water apportionments have also been made from the total available, these are to the City of Ardmore and the Kerr-McGee Corporation.

The base flow in Travertine Creek is fed primarily from Buffalo and Antelope Springs, both in the park. Peak flows are the result of surface runoff that enters the creek from rainfall. The drainage area of the Travertine Creek basin is very small, and after a significant rainstorm the runoff hydrograph peaks and recedes rapidly.

Rock Creek has a larger drainage area than does Travertine Creek, receiving its base flow from a watershed outside

Chickasaw NRA, and carries about 30% more surface flow than does Travertine. During a recent five year period, the flow in Travertine Creek, as measured at the Travertine Nature Center, was as much as 9 cfs in magnitude. The flow in Rock Creek has been unofficially observed to be several times this amount, with occasional rises of 10 feet.

b. Groundwater Springs in Travertine District

It is the complex faulting and tilting of the local rock strata that partially explains the mineral and freshwater springs in close proximity. In 1935, thirty-three mineral and freshwater springs were flowing in the Travertine Creek and Rock Creek stream valleys. By 1939, the springs had dropped to 19, and in 1976 only 7 could be located. The general ground water status in the District has gradually deteriorated from strong to weak, or non-existent, artesian conditions.

Of the freshwater springs, Buffalo and Antelope are the biggest and best known. They constitute the main supply for Travertine Creek. Although their normal daily flow is 5 million to 6 million gallons, they have been known to flow at the rate of 9½ million gallons per day, and also to dry up. Occasions when these two springs are known to have ceased flowing include (but are not restricted to) the following periods:

March 1926 to August 1926, September 1937 to June 1939, January 1951 to May 1951, October 1951 to June 1953, October 1953 to June 1956, February 1958 to December 1958, October 1962 to November 1963, October 1964 to July 1966, December 1976 to January 1977, December 1977 to March 1978, and December 1978 to March 1979.

The springs in the park are directly associated with groundwater recharge which is directly related to precipitation in the area. Buffalo and Antelope Springs derive their flows from the Arbuckle formation, an aquifer that crops out east of the District and at a higher altitude in an area of over 40 square miles. Rainfall on this formation percolates down the inclined strata in a general west to northwest direction toward the District. Then, about a mile east of the park boundary, the aquifer becomes overlain with the Vanoss formation, which acts as a confining layer for the water so that it flows from that point under artesian pressure. It is through cracks and fissures in the Vanoss formation that the water finds its way to the surface at Buffalo and Antelope Springs.

The same Arbuckle aquifer that supplies Buffalo and Antelope Springs is also tapped by the City of Sulphur well field, a few miles northwest of the springs. Because the ground surface at the City well field is about 70 feet lower than it is at the

two springs, the city's wells flow almost continually under artesian conditions. It is also the case that artesian conditions exist for several miles north of the District boundary. For instance, one well (Vendome, on land newly acquired by the National Park Service along the north boundary line) is artesian, supplying water with a sulphur odor to an artificial stream through Flower Park in the Travertine District. The University of Oklahoma's Bureau of Water Resources Research has recommended the flow of this well be decreased. The Bureau has also recommended that the City not permit discharge from its well field of excess flows into the surface water stream system, and to not allow drilling of any new artesian wells without adequate safeguards to stop flow of surplus water. The ground water supply from Buffalo and Antelope Springs to Travertine Creek will cease to exist if water stored in the Arbuckle formation aquifer is allowed to continue leaking out artesian wells faster than it can be replenished by natural rainfall.

The mineralized springs originate in the Simpson formation, which is shallower than the Arbuckle and has less artesian pressure. In fact, the mineralized springs have, for all practical purposes, ceased to flow under artesian conditions, and the public springs in the park are pumped so that visitors can have the famous sulphur water of reputed but unsubstantiated medicinal value.

The recharge area of the Simpson aquifer lies to the southeast of the park and covers an area of about 20 square miles. The underflow moves in a general west/northwest direction and is controlled by faulting, the Sulphur syncline, and general physical leaky aquifer characteristics of the terrain in the area. Analysis leads to the conclusion that the flow of the Vendome Well, Sulphur Well field, and Wyandotte Wells (see map), all adversely affect the flow conditions of Buffalo and Antelope Springs. Other private wells in the area are not considered important.

Historically, the mineral springs have included the following:

The Pavilion Group - seven springs of sulphur content lying southeast of the confluence of Rock Creek and Travertine Creek - has the largest flow and is the most popular of the sulphur group.

The Bromide Group lies at the base of Bromide Hill, south of Rock Creek near the west end of the Travertine District. The waters from these springs have been considered by many over the years to have the greatest medicinal value.

The Chalybeate Group (iron content) lies on the bank of Travertine Creek, halfway between the Pavilion Group and Buffalo and Antelope Springs.



- F Flowing well
- O Well (nonflowing)
- Spring

TRAVERTINE DISTRICT

SELECTED WELLS & SPRINGS

CHICKASAW NATIONAL RECREATION AREA

Medicine and Bromide are the only two remaining springs in the park which are classified as mineralized springs, as the water is stored and pumped since artesian flow no longer exists. Discharge from the Bromide Springs has been estimated to be about 1 gpm with the flow from Medicine Spring less than 1 gpm. Medicine Spring has not flowed since 1971.

Pavilion, Hillside, and Black Sulphur Springs have a combined flow which is usually less than 300 gpm. Black Sulphur Springs is of necessity being pumped so that the natural flow cannot be determined. The water at the three springs is less mineralized than at Bromide or Medicine Springs, but it is not classified as fresh.

Water from Pavillion Springs did have high mercury concentration but is still usable, based on interim standards of primary drinking water, proposed by the Environmental Protection Agency.

The Sulphur Well Field consists of seven wells used by the City of Sulphur for municipal purposes. Based on water quality analyses, these wells derive their flow from the Arbuckle aquifer. Currently, four of the wells flow freely part of the time while the two others do not. The city water supply from Sulphur is usable but does need treatment.

Medicine Springs and Jack Diamond Well are high in chlorides but usable.

Travertine desposits of contemporary and recent age are associated with the freshwater springs, as these waters contain large amounts of dissolved calcium bicarbonate, obtained by the leaching of the limestone conglomerates. Natural mechanical agitation of the waters in the streambed, plus the action of algae living in the water, results in the loss of carbon dioxide and the development of travertine, a relatively insoluble form of calcium carbonate. The extensive travertine deposits are geologically very young, and some are still being formed today.

c. Water Quality

The water quality of Rock Creek through the City of Sulphur and the Travertine District of the Chickasaw National Recreation Area is below the standards established by the Oklahoma Water Resources Board for the designated beneficial uses of that stream. The sustained flow for Rock Creek is a result of runoff and spring flow from land area several miles upstream from the boundary of the recreation area, where the stream traverses through rangeland, past livestock holding pens, industrial property, and the City of Sulphur's storm sewer system. As a result of these sources of pollution, the acceptable nutrient

concentrations and the fecal coliform levels are exceeded, resulting in observable algal blooms and concomitant water quality problems downstream in the Lake of the Arbuckles.

Other consequences of the degraded water quality of Rock Creek as a result of pollution from the industrial and urban activities are reduced aesthetic value and the loss of a very large portion of the waters of the Travertine District to park visitors as a swimming facility. All of Rock Creek flowing through the park is contaminated to a degree requiring prohibition of swimming and wading for health reasons.

The water quality of Travertine Creek is higher than that for Rock Creek since the sustained flow for Travertine emerges within the boundary of the recreation area and therefore is not as subjected to pollution from urban and industrial activities. During periods of high recreational use, however, a noticeable increase in the number of total fecal coliforms has been observed to the point where even Travertine Creek has to be closed to body contact.

The sub-basins of Guy Sandy and Buckhorn Creeks, in general, produce a higher quality water than that of the Rock Creek sub-basin; however, the potential for a significant contribution of nutrient loading from agricultural activities has been demonstrated by virtue of the much greater percentage of land used for that activity.

The preservation of the Lake of the Arbuckles and maintenance of its water quality is of utmost importance and concern as it serves many people both as a recreational facility and a municipal and industrial water supply. This lake is now and has been for several years a highly eutrophied lake, making it less productive of game fish than envisioned before construction. Water quality studies on the lake indicate nutrient concentrations adequate to support algal blooms, which have been observed visually, and it has also been demonstrated that the water sources supplying the lake are the source of the nutrient enrichment. Continued uncontrolled development of private lands adjacent to Arbuckle Lake without regard to soil and carrying capacity will intensify the threat of pollution there.

Veterans Lake (City-owned land inside the park boundaries) is polluted apparently from both an abandoned and operating city dump.

Further background data on the water quality of the area is quoted below from "Water Quality Management Study for the Chickasaw National Recreation Area", done by Streebin and Harp for the National Park Service in 1977 [Figures and Tables referred to are numbered as in their original report.]:

"Water quality is used to describe the nature of water in terms of its components and it is determined by the stream's beneficial uses. The Oklahoma Water Quality Standards (1973) set forth the beneficial uses of the waters of the state as listed below:

CODE	BENEFICIAL USE
A	Public and private water supplies
B	Emergency public and private water supplies
C ₁	Fish and wildlife propagation
C ₂	Fish and wildlife propagation to the extent allowed by specifically stated water quality parameters
D	Agriculture (includes livestock watering and irrigation)
E	Hydroelectric power
F ₁	Industrial and municipal cooling water
F ₂	Receiving, transporting and/or assimilation of adequately treated waste
G ₁	Recreation, primary body contact (includes recreational uses where the human body may come in direct contact with the water to the point of complete body submergence)
G ₂	Recreation, secondary body contact (includes recreational uses, such as fishing, wading and boating, where ingestion of water is not probable)
H	Navigation
I	Aesthetics
J	Small-mouth bass fishery excluding lake waters
K	Trout fishery (put-and-take)

"Rock Creek and the Lake of the Arbuckles have been designated as A, C₁, D, F₁, F₂, G₁, and I . . .

"According to the beneficial use categories for Rock Creek and the Lake of the Arbuckles as listed in the Oklahoma Water Quality Standards, the following water quality criteria are established:

Bacteria. Bacteria of the fecal coliform group shall not exceed a monthly geometric mean of 200/100 ml as determined by the membrane filter procedure and based on a minimum of not less than five samples for any 30-day period, nor shall more than 10% of the total samples during any 30-day period exceed 400/100 ml.

Dissolved oxygen (DO). The dissolved oxygen concentration shall not be less than 5 mg/l for all warm waters.

pH. The pH shall be between 6.5 and 8.5 pH values below 6.5 and above 8.5 must not be due to waste discharge.

Turbidity. Turbidity of other than natural origin shall be restricted to the following in-stream numerical values:

warm water streams	50 Jackson units
warm water lakes	25 Jackson units

Temperature. During any month of the year, heat shall not be added to any stream in excess of the amount that will raise the temperature of the water more than 5°F. In lakes, the temperature of the epilimnion shall not be raised more than 3°F above which existed before the addition of heat of artificial origin.

Nutrients. The total phosphorus concentration and nitrogen/phosphorus ratio shall be limited to prevent eutrophication problems.

Toxic substances. Toxic substances shall not be present in such quantities as to cause the waters to be toxic to human, animal, plant and aquatic life, not detrimental to any beneficial use including continued ingestion by livestock or continued use for irrigation. For aquatic life, using bioassay techniques, the toxic limit shall not exceed one-tenth of the 96-hour median tolerance limit for the most sensitive species common to the stream...

"Comparing the predictions by the Oklahoma Fishery Research Laboratory from their pre-impoundment study with the [later] studies it is obvious that the Arbuckle Reservoir is not nearly as productive [of game fish production] as envisioned...due to stresses placed on the ecosystem as a result of the available nutrients.

"Duffer and Harlin ["Changes in Water Quality Resulting from Impoundment", EPA, 1971] determined the water quality for a period of two years following dam closure. The location of the sampling stations are given on Figure 5. Their data on tributary streams entering the lake is reported in Table 3....

"Toetz ["Biological and Water Quality Effects of Artificial Destratification of Lake of the Arbuckles", Oklahoma Water Resources Research Institute, 1975.] concluded that the water quality has not appreciably changed since 1968. Some parameters, such as pH, are remarkably constant from year to year. Plant nutrients such as PO_4^{3-} and NH_4^+ show considerable variation, but considering their high rates of turnover, the variability shown in Table 4 is not surprising. Alkalinity and S^{2-} apparently decreased over the years, but such changes could have been the result of differences in methods of making measurements. Table 5 showed that Secchi disc transparency and dissolved oxygen at 10 m have

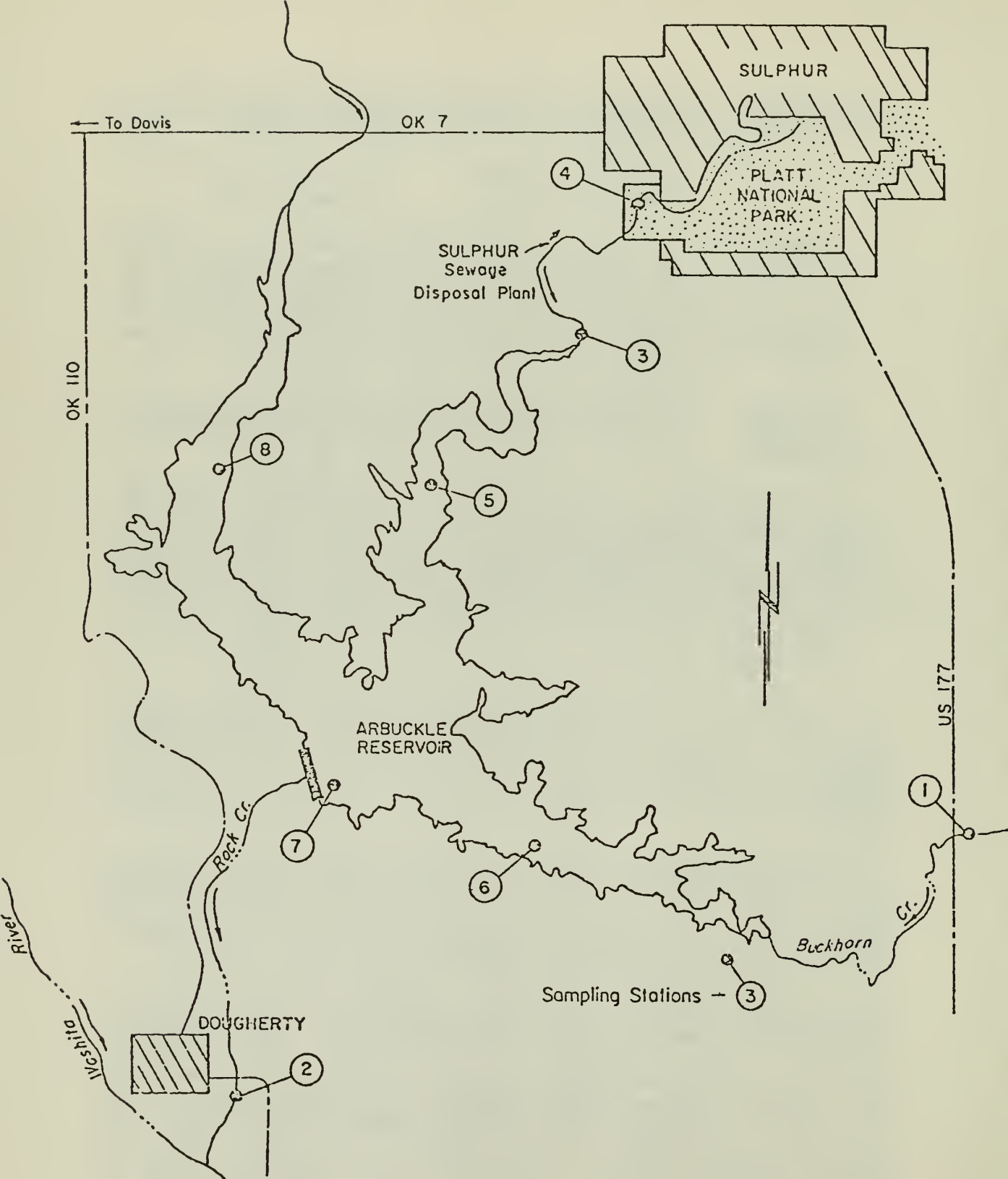


Figure 5. MAP OF LOCATIONS OF SAMPLING STATIONS.
 from "Water Quality Management Study for
 the Chickasaw National Recreation Area", by
 Streebin and Harp, National Park Service, 1977.

Table 3. STUDY PARAMETERS AT STREAM STATIONS IN ARBUCKLE SYSTEM AFTER CLOSURE OF THE DAM

Water Constituent or Characteristic	Station 2	Station 3	Station 4	Station 1
Total Coliform/100 ml ²	492.0	19360	1274	3508
Fecal Coliform/100 ml ²	67.30	3459	249.5	1035
Fecal Streptococci/100 ml ²	235.0	1315	514.0	1069
Total Plate Count/ml 35°C ²	1637	19630	2466	2972
Total Plate Count/ml 20° C	959.4	10380	946.2	1005
BOD, mg/l	2.230	5.544	1.912	1.840
COD, mg/l	20.481	28.366	19.358	11.492
pH	7.862	7.926	8.253	8.142
Alkalinity-HCO ₃ , mg/l	243.6	224.4	216.8	265.9
Alkalinity--CO ₃ , mg/l	24.7	25.3	30.8	20.7
Hardness as CaCO ₃ , mg/l	304.0	308.8	308.8	296.7
Conductivity-micromhos/cm @ 25°C	865.4	1491.4	1725.6	560.6
Magnesium, mg/l	23.8	27.1	29.5	34.3
Calcium, mg/l	68.4	79.2	72.7	62.6
Chlorides, mg/l	136.2	328.8	372.2	12.4
Sulphate, mg/l	74.1	50.8	52.5	16.0
Total Residue, mg/l	512.2	808.6	822.1	341.9
Filterable Residue, mg/l	461.7	817.9	868.0	335.0
Ammonia, mg/l	0.334	0.937	0.128	0.160
Organic Nitrogen, mg/l	0.361	0.491	0.183	0.476
Nitrite, mg/l	0.011	0.148	0.006	0.004
Nitrate, mg/l	0.100	0.242	0.181	0.602
Total Phosphate, mg/l	0.565	1.648	0.181	0.077
Ortho Phosphate, mg/l	0.405	1.355	0.122	0.040

from "Water Quality Management Study for the Chickasaw National Recreation Area," Streebin and Harp, National Park Service, 1977.

Table 4. CONCENTRATION OR VALUE AND 95% CONFIDENCE INTERVALS FOR SELECTED WATER QUALITY PARAMETERS DURING JULY AND AUGUST BETWEEN 8 AND 20 M IN ARBUCKLE LAKE AT STATION 7
[From "Biological and Water Quality Effects of Artificial Destratification of Lake of the Arbuckles", Oklahoma Water Resources Research Institute, 1975]

Parameter	Year	Units	Mean	95% Confidence Limits
NH ₄ -N	1968	microgram/l	283	72-546
"	1973	"	61	22-124
"	1975	"	171	112-228
Alkalinity	1968	milligrams/l	170	161-179
"	1973	"	150	142-156
"	1975	"	128	125-132
pH	1968	-----	7.28	7.04-7.52
"	1973	-----	7.55	7.41-7.69
"	1975	-----	7.30	7.26-7.34
Sulfide-S	1968	milligrams/l	0.27	0.06-0.46
"	1973	"	0.02	0.01-0.02
"	1975	"	0.06	0.01-0.11
Manganese	1968	milligrams/l	0.53	0.05-1.01
"	1973	"	0.40	0.21-0.59
"	1975	"		
Phosphate-P	1968	micrograms/l	117	15-219
"	1973	"	13	3-23
"	1975	"	9	3-15
BOD- ₅	1968	milligrams/l	2.10	0.98-3.22
"	1975	"	2.82	2.42-3.21

Table 5. CONCENTRATION OF IMPORTANT WATER QUALITY
PARAMETERS AT 10 M AND DEPTH OF THE
SECCHI DISC IN ARBUCKLE LAKE
DURING JUNE, JULY AND AUGUST (4)
[From "Biological and Water Quality Effects of
Artificial Destratification of Lake of the Arbuckles",
Oklahoma Water Resources Research Institute, 1975]

<u>Parameter</u>	<u>Year</u>	<u>Units</u>	<u>Mean</u>	<u>95% Confidence Interval</u>
Dissolved oxygen	1973	mg/l	0.66	0-2.45
	1974	mg/l	0.56	0-2.32
	1975	mg/l	0.53	0-2.36
Temperature	1973*	°C	20.5	16.5-24.5
	1974	°C	26.1	25.5-27.0
	1975	°C	24.8	23.3-26.3
Secchi disc	1973	m	1.80	1.17-2.43
	1974	m	1.50	1.28-2.72
	1975	m	1.60	0.97-2.23

*1973 data are systematically too low by 2° C.

remained relatively constant between 1968 and 1975. Temperature at 10 m showed considerable year to year variation, depending perhaps on the heat budget for the year. Concentrations of conservative elements such as Na, Ca and K did not change. Toetz concluded there was no evidence to suggest that the water chemistry of Arbuckle Lake during the summer had changed between 1968 and 1975 . . .

"Land Use Activities

"The water quality of the Rock Creek watershed is a function of the adjacent land use. Dispersed pollution from agricultural and forest lands, urban runoff and the point sources discharging into the creek affect its quality. Land use for the 124 square mile area of the Rock Creek watershed above the dam is...summarized in Table 19.

Table 19. LAND USE, ROCK CREEK WATERSHED
[from "Water Quality Management Study for the
Chickasaw National Recreation Area", Streebin
and Harp, National Park Service, 1977.]

<u>Use</u>	<u>Acres</u>	<u>Percent of Total</u>
Rangeland	42,930	54.0
Pastureland	19,080	24.0
Forest, Upland	7,950	10.0
Cropland	3,975	5.0
Water	3,180	4.0
Urban Area	1,590	2.0
Forest, Bottom	238	0.3

Note: Information from Oklahoma Conservation Commission

"Croplands occupy only 5 percent of the total area of the watershed and are mainly located in the Guy Sandy Creek sub-basin. The principal crops grown are oats, alfalfa and wheat. Fertilizer is currently being applied on these croplands at an annual rate of 200 pounds of (10N-20P-10K) fertilizer per acre.

"Pasturelands comprise about 24 percent of the total watershed area. Fertilizers are used at the average rate of about 20 pounds of nitrogen per acre to augment the growth of bermuda grass.

"Over half of the watershed area consists of rangeland scattered throughout the basin...

"Although the urban area comprises only about 2% of the total watershed area, its land use activities are of significance. Listed in Figure 17 are the major industries of Sulphur and their locations in the city.

"Increasingly more of the agricultural activities in Murray County are turning to poultry and dairy production with 21 dairy and poultry farms in the watershed area...

"Summer home development on the west side of the Lake of the Arbuckles [outside the national recreation area] may decrease the water quality by increasing erosion and by the discharge of wastes from improperly designed and constructed waste treatment systems...

"Estimates of Nutrient Contribution from Non-Point Sources

"The estimates of the amounts of total nitrogen and total phosphorous contributed from different non-point sources in the watershed are shown in Tables 20 and 21 . . .

"Referring to Tables 20 and 21, the relative importance of various sources is estimated as follows:

1. The largest contribution is estimated to be from the rural area, accounting for 71% of nitrogen and 68% of phosphorus. In this category pastureland is the largest contributor with about 40% of nitrogen and 30% of phosphorus. The second largest contributor is rangeland which accounts for 18% of nitrogen and 26% of phosphorus. Cropland contributes only 10% of nitrogen and about 9% of phosphorus because of its small area.
2. Urban area contributes about 6% of the nitrogen but is a large contributor of phosphorus (24%).
3. Contribution from precipitation is more significant in terms of nitrogen (13%) than in terms of phosphorus (1%).
4. Ground water contributes about 10% of the nitrogen and 7% of the phosphorus but the amount of nitrogen contributed is many times greater than that of phosphorus.

"Figure 18 designates the location of each sampling site in the vicinity of the Platt section of the Chickasaw National Recreation Area. Figure 19 gives the locations of the sampling stations on the

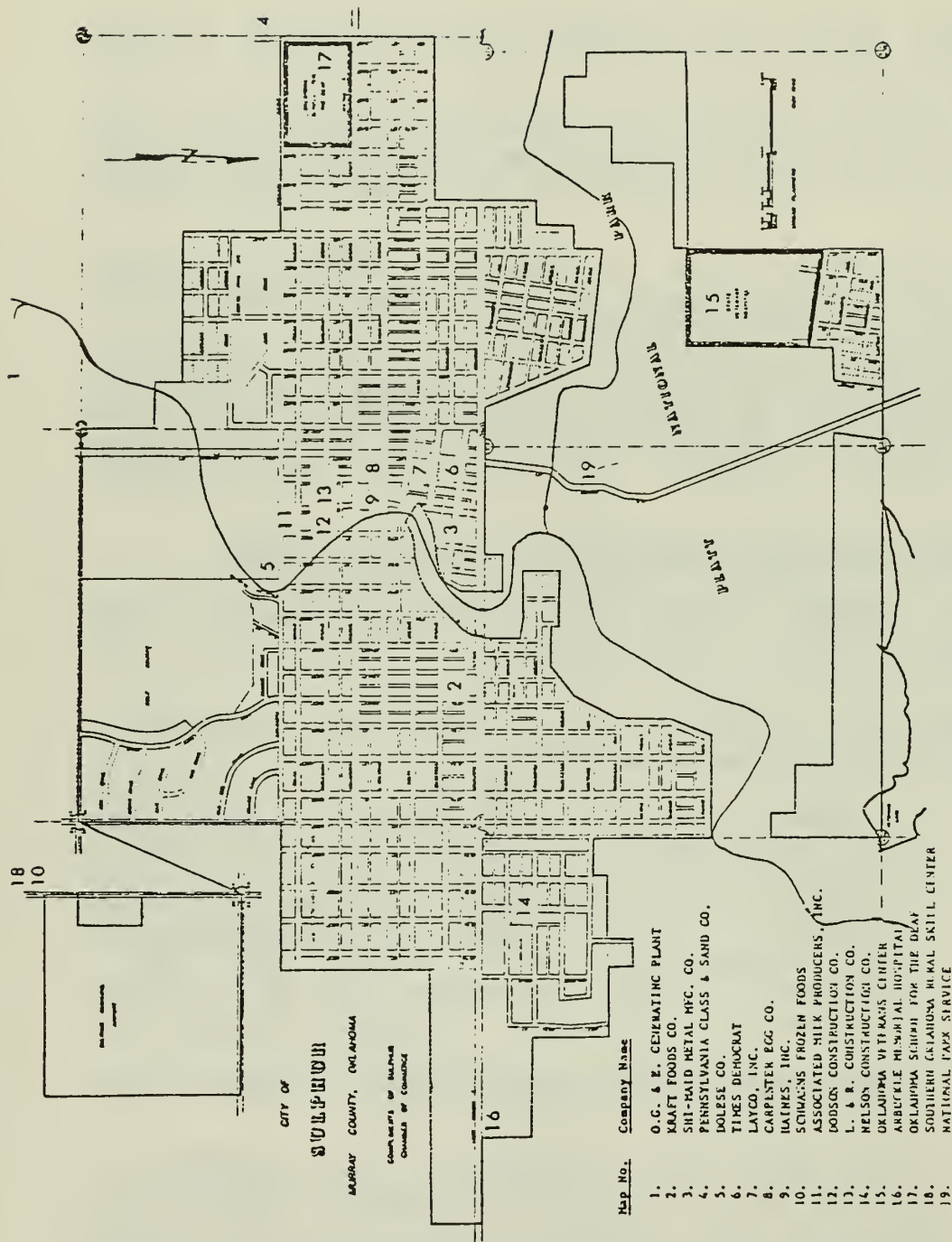


Figure 17. INDUSTRIES OF SULPHUR, OKLAHOMA.

[From Water Quality Management Study for the Chickasaw National Recreation Area", Streebin and Harp, National Park Service, 1977.]

Table 20. ESTIMATES OF ANNUAL AMOUNTS OF NITROGEN
CONTRIBUTED TO LAKE OF THE ARBUCKLES

<u>Sources</u>	<u>Acres</u>	<u>lbs/yr/ac</u>	<u>Pounds per watershed</u>	<u>Percent</u>
1. Run-off				
Rural Area				
Cropland	3,975	6	23,850	10
Pastureland	19,080	4	95,400	40
Rangeland	42,930	1	42,930	18
Forestland	7,950	1	7,950	3
			<u>170,130</u>	<u>71</u>
Urban Area	1,590	8	12,720	6
2. Precipitation	3,180	10	31,800	13
3. Groundwater	-----	--	<u>24,305</u>	<u>10</u>
		Total	239,000	100

[From "Water Quality Management Study for the Chickasaw National Recreation Area", Streebin and Harp, National Park Service, 1977.]

Table 21. ESTIMATES OF ANNUAL AMOUNTS OF PHOSPHORUS
CONTRIBUTED TO LAKE OF THE ARBUCKLES

<u>Sources</u>	<u>Acres</u>	<u>lbs/yr/ac</u>	<u>Pounds per Watershed</u>	<u>Percent</u>
1. Run-off				
Rural Area				
Cropland	3,975	0.30	1,192	9
Pastureland	19,080	0.20	3,816	30
Rangeland	42,930	0.08	3,434	26
Forestland	7,950	0.05	398	3
			<u>8,840</u>	<u>68</u>
Urban Area	1,590	2.0	3,180	24
2. Precipitation	3,180	0.05	160	1
3. Groundwater	----	---	<u>910</u>	<u>7</u>
		Total	13,090	100

[From "Water Quality Management Study for the Chickasaw National Recreation Area", Streebin and Harp, National Park Service, 1977]

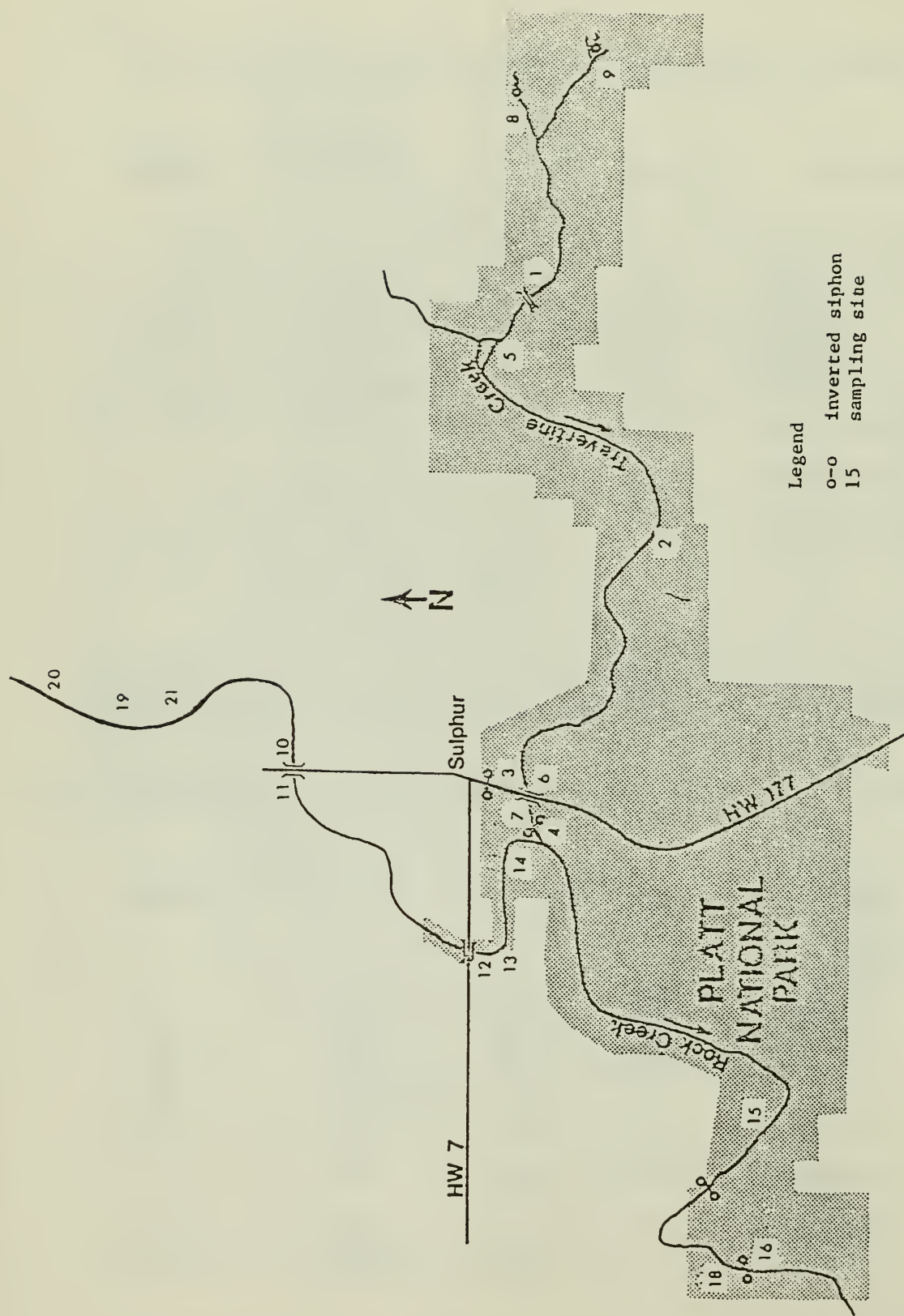


Figure 18 SAMPLING SITES—ROCK CREEK—CHICKASAW NATIONAL RECREATION AREA
 [From "Water Quality Management Study for the Chickasaw National Recreation Area", Streebin and Harp, National Park Service, 1977.]

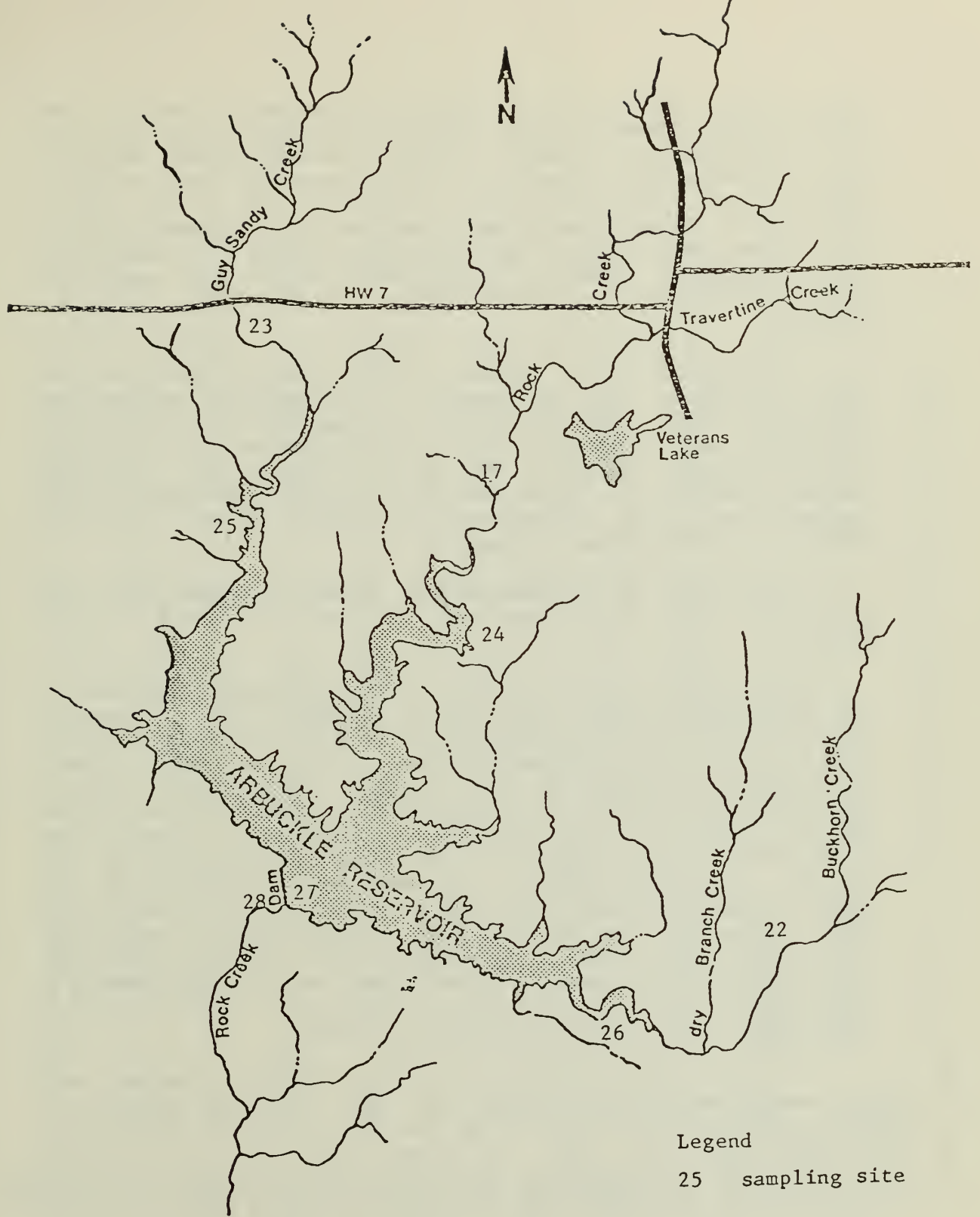


Figure 19.

SAMPLING SITES-ARBUCKLE RESERVOIR-CHICKASAW NATIONAL RECREATION AREA

[From "Water Quality Management Study for the Chickasaw National Recreation Area", Streebin and Harp, National Park Service,]977]

Lake of the Arbuckles and the tributaries thereto. Several of the sampling sites located on Rock Creek, its tributaries and the Lake of the Arbuckles were chosen to establish a water quality baseline. This facilitates the recognition of the source of any pollutant discharge and assessment of any variation in that quality due to that source. These locations were monitored on a somewhat regular basis during the period beginning June, 1976 and ending July, 1977. Additional sampling sites were located and monitored periodically for the purpose of isolating and identifying sources of pollution.

"Sites No. 19-21 are located on Rock Creek upstream from the City of Sulphur for the purpose of establishing background information, i.e., water quality prior to pollution from urban or recreational areas. Sampling sites No. 10-16 and No. 18 are located on Rock Creek throughout the City of Sulphur and the Platt section. Site No. 17 is located below the Sulphur municipal sewage treatment plant for the purpose of determining the extent of pollution originating from the plant.

"The results of the analyses of samples collected over the period from June, 1976 through July, 1977 are [summarized in Table 22.] . . .

"The influence of industrial and urban activities is apparent in the degradation of the water quality of Rock Creek. The most notable variations of the parameters measured are in the COD, TDS, CI and bacterial concentrations. The sources of these pollutants are numerous and their points of introduction to Rock Creek are distributed over the entire reach from sites No. 19 to No. 14. The mean CI concentration was observed to increase from a low of 51.7 mg/l at site No. 20 to a value of 516.0 mg/l at site No. 21. A similar increase in TDS was noted between these two points. These increases have been attributed to the cooling tower blow down water from the O.G. & E. Arbuckle Electric Generating Plant which is permitted by the Oklahoma Water Resources Board to discharge into Rock Creek...Also associated with this discharge is a high COD concentration, mean value of 50.9 mg/l, which contributes significantly to the COD loading of Rock Creek.

"A more dramatic increase in the COD loading, however, was observed between sites No. 21 and No. 11. A livestock holding pen where cattle and hogs are held for the weekly auction in Sulphur is located between these sites. An artesian well flows freely through the pens and discharges over the creek bank directly into Rock Creek. One consequence of the condition is the increase of the mean COD concentrations from 18.6 mg/l at station No. 21 and 30.2 mg/l at station No. 11. The magnitude of the impact on Rock Creek from this source of pollution as a result of runoff following a rainstorm event is depicted in Figure 20. Also associated with this type of pollution source is an increase in the bacterial population of the receiving stream . . .

Table 22. QUALITY DATA FOR CHICKASAW NATIONAL RECREATION AREA
(Mean ± Standard Deviation for Selected Sites)

Sampling Site Location Site No.	Temp.	D.O.	B.O.D.	C.O.D	pH	Alk.	Cl	TSS	TDS	NH ₃ -N	NO ₃ -N	K-N	P	O-P
Above														
O.G.&E. Site 20	mean 11.9 S.D. 2.46	9.72 1.28	1.16 0.76	10.9 9.17	8.0 0.70	233.0 29.7	51.7 54.5	3.0 2.83	892 198.5	0.140 0.198	0.035 0.049	0.333 0.050	0.037 0.033	0.003 0.004
O.G.&E. Site 19	mean 22.9 S.D. 2.19	9.60 1.8	--- ---	50.9 52.8	7.4 0.37	--- ---	1338.0 67.2	1.50 0.71	4892 162.5	2.20 ---	0.625 ---	0.150 0.057	0.00 ---	0.00 ---
Below														
O.G.&E. Site 21	mean 13.3 S.D. 2.86	9.72 2.17	1.16 0.23	18.6 14.54	7.4 0.78	161.0 29.7	516.0 284.6	3.33 2.08	3118 511.7	0.070 0.099	0.230 0.00	0.215 0.219	0.033 0.003	0.010 0.014
Rock Creek HY 177 Site 11	mean 18.12 S.D. 6.8	9.08 1.74	1.30 0.45	30.2 37.96	8.1 0.53	218.0 50.3	266.9 214.8	15.2 20.7	1490 871.6	0.748 1.244	0.103 0.049	1.307 2.16	0.044 0.035	0.010 0.014
Rock Creek HY 7 Site 12	mean 17.3 S.D. 8.37	9.62 2.24	1.49 0.90	29.1 25.89	8.1 0.52	168.6 103.3	250.0 189.7	3.2 4.6	1533 824.1	0.205 0.181	0.063 0.047	0.469 0.656	0.068 0.056	0.039 0.038
Sandy Beach Site 14	mean 18.0 S.D. 8.04	8.99 2.37	2.28 2.03	28.3 25.7	8.1 0.55	225.0 38.5	199.5 165.6	8.8 6.8	1454 752.1	0.181 0.155	0.208 0.016	0.558 0.517	0.224 0.327	0.151 0.221
Camp Grounds Site 18	mean 15.5 S.D. 7.71	10.4 2.28	1.71 1.25	24.5 23.0	8.2 0.61	241.0 18.4	326.0 157.7	11.0 11.4	1528.4 650.3	0.613 0.770	0.110 0.076	0.572 0.636	0.095 0.091	0.260 0.324
N.C. (Trav.) Site 1	mean 20.5 S.D. 1.7	8.6 1.1	0.47 0.38	11.9 11.1	8.3 0.42	342.0 70.5	2.3 1.26	3.9 2.44	548.6 3.78	---	---	---	---	---
Trav. Below Swim. Site 2	mean 14.25 S.D. 7.7	10.0 2.3	1.44 .65	30.3 39.1	8.2 .71	252.0 0.0	5.5 3.54	---	517.1 23.6	0.090 ---	0.00 ---	0.230 ---	0.0 ---	0.015 ---
Lincoln Bridge Site 7	mean 15.6 S.D. 4.65	9.7 1.10	0.78 0.471	19.7 21.48	8.0 0.50	250 ---	216.0 37.69	11.3 8.33	1076.5 438.7	0.223 0.271	0.043 0.012	0.625 0.675	0.031 0.029	0.008 0.008
Buckhorn Creek HY 177 Site 22	mean 16.0 S.D. 6.68	10.5 1.50	1.59 1.59	13.6 9.56	8.35 0.34	---	15.5 .71	15.0 ---	489 72.4	0.303 0.152	0.485 0.181	0.773 0.665	0.040 0.007	0.003 0.003
Guy Sandy Creek HY 7 Site 23	mean 17.1 S.D. 7.82	9.4 1.45	1.04 0.74	13.7 9.8	8.30 0.4	---	25.014.0 ---	---	466 86.0	0.079 0.041	0.165 0.021	1.08 0.424	0.053 0.025	0.020 ---

Temperature (°C)
TDS (micromhos)
All others (mg/l)

[From "Water Quality Management Study for the Chickasaw National Recreation Area". Streebin and Harp, National Park Service, 1977.]

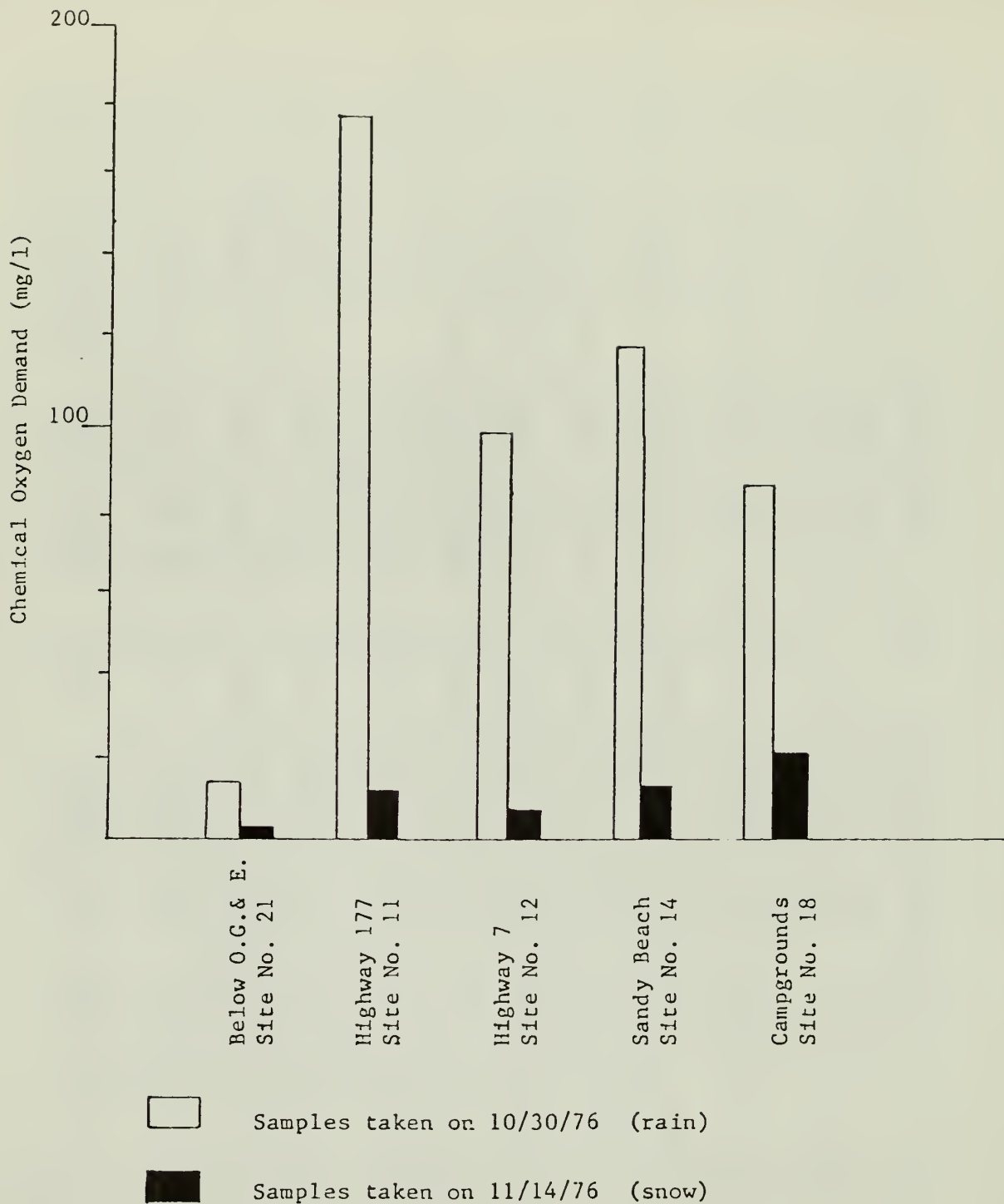


Figure 20. EFFECT OF URBAN RUNOFF ON WATER QUALITY OF ROCK CREEK, IN TERMS OF COD.

[From "Water Quality Management Study for the Chickasaw National Recreation Area", Streebin and Harp, National Park Service, 1977]

This is . . . graphically demonstrated in Figure 21. The fecal streptococci concentrations increase tremendously between these two sampling sites. The ratios of fecal coliform/fecal streptococci are consistent with published values . . . for pollution from animal sources.

"Another area of frequent high bacterial contamination on Rock Creek is in the proximity of Sandy Beach, site No. 14, also known as Black Sulphur Beach. However, this location generally exhibits a FC/FS ratio consistent with or at least suggestive of a human source. These high concentrations of fecal coliform and fecal strep prompted reconnaissance surveys of the upstream area. On several occasions raw sewage was observed flowing from breaks in the sewer line running parallel to Rock Creek. These breaks, discharging raw domestic wastes at a flow large enough to discolor the creek, were observed in the reach between Sandy Beach and Highway 7.

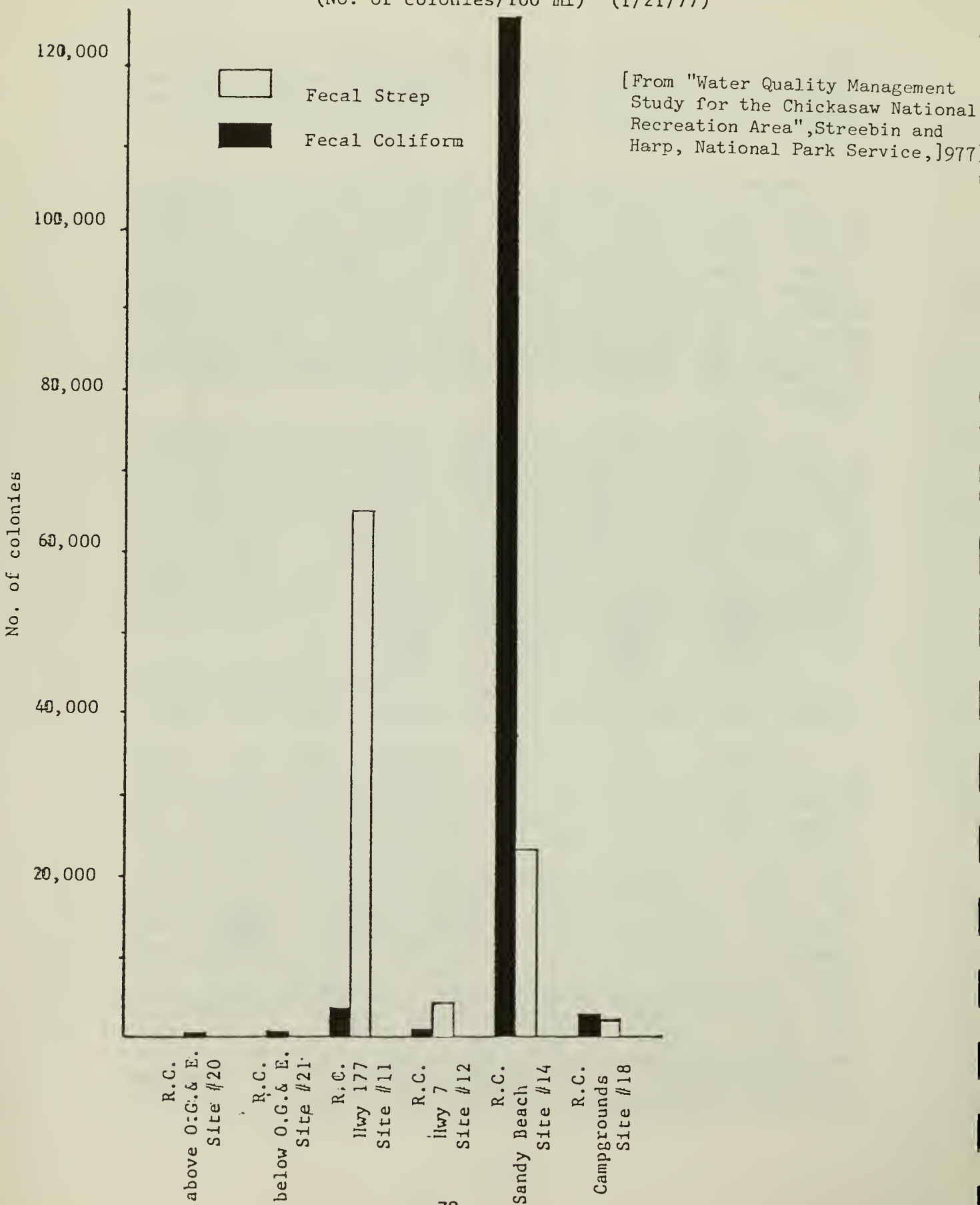
"On several occasions following rainstorm events manholes, associated with inverted siphons crossing Rock Creek in a number of places (Figure 18), were observed overflowing directly into the creek. The sanitary sewer collection system of Sulphur in general and broken lines in particular are very important contributions to the contamination and degradation of Rock Creek . . . [the City of Sulphur is proposing to replace its sewer line from Rock Creek Campground in the NRA to the treatment plant. This would include 2 siphons and approximately 6000' of line. A public hearing on the construction is scheduled for June 19, 1979.]

"The quality generally improves as the creek passes through the Platt section in part due to the dilution effect of the confluence of Rock Creek and Travertine Creek within the park boundaries.

"Travertine Creek, which originates within the park boundaries, is fed by two fresh water springs, Antelope and Buffalo (sites No. 8 and No. 9, Figure 18), and the flow from the Vendome Well, which is highly mineralized water from the same aquifer as the cooling water make-up supply used by O.G. & E. The quality of Travertine Creek is generally higher than that of Rock Creek. The storm sewer drainage culvert (site No. 3, Figure 18) was observed to be a constant source of pollution to Travertine. This culvert collects storm and other runoff from the streets and yards in this area of Sulphur and discharges into Travertine Creek. Although the flow from this culvert was generally very low, the BOD concentrations and bacterial populations were very high. During periods of storm runoff, however, both the flow and the pollutorial loading are significant. The bacterial concentration upstream from this source was observed to be within the allowable limits for the intended beneficial use of Travertine Creek under low recreational use conditions. However, during the

Figure 21. COMPARISON OF FECAL COLIFORM TO FECAL STREP CONCENTRATIONS

(No. of colonies/100 ml) (1/21/77)



summer months and especially on high use days the bacterial concentrations were found to increase considerably due to swimming activities in the many pools along the creek.

"A comparison of the number of swimmers in Travertine Creek and the total coliform concentrations indicates a close correlation between the two... The lag between the observed increase in number of swimmers and a corresponding increase in the coliform concentrations is due to the "time-of-travel" of the flow from the uppermost pool (site No. 5) to the sampling location (site No. 2). An examination of the FC/FS ratios produced mainly inconclusive results as the values were erratic . . .

"The very high nutrients loading of Rock Creek has several sources . . . [A] major contributor to the inorganic nitrogen ($\text{NO}_3 + \text{NH}_3$) is the discharge from O.G. & E. Another source of nitrogen, mainly in the form of $\text{NH}_3\text{-N}$, is the livestock holding pens upstream from site No. 11. Besides being a source of high organic loading to Rock Creek the broken sewer line between sites No. 12 and No. 14 is a major contributor of both phosphorus and nitrogen . . .

"A comparison of the pollutant levels of Rock Creek prior to entering the Sulphur area (site No. 20) and the concentrations as the creek leaves the park area (site No. 18) indicates a significant increase in organics (as indicated by BOD and COD concentrations), nutrients (nitrogen and phosphorus) and total dissolved solids. Coupled with the increase in flow of Rock Creek as it leaves the park it is clear the major contribution of organics and nutrients are from industrial, urban and recreational activities. The high TDS are associated with the highly mineralized aquifer supplying a portion of the flow of Rock Creek . . .

"The major tributaries to the Lake of the Arbuckles, Rock Creek, Guy Sandy and Buckhorn Creeks, were sampled at locations No. 18, No. 22 and No. 23 as seen in [Figures 18 and 19] . . . Comparison of the data from these sites leads to the conclusion that the total dissolved solids, ammonia nitrogen, phosphates and the organics as measured by the chemical oxygen demand are higher for Rock Creek than for either Buckhorn or Guy Sandy Creeks. The higher organic (COD) levels in Rock Creek than in Buckhorn or Guy Sandy Creeks are due to runoff from the urban area and the stock holding pens and to discharges from O.G. & E. and from the inadequately maintained domestic waste collection system of the City of Sulphur. The higher phosphates in Rock Creek are due to the municipal waste discharges and the higher ammonia level to both domestic wastes and wastes from O.G. & E. and the stock holding pens. The nitrate and organic nitrogen are higher for both Buckhorn and Guy Sandy than for Rock Creek. The primary contributor on the Guy Sandy basin is agriculture. The source of

nitrogen to Buckhorn was not isolated; however, a possible source is the catfish farm located approximately $\frac{1}{2}$ mile upstream from sampling site No. 22. Further investigation would be necessary to isolate and identify the source of nitrogen in this sub-basin.

"Although the data seems to indicate that industrial, urban and recreational activities are the major contributors to the nutrient loading of Rock Creek watershed, it must be realized that the study year was an unusually dry year. During periods of high runoff in the watershed, larger contributions from croplands, principally located in the Guy Sandy sub-basin and to a lesser extent in the Rock Creek sub-basin, will result. Pasturelands and rangelands, more densely located in the Guy Sandy and Buckhorn Creek sub-basins, will also result in much higher loadings of nutrients from the respective sub-basins than were observed during this study.

"Figure 19 shows the sampling sites located on the Lake of the Arbuckles. Samples were collected from the three major arms of the lake, Rock Creek, Guy Sandy Creek and Buckhorn Creek, and from a site near the dam and the outflow from the spillway. These various sites are indicated by Nos. 24-28 on Figure 19.

"Attention is focused on the degree of eutrophication of the lake since it impacts on the water quality and therefore on the beneficial uses of the lake. Eutrophy is defined in general terms as the enrichment due to nutrient addition to the lake system. The major constituents which either limit or increase the productivity of a lake are phosphorus, nitrogen and carbon. Phosphorus is generally considered to be the most important factor in the control of eutrophication since carbon is abundant from the atmosphere and nitrogen fixers are prevalent in natural aquatic systems.

"The nutrient loading from the Rock Creek watershed is sufficient to support accelerated growth of algae and other aquatic plants. In fact, during the summer months of 1976 and 1977 spectacular algal blooms were observed often in Rock Creek and its tributaries. Further evidence of nutrient enrichment of these waters is the supersaturated dissolved oxygen conditions observed during sunlight hours in the spring and summer as a result of oxygen-producing algae. In the Lake of the Arbuckles itself accelerated eutrophication is evident . . .

"The detrimental effects of lake eutrophication can be quite extreme. The depleting of the dissolved oxygen can result in sudden and massive fish kills. Odors and tastes produced by the anaerobic decomposition of organics detract from the aesthetic value of the lake and result in limited use as a municipal water supply."

2. Biologic Resources

a. Flora

The National Recreation Area lies in a zone of botanical transition between grassland and forest; four forest communities and three grassland communities contribute to a rich and varied flora. The variety of habitats and climatic conditions produce a valuable natural study area. A distinct boundary occurs between the lands of Travertine District and those adjacent, apparently reflecting the protection its lands have had from grazing and also tree-planting activities within the fenceline. The seven vegetative communities recognized in the Travertine District are listed below.

Forest Communities

Short-lobed oak (Quercus breviloba) is the most xeric forest community.

Post oak/winged elm (Q. stellata/Ulmus alata) is the next most xeric forest community. Other species prevalent in this association include Texas ash (Fraxinus texensis), saw greenbrier (Smilax bonanox), three-seeded mercury (Acalypha virginica), and Drummond aster (Aster drummondii).

Texas red oak/chinaquapin oak (Q. schmardii texana/muehlenbergii) generally occurs on lower hillsides and drier areas of the lower flood plains. Associated species include American elm (Ulmus americana), rough leaf dogwood (Cornus drummondii), bittersweet (Celastrus scandens), winged elm, and cat brier.

These three forest communities are usually associated with the arable forested upland soils.

American elm/southern hackberry (Ulmus americana/Celtis laevigata) is the most mesic forest community, and usually occurs adjacent to streams. Associated species include bitternut hickory (Carya cordiformis), black walnut (Juglans nigra), and bangle grass (Uniola latifolia). This community is usually associated with the alluvial soils and soils of oldstream terraces.

Grassland Communities

Hairy grama (Bouteloua hirsuta) is the most xeric of the grassland communities. It occurs on the brows of hills and on south-facing slopes. Associated species include purple threeawn (Aristida purpurea), little bluestem, hairy tall dropseed (Sporobolus asper var. pilosus), sideoats grama (Bouteloua curtipendula), rough triodia (Tridens elongatus), hairy triodia (Tridens pilosus), and several xeric forbs.

Little bluestem (Andropogon scoparius) occupies the deeper well-drained soils on hilltops and north-facing slopes. Associated species include hairy tall dropseed, yellow Indiangrass (Sorghastrum nutans), switch grass (Panicum virgatum), big bluestem (Andropogon gerardi), hairy grama (Bouteloua hirsuta), sideoats grama (Bouteloua curtipendula),

Seep muhly (Muhlenbergia reverchoni) is frequently associated with seeps or wet places that are poorly drained for at least part of the growing season. It also occurs in small patches on old building sites cleared from forested areas and along the sides of ravines where highly calcareous soils are present. It is the most homogeneous of the grassland communities; associated species include little bluestem, hairy tall dropseed, and rough triodia.

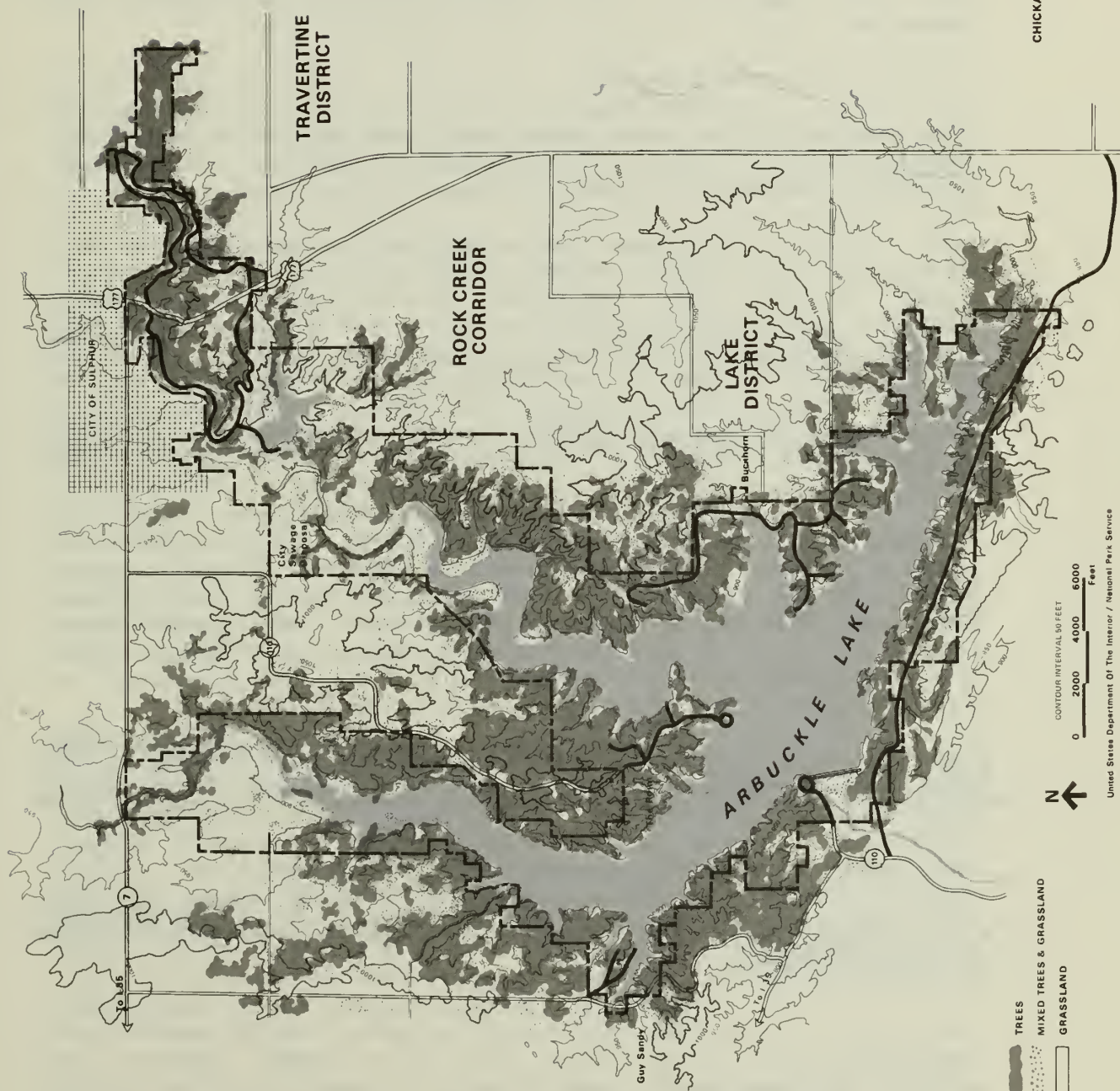
Some of these communities are also recognized in the Rock Creek Corridor and the Lake District.

The three grassland communities are most often associated with the arable prairie soils. However, the seep muhly community is often found on alluvial soils and soils of oldstream terraces, and the hairy grama community is often found on the nonarable soils and miscellaneous land types.

None of the forest or grassland communities in the area are unique or restricted, nor are any of their component species listed here. Those present in Travertine District have been manipulated deliberately by man to produce a pleasing park environment through planting of trees, shrubs, and grass, and constructing ponds, waterfalls, etc.; thereby being best termed naturalistic rather than natural. Abandoned road corridors, utility lines, former campgrounds, etc., interlace the area. Reintroduced natural ungulates graze only within a fenced pasture. There are cultivated zones of mowed lawns along roadways, picnic areas, and buildings. The balance of the National Recreation Area is mixed grassland and forest as shown on the accompanying maps. No rare or endangered floral species are known to be present nor are any species unique or of special significance.

On the higher rocky slopes, yucca, pricklypear, cactus, and dwarf sumac abound. Undisturbed parts of the moderately moist grassland community are composed of many species of true prairie plants, such as beardgrass, Indiangrass, and switchgrass.

The vegetative composition of the area has changed since the 1930's. The trend is toward an increase in



- TREES
- MIXED TREES & GRASSLAND
- GRASSLAND

0 2000 4000 5000 Feet

CONTOUR INTERVAL 50 FEET

N

eastern red cedar and a corresponding decrease in natural grasses and forbs on the uplands, reducing carrying capacity for foraging species. Furthermore, duff and litter are accumulating in the forested areas along the creek bottoms and fuel amounts are showing considerable increases. Additionally, members of the greenbriar family have grown up along stream borders until access to the water is extremely difficult in places. These apparent vegetational shifts may be the result of the policy to extinguish all fires, even though fire may have been a natural component of the ecosystem.

b. Fauna

Many faunal species are near the extremes of their ranges in the area. Also many ranges overlap, and this overlapping of species - northern and southern, eastern and western - comprises the ecologic attraction of the area.

Various species of shad, catfish, carp, shiner, bass, sunfish, bullhead, drum, carpsucker, gar, and crappie are common in the area's freshwater streams, ponds, and lakes. Gambusia (Gambusia affinis) is one of the few species found in the sulphur pools in Flower Park in Travertine District. Northern pike, a nonnative species, was introduced to the Arbuckle Lake in 1967, but has not been observed since 1975. Fish in the lake have direct access to the Rock Creek Corridor and Travertine Districts by stream.

More than 100 species of birds have been recorded here. Most common are the cardinal, bluejay, robin, and various species of sparrows and woodpeckers. Golden eagles (Aguila chrysetos) nest near Arbuckle Lake, but no nesting sites have been observed within the boundaries of Chickasaw National Recreation Area. A vulture (Cathartes aura) roost for 50 to 100 birds is located near the northern end of the Rock Creek arm of Arbuckle Lake. The wild turkey population is increasing.

Pronghorn (antelope) were once common to the area, but are not presently found closer than 100 miles to the west. Reintroduction potential is not known. Armadillo, opossum, short-tailed shrew, eastern mole, eastern cottontail rabbit, jackrabbit, fox squirrel, various mice and rats, gray fox, bobcat, raccoon, beaver, and various skunks are common. Flying squirrels are of particular interest, although seldom seen. Louisiana whitetail deer are present.

Poisonous snakes include the copperhead, diamondback rattlesnake, and water moccasin. Other reptiles and amphibians of the area include rough green snake, speckled king snake, hog-nosed snake, coachwhip, bull snake, black rat snake, eastern collared lizard, Texas horned lizard, ornate box turtle,

snapping turtle, three-toed box turtle, bull frog, leopard frog and narrow-mouthed salamander.

c. Threatened and Endangered Species

No species shown on the federal list of endangered species, Federal Register, Vol. 44, Number 12, Jan. 17, 1979, are known to occur in the area.

3. Soils and Topography

The Chickasaw National Recreation Area lies within the Arbuckle Uplift, on the northern edge. The NRA is a region of moderate topography, with rolling hills and a few steep bluffs in the northern portion, and, in the southern section, steep valley sides lining Arbuckle Reservoir with bluffs along lengthy sections, especially on the sides of the Rock Creek arm. In this southern section, the land is generally flatter on the interstream uplands. South of Arbuckle Reservoir is a significant, linear mountain, and it is at the natural water gap in this that Rock Creek has been dammed to flood its main channel and the Buckhorn Creek and Guy Sandy Creek tributaries.

Major soils in the area are: Denton clay loam, Denton stony loam, and Gilson gravelly loam.

Denton clay loam is the most important arable soil in the county. It is a fairly dark heavy prairie soil developed from limestone and interbedded calcareous shales. Denton clay loam, deep phase, has a gently rolling relief and is well drained. It is moderately fertile. This soil is susceptible to erosion because the fine granules of the dried surface soil are moved easily by running water. The principal areas of this soil occur in the Guy Sandy Creek basin, the western half of Rock Creek basin, and the northern portion of Buckhorn Creek basin.

Denton stony loam is somewhat similar to Denton clay loam, but is shallower and stonier than the clay loam. It is characterized by an abundance of limestone gravel and by broken relief. This soil occurs principally in the eastern part of Rock Creek sub-basin.

Gilson gravelly loam is light-colored forested soil developed from limestone conglomerate. The material is very loose, and erosion is severe on the unprotected cultivated soil. It is associated in most places with Gilson soil material (rough broken land), principally in the breaks of Guy Sandy Creek southwest of Sulphur. The relief is rolling or gently rolling.

4. Climate

Overall, Chickasaw National Recreation Area is in a warm continental climate. Annual rainfall averages 38 inches.

Humidity is variable, the monthly mean ranging from 46% to 80%. Rainfall is erratic in pattern, "adequate" 53% of the time, with droughts of severe to extreme intensity 11% of the time. Approximately 70% of the normal annual rainfall occurs during the growing season, April to October. April, May, and June are the wettest months.

Winter is the driest season (having implications for wildfire incidence), and is usually mild and of short duration, its storms dropping only a few inches of snow at a time and then melting within a few days. Average annual snowfall is about 5 inches, most of it falling in January and February. Freezing snows or rains coat the landscape and roads with thin ice occasionally; severe "northers" occur very infrequently. Winter storms are generally of low intensity, extend over large areas, and have several days' duration.

Major storms have occurred in the Rock Creek Basin during all seasons of the year, but most frequently during the months of May, June, September, and October. Thunderstorms having high intensity and short duration usually occur during spring and summer months; hail activity occurs.

The long, warm summers provide many hot days which are eased by the presence of relatively low humidity, prevailing southerly winds, and occasional rain showers or thunderstorms. However, drought conditions are greatly intensified when brisk, hot winds out of the southwest accompany high daytime temperatures. Cooling trends of autumn begin with the secondary maximums of precipitation that occur in September.

The mean annual freewater surface evaporation for the region is approximately 57.5 inches.

The 30-year mean annual temperature is 63°F, with January the coldest month; its mean is 40°F; July or August is the warmest month, with means of about 83°F. Temperature extremes recorded at Sulphur since 1892 have been -15°F to 120°F. The average date for the last killing frost is March 29 and the average date for the first killing frost is November 2, resulting in an annual growing season of 218 days.

The average surface wind speed is about 13 miles per hour. Less than 2 percent of the winds exceed 25 miles per hour and nearly 50 percent of the observations are reported as calm. The area is subject to tornadoes, and although rare, this action does produce destructive winds of over 100 miles per hour.

5. Air Quality

Because of the limited industrial development and generally rural character of the National Recreation Area, air quality is good overall. Hydrocarbons concentrate along the more heavily traveled roads, particularly U.S. Highway 177 through Travertine District, which carries 1,800 vehicles per day as an annual average.

E. History and Cultural Resources

The Chickasaw National Recreation Area is part of the general prehistoric cultural province of the Caddoan-speaking tribes of the Central and Southern plains. It is internally marginal to the localities of two moderately well-defined cultural entities--the Henrietta Focus and the Washita River Focus, both early village agriculturist groups. Sites representative of the Spiro Focus and the Fulton Aspect could also exist in the area. Any archaic sites that may be present would be expected to have Fourche Maline or Grove Focus affinities or perhaps the Edwards Plateau material of north-central Texas. There are no known paleo-Indian sites in the area. The suspected, tentative cultural sequence of the area is as follows:

Historic Tribes: Eighteenth Century to present, including the Caddoans, and such southeastern area imports (along the "Trail of Tears") as the Chickasaw.

Washita River and Henrietta Foci: From Ca. A.D. 1000 to 1450, or slightly later.

Archaic: Dates here could run from perhaps as early as 5-6,000 B.C. into the early centuries of the Christian era.

Paleo-Indian: Possibly 12,000 B.C. to 5-6,000 B.C.

An archeological reconnaissance by the University of Oklahoma in 1958-60 located 19 archeological sites within what was to become the Arbuckle Recreation Area (now essentially the Lake District). A later survey completed in 1964 located 34 more sites. Most of these sites were inundated as the reservoir filled with water after construction of the dam. Surface collections made during both surveys suggest that the region has been occupied over a considerable span of time, extending from archaic into historic. Test excavations made in 1968 at Antelope Springs in Travertine District failed to reveal any archeological features, even though a number of artifacts had been collected from that area earlier.

Indians are known to have frequented the region during early historic times. Legends tell that the streams near Sulphur were often dotted with tepees. The site of Fort Arbuckle lies 7 miles west of Davis; established in 1851, the fort was used in

connection with the frontier wars, but it is undeveloped for tourism today.

The story of settlement, and subsequent Indian efforts to protect the mineral springs from exploitation--which eventually led to the establishment of Platt National Park--are also of interest.

The NRA's mineral history, particularly that of mining the gilsonite pits for road paving materials, relates to both local geology and the economy.

No properties within the National Recreation Area are listed on the National Register of Historic Places, and none are eligible for such listing. Two properties are on the National Park Service List of Classified Structures:

The Leeper House (presently used as park administration office in Travertine District) was nominated to the Register, but was rejected by the State Historic Preservation Officer. The building was constructed in 1894 and has been used as a ranchhouse, community building, hardware store, and a schoolhouse until 1904 when it became the park administration building. One large room was added in 1934-35 by the Civilian Conservation Corps. The area listed totals 1.5 acres, and is just west of U.S. Highway 177 south of its Travertine Creek crossing.

The Lincoln Bridge is about $\frac{1}{4}$ -mile north of the Leeper House. It too was nominated to the Register, but was likewise rejected. This bridge dates from 1909 and features moderately fanciful rockwork with turret-like overlooks of the stream. Originally for a wagon road, it presently provides a pedestrian crossing north into Flower Park from a parking area just west of U.S. Highway 177. The area listed includes the lands within a 150-foot radius of the bridge, totaling approximately two acres.

Lowrence Springs is a site 4 miles southeast of Sulphur, $\frac{1}{2}$ -mile east of U.S. Highway 177 (see map "Existing Conditions Lake District/Rock Creek Corridor"), that is listed on the National Register of Historic Places (entered March 10, 1975). This is not inside the Chickasaw National Recreation Area, but is mentioned here as a peripheral feature. This site represents the location of an important late prehistoric/early historic base camp for such native people as the Caddo, Wichita, and perhaps the Apache and Comanche, from which they hunted buffalo. The site thus provides data that supports the observations as to natives inhabiting and using this segment of the ecotone between the Southern Plains and Eastern Woodlands. Archeological test work conducted here in 1969 confirmed the presence of structures and other archeological features relating to the late prehistoric habitation of this camp.

F. Visitors and Socioeconomic Environment

1. Regional Economy

Compared with the State of Oklahoma and the nation, Chickasaw National Recreation Area lies within a relatively depressed economic area. The regional economy is based upon light manufacturing, service industries, hospital institutions, agriculture, and oil/gas production. Tourism is an important source of income. Livestock production and dairy farming contribute the bulk of Murray County's agricultural income--56 and 34 percent, respectively. Poultry production is now significant, and gaining.

Several hundred recreational homes are located around Arbuckle Lake (outside the recreation area), with more sites being developed including a mobile home development near Buckhorn. This may increase "local" demand for boating. Motels, restaurants, automobile service stations and garages, and boating and fishing supply stores are also present in Sulphur and along some access roads. A commercial travel trailer campground has operated near Sulphur along the road to The Point, and may do so again.

Murray County is rich in mineral resources. Plentiful supplies of dimension stone and crushed limestone, dolomite, granite, and sandstone are quarried in the Arbuckle Mountains near Davis and Dougherty. South of Sulphur, asphalt limestone and sandstone deposits (known locally as gilsonite) were used from 1890 until the 1940s for road construction. Glass sand is also present.

One producing oilfield is located only 2 miles west of the recreation area. Three exploratory wells were drilled within the recreation area. One was on the north end of the Rock Creek arm of the lake and another about 0.5 mile west of the dam overlook, and the third on the west side of the upper Guy Sandy Creek arm. Each of these have been abandoned but the results of the exploratory drilling are not available.

Principal oil and natural gas fields lie near the recreation area boundaries and to the east of Davis.

Several sand and gravel pits are operated along nearby rivers and streams. High-grade glass silica is mined near Sulphur. Calcium-carbonate deposits are being mined for fertilizer.

Low-grade deposits of zinc exist, but they are relatively insignificant. Brown iron ore which may be of commercial value is found scattered in the limestone of the Arbuckles.

Mineral development is not allowed on federally owned lands within the national recreation area except in those

cases where all the mineral rights were not purchased. (These lands are located in the Lake District.)

2. Regional Demographics

Chickasaw National Recreation Area lies in central Murray County. The 1970 demographic characteristics of the county, compared with those of the State of Oklahoma and of the Nation, indicate a relatively depressed socioeconomic environment.

Population Characteristics of Murray County, Oklahoma and the United States

	<u>Murray County</u>	<u>State of Oklahoma</u>	<u>United States</u>
Total population, 1970	10,669	2,559,229	203,210,158
Pct. change. 1960-1970	0.4%	9.9%	12.2%
Median age	38.5	29.9	28.1
Median school years completed (persons over 24)	10.6	12.1	12.1
Median family income	\$6,167	\$7,725	\$9,590

The ethnic composition of Murray County's population is predominantly white. Of the 10,669 residents counted in 1970, 9,992 were of the white race. There were 189 residents of the Negro race, 470 residents of the Indian race, and 18 residents of all other races. Thus, although a distinct minority, Indian residents are the second most populous group, a fact to keep in mind with respect to the recreation area's name and featured portions of the interpretive theme.

Numbers of persons employed, August 1970, Murray County

Civilian labor force		3,640
Unemployed	(7.1 percent)	260
Total employment		3,380
Nonagricultural		2,730
Wholesale and retail trade		410
Government and schools		830
Products and service industries		1,100
Domestic		390
Agriculture		650

More than 5.5 million people live within a 200 mile radius of the recreation area--a feasible distance for weekend recreational use. Interstate Highway 35 passes within 11 miles west of the national recreation area, as it runs north-south between Oklahoma City and Dallas/Fort Worth. U.S. Highway 70, a major east-west traffic corridor, lies 30 miles south, U.S. Highway 7, being converted to four-lanes, lies at the north boundary.

Regional urban populations increased significantly during the 1960s in the larger centers of the region while populations in the smaller centers remained relatively stable.

<u>City or standard metropolitan statistical area (SMSA)</u>	<u>1970 population</u>	<u>Percent of change from 1960 census</u>
Ada, OK	14,859	+ 3.6
Ardmore, OK	20,881	+ 3.5
Dallas, TX SMSA	1,555,950	+ 39.0
Davis, OK	2,223	not available
Fort Worth, TX SMSA	762,086	+ 32.9
Oklahoma City, OK SMSA	640,889	+ 25.2
Sulphur, OK	5,158	+ 8.9

3. Visitor Use

Use of the recreation area is primarily as a weekend outing for local and regional residents, rather than a common destination for out-of-state tourists. Thus the visitation probably represents a smaller number of people making multiple visits over the year's time. Some out-of-state visitors do use the recreation area, usually as an intermediate stop on the way to other destinations. Surveys indicate that of the out-of-state visitors, the majority originate in adjacent states of Texas, Arkansas, Colorado, Kansas, Missouri, and New Mexico rather than more distant ones. Summer use on Saturdays, peaks to one and one-half times that of a weekday; on Sundays it peaks to twice that of a weekday. Holiday periods (such as the Fourth of July) may experience visitation four times that of a normal summer weekday.

Figures for visitor use are shown in the following table, revealing a recent decline of use in the Travertine District, for which there is only conjecture as to the causes. These guesses include improvements in recreational facilities elsewhere in the region, internal road-paving projects, deteriorating visitor experiences due to diminished water flow, pollution, and extremely hot summer weather. Over a 22-day span during the summer of 1978, 18 days were over 100°F, and there also were 24 consecutive days with maximum temperatures between 99°F and 105°F.

Visitor Use Statistics for Chickasaw National Recreation Area (rounded)

<u>Recreation Visits</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>
Travertine District Lake District	2,137,000 414,000	2,028,000 329,000	1,694,000 359,000	1,750,000 318,000	1,653,000 373,000	1,602,000 423,000	1,361,000 523,000	681,000 464,000
Combined Statistics for Both Districts	2,551,000	2,357,000	2,053,000	2,068,000	2,026,000	2,025,000	1,884,000	1,145,000
<u>Campers</u>								
Travertine District Lake District	171,000 71,000	163,000 79,000	80,000 63,000	87,000 60,000	75,000 60,000	76,000 58,000	61,000 55,000	45,000 46,000
Combined Statistics for Both Districts	242,000	242,000	143,000	147,000	135,000	133,000	115,000	91,000
<u>Boats (Lake District)</u>								
.....Statistics not available.....					23,000	23,000	23,400	25,000
Goddard Youth Camp (Lake District)	"	"	"			4,940	5,160	5,290

Major visitor activities at Travertine include auto touring, picnicking, camping, nature study, walking, wading, limited fishing, photography, attending nature center programs, partaking of mineral spring water, and attending family reunions. There is heavy spring and fall use by environmental education school groups at the Travertine Nature Center.

Lake District provides camping, limited hiking, picnicking, swimming, boating, fishing, hunting, sailing, water skiing, and sunbathing.

Monthly visitation counts indicate that 70 to 80 percent of annual visits occur during April through September. The family group, particularly in "reunion" gatherings, is common in the Travertine District, usually picnicking.

In the years 1973 to 1977, camping fluctuated without trend in both areas, and approximately 8 percent of the total number of visitors have been campers.

U.S. Highway 177, an important through highway in the region, passes directly through the Travertine District. Use has been comparatively constant in recent years, at an average of 1,800 vehicles per day; of that total 8% are heavy trucks (with two or more dual-wheeled axles).

G. Probable Future Environment Without the Proposal

Chickasaw National Recreation Area would continue to operate as is without the general management plan. Travertine District would continue to be a place for picnicking and camping and Arbuckle Lake would continue to attract and serve campers and boaters. However, there would not be opportunity for biking and hiking through the corridor connecting these two areas. Without a resources management program, the opportunity to determine methods of arresting and perhaps reversing degradation of water quality and quantity and of vegetative changes would be lost. Travertine and Rock Creeks, for instance, would remain polluted. Lack of visitor use management and maintenance facilities at Arbuckle Lake would preclude effective establishment of a carrying capacity. Campground management would remain inefficient at Guy Sandy and The Point, yet at Buckhorn sites now subject to erosion would continue in use. Visitor orientation could not occur and interpretation would be relatively ineffective without the visitor center near Sulphur; likewise park staff would remain crowded in present disjunct office areas. Travertine Nature Center would remain subject to periodic flooding.

ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

III. THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

A. Impacts on Hydrology

1. Surface Water

Siltation will occur from construction activities due to exposure of soil to erosion. Should intense storms occur during construction, siltation will correspondingly increase. The following land areas will be affected in varying degrees by construction, and thus potentially contribute sediment to area streams and lakes:

<u>Area</u>	<u>Action Proposed</u>	<u>Area Involved (total 30.25 acres)</u>
Travertine Nature Center	construct overflow channel	(250' x 12') .07 acres
Visitor Center/ Headquarters	construct, replacing existing structures	.09 acres
Parking Area for Above	construct, replacing existing structures and parking	.33 acres
Bicycle/Hiking Trail, East Side of Rock Creek	construct, using existing vehicle tracks where present	(9.5 miles x 10') 11.51 acres
Hiking Trail, West Side of Rock Creek	construct, using existing vehicle tracks where present	(6.5 miles x 2.5') 1.97 acres
Buckhorn Campground, Loop E	delete 27 campsties	2.7 acres
Buckhorn Ranger Station	construct, replacing existing trailer	.013 acres
Buckhorn Employee Residence	construct, replacing existing trailer	.053 acres
Buckhorn Maintenance Area	construct, replacing existing facility	.041 acres
Buckhorn Boatshed	construct adjacent to present dock	.018 acres
The Point Campground	construct 48 sites in existing campground	6.86 acres
The Point Fishing Dock	construct new	(60' x 6') .008 acres
The Point Ranger Station	construct, replacing existing trailer	.013 acres
The Point Employee Residence	construct, replacing existing trailer	.053 acres
The Point Maintenance Area	construct, replacing existing facility	.041 acres
The Point Boat House	construct adjacent to present dock	.018 acres

Guy Sandy Campground	construct 11 new sites	1.57 acres
Guy Sandy Fishing Dock	construct new	(60' x 6')
		.008 acres
Guy Sandy Ranger Station	construct on new site	.013 acres
Guy Sandy Employee Residence	construct on new site	.053 acres
Guy Sandy Maintenance Area	construct on new site	.041 acres
Guy Sandy Sewer System	construct new system tanks + lines	.17 acres
Guy Sandy Arm Hunter Access Roads with Parking	construct on present tracks where possible parking - roadway -	.41 acres (2.5 miles x 14') 4.2 acres

The possibility for increased siltation will continue following construction wherever areas are covered by impervious surfaces and runoff is channeled into surface watercourses. There would also be a loss of opportunity for rainfall to infiltrate the soil under such areas.

2. Ground Water

Capping of the Vendome artesian well to allow its regulation will conserve the ground water reservoir to the extent flow is reduced. Similar effects might result should the suggestion be followed by the City of Sulphur that it investigate the feasibility of capping the wells in its field as well as other flowing wells in the vicinity. Reducing flow volumes would of course reduce stream flows in the immediate area of the artesian wells. Should it be shown that reduction of flow from artesian wells will increase ground water levels, the hope that increases in springflow in the area might result would be closer to realization.

Water in Travertine Creek may become less contaminated should its flow volume increase as a result of increases in Buffalo and Antelope Springs in response to the ground water management program. This is because the pollution now builds up mainly from human use of the surface stream, which flows too slowly to disperse the contaminating bacteria.

A drop in contamination contributed by Travertine Creek would similarly reduce pollution in Rock Creek downstream from their junction. However, as Rock Creek receives most of its contaminants from sources upstream and beyond the park's boundaries, it will remain polluted until success is realized regionally in eliminating contributing practices. Likewise, the quality of water in Arbuckle Lake will remain as is until regional

practices are followed outside the park area that restrict the contribution of pollutants.

All park generated sewage will be treated at the City of Sulphur's plant and the treated effluent exported from the watershed.

Other than increased siltation, primarily during construction activities, this plan is not expected to have increased adverse effects on surface or ground water.

B. Impacts on Biologic Resources

Construction of the new and replacement facilities that are listed under the previous heading will result in the removal of vegetation from a total of 19.05 acres (of the total 30.25 involved acres), distributed as listed on the referenced chart. This loss of vegetation will result in a corresponding loss of wildlife, which was dependent on this habitat. In addition, alteration but not destruction of present biologic patterns will occur in the Travertine Creek overflow channel (12 feet wide by 250 feet long - .07 acres) and in campground areas where sites are to be added (The Point - 6.86 acres and Guy Sandy - 1.57 acres). Continuing impacts will occur in these campgrounds due to increased visitor use. Decreased use in Buckhorn Campground Loop E will allow some vegetative regeneration (on 2.7 acres). Likewise, once the sewer system at Guy Sandy is constructed, vegetative regeneration will take place on the surface (approximately .17 acres).

The trails along both sides of Rock Creek will introduce a continuing disturbance to animal behavior patterns from the increased number of humans in this area; the trail itself may alter some of the species travel patterns and hunting/escaping opportunities.

Transfer of primary responsibility for game management (under cooperative agreements with the state), to the National Park Service will result in a more natural composition of species and mosaics. For instance, as the planting of crops to encourage certain game species is gradually phased out, the animals favored by those crops will also decline. Other animals more attuned to the natural environment will replace them.

Implementation of a resources management program on the lands of the recreation area may, depending how it is formulated following research, eventually alter species mosaics over major areas. However, as the goals of any such program must conform to national policies of the NPS, the end result will be to move the biologic environment into a more nearly natural state. Because no endangered or threatened species are known in the area, such adjustments in the biologic regime will not affect them.

Because of the area's environmental factors, such as length of growing season, reasonably productive soils, warm climate, and sufficient rainfall, understory grasses and forbs where disturbed but not totally displaced should restore to a relatively stable condition within 2 to 5 years. Shrubs and trees damaged or destroyed will recover in 5 to 7 years for shrubs and as long as 35 to 40 years for trees.

C. Impacts on Soils and Topography

Construction of the new and replacement facilities that are listed under the heading "Impacts on Hydrology" of this section will result in exposing the soils in those areas to erosion during the construction period. Should intense storms occur at such times, erosion would correspondingly increase. Following construction the majority (19.05 acres out of the total 30.25 involved) of these soils would be covered by impervious surfaces, having the result of concentrating runoff from rainfall and thus increasing erosion where diverted into streams. Opportunities for infiltration of rainfall into the ground would also be lost or greatly diminished in the acreage so covered. Soils now eroding in Buckhorn Campground Loop E--where 27 campsites will be deleted--would be more likely to stabilize as vegetation reestablishes itself (or is reestablished, if necessary).

Imposition of a carrying capacity of 600 boats on Arbuckle Lake will limit shoreline erosion from wakes to roughly present levels.

Locally, there will be changes in topography. These will occur wherever non-level sites are graded to accept structures, roads, trails, and the Travertine Creek overflow channel, and thus includes all the development elements in the above list except for the visitor center and its parking, (which are now on a level site) and the boat sheds and fishing docks. In no case, however, will the topographic modification extend beyond the immediate site vicinity or road/trailside. New cuts and fills of over 3 feet height or depth are not envisioned, except for the Guy Sandy sewer system, and these will be restored to grade as part of the project.

D. Impacts on Air Quality

Overall, none. The proposal provides for a continuation of present use levels. In areas where new facilities are proposed, they will not involve introduction of engines. In the Lake District, there will be a minor shift in engine emissions toward The Point and Guy Sandy areas (where expansions in facilities are proposed) and away from Buckhorn (where decreases are proposed).

Temporary construction-related impacts on air quality will occur.

E. Impacts on Cultural Resources

None, unless encountered during construction, in which case the structures would be relocated or the artifacts salvaged as determined by a qualified archeologist (see Chapter IV, Mitigating Measures).

The two locally significant historic structures--the Leeper House and Lincoln Bridge--are slated for continuing adaptive use.

F. Impacts on Regional Socioeconomy

Construction of the facilities listed under the first section of this chapter will require investments for labor and materials and at least some of the construction outlays will thus enter regional economic cycles. Staffing the proposed visitor center and expanded patrol functions due to the new trails will generate continuing opportunities for employment in the park, although positions for these functions will be mainly in the form of seasonal employment. Only a few such jobs are likely to be generated, possibly seven.

There will also be new resources management positions, a total of three permanent and four seasonal is expected at full plan implementation.

The visitor center/headquarters adjacent to the town of Sulphur will provide a focus for regional tourism and introduce a visitor activity close to an existing business district, possibly generating increased sales of tourist-related items and meals. More definite prediction of such an increase is not warranted, however, as it is not proposed to increase the total number of visitors over 1973 to 1977 levels, just to redirect an aspect of their circulation pattern.

Similarly, the new bicycling and hiking trails may generate slightly expanded commercial opportunities in the region outside the park.

A shift in development of Arbuckle Lake, with reduction at Buckhorn and expansion at The Point and Guy Sandy may provide a corresponding shift in business opportunities on the access routes to these three developed areas. The decision not to provide services for gasoline, meals, marinas, campground hookups, and the like inside the recreation area may induce local businesses to meet, outside the recreation area, any demands for such services.

Long-term, the most important proposal element to the regional economy may be the implementation of resources management research and the development of programs based thereon. This is because of the possible causative correlation between past resource changes and reductions in visitor demand as

measured by park visitation drops. If such is the case, then reversal of such resource changes could induce visitation increases to the former level. If just the visitation drop in 1978 alone could be restored, for instance, it would replace 800,000 park visitors on access routes and in the area's motels, restaurants, service stations, and stores.

It is far too early to predict the effects and cost-benefit relationships of conserving the ground water resource and reducing surface pollutants compared to continuing the apparent consumptive-use practices of today.

G. Impacts on Visitor Use

Once again, the reader is referred to the list of construction projects in the first section of this chapter. In an overall sense for the recreation area, the proposal will produce no significant change in park use. It is planned to continue accommodating recently existing use levels of about 2 million per year. There will, however, be a more effective and easier-to-use program of interpretation/information in the Travertine District as a result of the new visitor center. The proposed bicycle/ hiking trail on the east side of Rock Creek will allow a new use in an area not formerly available, accommodating some 124 people at one time, while the hiking trail on the west side of the Creek will provide a longer hiking opportunity than now available in the park and in an area not presently used (accommodating some 191 people at one time).

Camping opportunities will be decreased at the Buckhorn developed area by 27 sites, with the remainder, however, providing a less crowded camping condition, (dropping from 17 sites per acre density to 10 sites per acre) with a more stable campground soil and biological environment, a situation preferred by most campers. At The Point there will be 48 additional sites to provide more camping opportunities here. However, density will increase from 2.4 sites per acre to 5 sites per acre, thus crowding campers more but still well within the assumed "optimum" standard of 7 sites per acre. At Guy Sandy there will be 11 additional sites, an increase from 6 sites per acre to 8 sites per acre with corresponding increase in camper density. The total change in campsites is to increase by 32. This will be accompanied by a shift to distribute use more evenly around the lakeshore among the three developed areas.

Implementation of a carrying capacity on boating use on the lake will likewise produce little change in visitor use, as the present launching capacity has approximately held the boating use to the proposed carrying capacity.

The carrying capacity proposed for the hunting area is in line with present use patterns of this area.

Once again, the effects of the resources mangement proposals on visitor use are uncertain as they involve primarily research at the outset and program formulation based on findings. Should it be possible, however, to improve water quality and increase quantity of flow in area springs, streams, and lakes, it is possible that visitors will find the area more attractive and hence visitation levels will rise to former levels.

MITIGATING MEASURES

IV. MITIGATING MEASURES INCLUDED IN THE PROPOSED ACTION

Construction contracts will be written to include environmental safeguards with respect to erosion, siltation, air quality, and prevention of damage to peripheral biological resources; supervision will enforce compliance. Where runoff from new impervious surfaces is returned to water courses, appropriate devices, such as water bars or check dams, will be installed to break up flows and preclude erosion. Important wildlife areas or natural scenes along the proposed trails will be preserved by appropriate routing during design. Vegetated areas disturbed during construction, by grading or cuts and fills, that are likely to take excessively long to regenerate will be encouraged by planting and watering as appropriate. The overflow channel built to bypass Travertine Nature Center will be landscaped and planted to minimize its visual alteration. User surveys and resource inspections will be done to better determine use patterns at various visitor levels, allowing refinement of capacity assumptions that have been made.

All actions proposed in this plan will comply with the procedures of the Advisory Council on Historic Preservation (36 CFR, Part 800), National Park Service Management Policies, and National Park Service historic preservation policies and procedures.

Prior to the decision to implement any provisions of the plan, an overview of the prehistory and history of the project area will be prepared by appropriate professionals. An intensive archaeological survey as required by Executive Order 11593 has been programmed, but it is unlikely that funds will be appropriated in the near future. All specific project areas will be physically surveyed for archaeological and historical remains by appropriate professionals, before any construction or development, in accordance with Executive Order 11593. A historic studies plan, and if necessary, a historic resource study, will be prepared in compliance with National Park Service Activity Standards. The regional office will prepare these studies or arrange for their execution prior to the final approval of the plan. The state historic preservation officer will be contacted to determine if he has any data regarding historical or archaeological resources within the area. Should any unknown cultural resources be located, these resources will be evaluated in terms of the National Register criteria by the appropriate professionals and if they meet, or may meet the criteria, the professionals will recommend to the regional director that he nominate them to the National Register and place them on the National Park Service List of Classified Structures.

In complying with the provisions of the Advisory Council procedures (36 CFR Part 800), the regional director is the responsible federal agency official but he will consult with the state historic preservation officer concerning the National Register

eligibility of any historical or archaeological remains discovered, as well as consulting with them regarding the effect or potential effect of proposal of the plan. The Advisory Council on Historic Preservation will be consulted in accordance with the procedures of 36 CFR Part 800 (see Appendix).

All activities or developments proposed will be in accord with established National Park Service historic preservation policies. The demolition of any structures, whether historic or not, must be made in accordance with the prescribed procedures.

Should archaeological material be encountered during construction, work will be halted until the material can be evaluated by a professional archaeologist. If the site or material is of significance to qualify for the National Register, it will be nominated and the Advisory Council will be given an opportunity to comment on the effects of the project on these archaeological resources. Salvage excavations will be conducted only if there is no prudent and feasible alternative to the location of facilities and only after consultation with the Advisory Council.

In addition, the contractor shall be made responsible to immediately halt construction activities and notify the contracting officer or archaeologist in the event that historical, archaeological, or paleontological resources are discovered during the course of such construction. The contractor shall be briefed specifically on these provisions by the contracting officer prior to the start of construction. All contracts shall reflect these provisions.

In general, if the National Park Service designs and implements the provisions of this plan, it will be done in such a manner that there will be no adverse effect upon the quality of the cultural resources which qualify, or may qualify, such resources for entry onto the National Register of Historic Places.

Specifically, the National Park Service proposes to design and implement all provisions of this plan in such a manner that the following impacts will be avoided or satisfactorily mitigated in accordance with 36 CFR Part 800:

- 1) destruction or alteration of all or part of a cultural property
- 2) isolation from or alteration of the surrounding environment of the cultural resources
- 3) introduction of visual, audible, or atmospheric elements that are out of character with the cultural property or its setting

- 4) transfer or sale of a federally owned property without adequate conditions or restrictions regarding preservation, maintenance, or use
- 5) neglect of a property through inadequate maintenance which might result in the deterioration or destruction of a cultural property

ANY ADVERSE EFFECTS WHICH CANNOT BE AVOIDED

V. ANY ADVERSE EFFECTS THAT CANNOT BE AVOIDED
SHOULD THE PROPOSAL BE IMPLEMENTED

The list of construction projects shown under the first section, Impacts on Hydrology, in Chapter III is referenced here to indicate the magnitude of each individual project. In sum, these construction activities will cover 19.05 acres of soil with impervious surfaces, totally converting the biological resources thereon. In addition, there will be 8.43 acres converted to camping use, with partial impacts to plants and animals due to installation of camp tables and fire grates, and to subsequent increases in visitor use locally. Also, the landscaped stream overflow channel will modify .07 acre. Animal behavior patterns will be altered by new trails. Local modifications of topographic landform--on a scale of 3 feet vertically--will occur.

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

VI. THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Overall, the effect of this plan will be to initiate means to arrest and perhaps eventually even to reverse declining resource/visitor experience situations and thereby produce sustained long-term enjoyment. For instance, should research adequately establish an adverse relationship between groundwater withdrawals and spring/stream flows, it would be appropriate to reduce such withdrawals and thereby restore and/or sustain for the long-term the natural habitats and visitor enjoyment that the flowing waters provide. Such a program would of course eliminate the inexpensive source of water presently obtained from the flowing artesian wells--but use of such water is short-term if it occurs at a rate faster than the groundwater can be recharged through natural infiltration of rainwater. Similar situations occur with respect to regional water pollution. Short-term, it may be more convenient not to control uses of lands along regional streams; yet long-term the pollution of Rock Creek for park visitors and the eutrophication of Arbuckle Lake will be a major loss. Determination of appropriate floral/faunal mosaics and management to reestablish them is a less dramatic but similar example of providing long-term environmental health to the recreational area. The resources management program will have opportunities--some better than others--to realize such long-term improvements.

In areas of development, new facilities will cause construction-related impacts to vegetation and animal life as well as some topographic changes. The impacts will be greatest during actual construction, but many will be long-term in that the changes will last as long as the development is needed and after that until it might disappear through deliberate or natural processes. However, the benefits in terms of improved visitor experiences associated with use of these facilities will also be of the same long-term character, lasting as long as the facilities are operated.

ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS

VII. ANY IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES THAT WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Soils, plants, and animals occurring in construction areas would be lost until such time as the developments were no longer needed and were either obliterated or reclaimed by the environment. Topographic modifications would likewise be permanent until regraded by man or eroded by the elements.

ALTERNATIVES TO THE PROPOSED ACTION

VIII. ALTERNATIVES TO THE PROPOSED ACTION

The scope of alternatives considered in the present planning effort have primarily involved aspects of development. This is so because of the recency of legislation defining the purposes and boundary of the recreation area and because the resources management program will go into a research phase at its outset. Two alternatives relating to area capacity and three relating to development options were considered, respectively as follows:

A. Alternatives Relating to Area-wide Capacity

1. No Action

Description of Alternative

In this, the park would continue to operate as at present, as described in Chapter II, Description of the Environment. However, there would be no new construction, efforts at resources management would not occur, and existing maintenance activities and visitor use capacities would be unchanged.

Impacts on Hydrology

The park would not catalyze research into methods to improve waters flowing into the park. Present water management practices outside the park's boundary and control, would remain unchanged, resulting in continued declines in water quality and flow quantity of the area's springs and streams. Restrictions on stream use would continue. Arbuckle Lake would continue to be eutrophied, and may become increasingly so.

Impacts on Biologic Resources

Present vegetational succession would continue in its random course to an uncertain destiny. Fuel build-up would also continue, increasing any effect that might accrue from wildfire. Changes in animal populations would continue, with some species possibly losing their ecologic niches altogether. Further declines in water quality/quantity would change the compositions of aquatic species--including game fishes--in area waters.

Impacts on Soils and Topography

Presently eroding campground areas at Buckhorn would continue in use and continue to erode.

Impacts on Air Quality

No added impacts.

Impacts on Cultural Resources

No impacts.

Impacts on Regional Socioeconomy

Continued declines in resource attractiveness--to the extent such declines have discouraged visits--could cause even greater drops in park use, further reducing potential tourist spending around the recreation area.

Impacts on Visitor Use

Assuming that people will not resume visiting the area at former use levels until area attractions are improved, there will be some 1,000,000 fewer visitors per year to enjoy the area, or more if resources deteriorate further. Possibly even those who come will enjoy their visits less under a No Action alternative.

2. Increase Facility Capacity to Terrain Capacity

Description of Proposal

This would involve adding facilities wherever terrain is available to place them--mainly in the form of picnic areas, marinas, parking lots, and campgrounds. Conceivably, there is enough terrain in the Arbuckle Lake area to perhaps double present development levels.

Impacts on Hydrology

Water consumption would increase and there would be correspondingly less volume available for flow in springs/streams. Restoring adequate water volume and quality would thus become substantially less likely and pollution would probably increase. Siltation would occur during construction and from erosion due to concentration of runoff from rainwater falling on pavement.

Impacts on Biologic Resources

Expanded facilities would increase the acreage covered by pavement, roofs, and impacted by the increased number of footfalls the new opportunities would generate.

Impacts on Soils and Topography

Much the same as Impacts on Biologic Resources.

Impacts on Air Quality

The tendency would be to increase the pollution of the atmosphere, but a significant impact would be unlikely.

Impacts on Cultural Resources

None, unless encountered during construction, in which case the facility would be relocated or the artifacts salvaged as determined by a qualified archeologist.

Impacts on Regional Socioeconomy

Normally, added tourist capacity would generate increased regional tourist spending. However, adding campgrounds in the park, for instance, would compete with those offered by

private enterprise, and might render the latter unprofitable. Too, should facility capacity increases generate use beyond the resource carrying capacity, further decline in quality of visit could result and thus discourage use. If the park was the only regional tourist area, visitors would more likely tolerate overcrowding and resource deterioration; as this is not the case, the visitors would have the option of going elsewhere.

Impacts on Visitor Use

More visitors could be accommodated, but the opportunity for varying densities of use and of maintaining more nearly natural sections of the area would be substantially diminished, thus shifting area values away from more traditional park uses to those of a more intense recreational character.

B. Alternatives Relating to Site-Specific Development Options

1. Develop Bicycle Trail From Travertine District to the Point

Description of Alternative

In this alternative, a bicycle trail 8 feet wide and 10 miles long would be constructed along the western side of the Rock Creek Corridor from the Bromide area to The Point.

Impacts on Hydrology

Some siltation would occur during construction.

Impacts on Biologic Resources

Vegetation and dependent animal species would be removed from a corridor 10 feet wide over the length of 10 miles.

Impacts on Soils and Topography

A corridor of soil 8 feet wide and 10 miles long would be covered with pavement. Accelerated erosion would occur locally where rainwater is diverted from the pavement to stream courses, although this would be partly mitigated in design. There would be cuts and fills on the landscape as a result of the trail.

Impacts on Air Quality

None, except temporarily due to construction equipment.

Impacts on Cultural Resources

None, unless encountered during construction, in which case the trail would be relocated or the artifacts salvaged as determined by a qualified archeologist.

Impacts on Regional Socioeconomy

This additional visitor opportunity for bicycling would attract a minor increase in park visitors, who would increase potential tourism spending in the region proportionately.

Impacts on Visitor Use

An additional bicycle trail would be available to visitors inclined to this use; however, some remote wildland areas would no longer be available to other visitors.

2. Relocate U.S. Highway 177 and Redesign Circulation in Travertine District

Description of Alternative

The through-highway U.S. 177 carries non-park traffic into the heart of the Travertine District, interjecting commuter traffic as well as many heavy trucks into the visitor circulation system. Design options have been studied in the past involving relocating the highway onto an overpass above the District or routing around the eastern end. NPS and Oklahoma Department of Transportation have in the past worked closely to resolve this problem. However, neither agency has active plans at the present time, primarily because of the large funding it would require in competition with other even more pressing projects.

Impacts on Hydrology

Should the highway be relocated onto an overpass, the potential exists for the structure's supports and fills to load the ground in such ways that underwater flow to springs is affected. Design would avoid any impacts on surface springs or streams. Should the highway be rerouted around the area's eastern end, and yet stay within the Travertine Creek watershed, some pollutants would be added to the stream at a higher point than they are at present (the present highway crosses the watershed near its downstream end). Construction activities could generate siltation.

Impacts on Biologic Resources

Should the highway be relocated onto an overpass, the sites of its supports and approaches would destroy the plants and displace the animals underneath. The magnitude of such would be uncertain until a design of the structure was available. There would also be a decline in vegetative vigor, thus supporting less animal life, in the area shaded by the structure. Again, the magnitude of such effect is uncertain because design is still in the future; however, the overpass has not been considered to be wider than 4 lanes (say 60 feet wide) and the entire length of the possible road corridor through the District is 1,300 feet, thus covering a maximum area of 2 acres. There would also be impacts of road relocation on the approaches, of course, but these would be outside the park. Somewhat greater acreages would be impacted if the road were relocated around the eastern end of the District, because the route would be longer, but again, these are outside the park. Animals would be disturbed during construction activities.

Impacts on Soils and Topography

Much the same, in terms of area, as the Impacts on Biologic Resources. Some erosion would occur during construction.

Impacts on Air Quality

None, except during construction.

Impacts on Cultural Resources

None, unless encountered during pre-construction inspections, or construction, in which cases the roadway or structure would be relocated or the artifacts salvaged as determined by a qualified archeologist.

Impacts on Regional Socioeconomy

Relocation of through traffic would improve the quality of park motoring, thus helping assure the viability of the park itself and its successful role in drawing and holding tourists in the area. The through traffic itself would be rendered more efficient and less subject to in-park delays. In order to finance the relocation, it might be necessary to forego another project in the regional highway system.

Impacts on Visitor Use

Traffic congestion at the intersections with U.S. Highway 177 would be eliminated and the pleasure of auto touring and a visit to the Travertine District itself would be increased. The overpass would generate added noise in Cold Springs Campground, and a visual intrusion in the park that would be visible from places nearby as well as distant overlooks. Relocation would also cause a restudy of in-park circulation, with the possibility of designating some roads as one-way for motor nature trail and bicycle use. It would also allow a redetermination of the feasibility of charging entrance fees to the park, which, if introduced, could reduce the number of casual visits.

3. No Visitor Center

Description of Alternative

There would be no visitor center for the park. Instead, visitors would either journey to the Travertine Nature Center, well into the park rather than near the entrance and serving a different purpose, or to the park headquarters, which is too small a building for the purpose.

Impacts on Hydrology

None

Impacts on Biologic Resources

None

Impacts on Soils and Topography

None

Impacts on Air Quality

None

Impacts on Cultural Resources

None

Impacts on Regional Socioeconomy

Any stimulation to the local economy the construction itself might have provided would be foregone. Also, the environment of the existing site would continue to lack vitality of appearance. Tourism within the region would not receive any stimulus.

Impacts on Visitor Use

Visitors would remain with inconvenient orientation or interpretation to the park, and thus continue to miss many of its meanings, program opportunities, and even some of its facilities. In particular, interpretation of the Chickasaw culture and local history would not be presented.

CONSULTATION AND COORDINATION

IX. CONSULTATION AND COORDINATION WITH OTHERS

A. Consultation and Coordination in the Development of the Proposal and in the Preparation of the Draft Environmental Statement

In early 1965, the National Park Service initiated a recreation study of the entire Arbuckle uplift area, searching for a significant resource to meet both the growing needs of a rapidly urbanizing region and the established criteria for national parklands. A report resulted in November 1965 and was widely distributed throughout Oklahoma. Proposals included incorporation of existing state parks into a national recreation area, highway development, etc. In general, response was not favorable to all the proposals contained in this report. A study for a combined Platt National Park/Arbuckle Recreation Area, based upon alternatives outlined in the 1965 report, was initiated by the National Park Service in September 1968. Following a limited regional distribution of a working draft of the proposed plan, a public hearing was held at Platt in October 1970. The plan was then revised to reflect concerns both voiced at the hearing and transmitted by letter. Subsequently, a variety of boundary configurations, acreages, land purchases, access and circulation systems, highway development, campground expansions, visitor center concepts, and trail developments were considered. One alternative included over \$33 million in development. This process was superceded by legislation in 1976. The present plan has been prepared in response to the more conservative mandate contained in this legislation (in particular limiting development not to exceed \$4,567,000).

The following agencies or individuals were consulted during the development of the Chickasaw National Recreation Area proposal:

Board of Supervisors, Murray County
Soil Conservation District
State Director, Oklahoma Division of Tourism and
Information
Board of County Commissioners, Murray County
Office of the Mayor, Sulphur, Oklahoma
Office of Community Affairs and Planning
State Grant-in-Aid Clearinghouse
Southern Oklahoma Development Association
Public Health Service, Santa Fe, New Mexico

B. Coordination in the Review of the Draft Environmental Statement
Availability of the draft environmental statement was published in the November 13, 1979 Federal Register: Copies were sent to and comments requested from the following, those starred (*) commented and are appended:

Federal Agencies

Advisory Council on Historic Preservation

Department of Agriculture

*Soil Conservation Service

Forest Service

Department of Defense

Army Corps of Engineers

*Department of Housing and Urban Development

Department of the Interior

Bureau of Indian Affairs

*Bureau of Land Management

*Bureau of Mines

*Fish and Wildlife Service

Geological Survey

Heritage Conservation and Recreation Service

*Water and Power Resources Service (formerly Bureau of Reclamation)

Department of Transportation

*Federal Highway Administration

*Environmental Protection Agency

State and Local Agencies

State Historic Preservation Officer

*Oklahoma Department of Transportation

*Oklahoma Department of Wildlife Conservation

*Oklahoma Tourism and Recreation Department

Office of Community Affairs and Planning

*State Grant-in Aid Clearinghouse
(State Clearinghouse)

Southern Oklahoma Development Association
(Areawide Clearinghouse)

Arbuckle Master Conservancy District

Chickasaw Indian Nation

Informational copies were sent to the following:

Interested Agencies and Organizations

National Audubon Society

National Parks and Conservation Association

National Recreation and Park Association

The Nature Conservancy

Oklahoma Recreation and Park Association

Sierra Club

University of Oklahoma at Norman

*Oklahoma Archeological Survey

*Hicks Service Incorporated (concessionaire)

*A number of copies were distributed, upon request, to interested individuals.

APPENDICES

Lists of Planning Team Members and Consultants

Early planning preceding the authorization of Chickasaw National Recreation Area was performed by the following:

David Turello, Team Captain, (Office of Environmental Planning and Design, Western Service Center), Jack Stark, Superintendent (to 1971) (Platt National Park, Arbuckle Recreation Area), John Higgins, Superintendent (through 1978) (Platt National Park, Arbuckle Recreation Area), Glen Key, Local Representative (Sulphur, Oklahoma), George D. Nadeau, Landscape Architect (Office of Environmental Planning and Design, Western Service Center), William Rothschild, Engineer (Office of Environmental Planning and Design, Western Service Center), Gary Gardner, Appraiser (Office of Land and Water Rights, Western Service Center).

Although not serving as official team members, the following people also contributed materially to the earlier studies:

Robert Barrell, Regional Chief of Interpretation and Visitor Services (Southwest Regional Office), Robert Peters, Chief of Interpretation and Research Management (Platt National Park, Arbuckle Recreation Area), Bill Laubner, Landscape Architect (Denver Service Center).

Following enactment of legislation establishing the recreation area in 1976, the following completed the planning for the area:

Bill Jones, Park Planner and Environmental Analyst,
Denver Service Center
Kathleen Gavan, Landscape Architect,
Denver Service Center
Paul Wykert and staff, Superintendent (1979-),
Chickasaw National Recreation Area

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- 1956 "A Preliminary Survey of the Flora of the Arbuckle Mountains, Oklahoma." Texas Journal of Science 8:1-73.

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- 1978 Average Dailly Traffic on U.S. Highway 177, Travertine District.

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STEEBIN, LEALE E. AND JAMES F. HARP

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1964 Addendum to Definite Plan Report. Arbuckle Project, Oklahoma.

1965 Final Report on Vegetation and Microenvironments of Platt National Park. Platt National Park, Oklahoma. Prepared by E.E. Dale, Jr.

1965 Platt National Park/Arbuckle Recreation Area, Oklahoma: Recreation Potential.

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF
RECLAMATION, REGION 5

1969 Platt-Arbuckle National Recreation Area. Master Plan
Study, preliminary working draft.

CHICKASAW ADVISORY COUNCIL RESOLUTION

". . . There is, near the town of Sulphur, a beautiful tract of land--known as Platt National Park--with lovely grassy hills and wooded vales; high bluffs and huge boulders; cool, endless-flowing mineral springs and clear sparkling spring-fed creeks, and . . . there is, not too far from Platt National Park, another Recreation Area--with winding and twisting streams; countless birds and animals; numerous species of plant life; and a clear-blue, fish-filled lake nestled in the foothills of the ancient Arbuckle Mountains The proud descendants of those Chickasaw red children who years ago were forced to give up beloved homeland east of the Mississippi truly believe that these two scenic tracts of former Chickasaw tribal land (to which the Chickasaw were moved from their southeastern homeland) would be most fitting as an everlasting memorial to Chickasaw Indians . . . (and) strongly recommends that the Congress . . . enact legislation which will unite the Platt National Park and the Arbuckle Recreation Area into a new national recreation area, and (that) the new . . . area (be designated) Chickasaw National Recreation Area. . . ."



United States Department of the Interior

NATIONAL PARK SERVICE

Southwest Cultural Resources Center

P. O. Box 728

Santa Fe, New Mexico 87501

IN REPLY REFER TO:

H30-(SWR)CR

Mr. Harry Deupree
State Historic Preservation Officer
2100 N. Linda
Oklahoma City, Oklahoma 73102

Dear Mr. Deupree:

The National Park Service has prepared a draft General Management Plan and an accompanying Draft Environmental Statement for Chickasaw National Recreation Area. There are no National Register properties within the area. However, there are two structures which are considered to have National Register potential: the Lincoln Bridge and the Headquarters Building.

In accordance with the procedures of the Advisory Council on Historic Preservation, we have applied the criteria of effect. As a result of the actions proposed in the General Management Plan there will be no effect upon the Lincoln Bridge. The removal of the park headquarters from the Headquarters Building will have no adverse effect upon that structure. The structure can be put to other, similar uses, compatible with its historic use.

Comparatively little is known about the archeological significance of the area at this time. A preliminary reconnaissance, conducted by the University of Oklahoma in 1958-60, located 19 sites within the Chickasaw National Recreation Area. In January 1964, the reservoir area was re-examined to make additional surface collections from known sites, to locate any additional sites that might be found and to test certain sites for possible excavations. Thirty-four additional sites were discovered. Surface collections made during both surveys suggest that the region has been occupied from archaic into historic times. Excavations of a suspected archeological site performed in 1968 within the Travertine District proved inconclusive.

Further professional surveys in both areas required to develop a comprehensive basic resources inventory, will be conducted when funding is available. These surveys are necessary to locate, inventory, and



nominate as appropriate, any other historical sites of significance and all archeological sites that appear to meet the criteria for nomination to the National Register of Historic Places. In the interim, site specific surveys will be conducted of any proposed construction areas to assure that no significant archeological resources are damaged or destroyed by construction. Should any significant archeological resources be discovered during the surveys they will be avoided or a mitigation plan will be developed in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. In case significant archeological resources are encountered during construction the same procedures outlined above will be followed. Salvage excavations in either case would only be conducted if there is no prudent and feasible alternative to the location of facilities.

We would appreciate your response on this matter as soon as possible. If you concur with the above determination, please sign in the space provided below and return the letter to this office. A copy of this letter is enclosed for your files.

Otherwise, should you have any special comments, please let us hear from you soon. If no comment is received within 45 days, we shall assume you have none. Should you have any questions on this matter, please contact Dr. Richard Sellars, Regional Historian, Southwest Regional Office, phone number (505) 988-6501.

Sincerely yours,

VSL John E. Cook

Regional Director
Southwest Region

In duplicate

Enclosures

I concur with the determination stated above regarding the effects of the actions proposed in the General Management Plan for Chickasaw National Recreation Area.

Harry L. Newbreck 7-19-77
State Historic Preservation Officer Date



United States Department of ~~the~~ Interior
NATIONAL PARK SERVICE

SOUTHWEST REGION
P.O. Box 728
Santa Fe, New Mexico 8750

IN REPLY REFER TO:
H30(SWR)CR

Mr. Robert R. Garvey, Jr.
Executive Secretary
Advisory Council on Historic Preservation
1522 K Street NW
Washington, D.C. 20005

Dear Mr. Garvey:

The National Park Service has prepared a draft General Management Plan and an accompanying Draft Environmental Statement for Chickasaw National Recreation Area. There are no National Register properties within the area. However, there are two structures which are considered to have National Register potential: the Lincoln Bridge and the Headquarters Building.

In accordance with the procedures of the Advisory Council on Historic Preservation, we have applied the criteria of effect. As a result of the actions proposed in the General Management Plan there will be no effect upon the Lincoln Bridge. The removal of the park headquarters from the Headquarters Building will have no adverse effect upon that structure. The structure will be put to other, similar uses, compatible with its historic use.

Comparatively little is known about the archeological significance of the area at this time. A preliminary reconnaissance, conducted by the University of Oklahoma in 1958-60, located 19 sites within the Chickasaw National Recreation Area. In January 1964, the reservoir area was re-examined to make additional surface collections from known sites, to locate any additional sites that might be found and to test certain sites for possible excavations. Thirty-four additional sites were discovered. Surface collections made during both surveys suggest that the region has been occupied from archaic into historic times. Excavations of a suspected archeological site performed in 1968 within the Travertine District proved inconclusive.

Further professional surveys in both areas required to develop a comprehensive basic resources inventory, will be conducted when funding is available. These surveys are necessary to locate, inventory, and

nominate as appropriate, any other historical sites of significance and all archeological sites that appear to meet the criteria for nomination to the National Register of Historic Places. In the interim, site specific surveys will be conducted of any proposed construction areas to assure that no significant archeological resources are damaged or destroyed by construction. Should any significant archeological resources be discovered during the surveys they will be avoided or a mitigation plan will be developed in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation. In case significant archeological resources are encountered during construction the same procedures outlined above will be followed. Salvage excavations in either case would only be conducted if there is no prudent and feasible alternative to the location of facilities.

Pursuant to procedures for compliance with Section 106 of the National Historic Preservation Act, we have consulted with the State Historic Preservation Officer of Oklahoma, and he has concurred with our findings, as indicated in the enclosed letter.

Copies of the draft General Management Plan and Draft Environmental Impact Statement have previously been forwarded to your Denver office. We look forward to hearing from you on this matter.

Sincerely yours,

(S) Theodore R. Thompson
Deputy Regional Director
Southwest Region

Enclosure

cc:
Louis Wall, Advisory Council, Denver
Glennie Wall Quality Control, DSC
Chief, Cultural Resources Management Division, WASO
Superintendent, CHIC

Advisory Council on
Historic Preservation
1522 K Street NW.
Washington, D.C. 20005

August 22

Mr. T. R. Thompson
Deputy Regional Director
Southwest Region
National Park Service
P. O. Box 728
Santa Fe, New Mexico 87501

Dear Mr. Thompson:

On August 11, 1977, the Council received a determination from the National Park Service that approval of a General Management Plan (GMP) for Chickasaw National Recreation Area, Oklahoma, would not adversely affect the Headquarters Building, a property which appears to be eligible for inclusion in the National Register of Historic Places. The Executive Director notes no objection to your determination.

A copy of your determination of no adverse effect, along with supporting documentation and this concurrence, should be included in any assessment or statement prepared for this undertaking in compliance with the National Environmental Policy Act and should be kept in your records as evidence of your compliance with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f, as amended, 90 Stat. 1320).

We also acknowledge receipt of the NPS's determination that the proposed undertaking will result in no effect to the Lincoln Bridge, another property which appears to be eligible for inclusion in the National Register. With regard to the effects of future actions generated by the GMP on cultural resources we look forward to working with the NPS in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800), as appropriate.

Your continued cooperation is appreciated.

Sincerely yours,



Robert M. Utley
Deputy Executive Director



An Act

To establish the Chickasaw National Recreation Area in the State of Oklahoma, and for other purposes.

Be it enacted by the Senate and House 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 land 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 area and to designate the area in such manner as will constitute a fitting memorialization of the Chickasaw Indian Nation, there is hereby established the Chickasaw National Recreation Area (hereinafter referred to as the "recreation area") consisting of lands and interests in lands within the area as generally depicted on the drawing entitled "Boundary Map, Chickasaw National Recreation Area," numbered 107-20004-A and dated February 1974, which shall be on file and available for inspection in the offices of the National Park Service, Department of the Interior. The Secretary of the Interior (hereinafter referred 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 acreage of the recreation area may not exceed ten thousand acres.

SEC. 2. (a) The Secretary may acquire land or interests in lands within the boundaries of the recreation area by donation, purchase with donated or appropriated funds, or exchange. When any tract of land is only partly within such boundaries, the Secretary may acquire all or any portion of the land outside of such boundaries in order to minimize the payment of severance costs. Land so acquired outside of the boundaries may be exchanged by the Secretary for non-Federal lands within the boundaries, and any land so acquired and not utilized for exchange shall be reported to the General Services Administration for disposal under the Federal Property and Administrative Services Act of 1949 (63 Stat. 377), as amended. Any Federal property located 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. Lands within the boundaries of the recreation area owned by the State of Oklahoma, or any political subdivision thereof, may be acquired only by donation: *Provided*, That the Secretary may also acquire lands by exchange with the city of Sulphur, utilizing therefor only such lands as may be excluded from the recreation area which were formerly within the Platt National Park.

(b) With respect to improved residential property acquired for the purposes of this 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 noncommercial residential purposes for a term, as the owner may elect, ending either (1) at the death of the owner or his spouse, whichever

Chickasaw
National
Recreation
Area, Olds,
Establishment,
16 USC 460hh.

Boundary
revision,
publication
in Federal
Register.

Land
acquisition,
16 USC
460hh-1.

Residential
property.

occurs later, or (2) not more than twenty-five years from the date of acquisition. 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.

"Improved
residential
property."

(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 acquisition by the United States, together with not more than three acres of land on which the dwelling and appurtenant buildings are located that the Secretary finds is reasonably necessary for the owner'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 deems is necessary for public access to such waters.

(d) The Secretary may terminate a right to use and occupancy retained pursuant to this section upon his determination that such use and occupancy is being exercised in a manner not 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 unexpired on the date of termination.

Hunting and
fishing,
16 USC
460hh-2.

SEC. 3. The Secretary shall permit hunting and fishing on lands and waters within the recreation area in accordance with applicable Federal and State laws: *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.

Administration,
16 USC
460hh-3.

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. 1, 2-4), as amended and supplemented.

(b) Nothing contained in this Act shall affect or interfere with the authority of the Secretary by the Act of August 24, 1962 (76 Stat. 395), to operate the Arbuckle Dam and Reservoir in accordance with and for the purposes set forth in that Act.

Repeal,
16 USC
460hh-4.

SEC. 5. The Act of June 29, 1906 (34 Stat. 837), which directed that certain lands 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 Hitchcock Platt and to commemorate the original establishment of Platt National Park.

16 USC
460hh-5.

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 acceptance 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 lands 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 jurisdiction over all other lands and waters within the Chickasaw National Recreation Area.

Notice,
publication
in Federal
Register.

Appropriation
authorization,
16 USC
460hh-6.

SEC. 7. There are hereby authorized to be appropriated such sums 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, and \$4,567,000 for development.

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):

Feb. 2, considered and passed House.
Mar. 5, considered and passed Senate.

AN ACT

August 24, 1962
[H. R. 23]

To authorize the Secretary of the Interior to construct, operate, and maintain the Arbuckle reclamation project, Oklahoma, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior is authorized to construct, operate, and maintain the Arbuckle Federal reclamation project, Oklahoma, in accordance with the Federal reclamation laws (Act of June 17, 1902, 32 Stat. 388, and Acts amendatory thereof or supplementary thereto), for the principal purposes of storing, regulating, and furnishing water for municipal, domestic, and industrial use, and for controlling floods and for the conservation and development of fish and wildlife, and the enhancement of recreational opportunities. The project shall consist of the following principal works: A reservoir on Rock Creek near Sulphur, Oklahoma, pumping plants, pipelines, and other conduits for furnishing water for municipal, domestic, and industrial use, and minimum basic recreational facilities.

SEC. 2. In constructing, operating, and maintaining the Arbuckle project, the Secretary shall allocate the costs thereof among different

Interior Department.
Arbuckle reclamation project,
Okla.
Construction authorization.
43 USC 371 note.

Allocation of costs.

functions resulting from multiple-purpose development under the following conditions:

(a) Allocations to flood control, recreation, and the conservation and development of fish and wildlife shall be nonreimbursable and non-returnable under the reclamation laws;

(b) Allocations to municipal water supply, including domestic, manufacturing, and industrial uses, shall be repayable to the United States by the water users through contracts with municipal corporations, or other organizations as defined by section 2, Reclamation Project Act of 1939 (53 Stat. 1187) under the provisions of the Federal reclamation laws, and to the extent appropriate, under the Water Supply Act of 1958 (72 Stat. 319), as amended. Such contracts shall be precedent to the commencement of construction of any project unit affecting the individual municipality or industrial users, and shall provide for repayment of construction costs allocated to municipal water supply in not to exceed fifty years from the date water is first delivered for that purpose: *Provided*, That the water users' organization be responsible for the disposal and sale of all water surplus to its requirements, and that the revenues therefrom shall be used by the organization for the retirement of project debt payment, payment of interest, and payment of operation and maintenance cost. The interest rate used for purposes of computing interest during construction and interest on the unpaid balance shall be determined by the Secretary of the Treasury, as of the beginning of the fiscal year in which construction is initiated, on the basis of the computed average interest rate payable by the Treasury upon its outstanding marketable public obligations, which are neither due nor callable for redemption for fifteen years from date of issue;

(c) Upon the completion of the payment of the water users' construction cost obligation, together with the interest thereon, the water users, their designee or designees, shall (1) have a permanent right to the use of that portion of the project allocable to municipal water supply purposes, so long as the space designated for those purposes may be physically available, taking into account such equitable reallocation of reservoir storage capacities among the purposes served by the project as may be necessary due to sedimentation, subject, if the project is then operated by the United States, to payment of a reasonable annual charge to the Secretary of the Interior sufficient to pay all operation and maintenance charges and a fair share of the administrative costs applicable to the project; (2) be conveyed title to such portions of the pipelines and related facilities as are used solely for delivering project water to the water users.

SEC. 3. Contracts may be entered into with the water users' organization pursuant to the provisions of this Act without regard to the last sentence of subsection (c) of section 9 of the Reclamation Project Act of 1939.

SEC. 4. The Secretary is authorized to transfer to a water users' organization the care, operation, and maintenance of the works herein authorized and, if such transfer is made, may deduct from the obligation of the water users the reasonable capitalized equivalent of that portion of the estimated operation and maintenance cost of the undertaking which, if the United States continues to operate the project, would be allocated to flood control and fish and wildlife purposes. Prior to taking over the care, operation, and maintenance of said works, the water users' organization shall obligate itself to operate them in accordance with criteria specified by the Secretary of the Army with respect to flood control and the Secretary of the Interior with respect to fish and wildlife and recreation.

43 USC 485a

43 USC 390b
note.

53 Stat. 1193.
43 USC 485h.
Transfer of op-
eration.

SEC. 5. Construction of the Arbuckle project herein authorized may be undertaken in such units or stages as in the opinion of the Secretary best serve the project requirements and the relative needs for water. Repayment contracts negotiated in connection with each unit or stage of construction shall be subject to the terms and conditions of section 2 of this Act.

Stages of construction.

SEC. 6. The Secretary may (1) contract for the construction of any part of the minimum basic recreational facilities with any qualified agency of the State of Oklahoma or a political subdivision thereof, and (2) upon conclusion of a suitable agreement with any such agency or political subdivision for assumption of the administration, operation, and maintenance thereof at the earliest practicable date, construct or permit the construction of public park and recreational facilities on lands owned by the United States adjacent to the reservoir of the Arbuckle project, when such use is determined by the Secretary not to be contrary to the public interest, all under such rules and regulations as the Secretary may prescribe. No recreational use of any area to which this section applies shall be permitted which is inconsistent with the laws of the State of Oklahoma for the protection of fish and game and the protection of the public health, safety, and welfare. The Federal costs of constructing the facilities authorized by this section shall be limited to the nonreimbursable costs of the Arbuckle project for minimum basic recreational facilities as determined by the Secretary.

Recreational facilities.

SEC. 7. The Secretary may make such reasonable provision in connection with the works of the Arbuckle Federal reclamation project, in accordance with section 2 of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, 16 U.S.C. 661, and the following), as he finds to be required for the conservation and development of fish and wildlife.

Fish and wildlife.

72 Stat. 563.

SEC. 8. Expenditures for Arbuckle Reservoir, and the water supply aqueduct system, may be made without regard to the soil survey and land classification requirements of the Interior Department Appropriation Act, 1954 (43 U.S.C. 390a).

67 Stat. 266.

SEC. 9. There is authorized to be appropriated for construction of the Arbuckle reclamation project the sum of \$13,340,000 (March 1962 prices), plus or minus such amounts as may be justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indices applicable to the type of construction involved herein. There are also authorized to be appropriated such additional sums as may be required for the operation and maintenance of the project.

Appropriation.

Approved August 24, 1962, 9:30 a. m.

SULPHUR SPRINGS.

64. The two tribes hereby absolutely and unqualifiedly relinquish, cede, and convey 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 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 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 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 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

Sulphur springs.

Cession of adjacent lands.

Limit of acreage.

Vol. 30, p. 508.

Vol. 31, p. 237.

Price to credit of tribes.

Improvements.

Use of water, etc.	Interior upon the Treasurer of the United States. Until otherwise provided by law, the Secretary of the Interior may, under 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 intoxicants of any kind within the Indian country or Indian 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: <i>Provided, however,</i> That nothing contained 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.
Sale, etc., of Intoxicants forbidden.	
<i>Proviso.</i> Expenditures.	

Public Comments and National Park Service Response



United States
Department of
Agriculture

Soil
Conservation
Service

Agricultural Center Building
Stillwater, Oklahoma
74074

December 13, 1979

Superintendent
Chickasaw National Recreation Area
Post Office Box 201
Sulphur, Oklahoma 73086

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 14 1979

Dear Sir:

The draft environmental statement for the general management plan of the Chickasaw National Recreation Area has been referred to us for review by the Coordinator of Environmental Quality Activities of the U.S. Department of Agriculture.

In reviewing the management plan, it is apparent that the selected action involving coordination of facility development, visitor use groups and resources management actions will result in more efficient use of the recreational resources present and in proportionally greater benefits to the public being served. Based upon the evaluation of the five alternatives considered, the selected plan appears to have few environmental objections and to provide opportunity for the greatest development of recreational potential in the Chickasaw National Recreation Area.

The draft environmental impact statement clearly sets forth anticipated effects of the plan and adequately reflects the magnitude of potential impacts. The impacts upon prime farmland and other agricultural interests will be insignificant.

We concur in the proposals and findings of the management plan and draft EIS and appreciate the opportunity to review the documents.

Sincerely,

Roland R. Willis
State Conservationist

cc:

Regional Director, NPS, SW Region, Santa Fe, New Mexico
Administrator, SCS, Washington, D.C.



L



REGION VI

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
FORT WORTH REGIONAL OFFICE
221 WEST LANCASTER AVENUE
P.O. BOX 2905
FORT WORTH, TEXAS 76113

December 18, 1979

IN REPLY REFER TO:

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 20 1979

Superintendent
Chickasaw National Recreation Area
P.O. Box 201
Sulphur, Oklahoma 73089

Dear Sir:

The Draft Environmental Impact Statement - General Management Plan for the Chickasaw National Recreation Area in Oklahoma has been reviewed in the Department of Housing and Urban Development's Oklahoma City Area Office and Fort Worth Regional Office and it has been determined that the Department will not have comments on this statement.

Victor J. Hancock
Environmental Clearance Officer

II



United States Department of the Interior

IN REPLY REFER TO

1793 (911)

BUREAU OF LAND MANAGEMENT

NEW MEXICO STATE OFFICE

P.O. BOX 1449

SANTA FE, NEW MEXICO 87501

DEC 5 1979

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

Superintendent
Chickasaw National Recreation Area
Post Office Box 201
Sulphur, Oklahoma 73086

DEC 10 1979

Dear Sir:

Public lands or programs administered by the Bureau will not be affected by this project. We do not have comments on the environmental statement and the general management plan for the Chickasaw National Recreation Area.

Sincerely yours

Van Manning
Van Manning
Chief, Division of Planning
and Environmental Coordination

III A



United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

December 19, 1979

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED
DES 79-59

DEC 31 1979

Memorandum

To: Superintendent, Chickasaw National Recreational Area,
Sulphur, Oklahoma

From: Director, Bureau of Mines

Subject: Draft environmental statement and general management
plan, Chickasaw National Recreation Area, Oklahoma

Thank you for the opportunity to review the draft environmental statement and general management plan for the Chickasaw National Recreation Area.

Two 8-inch crude oil pipelines owned by the Cherokee Pipeline Company may cross the natural recreation area south of Sulphur. If so, we suggest that the situation be clarified in the final statement and plan. Otherwise, we have no objection to either document.


Assistant Director

L. D. Newcomer, Jr.



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 31 1979

Austin Area Office
Federal Bldg., Room G-121
Austin, Texas 78701

Memorandum

To: Superintendent, Chickasaw National Recreation Area,
Sulphur, Oklahoma

From: Area Manager, FWS, Austin, Texas

Subject: Review of Draft Environmental Statement and General Management
Plan for Chickasaw National Recreation Area, Oklahoma

This is in response to Acting Regional Director Hassebrock's memorandum of November 19, 1979, which requested our agency's review of the subject documents. Our comments and suggestions follow. Since the Draft Environmental Statement (DES) includes all information provided in the General Management Plan (GMP) and a similar format, our comments are referenced to the former document, but apply to both where appropriate.

General Comments

The DES seems well written and concise. Its treatment of the faunal resource may be a bit brief in some areas although it probably is in keeping with the level of impacts expected to result from the proposed action.

Care should be taken in any attempts to reintroduce endemic animal species which have been extirpated through past human activities. The pronghorn (Antilocapra americana) is cited as an example of one such species. Although we wholeheartedly support the concept of re-establishing natural ecosystems, experience has taught that many times considerable time and effort are expended with poor or even adverse results. Before such a venture we would suggest consultation with the Oklahoma Department of Wildlife Conservation (ODWC), the U. S. Fish and Wildlife Service (FWS), and other entities which may have expertise in this area. Other species formerly found in the project area include elk (Cervus canadensis), black bear (Ursus americanus), gray wolf (Canis lupus), and river otter (Lutras canadensis).



Save Energy and You Serve America!

III C

From a statement on page 57 regarding the "normal flow" of Travertine Creek, it appears that work on the proposed flood diversion channel at the Travertine Nature Center may come under the jurisdiction of the U. S. Army Corps of Engineers' (CE) dredge and fill permit program (404). The CE is authorized under Section 404 of the Clean Water Act of 1977 (P.L. 95-217) to regulate the discharge of dredge and fill activities in or adjacent to waters of the United States, generally on streams with five cubic feet per second (cfs) or greater average annual flow. Should five to six million gallons per day (mgd) in fact constitute the average annual flow (equal to eight+ cfs), Travertine Creek could well be subject to the 404 permit program. We would urge you to contact the Tulsa District of the CE for a determination of this possible requirement.

In its report of November 20, 1959, on the Arbuckle Project, the Fish and Wildlife Service recommended that 660 acres of project land on the Big Sandy Creek arm, plus 615 acres of adjacent land to be acquired specifically to replace wildlife habitat inundated by Arbuckle Reservoir, be made available to the ODWC for wildlife management purposes in accordance with the terms of a General Plan as provided for in the Fish and Wildlife Coordination Act. Following project land acquisition, a General Plan for Use of Lands for Wildlife Conservation and Management-Arbuckle Reservoir, Oklahoma was executed between the Department of the Interior and the ODWC on April 13, 1967, and amended on March 17, 1969. It is our contention that the lands designated in the General Plan were set aside specifically to mitigate the loss of wildlife habitat and hunting losses resulting from the Arbuckle Project. It is unclear whether the General Plan and related use of Arbuckle Project lands legally is still in effect or whether it was rendered void along with the former management agreement between the Bureau of Reclamation and the ODWC by legislation establishing the Chickasaw NRA. The DES should address this issue and attempt to clear up the possible conflict in land management.

We noted on several pages in Section II, DESCRIPTION OF THE ENVIRONMENT, an inconsistency in the inclusion of scientific names of flora and fauna along with common names.

Specific Comments

I DESCRIPTION OF THE PROPOSAL

Page 8, I.B.1.a.#2. The last sentence under #2 regarding fish and wildlife statutes should include provision for compliance with Federal as well as State mandates if waterfowl hunting is to be allowed.

Page 9, I.B.1.b.#3. Before the use of wildlife food plots is discontinued, consideration should be given to the history of the Arbuckle Project and the original purpose for which lands were set aside as specified in the General Plan for Use of Lands for Wildlife Conservation and Management-Arbuckle Reservoir, dated April 13, 1967, and amended on March 17, 1969.

Page 11, I.B.1.g.#3. We suggest that a #3 be added to this list of requirements for mineral exploitation inside the boundaries of the Chickasaw NRA to require the restoration of lands as nearly as possible to their pre-exploration conditions of contour and vegetation.

Page 19, I.D.2.c.#4. Determination of a desirable number of hunters would depend to a large extent on the species being sought and probably should be coordinated with the ODWC.

Pages 20 and 25, I.D.4.a. The proposed flood diversion channel at the Travertine Nature Center could provide opportunities for fish and wildlife enhancement. Possibilities include the development of a controlled marsh environment and/or a small pond fishery. At any rate, we suggest that care be taken to disturb the least practicable amount of vegetation in the excavation. In revegetating the channel, consideration should be given to plant species of value to fish and wildlife including native grasses, forbs, legumes, and shrubs. Since the flood diversion channel is mentioned at several places in the DES, the applicability of the 404 permit program was discussed under General Comments.

Page 25, I.D.4.b. Alteration of wildlife habitat will be minimized by routing the proposed bicycle and hiking trails along the ridges. We suggest, however, that valuable habitat components such as den or nest trees, burrows, rock outcroppings, and established game trails be avoided.

Page 29, I.D.4.c. In removing stumps and debris from swimming areas, be cognizant of the value of these materials as fish habitat.

II DESCRIPTION OF THE ENVIRONMENT

Pages 60-80, II.D.1.c. We applaud your efforts at documenting water pollution sources and effecting corrective measures.

Page 84, II.D.2.b. The timber rattlesnake (Crotalus horridus) probably should be added to the list of poisonous snakes occurring on the area.

Page 85, II.D.2.c. We expect that both the bald eagle (Haliaeetus leucocephalus) and peregrine falcon (Falco peregrinus anatum) could occur in the area at least as migrants or transients.

III THE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

Page 99, III.A.2. Mention is made of transporting sewage effluent out of the watershed. Although not impacting the Arbuckle Lake watershed, will this action adversely affect other areas? At least a sentence or so should be added to adequately treat this potential concern.

Page 99, III.B. More detailed and specific information is needed concerning impacts on both aquatic and terrestrial habitats and resources associated with construction of the Travertine Creek overflow channel.

The last paragraph on this page indicates that no endangered or threatened species are known in the area. As mentioned previously, we believe the bald eagle and peregrine falcon could occur in the area occasionally.

BIBLIOGRAPHY, page 138. In scanning the bibliography of the DES, we questioned the citation crediting authorship of a research proposal to Robert S. Kerr.

Summary Comments

We find the DES and accompanying GMP to be with only limited exceptions, well-written and informative documents. Primary areas which may require attention include clarification of the General Plan issue, threatened and endangered species, applicable permits and ecological effects of the reintroduction of extirpated faunal species.

We previously mentioned that the proposed channel work on Travertine Creek may require a permit from the Corps of Engineers (Section 404 of P.L. 95-217) to conduct the dredge and fill activities associated with this project. The environmental statement does not provide adequate information concerning the design of the channel or its affect on fish and wildlife resources.

Accordingly, the comments in this statement do not in any way preclude additional and separate evaluation and comments by the Fish and Wildlife Service, pursuant to the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), if the proposed channel requires a permit from the Corps of Engineers.

In review of the application for such a permit, the Fish and Wildlife Service may concur, with or without stipulations, or object to the proposed work depending on the project's impact on fish and wildlife resources. It would appear that the Fish and Wildlife Service, as a minimum, will probably recommend that the Corps of Engineers when

issuing the permit, require (1) measures to protect the aquatic ecosystem of the creek, (2) features to reduce turbidity, (3) restoration of stream habitat following construction, and (4) such other measures as would be apparent and appropriate from the information available at that time.

W. J. D. D. D.

cc: Regional Director, FWS, Alb., NM (ES)
FWS/OEC, Washington, D. C.
Director, Oklahoma Department of Wildlife Conservation, Oklahoma
City, OK
Field Supervisor, FWS, ES, Tulsa, OK



United States Department of the Interior

~~BUREAU OF RECLAMATION~~
WATER AND POWER RESOURCES SERVICE
SOUTHWEST REGION
714 S. TYLER
AMARILLO, TEXAS 79101

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 26 1979

IN REPLY
REFER TO: 150
120.1

DEC 21 1979

Memorandum

To: Superintendent, Chickasaw National Recreation Area, National Park Service, Post Office Box 201, Sulphur, Oklahoma 73086

From: Regional Director

Subject: Review of Draft Environmental Statement and General Management Plan for Chickasaw National Recreation Area, Oklahoma (DES 79-59)

As requested, the Water and Power Resources Service (WPRS), formerly the Bureau of Reclamation, Southwest Regional office has reviewed the subject environmental statement and management plan. The following comments are submitted for your consideration:

Environmental Statement

General

In compliance with the new Council on Environmental Quality Regulation (40 CFR, Parts 1500-1508, November 29, 1978), it appears that the revised format for environmental statements should be considered in organizing the statement.

Specific

Page 15.--Regarding the parking congestion problem, we suggest this be further clarified. It appears that it would be appropriate to proceed with developing studies to resolve the parking problem instead of waiting for the problem to reoccur.

Pages 15, 23, 32, 33, 50, and throughout.--The proper name of the lake is the Lake of the Arbuckles and should be used in lieu of Arbuckle Lake or Arbuckle Reservoir.

Pages 17-18.--We suggest the boating carrying capacity calculations should be reevaluated. (See detailed comments regarding same subject in the land management plan.)

Page 17.--The agency "Bureau of Outdoor Recreation" should be changed to read "Heritage Conservation and Recreation Service."

Page 18 and throughout.--References to the Bureau of Reclamation should be changed to read "Water and Power Resources Service."

III D

Page 92.--It is suggested that visitor-use statistics be rechecked for accuracy. (See detailed comments regarding same subject concerning the land use plan.)

Page 45.--The date of the cooperative agreement with WPRS (Bureau of Reclamation) should be March 31, 1978.

General Management Plan

General

Water and Power Resources Service is in agreement with the concepts and plans outlined as related to Arbuckle Reservoir and associated lands.

Specific

Page 14.--The date of the cooperative agreement with WPRS (Bureau of Reclamation) should be March 31, 1978.

Page 59.--Reference paragraph 2, we suggest the text concerning parking congestion be clarified. It appears that it would be appropriate to proceed with developing studies to resolve the parking problem instead of waiting for the problem to reoccur.

Page 62 and throughout.--References to the Bureau of Reclamation should be changed to read "Water and Power Resources Service."

Page 38.--Regarding use statistics, we suggest they be rechecked. Visitation figures reported to us by National Park Service on annual WPRS recreation inventories differ significantly (at least for 1975-1978) from those appearing on page 38:

<u>WPRS Summary</u>	<u>Year</u>	<u>Visitor days*</u>
	1975	206,026
	1976	200,271
	1977	183,382
	1978	147,569

*One person participating in one or more activities at a site during all or any portion of one calendar day.

Page 55.--The listing of data on this page has 500-year flood control contour of elevation 885.85. We are not aware of where the elevation was acquired, but this should be checked since it is above top of flood pool elevation.

The average annual minimum pool elevation for the past 11 years of operation has been about elevation 870. This should be considered for use instead of 860.0.

Pages 62-63.--We believe the boating capacity analysis should be reexamined in several respects. We do not agree that the lake surface should be arbitrarily divided equally among the three types of boating use. This is not only inconsistent with the varying "areas per boat" standards cited, but it also fails to consider the varying "turnover" rates and relative activity distribution for the three activities.

While turnover rate was considered in determining daily boat launching capacity, this capacity was erroneously based on parking spaces instead of boat launching lanes. It is true that inadequate parking areas would prevent full boat ramp capacity from being used; however, actual boat access to a lake is governed by the number of boat launching lanes. Two daily launch standards are widely accepted. Based on a "12-hour" day, a maximum of 36 boats could be launched and retrieved per lane (based on 10 minutes per launch and retrieval) or a maximum of 40 launches (based on 9 minutes). These maximum standards are not affected by turnover rate. A secondary consideration, when relating boat launching capacity to lake surface capacity, is docking space. If docking space is available, boat launching capacity would have to be reduced accordingly:

Boats accessing lake from docks + boats	
accessing lake from launch lanes	= total boats on lake

It appears that no adjustment factor was included in the analysis to reflect what portion of the lake surface is "suitable" for the three boating activities. Normally, the entire lake surface is not suitable for each of these three activities because of size, wind and wave action, water depth, proximity to the shoreline, obstructions, shoreline configuration, etc.

Another adjustment factor which apparently was not considered relates to daily use patterns by activity. Boat fishing activity normally is high in the early morning and evening, while boating and water-skiing generally peak out during mid-afternoon. As a result, all of the available lake surface is not used to capacity by each activity during each hour of the assumed "12-hour" recreation day.

As was alluded to in the plan, another important adjustment factor is often required because the "summer pool" of a lake/reservoir is less than the normal "conservation pool." However, the reduced boating capacity that would be associated with a reduced lake surface area would not be directly proportional, as is stated in the narrative, due to the change in the "suitability factor" at lower elevations. For example, under a severe drawdown situation, an elevation would eventually be reached where power boating and water-skiing would no longer be safe because of inadequate water depth even though there still might be several hundred surface acres of water. Nevertheless, since the Lake of the Arbuckles has historically been near conservation pool elevation 872.0 between May 1 and September 1, the "conservation pool" adjustment factor is not applicable.

We suggest that in view of the above concerns, this analysis be reexamined. Should you have any questions regarding this concern, please contact Mr. Fred Landefeld of this office at (806) 378-5400, extension 612.

We appreciate the opportunity to review the subject statement and management plan.

Robert H. Weimer

cc: Commissioner, Attention: 150
Director, Office of Environmental Project Review



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Oklahoma City, Oklahoma 73102
December 3, 1979

REGION 6

IN REPLY REFER TO HEC-OK

General Management Plan and
Draft Environmental Impact Statement for
Chickasaw National Recreation Area
Murray County, Oklahoma

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

Superintendent
Chickasaw National Recreation Area
P. O. Box 201
Sulfur, Oklahoma

DEC 04 1979

Dear Sir:

We are in agreement with the discussion within the Draft Environmental Impact Statement which deals with the possible relocation of US-177 and the concerns which need to be addressed should this action be implemented. We anticipate being involved in the environmental as well as the design considerations should the project involve federal-aid highway funds.

We thank you for giving us the opportunity to review this document.

Sincerely yours

Frank N. Cunningham
Gordon E. Penney
Division Administrator



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI

1201 ELM STREET

DALLAS, TEXAS 75270

December 21, 1979

Mr. Earl Hassebrock
Acting Regional Director
National Park Service
P.O. Box 728
Santa Fe, New Mexico 87501

*11 Dec
2 PHS-Am*

Dear Mr. Hassebrock:

Letter to Chic 1/1/80

We have reviewed the Draft Environmental Impact Statement (EIS) for the Chickasaw National Recreation Area, Murray County, Oklahoma. New facilities are proposed to realize the recreational opportunities offered by the area; these include a visitor center/headquarters adjacent to the City of Sulphur, a 9.5 mile biking/hiking trail, a 6.5 mile hiking trail, a net of 32 additional campsites, 3 comfort stations, a campground sewage collection system, and 11 small structures for park protection and maintenance. This proposal will provide visitor experiences of varied character and at differing use intensities in designated parts of the recreation area. Resources will be restored, to the degree research indicates is feasible, to more parklike conditions. Should these situations induce restoration of visitor travel to former numbers, the regional economy could receive added tourist spending.

The following comment is offered for your consideration:

On page 30 of the General Management Plan and page 58 of the Draft Environmental Impact Statement, it is mentioned that there are spring developments where water is pumped and then stored for consumption by visitors to the park. Such an arrangement would be classified as a non-community public water system if it serves an average of at least 25 individuals daily, at least 60 days out of the year. All non-community public water systems were required by the Safe Drinking Water Act and State regulations to begin sampling for coliform bacteria and nitrate prior to June 24, 1979. The supplies may also be required to be sampled daily for turbidity depending on whether the systems are defined as surface or ground water systems. Shallow and subsurface springs and infiltration galleries at or below ground level are considered surface supplies by EPA since surface contamination can render such a system an unsafe source.

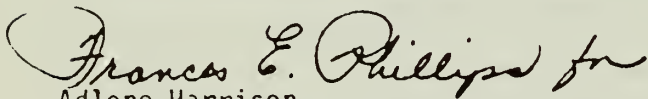
We realize that the subject documents were probably written before June 1979, and that the Chickasaw Recreation area supplies are probably already collecting the required samples; however, we believe the above should be mentioned. We would like to see a discussion of the results of sampling in the Final Statement.

We classify your Draft Environmental Impact Statement as LO-2. Specifically, we have no objections to the project as described in the Statement. However, we are requesting additional information regarding the results of water quality sampling as required by the Safe Drinking Water Act. Our classification will be published in the Federal Register according to our responsibility to inform the public of our views on proposed Federal actions, under Section 309 of the Clean Air Act.

Definitions of the categories are provided on the enclosure. Our procedure is to categorize the EIS on both the environmental consequences of the proposed action and on the adequacy of the Impact Statement at the draft stage, whenever possible.

We appreciated the opportunity to review the Draft Environmental Impact Statement. Please send our office five (5) copies of the Final Environmental Impact Statement at the same time it is sent to the Office of Environmental Review, U.S. Environmental Protection Agency, Washington, D.C.

Sincerely,



Adlene Harrison
Regional Administrator (6A)

Enclosure

ENVIRONMENTAL IMPACT OF THE ACTION

IC - Lack of Objections

EPA has no objections to the proposed action as described in the draft impact statement; or suggests only minor changes in the proposed action

ER - Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating Federal agency to re-assess these aspects.

EU - Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

ADEQUACY OF THE IMPACT STATEMENT

Category 1 - Adequate

The draft impact statement adequately sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2 - Insufficient Information

EPA believes the draft impact statement does not contain sufficient information to assess fully the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft statement.

Category 3 - Inadequate

EPA believes that the draft impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement. If a draft statement is assigned a Category 3, no rating will be made of the project or action, since a basis does not generally exist on which to make a determination.



STATE OF OKLAHOMA
DEPARTMENT OF

TRANSPORTATION

200 N. E. 21st Street
Oklahoma City, Oklahoma 73105

December 10, 1979

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 13 1979

Mr. Paul V. Wykert, Superintendent
Chickasaw National Recreation Area
Post Office Box 201
Sulphur, Oklahoma 73086

Dear Mr. Wykert:

re: Review Comments on the Draft Environmental Impact
Statement for the General Management Plan,
Chickasaw National Recreation Area.

This Department has completed review of the subject Draft
EIS (DEIS) and wish to direct our comments to the proposed
alternatives associated with US Highway 177, which crosses
the Chickasaw National Recreation Area immediately south of
the City of Sulphur, Oklahoma, and serves as a primary access
route for the park.

The DEIS discusses three possibilities with regard to US 177
in the area studied.

1. US 177 to remain on its present alignment.
2. US 177 to be constructed on a new alignment
with an overpass spanning the park area.
3. US 177 to be constructed on new alignment to
the east, totally bypassing the park lands.

The DEIS discussed how each of these alternatives may affect
the park proper; however, impacts within the park constitute
a very small percentage of the total affect of any action asso-
ciated with US 177 in this area. Other impacts of concern with
regard to US 177 would necessarily incorporate such factors as
the number of families to be relocated, noise and air quality
impacts of routing the highway through residential neighbor-
hoods, the potential isolation of the State Veterans Hospital,
excessive indirection for motorists, and the many other social,
economic and environmental effects of highway construction which
are normal considerations in the EIS process.

Although each of the alternates are discussed in very general
terms, final alternate selection must entail a full analysis
of all impacts associated with each. This Department has

STATE TRANSPORTATION COMMISSION

CHAIRMAN—WILLIAM R. NASH, VICE CHAIRMAN—MRS. R. L. PARKER, SECRETARY—JAMES H. GUNGOLL, MEMBERS—JAMES W. ALLEN,
W. E. ALLFORD, J. E. CARTER, JOHNNY M. PERRY, H. B. ATKINSON, DIRECTOR—R. A. WARD

AN EQUAL OPPORTUNITY EMPLOYER

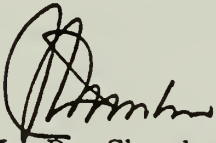
VI

performed some preliminary analyses necessary for early project planning, but formal project development procedures have not been initiated. We would recommend that each alternate presented in the DEIS be continued so as to not preclude future options with regard to the highway within the broader scope of potential impact analyses required by the National Environmental Policy Act, or other related legislation, and the corresponding implementing regulations.

We realize the burden this places upon long range planning relative to the Chickasaw National Recreation Area, and will lend our assistance, as far as practicable, towards minimizing this problem. However, since we have no active plan for improvement of this segment of US 177, we cannot provide input relative to the final location at this time.

We thank you for the opportunity to review the DEIS and trust these comments will be of some value in preparing the Final EIS.

Sincerely,

A handwritten signature in dark ink, appearing to read "J. D. Chambers", written over a circular stamp or seal.

J. D. Chambers
Planning Engineer

rs

WILDLIFE CONSERVATION COMMISSION

MERVIN LAWVER
CHAIRMAN

JUD LITTLE
VICE CHAIRMAN

DOYLE BURKE
SECRETARY

H. B. VAN PELT
MEMBER

ELLIS HOLLY
MEMBER

JOHN D. GROENDYKE
MEMBER

BOB MATTHEWS
MEMBER

ROY BOECHER
MEMBER



1801 N. LINCOLN

P.O. BOX 53465

OKLAHOMA CITY, OK 73152

PH. 521-3851

GEORGE B. WINT, DIRECTOR
GARLAND FLETCHER, ASSISTANT DIRECTOR
STEVEN ALAN LEWIS, ASSISTANT DIRECTOR

DEPARTMENT OF WILDLIFE CONSERVATION

January 14, 1980

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

JAN 16 1980

Mr. Paul V. Wykert, Superintendent
Chickasaw National Recreation Area
Sulphur, Oklahoma 73086

Dear Mr. Wykert:

The Oklahoma Department of Wildlife Conservation has reviewed the draft environmental statement on the proposed general management plan for the Chickasaw National Recreation Area. In general, we agree with the comments provided by the Fish and Wildlife Service and offer the additional attached comments.

We specifically have a problem with the proposed management plans for the present public hunting area. This area was set up as mitigation for hunting and fishing losses through creation of the reservoir. Without the ability to manipulate the habitat and utilize food plots, the areas mitigation value is lost. Mitigation was a required part of the original project and is still needed.

The Game Division would be happy to meet with you to explain what management practices are essential to provide mitigation in keeping with the creation of the area.

Sincerely,

George B. Wint
Director

GBW:SAL:bkh

cc: Byron Moser
Ric Gomez
Fish and Wildlife Service

VII

SPECIFIC COMMENTS:

Page 8, B. RESOURCE MANAGEMENT, 1.a. Proposals Related to Hunting and Fishing Management

Although the legislation of 1976 cancelled the management agreement between the Water and Power Resource Service (formerly the Bureau of Reclamation) and the Oklahoma Department of Wildlife Conservation, we feel the General Plan (of 4-13-67 and amended 3-17-69) which provided approximately 1,275 acres to mitigate wildlife losses resulting from the construction of the dam and reservoir should be in effect for the life of the project, which construction was made possible by the agreement drafted in accordance with the Fish and Wildlife Coordination Act. (Page 19, #4 addresses small game and deer hunting plan, involving approximately 1,000 acres.)

Page 8, B.1.a.#3

This item appears to be contradictory as it seeks to "keep exotic fish species from moving upstream....." but, at the same time, provides for the introduction of "new species" (top of page 9) which, in our vocabulary, means exotic fish. Exotic fish are present in the Lake of the Arbuckles, including such species as walleye, Northern pike, spotted bass, carp, and red ear sunfish. Any goals for fishery management will be difficult to attain, as long as water quality problems persist as described on pages 60-62.

Page 9,b. Proposals Related to Vegetation Management

In the pursuit of the restoration and preservation of a "natural environment", the lake itself is the most obvious extraneous influence, as it is a man-made impoundment which has drastically changed the ecology of the area, both in the terrestrial and aquatic ecosystems.

The following terms should be clearly defined:

- "natural" as used on page 9,b,1.
- "historical" as used on page 9,b.2.
- "natural setting" as used on page 9,c.1.
- "natural mosaics" as used on page 99, second paragraph from bottom of page.

Page 9,b.#3.

Phasing out of cropping intended for optimizing wild game populations will result in an overall decline in productivity at various trophic levels, affecting both game and nongame organisms, because food availability is one of the limiting factors. This objective seems aimed at phasing out hunting by phasing out game species dependent on food plots.

Page 9,c.#1. Proposals Related to Faunal Management

We concur in this philosophy but the small size of the project and the extensive ecological changes which have taken place would make it difficult, if not impossible, to determine what a "natural setting" is (at least, one free of human influence).

Page 9,c.#3.

The ecology of the area has undergone a gradual but drastic change in the past 200 years. It has been transformed from a mixed grass prairie interspersed with forested stream courses to an agrarian dominated community (see page 68). Settlers erected fences, plowed fields, planted crops, built roads, railways and highways, dammed streams, etc. Prior to such development, the prehistoric prairie supported roaming herds of the American bison, American elk and pronghorn antelope. These large herbivores maintained an equilibrium between themselves and their natural predators. Their migration movements were the result of seasonal climatic changes and range conditions. The habitat that supported these ungulates no longer exists; without it, reintroduction of the pronghorn antelope or any other former range animal would be a fruitless and futile effort.

Page 19,#4. Proposals Related to Rock Creek Corridor Carrying Capacity

We do not recommend concentrating hunters to a density of 10 acres per hunter. This not only degrades the quality of the hunting experience but it could be hazardous. We recommend on our Game Management Areas a density of 1 hunter per 80 acres of habitat for big game and 40 acres for small game, which may vary with type of terrain and cover.

Page 60,c. Water Quality

The presentation on Water Quality is excellent. The problems outlined will be a major obstacle in the implementation of fishery management proposals and, once again, provide evidence of human impacts on the aquatic environment.

Page 75, Table 22

Title should read "Water Quality Data....." instead of "Quality date....."

Page 84,c. Fauna (Biologic Resources)

The list of species is incomplete, vague and the use of scientific names is inconsistent. For example: lists "catfish" and

"bullhead" which is also a catfish. It lists unwanted fish such as carp and carpsucker, while omitting important sport species such as the walleye and spotted bass. Scientific names should be used for all species or none.

The nearest known self-supporting pronghorn antelope herd in the state is more than 200 miles northwest of Sulphur, in Ellis County.

Is "Louisiana whitetail deer" a distinct variety of deer in the project area? We are not aware of this particular sub-species occurring in Oklahoma.

Page 85,c. Threatened and Endangered Species

Bald eagles have been sighted in central Oklahoma on various occasions. Whooping cranes migrate through central Oklahoma, making brief stops in the state.

Page 99,b. Impacts on Biologic Resources, 3rd paragraph

This objective seems aimed at phasing out hunting by phasing out game species dependent on food plots. As the animals dependent on those crops are expected to decline, so will hunting opportunities decline, resulting in a degradation of the outdoor experience and a certain decline in visitation to the area during a time (fall and winter) when there is virtually no other outdoor recreation activity.

Oklahoma *Tourism*
and *Recreation Department*

500 WILL ROGERS BUILDING
OKLAHOMA CITY 73105

GEORGE NICH - GOVERNOR
SPENCER BERNARD - LT. GOV. - CHAIRMAN

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 10 1979

December 4, 1979

Mr. Paul V. Wykert, Superintendent
Chickasaw National Recreation Area
P. O. Box 201
Sulphur, Oklahoma 73086

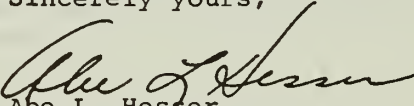
Dear Mr. Wykert:

Chickasaw National Recreation Area has long been a favorite destination for many of Oklahoma's residents and visitors. Because of its unique beauty, varied resource features and relative proximity to many Oklahomans, Chickasaw National Recreation Area has an important role to play in providing quality outdoor opportunities for our people.

Needless to say, I am most pleased that your agency plans to expand the facilities available at Chickasaw. The development concepts presented in the draft environmental statement are sound and thorough and I wish you every success in achieving full implementation of the program.

Thank you for providing me this opportunity to review this management proposal.

Sincerely yours,


Abe L. Hesser
Executive Director

ALH:be

VIII

**State Grant-In-Aid-Clearinghouse**

5500 N. WESTERN

OKLAHOMA CITY, OKLAHOMA 73118

(405) 840-2811

December 19, 1979

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

Superintendent
Chickasaw National
Recreational Area
Post Office Box 201
Sulphur, Oklahoma 73086

DEC 20 1979

RE: 27K903 - Chickasaw National Recreational Area -
(SAI#91219003) Direct Federal

Dear Superintendent:

The state clearinghouse has completed the review of a project proposal and the environmental assessment recently submitted by your office. Any future communication regarding this proposal should be accompanied by the SAI number referenced above.

Based on the information received by the state clearinghouse and the response of reviewing agencies, the proposed project is, as of this date, consistent with and contributes to existing state plans and goals in the State of Oklahoma. A review of the environmental assessment, as of this date, shows no adverse environmental impact is anticipated. This letter and comments from your areawide clearinghouse must be attached to your application as you apply for federal assistance.

This project application is subject to review at the time of annual renewal or when a continuation is requested. Any application not submitted to or acted upon by the federal funding agency within one year of the date of this letter is subject to re-review by the State Clearinghouse.

This letter is not a commitment of funds for your project from any state or federal agency. You should now proceed with your application to the National Park Service for funding consideration.

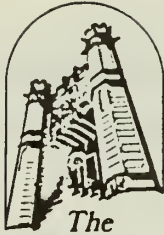
Sincerely,

Don N. Strain
Director

DNS:mt

cc: SODA

IX



The University of Oklahoma at Norman

Oklahoma Archaeological Survey

January 15, 1980

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

JAN 17 1980

Mary Schuitt
State Clearinghouse
5500 N. Western
Oklahoma City, OK 73118

Re: A-95 #27K903, Chickasaw National Recreational Area, Murray County.

Dear Ms. Schuitt:

I have evaluated the referenced project for its potential impact upon Oklahoma's archeological resources. The project does not take place on a known archeological site nor does it appear to be in a location likely to contain such a site. Consequently, I recommend that the project be allowed to proceed.

However, should any archeological remains be exposed during the course of construction, I request that my office be notified at once so that we may evaluate the possible site. Thank you for this opportunity to comment upon this project.

Sincerely,

Larry Neal
Assistant State Archeologist

cc: Chickasaw National Recreational Area

LN:jah

X



Oklahoma State University

School of Health, Physical Education and Leisure Services

STILLWATER, OKLAHOMA, 74074
COLVIN PHYSICAL EDUCATION CENTER
(405) 624-5493

12/18/79

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 20 1979

Mr. Paul Wykert, Superintendent
Chickasaw National Recreation Area
P.O. Box 201
Sulphur, Ok. 73086

RE: Comments: Draft Environmental Statement
General Management Plan
Chickasaw National Recreation Area

Dear Mr. Wykert:

The following comments regarding the above mentioned plan are submitted for your consideration:

1. Page 7, paragraph (4). A mention of conditions of some sections of trails in the park seems to be in order. For example, the trail from the Bromide Springs area to the overlook is in a deteriorated condition in places. Switch backs have been cut across and erosion is evident. (this may be in the state of environment statement)

2. Page 8, B.1.a. #3. To the casual reader this is unclear. Park managers certainly will understand what is meant, but if there were situations where others would be reading this it needs to be clarified. It seems to read that exotics will be kept from their natural environments and that certainly is not the intent I am sure.

3. Page 9, b. Yes, the proposal for increased research needs strong backing and the determination of the natural resource base is of vital importance to the park manager.

4. Page 10, e. All proposals should be vigorously pursued. Both point and non-point pollution sources need to be identified and researched to determine what directions the N.P.S. management should take.

An aggressive thrust to move the Sulphur dumping grounds is in order. As well as working with the City of Sulphur to eliminate other pollution sources. Proper control of upstream watershed is a long documented and necessary practice for proper park management.

5. Page 11, g. The National Park Service should take all steps to insure mineral extraction does not detract from preservation of the natural, scenic and recreational values of Chickasaw National Recreation Area.

6. Page 13, C.2. The inclusion of Environmental Education as a proper function of Travertine Nature Center is strongly supported. My recommendation is to further the development of Environmental Education programs in addition to the normal park interpretive functions.

7. Page 13, C.4. The collection of fees for the Travertine District is supported. Even with the realization that the local residents have viewed what was Platt National Park as their "own park" the continuance of existing user fees and the institution of new entrance fees is supported.

8. Page 13, D. #2. The concept of greater activity numbers within present use levels is generally supported. However, the concept of greater utilization of existing parks as opposed to expansion of park opportunities by the provision of increased parklands is opposed. Greater utilization of existing parks will inevitably lead to many more management problems.

9. Page 15, 2.a. #3. It is my recommendation that in the Cold Springs campground the campsites that lie directly adjacent to the access road to Travertine Nature Center be eliminated. I personally have camped there and have seen a problem of transition from the campground walker to the road traffic. Also the campsites adjacent to the Travertine access road receive a relatively high volume of traffic noise that is not evident in the campsites further away from this road.

There is no doubt that the camping facilities in the Travertine District of Chickasaw N.R.A. are the finest in that area of the state and all efforts to maintain that quality must be made.

A site rotation plan might be developed for the campgrounds in Travertine District in addition to the seasonal closings that now occur.

No campsites should be added in the Travertine District now or in the future.

10. Page 17, paragraph 1. It is misleading to use a "site density standard" as the criteria for establishing numbers/acre for campsites. Site numbers need to be related to the features of the natural resource and these of course vary considerably. An acceptable standard for Rock Creek may not be acceptable for Cold Springs or for the campgrounds located in the Lake District.

11. Page 18, 2.c. #2 continued. It is unrealistic to relate to arbitrarily dividing the lake into three equal areas. Management of the lake and the portions open to each activity must be based on the condition of the resource as well as the human reaction to that condition. For example high speed boat use for either water skiing or fisherman travel is not appropriate in the cove or narrow areas of the lake. Shoreline erosion always occurs at an accelerated rate when this is allowed.

A total analysis of the lake is in order to determine which areas should be open for high speed use and which areas should be wake or speed limits.

12. Page 20, 4.a. The proposed visitor center is strongly supported. The existing transition or buffer between the City of Sulpher and the Park is not adequate. The area targeted for the visitor center would benefit both the City of Sulpher and the Chickasaw N.R.A.

13. Page 36. The plan to provide external parking is strongly supported. Often the thought is that people will not use a system for transportation. However, experience in other N.P.S. areas seems to indicate that they will.

14. Page 36, Paragraph #3. The provision of the bicycle trail is supported. However, to call it "experimental" is questionable especially when the cost is considered. My recommendation it not be termed experimental unless this is a way of freeing funds for that part of the project.

15. Page 36 paragraph 6. Again, the question, are standard densities an adequate measure for management?

General Comments:

The plan is basically sound. It is realistic and perhaps recognizes the local political implications.

The research functions definitely need to be implemented as quickly as possible. Hard data is needed to make wise management decisions.

The efforts toward upgrading surface and subsurface water conditions should be vigorously pursued. All levels of government in that area must realize their responsibilities toward elimination of all sources of water pollution.

As a suggestion, land application of park sewage effluent might be considered as an alternative. The Environmental Protection Agency has been actively researching this procedure and it would be appropriate to explore and research this possibility at Chickasaw N.R. A.

The research projects in the midwest have shown land application of non chemical containing effluent to be feasible and in fact highly economical.

I would be happy to share specific information about land application of effluent should you desire.

Thank you very much for allowing me this opportunity for comment.

Sincerely,



M. Allen Arnold
Outdoor Recreation Consultant

Hardware ★ ★ Kampout & Invalid Equipment ★ ★ Sporting Goods



Hicks Service, Inc.



300 West Muskogee
Phone (405) 622-2400
Sulphur, Okla. 73086

Dec. 10, 1979

CHICKASAW
NATIONAL RECREATION AREA
RECEIVED

DEC 12 1979

Mr. Paul Wykert, Sup't.
Chickasaw Nat'l. Rec. Area
Sulphur, Oklahoma 73086

Dear Paul,

After reading as much as possible, the brochure of the proposed changes and improvements of the Chickasaw National Recreation Area, I feel like this will be a great asset to the community as well as the Park.

You probably have in your files the changes of U.S. 177 Highway proposal suggested and signed by members of the Sulphur Chamber of Commerce several years ago. This was a public meeting of interested citizens of Sulphur.

The proposal had a first and second choice. The first choice was with an overpass. The second was to go around the East side of Sulphur and then back South.

C. D. Hicks

DEC 04 1979

December 3, 1979

Paul V. Wykert, Superintendent
United States Department of the Interior
National Park Service
Chickasaw National Recreation Area
Post Office Box 201
Sulphur, Oklahoma 73086

Dear Sir:

SUBJECT: Comments on D.E.I.S. - 79-59, US DOI National Park Service

Page ii - My comments are as follows:

- (a) Public or User Comments
- (b) Have comments under Interested Agencies, Organizations or Individuals.
If so, where is correspondence of early public involvement?

Page iii - Table of Contents

Summary (a) Subsection - Paragraph 3
The Area's Needs (Page 8, 11 and 12)

The draft E.I.S. does not provide on page 8, 11 or 12 any specific need for further development of the Chickasaw National Recreation Area in Oklahoma. In fact, it does not list one plant or animal species that are suffering from loss of habitat due to visitor capacity or oppression. It does however indicate the desire to intensify studying the area at large expenses to the taxpayers (Primarily Oklahomans) to see if potential diversification of outdoor recreational opportunities would attract more visitors. Page 13; ~~however, does~~ begins to give insight into the true proposal of the Draft E.I.S. Chickasaw National Recreation Area. Since the area does not provide sufficient population to benefit from local access by hiking and biking trails proposed adjacent to Rock Creek, D.O.I. hopes to attract more visitor use by giving better facilitation to water and land recreation including, water skiing, boating, fishing, swimming, camping and hunting. However, these benefits are to be provided only if new agreements can be negotiated between the National Park Service and the Oklahoma Department of Wildlife Conservation, Page 8. Pages 8 and 9, continues discussing Resource Management stating:

XIII

" (Hunting will not be permitted in Travertine District, nor around Buckhorn, The Point, Guy Sandy, Goddard Youth Camp, the dam, and other developed areas.) Such an agreement will include provisions that assure management in accord with National Park Service policies, for instance, excluding introduction of any exotic species or gross artificial manipulations of animal or plant species mosaics. Hunting seasons and closure areas will be according to State laws and regulations and subject to NPS approval.

#3. Employ programs to keep exotic fish species from moving upstream into natural environments.

The goal for hunting will be sustained-yield cropping of native species that have grown up in a natural environment on the land where hunted. The goal for fishing in Arbuckle Reservoir will be sustained-yield harvest of suitable fish types, without stocking except to introduce new species or to correct imbalances.

b. Proposals Related to Vegetation Management

There is uncertainty as to what the natural vegetative mosaics throughout the recreation area would be had there not been townsite development, grazing, exclusion of fire, and concentrated visitor use at various locations. Therefore the proposals are:

#1. Initiate research to reveal what the flora was at various periods (including the present) in different parts of the area. This will reveal what the "natural" compositions were that occurred in the late aboriginal period, and so allow determination of the successional stages that should be restored or preserved. Extraneous influences not present in the natural setting will also be determined (such as introduced grasses, drainage devices, animals introduced or extirpated, and the frequency and effect of fire).

#2. Establish experimental test areas to determine the effects of various manipulative techniques and observe and record the results for ultimate use in designing a program of resources management geared to the selected goals. Generally the resource type that will be selected will be that prevailing at the start of the historic period; however, in certain spots, such as around public use areas, other vegetational situations may be selected.

#3. Discontinue agriculture throughout the area and allow the vegetation to succeed to a more nearly natural state. Where wildlife cropping has been practiced under permit with the Oklahoma Department of Wildlife Conservation, consideration will be given to gradually phasing out such cropping to minimize disruption of any species dependent upon it.

c. Proposals Related to Faunal Management

#1. Perpetuate native species, remove exotics to the extent practical, and introduce none.

Allow animals to interact with their habitat in natural settings. An exception would be the limited indoor display of live specimens at Travertine Nature Center.

#2. Provide special attention to unusual species for the area, including those threatened regionally (none are on Federal lists of threatened and endangered species).

#3. Initiate studies to determine extirpated species and the feasibility of reintroducing any to the free-roaming state; the pronghorn is one such example. "

This indicates to me a complete change in the nature of the area with numerous modifications to the natural geologic conditions as indicated throughout the Draft E.I.S. In addition, one of the purposes will be to eliminate any penned exotic animals which presently act to serve children of the area information as for example: the Bison who once roamed free throughout all of Oklahoma. As an Indian I object to this!

Another very lacking part of the Draft E.I.S. is the determination of the adverse effect the proposal would have upon the conservation of energy. Page 92 seems to indicate a decline in the attractiveness of the area; however, one very essential factor has been omitted. There is no distinction made of distances traveled to visit the area. And, should the purpose of the Chickasaw National Recreation Area be to increase the attractiveness to visitors who drive longer distances, it could drastically increase energy consumption.

Another very lacking part of the Draft E.I.S. is that it does not indicate any degree of significance to the known nineteen archaeological sites. This is also coupled with the insinuation that park headquarters could qualify as a National Historic Site; however, plans call for its relocation; and no mitigation of adverse impact measures have been given.

Additionally, it is my understanding that US 177 was situated through the area prior to the proposal of the area becoming the Chickasaw National Recreation area (presently and/or Platt National Park); and, that this prevents the Fees Proposals, Page 13, under current law. If this is true why was this very important issue

not addressed on Page 25 which states:

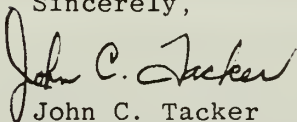
"Circulation by vehicle will remain as now until US 177 is relocated. A corridor for a potential overpass to accomplish this relocation is designated in the Cold Springs area so that development will not foreclose this option. However, other alternatives will be considered. When the relocation option has been selected, environmental analysis will be required".

The option referred too, is the proposed bicycle/hiking trail to Buckhorn from the Bromide Springs area. This appears to be a conceived idea to fulfill the purpose of relocating US 177 in order to initiate the fees proposal! Since, present visitors are protected by a 25 MPH speed limit it does not appear to be sufficient justification for the large expenditure of public funds to relocate US 177. Additionally, a commitment of funds or a funding agreement between ODOT and DOI should have been included in the Draft EIS. This poses a very interesting aspect to NEPA, in that to construct such projects as referred to in the Draft EIS require a Section 4(f) determination of no prudent or feasible alternative to the use of such lands. As a private citizen I do not see how US 177 could be relocated without still passing through park lands to serve its present traffic desire corridor!

I see such a proposal as a responsibility of D.O.I. and evidently from the large Government appropriations supporting your personnel bureaucracy funds would not be hard to find to relocate US 177 if you received ODOTS permission and agreed to acceptable standards of construction.

In summary, I love wildlife, I like to see beautiful plants in their natural state and I think the Chickasaw's deserve their tribute as passed by Public Law 94-235; however, I see no attempt at addressing the issues of importance in the Draft E.I.S. and request that a new study and Draft E.I.S. be circulated.

Sincerely,



John C. Tacker
528 Howard
Del City, Oklahoma 73115

CC: Senator David Boren
Secretary, Department of the Interior

Public Comments and National Park Service Response

I. United States Department of Agriculture-Soil Conservation Service:

Comment: "The draft environmental impact statement clearly sets forth anticipated effects of the plan and adequately reflects the magnitude of potential impacts. The impacts upon prime farmland and other agricultural interests will be insignificant. We concur in the proposals and findings of the management plan and draft EIS and appreciate the opportunity to review the documents."

Response: None

II. Department of Housing and Urban Development:

Comment: ". . . it has been determined that the Department will not have comments on this statement."

Response: None

III. United States Department of the Interior:

A. Bureau of Land Management

Comment: "We do not have comments on the environmental statement and the general management plan for the Chickasaw National Recreation Area."

Response: None

B. Bureau of Mines

Comment: "Two 8-inch crude oil pipelines owned by the Cherokee Pipeline Company may cross the national recreation area south of Sulphur. If so, we suggest that the situation be clarified in the final statement and plan. Otherwise, we have no objection to either document."

Response: The pipelines have been abandoned and, in 1975, most of the pipe removed except that underneath the Buckhorn arm of Lake of the Arbuckles.

C. Fish and Wildlife Service

I. Comment: "Care should be taken in any attempts to reintroduce endemic animal species which have been extirpated through past human activities. . . ." "Before

such a venture, we would suggest consultation with the Oklahoma Department of Wildlife Conservation, the U.S. Fish and Wildlife Service, and other entities which may have expertise in this area."

Response: Research and consultation, such as suggested, will precede any attempt at reintroduction.

2. Comment: "From a statement on page 57 regarding the 'normal flow' of Travertine Creek, it appears that work on the proposed flood diversion channel at the Travertine Nature Center may come under the jurisdiction of the U.S. Corps of Engineers' dredge and fill permit program (404)."

Response: The Corps of Engineers was sent copies of the draft environmental statement, but did not furnish comments. The Tulsa District Office of the Corps of Engineers has been contacted and indicated by letter of February 1, 1980, that the project falls within the scope of the nationwide permit. If deviations from that permit occur, the Corps of Engineers will be consulted to determine whether an individual permit is required. There is no intention to place dredge or fill material in Travertine Creek.

3. Comment: "In its report of November 20, 1959, on the Arbuckle Project, the Fish and Wildlife Service recommended that 660 acres of project land on the Big Sandy Creek arm, plus 615 acres of adjacent land to be acquired specifically to replace wildlife habitat inundated by Arbuckle Reservoir, be made available to the ODWC for wildlife management purposes in accordance with the terms of a General Plan as provided for in the Fish and Wildlife Coordination Act. Following project land acquisition, a General Plan for Use of Lands for Wildlife Conservation and Management-Arbuckle Reservoir, Oklahoma was executed between the Department of the Interior and the ODWC on April 13, 1967, and amended on March 17, 1969. It is our contention that the lands designated in the General Plan were set aside specifically to mitigate the loss of wildlife habitat and hunting losses resulting from the Arbuckle Project. It is unclear whether the General Plan and related use of Arbuckle Project lands legally is still in effect or whether it was rendered void along with the former management agreement between the Bureau of Reclamation and the ODWC by legislation establishing the Chickasaw NRA. The DES should address this issue and attempt to clear up the possible conflict in land management."

Response: "The Act of March 17, 1976 (80 Stat. 235), established the Chickasaw National Recreation Area, which includes Arbuckle Reservoir and lands adjacent thereto. With this act, the National Park Service assumed primary responsibility for public recreational use and management of available land and water areas of the Chickasaw National Recreation Area, but in such a manner so as not to interfere with the primary purpose of the project as set forth in the Act of August 24, 1962 (76 Stat. 395)." The above is quoted directly from the March 31, 1978 Memorandum of Agreement between the Bureau of Reclamation (now Water and Power Resources Service) and the National Park Service for the Administration of the Arbuckle Reservoir Section of the Chickasaw National Recreation Area for public recreation use. A Memorandum of Agreement for the Management of Game and Fish between the Oklahoma Department of Wildlife Conservation and the Chickasaw National Recreation Area was executed August 22, 1979. Thus, the lands in the Guy Sandy arm are administered by the National Park Service and the Service and the Oklahoma Department of Wildlife Conservation has agreed to cooperate in the formulation and application of plans and programs to guide the management of wildlife and fish upon and in lands and waters administered by the Service.

The lands will remain as wildlife habitat and be open to hunting. Any developments proposed thereon which will be counterproductive of such uses will be discussed and coordinated with the State Agency. The lands will gradually be returned to natural habitat for native wildlife species and monitoring of any changes to effect this return will take place. Section 3 of the Act of March 17, 1976, 16 U.S.C. - 460 hh-2 requires that the areas' lands and waters to be open to hunting and fishing in accordance with applicable Federal and State laws. The section further states that the Secretary may designate periods and zones where no hunting or fishing will be permitted for various listed reasons. Except in emergencies, any of these periods or zones will be put into effect only after consultation with the appropriate State agency, taken to mean the Oklahoma Department of Wildlife Conservation.

The National Park Service will allow hunting not only on the 1,000 some acres mentioned in the General Plan but also an additional 1,000 some acres in the Rock Creek Corridor. This land had not previously been open to public hunting and will effectively almost double the amount of public hunting land within the recreation area.

Description of the Proposal

4. Comment: "Page 8, I.B.I.a.#2. The last sentence under #2 regarding fish and wildlife statutes should include provision for compliance with Federal as well as State mandates if waterfowl hunting is to be allowed."

Response: A sentence will be added to the final environmental statement on page 8 to read: "In the case of waterfowl hunting, compliance with Federal and State mandates will be provided."

5. Comment: "Page 9, I.B.I.b.#3. Before the use of wildlife food plots is discontinued, consideration should be given to the history of the Arbuckle Project and the original purpose for which lands were set aside as specified in the General Plan for Use of Lands for Wildlife Conservation and Management-Arbuckle Reservoir, dated April 13, 1967, and amended on March 17, 1969."

Response: See response to the third comment.

6. Comment: "Page 11, I.B.I.g.#3. We suggest that a #3 be added to this list of requirements for mineral exploitation inside the boundaries of the Chickasaw NRA to require the restoration of lands as nearly as possible to their pre-exploration conditions of contour and vegetation."

Response: Item #2 has been changed as follows: "Any activities in the NRA in the exercise of rights to oil and gas not owned by the United States will be in accordance with 36 CFR Part 9, Subpart B. These regulations are designed to prevent or minimize damage to the environment and to insure to the extent feasible that all units of the National Park System are left unimpaired for the enjoyment of future generations."

7. Comment: "Page 19, I.D.2.c.#4. Determination of a desirable number of hunters would depend to a large extent on the species being sought and probably should be coordinated with the ODWC."

Response: This certainly will be done.

8. Comment: "Pages 20 and 25, I.D.4.a. The proposed flood diversion channel at the Travertine Nature Center could provide opportunities for fish and wildlife enhancement. Possibilities include the development of a controlled marsh environment and/or a small pond fishery. At any rate, we suggest that care be taken to disturb the least practicable

amount of vegetation in the excavation. In revegetating the channel, consideration should be given to plant species of value to fish and wildlife including native grasses, forbs, legumes, and shrubs."

Response: Travertine Creek, at the Nature Center, is subject to intermittent flow, dependent upon Buffalo and Antelope Springs. For the last several years, the springs have ceased to flow for 3-4 months during the winter. The channel will be constructed with the least practicable disturbance to vegetation and will be revegetated with native species. The channel will resemble the natural swale it will follow. Flood waters will flow into the channel only when the creek waters reach within three feet of the top of the arch beneath the building.

9. Comment: "Page 25, I.D.4.b. Alteration of wildlife habitat will be minimized by routing the proposed bicycle and hiking trails along the ridges. We suggest, however, that valuable habitat components such as den or nest trees, burrows, rock outcroppings, and established game trails be avoided."

Response: The bike trail will be located on both the ridges and along the creek, dependent upon terrain features and construction standards. Habitat components will be avoided whenever possible in the alignment of both the hiking and bicycle trails. This is addressed on page 107, in the Mitigating Measures section.

10. Comment: "Page 29, I.D.4.c. In removing stumps and debris from swimming areas, be cognizant of the value of these materials as fish habitat."

Response: The safety and health of visitors is the primary objective of the proposed removal. Active recreational pursuits at swimming beaches probably is not conducive to fish habitat.

Description of the Environment

1. Comment "Pages 60-80, II.D.1.c. We applaud your efforts at documenting water pollution sources and effecting corrective measures."

Response: None

12. Comment: "Page 84, II.D.2.b. The timber rattlesnake (Crotalus horridus) probably should be added to the list of poisonous snakes occurring on the area."

Response: There is no reported occurrence of the timber rattlesnake in the area.

13. Comment: "Page 85, II.D.2.c. We expect that both the bald eagle (Haliaeetus leucocephalus) and peregrine falcon (Falco peregrinus anatum) could occur in the area at least as migrants or transients."

Response: In the final environmental statement the following will be added to c., Page 85: "It is expected that the bald eagle (Haliaeetus leucocephalus) and the peregrine falcon (Falco peregrinus anatum) could occur in the area at least as migrants or transients. Park records show that since 1926 there have been no sightings of the peregrine falcon and three of the bald eagle, (2-14-72, 2-1-78, 12-4-78)." Also on Page 99 - a new sentence after 5th paragraph will be added: "Because of limited sighting and the minimal development planned, no effect is expected on threatened or endangered species."

The Environmental Impact of the Proposed Action

14. Comment: "Page 99, III.A.2. Mention is made of transporting sewage effluent out of the watershed. Although not impacting the Arbuckle Lake watershed, will this action adversely affect other areas? At least a sentence or so should be added to adequately treat this potential concern."

Response: Arbuckle Lake is a municipal water supply. The sewage treatment plant, while located within the 1976 boundary extension, is the responsibility of the City of Sulphur. Upgrading of the plant is underway. The EPA is involved in the renovation project, as are Oklahoma Public Health officials.

15. Comment: "Page 99, III.B. More detailed and specific information is needed concerning impacts on both aquatic and terrestrial habitats and resources associated with construction of the Travertine Creek overflow channel."

Response: This is a very minor project involving 0.7 acre. It consists of enlarging slightly an existing swale to allow flood waters, should they ever again occur, to flow around the building - rather than into it - when the existing archway beneath the building can no longer handle the flow. The impact on aquatic and terrestrial habitats will be negligible.

16. Comment: "BIBLIOGRAPHY, page 138. In scanning the bibliography of the DES, we questioned the citation crediting authorship of a research proposal to Robert S. Kerr."

Response: The citation has been corrected. Robert S. Kerr referenced the Robert S. Kerr Environmental Research Laboratory.

D. Water and Power Resources Service

1. Comment: "In compliance with the new Council on Environmental Quality Regulation (40 CFR, Parts 1500-1508, November 29, 1978), it appears that the revised format for environmental statements should be considered in organizing the statement."

Response: Planning and the development of the draft statement preceded the new guidelines. To change in the middle of the process would be both expensive and time consuming. Conversion was considered and rejected for those reasons.

2. Comment: "Page 15.--Regarding the parking congestion problem, we suggest this be further clarified. It appears that it would be appropriate to proceed with developing studies to resolve the parking problem instead of waiting for the problem to reoccur."

Response: Chickasaw NRA has experienced a drop in visitation in the past years. It may be premature to expect the problems of parking congestion to occur within new visitation figures. A circulation system study, at this time, would be further complicated by unknown utilization of the proposed visitor center and lack of an active project on moving U.S. 177, a definite factor in any circulation study.

3. Comment: "Pages 15, 23, 32, 33, 50, and throughout.--The proper name of the lake is the Lake of the Arbuckles and should be used in lieu of Arbuckle Lake or Arbuckle Reservoir."

Response: Highway signs on the interstate and road maps indicate both Arbuckle Lake and Arbuckle Reservoir. The lake is most commonly called Arbuckle Lake. The Chickasaw National Recreation Area brochure (handout) does call it Lake of the Arbuckles.

4. Comment: "Page 17-18.--We suggest the boating carrying capacity calculations should be reevaluated. (See detailed comments regarding same subject in the land management plan.)

Detailed Comments: We believe the boating capacity analysis should be reexamined in several respects. We do not agree

that the lake surface should be arbitrarily divided equally among the three types of boating use. This is not only inconsistent with the varying "areas per boat" standards cited, but it also fails to consider the varying "turnover" rates and relative activity distribution for the three activities.

While turnover rate was considered in determining daily boat launching capacity, this capacity was erroneously based on parking spaces instead of boat launching lanes. It is true that inadequate parking areas would prevent full boat ramp capacity from being used; however, actual boat access to a lake is governed by the number of boat launching lanes. Two daily launch standards are widely accepted. Based on a "12-hour" day, a maximum of 36 boats could be launched and retrieved per lane (based on 10 minutes per launch and retrieval) or a maximum of 40 launches (based on 9 minutes). These maximum standards are not affected by turnover rate. A secondary consideration, when relating boat launching capacity to lake surface capacity, is docking space. If docking space is available, boat launching capacity would have to be reduced accordingly:

Boats accessing lake from docks + boats accessing lake from launch lanes = total boats on lake.

It appears that no adjustment factor was included in the analysis to reflect what portion of the lake surface is "suitable" for the three boating activities. Normally, the entire lake surface is not suitable for each of these three activities because of size, wind and wave action, water depth, proximity to the shoreline, obstruction, shoreline configuration, etc.

Another adjustment factor which apparently was not considered relates to daily use patterns by activity. Boat fishing activity normally is high in the early morning and evening, while boating and water-skiing generally peak out during mid-afternoon. As a result, all of the available lake surface is not used to capacity by each activity during each hour of the assumed "12-hour" recreation day.

As was alluded to in the plan, another important adjustment factor is often required because the "summer pool" of a lake/reservoir is less than the normal "conservation pool." However, the reduced boating capacity that would be associated with a reduced lake surface area would not be directly proportional, as is stated in the narrative, due to the change in the "suitability factor" at lower elevations. For example, under a severe drawdown situation, an elevation would eventually be reached where power boating and

water-skiing would no longer be safe because of inadequate water depth even though there still might be several hundred surface acres of water. Nevertheless, since the Lake of the Arbuckles has historically been near conservation pool elevation 872.0 between May 1 and September 1, the "conservation pool" adjustment factor is not applicable."

Response: It is not proposed to equally divide the lake among three types of boating use. This was only one method of obtaining a maximum number of boats (of any type) on the lake at one time. The parking capacity was used because it effectively limits launch capacity. No docking space is available or proposed and management has delineated an area "suitable" for water skiing. The purpose of this section, in effect, is to propose an upper limit of boats on the lake at one time and leave the apportionment of uses to the site managers, perhaps using some examples given in the carrying capacity section. The suggested capacity limits will be refined and perhaps modified with management experience.

5. Comment: "Page 17.--The agency "Bureau of Outdoor Recreation" should be changed to read 'Heritage Conservation and Recreation Service'."

Response: The "BOR" was used in terms of a citation of a previously published document.

6. Comment: "Page 18 and throughout.--References to the Bureau of Reclamation should be changed to read 'Water and Power Resources Service'."

Response: This will be done where practicable or by addendum.

7. Comment: "Page 92.--It is suggested that visitor-use statistics be rechecked for accuracy. See detailed comments below:

Regarding use statistics, we suggest they be rechecked. Visitation figures reported to us by National Park Service on annual WPRS recreation inventories differ significantly (at least for 1975-1978) from those appearing on page 38:

<u>WPRS Summary</u>	<u>Year</u>	<u>Visitor Days *</u>	
	1975	206,026	1
	1976	200,271	
	1977	183,382	
	1978	147,569	

*One person participating in one or more activities at a site during all or any portion of one calendar day."

Response: National Park Service methods of computing use figures are quite different from those required in the WPRS Recreation Inventory. Comparisons between the two methods are meaningless. Attempts to resolve the discrepancy have not been successful. The use figures submitted by Chickasaw to the Water and Power Resources Service for their annual recreation and wildlife summary form do not match those that are later published in the WPRS annual "Utilization of Recreation Areas on Reclamation Projects."

8. Comment: "Page 45.--The date of the cooperative agreement with WPRS (Bureau of Reclamation) should be March 31, 1978."

Response: An apparent error. It will be corrected from 3/1/78 to 3/31/78.

9. Comment: "Page 55.--The listing of data on this page has 500-year flood control contour of elevation 885.85. We are not aware of where the elevation was acquired, but this should be checked since it is above top of flood pool elevation."

Response: Page 55 of the DES contains a misprint. Elevation 885.85 should read the 100-year flood contour as it does on page 27 of the GMP. This estimated figure was obtained from the Army Corps of Engineers in order for the Park Service to comply with Executive Orders 11988 and 11990 regarding use of floodplains. This misprint will be corrected in the final environmental statement.

IV. U.S. Department of Transportation, Federal Highway Administration:

Comment: "We are in agreement with the discussion within the Draft Environmental Impact Statement which deals with the possible relocation of US-177 and the concerns which need to be addressed should this action be implemented."

Response: None

V. Environmental Protection Agency:

Comment: "On . . . page 58 of the Draft Environmental Impact Statement, it is mentioned that there are spring developments where water is pumped and then stored for consumption by visitors to the park. Such an arrangement would be classified as a non-community public water system if it serves an average of at least 25 individuals daily, at least 60 days out of the year. All non-community public water systems were required by the Safe Drinking Water Act and State regulations to begin sampling for coliform bacteria and nitrate prior to June 24, 1979. The supplies may also be required to be sampled daily for turbidity depending on whether the systems are defined as surface or ground water systems. Shallow and subsurface springs and infiltration galleries at or below ground level are considered surface supplies by EPA since surface contamination can render such a system an unsafe source We would like to see a discussion of the results of sampling in the Final Statement."

Response: There is only one spring, Black Sulphur, which is pumped and then stored for public consumption. In compliance with the Safe Drinking Water Act as a non-community public water system it is sampled for both coliform bacteria and nitrate. The Black Sulphur Spring is used by an average of five (or less) persons per day year round. It is considered a ground water system, with a demand pump from a cased-well source. Nitrates (NO_3) are tested on a three-year cycle, maximum allowable level is 10 mg/l. The March, 1975 sample for NO_3 was 0.044 mg/l and the September, 1978 sample for NO_3 was 0.02 mg/l. Black Sulphur is chlorinated (ppm Cl_2 @ 0.1) and a complete bacteriological survey is done every two weeks. Any total coliform reading of MF 1.0 requires a retake and retest of sample. Regular samples tested by the Oklahoma State Department of Health over the past five years have never had a total coliform reading meeting or exceeding this value.

Medicine and Bromide Springs have been pumped in the past, although they have not been utilized in some years and there are no plans for doing so. Jack Diamond and Pavilion Springs are artesian and are approved systems, tested and sampled and in compliance with state and federal health requirements.

VI. State of Oklahoma Department of Transportation:

Comment: "The DEIS discusses three possibilities with regard to US 177 in the area studied.

1. US 177 to remain on its present alignment.
2. US 177 to be constructed on a new alignment with an overpass spanning the park area.
3. US 177 to be constructed on new alignment to the east, totally bypassing the park lands.

The DEIS discussed how each of these alternatives may affect the park proper; however, impacts within the park constitute a very small percentage of the total affect of any action associated with US 177 in this area. Other impacts of concern with regard to US 177 would necessarily incorporate such factors as the number of families to be relocated, noise and air quality impacts of routing the highway through residential neighborhoods, the potential isolation of the State Veterans Hospital, excessive and environmental effects of highway construction which are normal considerations in the EIS process.

Although each of the alternates are discussed in very general terms, final alternate selection must entail a full analysis of all impacts associated with each. This Department has performed some preliminary analyses necessary for early project planning, but formal project development procedures have not been initiated. We would recommend that each alternate presented in the DEIS be continued so as to not preclude future options with regard to the highway within the broader scope of potential impact analyses required by the National Environmental Policy Act, or other related legislation, and the corresponding implementing regulations.

We realize the burden this places upon long range planning relative to the Chickasaw National Recreation Area, and will lend our assistance, as far as practicable, towards minimizing this problem. However, since we have no active plan for improvement of this segment of US 177, we cannot provide input relative to the final location at this time."

Response: The effects noted in the Chickasaw draft environmental statement will be useful in the preparation of an environmental assessment on the alternate selection process and in a Section 4 (f) statement that may be required.

VII. Oklahoma Department of Wildlife Conservation:

1. Comment: "In general, we agree with the comments provided by the Fish and Wildlife Service We specifically have a problem with the proposed management plans for the present public hunting area. This area was set up as mitigation for hunting and fishing losses through

creation of the reservoir. Without the ability to manipulate the habitat and utilize food plots, the areas mitigation value is lost. Mitigation was a required part of the original project and is still needed."

Response: See response to Comment #3, Fish and Wildlife Service.

2. Comment: "Page 8, B. RESOURCE MANAGEMENT, I.a. Proposals Related to Hunting and Fishing Management. Although the legislation of 1976 cancelled the management agreement between the Water and Power Resource Service (formerly the Bureau of Reclamation) and the Oklahoma Department of Wildlife Conservation, we feel the General Plan (of 4-13-67 and amended 3-17-69) which provided approximately 1,275 acres to mitigate wildlife losses resulting from the construction of the dam and reservoir should be in effect for the life of the project, which construction was made possible by the agreement drafted in accordance with the Fish and Wildlife Coordination Act. (Page 19, #4 addresses small game and deer hunting plan, involving approximately 1,000 acres.)"

Response: The National Park Service (NPS) intends to fulfill the terms of an August 22, 1979 Memorandum of Agreement with the Oklahoma Department of Wildlife Conservation (ODWC) wherein it is stated:

"It is mutually agreed that joint and cooperative endeavors between the Department (ODWC) and the Service (NPS) will contribute substantially toward promoting and providing maximum recreation, hunting and fishing benefits at Chickasaw National Recreation Area for the best interests of the people of Oklahoma and of the United States."

3. Comments: "Page 8, B.I.a.#3 This item appears to be contradictory as it seeks to "keep exotic fish species from moving upstream" but, at the same time, provides for the introduction of "new species" (top of page 9) which, in our vocabulary, mean exotic fish. Exotic fish are present in the Lake of the Arbuckles, including such species as walleye, Northern pike, spotted bass, carp, and red ear sunfish. Any goals for fishery management will be difficult to attain, as long as water quality problems persist as described on pages 60-62."

Response: Exotic species, by definition, are those plants and animals not naturally occurring in the ecosystem in which they are presently found. In accordance with Executive Order 11987 of May 1977, the National Park Service is directed to restrict

the release, escape or establishment of such species. Therefore, the objective is to keep exotic fish species in the Lake of the Arbuckles, a man-made environment where they have been introduced, and physically prevent them from moving upstream into the natural stream environment where they do not naturally occur. The introduction of "new species" referred to on page 9 may include exotic species when referring to the Lake of the Arbuckles, as it is a man-made environment. The emphasis is to distinguish between the fishery management of the natural environment or streams, and the man-made environment in the lake.

Renovation of sewer lines that traverse the Recreation Area are underway by the City of Sulphur and improvements projects in the upstream watershed supplying the lake have been undertaken by the Murray County Agricultural Stabilization and Conservation Committee.

4. Comment: "Page 9, b. Proposals Related to Vegetation Management" In the pursuit of the restoration and preservation of a "natural environment", the lake itself is the most obvious extraneous influence, as it is a man-made impoundment which has drastically changed the ecology of the area, both in the terrestrial and aquatic ecosystems.

The following terms should be clearly defined:

- "natural" as used on page 9,b,1.
- "historical" as used on page 9,b,2.
- "natural setting" as used on page 9,c,1.
- "natural mosaics" as used on page 99.
- second paragraph from bottom of page."

Response: Definitions:

- "natural" - largely unaltered by human activity.
- "historic period" - period of time at the end of the aboriginal period and before the white man impacted the area.
- "natural setting" - habitat largely unaltered by human activity.
- "natural mosaics" - composition of ecological groupings of plants and animals according to factors largely unaltered by human activities.

5. Comment: "Page 9,b.#3. Phasing out of cropping intended for optimizing wild game populations will result in an overall decline in productivity at various trophic levels, affecting both game and nongame organisms, because food availability is one of the limiting factors. This objective seems

aimed at phasing out hunting by phasing out game species dependent on food plots"

Response: Emphatically and categorically, there is no intention nor objective to phase out hunting. The hunting of native species in a natural habitat is the long-term objective.

6. Comment: "Page 9,c.#1. Proposals Related to Faunal Management We concur in this philosophy but the small size of the project and the extensive ecological changes which have taken place would make it difficult, if not impossible, to determine what a "natural setting" is (at least, one free of human influence)."

Response: Either left alone or perhaps manipulated to encourage succession, lands can be made to reclaim themselves regardless of past use.

7. Comment: "Page 9,c.#3. The ecology of the area has undergone a gradual but drastic change in the past 200 years. It has been transformed from a mixed grass prairie interspersed with forested stream courses to an agrarian dominated community (see page 68). Settlers erected fences, plowed fields, planted crops, built roads, railways and highways, dammed streams, etc. Prior to such development, the prehistoric prairie supported roaming herds of the American bison, American elk and pronghorn antelope. These large herbivores maintained an equilibrium between themselves and their natural predators. Their migration movements were the result of seasonal climatic changes and range conditions. The habitat that supported these ungulates no longer exists; without it, reintroduction of the pronghorn antelope or any other former range animal would be a fruitless and futile effort."

Response: The feasibility of any reintroduction program would be coordinated with the U.S. Fish and Wildlife Service and the Oklahoma Department of Wildlife Conservation.

8. Comment: Page 19,#4. Proposals Related to Rock Creek Corridor Carrying Capacity We do not recommend concentrating hunters to a density of 10 acres per hunter. This not only degrades the quality of the hunting experience but it could be hazardous. We recommend on our Game Management Areas a density of 1 hunter per 80 acres of habitat for big game and 40 acres for small game, which may vary with type of terrain and cover."

Response: The objective as stated in #4, page 19 is to provide sufficient entry points and parking facilities for use of the

area. The parking areas will also serve visitors to the area in non-hunting or waterfowl hunting periods. As the differences between the referenced rate of 10 acres/hunter and your recommendation of 40-80 acres/hunter is large, it may be necessary to close a portion of the parking areas during hunting seasons as not to overload the area. This will be coordinated with the Oklahoma Department of Wildlife Conservation.

9. Comment: "Page 60,c. Water Quality The presentation on Water Quality is excellent. The problems outlined will be a major obstacle in the implementation of fishery management proposals and, once again, provide evidence of human impacts on the aquatic environment."

Response: None

10. Comment: "Page 75, Table 22 Title should read 'Water Quality Data. . . .' instead of 'Quality date. . . .'"

Response: The referenced report titled material "Quality Data." The typographical error will be corrected.

11. Comment: "Page 84,c. Fauna (Biological Resources) The list of species is incomplete, vague and the use of scientific names is inconsistent. For example: lists 'catfish' and 'bullhead' which is also a catfish. It lists unwanted fish such as carp and carpsucker, while omitting important sport species such as the walleye and spotted bass. Scientific names should be used for all species or none.

The nearest known self-supporting pronghorn antelope herd in the state is more than 200 miles northwest of Sulphur, in Ellis County.

Is 'Louisiana whitetail deer' a distinct variety of deer in the project area? We are not aware of this particular sub-species occurring in Oklahoma."

Response: The scientific names were used for three species which may not be familiar to the majority of readers. Actual species checklists (with scientific names) of those expected and/or sighted within Chickasaw are available at the park. The walleye, a type of perch, will be added to the final statement.

The information on the pronghorn will be revised to read: Pronghorn (antelope) were once common to the area, but are not presently found closer than 200 miles to the northwest.

The Louisiana whitetail deer will be changed to whitetail deer.

12. Comment: "Page 85,c. Threatened and Endangered Species Bald eagles have been sighted in central Oklahoma on various occasions. Whooping cranes migrate through central Oklahoma, making brief stops in the state."

Response: See response to 13. Comment, Fish and Wildlife Service. The whooping crane flyway extends through the central portion of the state, however, Chickasaw NRA does not provide desirable habitat for this species and they have not been sighted in the area.

13. Comment: "Page 99,b. Impacts on Biologic Resources, 3rd paragraph This objective seems aimed at phasing out hunting by phasing out game species dependent on food plots. As the animals dependent on those crops are expected to decline, so will hunting opportunities decline, resulting in a degradation of the outdoor experience and a certain decline in visitation to the area during a time (fall and winter) when there is virtually no other outdoor recreation activity."

Response: See response to 5. Comment above.

VIII. Oklahoma Tourism and Recreation Department:

Comment: "The development concepts presented in the draft environmental statement are sound and thorough and I wish you every success in achieving full implementation of the program."

Response: None

IX. Oklahoma Department of Economic and Community Affairs (State Grant-in-Aid-Clearinghouse):

Comment: "A review of the environmental assessment . . . shows no adverse environmental impact is anticipated."

Response: None

X. Oklahoma Archaeological Survey:

Comment: "The project does not take place on a known archeological site nor does it appear to be in a location likely to contain such a site."

Response: None

XI. M. Allen Arnold, Outdoor Recreation Consultant:

1. Comment: "Page 7, paragraph (4). A mention of conditions of some sections of trails in the park seems to be in order. For example, the trail from the Bromide Springs area to the overlook is in a deteriorated condition in places. Switch backs have been cut across and erosion is evident. (this may be in the state of environment statement)"

Response: Such deterioration can and will be corrected with programmed operating funds.

2. Comment: "Page 8, B.I.a.#3. To the casual reader this is unclear. Park managers certainly will understand what is meant, but if there were situations where others would be reading this it needs to be clarified. It seems to read that exotics will be kept from their natural environments and that certainly is not the intent I am sure."

Response: See response to 3. Comment, Oklahoma Department of Wildlife Conservation.

3. Comment: "Page 9,b. Yes, the proposal for increased research needs strong backing and the determination of the natural resource base is of vital importance to the park manager."

Response: Agree

4. Comment: "Page 10,e. All proposals should be vigorously pursued. Both point and non-point pollution sources need to be identified and researched to determine what directions the N.P.S. management should take.

An aggressive thrust to move the Sulphur dumping grounds is in order. As well as working with the City of Sulphur to eliminate other pollution sources. Proper control of upstream watershed is a long documented and necessary practice for proper park management."

Response: Agree

5. Comment: "Page 11, g. The National Park Service should take all steps to insure mineral extraction does not detract from preservation of the natural, scenic and recreational values of Chickasaw National Recreation Area."

Response: See response to 6. Comment, Fish and Wildlife Service.

6. Comment: "Page 13, C.2. The inclusion of Environmental Education as a proper function of Travertine Nature Center is strongly supported. My recommendation is to further the development of Environmental Education programs in addition to the normal park interpretive functions."

Response: Within budgetary constraints, this will be done.

7. Comment: "Page 13, C.4. The collection of fees for the Travertine District is supported. Even with the realization that the local residents have viewed what was Platt National Park as their 'own park' the continuance of existing user fees and the institution of new entrance fees is supported."

Response: None

8. Comment: "Page 13, D.#2. The concept of greater activity numbers within present use levels is generally supported. However, the concept of greater utilization of existing parks as opposed to expansion of park opportunities by the provision of increased parklands is opposed. Greater utilization of existing parks will inevitably lead to many more management problems."

Response: "Offering new facilities in terms of additional activities within present use levels rather than as a means to increase capacity" means renovated comfort stations, pavilions for inclement weather-use by picnickers, bike and hiking trails and similar improvements. One of the purposes of the plan is to provide a higher quality of visitor experience.

9. Comment: "Page 15, 2.a.#3. It is my recommendation that in the Cold Springs campground the campsites that lie directly adjacent to the access road to Travertine Nature Center be eliminated. I personally have camped there and have seen a problem of transition from the campground walker to the road traffic. Also the campsites adjacent to the Travertine access road receive a relatively high volume of traffic noise that is not evident in the campsites further away from this road.

There is no doubt that the camping facilities in the Travertine District of Chickasaw N.R.A. are the finest in that area of the state and all efforts to maintain that quality must be made.

A site rotation plan might be developed for the campgrounds in Travertine District in addition to the seasonal closings that now occur.

No campsites should be added in the Travertine District now or in the future."

Response: The possibility of a one-way road system past Cold Springs Campground along with the removal of some campsites may alleviate the traffic problem. Campground renovation by individual sites is an ongoing project. No additional campsites are foreseen for the Travertine District.

10. Comment: "Page 17, paragraph 1. It is misleading to use a 'site density standard' as the criteria for establishing numbers/acre for campsites. Site numbers need to be related to the features of the natural resource and these of course vary considerably. An acceptable standard for Rock Creek may not be acceptable for Cold Springs or for the campgrounds located in the Lake District."

Response: The "optimum" capacities cited in the Carrying Capacity section of the DES were selected from a suggested range of capacities presented in the referenced document. The capacities selected take into account various factors influencing each of the activities discussed. The capacities proposed are of a basic nature; maintenance and management practices may differ between area, according to their individual need. Also, adjustments will be made during final comprehensive design to best accommodate specific terrain factors.

11. Comment: "Page 18, 2.c. #2 continued. It is unrealistic to relate to arbitrarily dividing the lake into three equal areas. Management of the lake and the portions open to each activity must be based on the condition of the resource as well as the human reaction to that condition. For example, high speed boat use for either water skiing or fisherman travel is not appropriate in the cove or narrow areas of the lake. Shoreline erosion always occurs at an accelerated rate when this is allowed.

A total analysis of the lake is in order to determine which areas should be open for high speed use and which areas should be wake or speed limits."

Response: See response to Water and Power Resources Service, Comment #4.

12. Comment: "Page 20, 4.a. The proposed visitor center is strongly supported. The existing transition or buffer between the City of Sulphur and the Park is not adequate. The area targeted for the visitor center would benefit both the City of Sulphur and the Chickasaw N.R.A."

Response: Agree

13. Comment: "Page 36. The plan to provide external parking is strongly supported. Often the thought is that people will not use a system for transportation. However, experience in other N.P.S. areas seems to indicate that they will."

Response: None

14. Comment: "Page 36, Paragraph #3. The provision of the bicycle trail is supported. However, to call it 'experimental' is questionable especially when the cost is considered. My recommendation is it not be termed experimental unless this is a way of freeing funds for that part of the project."

Response: The first section of the bicycle trail is experimental in that potential use of such a trail is presently unknown.

15. Comment: "Page 36 paragraph 6. Again, the question, are standard densities an adequate measure for management?"

Response: Standard densities are a guideline to be tempered by observation of the effect of such a level of use upon the resource.

16. Comment; "As a suggestion, land application of park sewage effluent might be considered as an alternative."

Response: This will be explored.

XII. C.D. Hicks, Chickasaw NRA concessioner (tent rentals):

Comment: "You probably have in your files the changes of U.S. 177 Highway proposal suggested and signed by members of the Sulphur Chamber of Commerce several years ago. This was a public meeting of interested citizens of Sulphur."

The proposal had a first and second choice. The first choice was with an overpass. The second was to go around the East side of Sulphur and then back South."

Response: These two alternatives remain viable and are briefly discussed under Alternatives, page 128.

XIII. John C. Tacker:

1. Comment: "The draft E.I.S. does not provide on page 8, 11 or 12 any specific need for further development of the Chickasaw National Recreation Area in Oklahoma. In fact, it does not list one plant or animal species that are suffering from loss of habitat due to visitor capacity or oppression. It does however indicate the desire to intensify studying the area at large expenses to the taxpayers (Primarily Oklahomans) to see if potential diversification of outdoor recreational opportunities would attract more visitors."

Response: By Public Law 94-235 establishing Chickasaw National Recreation Area, the National Park Service is mandated to provide for public outdoor recreation use and enjoyment and the efficient administration of the area. Furthermore, the Park Service is mandated to prepare a general management plan for each unit of the park system by Public Law 94-458 (October 7, 1976). The Chickasaw draft environmental statement provides the basis for NEPA (National Environmental Policy Act) compliance on such a plan. Page 7 (paragraph 5) of the DES gives examples of resource deterioration that affect the visitor's (whether local or long distance) experience of the park. Proposals covered by the DES are designed to start correcting these problems. As an early step, studies are called for to better define the problems and their solutions.

2. Comment: "Pages 8 and 9 . . . indicates to me a complete change in the nature of the area with numerous modifications of the natural geologic conditions as indicated throughout the Draft E.I.S. In addition, one of the purposes will be to eliminate any penned exotic animals which presently act to service children of the area information as for example: the Bison who once roamed free throughout all of Oklahoma."

Response: There will be no modifications to the natural geologic conditions. By constraining somewhat the flow of the Vendome Well, it is hoped that some of the mineral springs which no longer flow will be recharged and flow again. There is no intention to eliminate the four bison that occupy the 95 acre fenced pasture in the Travertine District. The bison is not considered an exotic animal at Chickasaw National Recreation Area.

3. Comment: "Another very lacking part of the Draft E.I.S. is the determination of the adverse effect the proposal would have upon the conservation of energy. Page 92 seems to indicate a decline in the attractiveness of the area; however, one very essential factor has been omitted. There is no

distinction made of distances traveled to visit the area. And, should the purpose of the Chickasaw National Recreation Area be to increase the attractiveness to visitors who drive longer distances, it could drastically increase energy consumption."

Response: Page 91 of the DES states that over 5.5. million people live within 200 miles of the recreation area. It also states that the majority of visitors are from the immediate locality or region of the park and primarily use the area on multiple weekends during the year. The purposes of the proposals contained in the DES is to restore the attractiveness of the area to all visitors and protect from further deterioration the natural attributes of the area. It is neither intended nor anticipated that the plan will draw additional visitors from longer distances as compared to the past.

4. Comment: "Another very lacking part of the Draft E.I.S. is that it does not indicate any degree of significance to the known nineteen archaeological sites. This is also coupled with the insinuation that park headquarters could qualify as a National Historic Site; however, plans call for its relocation; and no mitigation of adverse impact measures have been given."

Response: Clearance of the general plan was received from the assistant State Archaeologist. (See Comment Letter X) The present park headquarters building will not be relocated. It will remain and serve a useful purpose when and if the administrative functions are moved to a new building.

5. Comment: "Additionally, it is my understanding that US 177 was situated through the area prior to the proposal of the area becoming the Chickasaw National Recreation area (presently and/or Platt National Park); and, that this prevents the Fees Proposals, Page 13, under current law. If this is true why was this very important issue not addressed on Page 25"

Response: The National Park Service, under the "Land and Water Conservation Fund Act of 1965" is directed to determine the feasibility of collecting entrance fees at its units. At Chickasaw, it would not be feasible to collect fees because of the large number of vehicular entrances to park land, the majority of which are to the Lake District. Relocation of US 177 has been under consideration for some time, however, neither the National Park Service nor the Oklahoma Department of Transportation have a commitment of funds for that purpose. If or when possible relocation of US 177 becomes an active project, all options and their impacts or consequences will be explored. The primary reasons the Park Service has

for possible relocation of US 177 is to eliminate the safety hazards to park visitors crossing the highway and to remove the detractive influence of heavy through traffic, particularly trucks, from the recreation area.

As the nation's principal conservation agency, the Department of the Interior has basic responsibilities to protect and conserve our land and water, energy and minerals, fish and wildlife, and parks and recreation areas, and to ensure the wise use of all these resources. The department also has major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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