RECREATIONAL RESOURCES OF THE DENISON DAM AND RESERVOIR PROJECT

TEXAS AND OKLAHOMA

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OCTOBER 1943

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

REPORT ON THE RECREATIONAL RESOURCES OF THE DENISON DAM AND RESERVOIR PROJECT, TEXAS AND OKLAHOMA

UNITED STATES DEPARTMENT OF THE INTERIOR
HAROLD L. ICKES, *Secretary*

NATIONAL PARK SERVICE
NEWTON B. DRURY, *Director*

DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
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OCTOBER 1943

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Foreword

Recreation is being increasingly recognized as an important collateral use of water-control projects developed primarily for flood control, irrigation, power generation, and navigation. This is particularly true of projects of unusual magnitude and of those located in the more arid sections of the country where natural recreational waters are scarce or nonexistent.

In 1941 Congress authorized the National Park Service to make a survey of the recreational resources of the Denison Dam and Reservoir Project on the Red River in Texas and Oklahoma, which is being developed by the United States Army Engineers for flood control and power generation, and to plan for their utilization. This report, as of October 1943, inventories the recreational, wildlife, forestry, historical, and archeological resources of the area, and makes recommendations for their protection and utilization based upon the recreational requirements of the region.

It is hoped that the findings and recommendations will be helpful in guiding the development and use of the area, and that the report may stimulate planning for the recreational use of other water-control projects.

Newton B. Drury, *Director, National Park Service.*

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Introduction

Hon. Sam Rayburn, Speaker of the House of Representatives, requested the Secretary of the Interior in November 1940, to have the National Park Service study and appraise the recreational possibilities of the Denison Dam and Reservoir Project in Texas and Oklahoma.

A preliminary investigation made early in 1941 revealed that the recreational resources of the area and the recreational requirements of the surrounding region were of sufficient importance to justify a detailed survey and plan. Subsequently, a special appropriation made under authority of the Park, Parkway, and Recreation Study Act of June 23, 1936 (49 Stat. 1894) enabled the National Park Service to initiate the survey.

A project office, staffed with experienced supervisory, technical, and clerical personnel was established at Denison, Tex., in January 1942 and continued to operate until the fall of 1943. The staff was assisted from time to time by professional personnel from the Region Three Office of the National Park Service at Santa Fe, N. Mex., and from the Director's Office in Chicago, Ill. Particular assistance was given in the fields of history and archeology.

Appreciation is expressed to the many individuals and officials of Federal, State, and private agencies and organizations who furnished technical data and other information for this survey. The United States Engineer Office, Denison, Tex., was especially helpful in providing maps, photographs, and other information. The Fish and Wildlife Service made field investigations and reports on the fish and wildlife resources of the area in the fall of 1942.

Special assistance was rendered by officials of the Red River Lake Development Association, the Regional Office of the National Resources Planning Board at Dallas, the Division of Water Resources of the Oklahoma Planning and Resources Board, the Arkansas State Planning Board, and many others.

After Pearl Harbor it was apparent that development of recreational facilities could not be undertaken until after the war. Efforts were then directed toward the completion of a general over-all plan covering the broad aspects of the program. This report presents plans and recommendations for additional lands needed, access roads, locations and layouts for recreational developments, and a suggested architectural style that will serve as a guide for whatever agency may develop and administer the area.

Before construction is undertaken, engineering site surveys and detailed working drawings and specifications will be required for such items as roads and trails, buildings, harbors, beaches, and utility installations.

Summary

Construction of the $54,000,000 Denison Dam and Reservoir, comprising approximately 185,000 acres located on the Red River in Texas and Oklahoma, was initiated by the United States Army Engineers in 1938 pursuant to the Flood Control Act of June 28, 1938 (52 Stat. 1215). It is expected that impoundment will begin about November 15, 1943, and that the entire project will be completed in 1944.

The project was authorized for the primary purposes of flood control and power generation. Congress realized, however, that the 145,500-acre reservoir (spillway elevation 640) with 1,250 miles of shore line would offer an unusual opportunity to provide for the recreational needs of some 6,000,000 persons residing within a 200-mile radius. In 1941, the National Park Service was authorized by Congress to make a survey of the recreational resources and to formulate plans and recommendations for their protection and utilization.

The dam itself, and related features such as the powerhouse and control gates, will attract many visitors. The 1,275,216 visitors recorded during the year ending June 30, 1941, at the T. V. A. Norris Dam near Knoxville, Tenn., is illustrative of the interest shown by the public in this type of project. Denison Dam and the area in its immediate vicinity should continue to be administered by the Army Engineers, or by whatever agency is designated to administer the project for flood control and power generation, and that agency should also retain such control over the entire reservoir area as is essential for realizing the primary purposes of the project.

The reservoir, with its irregular, rugged, and wooded shore line, will be a scenic attraction and will afford opportunities for various types of outdoor recreation, including fishing and duck hunting. In addition, the reservoir area will provide many excellent sites on which summer homes may be developed in accordance with policies determined in the future. The historical, archeological, and geological features of the area will have certain recreational value. The discovery of the Cumberland Oil Field on the area after construction of the dam was under way, and the subsequent drilling operations, may affect adversely the recreational use of a portion of the area. Protective levees have been constructed at a cost of approximately $5,000,000 to facilitate operation of the wells and to prevent pollution of the reservoir water, but it is not known at this time just how effective they may be, or what further measures may be desirable in the future.

The area in the immediate vicinity of the dam, and the balance of the reservoir and shorelands comprising the *Denison Dam Recreational Area,* should be placed under the unified administration of a Federal agency. Such an arrangement, however, should not preclude the possibility of entering into agreements with other Federal, State, or local agencies for the administration of specific recreational developments as has been done by the Tennessee Valley Authority in connection with certain of its reservoirs.

Acquisition of 9,630 acres of additional lands and certain additional mineral rights at an estimated cost of $590,000 is recommended in order to make possible the proposed recreational developments and to protect them properly.

Two major recreatonal developments are proposed—*Preston Bend Section* in Texas, and *Washita Point Section* in Oklahoma. In addition, three minor recreatonal areas and one historical area—*Fort Washita*—are proposed in Oklahoma; and one minor recreational area is proposed in Texas (fig. 6, opposite page 10).

Plans for these two major recreational developments provide facilities for fishing, swimming, picnicking, camping, horseback riding, golf, baseball, and other sports; overnight accommodations, including campgrounds, housekeeping cabins, and hotel-type cabins and rooms, and fishermen's barracks; organized camp facilities; and possible summer home sites.

The *Negro Area,* located within the *Preston Bend Section* about 1 mile west of the spillway, is a suitable site in close proximity to the

heaviest concentration of Negro population in the vicinity of the reservoir. The proposed development includes campgrounds, also facilities for picnicking, fishing, swimming, baseball, and other activities.

Except for the historical area, the minor areas are intended primarily to provide day-use facilities for such activities as fishing, boating, swimming, picnicking, and informal play. Recommended development for *Fort Washita* is directed toward stabilization of remains and presentation of the historical story; recreational facilities should be limited to a boat dock and a picnic area.

The estimated development cost for the above-mentioned developments is $5,513,000. In addition, $100,000 should be provided in 1944 for temporary facilities, since permanent construction cannot be undertaken until after the war.

Recreational developments along the shore line other than at the designated areas should not be undertaken or permitted except where a definite need develops and where a considerable number of persons would be served. The fringe of Federal land around the reservoir should be considered as a protective strip, and its use should be restricted.

Sites of historical significance are *Preston, Camp Washita,* and *Governor Overton's Home,* all of which will be inundated; *Butterfield Stage Crossing;* and the above-mentioned *Fort Washita.* The historical features of the sites should be investigated and appraised by a trained historian so that they may be properly preserved, marked, and interpreted for the public.

Preliminary reconnaissance reveals that there are a number of archeological sites of considerable importance in the vicinity of the reservoir. Early in 1943 the National Park Service recommended that salvage excavations at certain sites be conducted in collaboration with the University of Oklahoma and the University of Texas prior to inundation. Some of the sites that will not be inundated may be suited to development for exhibition of materials in place.

It is believed that the biological productivity of the impounded waters will be moderate, but will support large numbers of certain warm-water fish, particularly crappie, white bass, black bass, carp, and catfish. After the impoundment of water, consideration should be given to artificial stocking, control of populations of rough fish such as carp, buffalo, and suckers, the planting of aquatics and other food plants, and the construction of dykes across some of the shallow arms of the reservoir as measures to improve conditions for fish and waterfowl. Except for fishing and regulated hunting of ducks and geese in certain sections, the entire reservoir area should be maintained as a wildlife sanctuary.

There will be two phases of management: (1) the general custody and administration of the entire area and (2) the operation of certain facilities and provision of certain services which can best be accomplished on a concession basis by individuals or some private commercial organizations. Whether the recreational developments, in whole or in part, are administered under agreement by the States or their political subdivisions, it should be the responsibility of the Federal administering agency to see: (1) that the entire area is provided with fire and police protection; (2) that health, safety, and other regulations are enforced; (3) that roads, trails, and utilities are protected and maintained; (4) that facilities such as picnic grounds, campgrounds, playfields, and museums are provided; (5) that an interpretive program is furnished; and (6) that private boat docking facilities are properly controlled. The concessioners should operate facilities which offer special services such as restaurants, lodges, cabins, bathhouses, boats, golf courses, riding stables, and stores where fishing equipment may be obtained.

It is recommended that facilities and services usually offered free of charge in public parks be made available at *Denison Dam Recreational Area.* No fee should be required for entrance to the area or for such activities as sightseeing, hiking, picnicking, use of campgrounds where only water and sanitary facilities are provided, and swimming in the lake.

After well rounded and workable development units have been completed, the annual administrative and maintenance costs should be somewhere between $150,000 and $200,000. Areas such as the proposed *Denison Dam Recreational Area* usually are only partially self-supporting. In normal times,

revenue from the national parks is equal to about 70 percent of the total cost of operation and maintenance.

The agency authorized to administer the project will need an executive and staff to continue planning, acquire lands, execute developments, and finally, to operate and maintain the area when it is ready for visitors. After development has been completed, technical assistance will be needed for direction of conservation practices, for research, and for interpretation of the various features to the public. Full-time personnel in all of the fields involved will not be necessary, as certain phases of the work may be performed by consultants and some technical advice may be obtained from other Federal, State, and semi-public agencies. There should be available from various sources, however, personnel with appropriate training and experience in the fields of planning, construction, operation, history, geology, archeology, wildlife management, forestry, soil and moisture conservation, public health and sanitation, navigation, law, land acquisition, and fiscal matters.


TULSA
OKLAHOMA CITY
MUSKOGEE
OKMULGEE
CALVIN
FT SMITH
ADA
McALESTER
DAVIS
SULPHUR
PLATT NATIONAL PARK
DUNCAN
LAWTON
PAYIA
TISHOMINGO
ARDMORE
ATOKA
MADILL
FORT WASHITA
DURANT
OKLAHOMA
WASHITA POINT
MARIETTA
PRESTON BEND
DENISON DAM
DENISON
TEXAS
PERRIN FIELD
GAINESVILLE
WHITESBORO
SHERMAN
BONHAM
PARIS
DENTON
McKINNEY
DALLAS
FORT WORTH
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DENISON DAM RECREATIONAL AREA
AND SURROUNDING REGION
SEPTEMBER 1942
DRAWN BY C. J. DOTY

CHAPTER I

Denison Dam and Reservoir Project

Historical Background. Numerous local persons have supported and worked for the Denison Dam and Reservoir Project for more than 20 years. The Red River Improvement Association, a conservation organization, the members of which reside in Texas, Oklahoma, Arkansas, and Louisiana, was active in seeking approval of the project. There is general agreement, however, that the person largely resopnsible for bringing about the realization of what often seemed a dream is the Hon. Sam Rayburn, Speaker of the House of Representatives. Speaker Rayburn has promoted and has persistently worked for a dam across Red River in this vicinity for more than 20 years. His long-time, first-hand knowledge of the effects of the devastating floods on Red River below Denison and the urgent need for flood control at this point account to a great extent for his efforts in support of the project. A majority of the local people have supported the project since its authorization, but a well-financed, militant minority has put up a long and bitter fight against it, a fight similar to that waged against the Tennessee Valley Authority.

The project was authorized by the Flood Control Act of June 28, 1938 (52 Stat. 1215), which provides in part as follows:

Sec. 4 . . . The Denison Reservoir on Red River in Texas and Oklahoma for flood control and other purposes as described in House Document Number 541, Seventy-fifth Congress, third session, with such modifications thereof as in the discretion of the Secretary of War and the Chief of Enginers may be advisable, is adopted and authorized at an estimated cost of $54,000,000 . . .

While the primary purposes of the project are recognized as flood control and production of hydroelectric power, survey reports by the Army Engineers include "improved recreational facilities" as one of the indirect benefits to be derived from development of the project.

The District Engineer, United States Engineer Office, Denison, Tex., has immediate supervision of this all-Federal project. The Secretary of the Interior will be in charge of distribution of electric power for the duration of the war.

Location and Accessibility. Denison Dam is on Red River in Grayson County, Tex., and Bryan County, Okla., 5 miles northwest of Denison, Tex., and 15 miles southwest of Durant, Okla. The reservoir is located in Grayson and Cooke Counties, Tex., and in Bryan, Johnston, Marshall, and Love Counties, Okla. The project is about midway between Dallas and Oklahoma City.

Figure 1.—Artist's conception of completed dam and appurtenant structures (U. S. Engineer Office Photo)

The reservoir area is directly served by four major highways—U. S. 70, 75, 77, and 82, and one interstate highway—Texas 91 and Oklahoma 99. The importance of these highways is indicated by the Traffic Flow Chart on page 3. As a part of the long range planning program of the Highway Departments of Texas and Oklahoma, a north-south superhighway is proposed which will cross the reservoir at a point north of Gordonville, Tex., near Willis, Okla. Federal funds have been allotted to the States of Texas and Oklahoma for construction of the bridge. Practically all parts of the reservoir area are served by county or community roads. Some of these minor roads have gravel surface, but for the most part they are unsurfaced.

Access by rail from distant points to the major towns in the vicinity, such as Ardmore, Durant, Denison, Sherman, and Gainesville, is provided by trunk-line railroads. The Texas Electric Railway operates interurban cars on an hourly schedule from Dallas to Denison. Railroads which will cross the reservoir area are the Missouri-Kansas-Texas Railroad of Texas near Hagerman, Tex. (Katy), the St. Louis-San Francisco Railroad (Frisco) near Liggett and near Ravia, Okla., and the Atchison, Topeka & Santa Fe Railway at a point north of Gainesville, Tex.

Dallas and Oklahoma City are the nearest points served by regular commercial air lines. Perrin Field, extensively developed as an Army basic training school, is located near Pottsboro, Tex., and practically adjoins the reservoir area. Numerous auxiliary airfields and emergency landing fields are scattered throughout the counties which adjoin the reservoir area. The anticipated increase in air travel after the war may result in making the area directly accessible by air.

Construction and Development. Preliminary work was started soon after authorization and the expected date of completion of the entire project is June 1944. Studies by the Army Engineers of rainfall records indicate that 10 months is the average period that should be required to fill the reservoir to the normal power pool elevation (617).[1] The records also indicate that this elevation could be reached within 1 month. Impoundment is expected to begin about November 15, 1943.

[1] All references to elevations are expressed in feet above sea level.

Statistical Data

Rolled-fill Earthern Dam:

Length of main dam	15,200 feet.
Length of dike extension	5,800 feet.
Maximum height of dam	165 feet.
Base width, maximum	1,150 feet.
Top width	40 feet.
Elevation at top of dam	670 feet.
Elevation at spillway crest	640 feet.
Total earth fill in embankment	17,500,000 cubic yards.
Stone and crushed rock for slope protection and roadway	413,000 cubic yards.

Spillway (chute type, ungated, and free of obstructions to flow):

Maximum width of spillway approach channel	2,000 feet.
Length of paved chute	700 feet.
Length of discharge channel (not paved)	3,000 feet.
Bottom width of discharge channel	400 feet.
Crest elevation	640 feet.
Retarding walls elevation maximum	670 feet.
Discharge capacity	750,000 cubic feet per second.

The Army Engineers estimate that the spillway crest elevation will be reached only when there is a flood similar in magnitude to the 1908 flood, the severest one on record.

Outlet works consist of approach channel, intake structure and service bridge, eight reinforced concrete conduits, and a stilling basin.

Length of conduits	800 feet.
Inside diameter of conduits	20 feet.
Number of power conduits	5.
Number of flood-control conduits	3.

Reservoir:

Surface area at elevation 640 (spillway crest)	145,500 acres.
Surface area at elevation 617 (normal power pool)	95,000 acres.
Storage capacity	5,825,000 acre-feet.
Shore line (approximate)	1,250 miles.
Drainage area above the dam	38,291 square miles.

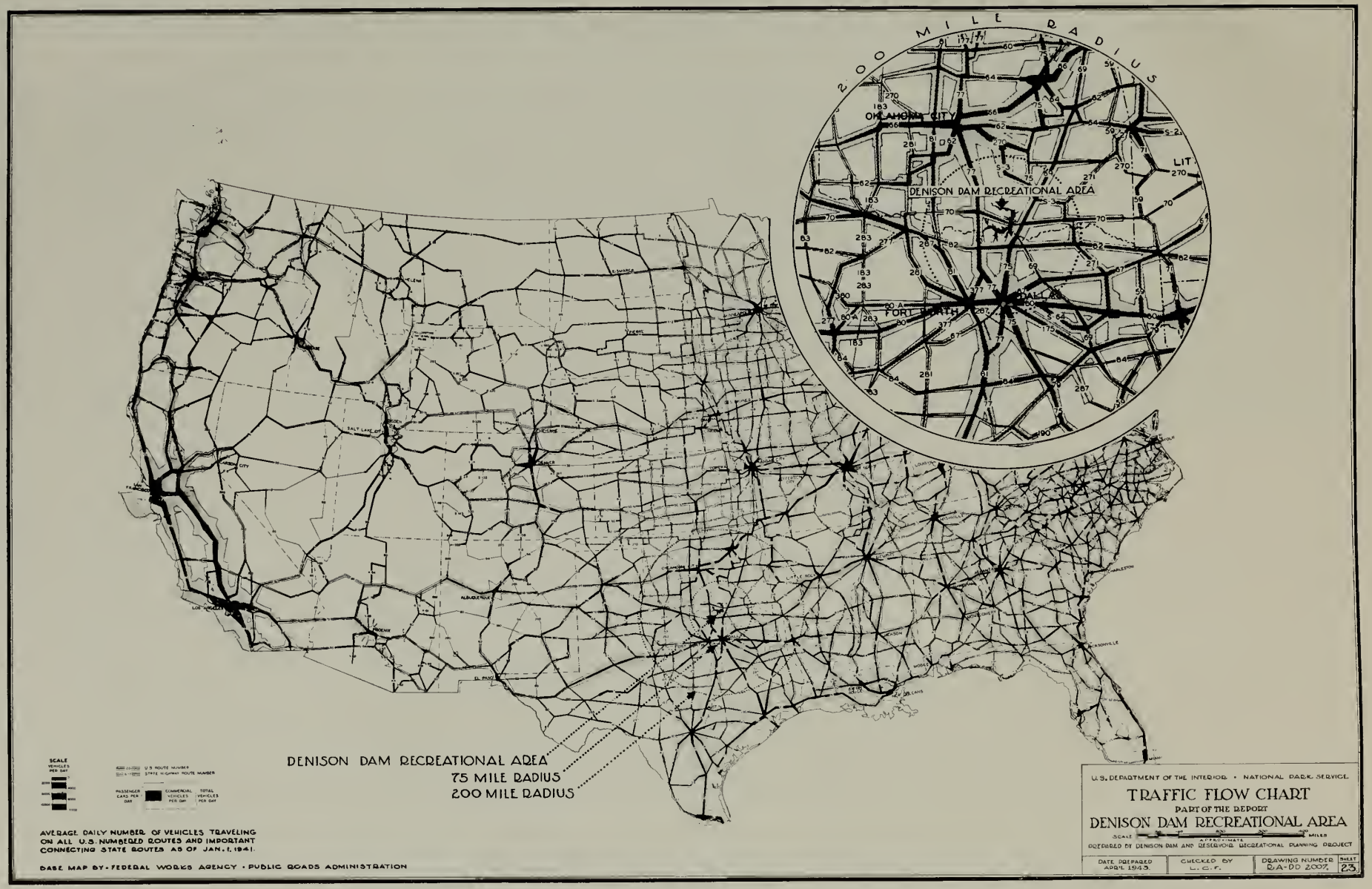

200 MILE RADIUS
DENISON DAM RECREATIONAL AREA
OKLAHOMA CITY
FORT WORTH
DALLAS
LIT.
DENISON DAM RECREATIONAL AREA
75 MILE RADIUS
200 MILE RADIUS
SCALE
VEHICLES PER DAY
U.S. ROUTE NUMBER
STATE HIGHWAY ROUTE NUMBER
PASSENGER CARS PER DAY
COMMERCIAL VEHICLES PER DAY
TOTAL VEHICLES PER DAY
AVERAGE DAILY NUMBER OF VEHICLES TRAVELING ON ALL U.S. NUMBERED ROUTES AND IMPORTANT CONNECTING STATE ROUTES AS OF JAN. 1, 1941.
BASE MAP BY - FEDERAL WORKS AGENCY - PUBLIC ROADS ADMINISTRATION
U.S. DEPARTMENT OF THE INTERIOR - NATIONAL PARK SERVICE
TRAFFIC FLOW CHART
PART OF THE REPORT
DENISON DAM RECREATIONAL AREA
SCALE
APPROXIMATE
MILES
PREPARED BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DATE PREPARED APRIL 1943.
CHECKED BY L. C. F.
DRAWING NUMBER RA-DD 2007
SHEET 23

Figure 2.

Power Installation:

Initial installation (1 unit)	35,000 kilowatts.
Preparation for future installation (4 units)	140,000 kilowatts.

Utility Relocation:

Railroads	27.5 miles.
Highways	17.0 miles.
Communication lines	19.0 miles.
Transmission lines	30.0 miles.
Pipe lines	17.0 miles.

CUMBERLAND OIL FIELD PROTECTIVE LEVEES. The Cumberland Oil Field, owned by the Pure Oil Co., Chicago, Ill., lies in the Washita arm of the basin near Cumberland, Okla. Limits of the field have been fairly well established. It extends from southeast to northwest for a distance of about 4½ miles in Bryan, Johnston, and Marshall Counties. The discovery well came into production in 1940, after construction of the Denison Dam was well under way, and by April 1943, there were 67 producing wells, and several others were being drilled. In April 1943, production was exceeded by no other field in Oklahoma except the Oklahoma City Oil Field. More than 3½ million barrels of oil have been produced since 1940 and potential recovery is estimated at 50 to 100 million barrels.

Numerous plans and methods were considered by the Army Engineers and the owners of the field for saving the field from inundation or making possible the continued drilling and production of oil after the reservoir filled with water. In April 1943, a decision was reached and construction was started immediately on a system of huge levees and cuts to protect the entire field from inundation at an estimated cost of approximately $5,000,000. The levees will in effect separate the upper third of the Washita arm from the main body of the reservoir. The smaller lake will be connected with the main reservoir by a channel. The system involves handling of approximately 8,000,000 cubic yards of earth, almost one-half the amount of earth in Denison Dam. The levees will have a combined length of 25,000 feet and a maximum height of 90 feet. The crest is at elevation 646. The two cuts will be 9,000 feet long, 350 feet wide, and have a maximum depth below ground surface of 80 feet. Elevation of the bottom of the lower cut will be 610. It is expected that 80 percent of the work will be completed by November 15, 1943.

SILTATION AND OTHER CHARACTERISTICS OF WATER IN RESERVOIR. The Army Engineers have made a study of sedimentation in rivers and streams in the vicinity of the reservoir. They expect to continue further the study of siltation, through and after the impoundment period, in the main body of the reservoir and its side arms. They have estimated the probable siltation of the reservoir at approximately 20,000 acre-feet per year, and are of the opinion that most of the heavy silt will settle in the upper reaches of the reservoir. Deposition of fine silt, however, will be general and will take place over the entire bed of the reservoir. Silt storage space is being provided for 1,020,000 acre-feet. On this basis, silt should not begin to encroach upon the originally planned water storage space (4,805,000 acre-feet) for a period of about 50 years. The construction of dams and other soil erosion control measures which may be developed in the future on the watersheds of the Red and Washita Rivers above Denison would tend to reduce the rate of silt deposition and would prolong the life of the Denison project beyond the above estimate.

The water in both the Red and Washita Rivers ordinarily is reddish brown in appearance and is heavily mineralized. It is believed, however, that the water of the main body of the reservoir will be clear except during certain flood periods. Water temporarily impounded for short periods during construction of the dam often has been clear. It is reasonable to assume that conditions which resulted in clear-water reservoirs formed by dams on other red-colored streams may result in clear water here. Notable examples are: Lake Mead, formed by Boulder Dam on the Colorado River in Arizona-Nevada; Possum Kingdom Lake on the Brazos River in Texas; Lake Buchanan on the Colorado River in Texas; and Lake Murray near Ardmore, Okla., which practically adjoins the Denison Reservoir. Fine silt usually flows, and silt density currents, like those found in Elephant Butte Reservoir, N. Mex., may be expected during the summer season in the Denison Reservoir. Silt clouds due to fine suspension may move down the reservoir at any time of the year. It is probable, however, that the impounded flood water will contain less objectionable mineral matter than the normal flow of the Red and Washita Rivers.

A feature of unusual interest to the people of this inland section will be the large waves and rough

water which are characteristic of large bodies of water. There will be a number of stretches of open water where the wind will have a sweep of 10 miles or more. Types of boats commonly used along the seacoast will be needed for negotiating the open waters on windy days. Small boats of all types, however, should be practical for use on the many inlets, coves, and protected waters along the reservoir's 1,200 mile shoreline.

Probable Fluctuation of Water Level. Prediction of definite fluctuations in water level with any degree of certainty is impossible because of probable changes in administrative policies and numerous other factors. However, the project is designed for a full power-pool elevation of 617 and a spillway crest elevation of 640. Elevation 617 is commonly referred to as the elevation of the maximum power pool, normal power pool, or the mean water level. Elevation 640 is commonly referred to in nontechnical terms as the high water or spillway level. The terms apply to probable water levels over a long term of years rather than to extreme possibilities. No attempt is made to estimate the extreme high-water level.

The Water Level Chart, based upon conditions for the period 1906–37 inclusive, shows that if the Denison Project had been in operation during that period it would have been possible to have operated the project for flood control and power purposes with the water level remaining fairly constant within a few feet of the 617 elevation. There are, however, a few notable exceptions: (1) during the severest flood on record, in 1908, the water level would have reached spillway crest elevation of 640 but would not have been appreciably above normal power-pool elevation of 617 for as much as 1 month; (2) during the only other important flood, in 1915, the water would have reached elevation 618, only 1 foot above normal power-pool elevation; (3) during the severest drought of the 32-year period in the latter part of 1910 and all of 1911, there would have been a draw-down of 21.3 feet from the 617 elevation in June 1911; (4) in 1918 there would have been a draw-down of 12 feet; and (5) in 1925 the draw-down would have been 9 feet. A few other years show draw-downs of less than 8 feet. The estimated average net loss per year through evaporation in excess of rainfall is about 24 inches.

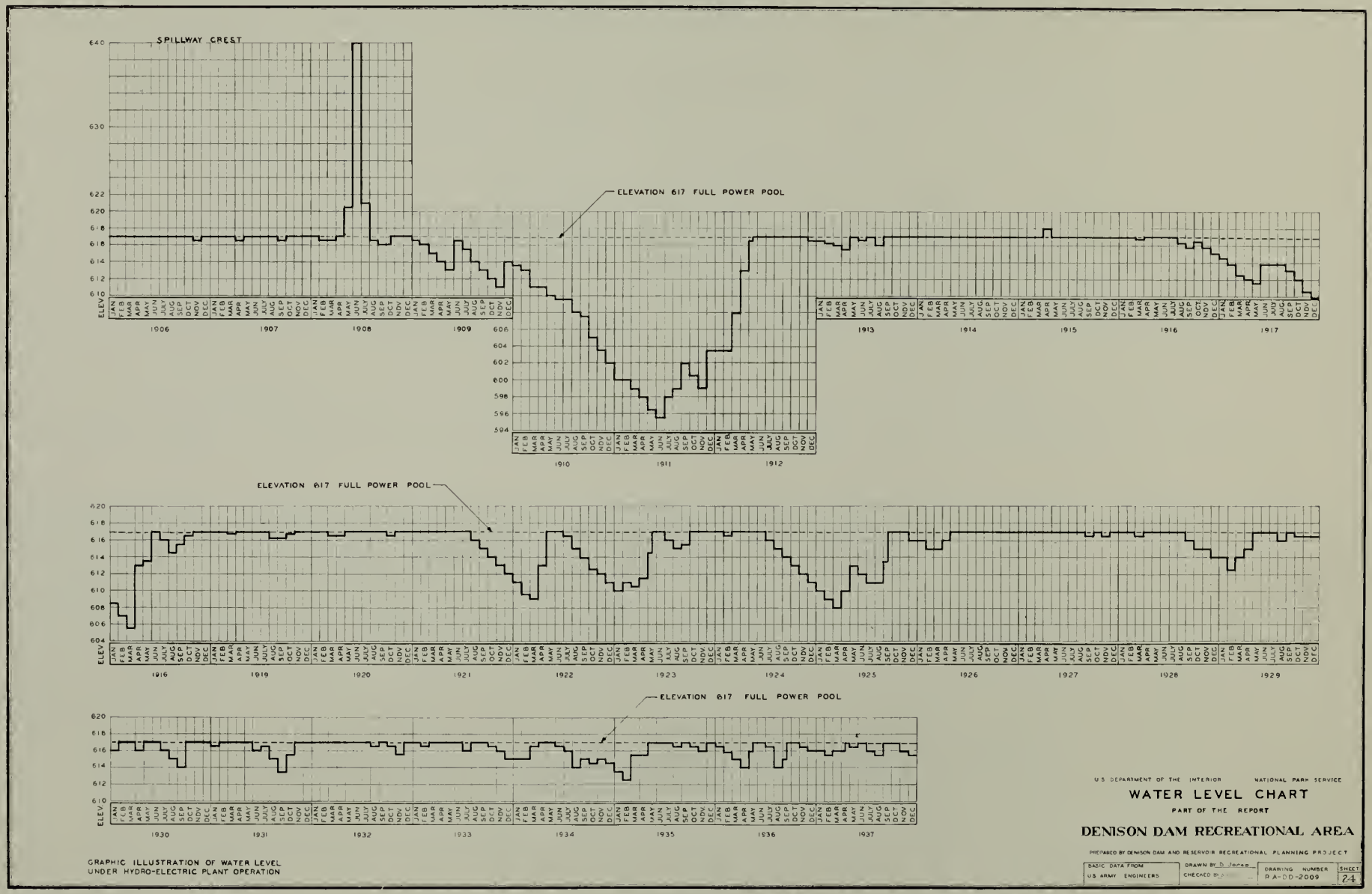
Timber Clearance in Basin. Timber in the reservoir basin is being cleared up to the 620-foot contour or 3 feet above the normal power pool level. Just what will happen to tree growth and other vegetation around the shore line above this elevation is a matter of speculation. It will depend to a great extent upon the amount and frequency of fluctuation. When the reservoir fills with water up to the normal pool level, the underground water table will be raised for some distance back from the shore line and some of the vegetation undoubtedly will succumb because of too much moisture. On the other hand, the increased moisture in certain areas should result in a more vigorous growth of certain species. Most of the tree trunks are being cut about 12 to 18 inches above ground. Considerable coppice (sprouts from stumps and roots) is now in evidence and may be expected to continue around the shore line, especially in the shallow water sections of the reservoir.

If floods should cause the water to reach the spillway elevation, it is estimated that not more than 20 days would be required to lower the water level from the 640 elevation to 617. Most of the tree growth and shrubs could withstand the effects of such a wide but brief fluctuation if it occurs only once in about 25 years.

The difficulty in obtaining sufficient labor to complete the task of clearing timber from the basin resulted in the Army Engineers obtaining assignment of a sufficient number of prisoners of war, captured in North Africa, to undertake completion of the timber clearance program by January 1, 1944. The first contingent arrived in April 1943, and are housed in internment camps located within the area. They work on a voluntary basis and receive wages.

Land Status.

Acquisition. The total area contemplated for acquisition is estimated at 185,000 acres, exclusive of additional lands needed for recreational purposes. (These additional lands are discussed in detail elsewhere in the report.) The Army Engineers started acquiring land for the dam and reservoir from private owners in the latter part of 1938. Their policy was to acquire title to lands in the basin up to about the 620-foot contour (approximate power pool elevation) and to take flowage easements between the 620-foot contour and the 640-foot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GRAPHIC ILLUSTRATION OF WATER LEVEL
UNDER HYDRO-ELECTRIC PLANT OPERATION
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
WATER LEVEL CHART
PART OF THE REPORT
DENISON DAM RECREATIONAL AREA
PREPARED BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
BASIC DATA FROM
U.S. ARMY ENGINEERS
DRAWN BY D. Jones
CHECKED BY
DRAWING NUMBER
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2-1

Figure 3.

Figure 4.—Clearing (U. S. Engineer Office Photo)

contour (spillway elevation). Accordingly, almost the entire shore line, except that in the vicinity of the dam, would remain in private ownership. When investigation of the recreational resources of the area by the National Park Service revealed the possibility of utilizing the reservoir and adjoining shorelands for public recreational purposes, the need for land above the 620-foot contour was discussed with the Army Engineers. Study and further discussion brought out the fact that ownership of shorelands up to and above the spillway elevation was desirable and necessary, not only for public recreational purposes but also to make possible control of access to the water and shorelands for the agency or agencies that will have the responsibility of administering the flood-control and power project after completion. Control of this strip of land is considered necessary for protection of life and property, determination of flood conditions and patrol, and enforcement of public-health, sanitary, and other regulations.

In view of these considerations, the policy of the Army Engineers was changed to provide for the acquisition of lands extending a reasonable distance above the 640-foot contour, rather than to obtain only flowage easements above the 620-foot contour. The Army Engineers' taking line shown in figure 6 has been established upon the basis of the new policy. This revised policy is of vital importance as far as recreational possibilities are concerned, for it means that the recreational values of the entire project may be protected and used for the benefit of all of the people rather than for a privileged few, or wasted and forever lost through unplanned, undesirable, haphazard, private and commercial development.

Following this change of policy, land was acquired in fee simple, except in a few cases where tract owners insisted upon retaining the mineral rights, or where owners refused to accept the nominal value of $1 or $2 per acre for such rights in addition to the price of land. Mineral rights were not sought where condemnation was necessary. This program

created dissatisfaction on the part of some owners, so the policy was further changed to provide that title to mineral rights to practically all of the lands would remain with the land owners; which means that the Federal Government will have the mineral rights on only a small part of the land within the taking line. This subject is discussed at length elsewhere in the report.

Practically all lands adjoining the project are in private ownership. Nonresident owners, including loan companies and banks, were in the majority prior to 1943. In 1943, numerous individuals purchased small tracts just outside Federal boundaries for summer home sites and camp sites.

Values. As late as January 1943, farm land values averaged $25 to $35 per acre, while timber land and eroded pasture land sold for $8 to $10 per acre. These prices did not include mineral rights in locations where oil had been discovered in the vicinity, or where test drilling was probable. Mineral rights on most of the land were considered worth not more than $1 to $2 per acre.

Since January 1943, land values have increased, and indications are that prices will advance still further. The price increase is primarily due to new oil-leasing activity and the demand for acreage adjoining the strip of Federal shorelands for summer home sites, cabin sites, and other recreational uses.

Present use. Most of the shoreland and land adjoining the Federal boundary is devoted to farms, pastures, and wood lots. Crops include cotton, corn, sorghum grains, wheat, oats, alfalfa, Johnson grass hay, pecans, and peanuts. There is a wide variation in the size of tracts, but in general they average about 250 acres. There was considerable improper land use prior to 1943, as evidenced by loss of topsoil and moderate to severe erosion conditions.

Oil is being produced from wells near Cumberland and Isom Springs in Oklahoma, and near Gordonville and Dexter in Texas. The Cumberland Field is the largest. There are no mining operations in this part of the country.

Site for proposed veterans' hospital. In March 1943, the National Park Service was informed by the United States Engineer Office, Denison, Tex., that a proposal for construction of a $2,000,000 veterans' hospital on the lake shore was under consideration. The proposed site of about 150 acres appears to be well chosen. It is located on high ground just west of the area recommended for a public observation point overlooking the dam on the west side of the spillway.

CHAPTER II

Recreational Resources

The Denison Dam Reservoir Area will offer a large expanse of artificial inland water with an irregular, rugged, wooded shore line as the chief scenic attraction. Unlike a natural area such as a national park, the principal features—the dam and lake—represent a spectacular achievement of man on a grand scale. The magnitude of the project and the fact that it is man-made, will interest and attract many sightseers.

Climate, topography, vegetative cover, wildlife, and the large body of water are favorable factors for providing outdoor recreation. Within the area many suitable sites may be found for development of facilities to enable the public to enjoy many kinds of recreational activities such as fishing, boating, swimming, duck hunting, picnicking, camping, horseback riding, and other sports. Attractive summer home sites are numerous. There are historic sites of some importance and several prehistoric Indian village sites and burial places. Of special interest is the abundance of fossil remains of extinct prehistoric animals and fish. Such variety provides an excellent opportunity to combine recreational and educational interests of visitors through a program designed to interpret and explain the historic, prehistoric, wildlife, and other features of the area.

The recreational value of the area as a whole is materially enhanced by its location in a densely populated, inland, agricultural region where there is a scarcity of running streams, natural lakes, and other large bodies of water.

Recreational Aspects of the Dam. Sightseeing will center largely around the dam. In its vicinity there will be a concentration of a variety of things to see and to do. The massive concrete spillway, the outlet works with the control gates and the powerhouse with its large turbines and generators in operation will be of interest to most visitors. Guided trips through the powerhouse, models, exhibits, and other means of explaining the purpose of the project, how it works, and what it means to man should be a part of the public information service.

There should be an opportunity for visitors to see close at hand the turbulent, roaring mass of water constantly released through the conduits below the dam. Most visitors display an intense interest in this feature of other large dams. Fishing might be expected to be exceptionally good in the river near the point where this water is released into the river channel below the dam.

A drive across the top of the 3-mile dam will afford unobstructed views of the large expanse of impounded water with possible views of a wide variety of watercraft. On this drive the boundary line between Texas and Oklahoma will be crossed.

The number of visitors at many of the dams completed within the past few years has exceeded all expectations. As an illustration, there were 761,512 visitors, exclusive of local residents, at Boulder Dam National Recreational Area, Ariz.-Nev., for the year ending June 30, 1941, and many of them took the guided trip through the powerhouse. During the same period there were 1,275,216 visitors recorded at Norris Dam, near Knoxville, Tenn.

All planning and development of facilities in the vicinity of the dam to meet the needs of visitors and sightseers is the responsibility of the Army Engineers. Plan preparation by the Recreational Planning Project of the National Park Service does not include that area. Its plans do include, however, a suggestion for a road across the apron of the spillway for the convenience of visitors desiring to reach the recreational developments on the shores farther westward.

Sites for Recreational Development. After consideration of the recreational needs, and after investigation of the area to be inundated and the adjacent shore-line area, two general sections of

Figure 5.—Dam embankment (U. S. Engineer Office Photo).

major importance were set aside for extensive and concentrated recreational development, and a number of secondary outlying areas were designated to serve local needs primarily (fig. 6, opposite p. 10). The selection of these sites was based upon the following factors:

1. Accessibility from centers of population over existing and proposed highways and other means of transportation.
2. Adaptability of the sites to the various types of development requirements.
3. Scenic qualities of the site and the relationship to large expanses of water.
4. Orientation with relation to prevailing wind.
5. Relationship of the sites to each other with respect to desirable and practical intercommunication.
6. Soil conditions and existing vegetative growth.
7. Location of the interstate boundary (south cut bank of Red River).
8. Depth of water adjacent to sites.
9. Minimum of objectionable features.

In addition to these sites, which are described below, minor developments in other locations may become necessary as a result of unforeseen public needs and future physical changes or improvements. Minor developments such as boat docking facilities will be needed for nine small communities located within a mile of the reservoir shore line. Isolated sites without improvements may be desired by certain camping groups not wishing to use the developed sites. The demand for fishing camps, spaced at intervals on the shores around desirable fishing waters, may eventually require the designation of other specific sites. This need may be met partially by the use of floating accommodations. Other uses may arise for undesignated sections of the protective shoreland strip that may necessitate additional development sites of a minor nature.

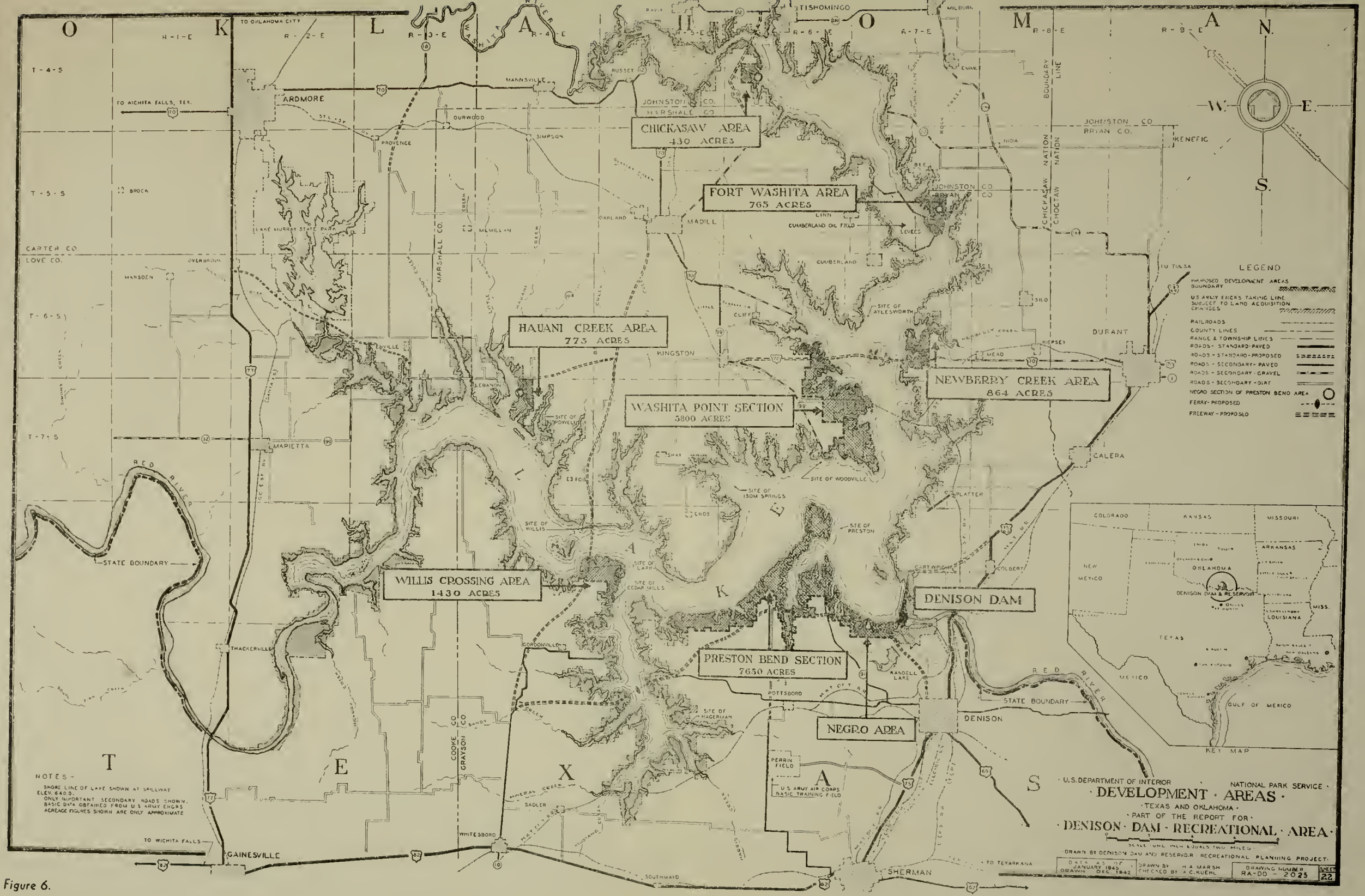
CHICKASAW AREA
430 ACRES
FORT WASHITA AREA
765 ACRES
HAUANI CREEK AREA
773 ACRES
WASHITA POINT SECTION
5800 ACRES
NEWBERRY CREEK AREA
864 ACRES
WILLIS CROSSING AREA
1430 ACRES
PRESTON BEND SECTION
7650 ACRES
NEGRO AREA
DENISON DAM
ARDMORE
MARIETTA
GAINESVILLE
DENISON
DURANT
CALERA
KENEFIC
TISHOMINGO
MILBURN
MADILL
KINGSTON
WHITESBORO
SHERMAN
STATE BOUNDARY
RED RIVER
LEGEND
PROPOSED DEVELOPMENT AREAS BOUNDARY
U.S. ARMY ENGRS. TAKING LINE SUBJECT TO LAND ACQUISITION CHANGES
RAILROADS
COUNTY LINES
RANGE & TOWNSHIP LINES
ROADS - STANDARD-PAVED
ROADS - STANDARD-PROPOSED
ROADS - SECONDARY-PAVED
ROADS - SECONDARY-GRAVEL
ROADS - SECONDARY-DIRT
NEGRO SECTION OF PRESTON BEND AREA
FERRY-PROPOSED
FREEWAY-PROPOSED
KEY MAP
NOTES -
SHORE LINE OF LAKE SHOWN AT SPILLWAY ELEV. 640.0.
ONLY IMPORTANT SECONDARY ROADS SHOWN.
BASIC DATA OBTAINED FROM U.S. ARMY ENGRS.
ACREAGE FIGURES SHOWN ARE ONLY APPROXIMATE
U.S. DEPARTMENT OF INTERIOR · NATIONAL PARK SERVICE ·
· DEVELOPMENT · AREAS ·
· TEXAS AND OKLAHOMA ·
· PART OF THE REPORT FOR ·
· DENISON · DAM · RECREATIONAL · AREA ·
SCALE ONE INCH EQUALS TWO MILES
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DATA AS OF JANUARY 1943
DRAWN DEC. 1942
DRAWN BY H.A. MARSH
CHECKED BY A.C. KUEHL
DRAWING NUMBER RA-DD - 2025
SHEET 22

Figure 6.

The Preston Bend Section in Texas and the *Washita Point Section* in Oklahoma appear to meet best the site requirements for primary development areas. The advantages of their interstate relationship, their proximity to a large water area, their relationship to each other, and their suitability to development determined their selection. Communication between the areas by way of a 5-mile excursion boat trip should be exceptionally popular for the recreationist and a good source of revenue for the operator or concessioner.

Preston Bend Section (Texas). The Preston Bend Section, shown on page 61, is located on the south shore of the reservoir between the dam on the east and Mineral Creek on the west. It contains approximately 7,650 acres and has a shore line of about 55 miles. Outstanding features are the rugged, irregular, and wooded shore line with adjacent lands considerably elevated above the proposed mean water level, and the Preston Bend Peninsula which projects northward into the main body of the reservoir and is bounded on the west by the reservoir and on the east by the 5-mile-long Little Mineral Bay. The specific sites for recreational development in this general area are described below:

(1) Preston Bend Area. The primary site selected for recreational developments, such as principal boat harbor, beach, lodge, and cabins, is the terminus or head of the Preston Bend Peninsula, an area of approximately 1,000 acres. It was selected because of its relationship to a large expanse of water, the advantages of administrative control offered by the land approach, and the fact that it contains the necessary elements for good development.

Shorelands encompassing the site are elevated sufficiently to provide reasonably close relationship between developments and the water at varying stages of fluctuation. Land adjacent to the shore line is generally rolling, with considerable variation in form. Toplands slope generally from the center of the peninsula head to the shore line in all directions. The site contains a potential boat basin of about 23 acres, ideally located with relation to prevailing breeze for necessary protection. The irregularity of both the north and south shore line provides many protected coves for boat anchorages and offers a varied opportunity for interesting development. Approximately 60 percent of the topland is now or has been under cultivation, the remaining acreage being timber and grassland. A good portion of the shoreland is covered with tree growth, mainly post oak, winged elm, etc., which is supplemented by a stand of native shrubs such as wild rose, dogwood, and coralberry. Tree growth on the topland varies from large masses to thickly scattered groups and single specimens. Considerable reforestation of those portions of the site designated for intensive development is suggested.

The neck of the peninsula offers numerous sites for secondary recreational facilities, such as organized camps and fishing camps, which would have the advantage of secluded isolation and close relationship to the major development on the peninsula terminus. Little Mineral Bay provides ample space for almost unlimited open-water mooring of boats.

(2) Grandpappy Point Fishing Village. It is lieved that Little Mineral Bay will become a highly desirable fishing area. An excellent site on the east shore of the bay near the mouth, although limited in size, is suitable for the development of fishing facilities. It can be made readily accessible by means of a short approach road connecting with State Highway 91, and is accessible from the primary development of the head of the peninsula by means of a 3-mile boat trip. The site is slightly elevated above mean water level, and will afford a desirable relationship between facilities and the water surface. Shore-line conditions will permit the location of additional fishing camp sites on the west shore of the bay.

(3) Negro Area. An area of approximately 100 acres located about 2 miles west of the dam was selected to serve the Negro population. The site is a point bounded on the east and west by suitable bays and can be made accessible by a short spur road connecting with a proposed park road. It is admirably suited for recreational developments, which can be closely related to the water at all reasonable stages of fluctuation in level because of moderately steep shore-line gradients.

(4) Summer Home Sites. The shore line of the Preston Bend Section offers many potential sites for summer homes, located either individually or in small groups, which might be developed in accordance with administrative policies determined in the

future. However, the grouping of such sites into restricted areas related to the major recreational development area seems advisable for the reasons of administrative control, cost of supplying utility services, and accessibility.

In addition to the sites provided in the major development area on the peninsula head, two outstanding areas, somewhat removed from the major development and having sufficient size and quality, are available for summer home sites. One area is located on the south shore blufflands about midway between the dam and the Preston Bend Area and will be accessible by State Highway 91 and proposed park roads. It has a shore line frontage of about 1½ miles and contains approximately 200 acres of land suitable for development. The other area is located on the west shore of the peninsula on bluffland 7½ miles west of the dam and 5½ miles northwest of the community of Pottsboro, and will be accessible by county roads and proposed park roads. Ultimate development of these two areas may become necessary if the space set aside in the major development area on the head of the peninsula proves inadequate. For this reason they should be held and protected as reserve areas.

Washita Point Section (Oklahoma). This general area of 5,800 acres, shown on page 77, is intended to serve the population centers to the north, northwest, and northeast. It will be accessible by way of a proposed approach road connecting with U. S. Highway 70, which forms the northern boundary of this section. For administrative control, a desirable relationship between necessary secondary uses and the major development is possible.

(1) Washita Point Area. The southerly extremity of the section, which is formed by the junction of the Washita and Red Rivers, offers a desirable site for recreational development, and was selected for the principal development within the Washita Point Section. Topography is suitable for the many intended recreational uses, such as picknicking, camping, swimming, golf, and other sports, and for summer home sites. The land adjacent to the shore is sufficiently elevated above the expected mean water level to permit a reasonably close relationship between the developments and the fluctuating water surface. The top area slopes with a gentle gradient to the shoreland and there is sufficient variation in ground forms to allow freedom and interest in development. The site contains a potential boat basin with a water surface of approximately 15 acres at the expected mean water level, well protected from the prevailing southeasterly breeze. The shoreland area is generally covered by a comparatively dense tree growth of blackjack oak, post oak, winged elm, redbud, persimmon, osageorange, hackberry, and American elm. As the land flattens out the tree growth thins to scattered clumps. Much of the flat and gently rolling land is grass-covered and supports a magnificient stand of native wild flowers in season. The denser tree growth is supplemented by a stand of native shrubs such as haw, dogwood, wild rose, sumac, French mulberry, elder, and holly.

(2) Catfish Bay. This exceptionally desirable development site is located 5 miles east of the community of Kingston, Okla., on the west shore of the reservoir, direcly adjacent to and south of new U. S. Highway 70, and it can be made accessible to the highway by the construction of a short spur road. It is strategically located to serve as a local fishing center and for other day-use facilities for Kingston, Madill, and the local rural population. The site is a narrow neck of land containing sufficient area to accommodate the required recreational facilities and also to provide for future expansion. It is bordered on the east by the main body of the reservoir and on the south by the waters of the bay. It contains a potential boat harbor basin sufficiently deep and well protected from the prevailing breeze to provide excellent boating. The reservoir shoreland section is extremely steep, whereas the bay shore is moderately steep making possible a close relationship between developments and the fluctuating water surface. There is sufficient suitable level land on the top of the site to provide for general development. The shoreland and a good portion of the topland are moderately covered with native timber such as post oak, blackjack oak, and winged elm, supplemented by a rather light stand of shrubs and ground cover. There is sufficient variation in density of tree growth to permit good air circulation.

(3) Camp Washita is an historic site located near the southern point of the peninsula. A full discussion is given on page 19.

(4) Summer Home Sites. The development plan for Washita Point, page 79, indicates the possibility of a number of summer home sites. There also are several other areas on the Oklahoma side that are suitable for this purpose.

Secondary Areas (Fig. 33, p. 89).

(1) Chickasaw (Oklahoma). The site contains approximately 430 acres, is located on the west shore of the reservoir, is bounded on the north by a bay and on the east by the reservoir and is approximately 5½ miles by road southwest of Tishomingo. An approach road of 1½ miles in length would make the site accessible from the new alignment of State Highway 99. The primary factor determining its selection was the close relationship of the bluff shorelands to the Washita River channel which provides additional water depth for navigation and boat anchorage. Sufficient space is available for concentrated day-use development on the topland, which is gently rolling and open and varies in elevation from 20 to 50 feet above the 640-foot contour. The site is bordered on the east and north by moderately steep tree-covered shoreland. The land adjacent to and directly south of the selected development site is suitable for expansion.

(2) Newberry Creek (Oklahoma). Located on the east shore of the reservoir at the junction with Newberry Creek Bay, 2 miles by road north of the new U. S. Highway 70 bridge, is a site suggested for the development of day-use recreational facilities and possibly summer home sites to serve the people of Durant, Okla., and smaller communities in the immediate vicinity. It is closely related to Highway 70 for accessibility, yet far enough removed for desirable seclusion. The site is a tree-covered point of land and is sufficiently large to take care of the expected recreational needs. The topland is sufficiently elevated above the 640-foot contour to provide close relationship between the development and the fluctuating water surface. Newberry Creek Bay shore line is rugged and irregular, with many coves which may provide excellent fishing waters. Newberry Creek is a spring-fed stream heading in the vicinity of the community of Mead. The waters of the reservoir and the bay bordering the site are sufficiently deep to provide good navigation and boat-harbor facilities. Broad expanses of reservoir water to the north enhance the scenic value.

(3) Hauani Creek (Oklahoma). The Hauani Creek development site, containing 773 acres, is approximately 2½ miles east of the town of Lebanon on the opposite shore of Hauani Creek Bay, in the northwest portion of the reservoir area. The site will be accessible by way of Oklahoma State Highway 199 east of Lebanon and by a future spur road connection from the highway to the site, a distance of approximately 1 mile. Twelve and one-half miles of water will separate this site from the Willis Crossing development site. It should serve the recreational needs of Lebanon, the other communities to the west, and transient recreationists using this westerly approach to the reservoir area.

The development site has a sloping shore line which rises gradually to a comparatively flat top section. The entire area is moderately covered with native tree growth—the best stand of timber in this part of the reservoir area. The shoreland forms a protected cove suitable for boating activities closely related to the development site. Flat topland available for day-use recreational facilities is ample to provide for all expected needs. Hauani Bay at the development site has a width of approximately one-half mile, and the water will be sufficiently deep at all reasonable stages of fluctuation to serve all contemplated boating activities.

(4) Fort Washita (Oklahoma). See discussion on page 18.

(5) Willis Crossing (Texas). The Willis Crossing development site is located 1½ miles east of the proposed Willis Crossing Bridge on the east shore of the point formed by the main body of the reservoir and Mineral Creek Bay, 15 miles by road north of Whitesboro and approximately 29 miles from Gainesville. The site is now accessible by county roads, but upon completion of the future highway it can be made readily accessible by development of a short spur road connecting with the new highway. It is accessible to the primary development at Preston Bend by means of a 13-mile boat trip. Population centers to the south and west and local communities closely related to the area will be served by this development.

The area contains about 1,430 acres, approximately 50 percent of which is covered by native timber. The remainder is under cultivation or used for pasture. The shoreland and much of the topland of the development site is moderately

wooded. The topland rolls gently to the moderately steep shorelands. The site will afford a superb outlook over a broad expanse of reservoir to the east, and an excellent view of the extremely rugged bluff shoreland bordering the reservoir on the south. The land adjacent to the east shore of the area is suitable for desired development. A mile-long section of the shore line bordering on Mineral Bay has the necessary elevation to provide excellent relationship to water surface at all reasonable stages of fluctuation. It possesses a potential boat basin with desirable protection from the prevailing breeze. Because of the relationship of this site to the centers of population to the west, and to new highway proposals, the development demands and uses may prove to be greater than for any of the other suggested secondary sites.

(6) Mineral Bay (Texas). Because of its rugged, irregular shore line, Mineral Bay will have hundreds of secluded coves and small bays, and it is believed that fishing will be good in this vicinity. From the mouth of the bay to its head, a body of water will be formed that will be approximately 13 miles in length and vary from 1 to 2 miles in width.

In addition to the many potential fishing camp sites on the many miles of the bay shore, a site of strategic importance should be developed as a fishing center on the shore of the bay closely related to the proposed scenic road ferry crossing west of Pottsboro. Because of the uncertainty of the location of the crossing, which will influence the approach to the crossing, determination of the exact location for a development site is held in abeyance pending formation of the bay waters. There are, however, sufficient sites in the general vicinity of the proposed crossing on either side of the bay which possess the necessary qualifications to serve the development needs.

Detailed proposals for the development of the above-mentioned sites are contained in chapter IV, beginning on page 54.

Fish and Wildlife. Most of the fish caught in the Red and Washita Rivers in the vicinity of the reservoir location are buffalo, drum, carp, and several varieties of catfish and perch. A few largemouth bass and crappie are caught in the rivers, but most of the bass and crappie fishing is in the small tributary streams and in the river bottom cut-offs, bayous, and lagoons where angling for these varieties ordinarily is fair. Bass and crappie fishing in nearby Lake Murray in Oklahoma is excellent.

Since fishing is expected to be one of the principal attractions at the Denison Dam Recreational Area, it is important that management measures be developed which will maintain the highest possible yield of fish. Suggestions for a fish management program are offered on page 82.

The forest and adjacent prairie lands were once inhabited by white-tailed deer, bison, black bear, cougar, red wolf, passenger pigeon, wild turkey, and greater prairie chicken. All of these have been extirpated except the red wolf, which is seen occasionally. Species of mammals now present include fox squirrel, gray squirrel, cottontail, swamp rabbit, jackrabbit, striped skunk, red fox, gray fox, 13-lined spermophile, and mink. Rabbits are plentiful in spite of constant hunting. Squirrels are persistently hunted and are not very common. Present game species are rabbit, squirrel, bob-white quail, dove, and waterfowl. The few good hounds left in this vicinity are used for hunting fox, wolf, bobcat, raccoon, and opossum.

The area lies within the Central Flyway, which is a major waterfowl migration route. Only a few ducks and geese spend the winter in the vicinity but they are plentiful during fall and spring migration. Canada and snow geese are hunted along Red River during the migration period. The river is used as a resting area by mallard, pintail, teal, and black ducks that feed in the adjacent fields. The river itself is deficient in waterfowl foods. No ducks or geese are known to nest in this vicinity, although Lake Murray is a favorite resting and feeding area for geese, coots, gallinules, and a variety of ducks, including canvasback and scaup.

Mourning doves are common in the vicinity. Bob-white quail are plentiful. Raptorial birds are common, especially in migration. There are many varieties of hawks and owls. Turkey vultures, black vultures, and crows may be seen. Typical songbird species include cardinal, mockingbird, meadowlark, and lark sparrow. An interesting bird which often displays considerable curiosity and frequently is seen along country roads is the road runner or chaparral.

A program of wildlife management for the Denison Dam Recreational Area is discussed on page 82.

Vegetative Ground Cover. The reservoir area lies in the section of Texas and Oklahoma commonly known as the "Cross-Timbers." Soils in the reservoir area vary from red clay and sand to black loam. River-bottom soils are exceedingly fertile and rich in organic content. Due to the steep slope, much of the land just above the 640-foot contour has not been constantly cultivated, but has been used over a long period of years for wood lots and woods pastures. The more level upland and bottom land have been used for crops. Consequently, there will be a fringe of timber along a large part of the shore line, as is sharply illustrated in the aerial photographs on pages 59 and 75.

The trees are mostly oak, with post oak and blackjack predominating. Also common to the area are hickory, hackberry, redbud, juniper, dogwood, persimmon, plum, maple, haw, elm (including the winged elm), ash, pecan, black walnut, osageorange (*bois d'arc*), willow, cottonwood, sycamore, and many others. The osageorange attains its greatest size in America in the Red River Valley. The area lies in the transition belt between the East and the West. It is a little too far west for pine and a little too far east for mesquite.

There is scracely any virgin timber in the vicinity. Most of the timberlands have been cut over for firewood, railroad ties, and fence posts, and some of them have been repeatedly burned over. When given even a semblance of protection, however, the forest will "come back" quickly because of the ample rainfall and other prevailing conditions extremely favorable for plant growth.

Beauty of the autumn leaves is an outstanding characteristic of the wooded hills of this section. In the spring, one of the principal attractions is the abundance of dogwood and redbud in bloom.

There are many species of native shrubs, vines, and other plants including sumac, coralberry, French mulberry, possumhaw (holly), mimosa, wild rose, blackberry, dewberry, strawberry, possum grape, honeysuckle, elderberry, mistletoe, and, unfortunately, poison ivy.

The prairie sections support many grasses. On some few spots which have never been placed in cultivation the original bluestem tall grass is found. Bermudagrass and Johnsongrass are common.

Beginning in early spring and lasting throughout the summer there is an abundance of wild flowers. Among those which seem to be especially impressive to visitors are lupine, Indian paint brush, Texas plume, winecup, gaillardia, coreopsis, aster, phlox, canterbury bell, violet, dutchmanspipe, blue-eyed-grass, poppy, primrose, wild rose, brown-eyed-susan, and verbena. With proper protection, wild flowers undoubtedly will continue to thrive on a broader scale and prove to be an attraction of considerable importance on the shorelands and surrounding countryside.

Historical Features. There are several historic sites of importance in the reservoir basin and the immediate vicinity, as shown on page 25. Two of the sites, Fort Washita and the Butterfield Trail Stage Crossing on Red River, appear to have some national significance, and two others, Preston and Camp Washita have certain regional aspects, while Governor Overton's home and the town of Tishomingo have, at least, local significance. The most interesting period of the history of the vicinity was from about 1830 to 1875. Its color and romance appeal to the imagination. There was a concentration of events involving Indians, early settlers, white captives, Dragoons and other units of the United States Army, plantations, slaves, river boats, trading posts, buffalo hunting, cowboys, cattle drives, stagecoaches, prairie schooners, forty-niners, bandits, and Texas Rangers.

Preston. The site of the old settlement of Preston, Tex., located in the fertile valley of Riviere Rouge [1] about 8 miles northwest from Denison is a concentrated center of significant history. The large bend in the Red River at this location is known as Preston Bend. Important east-west and north-south aboriginal trails converging at this point on the river developed into the oldest pioneer roads and crossings in this part of the States of Texas and Oklahoma. In the early 1830's, Col. Holland Coffee established an Indian trading post, inn, and plantation on the south side of the river. He was successful in his dealings with the Indians, held their confidence, and was able to redeem many white captives taken in raids by the Indians. About 1837 he built "Glen Eden," a mansion of hospitality in the wilderness, where an important social center was developed by Colonel Coffee and his wife, Sophia. Sophia was the daughter of Col. William Sut-

[1] Original name of Red River as shown on early maps.

tonfield, Commander of Fort Wayne, Ind. Notables entertained included Gen. Robert E. Lee, Gen. U. S. Grant, Fitzhugh Lee, James Bourland, Sam Houston, and many others. Gen. Albert Sidney Johnston brought Sophia plantings of catalpa trees from California which flourished around the plantation and became a source for other plantings over a wide region of the Red River Valley. Many of the catalpa trees may be seen today in the towns and at farm homes of the region. A famous wine cellar contributed to the popularity of Glen Eden. The river crossing at Coffee's was just a ford and ordinarily prairie schooners could be floated across, but when the river was on a rise travelers frequently were forced to wait for weeks for the waters to recede. A thriving community developed where these "tourists" could obtain supplies, blacksmith services, guides, and protection from the Indians, and participate in various forms of recreation and entertainment. One of the best sites on the entire reservoir for development of recreational facilities (head of Preston Bend Peninsula) is on the high ground adjoining the site of Preston, the pioneer social center of the region.

The community became an important point on Marcy's California Route. Many forty-niners came this way. The Old Preston Road from Preston to the present site of Dallas was the first Grayson County road to be officially designated by the Republic of Texas in the first year of Texas Independence (1836). The contract for construction of the road stipulated that stumps were not to exceed 12 inches in height. By 1840 the Republic of Texas, in its efforts to attract settlers and to afford protection against hostile Indians, had established a stockaded fort of Texas Rangers under the command of William Preston at Coffee's Trading Post. The fort was called Fort Preston and the community adopted the name Preston. This was the head of navigation on Red River. Many of the supplies for Preston and Fort Washita came up the river by boat. Thousands of settlers poured into the Southwest through this gateway, and Preston became the largest town in north Texas.

From Preston the Snively Expedition set out for New Mexico on April 25, 1843. Col. Jacob Snively, commanding a force of 200 adventurers, set out to harass caravans on the Santa Fe Trail and to collect customs

Figure 7.—Glen Eden in 1937 (U. S. Engineer Office Photo).

for crossing Texas Territory. It is said that the plan of Sam Houston in sending out this expedition was to begin on a small scale with capture of booty from caravans as a penalty for refusal to pay such customs for crossing Texas Territory and then to expand, with annexation of New Mexico and northern Mexico as the ultimate goal. The expedition failed to capture a single caravan and surrendered to United States troops of superior numbers under Capt. Phillip St. George Cooke at a point near the present location of Dodge City, Kans.

During Civil War days Coffee's Inn served as a rendezvous for a famous outlaw band known as "Quantrill's Men." Frank and Jesse James were members of the organization.

The site of Preston will be inundated. Glen Eden, which was in a fair state of preservation in 1942, has been razed and it is understood that Grayson County will rebuild the house on a small tract recently purchased by the county for that purpose on the head of the Preston Bend Peninsula. It was the only surviving architectural gem of plantation days in the area. Brick walls of part of the trading post were standing in 1942. The bricks were made by Negro slaves on the plantation. Remains of the trading post and the brick tomb of Colonel Coffee have been removed to the county tract near Glen Eden. The oldest Methodist Church in north Texas (1832) was located at Preston. The church building has been moved to higher ground where it will continue to serve the community.

Downstream from Preston, about 3 miles on the Texas side of the river, is Rock Bluff which served as a favorite crossing for cattle being driven in large herds from Texas to Dodge City, Kans., and other railheads following the war between the States. A natural chute-like formation of rock at this point was of great value in forcing the cattle into the water for crossing on their way north. This heavy traffic up the trail was an important economic asset to the vicinity and contributed in no small measure to the boom town, Red River City.

Butterfield Trail Stage Crossing. In 1858 B. F. Colbert, Chief of the Chickasaw Nation, saw the need for a ferry in this vicinity as the only means of crossing the river was by fords and traffic was becoming increasingly heavy. Colbert descended from a French family (Colbert) and

Figure 8.—Col. Holland Coffee Tomb (U. S. Engineer Office Photo).

a noted Chickasaw family in Mississippi who had been successful in business enterprises along the Natchez Trace. He had led his people in the move from Mississippi to the Indian Territory on orders from the Federal Government and had established a home on Red River. After a charter had been obtained from the Tribal Council of the Chickasaw Nation he selected a ferry site and placed the ferry in operation just north of the present site of Denison and near the present bridge across the river on U. S. Highway 75.

The ferry was a success from the beginning and soon Red River City sprang up on the Texas side. It was a supply center for freighters, drovers, buffalo hunters, and trappers, and soon grew to a considerable size. It was a wild shanty town of tents and shacks and the story is that entertainment was gaudy. During the first year of ferry operation (1858) the Butterfield Stage Line started operation and used Colbert's Ferry.

On September 16, 1857, John Butterfield and associates entered into a contract with the Federal Government to operate the first mail route connecting the eastern United States with the West. The stage line started at St. Louis, went to Tipton, over the Ozarks to Fayetteville, to Fort Smith, then across the Choctaw country to Colbert's Ferry, and on to Sherman and Gainesville, and thence westward to California. This was the Butterfield Southern Route. The central route ran through Denver and Salt Lake City. The company had a 6-year contract at $600,000 a year to carry mail semiweekly, service to begin September 15, 1858.

Stations were established 10 to 20 miles apart along the route where horses could be changed, mail deposited and collected, and patrons accommodated. Each station usually included agent's house, stables, blacksmith' shop, and an eating place. At first the line used Concord spring wagons, with capacity of four passengers and baggage, and with 500 to 600 pounds of mail. Later, coaches were added which accommodated six to nine passengers inside the coach and one or more outside on the top. Through fare from St. Louis to Golden Gate was $200. Contract time for the trip was 25 days. This was the world's longest stage route—2,795 miles of which 767 miles were in Texas. The first mail coaches left St. Louis and San Francisco simultaneously on September 15, 1858, and made the trip in less than 25 days. It was a time for celebration along the line. When Butterfield and his associates came to Sherman, Tex., a banquet was held. Champagne was served and arrangements were made for free crossing of stages at Colbert's Ferry. The Butterfield (Southern) Overland Mail and Stage Road was of paramount importance through the 1860's in transportation of many settlers, immigrants, and travelers to the Far West. It was probably the most important overland route of travel south of the Santa Fe Trail.

The Missouri, Kansas, and Texas Railroad was being built from the north to the Gulf of Mexico. The line crossed the Red River at Red River City near Colbert's Ferry and the first train arrived at Red River City on Christmas Eve 1872. Inhabitants soon thereafter moved en masse to higher ground about 4 miles south to establish the new town of Denison and Red River City became a ghost town. There are no surviving physical remains or structures at the old Colbert's Ferry site.

Fort Washita. The site of Fort Washita is located in Bryan County, Okla., on the eastern shore line of the Washita arm of the reservoir, about 10 miles northwest of Durant. The fort was established as a western outpost in 1843 to serve the Federal Government in its relations with the Indians who were numerous in that part of the country. Under treaty agreements with the Indians, the Government was to render aid in protecting the Choctaws and Chickasaws from border raids by the wild tribes of the Southwest. Gen. Zachary Taylor selected the site and gave the fort its name. It is one of the few forts for which the site was selected and named by a military hero who later became President of the United States. The reservation was about 5 miles long and 2 miles wide. Structures were built of native shell rock. Many names famous in history are associated with activities at Fort Washita. Robert E. Lee, U. S. Grant, Fitzhugh Lee, W. G. Harney, Braxton Bragg, and many others were stationed here as young Army officers at various periods prior to the Civil War. Travelers bound for the West gathered at this outpost to form wagon trains with military escorts or guides for the most dangerous part of the trip. It was an important point on Marcy's California Route.

Gen. R. B. Marcy, a graduate of West Point, and one of the best-known soldiers in this western country prior to the Civil War, became an authority on western travel and published a guidebook on the subject entitled "Prairie Traveler." Concerning Fort Washita, he noted that there was a good camping place within a half mile of the Fort, and settlers along the road who would give needed information to strangers; that the road ran through Indian settlements to Preston, Tex., where stores and a blacksmith shop were to be found.

Marcy left Fort Washita to establish Fort Arbuckle in 1851. Later he served as Chief of Staff for his son-in-law, Gen. George B. McClellan, in the West Virginia campaign of the Civil War.

Adjoining Fort Washita on the west was the Chickasaw Indian Agency where families of soldiers and employees set up homes and established a town called, at different times, Hatsboro and Rugglesville.

Fort Washita was continuously occupied by Federal troops until 1861. Just prior to the outbreak of the War

between the States, Col. W. H. Emory, in charge of troops in this region, was instructed to make Fort Washita the center of defense of the Indian country and to concentrate troops there from other posts in the Territory in preparation for the Civil War. The Adjutant General reported about this time to the Secretary of War that Fort Washita was an important military point, and that the buildings were in good repair. On the outbreak of the Civil War, however, Emory used his authorized discretion and evacuated the fort. Confederate troops occupied the fort without a battle and remained in command of the area until the close of war.

On July 1, 1870, the post was definitely abandoned by the War Department and turned over to the Department of the Interior to be administered along with other Indian lands. Later, when the Chickasaw Territory was allotted, Fort Washita became the property of a descendant of the Colbert family. Mr. Colbert, who resides on the place, has converted one of the old structures to a dwelling and another to a barn. He recently sold part of the reservation to the Army Engineers for reservoir purposes.

Brig. Gen. William D. Belknap, ranking officer in the Southwest, died in November 1851 and was buried at Fort Washita. A large tombstone bearing his name is still located there, but the body was removed to Fort Gibson several years ago. General Belknap was the father of Wm. W. Belknap, a Federal General in the Civil War, and Secretary of War under President Grant. Also buried in an unmarked grave in the cemetery is the body of Douglas H. Cooper who fought in the Mexican War with Jefferson Davis and later served as Government Indian Agent at Fort Washita and still later served as Commander of Confederate forces of the Territory with the rank of major general. The cemetery at Fort Washita is still used for burial purposes by the people of the community.

Physical remains of the old fort include rock walls of several of the structures, the oven, the well, several chimneys, foundations, and other miscellaneous ruins. Traces of the first paved road in the State of Oklahoma are visible at the fort location. There are a few ruins of the nearby village of Hatsboro-Rugglesville.

Camp Washita. The site of Camp Washita is located on low ground in Marshall County, Okla., at the confluence of the Red and Washita Rivers just across Red River from Preston and will be inundated by the rising waters of the reservoir. The camp was occupied during the summer of 1834 by the First Dragoon Regiment of the United States Army under the command of Col. Henry Dodge, and detachments of the Third and Seventh Infantry, all a part of the command of Gen. Henry Leavenworth.

No great battles were fought here and no great military objectives were involved. However, the site has some claim to historical significance as Camp Washita played a part in the lives of some famous men and others who later became well-known. As the southernmost point reached by an expedition, the camp was effective in establishing the authority of the United States over this section of the country. From the standpoint of interpreting the history of the region to visitors, Camp Washita offers the greatest opportunity because of the romance, color, and drama in the story of the ill-fated Dragoon expedition.

The fact that the unmarked and unlocated graves of many of the 450 men who made up the expeditionary force will soon be inundated by the rising waters of the reservoir is partially responsible for renewal of interest in the Dragoon Expedition. Incidentally, remains from all marked graves in more than 30 cemeteries which lie in the reservoir basin have been removed by the Army Engineers to other cemeteries on higher ground. Both whites and Indians are interred in most of these cemeteries. A typical cemetery relocated by the Army Engineers is shown in the photograph on page 20.

Interesting details of the Dragoon expedition are recorded in Colonel Dodge's report to the Secretary of War and in the memoirs of George Catlin, lawyer-artist, who accompanied the group to paint and record what he saw.

Mention is made of seeing several springs of "rock oil" or petroleum near Camp Cross Timbers. They also saw, "rocks 2,000 feet high of a granite quartz piled one upon the other," which could have been the Wichita Mountains near Lawton, Okla. A blanket or a butcher knife was good for a horse in barter with the Indians. Mention is made of one Indian so expert with bow and arrow that he could kill three buffalos with three arrows.

The purpose of the expedition was to explore the area from Fort Gibson, near the present site of Muskogee, Okla., to the south and west, and to make friends with the marauding Indians, as well as to impress them, especially the Pawnee Picts, with the superior forces and splendid equipment of the white man. Recruited at Jefferson Barracks, St. Louis, the group gathered at Fort Washita for inspection just before starting on the expedition late in June 1834. Pay was only $5 per month, but Army issues of whiskey were generous, there was prospect of adventure, and uniforms were colorful. Each company had good horses and of the same color so that the bays, roans, whites, blacks, etc., distinguished each of the 8 companies. It is said that even though the Seventh Infantry was located at Fort Gibson at the time, all eyes were turned to the dashing Dragoons. Full-dress uniforms

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Figure 9.—New Burney Cemetery No. 9 entrance gate (U. S. Engineer Office Photo).

worn by the Dragoons consisted of a dark blue, double-breasted, cloth coat with 2 rows of gilt buttons, 10 to the row, and yellow collar and cuffs with gold lace framing the collar; blue-gray trousers with 2 stripes of yellow cloth, three-fourths of an inch wide down the outer seams; and a cap with a gold eagle, gold cord, gold star in front and a white drooping horsehair pom-pon. The black patent leather boots had a yellow spur at the ankle. The half-basket hilt sabre had a steel scabbard. The sash at the right hip was made of dark orange silk net. Gloves were white. Regular uniforms were slightly less elaborate. The coat was blue with 9 buttons to the row, a button on each side of the collar, 4 buttons each on the cuffs and flaps, and 2 at the hips. Epaulets were on the shoulders. There was a blue-gray, double-breasted great coat, worn with a cape.[2]

Nine days were required for the trip to Camp Washita. Before reaching the camp, General Leavenworth, who was riding at the head of the group with Dodge and Catlin, saw a herd of buffalo. Sporting instincts of the 70-year-old Leavenworth directed a chase, and his horse stepped in a hole. The fall resulted in internal injuries to the general, and those, combined with an attack of fever that probably was malaria, resulted in his death on July 21, 1834. His body was treated with spices, Indian fashion, and hauled back to St. Louis. Later it was removed to New York and finally to Leavenworth, Kans., to the fort which now bears his name.

[2] Grant Foreman, Pioneer Days in the Early Southwest, 1926, pp. 123 and 124, published by Arthur H. Clark Co., Cleveland.

Catlin reported that by the time the group reached Camp Washita, a bilious fever was throwing one-half of the command on their backs. Leavenworth thought the fever-mists of the lowlands might be responsible for the sickness. Men continued to die. Exactly how many died is not recorded, but the inference is that the bodies of about 100 men were left in the sodden soil of the little peninsula at the confluence of the Red and Washita Rivers called Camp Washita, for Catlin reports that the returning survivors left behind them, "one-third of 450 men who started out so bravely 2 months ago and more due." The illness of the men was attributed by the regimental surgeon to heat, exposure, and intemperance.

Part of the group under Colonel Dodge left Camp Washita and proceeded northwestward through Camp Cross Timbers, located near the present site of either Madill or Pauls Valley, and then continued on through the Wichita Mountains, but it was a disheartened, unglamorous group of Dragoons who finally returned to Fort Gibson some 2 months after the expedition started. The Army report says that those returning were "a sorry figure, but one (stout fellow!) who looks like service. They are literally half naked and many are sick."

There is a marked difference between the appearance of the country around Camp Washita today and its appearance a century ago when Catlin saw it. Today timber has been cleared from the bottom lands for the reservoir and on the upland section there are eroded fields, scrub timber, Johnsongrass, bumblebee cottonfields, and unkept fence rows. Catlin described the country around Camp Washita as a panorama too beautiful to be painted with a pen, being composed of prairie and timber alter-

nating in the most delightful forms and proportions that the eye of a connoisseur could desire. The verdure was of the deepest green and the prairies were literally speckled with buffalo.[3]

In his address to Congress, December 1, 1834, President Andrew Jackson said: "The expedition of the regiment of the Dragoons into the territory of the wandering and predatory tribes inhabiting the Western Frontier and living adjacent to the Mexican boundary has been effected. It became necessary for the peace of the frontier to check these habitual inroads, and I am happy to inform you that the object has been effected without the commission of any crime. Colonel Dodge and the troops under his command have acted with equal firmness and humanity, and an arrangement has been made with those Indians which it is hoped will assure their permanent pacific relations with the United States and the other tribes of Indians upon that border."

In addition to Colonel Dodge and Lt. Col. Stephen W. Kearney, second in command, officers mentioned as surviving the expedition included Capt. Nathan Boone, son of Daniel Boone, and Lt. Jefferson Davis, who later became President of the Confederacy.

From high elevations on the peninsula, called Washita Point in this report, just above the confluence of the Red and Washita Rivers, excellent panoramic views of the lake will be afforded. It is here that a text marker concerning Camp Washita and the Dragoon Expedition might be appropriate.

Governor Overton's Home. Benjamin Franklin Overton, son of John Overton, said to be one of the founders of Memphis, Tenn., was Governor of the Chickasaw Nation from 1874 to 1878 and again from 1880 to the time of his death in February 1884. His formal education was limited to attendance for a short while at the Chickasaw Male Academy at Tishomingo, but he was instrumental in establishment of the Chickasaw neighborhood schools and extension of the Indian boarding schools in his Nation. Governor Overton held a deep and abiding interest in the spiritual, social, and political welfare of his people and contributed valuable leadership in their efforts to improve conditions through self government. His home was on Red River in Marshall County, Okla., near the town of Willis. The site of the old residence and grave of Governor Overton will be inundated or converted into an island by waters of the reservoir. His remains and the grave marker have been moved to the new cemetery just northwest of Willis. It is understood that members of the family expect to remove the old house to Willis and preserve it as a point of historic interest.

[3] Catlin, North American Indians, Vol. 2, page 51.

Benjamin C. Burney, a close friend and brother-in-law of Governor Overton, served one term as Governor of the Chickasaw Nation from 1878 to 1880. He also attended an Indian school at Tishomingo and was probably the youngest Governor the Chickasaws ever had. His efforts while Governor were concentrated on religious and educational improvement of his people. The site of his old home and grave near Aylesworth, Okla., will be inundated by the waters of the reservoir. His remains have been removed to the new Burney cemetery about 2 miles west of Aylesworth.

An interesting article by John B. Meserve describing the part these two men played in the Indian history of the vicinity of the new reservoir is contained in the June 1938, issue of "The Chronicles of Oklahoma," published by the Oklahoma Historical Society.

Tishomingo. Tishomingo is the county seat of Johnston County, Okla. Waters of the reservoir will rise at spillway elevation to inundate a small section of the town. Present population is about 2,000. The Indian name of the town came from an illustrious Chickasaw Chief. Along Pennington Creek, which runs through part of the town and into the Washita, there are numerous historical landmarks of the Creek Indians.

At a mass convention on Pennington Creek in 1856 a new tribal organization and government was formed and a capitol building of logs was erected. This structure is still standing. The second capitol was a two-story brick building which burned and was replaced by a two-story granite structure which is now the Johnston County Courthouse.

Tishomingo was the educational, cultural, and political center for the Chickasaw Indians for three quarters of a century and represents an important part of pioneer settlement by the white man and his relations with the Indian in southwestern development.

Suggestions for preservation and interpretation of the historic sites and historical features of the Denison Dam Recreational Area are given in other sections of the report.

ARCHEOLOGICAL SITES. A preliminary archeological reconnaissance and study of the Denison Reservoir Area in October–November 1942, revealed that there are a number of known archeological sites of considerable importance in the vicinity of the reservoir, some of which will be inundated by the waters of the reservoir. Some of the sites have been excavated; others have been merely located and the location recorded (fig. 10, p. 25). The University of Oklahoma with W. P. A. assistance salvaged some archeological material in 1941 and 1942 from sites to be inundated.

There is evidence from field data that the number and importance of the sites decrease as one moves from east to west and that the greatest concentration occurs near the Washita-Red confluence. This is the view which the University of Texas has obtained from its informants, but it has not been checked by the university in actual survey of the immediate Denison area. The University of Texas has large archeological collections but these come from the eastern portion of the Red River country and are derived largely from burial mounds and cemeteries. A. D. Krieger of the Laboratory of Anthropology, University of Texas, has been employed at the University for the past 3 years organizing the archeological collections and in studying and analyzing them to give a synthesis of past surveys and explorations. His statement below regarding the comparative archeological significance of the Red River area in connection with other contiguous southwestern investigations is thus based on opportunities for study and refinements of conclusions not perhaps possible for other students, and may be taken as the best summary available. There appears to be no published material that will assist in making an appraisal of the Denison area.

No Indian mounds in the Denison Reservoir are reported by local collectors or are known to the consulting archeologists. However, Indian mounds, both prehistoric and historic, abound in northeastern Texas and southeastern Oklahoma, in southwestern Arkansas, and in eastern Louisiana along the Red River to its confluence with the Mississippi southward. Extensive burial grounds, rich in associated burial furniture, have lured many collectors and local exploiters to excavate them for the striking material, which is frequently flamboyant in style and form, especially the pottery. Much archeological work has been done in these areas.

The known distribution of mounds and site indications of sedentary agricultural groups is to the east of Grayson County, Tex., and Bryan County, Okla. Westward the sites are smaller, are less numerous, and have sparser surface indications of occupation. Stone artifacts, flint scrap, scattered midden material, and a few animal or human bones are likely to be the only indications on even the longest occupied sites. For this reason site hunting is an elusive pursuit in the portion of the Red River drainage above the Denison Dam. The sites simulate more the conditon presumed to result from camp sites, or village occupations of only seasonal duration. These peculiar ecological features of archeological distribution were regarded as highly significant in discussions with Dr. Forrest Clements and David Barerreis at the University of Oklahoma and with A. D. Krieger at the University of Texas. Notwithstanding the relative paucity of material culture objects, and the comparative lack of archeological features which would be attractive to visitors, the general conclusion is that the archeology of this area is highly significant to fill in important gaps in our knowledge and to show the relationships between southwestern and southeastern aboriginal civilization. Mr. Krieger stresses particularly the interesting interplay in tribal movements between typical Plains nomad and semi- or fully sedentary agriculturists such as the historic eastern Caddo. The whole question of the origin of the Caddo is intimately concerned. The section of the Red River affected by the Denison Dam is critical for the solution of all these problems.

The current summary of the scientific importance of archeological sites in the Denison Reservoir Basin, comparing sites in this region with those in neighboring areas in Oklahoma, Texas, Louisiana, and Arkansas, is given in a letter written by A. D. Krieger, Research Associate in Anthropology, University of Texas, on November 19, 1942, to A. R. Kelly, Chief, Archeologic Sites Division, National Park Service. This letter reads as follows:

> In respect to your survey of archeological sites in the Denison Dam Basin, and your subsequent visit and discussion here, I would like to offer a brief summary of the archeological problems in the Denison region. This statement of the general problems is aside from the usual desirability of recovering anything of value from dam reservoirs throughout the country.
>
> The confluence of the Red and Washita Rivers marks an unusually strategic position in that aboriginal trade routes from east to west and north to south crossed there. Apparently the Denison Dam Basin lies in the approximate center of a distinctive archeological area extending along the middle Red River from about Quanah to near Direct in Lamar County, and from the upper Brazos River in Texas on north into Oklahoma. In Texas we call this complex the Henrietta Focus and it denotes a southern Plains culture in distinction to the Mississippian

cultures farther east in eastern Texas and eastern Oklahoma.

The Henrietta Focus occupies a rather peculiar position in native North American cultures in that its economic dependence was apparently based both on agricultural practices and on bison hunting. There are several possible explanations for the origin of this agricultural complex. It may have been due to a gradual diffusion westward from the Mississippi Valley area; or it may have reached the Denison region through southern diffusions from the central Plains of Kansas and Nebraska; or barely possible, it may come from the Puebloan Southwest of New Mexico and the Panhandle. The emphasis on bison hunting may or may not have been directly connected with the agricultural complex found along the middle Red River, hence it would be of great interest to discover through excavations the nature and relationships of these complexes. The Denison basin would appear to be ideally situated for this, and both the Texas and Oklahoma sides of the river would be equally important, for sites connected with the Washita confluence might be found on both sides of the Red River.

A second aspect of the problem is that involving the relation between the later agricultural groups and the earlier nonagricultural hunting tribes. As the agricultural practices were rather later here than farther to the east and west, say about 1400 to 1500 A. D. and after, it seems quite possible that nonagricultural sites could be readily located and directly compared with the later culture. From what you said, you have already located such contrasts in the surface collections. Excavations carried to some depth in such a site as that on the Ralph Arnold farm might be expected to yield a direct sequence stratigraphically.

A third problem on which the Denison sites could be expected to yield valuable information would be that of the location and movements of known tribes such as the Taovaya, Caddo, and Wichita. There has been a great deal of confusion of terminology regarding separate archeological complexes and the tribes belonging to different linguistic families. The true Caddoan groups certainly occupied the Red River Valley some distance down from the Denison Basin, and their remains are easily distinguished from those of the Henrietta Focus. However, the remains of a distinct culture which is neither Caddoan nor that of the Henrietta Focus have been found near Red River in Lamar County, Tex. In this latter place, intrusive potsherds and other artifacts have been found which undoubtedly came from upriver either in or near the Denison Basin, and likewise there are intrusions there from farther down the Red River in the region occupied by Caddo Indians in very late times (seventeenth and eighteenth centuries). Unfortunately, in spite of the certainty that three complexes have been found in Lamar County site, the excavations there were not conducted in such a way that these complexes could be arranged in a chronological scale.

Now, inasmuch as the Denison Basin sites are only about 50 miles up the Red from the above-mentioned site, and surface surveys there indicate the presence of two or more distinct complexes, *plus some very important intrusions from both the Mississippian and Southwestern areas,* two or three good controlled excavations within the Denison Dam (more specifically, at the Red-Washita confluence) might well be expected to give us the information which will place all these factors in their true relationship to one another. It is essential that more than one excavation be conducted so that they will serve to complement one another. There is always an element of uncertainty in the results gained from one site, especially if the site has been damaged by flood, etc., so in order to gain a true picture it is necessary to have two or three excavations to check against one another.

As you know, there has always been a very large gap between the southwestern and eastern archeological pictures. Some of our present work in Texas, especially in the extreme western and eastern portions, is greatly helping to clarify the past relationships between east and west across the middle of the continent. It happens that the middle Red River region, including the Denison area, is in an extremely strategic position regarding several important problems. Naturally, anything which will be covered by the reservoir should be recovered systematically while there is still time.

All archeological sites are identified from information supplied by local informants, and reported by the survey of the University of Oklahoma or the Laboratory of Anthropology at the University of Texas. Archeological sites are divided into three classes—A, B, and C—on the basis of the following characteristics:

"A" sites are so designated to indicate that they are considered the most important and scientifically valuable for purposes of archeological salvage or preservation. Examination of the sites in the field has demonstrated that the cultural deposits are deeper or more widely distributed, that the type of pottery and other artifacts gathered from the surface or taken from test pits shows significant relationships or chronological connections with materials from other sites in the Red River basin, and thus that careful explorations should yield the maximum data for scientific recon-

struction of the archeology of the region. Whatever funds or facilities for archeological salvage may be made available should be expended first upon excavation of the "A" sites. Where the "A" sites are not located in places which will be inundated but are within the taking line which is, or may be, established by the United States Engineers, it is strongly recommended that these sites be purchased and included within the proposed recreational area. In the preliminary investigation, attention was concentrated on those sites which will be irretrievably lost. It would be desirable to extend the survey to report on other valuable sites that could be protected by land acquisition and thus be saved.

"B" sites are designated to show that they are of sufficient importance to merit salvage operations if funds and time are available. Considerations of economy have entered into the judgments which led to the classification of some sites as of "B" status. It is wise to limit rather strictly the number of sites which are on the urgent list. Some "B" sites are of such importance that they would undoubtedly be listed as "A" if funds for salvage could be obtained. Also, superficial surface examination and collection of material may result in a snap judgment which may not stand up after some systematic exploration in an area has taken place. The less pretentious and more obscure site may, as a result of a more competent site analysis, be indicated as of greater archeological significance.

"C" sites are recorded for completeness but are not recommended for emergency salvage operations. In general, examination of the site has revealed a paucity of surface indications. It is possible, even probable, that vegetative cover and extensive erosion have combined to make exact appraisal of the site difficult. Hurried observations on the ground may in some instances have led to observations away from the main concentration of the aboriginally occupied area. Nevertheless, for practical reasons, it is necessary to make selections even though they may be arbitrary.

Sites reported from the 1941–42 Archeological Survey of the University of Oklahoma.

A–1 Club House Site, Big Glasses Creek: Located approximately 2 miles southwest of Aylesworth, Marshall County, Okla. A low ridge, approximately 400 yards long, in a big bend of the Washita River known locally as Big Glasses Creek, shows a rich village mixture. A private fishing and hunting club maintains nearby quarters for which the site is named. A test pit dug by a University of Oklahoma survey party in 1942 located a rectangular house site upon the ridge mentioned above. They found clay walls preserved to a height of approximately 1 foot with posts inset in the walls. A burial was encountered in the corner of the house. The house type represented had not previously been uncovered in the area, and the important architectural data available make the excavation of this site particularly desirable.

A–2 B. J. Wheeler Farm Site: Located in sec. 7, T7S, R7E. The ridge behind the Wheeler Farmhouse, a terrace of Washita River, bears sherds and chipped stonework on the surface. One burial, with approximately five pottery vessels in association, had been plowed up by the tenant. The pottery vessels are now in the possession of Monroe Russel. Several test pits by a University of Oklahoma survey party in 1942 revealed another burial. This one had historic trade material (a gun, brass buttons, etc.) in association, in addition to one pottery vessel. Other material found in test pits included large vessel sections and sherds and numerous small projectile points. The pottery types seem to be divergent from others found in the area and the preponderance of small points is not duplicated at other sites. The question of contact (white) material deserves further attention since it might be intrusive into a prehistoric complex which deviates from the types already defined by excavations in the region.

B–1 "Poison Spring" Site, Monroe Russel Farm: Located in sec. 7, T7S, R7E, Marshall County about one-half mile north of the Wheeler Site (A–2). This site was visited by a University of Oklahoma survey party in 1941. It contains a cultural deposit which in areas exceeds 16 inches in thickness, the thickness being revealed by several pits that had been previously dug in the deposit. China, glass, and iron indicate a historic contact period, yet the pottery deviates from the common "Chickasaw" type, being unusually thick with a coarse, abundant, shell temper and "brush-marked" surfaces. Rim sherds are strongly recurved, another trait which is not common in the Chickasaw type. The unusual thickness of the deposit and the deviation in pottery type warrant giving the site a "B" classification. If another recommendation, a third site, for "A" classification should be made for the Oklahoma side of the basin, the Poison Spring site would be selected. It could be explored advantageously in conjunction with work carried on at the Wheeler site.

B–2 Talley Farm Site: Located in Coffee Bend of Red River, Bryan County, Okla. The chipped stone types found at this site appear to differ from other site collec-

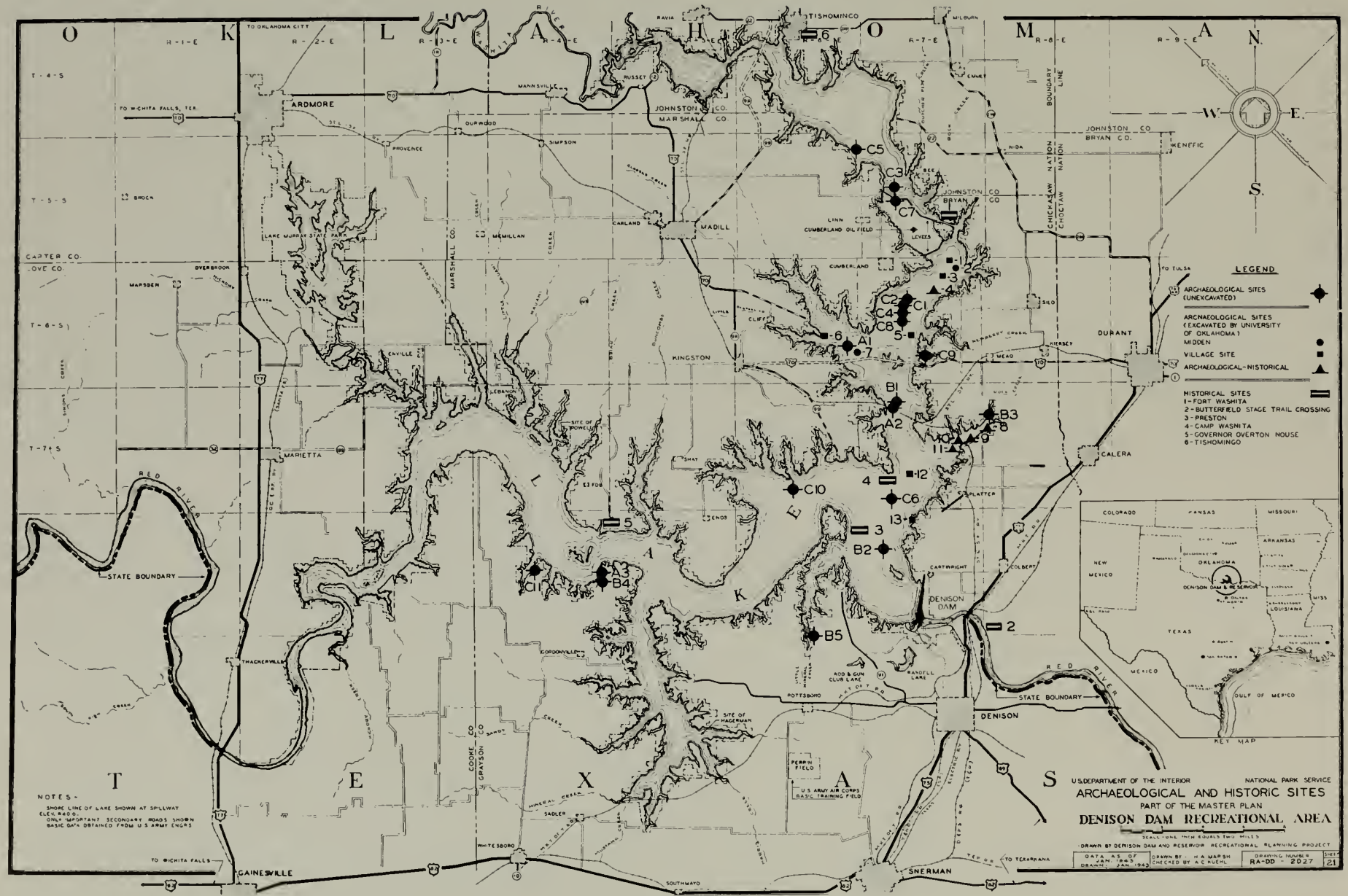

LEGEND
ARCHAEOLOGICAL SITES (UNEXCAVATED)
ARCHAEOLOGICAL SITES (EXCAVATED BY UNIVERSITY OF OKLAHOMA)
MIDDEN
VILLAGE SITE
ARCHAEOLOGICAL-HISTORICAL
HISTORICAL SITES
1-FORT WASHITA
2-BUTTERFIELD STAGE TRAIL CROSSING
3-PRESTON
4-CAMP WASNITA
5-GOVERNOR OVERTON HOUSE
6-TISHOMINGO
KEY MAP
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
ARCHAEOLOGICAL AND HISTORIC SITES
PART OF THE MASTER PLAN
DENISON DAM RECREATIONAL AREA
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
NOTES-
SHORE LINE OF LAKE SHOWN AT SPILLWAY ELEVATION 640.
ONLY IMPORTANT SECONDARY ROADS SHOWN
BASIC DATA OBTAINED FROM U.S. ARMY ENGRS
STATE BOUNDARY
RED RIVER
DENISON DAM
DENISON
SHERMAN
GAINESVILLE
MARIETTA
ARDMORE
MADILL
KINGSTON
DURANT
CALERA
TISHOMINGO
THACKERVILLE
ROTTSBORO
CARTWRIGHT
COLBERT
RANDELL LAKE
PERRIN FIELD
U.S. ARMY AIR CORPS BASIC TRAINING FIELD
SOUTHMAYD
WHITESBORO
TO WICHITA FALLS, TEX.
TO OKLAHOMA CITY
TO TULSA
TO TERRELL
JOHNSTON CO.
MARSHALL CO.
BRYAN CO.
CHICKASAW NATION
CHOCTAW NATION
BOUNDARY LINE
LAKE MURRAY STATE PARK
CARTER CO.
LOVE CO.
MARSHALL CO.
COOKE CO.
GRAYSON CO.
LINN CUMBERLAND OIL FIELD
SITE OF POWELL
SITE OF HAGERMAN
DATA AS OF JAN 1943
DRAWN JAN 1943
DRAWN BY H.A. MARSH
CHECKED BY A.C. NUEHL
DRAWING NUMBER RA-DD-2027
SHEET 21
SCALE ONE INCH EQUALS TWO MILES

Figure 10.

tions in Bryan County. There is a marked preponderance of end and side scrapers, and emphasis on skin-dressing tools which may be significant. The pottery also may be aberrant. The excavation of the site should add materially to our comparative knowledge of the region. Distribution of surface materials is rather scattered over a large area on the Talley Farm and test pit explorations would probably be the best method of sampling the site.

B–3 George L. Rose Farm (known locally as Mayberry Place): The location is the S. of SW¼ and S. of sec. 6, T7S, R8E. Sherd collections were made by a University of Oklahoma survey crew from what is tentatively identified as a historic Chicasaw site lying immediately above the reservoir. This is probably the largest of the historic sites of this type and contains abundant material.

C–1 Dudley Farm Site No. 1: Located approximately 1 mile east and a quarter mile north of Aylesworth, Marshall County. Two distinct areas were located on this farm by a University of Oklahoma survey crew in 1942, both probably village or camp sites. The first area, designated site No. 1, is near the south edge of the farm. Surface collections of sherds and chipped stone artifacts indicate a prehistoric occupation similar to the Marra Site (BrMaI) in Bryan County, previously excavated by the University.

C–2 Dudley Farm Site No. 2: Located approximately 1 mile east and 1 mile north of Aylesworth, Marshall County. Test pits placed in this area near the north edge of the farm by a University of Oklahoma survey party in 1942 yielded pottery and chipped stone artifacts similar in type to those found on the other site area—No. 1—located on this farm.

C–3 Quinton Little Farm Site: Located approximately 1½ miles east of Linn. An area about one-quarter mile north of gravel pit bears a concentration of chipped stone artifacts, indicating a camp or village site. Surface collections made by the University of Oklahoma field survey in 1941 contain principally large projectile points similar to those found in the middens excavated in Bryan County (BRJaI and BrLaI).

C–4 Ellas Farm Site: Located approximately one-half mile east of Aylesworth, Marshall County. Sherds were collected from the surface by a University of Oklahoma survey crew in 1942 but no subsurface material was located. Some areas of the site may have a more concentrated deposit. Affiliations of the site are not definitely determined.

C–5 Purcell Farm Site: Located approximately 1½ miles north of Linn Schoolhouse, Marshall County. University of Oklahoma survey materials gathered in 1942 from this farm are confined to flint, chips, and artifacts, the materials suggesting a camp site. Cultural affiliations not determined.

C–6 Red River Site (owner not known): The high benchland along Red River near its confluence with Washita River in the south half of sec. 30, T7S, R7E, Marshall County, was inspected by University of Oklahoma survey party to see what surface indications of sites could be found. Several concentrations of pottery associated with white cultural material similar to the type tentatively identified as Chickasaw were located in the eastern portion of this area. This is one of the few instances of this pottery type being found in the open flood plain. Scattered stonework in the area indicates a prehistoric occupation, but the specific site concentrations could not be determined without intensive testing by pits.

C–7 Stafford Farm Site: Approximately 2 miles east of Linn, Marshall County. A small collection of chipped stone projectile points was obtained from what appears to be a camp site by survey party in October 1941.

C–8 J. I. Henshaw Farm Site: Located approximately 1½ miles east of Aylesworth School, Marshall County. A camp site on this farm was inspected by university field party in October, 1941. The site yielded the most chipped stonework of any in the immediate area. A few sherds were also found on the surface. It possibly represents the same complex found in the other middens in Bryan County, although some testing would be necessary to confirm this. Classified as "C" site in the absence of more definite information.

C–9 Trent Farm Site: Located 3½ miles west and one-half mile north of Mead on the north side of an intermittent stream flowing into Washita River about 1½ miles below Newberry Creek (Bryan County). Abundant stone artifacts were found on the surface by survey crew in 1941.

C–10 Isom Springs: This site was reported by E. L. Savage of Denison, Tex., and was visited but not reported by a member of the University of Oklahoma field survey. Owner not known and exact survey location not given. The site is reported as relatively large with a fair amount of both sherds and flints on surface, including some glass trade beads. Mr. Savage reports it as being located 5 miles west of Woodville, Okla., about one-half to three-quarters of a mile north of the Red River. Classified as "C" site until further data can be obtained, with recommendation that any future survey check the site.

The foregoing list of sites in Oklahoma indicates that most of them are small and obscure, presumably camp sites, with little more surface indications than scattered flint scrap, a few artifacts, and occasionally some potsherds— the whole frequently suggesting temporary occupation by small groups. Since the 1941–42 field survey of the University of Oklahoma, many more tracts of land below the 640-

foot contour have been purchased by the Army Engineers and for one or two seasons these lands have lain idle, growing rapidly in grass and underbrush, making the observation of surface data very difficult. The finding of a few scattered flints on sites which local collectors state once yielded more abundant collections hardly merits the designation of a "C" site.

Sites reported on the Texas side of Red River. Only one site on the Texas side of Red River was reported as of outstanding importance by the Laboratory of Anthropology, University of Texas. No systematic site survey in the reservoir area has been carried out by the University of Texas comparable to that of the University of Oklahoma in Marshall and Bryan Counties. In fact, the University of Texas obtained most of its data from local informants. The University of Texas explorations and surveys have obtained material from areas south and southwest of the Denison region, and eastward in the mound areas of the Red River. The laboratory does have large collections of materials from east and northeast Texas, and A. D. Krieger's comments on the comparative relationships of Red River archeology are of considerable value in ascertaining the archeological significance of the general basin region around Denison.

A–3 Ralph Arnold Farm Site: Three and one-half miles north of Gordonville, Grayson County, Tex. This site is one of the largest and best known on the Texas side of the Red River. It is also one of two sites (the other being the Tom Holder Farm Site) reported by the Laboratory of Anthropology, University of Texas (reference letter of A. D. Krieger, October 30, 1942) and specially recommended for attention. Note that the Tom Holder site is not 5 miles northwest of Gordonville but immediately adjoins the Arnold Farm Site on the west. On a low primary river terrace is found a knoll several acres in extent which is black with midden. The river road cuts sharply down to a small creek crossing through one section of the knoll affording a cross section in which it is apparent that the dark midden and topsoil has a thickness of from 14 inches to 2 feet in places. There has been extensive sheet wash erosion and the place has been the happy hunting ground of local collectors for two generations. Many burials, some with rich burial furniture, have either washed out, or have been plowed out of the terrace bench just beyond the pasture gate. Pottery, pipes, bone and shell beads, and varied flint and stone artifacts still occur on the surface. There is every indication that the Arnold Site is the deepest, most extensive, and concentrated for archeological survey examination of any known for the Texas side of the Red River in the neighborhood of the Denison Dam Reservoir. There are no true burial mounds—the aboriginal interments were made in the first terrace ground above the alluvial flats. In part, the terrace here is a shelving portion of a promontory on which occurs the high ground where the Arnold Farmhouse is located. The flat tableland on the high area east of the farmhouse also yields artifacts of stone, bone, and potsherds. The signs of occupancy are not so extensive in this plowed ground as in the bottom land section where the burials occur. The narrow strips of bottom land immediately adjoining the river, just below and contiguous to the rich village midden area, have evidently been covered in recent generations with several feet of alluvium. It is not impossible, perhaps even probable that these sections also may have been occupied, in which case the alluvium might serve to insulate and preserve such features as house patterns. The richest culture-bearing strata of the Arnold Site are only some 15 to 20 feet above the present river level and are well below the maximum power pool.

B–4 Tom Holder Farm Site: Adjoins the western boundary of the Arnold Site. A bench or spur of ground fingering out parallel to the river from the Arnold property line has yielded several burials in the past. Most of the flint and artifacts picked up by local collectors have come from this terrace. Sheet wash erosion is extensive and may be responsible for the relative paucity of surface materials. The Holder Site is conveniently located with reference to the Arnold Site and could be advantageously examined by a few pits in conjunction with work undertaken at Arnold's. Under the conditions observed, the site would not rate more than "B" classification.

B–5 Jim Child's Place: Located 1 mile north of Pottsboro, Grayson County. Reported by N. C. Dorchester. The area covered by surface materials might cover between 30 and 40 acres. Both sherds and flint have been recovered. It is recommended that this site be checked on the ground in connection with any work undertaken for salvage at the Arnold Site.

C–11 Collin's Farm Site: Located on Paw Paw Creek, Delaware Peninsula, Grayson County T–214–2 on tract maps, within 125 yards of Red River. The tenant has potsherds, human skeletal parts, including skulls, mealing stone, and flint artifacts gleaned from the site while plowing. Examination of the site showed flint scrap and a few scattered sherds. The burials had been made in the slope of a small bench extending out into cultivated ground from a wooded section. Only a temporary occupation by a relatively small group of persons would seem to be represented.

Archeological Salvage. While it is conceded that the archeological sites are not imposing or sensational in their physical appearance, or might not offer permanent values for educational exhibit purposes, nevertheless their importance for reconstruction of the prehistory of a large area of the greater Southwest can hardly be overestimated.

It might be added that, in addition to the significance of archeological salvage as indicated by the reports from the Universities of Texas and Oklahoma, other fundamental research in the Great Plains areas would be greatly benefited by making this new information from the Denison Basin available. Reference is made to the researches of Dr. Waldo Wedel of the Smithsonian Institution and Dr. William Duncan Strong of the Department of Anthropology, Columbia University. Similarly, with regard to the presumptive association of the Caddoan-speaking groups with mound-builder civilization, the data anticipated from survey excavation of the recommended sites would have an important bearing on current investigations in Louisiana, Arkansas, and Mississippi.

The National Park Service recommended early in 1943 that salvage excavations be conducted prior to inundation at the three "A" sites and at certain "B" sites by the National Park Service in collaboration with the University of Oklahoma and the University of Texas, and suggested to the District Engineers Office at Denison that $2,500 from the Denison Dam fund be made available for this purpose. The Service was informed that no authority existed for the expenditure of funds for such work.

The Recreational Aspects of the archeological features of the Denison Dam Recreational Area and proposals concerning them are discussed on page 92.

GEOLOGY.

Physiography. Elevations in the vicinity of the reservoir range from about 500 feet above sea level at the base of the dam to about 850 feet in the central part of Marshall County, Okla. River gradient for the length of the reservoir is about 1.6 feet per mile.

Surface formations slope generally to the south and southeast toward the Gulf of Mexico. General topography of the area surrounding the reservoir might be described as rolling to hilly, with occasional escarpments and benches. The Red and Washita Rivers have cut broad valleys which lie some 200 feet or more below the general elevation of the surrounding country. In some places the valley slopes are steep. When water fills the reservoir, the many rugged cliffs, hills, and promontories along the 1,200-mile shore line will hold special interest.

Stratigraphy. The bedrock strata of the Denison Reservoir Area are chiefly of Comanchean age. In addition, there are alluvial deposits found chiefly along the Red and Washita River Valleys. The names of the formations, arranged in their chronological sequence, are described below.

(1) The Trinity sand represents the beach deposit of the Comanchean Sea. It is a fine, incoherent sand containing scattered lentils of sandy clay with a conglomerate at the base. The fine white-yellowish-white, and yellow pack sand is the predominant type of exposed material. These strata weather easily and are responsible for the sandy soil seen throughout much of the reservoir area. Undoubtedly many good beaches suitable for recreation will be formed along the 1,200-mile shore line when water rises in the reservoir.

(2) The Goodland limestone lies over the Trinity sand. It consists of 10 to 20 feet of hard, gray, semicrystalline limestone. In fresh exposure the strata appear massive, but when weathered the surface scales off in thin plates giving the exposure a shattered appearance. Nevertheless, these strata are quite resistant to erosion and constitute the principal cap rock and cliff forming formation in the reservoir area.

(3) The Washita Group is the highest subdivision of the Comanchean and its strata rest upon the Goodland limestone. They consist of marine shaly clays, marls, and subordinate limestones. It is the clay and marl of this group that has "broken down" to form the dark soil seen above the stream flood plains, as well as the sticky mud encountered along some of the unimproved roads.

Structure. The general structure of the surface formations of this area is that of a gently dipping monocline sloping to the south and southeast, toward the Gulf of Mexico. This general dip is interrupted by several minor folds. Both anticlines (arches) and synclines (troughs) are known, and

are exemplified by the Preston anticline, and by the Marietta syncline of Marshall County, Okla.

Underground water. Water wells less than 50 feet deep at farm homes in the vicinity of the reservoir shore line show that the Trinity sand contains water-bearing zones. Wells about 800 feet deep at Perrin Field near Pottsboro and at other locations in the vicinity of the reservoir site furnish an ample supply of good drinking water. Before development of recreational facilities begins, test wells should be drilled at all sites where a water supply will be needed in connection with recreational development.

Paleontological remains. No paleontological investigation of the area has been made by the National Park Service, but the following comments on prehistoric features by Darwin Harbin, Paleontologist of the Denison District, United States Engineers, furnish valuable information and indicate the need for further investigation.

Sedimentary rock exposed in the Denison Dam and Reservoir area belong chiefly to the Mesozoic Era, and to strata assigned to the lower and upper Cretaceous periods. In the western portion there is a small exposure of upper Paleozoic rocks of the Pennsylvanian Series. There are also scattered terrace gravels along the Washita and Red Rivers tentatively assigned to both the Pliocene and Pleistocene. The Pliocene and Pleistocene materials lie uncomformably upon strata of upper or lower Cretaceous Age, and consist principally of debris, sands, and gravels of the ice-age and pre-ice-age period. By far the greater portion of this area, however, exposes Cretaceous strata at the surface. Pennsylvanian strata in the western portion contain the characteristic crinoids and small invertebrate fossils of the late Paleozic. The Pliocene terrace gravels which lie near the outer limits of the Reservoir contain, among others, Mastodon, horse, and deer remains. The Pleistocene here has produced the remains of mammoth, horse, and bison. The alluvial silts and sands contain scattered remains of post-glacial bison and other mammals.

Chief interest in the paleontology of this region is centered in the prolific fossil remains of the Cretaceous which include a great variety of invertebrates with occasional remains of swimming reptiles. There are also considerable numbers of fishes, including the armored fishes. In the Austin Chalk and Eagle Ford of the upper Cretaceous, and in the transition zone between the Goodland lime and the Washita series of the lower Cretaceous, there are both fish remains and shark teeth, the latter from both the commonly known species and the less familiar pavement-toothed shark.

Among the invertebrates are many remains of prehistoric shellfish. The associated thin limestones and clays contain great numbers of echinoids or sea urchins and coiled ammonites. The ammonites range in size from the smallest to large ones several feet in diameter. In many places they are entirely uncrushed, with the suture or cell lines forming a beautiful and well-defined pattern.

In the warm shallow sea which existed here 60 to 100 million years ago sharks and armored fishes and the pavement-toothed sharks readily found plentiful food supplies. The last of the great fish lizzards were the virtual rulers of those seas but already the mosasaurs, tigers of the late Cretaceous seas, were appearing in ever greater numbers and size together with the serpent-like plesiosaurs. The remains of all these are found in the reservoir area. It may be anticipated that the lapping waters of the Denison Reservoir-to-be will long create a happy hunting ground for both layman and scientist along its shores.

Of special interest to both laymen and scientists is the great variety of echinoids or sea urchins which occur in the Comanche series. Some of those found here are described as type specimens in University of Texas Bulletin No. 2838, by W. S. Adkins.

Remains of shellfish are so plentiful at certain horizons that they form a shell marl. This marl and other highly fossiliferous rock were used almost exclusively for the construction of old Fort Washita in Bryan County.

It is certain that the waters of Denison Reservoir will, near its shore line, expose new specimens in the fossiliferous shales, limestones, clays, and gravels for many years to come. Gravels along the high banks and in the upper reaches of creeks may conceivably yield the remains of prehistoric elephants, bison, and other mammals. Remains of swimming reptiles have been found throughout this area in the Austin Chalk and Eagle Ford, and in the Washita formations in the Denison Dam construction area. A vertebra indicating one of the largest known ichthyosaurs, or fish lizards, was recently found here.

An interesting possibility in the Denison Reservoir Area is the discovery in gravels of the Pleistocene and deposits of Quaternary Age of additional evidence of ancient man in North America, such as the little-known Folsom man. Several artifacts of Folsom type have been reported from this area. A close search for additional evidence would be of especial interest to Texas and Oklahoma scientists and of general interest to the entire scientific world.

Gastroliths. An especial interesting discovery in the Trinity sands, the basal Comanchean formation, has recently come to the writer's attention from near Tishomingo in Johnston County, Okla., at a place that will soon be

near but above the waters of the Denison Reservoir. This discovery consists of several thin but persistent horizons in the white sands, containing countless more or less rounded pebbles ranging in size from that of a pea to a small pecan, with an occasional one the size of a chicken egg. A superficial examination of these pebbles, many of which contain fossil remains, indicates that a great many originated in strata of Lower Carboniferous, Devonian, Silurian, and Ordovician Age.

It is the opinion of the writer that these pebbles are gastroliths, i. e., stomach or gizzard stone, left here by Lower Cretaceous swimming reptiles, swimming birds, or possibly by both. These stones show no concussion rings or abrasion marks such as one would find on stones that were deposited directly through the action of water. Some contain smooth, hollowed-out places where other stones apparently have ground against them, presumably in the gizzard of a Mesozoic reptile or toothed-bird. Many of the stones are beautiful, very hard, and highly polished with the thin edges rounded, but there are some that evidently had not had time to become worn to an extent where they would be of no further use in a gizzard, indicating that the creatures died before they were ready to eliminate these digestive helps.

The fact that only a few remnants of fossil bone were found associated with these stones probably means that conditions for fossilization were not favorable. Conditions necessary for the preservation and fossilization of bird bones would have to be exceptionally favorable, while small reptile bones would probably require somewhat similar conditions.

It appears probable that the Arbuckle uplift to the north and west of this location formed an extensive island during at least a portion of the Lower Cretaceous period, surrounded by a sea on the shores of which these birds and reptiles obtained the grit they needed much as a chicken does today. Although conclusive proof is still lacking, the writer fully believes that these stones or gastroliths probably were dropped in shallow waters or lagoons after being picked up as grit on the shores of this subtropical sea of over a hundred million years ago. The Arbuckle uplift presumably attained its maximum height between the Lower Carboniferous and the Upper Jurassic epochs when Lower Paleozoic strata were thrust many thousands of feet above their original position, and were then subjected to erosion for an unknown period before and during the time that the Lower Cretaceous Trinity sands were deposited.

CLIMATE. In this section of the country, the general climate might be termed temperate or mild. Conditions are suitable for most kinds of outdoor recreational activities throughout the year. The swimming season is from May to October. People complain about the summer heat and seek relief in the outdoors just as they do in most of the Midwest farm belt. Heaviest recreational use of the area may be expected during June, July, and August.

The mean average temperature for January is about 43°, for July it is about 83°, while the annual average is about 64°. There is an average daily range of about 10° during the summer; while the daily range during the winter is about 20°. The highest temperature ever recorded was 112°; the lowest temperature ever recorded was −12° (Gainesville, Tex.).

There has been considerable speculation as to whether introduction of an artificial body of water of the magnitude of the Denison Reservoir would cause an appreciable reduction in summer temperatures or otherwise affect the climate of the region. The fact that summer breezes will have an unobstructed sweep across wide stretches of open water will locally increase their cooling effect on the shores against which they blow. Undoubtedly certain locations near the shore of the reservoir will have a more pleasant summer climate after the reservoir is filled with water. There is a possibility also that such a large body of water may tend to have a stabilizing effect on summer rainfall.

In this vicinity the growing season is relatively long, the average being about 238 days. The average date of the last killing frost in the spring is about March 18, while the average date of the first killing frost in the fall is about November 14. There is a possibility that damage to fruit trees and other vegetation from late spring frosts may be lessened on some lands near the shore of the reservoir.

The average annual precipitation of about 37 inches, which is fairly well distributed over the year, is ample for plant growth. Heaviest rainfall ususally occurs during April and May, and showers are frequent during the summer months. The following table shows normal precipitation in inches at three points in the vicinity of the reservoir where official United States Weather Bureau records have been kept for many years.

Precipitation in inches at certain points in Texas

Place	Annual	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Sherman	37.00	2.20	2.07	2.80	3.99	4.75	3.37	3.68	2.95	2.71	3.67	2.12	2.69
Gainesville	35.55	1.86	1.97	2.34	3.96	4.65	3.38	3.53	2.51	3.24	3.59	2.26	2.27
Bonham	37.73	2.51	2.35	3.09	4.21	4.70	3.50	4.10	2.39	2.29	3.41	2.22	2.96

The average annual snowfall is about 3 inches. This compares with 20 inches at Amarillo and one-half inch at San Antonio.

The percentage of possible sunshine at Denison averages 75 annually. This compares with 80 at El Paso and 61 at San Antonio.

Humidity is relatively low as is indicated by the estimated 61 inches of evaporation annually. Similar evaporation may be expected from the Denison Reservoir.

The average annual wind velocity of about 10 miles per hour is considered moderate. During the winter the wind is usually from the north and northwest, while the prevailing breeze during June, July, and August is from the south and southeast. The average velocity during the summer months is about 9 miles per hour. In the spring and summer strong winds sometimes accompany storms for brief periods. The summer breeze is especially important to the outdoor recreationist near bodies of water, not only for its effect on the apparent temperature, but also because it makes the mosquitoes less troublesome. Although Denison is not in the malaria belt, it is just on the western edge of it and a few cases of the disease ordinarily may be found in the river lowlands during the summer.

Unfavorable Feature. The proposed Denison Dam Recreational Area has one unfavorable feature of considerable importance—the production of oil from wells on the area (Cumberland Oil Field), and the possibility of discovery of oil in new locations from further drilling operations.

No recreational developments have been recommended in the vicinity of the Cumberland Field, except for the preservation of Fort Washita which should not be adversely affected by the construction of the levees and cuts.

The possibility of serious pollution of the waters of certain parts of the reservoir through operation of the oil field, however, may affect the recreation and fish and wildlife proposals. Water which will collect in the oil field from seepage and run-off from the drainage of a considerable watershed must be pumped out of the area protected by the levees. Present plans are to pump this water over the levees directly into the reservoir. The seriousness of the pollution from this operation cannot be determined now, but it is probable that there will be ample time to observe the effects of these operations before major recreational developments can be undertaken. If pollution does become serious, there will be opportunity for consideration of remedial measures before commitments are made on major recreational developments.

There is also the possibility that other oil fields may be discovered on lands within Federal boundaries. Wildcat drilling may be expected, since the mineral rights on only a small portion of the lands within the boundaries are Federally owned, but the possibility of discovering another oil field in the area is generally considered remote. In the selection of sites for recreational development, special effort was made to avoid the vicinity where oil was being produced, or locations where available geological information indicated that future drilling was likely. Future drilling operations in the vicinity of sites proposed for recreational development could be prevented by Federal acquisition of mineral rights, and such action is recommended.

CHAPTER III

Factors Influencing Recreational Development

There are two broad purposes for establishment of public outdoor recreational areas: (1) The provision of needed recreational facilities, and (2) the protection and conservation of recreational resources.

Establishment of the Denison Dam Recreational Area and development of recreational facilities to meet the needs of the people are justified on the basis of both of these broad purposes. The region surrounding the area is nonmountainous, densely populated, farm country in which there is a deficiency of parks, forests, lakes, streams, and other types of recreational facilities. Common sense demands protection and provision for proper utilization of the recreational resources of the Denison Reservoir and its surrounding shorelands, insofar as such use would not conflict with the primary purposes of the project.

The recreational plan, which is presented in Chapter IV, is designed to serve as a guide in the achievement of these purposes. Formulation of the plan required determination, as far as possible, of the needs of the people of the surrounding region and visitors from beyond the region for the type and number of facilities. Important factors and data which have been considered in formulating the plan include characteristics of the surrounding region; existing and proposed related recreational areas; characteristics of the population of the region, including recreational habits and interests; estimated attendance; and possible benefits. Experience gained in the planning and operation of other large recreational areas has been used as a basis in estimating needs and requirements.

Surrounding Region. It is believed that the recreational opportunities offered by the Denison Dam Recreational Area will attract visitors from a radius of about 200 miles. Special events such as boat races and fishing contests will draw some visitors from a greater distance, but the number will be small in comparison with the total number of visitors. Within the region bounded by the 200-mile radius and for a considerable distance beyond, there are no lakes or reservoirs which compare in size with Denison Reservoir. The size and shape of the reservoir will permit relatively long trips in large, cabin-type cruisers and excursion boats such as the old-fashioned stern wheeler river boat. South of the 200-mile zone, the Gulf of Mexico exerts a strong influence or drawing power. To the east and northeast the Ozark-Ouachita Mountain section is an important attraction. For the people living west and northwest of the region, the Rocky Mountains serve as the principal vacation attraction. Influence of the Denison Dam Recreational Area in Texas and Oklahoma will be considerably stronger than in the sections of Arkansas and Louisiana lying within the 200-mile radius because the residents of the last two States are attracted by the nearby mountains, numerous streams, small lakes, and bayous—all of which tend to minimize the influence of the Denison area, except for the few recreational activities associated with "big water."

The region is largely flat to rolling. Foothills of the Ozarks and Ouachita Mountains extend into eastern Oklahoma. Most of the rivers are muddy and sluggish. Natural lakes are almost unknown. Most of the land in the region is in cultivation or has been in cultivation at some time in the past. There are no forests of consequence, except in the eastern part of the region, and large public-land holdings are uncommon. Emphasis has been placed for many years upon the growing of cotton. Other crops include corn, wheat, oats, hay, and a variety of livestock feed crops. The livestock, poultry, and dairy industries are important. Large farms and ranches characterize the western part of the region.

Related Recreational Areas. In order to estimate the need for recreational developments at this project, it was necessary to ascertain the number and location of other important lakes and reservoirs and other types of recreational areas existing in, or proposed for, the region.

Major lakes and reservoirs within 200-mile zone

Number	Name	State	County	Distance, miles [1]	Administering agency	Primary purpose	Approximate acreage	Recreational development	Cabins [2]	Camping facilities [2]
1	2	3	4	5	6	7	8	9	10	11
	EXISTING OR UNDER CONSTRUCTION									
1	Lake Murray [3]	Oklahoma	Love, other	Adjoin	Division of Forestry and State Parks.	Recreation	6,000	Extensive, public (State park).	X	X
2	Lake McAlester [3]	do	Pittsburg	90	City of McAlester	Water supply, recreation.	2,500	Moderate, public	[4]	X
3	Pensacola Reservoir	do	Delaware, other	200	Reconstruction Finance Corporation.	Power, flood control	50,000	Limited, private, commercial.	X	X
4	Spavinaw Lake [3]	do	Mayes	180	City of Tulsa	Municipal water supply	1,800	Incomplete, public	X	X
5	Great Salt Plains Reservoir.	do	Alfalfa	200	U. S. Army Engineers	Flood control, wildlife, conservation.	29,000	Incomplete, potential wildlife.	[4]	[4]
6	Canton Reservoir	do	Blaine	180	do	Flood control, irrigation	15,000	Public	[4]	[4]
7	Lake Blackwell [3]	do	Payne	150	Oklahoma A & M College.	Recreation	3,300	Moderate, public	X	X
8	Lake Lugert-Altus [3]	do	Greer	150	U. S. Army Engineers	Irrigation, flood control, recreation.	4,500	Incomplete, public (Quartz Mountain State Park).	X	X
9	Lake Kemp	Texas	Baylor	130	City of Wichita Falls	Municipal water supply, irrigation.	22,827	Limited, private, commercial.	X	X
10	Lake Bridgeport	do	Wise, other	75	Tarrant County Water District.	Municipal water supply, flood control.	13,000	do	[4]	X
11	Possum Kingdom Reservoir [3]	do	Palo Pinto	100	Brazos River Authority	Power, flood control, irrigation.	21,300	Public, incomplete, limited, private and commercial (State park).	X	X
12	Lake Eagle Mountain [3]	do	Wise, other	75	Tarrant County Water, District.	Municipal water supply, flood control.	9,600	Limited, public, commercial, private (county park).	X	X
13	Lake Worth [3]	do	Tarrant	75	City of Fort Worth	[4]	3,720	Extensive, public, private, commercial (park).	X	X
14	Lake Brownwood [3]	do	Brown	185	Brown County Water District.	Municipal water supply, flood control, irrigation.	4,500	Extensive, public, private, commercial (State park).	X	X
15	Lake Waco	do	McLennan	150	City of Waco	Municipal water supply	1,850	Moderate, public, private, commercial (park).	X	X
16	Lake Whiterock [3]	do	Dallas	75	City of Dallas	Auxiliary municipal water supply, recreation.	1,279	Extensive, public, private, commercial (park).	X	X
17	Lake Dallas	do	Denton	45	do	Municipal water supply	11,000	Limited, private, commercial.	[4]	X
18	Caddo Lake [3]	Texas and Louisiana.		160	Privately owned shoreland.	Natural lake	70,000	Extensive, public, private and commercial (State park).	X	X
19	Lake Hamilton	Arkansas	Garland	200	Arkansas Power & Light Co.	Power	7,195	Private, commercial, semi public.	X	X
20	Nimrod Reservoir	do	Perry, other	190	U. S. Army Engineers	Flood control, power	[4]	Public (Ozark National Forest).	[4]	X
21	Blue Mountain Reservoir	do	Yell, other	180	do	Flood control	[4]	Public (adjoining Ozark National Forest).	[4]	X
22	Wallace Lake Dam	Louisiana	Caddo and De Soto.	195	do	do	9,300	Proposed	[4]	[4]
23	Wister Dam	Oklahoma	Le Flore	135	do	do	23,000	do		
24	Tenkiller Ferry Dam	do	Sequoyah	165	do	Flood control, power	20,800	do		
25	Fort Gibson Dam	do	Muskogee	165	do	do	51,000	do		
26	Markham Ferry Dam	do	Mayes	180	do	do	18,000	do		
27	Oologah Reservoir	do	Rogers	200	do	do	41,000	do		
28	Mannford Dam	do	Creek	145	do	Flood control	24,800	do		
29	Lake Overholser	do	Oklahoma	120	Oklahoma City	Municipal water supply	1,700	Public, commercial	X	X
30	Bluff Creek Reservoir	do	do	135	do	do	2,850	Proposed		
31	Denison Reservoir	Oklahoma and Texas.			U. S. Army Engineers	Flood control, power	146,000	do		
	PROPOSED WATER CONTROL PROJECTS									
1	Blakely Mountain Reservoir.	Arkansas	Garland	190	Arkansas Power & Light Co.	do	[4]	do		
2	Lake Whitney	Texas	Bosque	125	U. S. Army Engineers	do	[4]	do		
3	Hords Creek Dam	do	Brown	195	do	Flood control	[4]	do		
4	McGee Bend Dam	do	Tyler, other	200	do	do	[4]	do		
5	Rockland Dam	do	do	200	do	do	[4]	do		
6	Narrows Reservoir	Arkansas	Pike	140	do	Flood control, power	[4]	do		

[1] Distance from Denison Dam Recreational Area.
[2] In the column, "X" indicates that facilities are available.
[3] Recreational development of lake is indicated on table and map, "Parks and other nonurban outdoor recreational areas."
[4] Information not available.

Major lakes and reservoirs. For the reason that other major lakes and reservoirs have greater bearing upon the needs at the Denison Area than would most parks, wildlife refuges, and other miscellaneous recreational areas, information on the major lakes and reservoirs is shown separately on the map on page 35, and in the table on page 33. In addition to the major lakes and reservoirs, a number of smaller reservoirs have been included because of their special importance from the standpoint of recreational use. Not shown are proposed projects such as the ones covering construction of 26 dams on the Washita River and its tributaries for flood control, irrigation, and other purposes. These proposed reservoirs range in surface area from 480 acres to 12,300 acres. Army Engineers have investigated these proposals and have found that the system as a whole is not economically justified at this time. As a long-range program, however, the Engineers consider that some of the proposed dams have considerable merit.

From the standpoint of "big water" recreation the Denison Reservoir will receive little competition from other areas in this region. The nearest large bodies of water are Pensacola Reservoir, located in the northeast corner of Oklahoma, and Caddo Lake on the Texas-Louisiana border—each of which contains less than half the area of the Denison Reservoir. Lake of the Ozarks, located in central Missouri outside of the 200-mile zone, also has less than half the area of the Denison Reservoir.

Most of the existing lakes and reservoirs of the region are of local significance. They serve for day use and also for limited week-end use, and they probably would continue to serve in such capacity if a major recreational area were established at the Denison Reservoir. It is probable that any of their patronage that might be lost to the Denison Reservoir would be offset by the general trend in the region toward increased interest in fishing, boating, and other water recreation which has resulted from establishment of a number of new reservoirs within the past few years.

Each of the proposed major reservoirs in the region, as well as many of the minor ones, undoubtedly will have some recreational value, and it is reasonable to assume that some recreational facilities will be needed at most of the areas to serve the nearby population. Facilities also will be needed at some of the areas to serve fishermen who have come a considerable distance; for experience has shown that under normal conditions fishermen in this part of the country go wherever the fishing is good, without too much regard for travel distances. The possibility of future development of needed recreational facilities at all of the proposed reservoirs in the region does not affect adversely the recommendation for establishment of a major recreational area at the Denison Reservoir to serve the entire region.

Parks and other nonurban outdoor recreational areas. In addition to the major lakes and reservoirs within the 200-mile zone are: 1 national park (Platt); 24 State parks; a number of metropolitan parks; wildlife refuges where certain recreational facilities have been provided; land utilization projects; and other miscellaneous public areas which receive some recreational use. These areas are shown on the map on page 38, and in the table on page 36. Most of them have been established and developed since 1933. Numerous municipalities have small water-supply reservoirs which provide a certain amount of fishing for local residents but cannot be classed as parks. There are a number of organized group camps in the region, but studies conducted by the States of Texas and Oklahoma in 1938–39 in cooperation with the National Park Service revealed that there was a serious deficiency of such facilities.


COLO.
KANS.
MO.
TENN.
MISS.
ALA.
OKLAHOMA
ARKANSAS
LOUISIANA
NEW MEXICO
TEXAS
MEXICO
GULF OF MEXICO
EL VADO RES.
OPTIMA RES.
FT SUPPLY RES.
GREAT SALT PLAINS RES.
HULAH RESERVOIR
OOLOGAH RES.
PENSOCOLA RESERVOIR
CLEAR WATER DAM
WARAPELLO RESERVOIR
NORFORK DAM
WATER VALLEY DAM
BELL FOLEY DAM
LONE ROCK DAM
GREERS FERRY DAM
GRAND RIVER DAM
MARKHAM FERRY DAM
LAKE SPAVINAW
FT GIBSON DAM
TENKILLER FERRY DAM
MANNFORD DAM
CANTON LAKE
LAKE BLACKWELL
ENID
TULSA
OKLAHOMA CITY
BLUFF CREEK RES.
LAKE OVERHOLSER
CONCHAS DAM
AMARILLO
ALAMOGORDO RESERVOIR
LAKE LUGERT-ALTUS
LAKE LAWTONKA
LAKE McALESTER
WISTER DAM
BLUE MT RES.
NIMROO RES.
LITTLE ROCK
BLAKELEY MT. DAM
LAKE CATHERINE
LAKE HAMILTON
PLATT NATIONAL PARK
LAKE MURRAY
DENISON
NARROWS RES.
LAKE KEMP
LUBBOCK
DENISON DAM AND RESERVOIR
LAKE BRIDGEPORT
LAKE DALLAS
ELEPHANT BUTTE RESEARVOIR
LAKE McMILLAN
LAKE AVALON
POSSOM KINGDOM RESERVOIR
LAKE EAGLE MT.
FT WORTH
DALLAS
LAKE WHITEROCK
CADDO LAKE
WALLACE LAKE DAM
LAKE BISTENEAU
RED BLUFF LAKE
SHORDS CREEK DAM
LAKE BROWNWOOD
LAKE WHITNEY
LAKE WACO
LAKE NASWORTHY
SAN ANGELO
McGEE BEND DAM
ROCKLAND DAM
200 MILE RADIUS
LAKE BUCHANAN
INKS LAKE
MARSHALL FORD RES.
LAKE AUSTIN
AUSTIN
BEAUMONT
PORT ARTHUR
HOUSTON
LAKE WALK
MEDINA LAKE
SAN ANTONIO
GALVESTON
LAKE CORPUS CHRISTI
CORPUS CHRISTI
LOS OLMOS RES.
N
W
E
S
KEY MAP
DENISON DAM
LEGEND
EXISTING
PROJECTS UNDER CONSTRUCTION
PROPOSED
(SEE REPORT TEXT)
DATA AS OF MAY 1, 1943.
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
MAJOR LAKES AND RESERVOIRS
PART OF THE REPORT
DENISON DAM RECREATIONAL AREA
SCALE OF MILES
PREPARED BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
BASIC DATA FROM NAT RESOURCES PLANNING BD. U.S. ARMY ENGINEERS PUBLIC DOCUMENTS
DRAWN BY B. JONES
CHECKED BY
DRAWING NUMBER R A-DO-2004
SHEET 25

Figure 11.

Parks and other nonurban outdoor recreational areas within 200-mile zone

Number [1]	Name	State	County	Administering agency	Acreage	Principal attraction	Water recreation	Prineipal types of use	Cabins [2]	Camping facilities [2]
1	2	3	4	5	6	7	8	9	10	11
	FEDERAL AREAS									
1N	Platt National Park	Oklahoma	Murray	National Park Service.	912	Mineral waters	Swimming	Day, week-end, vacation.	—	X
3N	Wichita Mountains Wildlife Refuge.	do	Comanche	Fish and Wildlife Service.	61,480	Granite hills, wildlife.	Swimming, fishing, boating.	do	X	X
4N	Ouachita National Forest	Oklahoma-Arkansas.		Forest Service	1,100,000	Mountains, pine forest, streams.	do	do	X	X
5N	Salt Plains Migratory Bird Refuge. [3]	Oklahoma	Alfalfa	Fish and Wildlife Service.	19,459	New reservoir, waterfowl.	Development incomplete.	Development incomplete.	—	(4)
6N	Central Oklahoma Land Development Project. [3]	do	Payne, other	Oklahoma A. & M. College.	20,000	Recreation lake	Swimming, fishing, boating.	Day	X	X
7N	Cookson Hills Land Development Project.	do	Muskogee	Soil Conservation Service.	3,488	Hills, forest, small lake.	do	Day, week-end	X	X
9N	Davey Crockett National Forest.	Texas	Houston	Forest Service	125,000	Pine forest (recreation secondary).	do	do	X	X
15N	Northeast Texas Land Development Project.	do	Fannin	Soil Conservation Service.	17,000	3 recreation lakes	do	do	X	X
16N	Ozark National Forest	Arkansas	Johnson, other	Forest Service	100,000	Mountains, pine forest, stream.	do	Day, week-end, vacation.	X	X
17N	Northwest Arkansas Land Development Project.	do	Benton, other	Soil Conservation Service.	19,963	Wooded hills, lake	do	do	X	X
18N	Boston Mountain Land Development Project.	do	Crawford, other	do	34,040	Mountain, forest (recreation secondary).	do	Day, week-end	—	X
20N	Northwest Louisiana Land Development Project.	Louisiana	Webster	do	800	Forest (recreation secondary).	do	Day	X	X
	STATE AREAS									
30S	Bonham State Park	Texas	Fannin	Texas State Parks Board.	532	Recreation lake	do	do	—	—
31S	Fort Griffin State Park	do	Shackleford	do	520	Historic site	None	Development incomplete.	—	—
32S	Possum Kingdom State Park. [3]	do	Palo Pinto, other	do	6,969	Large reservoir	Swimming, fishing, boating.	Day, week-end	—	X
34S	Lake Brownwood State Park. [3]	do	Brown	do	538	Reservoir	do	do	X	X
35S	Stephenville State Park	do	Erath	do	300	Small lake	do	Day	--	-
36S	Mineral Wells State Park	do	Palo Pinto	do	70	Picnic facilities	None	do	--	--
37S	Cleburne State Park	do	Johnson	do	503	Small lake	Swimming, fishing, boating.	do	--	--
38S	Meridian State Park	do	Bosque	do	542	do	do	do	--	--
39S	Clifton State Park	do	do	do	104	Small golf course	None	do	--	--
40S	Mother Neff State Park	do	Coryell	do	256	Religious encampment grounds.	do	do	--	X
43S	Tyler State Park	do	Smith	do	985	Small lake	Swimming, fishing, boating.	do	--	--
44S	Love Lookout State Park	do	Cherokee	do	20	Overlook	None	do	--	--
45S	Fort Parker State Park	do	Limestone	do	1,496	Lake, historic site	Swimming, fishing, boating.	do	--	--
46S	Normangee State Park	do	Leon	do	504	Small lake	do	do	X	X
47S	Huntsville State Park	do	Walker	do	2,044	Forest	None	Development incomplete.	(4)	(4)
48S	Daingerfield State Park	do	Morris	do	580	Small lake	Swimming, fishing, boating.	Day	--	--
49S	Caddo Lake State Park [3]	do	Harrison	do	432	Park on large lake	do	Day, week-end	X	X
50S	Maydelle State Forest	do	Cherokee	Texas Forest Service.	2,400	Forest (recreation secondary).	do	Day	(4)	X
51S	San Francisco State Forest.	do	Houston	do	117	do	do	do	(4)	X
52S	Lake Murray State Park	Oklahoma	Carter and Love.	Division of Forestry and State Parks.	19,486	6,000-acre recreation lake.	do	Day, week-end, vacation.	X	X
53S	Quartz Mountain State Park. [3]	do	Greer	do	3,458	Hills, lake	do	Day, week-end	X	(4)
55S	Roman Nose State Park	do	Blaine	do	520	Hills, springs, historic site.	do	do	X	X
56S	Osage Hills State Park	do	Osage	do	840	Hills, stream	do	do	X	X
57S	Robbers Cave State Park	do	Latimer	do	8,340	Rugged terrain, history.	do	Day, week-end, vacation.	X	X
58S	Beavers Bend State Park	do	McCurtain	do	1,250	River, wildlife	do	do	X	X

Parks and other nonurban outdoor recreational areas within 200-mile zone–Continued

Number [1]	Name	State	County	Administering ageney	Acreage	Prineipal attraction	Water reereation	Principal types of use	Cabins [2]	Camping facilities [2]
1	2	3	4	5	6	7	8	9	10	11
59S	Pioneer Woman Monument.	Oklahoma	Kay	Division of Forestry and State Parks.	2	Historie site	None	Day	--	--
60S	Fort Gibson	do	Muskogee	Old Fort Gibson Stoekade Commission.	55	do	do	do	--	--
61S	Sequoyah's Home	do	Sequoyah	Division of Forestry and State Parks.	10	do	do	do	--	--
62S	Schooler Lake Wildlife Reservation.	do	Choetaw	State Game and Fish Commission.	63	Fish and wildlife	Fishing	do	(4)	(4)
63S	Mountain Fork Game Preserve.	do	McCurtain	do	16,000	do	do	Day, week-end	X	(4)
64S	Devil's Den State Park	Arkansas	Washington	State Park Commission.	4,320	Mountains, eool summer elimate.	Swimming, fishing, boating.	Day, week-end, vaeation.	X	X
	COUNTY AREAS									
75C	Loy Park	Texas	Grayson	Grayson County	350	Small lake	do	Day	—	—
76C	Eagle Mountain Lake Park.[3]	do	Tarrant	Tarrant County Water Distriet.	346	Lake	Fishing, boating	do	—	—
77C	Lake Lu Emma Park	Arkansas	Crawford	Crawford County	(3)	do	(4)	do	(4)	(4)
	METROPOLITAN AND MUNICIPAL AREAS									
79M	Lake Fort Smith Park	do	do	City of Fort Smith	(3)	Lake, mountains	Swimming, fishing, boating.	Day, week-end	—	—
80M	Whiteroek Lake Park [3]	Texas	Dallas	Dallas Park Board	2,780	Lake	do	Day	—	—
61M	Lake Worth Park [3]	do	Tarrant	Fort Worth Park Board.	(3)	do	Fishing, boating	Day, week-end	X	—
82M	Lake Crook Park	do	Lamar	City of Paris	3,592	do	do	Day	—	—
84M	Oklahoma City Parks	Oklahoma	Oklahoma	Oklahoma City Park Department.	(3)	Reereation faeilities	Swimming	do	—	—
85M	Mohawk and Spavinaw Lake Parks.[3]	do	Delaware, other	City of Tulsa	(3)	Lake	Swimming, fishing, boating.	Day, week-end	(4)	(4)
86M	Lake Okmulgee Park	do	Okmulgee	City of Okmulgee	(3)	do	Fishing, boating	Day	(4)	(4)
87M	Ponea Lake Park	do	Kay	City of Ponea	1,350	do	do	do	(4)	(4)
88M	Henryetta-Niehols Park	do	Okfuskee	City of Henryetta	1,500	do	Swimming, fishing, boating.	do	(4)	(4)
89M	Clinton Lake Park	do	Custer	City of Clinton	1,000	do	Fishing, boating	do	(4)	(4)
90M	Wetumka Lake Park	do	Hughes	City of Wetumka	880	do	Swimming, fishing, boating.	do	(4)	(4)
91M	Lake McAlester [3]	do	Pittsburg	City of McAlester	(3)	do	Fishing, boating	do	(4)	(4)
92M	Shawnee Lake Park	do	Pottawatomie	City of Shawnee	(3)	do	do	do	(4)	(4)
93M	Turner Falls Park	do	Murray	City of Davis	(3)	Small stream, waterfall.	Swimming, fishing	Day, week-end	X	—

[1] Numbers refer to key on map, "Related parks and other nonurban outdoor reereational areas", p. 38.
[2] In the column "X" indieates faeilities available, p. 33, not available.
[3] Lake shown on map, "Major lakes and reservoirs", p. 35, and in table, "Major lakes and reservoirs within 200-mile zone", p. 33.
[4] Information not available.

Most of the parks and other reereational areas within the 200-mile zone which offer water as the chief attraction are primarily of local significance. They are mainly day use areas, with limited facilities for week-end use. Relationship between the proposed Denison Dam Reereational Area and other reereational areas in the immediate vicinity should not be one of competition which would result in drawing patronage from nearby smaller areas. It is believed that establishment of the Denison Dam Reereational Area near the center of a section of the country which contains a number of reereational areas of lesser importance will tend to create a reereational region comprising a number of units furnishing a wide variety of interest. The combined drawing power of these varied units should tend to increase the number of visitors to the general vicinity to such an extent that most of the areas or units will receive greater use.

In addition to proposed developments at the Denison Area, the following features of major interest are included in this reereational region:

(1) Platt National Park at Sulphur, Okla., which is famous for a variety of mineral waters said to contain rare medicinal qualities and which for many years has been patronized by thousands of visitors annually. Visitors in

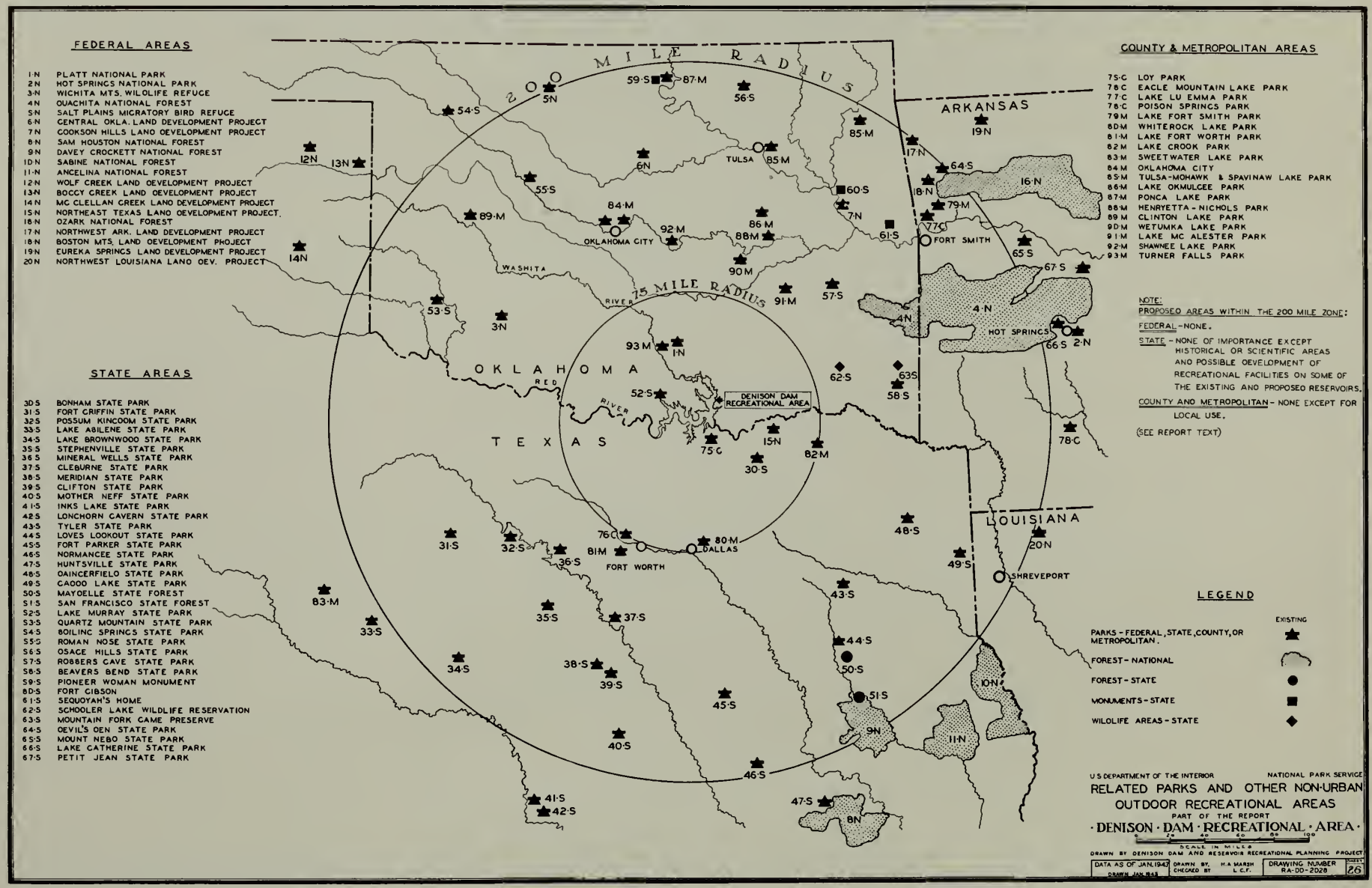

FEDERAL AREAS
1-N PLATT NATIONAL PARK
2-N HOT SPRINGS NATIONAL PARK
3-N WICHITA MTS. WILDLIFE REFUGE
4-N OUACHITA NATIONAL FOREST
5-N SALT PLAINS MIGRATORY BIRD REFUGE
6-N CENTRAL OKLA. LAND DEVELOPMENT PROJECT
7-N COOKSON HILLS LAND DEVELOPMENT PROJECT
8-N SAM HOUSTON NATIONAL FOREST
9-N DAVEY CROCKETT NATIONAL FOREST
10-N SABINE NATIONAL FOREST
11-N ANGELINA NATIONAL FOREST
12-N WOLF CREEK LAND DEVELOPMENT PROJECT
13-N BOGGY CREEK LAND DEVELOPMENT PROJECT
14-N MC CLELLAN CREEK LAND DEVELOPMENT PROJECT
15-N NORTHEAST TEXAS LAND DEVELOPMENT PROJECT.
16-N OZARK NATIONAL FOREST
17-N NORTHWEST ARK. LAND DEVELOPMENT PROJECT
18-N BOSTON MTS. LAND DEVELOPMENT PROJECT
19-N EUREKA SPRINGS LAND DEVELOPMENT PROJECT
20-N NORTHWEST LOUISIANA LAND DEV. PROJECT
STATE AREAS
30-S BONHAM STATE PARK
31-S FORT CRIFFIN STATE PARK
32-S POSSUM KINGDOM STATE PARK
33-S LAKE ABILENE STATE PARK
34-S LAKE BROWNWOOD STATE PARK
35-S STEPHENVILLE STATE PARK
36-S MINERAL WELLS STATE PARK
37-S CLEBURNE STATE PARK
38-S MERIDIAN STATE PARK
39-S CLIFTON STATE PARK
40-S MOTHER NEFF STATE PARK
41-S INKS LAKE STATE PARK
42-S LONGHORN CAVERN STATE PARK
43-S TYLER STATE PARK
44-S LOVES LOOKOUT STATE PARK
45-S FORT PARKER STATE PARK
46-S NORMANCEE STATE PARK
47-S HUNTSVILLE STATE PARK
48-S CAINCERFIELD STATE PARK
49-S CADDO LAKE STATE PARK
50-S MAYDELLE STATE FOREST
51-S SAN FRANCISCO STATE FOREST
52-S LAKE MURRAY STATE PARK
53-S QUARTZ MOUNTAIN STATE PARK
54-S BOILING SPRINGS STATE PARK
55-S ROMAN NOSE STATE PARK
56-S OSAGE MILLS STATE PARK
57-S ROBBERS CAVE STATE PARK
58-S BEAVERS BEND STATE PARK
59-S PIONEER WOMAN MONUMENT
60-S FORT GIBSON
61-S SEQUOYAH'S HOME
62-S SCHOOLER LAKE WILDLIFE RESERVATION
63-S MOUNTAIN FORK GAME PRESERVE
64-S OEVIL'S DEN STATE PARK
65-S MOUNT NEBO STATE PARK
66-S LAKE CATHERINE STATE PARK
67-S PETIT JEAN STATE PARK
200 MILE RADIUS
75 MILE RADIUS
OKLAHOMA
TEXAS
ARKANSAS
LOUISIANA
RED RIVER
WASHITA RIVER
TULSA
OKLAHOMA CITY
FORT SMITH
HOT SPRINGS
DALLAS
FORT WORTH
SHREVEPORT
DENISON DAM RECREATIONAL AREA
COUNTY & METROPOLITAN AREAS
75-C LOY PARK
76-C EAGLE MOUNTAIN LAKE PARK
77-C LAKE LU EMMA PARK
78-C POISON SPRINGS PARK
79-M LAKE FORT SMITH PARK
80-M WHITEROCK LAKE PARK
81-M LAKE FORT WORTH PARK
82-M LAKE CROOK PARK
83-M SWEETWATER LAKE PARK
84-M OKLAHOMA CITY
85-M TULSA-MOHAWK & SPAVINAW LAKE PARK
86-M LAKE OKMULGEE PARK
87-M PONCA LAKE PARK
88-M HENRYETTA - NICHOLS PARK
89-M CLINTON LAKE PARK
90-M WETUMKA LAKE PARK
91-M LAKE MC ALESTER PARK
92-M SHAWNEE LAKE PARK
93-M TURNER FALLS PARK
NOTE:
PROPOSED AREAS WITHIN THE 200 MILE ZONE:
FEDERAL - NONE.
STATE - NONE OF IMPORTANCE EXCEPT HISTORICAL OR SCIENTIFIC AREAS AND POSSIBLE DEVELOPMENT OF RECREATIONAL FACILITIES ON SOME OF THE EXISTING AND PROPOSED RESERVOIRS.
COUNTY AND METROPOLITAN - NONE EXCEPT FOR LOCAL USE.
(SEE REPORT TEXT)
LEGEND
EXISTING
PARKS - FEDERAL, STATE, COUNTY, OR METROPOLITAN.
FOREST - NATIONAL
FOREST - STATE
MONUMENTS - STATE
WILDLIFE AREAS - STATE
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
RELATED PARKS AND OTHER NON-URBAN OUTDOOR RECREATIONAL AREAS
PART OF THE REPORT
· DENISON · DAM · RECREATIONAL · AREA ·
SCALE IN MILES
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DATA AS OF JAN. 1947
DRAWN JAN. 1948
DRAWN BY H.A. MARSH
CHECKED BY L.C.F.
DRAWING NUMBER RA-DD-2028
SHEET 26

Figure 12.

the 1941 travel year (October 1, 1940–September 30, 1941) totaled 316,000.

(2) The Arbuckle Mountains which rise about 500 feet above the surrounding country are traversed by U. S. Highway 77 between Davis and Ardmore, Okla. Peculiar geological formations here are not only of importance to scientists but are of special interest to tourists and visitors because of their spectacular, vertical positions. Traveling north along U. S. Highway 77 one sees in sequence the same type of rock formations outcropping at the surface that he would see if he could travel straight down into the earth at Ardmore from 5 to 7 miles.

(3) Turner Falls, located near Davis, Okla., on a small stream, is popular for picnicking, swimming, camping, and religious encampments. Other waterfalls of interest in this vicinity are Prices Falls, and further eastward, Oil Springs Falls. At Devils Den on the historic Pennington Creek near Tishomingo, huge granite boulders are piled one upon another to form fantastic shapes mirrored in the clear stream.

(4) Lake Murray State Park, near Ardmore, Okla., practically adjoins the Denison Dam Recreational Area and it is planned that a good highway will provide easy communication between important points in both areas. A number of excellent recreational facilities, including organized group camps, have been developed. The park is used intensively, as evidenced by the average annual attendence of about 125,000, and good bass fishing has attracted many visitors from considerable distances. Insofar as public use is concerned, these two areas will be considered generally as one recreational unit.

(5) A 17,000-acre land-use demonstration project, administered by the Soil Conservation Service of the United States Department of Agriculture, is located in Fannin County, Tex., on Red River about 25 miles downstream from Denison. It has three small fishing lakes of 60, 400, and 700 acres, and other recreational attractions which receive intensive use. Many fishermen from Dallas and Fort Worth regularly spend week ends at this area because of the close relationship of the three lakes. Many fishermen reason that if fishing is not good at one lake on a particular day, it may be good at one of the others. This same reasoning may in the future account for a general increase in patronage of the small lakes surrounding the Denison Reservoir.

(6) Bonham State Park, 4 miles southeast of Bonham, Tex., has a small recreational lake as the chief attraction. The drawing power of even a small lake in this part of the country is illustrated by the 128,000 attendance in 1942. Bass fishing is especially good.

(7) Loy Park, located about 5 miles southwest of Denison, Tex., is administered by Grayson County. The small lake and picnic grounds receive intensive day use.

(8) A number of historic sites in this region are privately owned and the public is not encouraged to visit them. With proper development and public administration, the sites would undoubtedly attract many visitors.

Coordination. Experience has shown that ordinarily when a section begins to develop as a recreational region, the people of the entire section become aware of the increase in the number of visitors and their demand for services of local commercial establishments. The need becomes apparent for proper expansion of commercial facilities as well as for improved standards in quality of goods and services. On a long-range basis, proper planning and development of the recreational resources of an entire section are more effective than the haphazard system under which many individuals and communities attempt to promote their own interests, and pay little attention to any unsanitary, unsafe, and unsightly conditions that may exist nearby or in the other communities. The sustained drawing power of a recreational region depends upon the quality of services rendered as well as upon the variety of its attractions. A survey by the American Automobile Association indicated that approximately two-thirds of its members spent their vacation at certain places because they had been there previously and liked them, or because friends had been there and had recommended the areas. A disagreeable experience of a tourist or visitor at one establishment in a community in the region may color his impression of the entire community or even the region and he will never return or recommend the area to his friends. Bad news travels fast. As an illustration of the need for regional cooperation—if typhoid fever should break out in one of the communities on the lake shore, the entire region would be affected by loss of patronage. Every effort should be made in all of the communities of the entire region to have the water supply and other public health matters, especially in public eating and drinking places, placed under strict control with regular inspection by public health authorities.

Communities in the vicinity of the Denison Reservoir have taken the first step in a long-range program for the promotion of proper development of the recreational resources of the region. The Red River Lake Development Association, in which the communities are represented on a population basis,

has made considerable progress in promoting uniform fishing and hunting regulations on the reservoir.

A number of States have at least preliminary long-range proposals to establish State parks or other recreational facilities on suitable major reservoirs which may be created in the future, wherever arrangements can be made with the agencies charged with the duty of administering the water-control projects for flood control, power generation, and irrigation. In the event that a public works program is inaugurated after the war, and it again becomes possible to develop State and metropolitan parks with Federal aid, it is believed that additional State parks will be established, and that many of them will be located on the shores of new water-control projects.

If the Federal Government decides not to develop and administer the recreational features of the Denison Reservoir Area, the States of Oklahoma and Texas would likely be interested in establishment of State parks fronting on the reservoir. Several municipalities also might be interested in establishing local areas.

There are no outstanding large parks or bodies of water which can be considered as serving the needs of the population within the 200-mile zone as a major recreational area for week-end and vacation use; and no proposals for parks or other types of recreational areas in the region are known that would influence adversely the proposal to establish such an area at the Denison Reservoir.

POPULATION. The 1940 census recorded approximately 6,000,000 persons residing within 200 miles of the Denison Dam Recreational Area, and approximately 1,800,000 within 75 miles. Since the influence of the Denison Dam Recreational Area is expected to be of minor importance in the sections of Arkansas and Louisiana which fall within the 200-mile zone, most of the discussion on population is confined to Texas and Oklahoma.

Distribution. The chart, Population Distribution of the United States, page 41, shows the relation between location of the proposed recreational area and the distribution of surrounding population. Attention is invited to the dense population belt extending from Kansas City, Mo., to San Antonio, Tex., near the center of which is located the Denison Dam Recreational Area.

POPULATION ZONES 1940 CENSUS

200-MILE RADIUS [1]

State	Total population	Negro population	Percentage negro population	Farm population	Percentage farm population
Texas	2,768,521	506,899	14.7	1,117,300	40.0
Oklahoma	2,076,160	164,407	7.9	811,035	39.0
Arkansas	522,980	96,693	18.5	289,142	53.4
Louisiana	279,573	128,929	46.1	106,209	38.0
Totals	5,647,234	896,928	15.9	2,323,686	41.1

75-MILE RADIUS [1]

State	Total population	Negro population	Percentage negro population	Farm population	Percentage farm population
Texas	1,104,448	145,207	13.1	298,222	27.0
Oklahoma	324,931	19,497	6.0	164,128	50.5
Totals	1,429,419	167,704	11.5	462,350	32.3

6 COUNTIES ADJOINING RESERVOIR

State	Total population	Negro population	Percentage negro population	Farm population	Percentage farm population
2 counties in Texas	94,408	7,817	8.3	37,921	39.1
4 counties in Oklahoma	77,915	2,425	3.1	46,827	60.0
Totals	172,323	10,242	5.9	84,748	49.0

[1] Center of the radius used is a point near the dam. Considerably larger population figures result from use of airline distances from points along the 1,200-mile shore line.

The population trend in Texas and Oklahoma was consistently upward for many decades prior to 1930. However, the rate of increase has been constantly diminishing, and there was a slight decrease in population in Oklahoma during 1930–40.

	1930	1940	Increase	Percent increase
Texas	5,824,715	6,414,824	590,109	10.1
Oklahoma	2,396,040	2,336,434	−59,606	−2.5

In general terms, the western half of the 200-mile region experienced a marked decrease in population during the decade 1930–40, while the area in the immediate vicinity of the Denison Dam and Reservoir and directly east and north had a population increase of 10 to 30 percent. There are indications that there was a migration from western Oklahoma and the Panhandle of Texas to the industrial and mining regions of eastern Oklahoma.

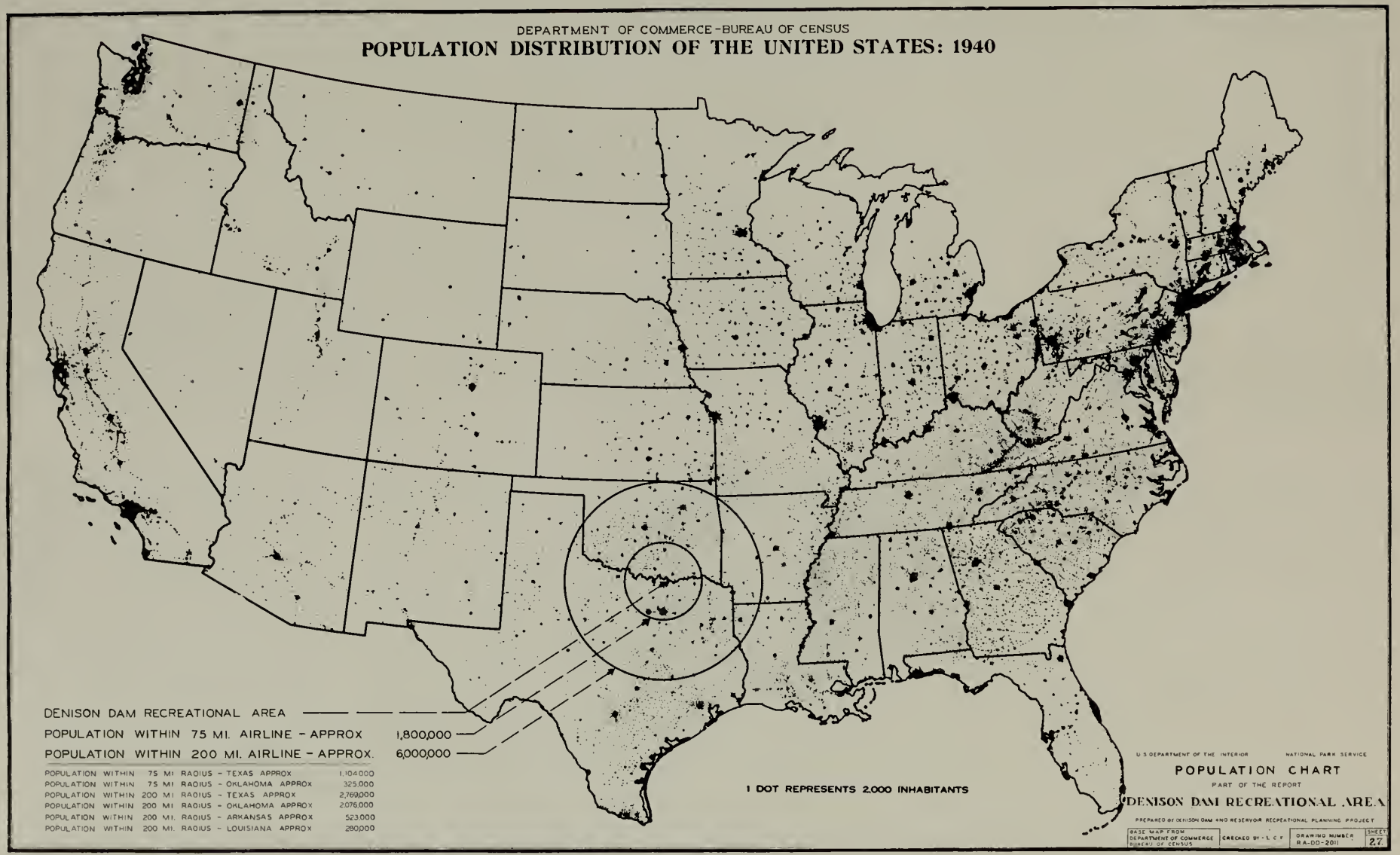

DEPARTMENT OF COMMERCE-BUREAU OF CENSUS
POPULATION DISTRIBUTION OF THE UNITED STATES: 1940
DENISON DAM RECREATIONAL AREA
POPULATION WITHIN 75 MI. AIRLINE - APPROX 1,800,000
POPULATION WITHIN 200 MI. AIRLINE - APPROX. 6,000,000
POPULATION WITHIN 75 MI. RADIUS - TEXAS APPROX 1,104,000
POPULATION WITHIN 75 MI. RADIUS - OKLAHOMA APPROX 325,000
POPULATION WITHIN 200 MI. RADIUS - TEXAS APPROX 2,769,000
POPULATION WITHIN 200 MI. RADIUS - OKLAHOMA APPROX 2,076,000
POPULATION WITHIN 200 MI. RADIUS - ARKANSAS APPROX 523,000
POPULATION WITHIN 200 MI. RADIUS - LOUISIANA APPROX 280,000
1 DOT REPRESENTS 2,000 INHABITANTS
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
POPULATION CHART
PART OF THE REPORT
DENISON DAM RECREATIONAL AREA
PREPARED BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
BASE MAP FROM DEPARTMENT OF COMMERCE BUREAU OF CENSUS
CHECKED BY - L C F
DRAWING NUMBER RA-DD-2011
SHEET 27

Figure 13.

Future population of Texas and Oklahoma. Estimates of future population are apt to be unreliable because of present unsettled conditions and future uncertainties resulting from the war. However, a few pertinent facts are pointed out. Since 1940 there have been numerous shifts in population. This section of the country ranks relatively high in percentage of population to join the armed forces. Great numbers of persons have left farms and small towns to enter war work at increased pay. Observation leads to the conclusion that there has been no great exodus of workers to distant points in other States as there have been almost unlimited opportunities for war work in nearly every section of Texas and Oklahoma. Many new war and allied industries of considerable magnitude, as well as military establishments of many kinds, have given numerous opportunities for employment and have drawn great numbers of workers from every State in the Union. There is every indication that at present the population of Texas and Oklahoma is considerably in excess of what it was in 1940. Estimates based upon registration for sugar rationing in a score of the larger cities show increases in population ranging from 5 to 11 percent.

After the war, undoubtedly there will be some new ghost towns, but much of the new industrialization is on a permanent basis and many of the airfields and other military establishments can be converted to meet peacetime needs.

There are many indications pointing to a material increase in the population of these two States, which are rich in undeveloped natural resources. The plans for the Denison Dam Recreational Area are based upon that assumption and, accordingly, provision has been made for expansion of facilities when the needs arise.

Urban-rural. According to the 1940 census, the urban population of Texas and Oklahoma within the 200-mile zone resided in the 43 cities of more that 10,000 population, plus numerous smaller places with 2,500 to 10,000 residents. Most of these places of 2,500 or more population are well established towns, not of mushroom growth. Many places of less than 2,500 population which depend upon agriculture have lost inhabitants during the past decade and may continue to lose still more along with the expected decline in farm population. It is possible that the trend of typical county-seat towns and larger towns, together with the larger cities, will continue to show increases following the close of war.

TEXAS AND OKLAHOMA CITIES OF MORE THAN 10,000 POPULATION, 1940

6 COUNTIES ADJOINING THE LAKE

	Population
Texas	
1. Denison	15, 581
2. Sherman	17, 156
Oklahoma	
3. Durant	10, 027
Total	42, 764

75-MILE RADIUS

Texas	
1. Dallas	294, 734
2. Denison	15, 581
3. Denton	11, 192
4. Ft. Worth	177, 662
5. Greenville	13, 995
6. Highland Park	10, 288
7. Paris	18, 678
8. Sherman	17, 156
9. Terrell	10, 481
10. University Park	14, 458
Total	584, 225
Oklahoma	
11. Ada	15, 143
12. Ardmore	16, 886
13. Durant	10, 027
Total	42, 056
Grand total 75-mile radius	626, 281

BETWEEN 75-200 MILE RADIUS

Texas	
14. Abilene	26, 612
15. Brownwood	13, 398
16. Bryan	11, 842
17. Cleburne	10, 558
18. Corsicana	15, 232
19. Longview	13, 758
20. Marshal	18, 410
21. Palestine	12, 144
22. Temple	15, 344
23. Texarkana	17, 019
24. Tyler	28, 279
25. Waco	55, 982
26. Wichita Falls	45, 112
Total	283, 690

Oklahoma	*Population*
27. Bartlesville	16, 267
28. Chickasha	14, 111
29. El Reno	10, 078
30. Enid	28, 081
31. Guthrie	10, 018
32. Lawton	18, 055
33. McAlester	12, 401
34. Muskogee	32, 332
35. Norman	11, 429
36. Oklahoma City	204, 424
37. Okmulgee	16, 051
38. Ponca City	16, 794
39. Sapulpa	12, 249
40. Seminole	11, 547
41. Shawnee	22, 053
42. Stillwater	10, 097
43. Tulsa	142, 157
Total	588, 144
Grand total 200-mile radius	1, 498, 115

Farm population, which amounts to about 40 percent of the total, will need in general about the same type of recreational facilities at the Denison Dam Recreational Area as are provided for urban residents. Experience has shown that in this part of the country the present-day farm population visits State parks and other similar recreational areas and uses most types of facilities in about the same proportion as the urban population. An outstanding exception is the type of recreation that involves ownership and use of expensive boats. Most of the large and more expensive boats are owned by urban dwellers rather than by farmers.

Recreational habits and interests of the people of this region have been materially affected during the past 10 years by establishment of new recreational facilities through Federal expenditures. Fishing, boating, swimming, and other water sports have been increasingly popular as new reservoirs made such activities possible. The newly established State parks and related areas have received use beyond all expectations. The people have become park conscious and the general attitude toward outdoor recreation has become more favorable. Provision of needed recreational facilities by the various levels of government is beginning to be considered as a governmental obligation and duty.

A 2-week vacation in the summer is customary for salaried people. Favorite summer vacation regions, for those who can afford extensive travel, are the Rocky Mountains of Colorado, the Ozark Mountains of Arkansas, and the Gulf of Mexico.

Week-end trips and Sunday or holiday drives to recreational areas were customary for those who resided within convenient driving distance prior to the time of gasoline rationing. Per capita ownership of automobiles was relatively high. This zone is in the Cotton Belt and many of the farmers take vacations of 2 weeks or more during the summer after crops are "laid by." Farmers and their families ordinarily go to town on Saturday afternoon, but on other days large picnics and family reunions are common in State parks and other recreational areas.

The Negro is the only racial group having sufficient numerical importance to require special consideration in planning recreational facilities for the Denison Dam Recreational Area. In 1940 there were 63,125 Indians residing in Oklahoma, but for recreational planning purposes they may be included with the white population. The 671,000 Negroes of Texas and Oklahoma who reside within the 200-mile radius should be provided with at least one first-class development located on a convenient site. The need is for various types of facilities which will afford inexpensive recreation, since the economic status of the Negro is relatively low. Ample day-use facilities to meet the needs of a people of gregarious tendencies in recreational habits should be provided. Limited overnight accommodations and organized group camping facilities also should be included in the development. An idea of the deficiency of Negro recreational areas in this zone may be gained by considering the fact that the only existing public Negro recreational areas of consequence within the zone (Texas and Oklahoma) are meagre facilities on Negro school grounds, Negro municipal parks at Oklahoma City, Dallas, and Fort Worth, and one organized group camp at Lake Murray near Ardmore. Recommended development of the Negro area is discussed on page 64. A dominant factor in locating the site in Texas rather than in Oklahoma was the population distribution. Within the 75-mile zone 145,207

Negroes reside in Texas, as against 19,497 in Oklahoma.

The economic status of the people of any region is one of the factors that should be considered, since the type and extent of the facilities they will be able to use and enjoy depend to a great extent upon the amount of money they have to spend for recreation. Even though most of the facilities are planned for free use by the visitors, there is some expense involved in reaching a recreational area, and the frequency of their visits is governed accordingly.

The per capita income of the people residing in the 200-mile region is somewhat below the national average, but the cost of living also is lower. In a recent study of the Arkansas and Red River Basins made by the National Resources Planning Board, the 1940 per capita income for the people residing in those basins was reported as $347. The national average is $579. It is believed that the 200-mile zone under consideration would represent a fairly good sample of the area covered by the four States—Texas, Oklahoma, Louisiana, and Arkansas. The 1940 per capita income of those States averaged $348. However, the figure for the 200-mile zone might be somewhat higher, due to the number of larger cities included whose residents have higher per capita incomes.

The 1940 per capita income for farm population of the 200-mile zone was approximately $194, as compared with the national average of $299. Since 1940 many farmers have left the farms for higher wages in the cities. The 1940 figures, therefore, do not indicate accurately what may be the relative economic status of the nonurban population of the region after the war, when the development of recreational facilities at the Denison Dam Recreational Area may be undertaken.

It is generally believed that a large part of the new industrialization, especially the processing of foods which has taken place on a broad scale in this region since the beginning of the war, will continue to increase after the war, and that a more balanced economy and an increased per capita income may be expected.

From the standpoint of the prospective users' financial ability to utilize recreational facilities, it appears probable that facilities similar to those usually provided on the larger recreational areas in the four States mentioned above would be satisfactory for the Denison Dam Recreational Area.

Nonresidents. Facilities on the Denison Dam Recreational Area must meet not only the needs of the population of the 200-mile zone, but must be of such type and extent as to meet adequately the needs of many visitors from outside the zone who may be expected to visit the area, even though many of such visits will likely be incidental to other travel.

A well-known characteristic of the American people is a strong desire to see the largest of anything, no matter what it is. This may be relied upon to attract many visitors to see the largest earthen dam of its kind in the world and to see one of the largest artificial bodies of water in the United States. In planning long-distance travel, many persons often choose routes which will permit visits to outstanding points of interest along the way. Experience also shows that many travelers will make spur-of-the-moment decisions to make side trips or take time to visit areas, such as the Denison Dam Recreational Area, when they realize that they are in the vicinity of something of special importance.

Recreational activities which will be possible, and which ordinarily attract people from exceptionally great distances, are fishing, hunting, and boat races.

Tourists making casual sightseeing visits will first want to see the area. Many of them then will want to buy souvenirs, curios, and post cards. This may seem to be a small matter, but the National Park Service has learned in its operation of the national parks that this concession, especially the sale of post cards, is most profitable to the concessioner and is the concession most sought after. Facilities should be provided to meet such tourist needs.

Principal Types of Recreational Use. In estimating the requirements and needs for recreational facilities it is important that consideration be given to the principal leisure-time periods of the surrounding population. These periods may be classified as: (1) *Day* (principally after work hours), (2) *week end* or *holiday,* and (3) *vacation.*

Day use. Persons who reside within counties adjoining the Denison Dam Recreational Area will be able to reach the area by traveling an average of about 10 to 15 miles. After work on a normal weekday, persons are able to travel up to about

15 miles by automobile to participate in recreational activity and return to their homes that night. Frequency of such trips is governed in a large measure by financial considerations, but individuals in this group may be expected to visit the area much more frequently than those who have to travel greater distances. Day-use facilities, as the term implies, includes all types of facilities except overnight accommodations, and they should be adequate to serve all visitors, regardless of residence or income status.

Within the counties adjoining the reservoir there is a population of 172,323 (1940).

Week-end use. Under normal conditions many of the people can travel beyond their immediate locality for recreation on week ends. In this part of the country oustanding recreational attractions, such as the Gulf of Mexico, draw many visitors from distances as great as 150 miles for week-end trips. Good highways and other favorable traffic conditions which are not often present in congested sections of the East and North, make long-distance travel possible on week ends. While the Denison Reservoir cannot be expected to compare in importance with the Gulf, it will have a tremendous drawing power for the people of a great inland section in which no other body of water comparable size exists. If this area is properly developed and operated, it will serve these people in much the same way as the seashore serves the population of other parts of the country within comparable distances.

Although many week-end visitors from as much as 150 miles away may be expected, a large percentage of the week-end attendance will be from points within 75 miles or less. Studies of attendance at State parks in this part of the country indicate that about 75 percent of the total visitors are from points within the 75-mile radius. The population within this area is 1,429,419 (1940). These studies also indicate that the largest attendance may be expected on Sundays and holidays, and that more than one-third of the total attendance for the week may be expected on Sunday. The peak load is usually on Sunday afternoon.

Overnight accommodations within the Denison Dam Recreational Area should range from free campgrounds to hotel-type accommodations and should be adequate to meet the needs of those who prefer to stay near the water. Many visitors will prefer to spend the night at hotels and tourist courts in the nearby towns. Such commercial establishments should be encouraged to maintain high standards with respect to service and sanitation. Each private enterprise of this kind which successfully meets a need reduces the governmental obligation to just that extent.

Anticipated increase in use of the airplane after the war should be considered as a factor which would tend to increase week-end attendance by residents of such cities as Dallas, Fort Worth, Oklahoma City, and Tulsa.

Vacation use of the area will consist largely of summer visitation of 1 or 2 weeks duration. The number of inquiries already received indicates also that there will be a considerable demand for summer home sites and cabin sites near the lake, and the occupants of these sites may be expected to remain longer. Facilities needed for vacation use are about the same as those needed for week-end use. Vacationists from points as far away as 200 miles may be expected. Fishing enthusiasts, including those of low-income groups, ordinarily travel even greater distances for their annual vacation. Boating enthusiasts also travel far to engage in their favorite recreation. "Big-water" boating will be a new experience for many of the residents of this inland section. Organized camping by youth groups should be popular.

Vacation use and week-end use of this area may be far in excess of that which ordinarily might be expected of an area of this kind for the reason that the densely populated section extending from well below Dallas and Fort Worth northward into Oklahoma is not within week-end driving distance of mountains, seashore, or other large natural areas providing relief from the summer heat. There is a scarcity of lakes, clear running streams, and forests. Existing and proposed reservoirs in this section are small in comparison with the Denison lake. Most of the people of this section who ordinarily spend their summer vacation in Arkansas, New Mexico, or Colorado may be expected to continue to do so. Many who cannot afford a vacation involving such travel distances and who normally spend most of their vacation at home will probably

respond to the proposed attractive and inexpensive accommodations at the new nearby lake where the weather in at least some locations will be cooler and more pleasant than at home. A custom of the middle-income group in many American cities is for the family to avoid the heat by spending a large part of the summer at the nearby seashore or mountains, where it is possible for the man to visit his family on week ends. Residents of Dallas, Fort Worth, Oklahoma City, and intervening communities have never been able to indulge in that custom because there is no suitable resort of that kind within week-end driving distance.

Population of Texas and Oklahoma within the 200-mile radius is 4,844,681 (1940).

Estimated Attendance. It is estimated that the Denison Dam Recreational Area will have an annual attendance of from 600,000 to 1,000,000.

"Attendance," as used here, means the total number of visits of those who would actually use the area for recreational purposes, even though their visit might be only a pleasure drive through some part of the area, and it includes those who might visit the dam or any other part of the area as sightseers. It does not include, however, those who might enter the area, or travel for purposes other than recreation on one of the highways or roads which traverses some part of the area. It is assumed that after the war people will be able to travel and participate in recreational activities in about the same manner that they did before the war (1940–41); that the area will be properly developed, operated, and maintained; and that the public will be encouraged to visit the area for recreational purposes.

An indication of sightseer interest in construction work at the dam is evidenced by Sunday attendance, prior to gasoline rationing, at the "sidewalk superintendents'" observation point near the dam. Counts were made on only two Sundays. On one Sunday, which was considered average, attendance was 8,000. On the other Sunday, soon after the coffer dam started impoundment of water, attendance at the observation point was 15,000.

On the basis of the probable drawing power within the 200-mile region, it is estimated that attendance from the 6 counties adjoining the reservoir will at least equal the 1940 population (172,323) of those counties; attendance from other points within 75 miles air-line distance of the reservoir will equal 20 percent of the population (325,600); and attendance from points between 75 miles and 200 miles air-line distance will equal 1 percent of the population (42,000). This gives a total estimated annual attendance of 539,923 by persons residing within 200 miles of the reservoir. Adding to this figure the number of visits of all those who reside beyond the 200-mile distance, many of which will be incident to other travel, the total will be well above 600,000.

In support of the 600,000 attendance estimate as a conservative figure, it is pointed out that attendance at the Boulder Dam National Recreational Area, Arizona-Nevada, increased from 225,000 in 1938 to 800,000 in 1941. Lake Mead is practically equal in size to the Denison Reservoir but it is located in a sparsely populated section of the United States and a large portion of the visitors are from distant States. About 40 percent of the visitors were from outside the southwest region and another 40 percent were from California. Because of the great difference in population density, attendance at the Denison Area should be considerably more than that at Lake Mead. Comparison of traffic-flow charts shows that there is more out-of-State or foreign traffic on highways serving the Denison Reservoir Area than on those serving the Boulder Dam National Recreational Area. This would indicate that travel to the Denison Area from distant States might equal or exceed that type of travel to Lake Mead.

An indication of the amount of traffic from which the Denison Dam Recreational Area may draw visitors is shown by the latest traffic census charts of the State Highway Departments of Texas and Oklahoma. The average total number of vehicles for a 24-hour period on the four principal highways at points in or adjacent to the reservoir area is shown in the following table:

U. S. Highway 75	2,760
U. S. Highway 77	1,790
U. S. Highway 70	604
Texas-Oklahoma (91–99)	350
Daily total	5,540
Annual total	2,008,960

At an assumed average of 3 persons per vehicle, more than 6,000,000 persons would either enter or pass by the proposed recreational area in travel not induced by recreational features of the area.

Undoubtedly, considerable recreational use of the area will be derived from this source alone. If an average of only 1 person out of each 20 received some recreational benefit from use of the area, the annual attendance would be increased by 300,000.

Lake of the Ozarks, located in the central part of Missouri, has a surface area of about 65,000 acres. It is a hydroelectric project developed by a private utility company. It has been extensively developed for recreation and has had intensive use for the past 10 years. The dam was completed in 1931. Summer temperatures there are considerably lower than at St. Louis and Kansas City, but the area is not in the Ozark Mountains proper. Spillway elevation at the dam is 660 feet above sea level. Actual attendance figures are not available, but an idea of the number of visitors may be gained from a report entitled "Economic Aspects of the Recreational Land Use of the Lake-of-the-Ozarks Area," published in 1942 by the University of Missouri College of Agriculture as Bulletin 448. This report states that lake resorts can provide for 796,222 guest days (overnight use) during the season which extends from May 1 to October 1, and that usually these resorts operate at 100 percent capacity in June, July, and August. The maximum attendance of more than 10,000 visitors occurs in August. It is estimated that 80 percent of the visitors are Missourians, which means that 80 percent of the visitors resided within 200 miles of the lake and were drawn from a State with a 1940 population of 3,775,737.

Attendance at Lake Murray, near Denison Reservoir, has averaged 125,000 annually. Attendance at the small Bonham State Park, 30 miles southeast of Denison, which has only a 60-acre recreational lake, has ranged consistently upward from 60,000 in 1936 to 128,000 in 1941.

Attendance at these areas, considered in the light of size and importance of the areas in comparison with the Denison Dam Recreational Area, leads to the belief that the 600,000 estimate is conservative.

Benefits. Many new recreational resources are being created by the construction of the Denison Dam and Reservoir; but the total recreational benefits to be derived depend to a great extent upon proper use of those resources and the development of facilities. Some recreational benefits would be possible from use of the new lake even though there were no development program, but they would be limited and meagre in comparison to the benefits that would accrue if appropriate and adequate facilities were provided. In all probability, without a conservation and development program, many of the most valuable resources would be forever lost. Under a lax administrative policy of allowing individuals to construct private and commercial recreational developments of every conceivable type on the area, many of the values which have been created by construction of the dam and reservoir would decrease greatly, and some might become worthless. Therefore, in attempting to evaluate the recreational benefits, more importance should be placed on the proposed development and long-range administrative program than upon the mere fact that a new lake has been created.

Development of the recreational resources is recommended so that the people may derive pleasure, enjoyment, and inspiration through their proper conservation and use—in addition to other economic benefits that may accrue.

In addition to the benefits to visitors, there are many other benefits which would result from recreational developments such as are contemplated at this area. Some of the more tangible economic benefits are as follows:

(1) Increase in value of certain lands near the lake and along the highways leading to the lake. A large part of this increment will go to owners and developers of land outside the Government-owned strip of shoreland.

(2) A large increase in value also will accrue to the Government as owner of the strip of land which forms the actual shoreland, thus benefiting all of the people. It is presumed that the Government will not sell this land, but if it should become necessary or desirable to do so, much of the shoreland could be sold at a price considerably above that paid originally.

(3) Increase in business along the highways and in communities near the area as a result of supplying goods and services to meet the needs of recreationists.

(4) Increase in recreational travel.

(5) Revenue to the administering agency and concessioners or operators from fees, charges, sale of goods and services, transportation franchises, etc.

(6) Increase in employment in development, maintenance, and operation of the area.

(7) Increased revenue to governmental agencies from fishing and hunting licenses, sales taxes, gasoline taxes, taxes on new or increased business revenue, and taxes due to increased valuation of property.

(8) New local and roadside markets will be created for products of farms in the vicinity such as chickens, eggs, butter, fruits, vegetables, and handicraft objects.

While no attempt is made here to estimate the total economic value of recreation at this area, the following information concerning the economic phases of recreation at other reservoirs is offered for comparison.

The report on the Lake of the Ozarks Area (referred to on p. 47) reveals that the recreation business in the vicinity of the area has attracted a $4,000,000 investment which returns nearly $1,000,000 annually to the 297 small business enterprises located in the vicinity. The main attraction at the lake has been fishing. Resort owners estimated that in 1940 four out of every five resorts were dependent upon fishermen for the bulk of their business. Counties bordering the lake have profited through increased tax returns. The recreational developments have resulted in an increase of 1,687 percent in assessed valuation in Miller County, 129 percent in Camden County, 120 percent in Morgan County, and 37 percent in Benton County.

The following statements are quoted from a report by C. M. Terry, Associate Technician, Tennessee Valley Authority, entitled "Water Recreation in TVA—1940."

The natural advantages of lakes for outdoor play is a by-product of TVA's work in building dams on the Tennessee River system for the developmnt of navigation and electric power and for the control of floods.

Three and a half million people enjoyed themselves on one or another of the Tennessee Valley Authority's lakes last year (1940), fishing, swimming, sail and motor boating, watching speed races, hiking, picnicking, horseback riding, and seeing the sights.

There are now more than 5,000 pleasure craft on the TVA chain of lakes (8 lakes). They range from homemade rowboats to cabin cruisers 65 feet in length and are estimated to have a total value of approximately $1,000,000. In 1940 on Norris Lake alone there were 2,000 boats, while in 1938 there were only 1,100.

Fishing is already one of the most popular sports on TVA waters. More than one million three hundred thousand fishermen enjoyed the TVA lakes during 1940. In Alabama, where the lakes have been in existence for several years, more than one-third of all of the fishing licenses issued in the entire State were sold in the eight counties bordering the TVA lakes. A hardware dealer in Corinth, Miss., reported that he paid the entire cost of his overhead from sale of fishing tackle at Pickwick Lake. Stores in Knoxville and other places close to Norris Lake report substantial increases in sales of fishing and boating equipment.

Chattanooga, Tenn., an inland city of less than 150,000 population, was reported by the boat industry to be the most active market for boats in the United States the year after nearby Chickamauga Lake was formed.

The cottages at TVA's demonstration parks are continuously full during the summer season and usually reservations have to be made several weeks in advance. The Norris Fishing Rodeo has had 500 participants, from 9 States. The celebration in June 1940, marking the completion of Pickwick Dam brought out 40,000 spectators. Guntersville, Ala., a town of 3,500 population, was swamped by a crowd of 55,000 that turned out for its first regatta in 1939.

CHAPTER IV

Recommended Program

It is within the province of the Congress of the United States to determine the answers to such fundamental questions as—

1. Will the recreational resources of the Denison Dam and Reservoir Project be developed for public use?
2. If so, when and to what extent?
3. What amount of funds shall be spent for developments?
4. What agency will administer further planning and development of recreational facilities, and operation of the area after it is ready for visitors?

The recommended program, as discussed in the following sections of this chapter, is intended to be of assistance in answering these questions. It is offered also as a guide for any agency that may be assigned the responsibility for the conservation and utilization of the recreational resources.

The Master Plan.[1] The master plan system as developed and used by the National Park Service is a method of advance planning under which each of its areas may be orderly and progressively developed in a sound manner. The master plan for each area is composed of two parts: (1) *Drawings,* sufficient in number and kind to legibly portray existing conditions, and to convey a comprehensive conception of the development proposed for the area; and (2) *Development Outline and Charts,* consisting of written statements, and data recorded in chart form, to supplement the drawings and to present important factors which influence the policy of development.

The master plan is the controlling document which governs development. It coordinates the thought and effort of all persons engaged in establishing the policies that govern the planning, development, protection, preservation, interpretation, administration, and operation of an area. It is a progressive document. Revision of any or all of its parts must be made as often as necessary to record past accomplishments and to further determine the ultimate uses of an area. It, therefore, becomes a constantly improving documentation of development policies related to changing conditions.

The master plan indicates the ultimate use of all land and water areas within the boundaries and the location of each facility in the ultimate scheme of development. Even remote possibilities are indicated so that when development of specific facilities become imminent, sites may be selected in the light of possible future uses for the surrounding area and the relationship of each facility in the complete development.

The master plan system is recommended for the Denison Dam Recreational Area regardless of what agency may be designated for recreational administration.

Drawings of the preliminary master plan for the Denison Dam Recreational Area are presented at reduced scale on pages 51 to 93.

Land Program. As of June 1943, the Army Engineers had acquired more than 150,000 acres of land for the project and the acquisition program was still under way. Their taking line is shown in figure 6, opposite page 10. By October 1943, approximately 185,000 acres of land had been acquired or were in the process of acquisition. Waters of the reservoir, at spillway elevation, will inundate about 145,500 acres. On this basis, the fringe of land in Federal ownership surrounding the reservoir above spillway elevation will total about 39,000 acres. All lands within the basin which will form islands have been purchased by the Army Engineers.

Additional lands needed for the recreational development areas totals approximately 9,600 acres. This does not include lands needed for the proposed

[1] Master Plans, a Manual of Standard Practice for Use in the National Park Service.

boundary roads and access roads outside the proposed property line. Such roads might be developed by the States of Texas and Oklahoma or by agencies other than the one which is finally designated to administer the recreational lands of the Denison Dam Recreational Area. In any event, it is strongly recommended that certain of these roads be developed on the freeway principle—with rights-of-way sufficiently wide to permit roadside improvement to harmonize with the character of the roadside treatment within the project boundary. This is especially important in connection with the short sections of the boundary road along the Preston Bend Section and the access roads to Preston Bend Recreational Area and to Grandpappy Point Fishing Village, as shown on page 61.

The following tables show a breakdown of approximate acreage in various locations and classifications.

Acreage requirements for recreational lands

Development	Total	Between Engineers' taking line and 640-foot contour	Additional lands needed
Preston Bend Section	7,650	3,750	3,900
Washita Point Section	5,800	2,330	3,470
Newberry Creek Area	864	400	464
Fort Washita Area	765	290	475
Chickasaw Area	430	330	100
Hauani Creek Area	773	485	288
Willis Crossing Area	1,430	497	933
Total	17,712	8,082	9,630

Acreage summary by States

Development	Total	Between Engineers' taking line and 640-foot contour	Additional lands needed
Texas (2 developments)	9,080	4,247	4,833
Oklahoma (5 developments)	8,632	3,835	4,797
Total	17,712	8,082	9,630

It is recommended that fee simple title be acquired for all lands within the boundaries shown for the development areas. Exceptions are existing cemeteries, important highways such as U. S. 70, and railroad rights-of-way. There should be acquired also within the development areas all mineral rights which former owners may have reserved in conveyances to the Government. Mineral rights also should be acquired for the submerged lands bordering the shore line of the development areas, and extending out a sufficient distance into the water to afford protection against any new drilling operations in the vicinity of recreational developments. It is believed that control of off-shore lands, adjacent to the designated development areas down to the 570-foot contour, would afford ample protection.

All recommended recreational lands should be acquired as soon as possible, and not on a piecemeal basis, as the lands are needed for immediate development.

Another possible exception to the recommendation for additional land acquisition is the Fort Washita Historical Area. The recent decision to construct levees for protection of the Cumberland Oil Field in the vicinity of Fort Washita and the recent increase in the estimated value of land and mineral rights in that vicinity have resulted in such a change of conditions that radical revisions may be advisable in the plans for establishment and development of the Fort Washita Area. Further study will be required.

Estimated Cost of Lands. It is estimated that $590,000 will be required for the purchase of the 9,630 acres of additional lands and mineral rights, and for expenses incidental to acquisition. This amount does not include the mineral rights to the offshore section of the Fort Washita Area below the 640-foot contour. The estimate is as of June 1943, and was made by the Division Real Estate Suboffice, United States Army Corps of Engineers, Denison, Tex.

The sketch of Grandpappy Point Fishing Village has been placed on the cover sheet of the Master Plan Study because it is expected that fishing will be one of the major attractions of the Denison Dam Recreational Area.

594011—44——5

Figure 14.

Summary of acquisition costs

Item	Development area	Acres	Estimated cost
Additional lands needed in fee simple.	Preston Bend	3,900	$175,000
	Washita Point	3,470	70,000
	Newberry Creek	464	10,000
	Fort Washita	475	65,000
	Chickasaw	100	3,000
	Hauani Creek	288	16,000
	Willis Crossing	933	42,000
Mineral rights between taking line and 640-foot contour.	Fort Washita	290	29,000
	Others	7,792	40,000
Mineral rights between 640-foot and 570-foot contours in vicinity of development areas.	Areas listed above, except Fort Washita.	8,000	40,000
Expenses incidental to acquisition			100,000
Total			$590,000

Boundary establishment. The Army Engineers are marking the tract corners of the outside boundary of the Federal property with stakes, but it is understood that their plans call for marking the boundary with concrete corner markers at a later date, probably after the war. It is recommended that the outside boundary of the Denison Dam Recreational Area be enclosed with a good, substantial livestockproof fence.

DEVELOPMENT. The general development plan for the primary and secondary recreational areas is based upon the premise, resulting from experience and observation, that concentration of extensive recreational facilities in reasonably close proximity to each other serves in the most efficient manner the majority of persons. Such a relationship reduces to a minimum problems of administrative control and maintenance, and results in more economical operation. Utility costs are reducted by centrally located systems to serve initial and ultimate development. Development sites having comparatively steep gradients between the 617-foot contour and the toplands, and which will have a minimum width of exposed shoreland at times of draw-down, were selected in order to effect a close relationship between facilities and the water at all stages of fluctuation. Permanent structures and development features relating to the recreational use of the water generally have been located above, but as close to the spillway level as practicable. Other facilities that require close relationship to the water surface at all times for satisfactory operation have been placed on barges and floats which can be pulled toward the shore when the water rises.

Plans for recreational developments have been designed in relation to elevation 617 as the maximum power-pool elevation set by the Army Engineers. It is recognized, however, that a demand for additional power might necessitate raising the normal power-pool elevation to as much as 630. Such a change would result in a more stable water level, a factor which would be favorable for recreational developments. If the normal power-pool elevation is raised above elevation 617 before recreational development is undertaken, or if such a change appears likely, it will be necessary to make corresponding revisions in elevations for some of the facilities located along the shore line. The revisions should not be difficult since the development sites were selected with the thought of such a possibility.

The optimum elevation for each part of each development must be determined when detailed construction plans are prepared. Developments should be designed to sustain only minor damage in the event that an unprecedented flood should raise the water level a few feet above the 640 elevation. It is not practicable, however, to locate all developments on high and dry sites beyond all possibility of even minor damage, disregarding other considerations such as distance from the normal water line during the summer. In many cases such caution would sacrifice desirable features essential to successful operation and defeat the purpose of the development. The elevation of the crest of the levees protecting the huge Cumberland Oil Field is 646.

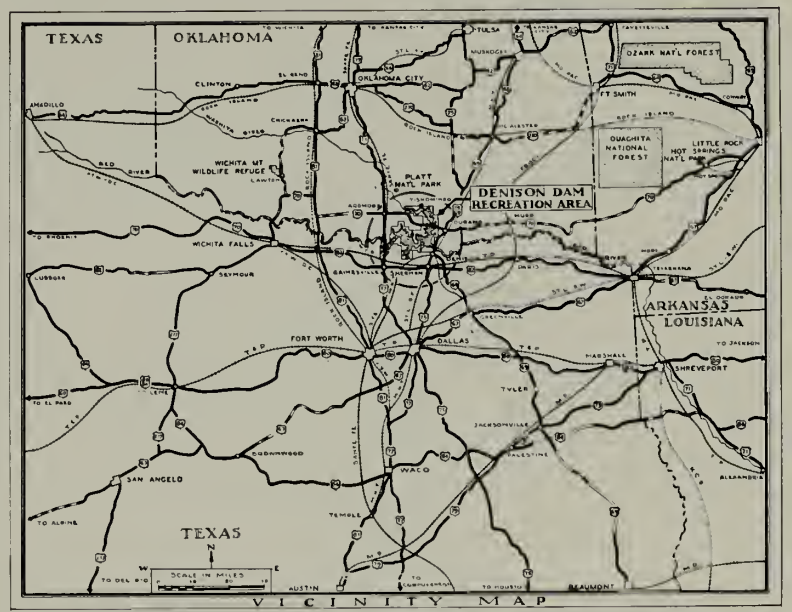
The preliminary general plans for the development areas have been designed to allow for future expansion and unforeseen demands. Many features of design involving relationship of units are based on the premise that concession facilities will be operated by only a few concessioners.

The following pages are devoted to rather de-

The index sheet shows the general location of the project and lists the titles and numbers of the various drawings.

THE MASTER PLAN
DENISON DAM RECREATIONAL AREA
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

HAROLD L. ICKES
SECRETARY OF THE INTERIOR



VICINITY MAP

NEWTON B. DRURY
DIRECTOR
NATIONAL PARK SERVICE

INDEX

DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT

Figure 15.

tailed comment on the development of recreational facilities.

Preston Bend Section.

(1) Preston Bend Area (figs. 20 and 21). By relating recreational-use areas to the shore line, two-thirds of the outer perimeter of the area is consumed by development, leaving the center section free for uses having objectionable features or uses requiring isolation from other facilities. The boat basin in the northeast section of the area becomes the focal center around which the various uses radiate. If additional boat facilities become necessary, the area indicated on figure 20 for future expansion is suggested as suitable for this purpose.

The following recreational activities and facilities are provided for in the preliminary development plan for the area: Boating, fishing, swimming, picnicking, camping, minor sports, tennis, golf, children's play areas, equestrian sports, hiking, dancing, vacation cabins, overnight accommodations, floating cabins, lodge, summer home sites, regatta course, and excursion boating.

(a) Boat basin and boating facilities. The boat basin has a total water surface area at mean water level of 23 acres, of which 12 surface acres of ample depth, located in the upper reaches of the basin, are suitable for open-water boat mooring. This section is secluded from in-and-out boat traffic, and has a potential mooring capacity for 130 craft. The basin is well protected from the prevailing southeasterly wind by a point of land. The shoreland surrounding the basin is moderately steep, varying in gradient from 12 percent to 25 percent. The depth of the water at mean water level varies from 10 feet at the head of the basin to 70 feet at the mouth. A single launching road sufficiently wide to permit parking of boat trailers adjacent to it is located on the west shore midway between the mouth and the head, making the basin accessible to boat owners.

(b) Marina. The marina development in the cove on the west shore of the basin is intended to provide slip and floating berth accommodations for inboard runabouts, outboard craft, sailboats, and cruisers (fig. 21). In view of fluctuating reservoir water surface, the construction of permanent piers and slips is impractical, so a system of floating slips and docks anchored to the sloping sides and bottom of the developed marina area is suggested. By standardization of float and slip sizes, an economical docking system is made possible which can be expanded by rearrangement of the float units from a straight-line arrangement to a system of floating piers projecting into the marina from the shore line (fig. 34). Standard locker units to provide storage space for outboard motors, and fishing gear and private boating equipment are provided on a limited number of floats. These units can be added to as the demands for such accommodations increase. Sizable concession barges are to be located at the ends of floating piers and at the wharf to provide facilities for excursion boat operations such as sale of tickets, refreshments, curios, and camera supplies, and a sheltered waiting space for patrons. Similiar accommodations are suggested on another barge to provide space for the rental of fishing boats, the rental and sale of fishing paraphernalia, the sale of bait, and procurement of guide and boat-operator service. Landing barges for excursion boats and smaller transient boats are provided adjacent to the marina wharf.

On the basis of the layout indicated on the preliminary development plan, the marina has an approximate maximum capacity of 125 moderate-size craft. If the boat fleet docking in the marina outgrows its capacity, there is available 300 feet of suitable shore line adjacent and south of the area for development of similiar facilities which would accommodate an additional 60 to 100 craft, depending on arrangement of floats and slips. In addition to this available space, the shore line of the upper reaches of the basin will provide marina expansion accommodations. An automobile parking area having a capacity of 90 cars is provided above the marina and ample field space for overflow parking is available to the west and south. Located on the east shore of the boat basin is a

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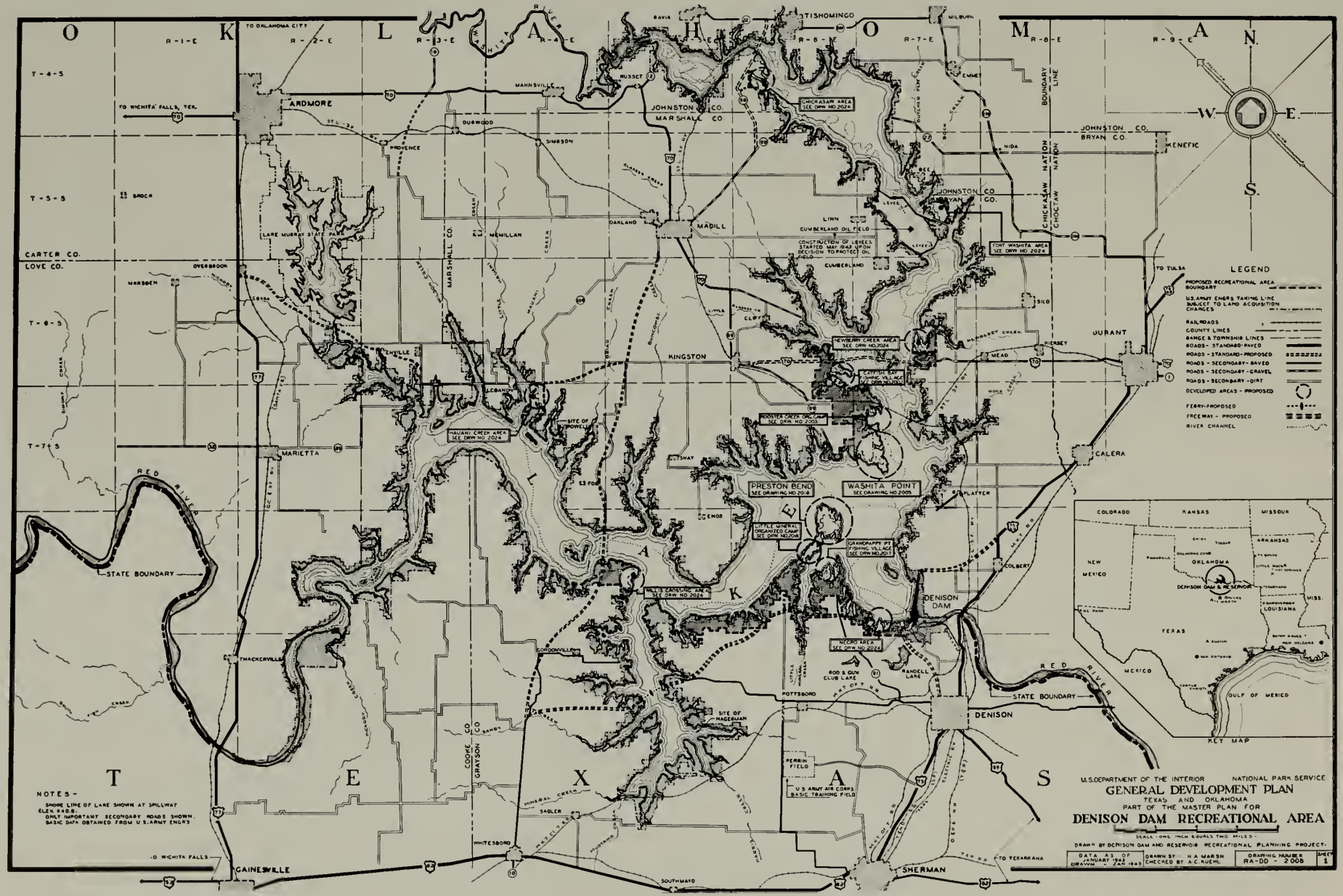
The General Development Plan portrays the size and scope of the project as a whole, and its relationship to the immediate vicinity. Shown are existing and proposed boundaries of the land area bordering the reservoir.

The principal development locations, two major and eight minor, are marked by circles. The major sites are referred to as Preston Bend on the Texas side and Washitta Point on the Oklahoma side. The minor sites shown in Oklahoma are the Chickasaw Area, Fort Washita, Newberry Creek Area, Catfish Bay Fishing Village, Hauani Creek Area, and Rooster Creek Organized Camp. Those in Texas are the Willis Crossing Area, Grandpappy Point Fishing Village, Little Mineral Organized Camps, and the Negro Area.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R-5-E
R-6-E
R-7-E
R-8-E
R-9-E
T-4-S
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T-6-S
T-7-S
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TO WICHITA FALLS, TEX.
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MANNSVILLE
DUBWOOD
SIMPSON
PROVENCE
TISHOMINGO
MILBURN
BAVIA
RUSSET
EMET
JOHNSTON CO.
MARSHALL CO.
BRYAN CO.
CHICKASAW NATION
CHOCTAW NATION
BOUNDARY LINE
NIDA
KENEFIC
MADILL
LINN
CUMBERLAND OIL FIELD
CUMBERLAND
CARTER CO.
LOVE CO.
MARSHALL CO.
MEMILLAN
OVERBROOK
WARDEN
KINGSTON
LEBANON
MARIETTA
CALERA
DURANT
MEAD
KIERSEY
SILO
TO TULSA
RED RIVER
STATE BOUNDARY
THACKERVILLE
GAINESVILLE
WHITESBORO
SOUTHMAYD
DENISON
DENISON DAM
SHERMAN
TO TEXARKANA
COLBERT
PLATTER
ENOS
POTTSBORO
RANDELL LAKE
ROD & GUN CLUB LAKE
PERRIN FIELD
U.S. ARMY AIR CORPS BASIC TRAINING FIELD
COOKE CO.
GRAYSON CO.
LAKE MURRAY STATE PARK
CHICKASAW AREA SEE DRWG NO 2024
FORT WASHITA AREA SEE DRWG NO 2024
NEWBERRY CREEK AREA SEE DRWG NO 2024
CATFISH BAY FISHING VILLAGE SEE DRWG NO 2007
BOOSTER CREEK CAMP SEE DRWG NO 2003
HAUANI CREEK AREA SEE DRWG NO 2024
SITE OF POWELL
PRESTON BEND SEE DRAWING NO 2018
WASHITA POINT SEE DRAWING NO 2005
LITTLE MINERAL ORGANIZED CAMP SEE DRW NO 2004
GRANDPAPPY JO'S FISHING VILLAGE SEE DRW NO 2017
WILLIS CAMP SITE SEE DRW NO 2024
NICOR TREA SEE DRW NO 2024
SITE OF MAGEQUAH
LEGEND
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ROADS - STANDARD - PROPOSED
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RIVER CHANNEL
KEY MAP
COLORADO
KANSAS
MISSOURI
NEW MEXICO
OKLAHOMA
ARKANSAS
TEXAS
LOUISIANA
MISS.
GULF OF MEXICO
DENISON DAM & RESERVOIR
NOTES -
SHORE LINE OF LAKE SHOWN AT SPILLWAY ELEV. 640.0.
ONLY IMPORTANT SECONDARY ROADS SHOWN.
BASIC DATA OBTAINED FROM U.S. ARMY ENGR'S
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
GENERAL DEVELOPMENT PLAN
TEXAS AND OKLAHOMA
PART OF THE MASTER PLAN FOR
DENISON DAM RECREATIONAL AREA
SCALE - ONE INCH EQUALS TWO MILES
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT.
DATA AS OF JANUARY 1962
DRAWN BY H.A. MARSH
CHECKED BY A.C. KUEHL
DRAWING NUMBER RA-DD-2008
SHEET 1

Figure 16.

floating pier with landing barges and a limited number of floating slips to serve patrons of the lodge.

(c) Boat center. The boat center building on the point north of the marina is intended to serve as a gathering place for boating enthusiasts. It should contain office space for dissemination of boating information, space for the sale of ship stores and refreshments, locker rooms, quarters for attendants, public rest rooms, and spacious lounge room for group gatherings and public use. Because of its strategic location with reference to the main body of the reservoir, the building provides an ideal location for the installation of elevated navigation lights and for the display of weather flags (fig. 30).

(d) Service and utility area. A service and utility area to serve jointly the needs of the administrative agency and the concessioner is located south of the marina, adjacent to the shore line. In this area there will be sheds for storage of mobile maintenance equipment; garages; boat repair and boat painting shops; boat building facilities; storage warehouses; boat sales and display quarters; boat storage buildings; carpentry, electrical, and plumbing repair shops; fire-equipment shed; outdoor space for boat and boat trailer storage; quarters for harbor masters and caretakers; and other service facilities. A short-inclined marine railway is provided from this area to the water, permitting efficient removal of craft for hull painting, structural repair, and storage. Boats can be launched by using either the marine railway or the launching road adjacent to the area. There is ample ground area to the west of the service unit for expansion of boat storage space, and this area can be made accessible to the water by extension of the marine railway and a system of yard trackage. An added concessioner facility for the convenience of boat owners is the floating repair barge and hoist float located at the base of the marine railway (fig. 34). Provision is made for the sale of gas and oil to boat owners by development of a service barge. This barge should be in an isolated location for safety reasons.

(e) The Lodge. The lodge or concession building, centrally located with respect to public use facilities, is on the east point flanking the boat basin, at the terminus of the main park road (figs. 21 and 23). It includes the principal eating facilities, lounge rooms, space for the sale of refreshments and curios, rest rooms, recreation room for dancing and educational lectures, quarters for employees, public information booth, and concessioner's office. It is oriented with relation to views of boating activity in the boat basin, and the magnificient reservoir expanse to the northeast. Auto parking space for lodge and beach patrons has been provided at the end of the loop road. Boat landing facilities readily accessible from the lodge are provided adjacent to the parking space on the basin shore line.

(f) Swimming facilities. Because of location with reference to "big water" and prevailing breeze, excellent swimming conditions should prevail in the lake adjacent to the designated beach area south of the lodge. This beach is 500 feet in length with ample room for expansion in a southerly direction. It will have an average uniform gradient of 8 percent and the width will vary with the fluctuating water level. It will be suitable for nonswimmers as well as deep-water enthusiasts. Portable canvas or bamboo cabanas placed on the beach would provide popular shelter for swimmers and spectators. A portable

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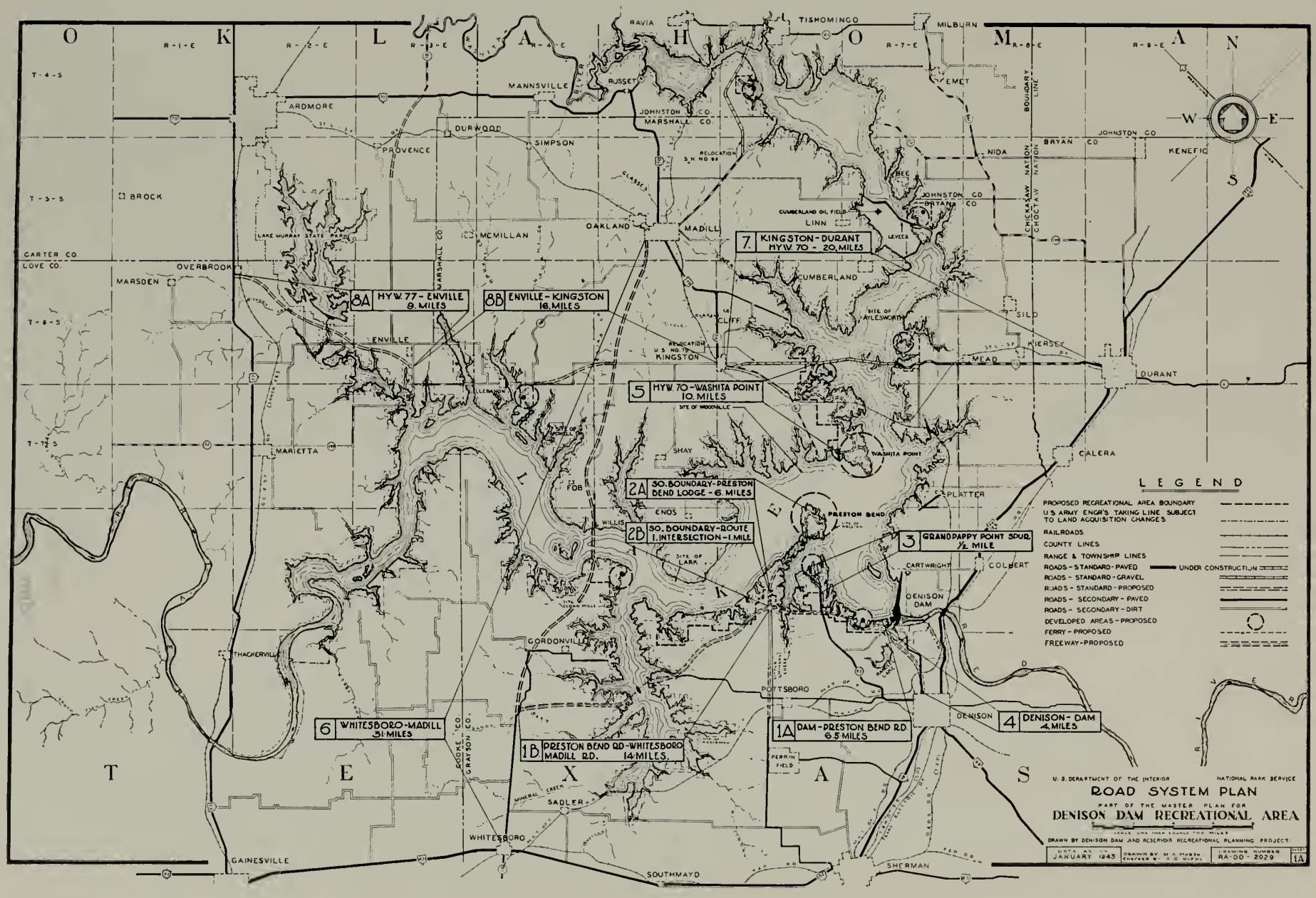
The Road System Plan indicates existing and proposed roads relating to the project:

1A—Denison Dam to Preston Bend Road, 6.5 miles.
1B—Preston Bend Road to Whitesboro-Madill Road, 14 miles.
2A—Preston Bend Area south boundary to Preston Bend Lodge, 6 miles.
2B—Preston Bend Area south boundary to intersection of Route 1, 1 mile.
3—Grandpappy Point spur, ½ mile.
4—Denison to Denison Dam, 4 miles.
5—Highway 70 to Washita Point, 10 miles.
6—Whitesboro to Madill, 31 miles.
7—Kingston to Durant Highway 70, 20 miles.
8A—Highway 77 to Enville, 9 miles.
8B—Enville to Kingston, 16 miles.

All of the proposed standard roads shown on the plan outside recreational area boundaries are proposals of other agencies. The scenic road or freeway, which would afford access to the dam and to the head of the Preston Bend Peninsula from U. S. Highway 75 at Denison and from U. S. 77 at a point north of Whitesboro, is suggested by the Recreational Planning Project.


OKLAHOMA
TEXAS
RAVIA
TISHOMINGO
MILBURN
EMET
NIDA
BRYAN CO
JOHNSTON CO
MARSHALL CO
CHICKASAW NATION
CHOCTAW NATION
BOUNDARY LINE
KENEFIC
RUSSET
MANNSVILLE
ARDMORE
DURWOOD
PROVENCE
SIMPSON
RELOCATION S.H. NO 99
BEE
CUMBERLAND OIL FIELD
LINN
OAKLAND
MADILL
LEVEES
7. KINGSTON - DURANT HYW 70 - 20 MILES
BROCK
LAKE MURRAY STATE PARK
MCMILLAN
CARTER CO
LOVE CO
OVERBROOK
MARSDEN
8A HYW 77 - ENVILLE 9 MILES
8B ENVILLE - KINGSTON 16 MILES
CUMBERLAND
SITE OF AYLESWORTH
SILO
CLIFF
ENVILLE
RELOCATION U.S. NO 70 KINGSTON
KIEMSEY
MEAD
DURANT
5 HYW 70 - WASHITA POINT 10 MILES
SITE OF WOODVILLE
MARIETTA
SHAY
WASHITA POINT
CALERA
2A SO. BOUNDARY - PRESTON BEND LODGE - 6 MILES
FOB
ENOS
WILLIS
PRESTON BEND
PLATTER
2B SO. BOUNDARY - ROUTE 1. INTERSECTION - 1 MILE
3 GRANDPAPPY POINT SQUR. ½ MILE
SITE OF LARK
CARTWRIGHT
COLBERT
DENISON DAM
THACKERVILLE
GORDONVILLE
POTTSBORO
DENISON
4 DENISON - DAM 4 MILES
6 WHITESBORO - MADILL 31 MILES
1A DAM - PRESTON BEND RD. 6.5 MILES
1B PRESTON BEND RD - WHITESBORO MADILL RD. 14 MILES.
GRAYSON CO
PERRIN FIELD
MINERAL CREEK
SADLER
WHITESBORO
GAINESVILLE
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ROADS - STANDARD - GRAVEL
ROADS - STANDARD - PROPOSED
ROADS - SECONDARY - PAVED
ROADS - SECONDARY - DIRT
DEVELOPED AREAS - PROPOSED
FERRY - PROPOSED
FREEWAY - PROPOSED
U. S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
ROAD SYSTEM PLAN
PART OF THE MASTER PLAN FOR
DENISON DAM RECREATIONAL AREA
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT.
DATE AS OF JANUARY 1943
DRAWN BY M. A. MARSH
CHECKED BY A. C. WYNN
DRAWING NUMBER RA-DD-2029
SHEET 1A

Figure 17.

refreshment booth may become essential when the popularity of the beach justifies such a convenience. Movable lifeguard stands also must be provided. The shallow-water area should be roped off for the use of nonswimmers, and diving floats should be provided in deep water. For those desiring quiet restricted water, a swimming pool suitable for tournament and swimming races, as well as for public use, is provided on the plan for the terrance adjacent to the lodge. The spacious lodge veranda and shelter adjacent to the pool is intended for the use of spectators. Bathhouse facilities are provided in close relationship to the beach and the pool (fig. 23). Parking space for 125 cars is provided adjacent to the main park road and within walking distance of the lodge and the beach. Should this area prove inadequate, another area of equal capacity could be developed on the west side of the entrance road directly opposite the parking area, as indicated on the plan. Field space for overflow parking is available south of the entrance road opposite the campground.

(g) Picnic areas. In the picnic areas, all of which are closely related to the centers of activity, provision has been made for such facilities as camp stoves, tables, refuse containers, and drinking water. Two sizable areas located adjacent to the beach and in the vicinity of the boating center are designated for full development. Each designated area will provide accommodations for large group gatherings as well as small family groups. In the two major designated picnic areas, playgrounds equipped with apparatus and space for games such as horseshoes and roque should be provided.

(h) Overnight accommodations. The vacation cabin and overnight accommodations area is located in the wooded section south of the beach on the east shore. The area is sufficiently large to accommodate all facilities that will be required ultimately, has a shore line frontage of approximately half a mile, and is oriented to take advantage of the prevailing breeze. The arrangement of cabins and small lodges is based on the assumption that all facilities will be operated by one concessioner. Booking office and supply store are located on the spur road readily accessible to incoming patrons. Construction of a group of three small lodges containing hotel-type accommodations of a varied range in a central location is suggested. These units should be of a two-story type, with all rooms opening on broad screened verandas facing the prevailing breeze. The number of rooms in each lodge may vary; however, it is believed that units containing from 25 to 50 rooms will provide the most efficient operation.

On either side of these small lodges are the vacation cabin areas. Single- and double-room cabins, with or without housekeeping facilities, should be provided, as well as a limited number of de luxe multiple-room cabins. It is estimated that there is sufficient space within this central area to provide varied overnight accommodations for 500 guests. Provision for expansion of facilities is made by development of the loop area to the south. Boat landing facilities for convenience of cabin and lodge patrons are provided for on the shore.

(i) Camping. To meet the demands of visitors desiring outdoor camping facilities, public camping units have been designated on both sides of the head of the boat basin. They have been related as closely as practicable to the 640-foot contour, with access from the main park road by means of a loop spur road. Because of the nature of the terrain and the tree growth, the necessary seclusion for such development is possible. These units will provide sanitary facilities, individual and group camp sites and trailer sites equipped with camp stoves, tables, refuse containers, and drinking water. Since it is believed that the demand for camping will be limited, such development should be limited until the demand proves otherwise. There is sufficient space available to provide for expansion. The units are centrally located within easy walking distance of other use areas. Camping should be permitted only within these designated areas.

(j) Games and sports. The plan suggests the development of a battery of tennis courts closely related to the lodge on the west slope of the point. This location offers reasonable protection from the prevailing breeze, is readily accessible to shower and locker facilities located in the bathhouse, and is close to automobile parking space. If future demands require expansion, additional units can be added to the south. Spectator space could be provided by a shelter located on the east side of the courts. By some development work, space could be provided adjacent to the east side of the courts for badminton, roque, and

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In the aerial photograph of the Preston Bend Section in Texas, the strategic importance of the peninsula for recreational use is evident. Proposed boundaries are shown by the white line. Almost the entire length of the rugged meandering shore line is wooded—the dark areas on the photograph indicate the tree growth. The huge dam appears in the lower right-hand corner.

Figure 18.

shuffleboard. In the area between the park road and the tennis courts there is suitable space for the development of an archery range. Horseshoe pitching is discussed under (g) "Picnic Areas." Table tennis and shuffleboard facilities should be provided on the swimming pool and lodge terraces.

There is unlimited suitable space between the cabin area and the stable pasture for sports having larger space requirements, such as baseball and softball.

(k) Golf. Bordered by the periferal entrance road, the center section of the development site offers excellent possibilities for development of an 18-hole golf course (Fig. 20). The area occupied by the lay-out is approximately 200 acres in extent and possesses essential terrain qualities, necessary isolation from other concentrated recreational-use areas, and is readily accessible to summer home and vacation cabin areas. The golf house is located centrally, being accessible from the main road by a short spur road. This structure should contain a ticket office, a small golf supply and repair shop, rest rooms, locker and shower accommodations, public lounge, and a caddy room. A small service unit for storage and repair of course-maintenance equipment should be located near the golf house. Ample parking space has been provided adjacent to the golf house for visitor use.

(l) Trails. Only basic walks and trails related to individual use areas are shown on the plan for development. The necessity for tying all recreational-use areas together with a circulatory trail system for purposes of accessibility is obvious. For the hiking enthusiast seeking the pleasure of scenic views, enjoyment of landscape compositions, and study of nature a circumferential nature trail could be developed around the wooded shore line of the area. For those seeking educational benefits of such a trail, a system of uniform plant and tree labeling and wayside educational data developed in conjunction with rest stops should be devised and provided. There are many opportunities for the development of short hiking trails at the water level near the development areas.

(m) Equestrian facilities. It is believed that horseback riding will become a popular recreational activity within the area. A stable group and pasture area has been located south of the boat basin in a somewhat isolated section, but within easy access of other recreational-use areas via foot trails or road. A short spur road connects the area with the main park road. The stable group should provide stalls, feed storage, tack room, equipment storage, and wash racks. Catch corrals, saddling racks, and riding ring are closely related to the stable for efficient operation. Flanking the stable on the south is a 10-acre pasture which usually is necessary for a development of this kind. Caretaker's quarters are closely related to the service group. Ample parking space is provided adjacent to the approach road at the front of the stable group.

To facilitate the rental of saddle horses and to stimulate enthusiasm through their display, a saddle horse rack is planned near the main road adjacent to the gasoline service station south of the beach parking area. The system of bridle trails located adjacent to park roads and around the southerly wooded shore line will offer ample opportunity for enjoyment of this form of recreation.

(n) Regatta course. The popularity of sailing and outboard motorboat races on small lakes in the vicinity of Dallas and Fort Worth, Tex., has already been established and it is logical to assume that the sport will gain in popularity and that demands for facilities will be made by boat racing enthusiasts. The water of the reservoir adjacent to the suggested beach and cabin area is closely related to the center of recreational activity and is suitable for the establishment of a half-mile or mile straightaway racing course. By establishing the starting line in front of the beach area, maximum spectator space for large gatherings is available on the beach and the adjacent shoreland. Movable floating slip units would provide temporary landing and pit service for contestant use. Parking space for approximately 200 cars is provided in the combined lodge and beach parking areas and in the event this space proved to be inadequate cars could be parked parallel along nearby roads and in fields as mentioned in the foregoing discussion of "Swimming facilities."

(o) Excursion boating and commercial boat operation. Excursion boating should be made available by the concessioner to the many persons who do not own boats. For many visitors living in this inland region where large bodies of water are nonexistent, the experience of boating on "big water" will be unique. There are a number of boat excursions which might be inaugurated on regular schedule, some of which are:

	Miles
Preston Bend Area to Washita Point Area	5
Preston Bend Area to Denison Dam	6½
Preston Bend Area to Grandpappy Point Fishing Village	3
Preston Bend Area to Willis Crossing	9

The head of the peninsula, reaching far out into the lake, is the location selected for the principal recreational development on the Texas side. All secondary sites relating to this development are labeled.

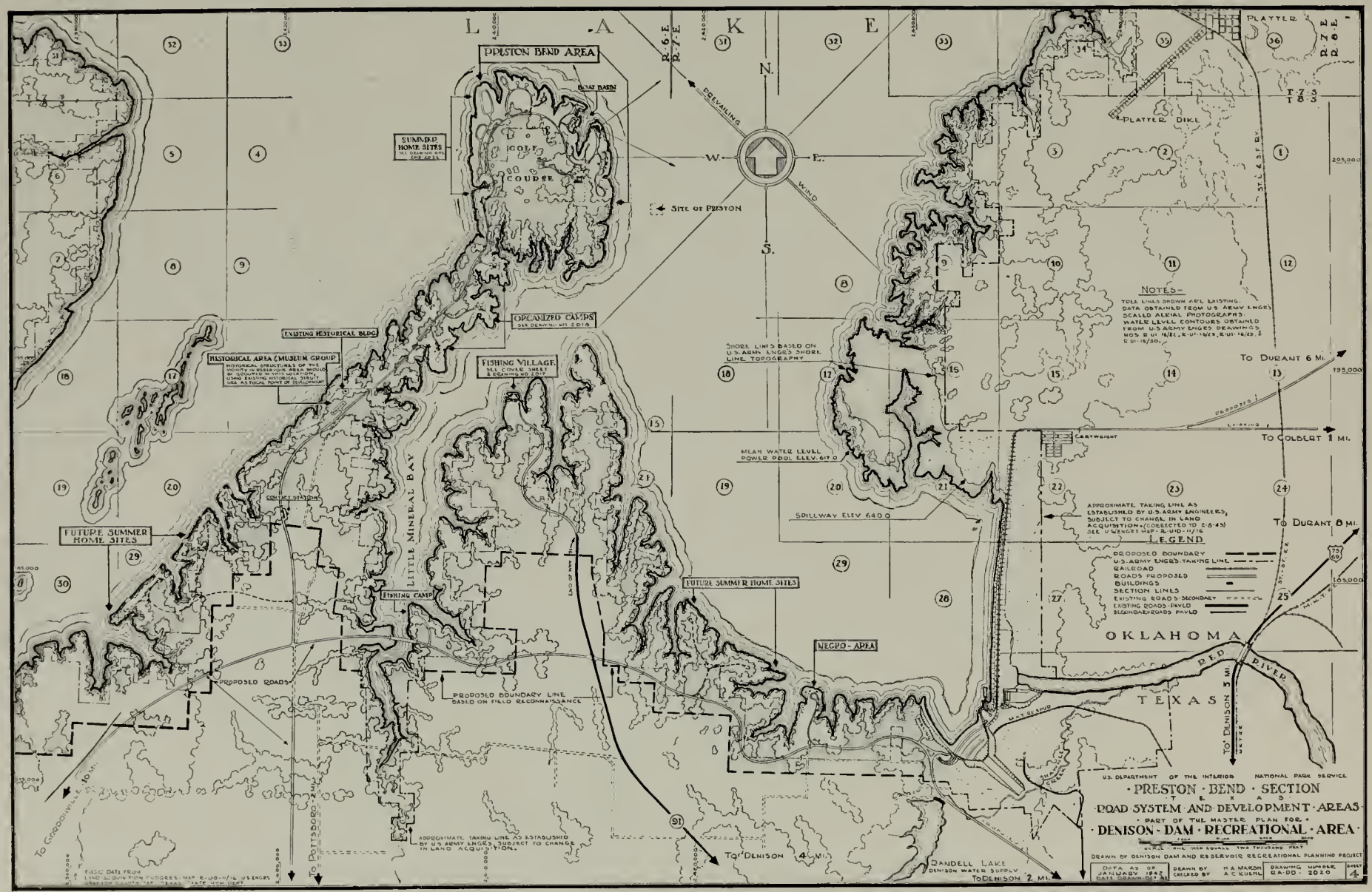
PRESTON BEND AREA
BOAT BASIN
SUMMER HOME SITES
GOLF COURSE
SITE OF PRESTON
PREVAILING WIND
N.
S.
E.
W.
ORGANIZED CAMPS
EXISTING HISTORICAL BLDG.
HISTORICAL AREA & MUSEUM GROUP
FISHING VILLAGE
SEE COVER SHEET & DRAWING NO. 2017
SHORE LINES BASED ON U.S. ARMY ENGRS SHORE LINE TOPOGRAPHY
MEAN WATER LEVEL POWER POOL ELEV. 617.0
SPILLWAY ELEV. 640.0
FUTURE SUMMER HOME SITES
LITTLE MINERAL BAY
FISHING CAMP
PROPOSED ROADS
PROPOSED BOUNDARY LINE BASED ON FIELD RECONNAISSANCE
APPROXIMATE TAKING LINE AS ESTABLISHED BY U.S. ARMY ENGRS SUBJECT TO CHANGE IN LAND ACQUISITION.
TO DENISON 4 MI.
TO DENISON 2 MI.
TO GODDONVILLE 10 MI.
TO POTTSBORO 2 MI.
WEGPO - AREA
RANDELL LAKE
DENISON WATER SUPPLY
PLATTER DIKE
NOTES-
TELE LINES SHOWN ARE EXISTING.
DATA OBTAINED FROM U.S. ARMY ENGRS SCALED AERIAL PHOTOGRAPHS
WATER LEVEL CONTOURS OBTAINED FROM U.S. ARMY ENGRS DRAWINGS NOS. R-U-16/E1, R-U-16/29, R-U-16/29.8 & R-U-16/30.
TO DURANT 6 MI.
TO COLBERT 1 MI.
TO DURANT 8 MI.
CARTWRIGHT
APPROXIMATE TAKING LINE AS ESTABLISHED BY U.S. ARMY ENGINEERS, SUBJECT TO CHANGE IN LAND ACQUISITION (CORRECTED TO 2-8-45) SEE U.S. ENGRS MAP - R-U-10-11/16
LEGEND
PROPOSED BOUNDARY
U.S. ARMY ENGRS. TAKING LINE
RAILROAD
ROADS PROPOSED
BUILDINGS
SECTION LINES
EXISTING ROADS-SECONDARY
EXISTING ROADS-PAVED
SECONDARY ROADS PAVED
OKLAHOMA
TEXAS
RED RIVER
TO DENISON 3 MI.
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
PRESTON BEND SECTION
TEXAS
ROAD SYSTEM AND DEVELOPMENT AREAS
PART OF THE MASTER PLAN FOR
DENISON DAM RECREATIONAL AREA
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DATA AS OF JANUARY 1942
DRAWN BY H.A. MASON
CHECKED BY A.C. KUEHL
DRAWING NUMBER NA-DD-2020
SHEET 4

Figure 19.

Diesel-powered sight-seeing boats of 20- to 40-passenger capacity are most commonly used for this type of operation. Such an operation might be augmented by a single large river type vessel which could accommodate large crowds on daylight and on moonlight excursions. Excursions on the Lake of the Ozarks in boats of this type have been very popular with visitors and profitable to the operator. To supplement these facilities, a limited number of speedboats, charter boats, and fishing boats should be provided by the concessioner.

There are several potential auto-ferry routes which might eventually be operated on a franchise basis. One, between Preston Bend and Woodville, Okla., is 2 miles in length; and another, between Mineral Bay Crossing and the Gordonville-Pottsboro Route is 1 mile in length.

(p) Administration Center. (Park office—public contact—employee residential area.) The principal administration facilities should be located within the Preston Bend Area, since it is believed that this area will receive the greatest concentrated use of all the developed areas because of its relationship to transportation facilities and to the large population to the south within 75 miles. The site selected for the administration center is adjacent to the main road between the summer home site areas and the principal recreational-use areas. A residential area for administrative and concessioner employees is suggested on the point overlooking the reservoir north of the administration offices. An indirect road approach from the summer home site area road at the west is suggested.

(2) Organized Camps (figs. 19 and 25). Closely related to the Preston Bend Area on the neck of the peninsula 2½ miles south of the administration center are three organized group camps. Each camp site is isolated from other centers of public use and from the main park approach road, but is sufficiently close to the principal administration center to offer the advantages of administrative control and utility service economy. The camps contain separate administration centers, several camp units, central swimming beach, and play areas. Each camp unit contains a unit lodge, wash house and latrine, 2 counselor cabins, and 6 camper cabins each of which accommodates 4 occupants. The capacity of the camps varies from 120 to 168 campers. There is ample space within each site for development of additional units when needed. The sites are all heavily wooded, are well situated with respect to the prevailing wind, and are closely related to waters of Little Mineral Bay.

It is intended that the camps will be leased to various groups such as church organizations and Girl Scouts for specified periods, principally during the summer. Many such camps were developed during the past 10 years by the National Park Service on Recreational Demonstration Areas, such as Lake Murray in Oklahoma. There has been considerable local demand for inclusion of such developments in plans for the Denison Dam Recreational Area.

(3) Grandpappy Point Fishing Village is located near the mouth of Little Mineral Bay on the east shore opposite the neck of the Preston Bend Peninsula (figs. 14, 17, and 24). It is accessible from the Preston Bend Area by boat (a 3-mile trip) and is also within easy reach by boat of other potential fishing camp sites on the bay. The proposed 1½-mile spur road connecting with State Highway 91 will make the development accessible by automobile. It has been planned as a major base for fishing activities, with provisions for all normal facilities required by an operation of this sort. Since the available suitable land area of the point near the water's edge is extremely limited due to topographical conditions, a concentrated plan for development of the site has been evolved. It is assumed that all of the facilities will be operated by one concessioner; therefore, placement of the buildings close to each other around a plaza should make for an economical and simplified operation.

The principal structure is the concession building which has been located centrally with reference to views of boating activity and the lake. It provides for eating facilities, the sale of refreshments, spacious lounge room, booking office, rest rooms, dancing space, and screened-in dining and lounge verandas. Moderate-priced sleeping accommodations for approximately 50 guests are provided in the multiple-room lodge. Provision for the sale of fishing paraphernalia, bait, supplies and curios, rental of boats, tackle, anchorage space, and issuance of permits should be made in the supply store located on the southwest corner of the plaza. Concessioner employee quarters have been grouped together in an extension of the supply store. Located on the same side of the plaza is the boat

The Preston Bend Area at the head of the peninsula will provide space for a major recreational development, including a concession building or lodge, a bathing beach, vacation cabins, boating facilities, a golf course, campgrounds, picnic areas, facilities for minor sports and horseback riding and possibly summer home sites. Most of these facilities have been closely related to the lake shore.


L A K E
SUMMER HOME SITES
MEAN WATER LEVEL, POWER POOL ELEV 619.0
ORGANIZED CAMPS
GOLF COURSE
EMPLOYEES RESIDENCES
PICNIC AREA
UTILITY AREA
BOAT BASIN
STABLE & CORRAL
PASTURE 19 AC.±
PRESTON BEND CEMETERY (HISTORICAL)
OVERNIGHT ACCOMMODATIONS AND VACATION CABINS
CONCESSION BLDG. BEACH & PICNIC AREA
INTURE EXPANSION AREA
W.
S.
N.
E.
NOTES
THIS LAYOUT BASED ON TOPOGRAPHY TAKEN BY PROJECT ENGINEER AND U.S. ARMY ENGRS DRAWING NO. R-UI-16/30.
SHORE LINE & WATER LEVEL CONTOURS OBTAINED FROM U.S. ARMY ENGRS DRAWING NO. R-UI-15/30.
EXISTING TREE LOCATION OBTAINED FROM U.S. ARMY ENGRS AERIAL PHOTOS & DRAWING NO. R-UI-16/30, SEE DRAWING NO. 2015.
EXISTING TREES SHOWN
PROPOSED TREES SHOWN
EXISTING ROADS
PROPOSED ROADS
U.S. ARMY ENGRS B.M ELEV. SHOWN
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
PRESTON BEND SECTION
TEXAS
PRESTON BEND AREA
PART OF THE MASTER PLAN FOR
DENISON DAM RECREATIONAL AREA
SCALE ONE INCH EQUALS 400 FEET
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
BASE DATA - U.S. ARMY ENGR. DRAWING - R-UI-16/30 DRAWN NOV. 1942
DESIGNED BY R.C. LANDIS
DRAWN BY H.A. MARSH
CHECKED BY NUBAL
DRAWING NUMBER RA-DD-2022
SHEET 3.

Figure 20.

storage and repair shop building, which is readily accessible to the launching road. An outdoor boat storage area is suggested on the south side of the launching road opposite the boat-storage building. The plaza area provides parking space for approximately 80 cars.

In order to obtain a close relationship between the boat anchorage area and the plaza development at the various stages of the fluctuating water surface, the suggested marina has been cut out of the shore line in the manner indicated on the cover sheet in figure 24. The marina will provide floating slip anchorage accommodations for approximately 45 small craft such as rowboats, inboard runabouts, outboard craft, sailboats, and small cruisers. This capacity could easily be increased by placement of floating slip units along the shore south of the launching road. Boat owners using the marina accommodations should be charged a monthly or seasonal rental fee, based on the size of the boat. An additional convenience for boat owners is the suggested standardized slip locker for storage of outboard motors and fishing gear (fig. 34).

It is believed that the public derives more enjoyment and better service from a well-developed and well-operated concentration of fishing facilities than from numerous small units located at widely separated intervals along the shore line. This factor contributes to the popularity of such famous fishing villages as Port Aransas and Point Isabel on the Texas Gulf Coast.

(4) Negro Area (figs. 19 and 33). The principal center of interest in the plan is the concession building which is located at the terminus of the proposed entrance spur road. This building should provide eating facilities, a lounge room, a spacious meeting room which could also be used for dancing, space where refreshments, curios, and supplies could be purchased, rest rooms, and a limited number of dressing rooms for bathers. A bathing beach is located in front of the concession building.

Adjoining the bathing beach to the south is a sizable picnic area which should be equipped with tables, stoves, drinking water, refuse containers, comfort stations, and play spaces for children. This area should offer facilities for fish frys and barbecues. A limited number of vacation cabins and overnight rooms are provided in the space west of the concession building. Boat anchorage facilities are provided on the east shore of the site on the east bay. Here floating slips should be provided for small boats, and there should also be a floating concession unit with provision for sale and rental of fishing paraphernalia, rental of boats, and sale of refreshments and supplies. These facilities are made accessible by the launching road which branches off the main entrance road. A small campground, equipped with stoves, tables, drinking water, and comfort station, is suggested in the wooded area on the west shore. The top land between the entrance road and the campground is suitable for minor sports, such as softball, roque, and horseshoes. A secluded area located on the east shore of the site and somewhat removed from the center of activity has been designated for organized camp use. A small utility area for the combined use of the administrative agency and concessioner to provide for storage and repair of maintenance equipment is suggested near the launching road.

(5) Summer home sites. If summer home sites are provided, it is believed that many advantages will accrue to the individual occupant and to the administering agency by relating summer home site development to the major recreational-use areas. Some of these advantages are: Patrol, control, accessibility to supplies, relationship to recreational facilities, boating accommodations, and available eating facilities. Utility service cost can be reduced substantially by extension of centralized park services to home-site sections.

The entire west shore and a portion of the north shoreland above the spillway elevation is suitable for summer home sites. The 1½ miles of wooded shore frontage will provide a minimum of approximately 200 excellent lake view sites. For access to the residential area, a minimum number of access road intersections with the primary park road is suggested.

Private boat landings and boat shelters anchored along the west shore and the coves of the north shore will be well protected from the prevailing wind by the moderately steep wooded shorelands. It is suggested that group landing floats and boat slips of an approved type to accommodate six or eight boats be located at intervals along the shore rather than have single float facilities for each site occupant. Should individual boat shelters be desired by owners, they should be of a type approved by the agency administering the Denison Dam Recreational Area (fig. 34).

(6) Historical area and museum group (fig. 19). Located 1½ miles north of the proposed Preston Bend Area boundary on the west shore of the peninsula are

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The proposed development for the northeast part of the Preston Bend Area is concentrated around the principal boat basin.


GOLF COURSE
SUMMER HOME SITES
CONTACT & PARK OFFICE
EMPLOYEES RESIDENCES
MEAN WATER LEVEL
FULL POWER POOL ELEV. 670.0
SPILLWAY ELEV 640.0
STABLE & CORRALS
PASTURE 10 AC.
CAMPING UNIT 'B'
PRESTON BEND CEMETERY (HISTORICAL)
LAUNCHING
HARBOR MASTER
MARINA
BOAT BASIN
163 AC.
BRIDLE TRAIL
CAMPING UNIT 'A'
TENNIS
MINOR SPORTS
OFFICE & SUPPLIES
VACATION CABINS
OVERNIGHT ACCOMMODATIONS
SWIMMING
OP. CONCESSION BLDG.
LAKE
NOTES:
OPERATOR'S UTILITY AREA-HARBOR SECTION, INCLUDES THE FOLLOWING:
A- BOAT REPAIR SHOP.
B- MARINE RAILWAY.
C- FLOAT
D- REPAIR BARGE FOR MOTOR WORK.
E- GAS SERVICE BARGE - GRAVITY FILL.
THIS LAYOUT BASED ON TOPOGRAPHY TAKEN BY PROJECT ENGINEER.
U.S. DEPARTMENT OF THE INTERIOR · NATIONAL PARK SERVICE
PRESTON · BEND · SECTION
TEXAS
PRESTON · BEND · AREA
PART OF THE MASTER PLAN FOR
DENISON · DAM · RECREATIONAL · AREA
SCALE - ONE INCH EQUALS 200 FEET
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DRAWING NUMBER
NRA-DD-2019
6

Figure 21.

the remains of an old abandoned residence which appears to have been built about the time of Glen Eden (1837). Architectural style, type of construction, and evidence of old wagon trails and dugways which lead in the general direction of the original site of the Coffee Trading Post have prompted this conclusion. This property was once a part of Coffee's Plantation. In addition to the old residence, which commands a magnificent view of the reservoir, the site contains many fine old cedar trees and is adjacent to the present and proposed Preston Bend Area entrance road. This site is admirably suited for development of a museum group.

Washita Point Section.

(1) Washita Point Area (figs. 28 and 29). The portion of the area selected for concentrated recreational development is located on the east shore midway between Rooster Creek Bay and the extreme point formed by the confluence of the Washita and Red Rivers. Excellent tree growth, desirable elevation above mean water level, ideal orientation with relation to prevailing winds, excellent scenic outlook, a well-protected boat basin, and its accessibility with relation to the Preston Bend Area help to make this area particularly desirable. Access to the site is gained by the proposed park entrance road which intersects with U. S. Highway 70 on the north and terminates on a high knoll overlooking the reservoir on the south. This road location is on high land for a great portion of its length in order to take advantage of the area's scenic aspects (fig. 27). The development plans for the site are preliminary in scope. They are intended primarily to show land-use possibilities and relationship of potential recreational-use areas.

Commanding the center of interest, the boat basin is flanked on either side by concentrated recreational developments which have been closely related to the shore line for maximum convenience to the user. Facilities have been provided for boating, fishing, swimming, picnicking, camping, tennis, golf, horseback riding, hiking, and dancing. There are play areas for children, vacation cabins, overnight guest accommodations, floating cabins, a lodge, summer home sites, and a regatta course.

(a) The boat basin has a surface area at mean water level of approximately 15 acres, is of sufficient depth, and is protected from the prevailing wind by the narrow point of land on the southeast. It is accessible by means of the proposed launching road indicated in the south fork of the basin.

(b) Marina developments with slip and floating berth accommodations for various types of craft are suggested on the north and south shores of the basin. These developments are similar to those proposed in the Preston Bend Basin and have a potential combined anchorage capacity of 200 or more craft. This capacity could easily be expanded by rearrangement or extension of the facilities along the shore. The marina suggested on the south shore is intended for use of larger craft such as cruisers, whereas the north shore marina is intended for smaller craft such as inboard runabouts, fishing boats, sailboats, and excursion-boat facilities. The mouth of the basin is restricted in width for added marina protection against rough water by the suggested development of earth-filled piers on both sides (figs. 30 and 34). Access to the two marina areas is by means of spur roads, adjacent to which is ample parking space close to the high-water line. Comfort stations for the north shore harbor section might be provided adjacent to the spur road terminal loop.

(c) A community boat club center is located on the narrow point bordering the east shore of the basin. This public building and other facilities are intended to serve the needs of individuals or groups of boating enthusiasts. The building will have only essential accommodations such as locker space, rest rooms, lounge room, space for the sale of refreshments and incidental supplies, and office space (fig. 30).

(d) Utility and service areas for the concessioner and the administrative agency are closely related to each other and are located adjacent to the high-water level at the head of the south fork of the basin. The functions and facilities provided within this area are similar to those recommended for the Preston Bend Area. Harbor master quarters are indicated on the point adjacent to the south fork which commands an unobstructed view of all boating activities within the basin. The plan suggests separate units for the concessioner and the administrative agency, but these units could be combined under one roof.

(e) The lodge or concession building is located on a site selected for the fine foreground lake view, relationship to the boat basin, and central relationship to all developments. It is accessible by way of the left fork

The perspective sketch of the Preston Bend Area shows the boat basin in the central foreground, and the lodge, beach, and vacation cabins in the left foreground. The neck of the peninsula is in the upper left background.

59011—44——6

Figure **22.**

of the area road skirting the outer edge of the approach meadow. A spectacular wild-flower display can be seen from the road during the early summer months. The building should contain the principal eating facilities to serve the entire area, also other accommodations such as lounge rooms, recreation room, rest rooms, quarters for help, and service facilities. Provisions should also be made for the sale of supplies, refreshments, and curios. Since the building is closely related to facilities for boating, swimming, games, and picnicking, it would become the principal public gathering place and, therefore, a large parking space has been provided in close relationship.

(f) Swimming facilities and games. The plans indicate two widely separated beach areas. Since the shorelands of the entire concession building area are rather steep, opportunities for an extensive beach within the immediate vicinity are limited. Should the demand for greater space arise, a particularly suitable area for large-scale beach development is located on the south shore midway between the terminus of the entrance road and Washita Point (fig. 27). Facilities to be provided for beach use are similar to those suggested for the Preston Bend Area.

A swimming pool of regulation size suitable for tournaments and swimming races has been located a short distance to the north of the lodge. Bathhouse facilities for the pool and beach swimmers might well be located under the front terrace of the lodge, since this terrace will necessarily have to be elevated to meet grade conditions. This location is also within easy reach of the recreational facilities located north of the lodge. The games area will contain such facilities as tennis, roque, badminton and horseshoe courts, shuffleboard alleys, and a shelter for spectators.

(g) Picnic areas. The section along the shore of the games area, the areas adjacent to the beach, and the parking areas south of the lodge have been designated as potential picnic areas. A portion of the proposed campground on the west shore of the boat basin might also be used by overflow picnic crowds. These areas should be equipped for group and family use, with facilities such as camp stoves, tables, refuse containers, comfort stations, shelters, and equipped play spaces for small children.

In addition to these picnic units within the main development, two isolated areas are suggested at the tip of Washita Point and at the terminus of the entrance road referred to as Roads End Lake View (fig. 27).

(h) Campgrounds. A portion of the wooded west shore of the boat basin has been designated as a public campground. This campground should be developed to meet the demands as they arise. Limited space should be allotted for the initial development, and the remainder of the area should be held in reserve for ultimate expansion. The area is accessible by means of a spur road connecting with the principal area road. Facilities such as comfort stations, camp sites for groups and families, trailer sites, stoves, tables, and refuse containers should be provided. The area is centrally located with relation to other use areas and is closely related to the 640-foot contour.

(i) Overnight guest accommodations. The area selected for vacation cabins and other overnight accommodations is the point of land north of the centrally located concession building (figs. 28 and 29). It is isolated from day-use facilities, is exceptionally well oriented with relation to prevailing wind, is considerably elevated above surrounding land, and is well covered with native timber. The concessioner booking office and supply store are located at the entrance to the area. Vacation cabin areas are designated on both sides of a lodge group which is located on the highest section of the area. The lodges should be small multiple-room units containing hotel-type accommodations similar to those recommended for the Preston Bend Area (fig. 35). Installation of group boat-landing facilities at intervals along the shore for the convenience of cabin and lodge patrons is suggested.

(j) Trails. There are many possibilities for the development of a comprehensive trail system within the wooded region of the area. Not all trail potentialties are indicated on the preliminary plans; however, essential circulatory trails within the developed use areas have been incorporated. A shore line trail paralleling the lake from

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The plan and perspective for the lodge or concession building at Preston Bend Area is shown as a suggestion for architectural style and building space use. Facing northeast, the building overlooks the broadest expanse of the lake. This structure contains the principal eating facilities of the development as well as lounge space, recreation room for dancing, provision for the sale of curios and refreshments, and space for necessary service requirements. The swimming pool, bathing beach, and bathhouse are shown in the upper section of the sketch.

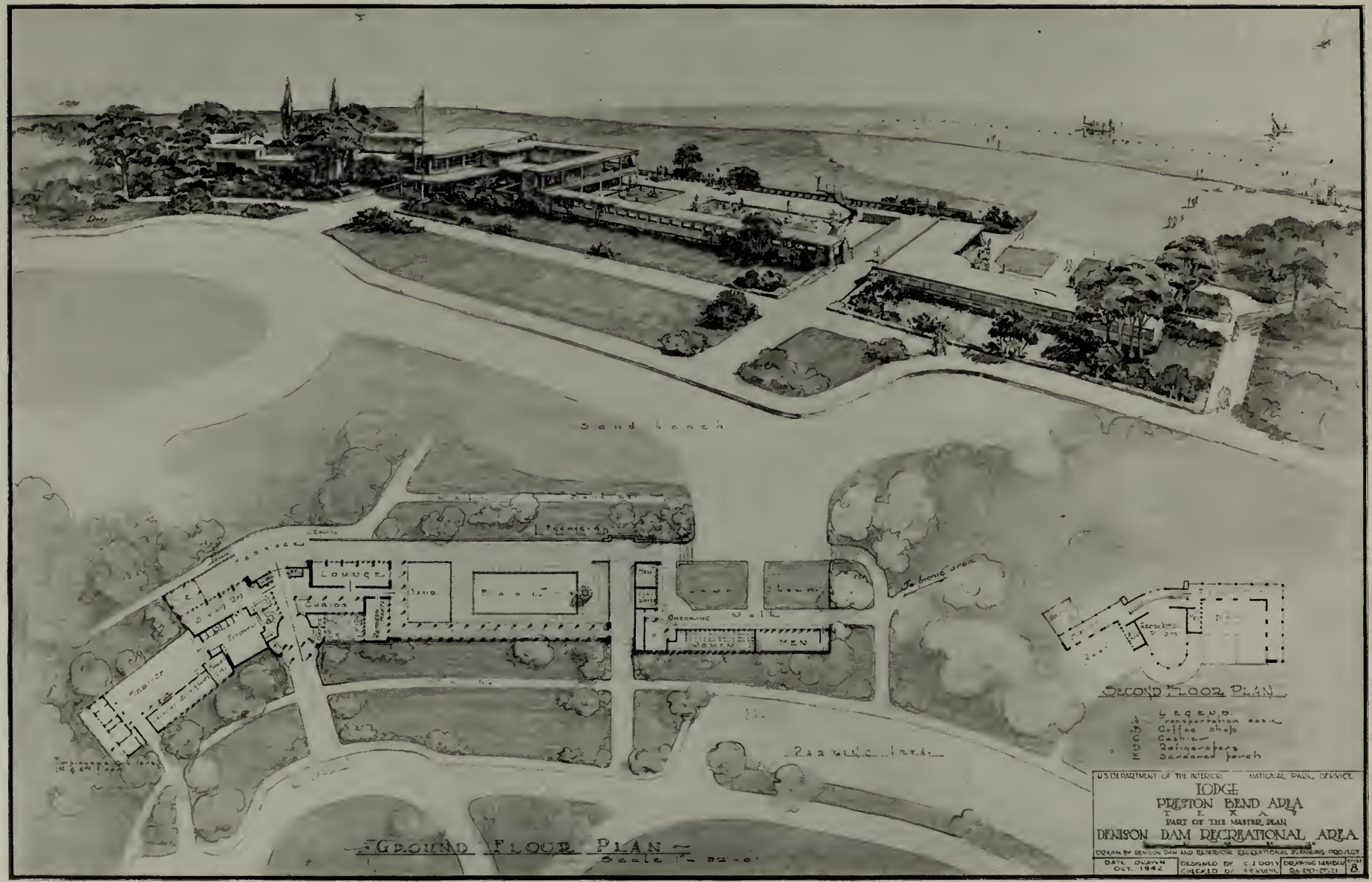
Sand beach
LOUNGE
CURIOS
POOL
WOMEN
MEN
GROUND FLOOR PLAN
SECOND FLOOR PLAN
LODGE
PRESTON BEND AREA
TEXAS
PART OF THE MASTER PLAN
DENISON DAM RECREATIONAL AREA
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

Figure 23.

the vacation cabin area to the summer home site section would provide hikers with excellent opportunities for the study of nature and also would connect the various facilities developed along the shore.

(k) Equestrian facilities. Saddle-horse stables have been located on a site approximately one-quarter of a mile west of the vacation cabin office. They should provide stall space for a sizable string of horses and other necessary facilities. Riding ring, catch corrals, caretaker quarters, and a 10-acre pasture are closely related to the stable for efficient operation. A saddle horse display rack is indicated adjacent to the gasoline service station on the main road to stimulate and facilitate the rental of horses. A system of bridle trails located adjacent to park roads and through the wooded region of the area would offer ample opportunities for the enjoyment of horseback riding.

(l) Golf. The open, rolling, high land between the entrance road and the main area road is particularly adaptable and conveniently located with relation to the centers of public activity and to the summer home sites section for the development of an 18-hole golf course. The preliminary plan for the development suggests a centrally located golf house that would be accessible from the main area loop road by means of a short spur road. Within close proximity of this golf center there should be a small service area for storage and repair of maintenance equipment (figs. 27 and 28).

(m) Administration center and employee residential area. In addition to the park contact station, located near the intersection of the main entrance road with U. S. Highway 70, a central administration office is suggested within the development area at the intersection of the main entrance road and the main area road (fig. 28). The office has been located centrally with relation to public activities for convenience of control and administrative operation and is readily accessible to the public for purposes of distributing information relating to the recreational facilities provided within the area.

The employee residences have been grouped together in the shoreland area adjacent to the summer home site section.

(2) Summer home sites. The shore-line area south of the proposed boat basin and east of the golf course has been suggested as a potential summer home section. This section contains 100 acres or more, paralleling the lake for a distance of nearly 1 mile. It is covered with a good stand of native timber, is ideally oriented with reference to broad lake views and the prevailing southeasterly wind, and is close to the center of all recreational activities. Because of its proximity to principal development centers, the cost of providing access roads and utilities can be materially reduced by extension of park roads and by utilization of the main park sewage disposal, power, and water systems. Assuming that the area might be subdivided on a minimum three-lots-to-an-acre basis, several hundred excellent summer home sites could be provided. Request for such accommodations has already been made by a number of local residents.

(3) Organized camps—Rooster Creek Bay (figs. 27 and 32). Three organized group camp developments have been suggested on Rooster Creek Bay. The camps are definitely isolated from the public activities in the main development area, but are within easy reach of the park administration center. The sites are especially desirable since the region in which they are located is quite rugged, is densely covered with native timber, and is closely related to the lake and the bay. All the sites are accessible from the park entrance road by means of short spur roads, the use of which should be confined to camp groups only. Each group camp contains a central administration center, swimming beach, boat-landing facilities, council ring, and a games area around which cabin units are grouped. Each camp unit contains 6 camper cabins, and each cabin has accommodations for 4 campers. Group camp No. 1 will provide accommodations for 72 campers; camp No. 2, 72 campers; and camp No. 3, 96 campers.

(4) Catfish Bay Fishing Village (figs. 27 and 31). Catfish Bay has protected waters and an irregular shore line which is desirably located in relation to what should prove

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The area selected for Grandpappy Point Fishing Village is located near the mouth of Little Mineral Bay on the east shore opposite the neck of the Preston Bend Peninsula. The development is intended to serve as a major base for fishing activities. The plan provides facilities for boating, eating, sleeping, the storage and repair of fishing boats, and the sale of supplies. All of these facilities have been closely grouped for the convenience of patrons.

The sketch of the development as seen from the water suggests a picturesque "seashore" style of architecture. The sketch on the cover sheet of the master plan shows the same development from a different angle.

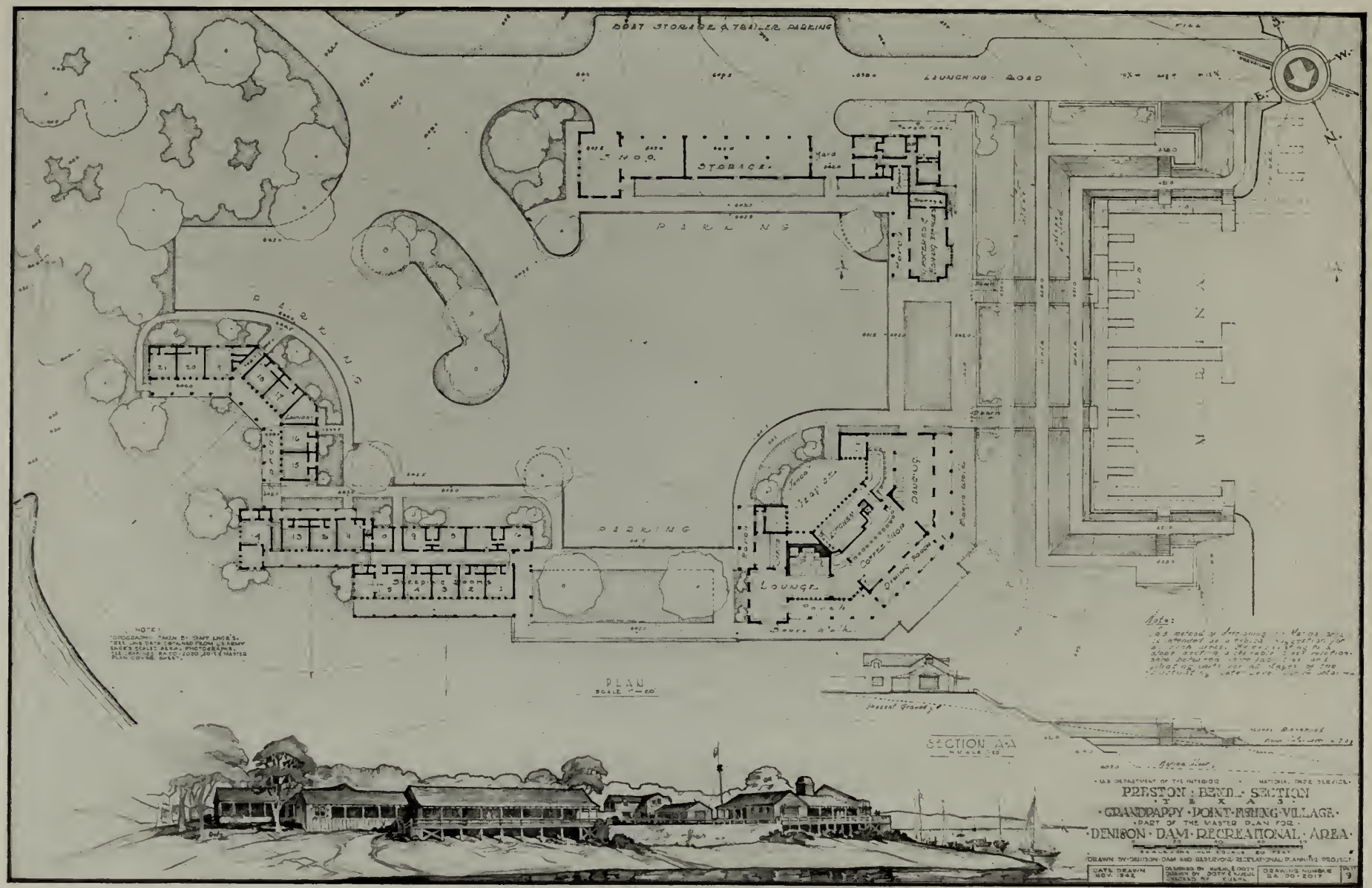
BOAT STORAGE & TRAILER PARKING
LAUNCHING ROAD
STORAGE
PARKING
PARKING
Lounge
Coffee Shop
Dining Room
Sleeping Rooms
PLAN
SECTION A-A
PRESTON · BEND · SECTION
· TEXAS ·
· GRANDDADDY · POINT · FISHING · VILLAGE ·
· PART OF THE MASTER PLAN FOR ·
· DENISON · DAM · RECREATIONAL · AREA ·

Figure 24.

to be a good fishing region. The bay is approximately 1½ miles long and varies in width from several hundred feet to a half mile. Since it is closely related to U. S. Highway 70, the site selected for development as a fishing center is readily accessible to visitors. There are several possibilities for the development. It is felt that the scope and type of facilities provided here should not be allowed to conflict seriously with the primary development 6 miles south which should be undertaken first.

The proposed development as suggested in figure 31 is based upon the assumption that the facilities primarily should serve fishermen and their families for both day use and week-end use. The principal facilities for this type of use have been located on high ground adjacent to a side cove which offers protected water for anchoring boats to floating slips. This cove is easily accessible by means of a launching road which branches off the main entrance road. The number of overnight accommodations should be limited. Two 10-room barracks-type buildings are suggested on the point above the boat-anchorage area. A small tavern or concession building containing eating facilities and supply store is proposed in close relationship to the barracks. Limited campground space equipped with tables, stoves, drinking water, and comfort stations is provided at the head of the cove for the convenience of those desiring overnight camping accommodations. The shore area in front of the concession building is suitable for beach development. Limited bathhouse facilities could be provided in the concession building. Ample picnic space with stoves, tables, drinking water, comfort station, and shelter is suggested on the high bluff and overlooking the main body of the lake.

An alternate scheme for development of this site is the provision of only fishing accommodations, similar to those suggested for Grandpappy Point Fishing Village.

Secondary development areas (figs. 16 and 33).

(1) Newberry Creek Area. Since the Newberry Creek development is intended to serve the people of Durant, Okla., and the small communities of the vicinity, and since extensive facilities for week-end use have been provided in the Washita Point Section located 13 miles from this site, it is believed advisable to provide mostly day-use facilities in this development scheme. The plan represents a preliminary suggestion to serve as a guide for type and location of recreational development. Provision is made for boating, fishing, swimming, dancing, picnicking, games, play areas for children, and summer home sites.

Access to the site is provided by a proposed 1½-mile approach road connecting with U. S. Highway 70. The suggested development occupies approximately 50 acres of the point which is bordered on the east by Newberry Creek Bay and on the west by the reservoir. The small cove on the east side in which boat landing facilities are provided is well protected from the prevailing wind. A small marina development with floating slip boat anchorage accommodation is suggested on the shore of this cove. A concession building containing lounge room, recreation room for dancing, lunchroom, space for sale and rental of fishing paraphernalia, rest rooms, employee quarters, and office space is suggested above the marina area. The cove is accessible by way of the launching road located in the upper end. Picnic areas equipped with stoves, tables, drinking water, refuse containers, and sanitary facilities are suggested on the point adjacent to the beach and on either side of the concession building. Ample parking space has been provided. A suitable swimming beach is suggested on the reservoir side of the point. Adjacent to the beach at the end of approach road a building containing sanitary facilities, shelter space, and limited bathhouse accommodations is proposed. The flat area opposite the concession building is designated for games such as softball, badminton, roque, and horseshoes. The point east of the boat basin, which has a shore frontage of approximately 3,000 feet and contains about 25 acres, has been designated for summer home sites. A service area for the combined use of the administrative agency and the con-

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Three organized group camps are planned for the Preston Bend Section. They are located on the neck of the peninsula bordering the west shore of Little Mineral Bay. The camps are designed for leasing to groups such as the Boy Scouts, Girl Scouts, 4–H Clubs, and church organizations. Most groups desire a camp for 2 or more weeks in the summer, but it is probable that camps in this location also would be in demand for week ends during other seasons. Each of the camps will include cabins to accommodate from 120 to 168 campers, as well as accommodations for counselors and staff personnel.

The National Park Service has made an analysis of the type of facilities desired by organizations that conduct group camping activities, and has designed standard plans which are intended to serve as a guide in meeting the requirements of these organizations. Adaptation of the standard plans is recommended for the camps in this area.

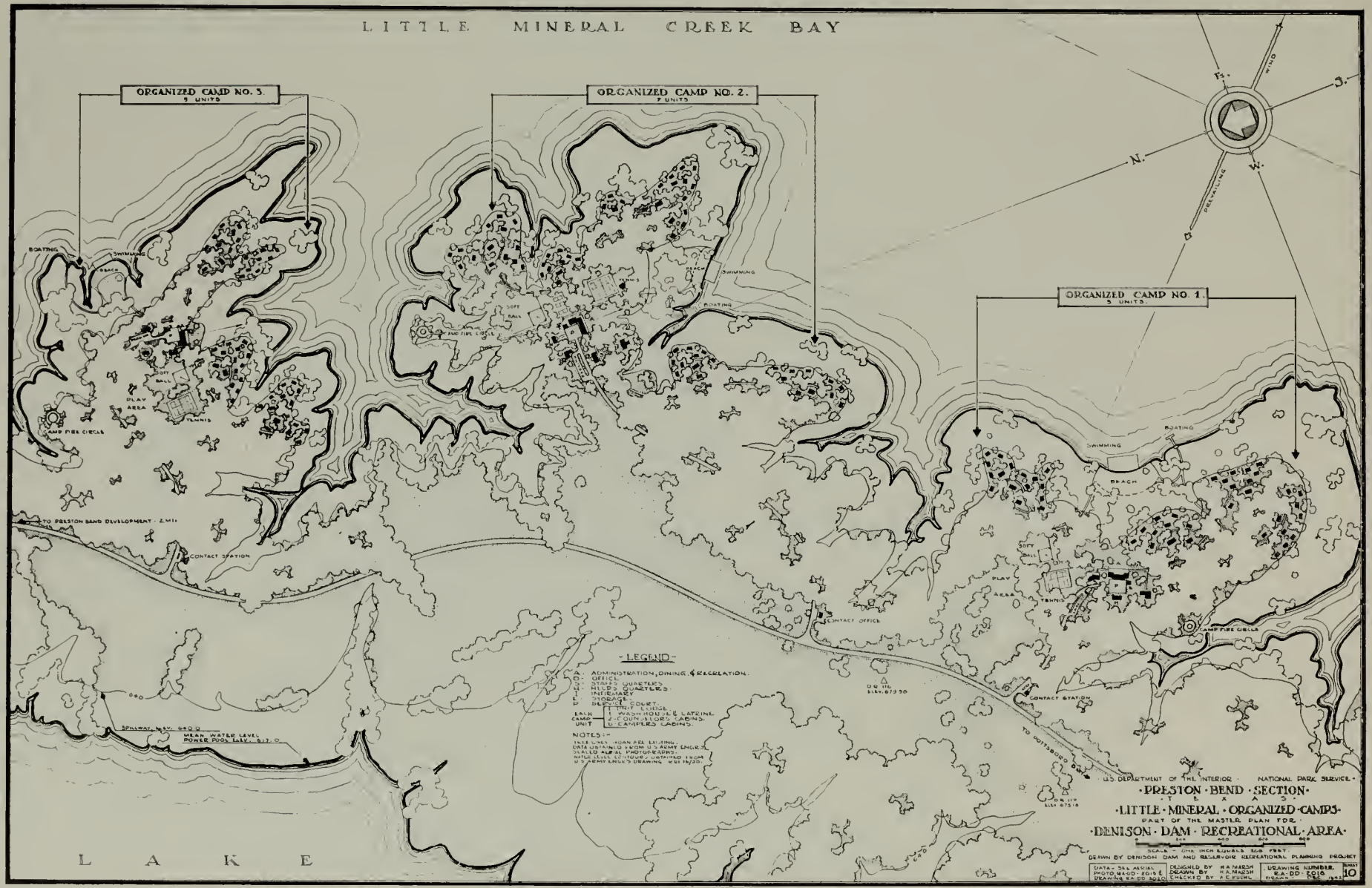
LITTLE MINERAL CREEK BAY
ORGANIZED CAMP NO. 3.
9 UNITS
ORGANIZED CAMP NO. 2.
7 UNITS
ORGANIZED CAMP NO. 1.
5 UNITS
BOATING
SWIMMING
BEACH
SOFT BALL
PLAY AREA
TENNIS
CAMP FIRE CIRCLE
TO PRESTON BEND DEVELOPMENT - 2 MI.
CONTACT STATION
CONTACT OFFICE
-LEGEND-
A - ADMINISTRATION, DINING & RECREATION.
O - OFFICE.
S - STAFF'S QUARTERS.
H - HELPS QUARTERS.
I - INFIRMARY.
S - STORAGE.
P - PLAYGROUND.
EACH CAMP UNIT
1 - DISTRICT LODGE
1 - WASH HOUSE & LATRINE
2 - COUNSELORS' CABINS.
6 - CAMPERS CABINS.
NOTES:-
SPILLWAY ELEV. 640.0
MEAN WATER LEVEL POWER POOL ELEV. 617.0
TO POTTSBORO
L A K E
U.S. DEPARTMENT OF THE INTERIOR · NATIONAL PARK SERVICE ·
·PRESTON · BEND · SECTION·
· T E X A S ·
·LITTLE · MINERAL · ORGANIZED · CAMPS·
PART OF THE MASTER PLAN FOR
·DENISON · DAM · RECREATIONAL · AREA·
SCALE - ONE INCH EQUALS 200 FEET
DRAWN BY DENISON DAM AND BALCONES RECREATIONAL PLANNING PROJECT
DRAWING NUMBER
R.A.-DD-2016
SHEET 10

Figure 25.

cessioner is suggested in close relationship to the launching road.

(2) Fort Washita. The ruins of Fort Washita will be of interest to many visitors because of its historical significance. The site is situated in section 23 of Bryan County, Okla., 4 miles west of State Highway 299, near the east shore of the Washita arm of the reservoir. The recommended area comprises 765 acres, but the acreage recommendation is subject to change as the new levees may affect requirements. The ruins and adjacent historical features occupy an area of approximately 80 acres outside of the taking line of the Army Engineers. Many fine old oak trees are interspersed among the ruins of the area.

Since the ruins are in a state of decomposition, a stabilization program to preserve them should be undertaken. No development other than limited day-use facilities is suggested. Some of the present county section line access roads in the vicinity will be cut off by the reservoir; therefore, principal access must be by way of a new boundary line road between Johnston and Bryan Counties or by the existing section line road 1 mile north of this county boundary. This section line road connects with State Highway 299. Development of a short spur entrance road to connect with existing section line roads will be necessary. A small wayside museum is suggested at the terminus of the proposed entrance spur road. An organized circulatory trail system connecting all of the ruins and the museum should be developed. A small picnic area, equipped with tables, stoves, drinking water, and a combination shelter and comfort station is suggested west of the ruins. As an alternate solution, to reduce development costs, a small picnic area could be developed adjacent to the entrance road terminus near the suggested museum. Secondary boat landing facilities are suggested on the shore of the above-mentioned cove for the convenience of boat visitors; however, levee and dike construction to preserve the Cumberland Oil Field situated in the bottom lands of the basin west of this area may necessitate radical changes in this plan.

(3) Chickasaw Area. The recreational developments suggested for this area have been limited to day-use facilities to serve the communities of Tishomingo and Ravia, Okla., and the rural population in the immediate vicinity of the area. The site is readily accessible to tourists, since it is closely related to State Highway 99. The preliminary plan is intended primarily as a suggestion to indicate the space requirements and relationships of the various uses. Facilities are provided for boating, fishing, swimming, picnicking, and games.

The point on which development is suggested can be made accessible by construction of a short spur road approximately 1½ miles in length, which would intersect with Highway 99 about 4 miles south of Tishomingo. A concession building has been located at the terminus of this entrance road. The structure, because of its relationship to the boating, fishing, and swimming facilities, would be the center of interest for public use and should provide eating facilities, a dancing hall, space for the sale of fishing supplies, public rest rooms, and quarters for the concessioner and administrative staff. A small marina development with floating slip boat anchorage accommodations for fishing boats, runabouts, and small cruisers is suggested on the shore of the north cove adjacent to the concession building. The marina facilities and boat basin will be accessible by development of a spur launching road which intersects the main road. A beach is suggested on the reservoir side of the point. A shelter building containing limited bathhouse facilities for bathers is indicated adjacent to the beach. Fully equipped picnic areas are proposed on either side of the beach. Ample parking space has been provided adjacent to the entrance road to serve normal requirements. Sufficient space, closely related to the other developments, is available for games such as softball, tennis, and volleyball. A small utility area containing boat storage units, warehouse facilities, repair shops, equipment storage units, and quarters for employees is indicated adjacent to the launching road. This area should serve both the concessioner and the administrative agency.

(4) Hauani Creek Area. Day-use recreational facilities are recommended to serve principally the people of Lebanon and Marietta, Okla., and the smaller communities of the immediate vicinity. It is believed that many tourists will use Highway 199 as a short cut to Highway 70 reservoir crossing. Consequently, use of the development by some transients may be expected. It is probable that

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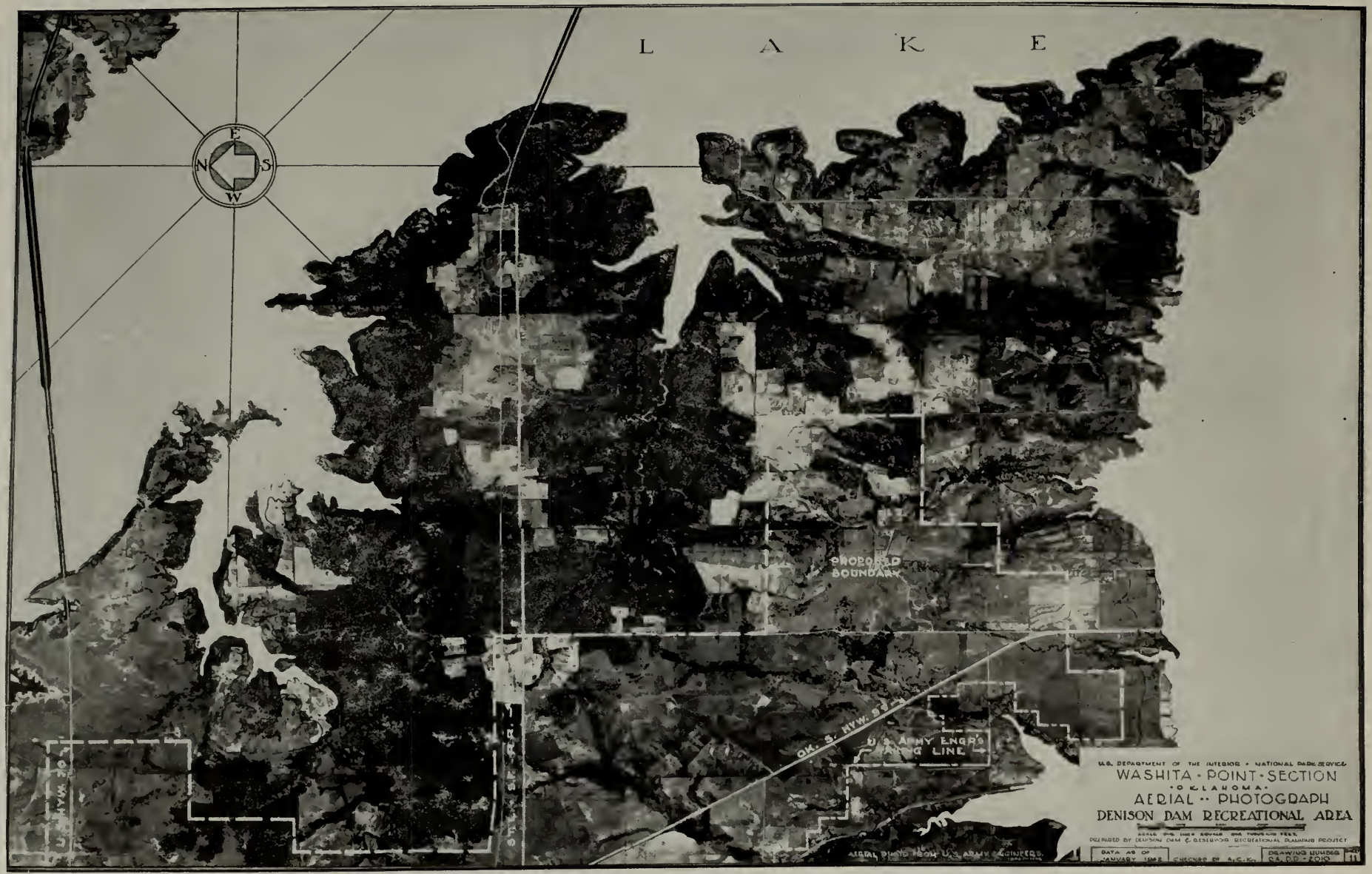
The aerial photograph of Washita Point Section in Oklahoma shows the relationship of the proposed area to the reservoir, and the forest lands within the proposed boundary. The darker portions of the photograph represent the tree-covered areas, most of which are rugged in character. The shore line shows the normal water level (617), whereas the dark line immediately back from the shore indicates the spillway elevation (640).


L A K E
E
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PROPOSED BOUNDARY
OK. S. HYW. 91
U.S. ARMY ENGR'S TAKING LINE
U.S. DEPARTMENT OF THE INTERIOR • NATIONAL PARK SERVICE
WASHITA · POINT · SECTION
· OKLAHOMA ·
AERIAL · · PHOTOGRAPH
DENISON DAM RECREATIONAL AREA
PREPARED BY DENISON DAM & RESERVOIR RECREATIONAL PLANNING PROJECT
DATA AS OF JANUARY 1958
DRAWING NUMBER
AERIAL PHOTO FROM U.S. ARMY ENGINEERS

Figure 26.

the area also will serve as a fishing center for the residents of the region. Facilities for fishing, boating, swimming, picnicking, and games are provided for in the preliminary scheme for development.

Construction of a 1-mile spur road from State Highway 199 south to the site will be necessary. The recreational facilities suggested are similar in type and scope to those recommended for the Chickasaw Area.

(5) Willis Crossing Area. The recreational facilities proposed are intended to serve the needs of the population centers near the southwest extremity of the reservoir and of transients using the proposed Madill-Whitesboro Highway. Because of the close relationship of the area to the reservoir bridge crossing on this proposed highway and the outstanding scenic aspects of the area, greater importance is attached to the proposed development and ultimate possibilities than has been given to any of the other outlying secondary areas. The suggested development is particularly well oriented with reference to the prevailing wind and to superb views of the reservoir, of Mineral Bay, and of the bluffland bordering the south shore of the reservoir to the east. In addition to day-use facilities, week-end and vacation accommodations are recommended. The preliminary plan for development is intended primarily as a suggestion to indicate types of recreational facilities recommended, their relationship to each other, and space requirements. Facilities are suggested for boating, fishing, swimming, picnicking, games, and vacation cabins.

The area may now be reached over existing county roads. Upon construction of the Madill-Whitesboro Highway, however, a 1½-mile spur road to the development site must be constructed. The preliminary development scheme suggests the placement of facilities close to the 640-foot contour along a 2,000-foot strip of the east shore facing the mouth of Mineral Bay. The entrance road leads to the principal concession building which overlooks the beach and to the adjacent vacation cabin area. The concession building should contain eating facilities, space for the sale of refreshments and supplies, public lounge, and room for dancing, cabin booking office, concessioner employee quarters, bathhouse accommodations, and public rest rooms. The area in front of the building is indicated as a beach. A limited number of week-end and vacation cabins are suggested in the area north of the principal concession building. Fishing and boating facilities are located adjacent to the south cove where a small developed marina similar in size and type of floating boat anchorage slips to the Grandpappy Point unit is recommended (figs. 24 and 34). A fishermens' headquarters building for the sale and rental of fishing paraphernalia, bait and supplies, sale of refreshments, public rest rooms, quarters for the concessioner and administrative agency employees, and lounge room is suggested close to the marina. This building ultimately may be expanded to include overnight accommodations for fishermen. The cove is made accessible for launching of boats by development of a road into the upper end. A small utility area to meet the service requirements of the concessioner and the administrative agency is suggested adjacent to the launching road. This unit should provide accommodations for the storage and repair of boats and maintenance equipment, gas and oil storage, and possibly quarters for employees connected with the operation of the unit. Fully equipped picnic areas are suggested adjacent to the beach and in the vicinity of the fishing center. Provisions for games should be made on the beach and in picnic areas. For those games requiring large areas, such as softball, there is ample space west of the entrance road in the vicinity of the principal concession building. If the demand for overnight camping arises, the point south of the boat landing cove is suitable for the purpose.

Utilities.

Water supply. One of the first steps in the development program should be the investigation and determination of an adequate supply of drinking water for all areas proposed for development. There are three possible sources of supply—drilled wells, the reservoir, and impoundment of surface waters. Wells are recommended at all locations where tests prove the supply to be satisfactory, because this type of installation is the least complicated and most economical to operate. If a suitable supply from wells is not located at any particular development area, the next choice would be reservoir water, and the third choice, impoundment of surface waters. Thorough investigation should be made before adopting any source other than drilled wells.

The plan for the development areas and road system for Washita Point Section shows the relationship of the principal development of Washita Point Area to the secondary development sites (Catfish Bay Fishing Village and the Rooster Creek Organized Camps) and to the proposed access roads.

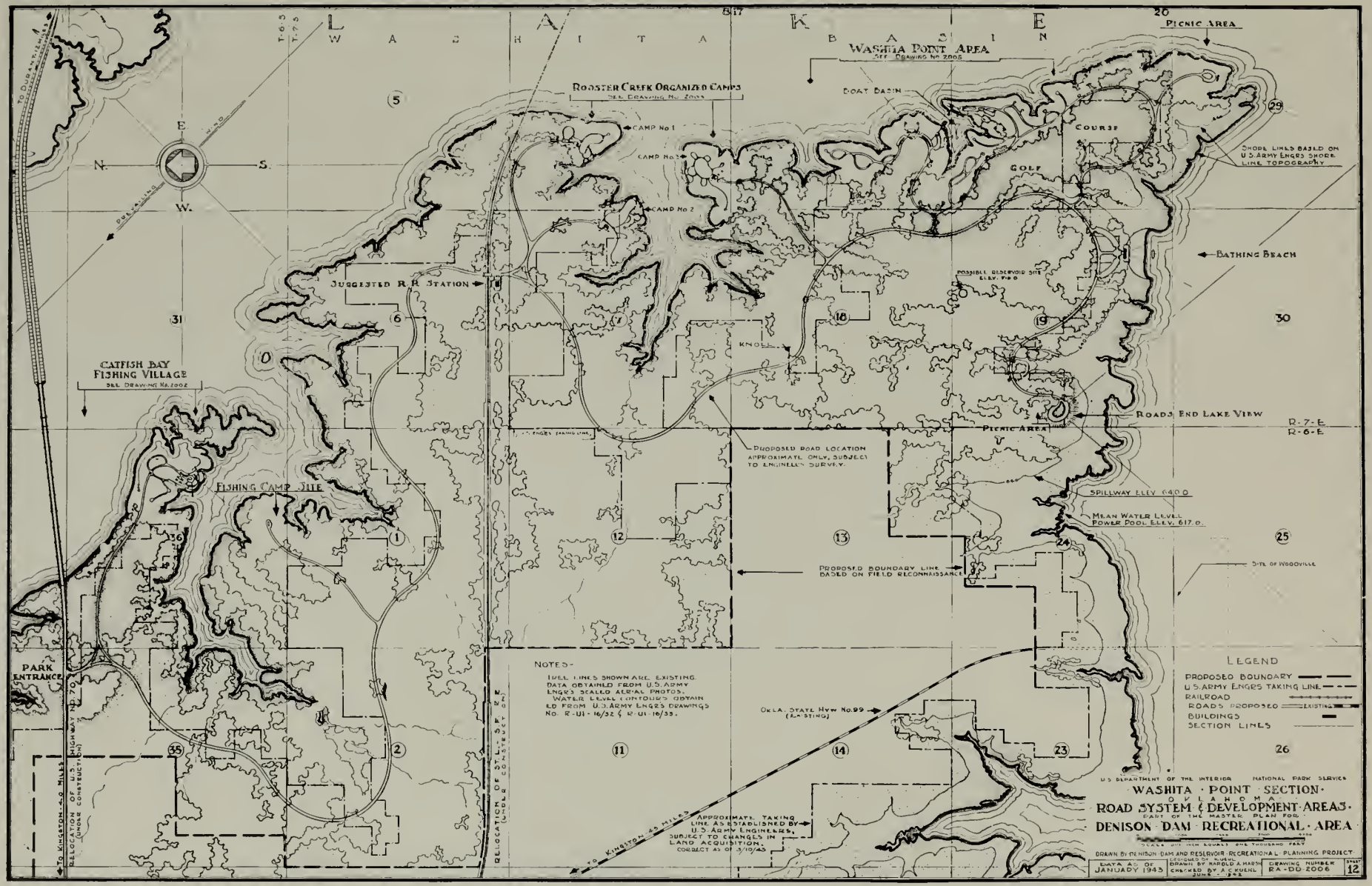
WASHITA POINT AREA
ROOSTER CREEK ORGANIZED CAMPS
BOAT BASIN
PICNIC AREA
GOLF COURSE
BATHING BEACH
CAMP No 1
CAMP No 3
CAMP No 2
SUGGESTED R.R. STATION
CATFISH BAY FISHING VILLAGE
FISHING CAMP SITE
KNOLL
ROADS END LAKE VIEW
PROPOSED ROAD LOCATION APPROXIMATE ONLY, SUBJECT TO ENGINEERS SURVEY.
SPILLWAY ELEV 640.0
MEAN WATER LEVEL POWER POOL ELEV. 617.0
PROPOSED BOUNDARY LINE BASED ON FIELD RECONNAISSANCE
SITE OF WOODVILLE
PARK ENTRANCE
OKLA. STATE HWY No.99 (EXISTING)
TO KINGSTON 4.5 MILES
NOTES-
LEGEND
PROPOSED BOUNDARY
U.S. ARMY ENGRS TAKING LINE
RAILROAD
ROADS PROPOSED
EXISTING
BUILDINGS
SECTION LINES
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
WASHITA · POINT · SECTION ·
OKLAHOMA
ROAD SYSTEM & DEVELOPMENT AREAS
PART OF THE MASTER PLAN FOR
DENISON DAM RECREATIONAL AREA
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DRAWING NUMBER RA-DD 2006
SHEET 12

Figure 27.

In designing the water-distribution system, provision must be made for storing sufficient water to meet domestic needs and to provide fire protection commensurate with the value and importance of the installed facilities, and with the anticipated fire hazards. The system also might include provision for supplying water to landing barges, boats, and other floating facilities at the fluctuating shore line. Water lines might be laid down the banks of the reservoir and connected with a flexible hose to accommodate the rising and falling of the water level.

Sewage disposal plants should be located on high ground where the effluent can be disposed by subsurface tile lines, or if soil conditions are not favorable, by trickling filters and chlorination. The plants may use either septic tanks or Imhoff tanks, depending upon the volume of sewage to be handled at each location. Sewage originating at lower elevations near the shore line should be collected in sumps or tanks and pumped up to the plants. This same method is recommended for pumping sewage from floating docks, barges, and large boats into collecting tanks through lines connected with flexible hose. Wastes from toilets on floating cabins and houseboats might be collected by a scavenger boat for pumping into the sewer system.

Garbage and refuse disposal. Incinerators, designed to thoroughly consume wet garbage, are recommended for at least the major development areas. It may prove advisable to transport garbage from certain of the minor areas to a centrally located incinerator in one of the major areas. Adequate containers should be located at all points of visitor concentration and at all docks so that refuse, including bottles and cans, from boats can be picked up in the regular collections and not thrown into the reservoir.

Electric power. Since this is a hydroelectric power project, it is presumed that low-cost power will be made available at the recreational developments for lighting, cooking, heating, and other uses.

Accessibility (fig. 17, p. 57).

Roads.

(1) Preston Bend Section (figs. 16 and 19) is now accessible by paved county roads leading west from Denison to Pottsboro, 6½ miles, and north from Sherman to Pottsboro 12 miles, thence north from Pottsboro 11½ miles over a graveled county road to the proposed development within the section. The distance from Pottsboro north to the south boundary of the section over an existing gravel county road is 6¼ miles, which becomes a portion of the access road from Sherman. The distance from Denison to Preston Bend Area via this route is 18 miles; from Sherman, 23½ miles.

(a) Route 2A—South boundary to Preston Bend Lodge. The primary access to the development site at the head of the peninsula will require construction of a new entrance road 6 miles in length from the south boundary to the terminus at the lodge site. It is recommended that this road be built to park standards with a minimum top width section of 26 feet to shoulder line, and a two-lane 22-foot bituminous surface. The standards for spur roads to important use areas should be the same. Other secondary access roads should be reduced in width corresponding to their lesser anticipated use.

(b) Route 2B—South boundary to Route 1 intersection. The 1-mile section from the intersection of the east-west scenic road to the area boundary should be developed as a freeway with wide right-of-way.

(c) Route 4—Denison to Denison Dam. Relocation of this 4-mile road and construction to park road standards with a minimum right-of-way of 300 feet to discourage commercialization of the roadside is recommended.

(d) Route 1—Denison Dam west to Whitesboro-Madill Road. It is recommended that this route, 20.5 miles in length be developed as a scenic road paralleling the reservoir shore from the spillway crossing west to existing State Highway 91,

The principal concentration of development in the Washita Point Area is centered around the boat basin. Proposed development is similar to that planned for the Preston Bend Peninsula on the Texas side.

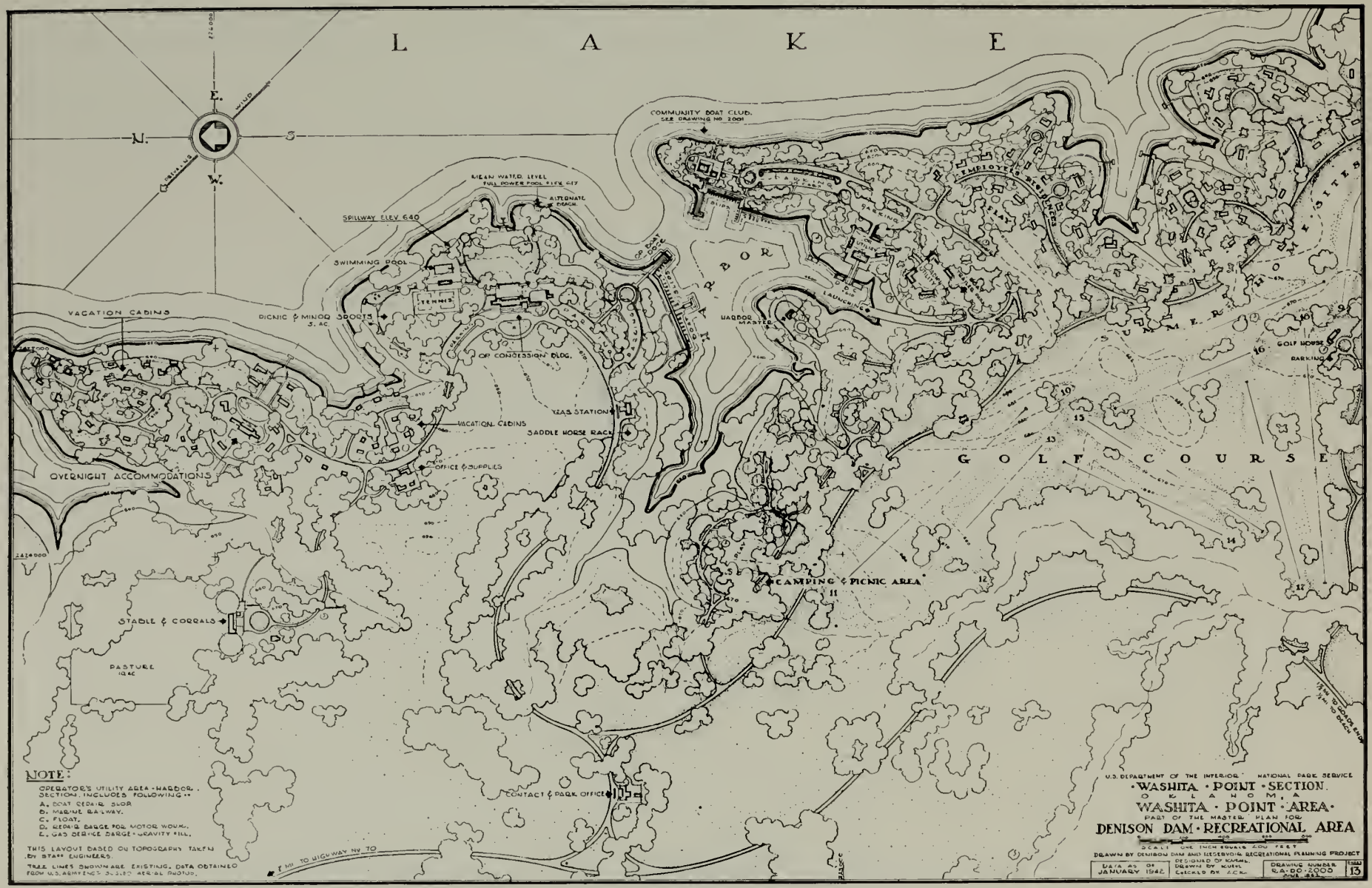
L A K E
COMMUNITY BOAT CLUB.
SEE DRAWING NO 2001
MEAN WATER LEVEL
FULL POWER POOL ELEV 617
ALTERNATE
SPILLWAY ELEV 640
SWIMMING POOL
TENNIS
VACATION CABINS
PICNIC & MINOR SPORTS
3 AC.
OP CONCESSION BLDG.
HARBOR
MASTER
LAUNCHING
EMPLOYEES RESIDENCES
GOLF HOUSE
PARKING
YCAS STATION
VACATION CABINS
SADDLE HORSE RACK
OFFICE & SUPPLIES
OVERNIGHT ACCOMMODATIONS
G O L F C O U R S E
CAMPING & PICNIC AREA
STABLE & CORRALS
PASTURE
10 AC
CONTACT & PARK OFFICE
NOTE:
OPERATOR'S UTILITY AREA - HARBOR SECTION, INCLUDES FOLLOWING:
A. BOAT REPAIR SLIP.
B. MARINE RAILWAY.
C. FLOAT.
D. REPAIR BARGE FOR MOTOR WORK.
E. GAS SERVICE BARGE - GRAVITY FILL.
THIS LAYOUT BASED ON TOPOGRAPHY TAKEN BY STAFF ENGINEERS.
TREE LINES SHOWN ARE EXISTING. DATA OBTAINED FROM U.S. ARMY ENGR. 3-1-1940 AERIAL PHOTOS.
U.S. DEPARTMENT OF THE INTERIOR - NATIONAL PARK SERVICE
WASHITA POINT SECTION
OKLAHOMA
WASHITA POINT AREA
PART OF THE MASTER PLAN FOR
DENISON DAM RECREATIONAL AREA
SCALE ONE INCH EQUALS 400 FEET
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DATA AS OF JANUARY 1942
DESIGNED OF KAMEL
DRAWN BY KOHL
CHECKED BY A.C.K.
DRAWING NUMBER
SA-DD-2000
13

Figure 28.

thence in a westerly direction across Little Mineral Bay to the intersection of the Preston Bend Area road and southwesterly to the Willis Crossing proposed route. If a new east-west State highway and a bridge across Mineral Bay should be constructed as proposed by local citizens, the bridge might serve the proposed scenic road. Until such time as the bridge may be constructed, a ferry crossing might serve. The road should be constructed to park road standards and as a freeway with a minimum right-of-way of 300 feet over lands outside of the boundaries of the Denison Dam Recreational Area.

Section 1A of this proposed road will make Preston Bend Section accessible to south-bound travel over Highway 75 using the cut-off road over the dam from Colbert, Okla. It also will become the approach road from Denison.

Section 1B will serve as an approach to Preston Bend Section for east-bound travel over Highway 82 via Whitesboro, Tex. It also will serve north and south travel using the proposed Whitesboro-Madill Highway.

(c) Route 6—Whitesboro-Madill. It is assumed that future construction of this 31-mile route is possible, since funds for a major reservoir crossing known as Willis Crossing have been allotted by the Federal Government and preliminary surveys of the route have been made by Texas and Oklahoma. It has been indicated that construction will be deferred until after the war.

(2) Washita Point Section (figs. 16 and 27). The principal development site is now accessible by way of unimproved county section line roads. Upon completion of U. S. Highway 70 bridge crossing and the approach sections to Durant, Okla., on the east and to Kingston, Okla., on the west, the section will be accessible by standard paved roads.

(a) Route 5—Highway 70 to Washita Point Area. Access will require construction of a new road 10 miles in length from the intersection with U. S. Highway 70 on the north, to the terminal loop on the south. The standards for this road and the secondary roads within the development areas should be similar to those recommended for the Preston Bend Area.

(b) Route 7—Kingston to Durant. Relocation of portions of Highway 70 and construction of the reservoir crossing is now under way. The proposed entrance road to Washita Point Section intersects the highway at a point west of the bridge crossing.

(c) Route 8A and 8B—Highway 77 to Kingston, Okla. The west approach from Highway 77 near Lake Murray to the connection with Highway 70 at Kingston, a distance of 25 miles, provides access from the west to the Washita Point Section and to the secondary Hauani Creek Area. The connecting section proposed between Highway 77 near Overbrook to State Highway 199 in the vicinity of Enville (8A) will provide connection to Lake Murray State Park by development of a south approach road to the park. Three bridge crossings over Boggy, Hauani, and Wilson Creeks are now under construction. Improvement of the route to State highway standards is recommended.

(3) Secondary area approach roads. Spur approach roads to the outlying secondary areas are indicated on figure 16. Construction of the relocation section of State Highway 99 near Tishomingo is now under way. This improvement will provide access to the Chickasaw Area.

Airfields. There are four established airfields within a 25-mile radius of the two principal development sections—Preston Bend and Washita Point. The Eaker Airport at Durant, Okla., is 20 miles by road from the Washita Point Section. Gray Municipal Airport, east of Denison, is 17 miles from the Preston Bend Section, and Sherman Municipal Airport is 24 miles away. Perrin Field, a United

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The perspective sketch of the Washita Point Area shows the relationship of the proposed recreational facilities. The principal activities center around the lodge or concession building shown in the central foreground to the right of the boat harbor. The vacation cabins and hotel-type accommodations are confined to the long narrow point at the extreme right. The community boat club center and the summer home sites are indicated on the shore to the left of the boat harbor. The head of the Preston Bend Peninsula is shown in the background.


U.S. DEPARTMENT OF THE INTERIOR · NATIONAL PARK SERVICE
WASHITA POINT AREA
OKLAHOMA
PART OF THE MASTER PLAN
DENISON DAM RECREATIONAL AREA
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
BASIC DATA
DRAWING NO. DB-200
DRAWN BY C.J. DOTY
SEPT 1947
DRAWING NUMBER
NO. DD-2013
SHEET
14

Figure 29.

States Army Air Corps training field, is 10 miles north of Sherman and 13½ miles south of Preston Bend on the main Sherman access road. If future demands require a closer relationship of airfields to the principal recreational sections, there are suitable lands in close proximity.

Railroads. Rail points from which the Preston Bend Section is readily accessible are located at Denison and Sherman. Denison is served by the (1) Missouri, Kansas & Texas Railroad (Katy), (2) Kansas, Oklahoma & Gulf Railroad, (3) Texas Electric Railway, (4) St. Louis-San Francisco Railroad (Frisco), and (5) Texas & New Orleans Railroad. Sherman is served by the (1) Texas & New Orleans Railroad, (2) Missouri, Kansas & Texas Railroad, (3) Texas & Pacific Railroad, (4) St. Louis-San Francisco Railroad, and (5) Texas Electric Railway.

The St. Louis-San Francisco Railroad (Frisco) bisects the Washita Point Section and the reservoir south of U. S. Highway 70. The nearest rail points west of Washita Point Section are Kingston and Madill, 12 and 21 miles distant, respectively. Both the Frisco and Katy lines pass through Durant, 23 miles east of the section. Since the Frisco line passes through the area and within 3½ miles of the Washita Point Area, a railroad station within the boundaries of the area is suggested (fig. 27).

Transportation from rail points and airfields to the development areas is a service which should be provided either by the concessioner or by a franchised bus system.

Wildlife management. The following discussion of a wildlife-management program is based for the most part upon the findings of the preliminary investigations made by representatives of the Fish and Wildlife Service in cooperation with the National Park Service. Work on some phases of the program should be undertaken as soon as funds become available, and further study and planning should be continued as development of the project progresses.

The act of 1934, as revised (48 Stat. 401, sec. 3) authorizes the Fish and Wildlife Service to make such uses of waters impounded by the Federal Government for fish-culture stations and migratory resting and nesting areas as are not inconsistent with the primary uses of the waters and/or the constitutional rights of the States.

Fish. It is urgent that recognition be given to the desirability of early establishment of a fish-management program.

Analyses of the water of streams which will flow into the impoundment and study of other data on physical conditions which will affect the biological productivity of the impounded waters indicate that the waters of the reservoir will be definitely alkaline, quite hard, and will carry above-average quantities of dissolved salts. During the summer months the water temperature of the eastern portion of the reservoir will be relatively high, and the dissolved oxygen content relatively low. Hazards to fish life will be: Stagnation at the lower end of the impoundment with attendant low oxygen content due to high temperature and the organic loads carried by the waters of the Washita; pollution possibilities from oil wells; saline density currents from the Red River; silt density currents and silt clouds due to fine suspension; and the fluctuating water-surface elevation.

It appears that the biological productivity of the impounded waters will be somewhat less than that of an impoundment such as the TVA Wheeler Reservoir, where conditions are very favorable to fish production. The Denison Reservoir, because of its size, however, will support a great deal of angling, with even a moderate production of game and food fish. These waters should support large

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The community boat club and docks for the Washita Point Area are located on the narrow point of land bordering the east shore of the boat basin. The public club building will serve as a gathering place for boating enthusiasts. It provides a large lounge room overlooking the reservoir and harbor, space for the sale of refreshments, a locker room, and public rest rooms.

The boat harbor area indicated in the foreground of the sketch provides anchorage facilities for larger boats.

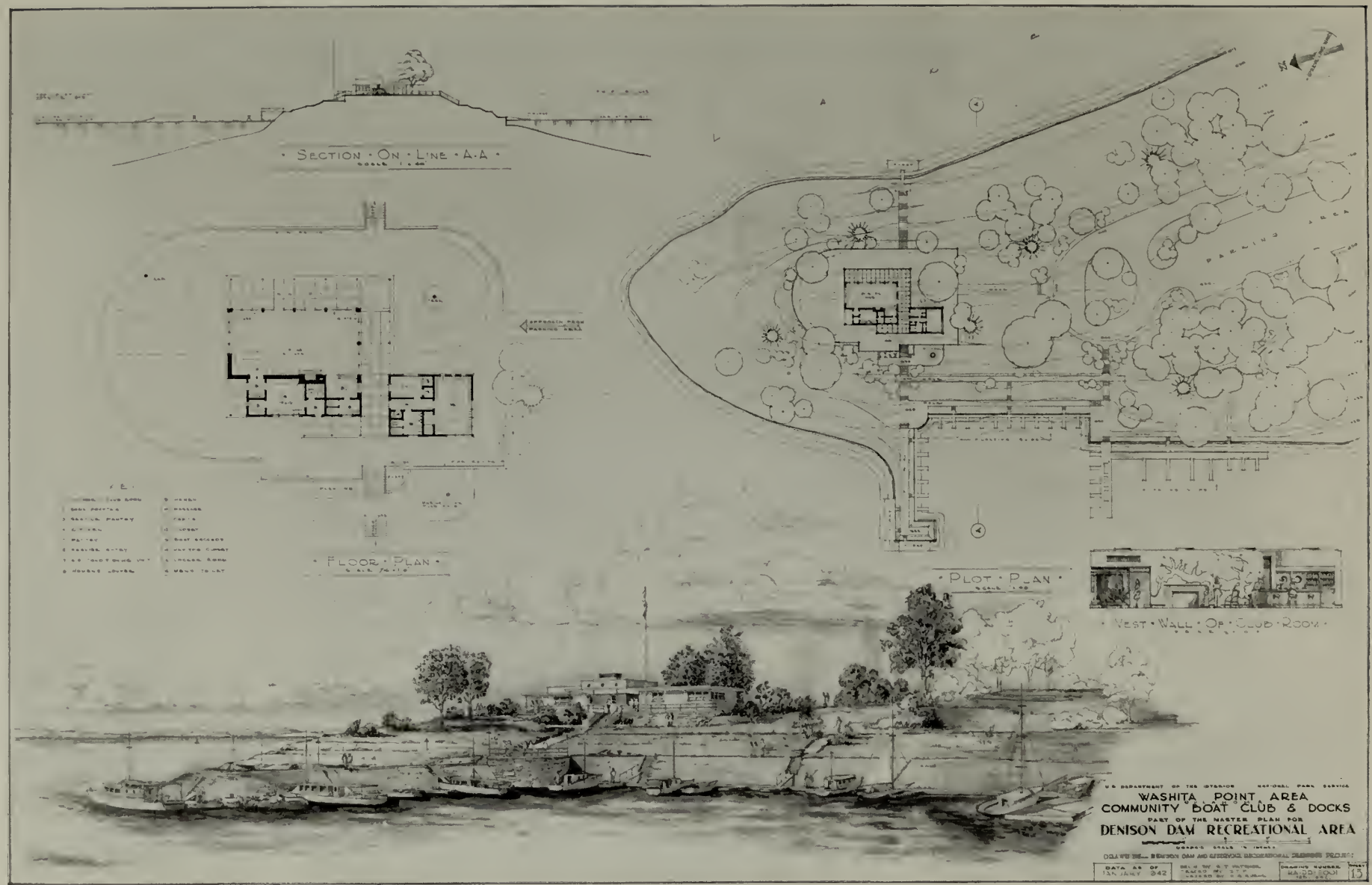
SECTION · ON · LINE · A-A ·
FLOOR · PLAN ·
PLOT · PLAN ·
WEST · WALL · OF · CLUB · ROOM ·
WASHITA POINT AREA
COMMUNITY BOAT CLUB & DOCKS
PART OF THE MASTER PLAN FOR
DENISON DAM RECREATIONAL AREA

Figure 30.

numbers of certain warm-water fishes, particularly crappie, white bass, black bass, carp, and catfish. The blue-channel catfish is very desirable and should thrive here.

In the normal course of the biological development and adjustment of newly impounded water areas, fish production rises rapidly during the first few years of impoundment, reaches maximum production in 4 or 5 years, and then gradually declines to a lower stabilized level. Such a cycle probably will be followed in the Denison impoundment.

Whether artificial stocking would be effective in raising total production or in balancing the fish populations in the reservoir after the period of final stabilization has been reached is a matter to be considered and investigated. Solution of the problem of producing small fish for artificial stocking of the reservoir, if stocking should appear desirable, is not difficult as an ample supply of such fish could be produced by expansion of existing Federal fish hatcheries at Tishomingo, Okla., or Fort Worth, Tex.

Consideration might be given to establishment of a complete and modern fish-cultural unit on the Denison Dam Recreational Area, however, as a part of the wildlife conservation and education program for visitors. Such a unit might include administrative headquarters for conducting the wildlife-management program, a small aquarium for exhibition of the various species of fish of the region, a laboratory for research, and rearing ponds.

An important measure designed to maintain the maximum yield for sport fishing doubtless will be the control of populations of rough fish, such as carp, buffalo, and suckers, to maintain a favorable balance for the production of the more highly prized game fish. In this effort, a reasonably controlled commercial fishery for rough fish would be most effective and commercial fishing operations for this purpose should be considered.

It is probable that receding waters resulting from draw-downs in operation for flood control and power generation will leave fish stranded in shallow ponds along some portions of the shorelands, and in the upper reaches of the reservoir. Salvage and other measures to reduce loss of fish should be a part of the management program.

Pollution from oil fields or others sources can and should be prevented.

Improved fishing conditions may be expected for a considerable distance below the dam on the Red River. Such downstream improvement should result from reduced flood conditions and a steadier flow during periods of drought. An ample supply of fish in the reservoir also may be a factor in improvement upstream of fishing conditions in the Red and Washita Rivers for a considerable distance above the upper reaches of the reservoir.

Advisability of applying uniform fishing and hunting regulations over the entire reservoir area is discussed under "Legislation," on page 97.

Mammals. When the partially wooded and thicket-covered bottomlands of the Red and Washita Rivers are converted into a large deep reservoir, the wildlife of a wide area will face problems of survival and readjustment. Except for the designated recreational development areas, Federal lands will form a relatively narrow buffer strip around the reservoir. This buffer strip will be about half wooded and half open. Since most of the land adjoining the Federal boundary will be used for agriculture, there will be a tendency toward concentration of wildlife on the Federal lands. Protection will be offered to rabbits, squirrels, and other small fur bearers, as well as to quail, doves, and other birds. As a part of the wildlife-manage-

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Catfish Bay Fishing Village is readily accessible because of its close relationship to U. S. Highway 70. The development occupies a spectacular site on the long narrow point at the mouth of Catfish Bay and is intended mainly for the use of fishermen and their families. Facilities are indicated for boating, fishing, swimming, picnicking, and camping. A limited number of barracks-type rooms to accommodate fishing parties is suggested. The centrally located concession building should contain eating facilities, space for the sale of supplies, rest rooms, and limited bathhouse facilities.


TO DURANT
70 KINGSTON 43 mi US HIGHWAY NO 70 (UNDER CONSTRUCTION)
ENTRANCE CONTACT STATION
WASHITA POINT SECTION
ADMINISTRATION AREA
CAMPGROUND AREA
CAMPGROUND EXTENSION
LAUNCHING RAMP
BOAT SLIPS
PARKING
BOATING
SWIMMING
CONCESSION
L A K E
C A T F I S H B A Y
N
W
E
S
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
WASHITA · POINT · SECTION
CATFISH · BAY · FISHING · VILLAGE
PART OF THE MASTER PLAN FOR
DENISON · DAM · RECREATIONAL · AREA
SCALE ONE INCH EQUALS TWO HUNDRED FEET
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DATA AS OF JANUARY 1942
DRAWING NUMBER RA-DD-2002
SHEET 16

Figure 31.

ment program, some of the open areas in the buffer strip might be planted to grain crops for the benefit of waterfowl and other birds. Reintroduction of deer and wild turkey is not considered advisable because of the natural conflict with agriculture on the adjoining, privately-owned lands. Hunting of upland game on Federal lands should be prohibited.

Waterfowl. The reservoir will very likely alter the complexion of bird life in the vicinity. A variety of water birds not ordinarily seen in this inland section will be attracted. Waterfowl probably will be the oustanding class of wildlife. Migratory waterfowl nesting in the area will be negligible. If conditions are favorable, the area will be used principally as a resting ground in migration, and to some extent as a wintering area. Whether the area will attract and hold large numbers of ducks will depend upon the food supply, which in turn will depend upon water levels and use of adjoining lands. Survival and increase of waterfowl food plants, either by natural growth or by plantings, will depend on the range of water levels and the length of time and the season during which constant level is maintained.

The value of Denison Reservoir for waterfowl will depend upon the amount of fluctuation in the water level, the length of time the water remains at a particular level, and at what season the reservoir level is rising or falling. Many flood control and power reservoirs are not good waterfowl areas because fluctuations in water level of 5 to 50 feet in growing season usually makes them "biological deserts."

If the level does not fluctuate more than 2 or possibly 3 feet in a growing season, the Denison Reservoir should produce a good supply of aquatics of value to waterfowl. The data at hand, however, lead to the conclusion that in most years there will be a greater fluctuation. If not, the reservoir should produce a good growth of plants of the same species as were noted at Lake Murray, Okla. These species are: Long-leaf pondweed (*Potamogeton americanus*), southern naiad (*Najas guadalupensis*), muskgrass (*Chara sp.*), water milfoil (*Myriophyllum sp.*), marsh smartweed (*Polygonum muhlenbergii*), and water primrose (*Jussiaea diffusa*). All of these are fair to excellent waterfowl foods. Other aquatics, noted at local lakes, which might become established are duck potatoes, water lilies (*Castalia*), hardstem bulrush, and such smartweeds as *Polygonum lapathifolium, P. pensylvanicum, P. hydropiper, P. hydropiperoides,* and *P. persicaria.*

There will be practically no submerged aquatics for waterfowl food if draw-downs of more than 4 feet, or of 2 to 3 feet if the water is muddy, are regularly made. In general, it may be stated that if the reservoir level rises in the growing season, there will be very little production of submerged or emergent food plants in the water. If there is a declining level for 2 or 3 months in the spring or early summer, with a rather stable or only slight increase in level after July, a good production of terrestrial or emergent plants, and a negligible growth of submerged plants, can be expected along the shore line. Dominant species would be smartweed and wild millet, with panic grasses (*Panicum* spp.) and paspalum or Dallis grasses (*Paspalum* spp.) at the upper limits of water level. At times of high water, when bays are flooded up to the oak woods, a supply of acorns should be available for mallards and other ducks. After impoundment the area should be studied to determine desirability of planting aquatic and other food crops.

The upper reaches of the bays will be shallow, and the gradient of the land will range from 0.5 percent to 5 percent. The upper part of the main Washita arm will be quite shallow. For example, the basin southeast of Tishomingo, 2½ to 3 miles wide, will have an average depth of 8 feet when the surface is at elevation 617. A draw-down of 5 feet will expose a 3,000-foot strip of shore on the east side of this basin. Draw-downs of a few feet will expose large areas of land at the upper ends of the various bays. An early draw-down probably will result in mud flats covered with cockleburs (*Xan-*

Organized group camps are located in the densely wooded areas adjacent to the mouth of Rooster Creek Bay. The sites are secluded from the principal recreational centers. Cabin units and facilities for swimming, boating, and minor sports are intended for the use of organized groups on a lease basis.

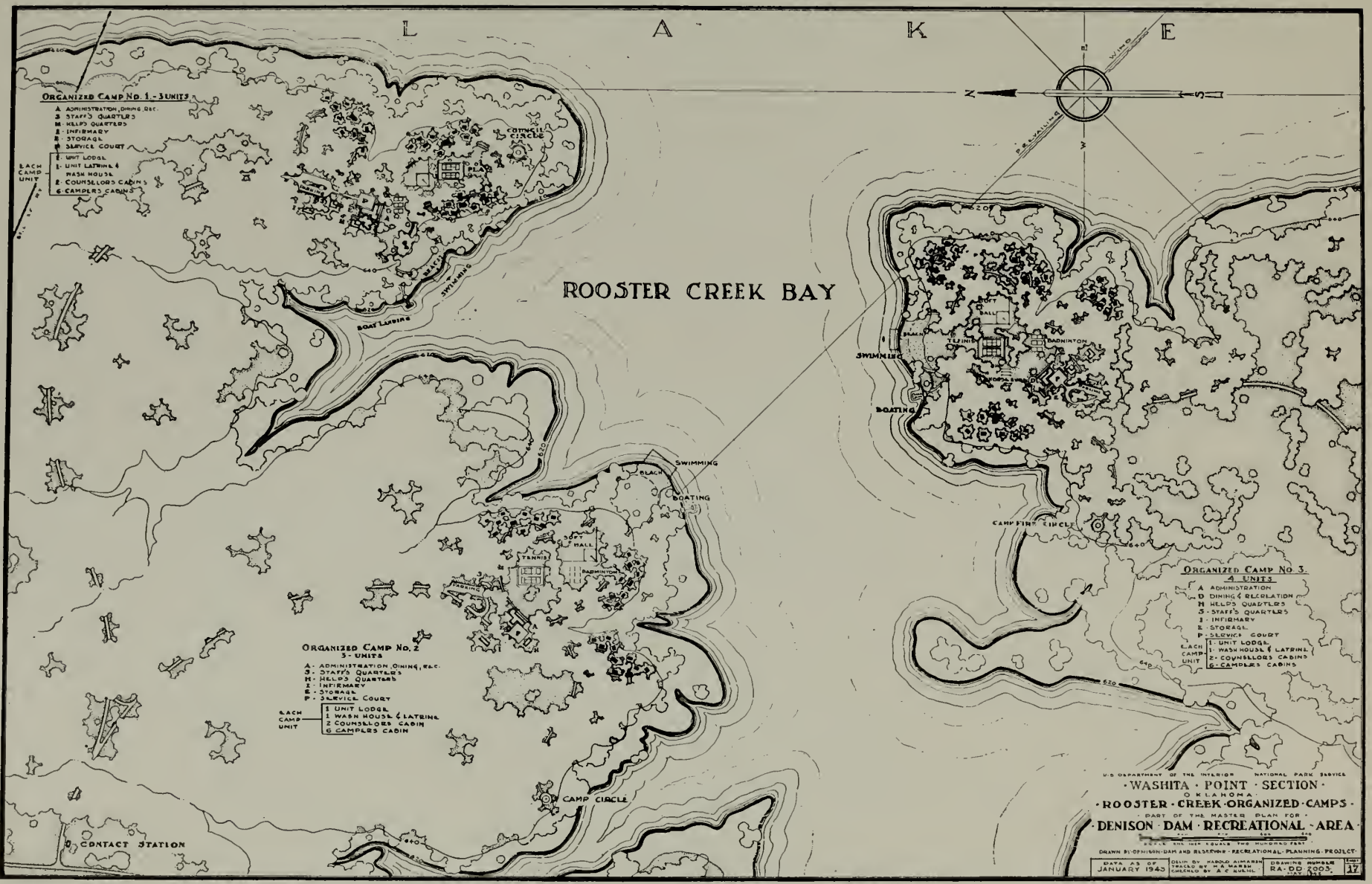
L A K E
ROOSTER CREEK BAY
ORGANIZED CAMP NO. 1. - 3 UNITS
A ADMINISTRATION, DINING, REC.
S STAFF'S QUARTERS
H HELPS QUARTERS
I INFIRMARY
E STORAGE
P SERVICE COURT
EACH CAMP UNIT
1 UNIT LODGE
1 UNIT LATRINE & WASH HOUSE
2 COUNSELLORS CABINS
6 CAMPERS CABINS
COUNCIL CIRCLE
SWIMMING
BOAT LANDING
ORGANIZED CAMP NO. 2
3 UNITS
A - ADMINISTRATION, DINING, REC.
S - STAFF'S QUARTERS
H - HELPS QUARTERS
I - INFIRMARY
E - STORAGE
P - SERVICE COURT
EACH CAMP UNIT
1 UNIT LODGE
1 WASH HOUSE & LATRINE
2 COUNSELLORS CABIN
6 CAMPERS CABIN
HALL
TENNIS
BADMINTON
BEACH
SWIMMING
BOATING
CAMP CIRCLE
CONTACT STATION
ORGANIZED CAMP NO. 3
4 UNITS
A ADMINISTRATION
D DINING & RECREATION
H HELPS QUARTERS
S STAFF'S QUARTERS
I INFIRMARY
E STORAGE
P SERVICE COURT
EACH CAMP UNIT
1 UNIT LODGE
1 WASH HOUSE & LATRINE
2 COUNSELLORS CABINS
6 CAMPERS CABINS
CAMP FIRE CIRCLE
BALL
TRAINING
BADMINTON
SWIMMING
BOATING
U.S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE
WASHITA · POINT · SECTION
OKLAHOMA
ROOSTER · CREEK · ORGANIZED · CAMPS
PART OF THE MASTER PLAN FOR
DENISON · DAM · RECREATIONAL · AREA
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
DATA AS OF JANUARY 1943
DRAWING NUMBER RA-DD 2005
SHEET 17

Figure 32.

thium), and possibly lizardtail (*Saururus*) and other pest species.

Possible pollution of reservoir waters from oil fields presents a very definite hazard to water birds and aquatic flora and fauna. It is repeated that such pollution can and should be prevented.

Stabilized ponds. In planning for waterfowl development on reservoirs of fluctuating level, it is customary to consider the practicability of stabilizing levels. If water levels can be satisfactorily regulated, consistent with the main uses of Denison Reservoir, no stabilized ponds will be needed. If not, it will be desirable to stabilize levels by diking shallow arms of the lake. The ponds thus formed would be valuable for development of waterfowl food plants. Carp, now present in streams, will probably be common in the reservoir but could be excluded from the ponds. Carp are undesirable because they roil the waters, and also uproot submerged aquatics, causing their destruction and inhibiting growth through lack of sunlight.

The upper reaches of some of the draws which have a flowing water supply can be diked and developed as waterfowl feeding areas with only a slight reduction of the storage capacity of the reservoir. In the establishment of stabilized ponds of more than a few acres, however, certain unfavorable aspects must be considered, such as the lack of a continuous water supply, the possibility of excessive siltation from agricultural lands, and the fact that dam site locations on large watersheds would require expensive dams and spillways.

The only tributary streams with continuous flow from springs appear to be Big Mineral, Hickory, Glasses, and Newberry Creeks. Dams would be desirable at a number of sites on streams carrying an excessive head of water during flash floods. There are a number of locations along the Oklahoma shore line and in the Big Mineral Basin where low dams with spillway levels ranging between elevations 620 and 640 would impound 5 to 15 acres at water not exceeding 10 feet in depth. Possibilities for small dikes for the purpose of stabilizing or controlling levels should be investigated at a later date by engineers and biologists with reference to impoundment costs in relation to such benefits as the acreage of shallow water impounded, the length of shore line stabilized, and the gradient of pond slopes.

Waterfowl refuge. Because of the scarcity of water areas in this region, there is a need for public areas where ducks and geese may be hunted. The bottomlands of the Red and Washita Rivers in this vicinity have served for many years as waterfowl hunting grounds and it is believed that there will be considerable demand for hunting privileges on at least some parts of the new reservoir. There seems to be no good reason why such hunting, if properly regulated, should not be permitted in certain parts of the area.

Certain sections of the shore line and waters should be zoned as waterfowl refuges, with some variation from year to year in location and size depending on food resources, waterfowl concentrations, and need for protecting certain species or populations. Just what areas and how much of the project should be included in a waterfowl refuge cannot be determined at this time. The question will require study during and after impoundment. It is evident that at least the areas set aside for recreational development, such as the Washita Point and Preston Bend Sections and the secondary areas, as well as any small ponds created for waterfowl feeding areas, should be closed to all kinds of hunting. As a matter of public safety, shooting should not be allowed in the vicinity of the dam or at other places where persons are likely to congregate. Use of rifles should not be permitted on the area.

Upland game refuge. Consideration has been given to the proposal to establish a large refuge for upland game adjacent to the reservoir project, but at this time purchase of large blocks of agricultural

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The locations for the development of secondary recreational areas are indicated on the key map in the center of the sheet. The facilities suggested for each site are intended to serve primarily local needs within restricted areas, and they provide for swimming, fishing, boating, and picnicking. Vacation cabins are indicated on the plans for the Willis Crossing Area and the Negro Area.

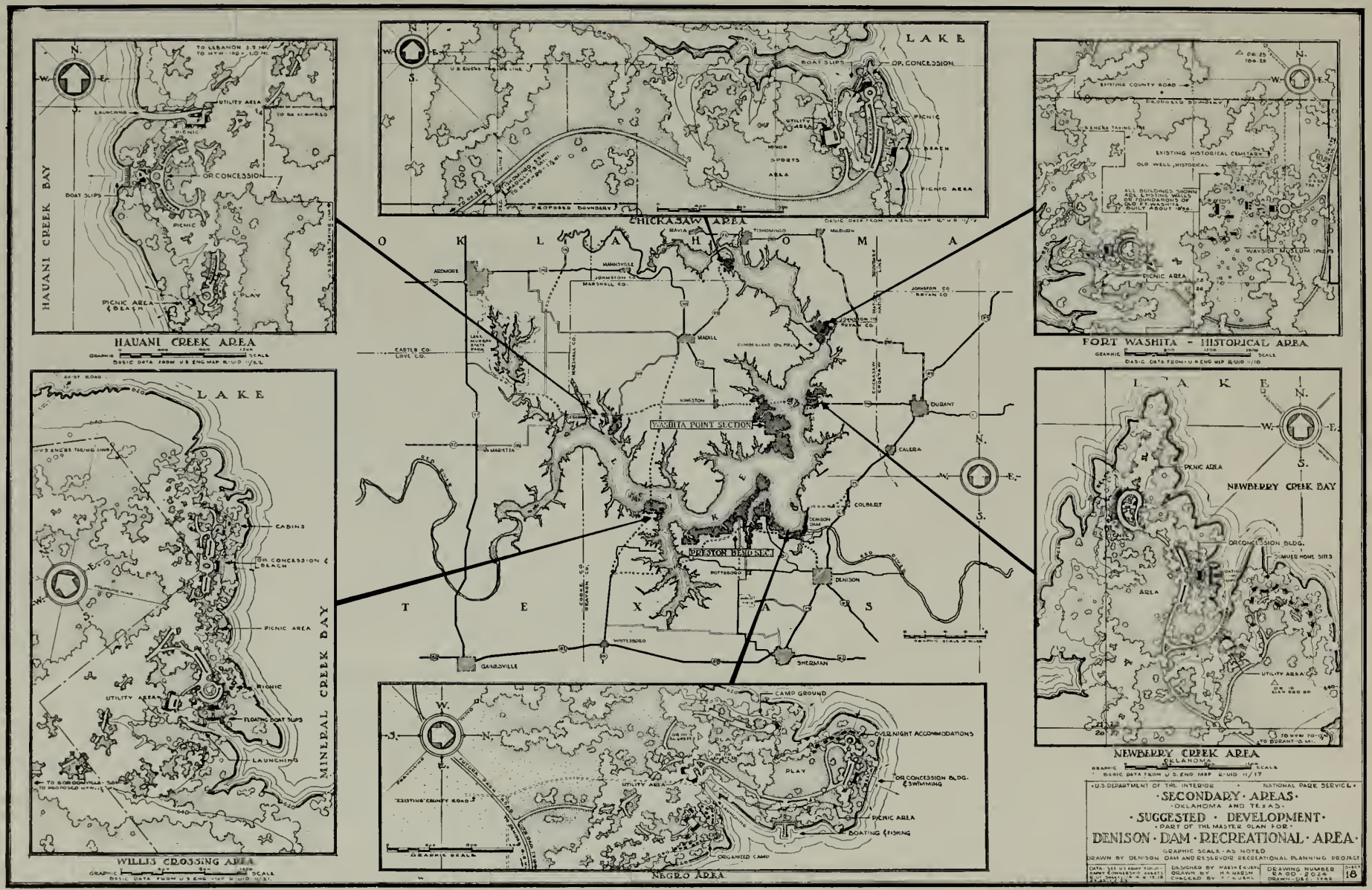
HAUANI CREEK AREA
HAUANI CREEK BAY
CHICKASAW AREA
FORT WASHITA - HISTORICAL AREA
WILLIS CROSSING AREA
MINERAL CREEK BAY
NEWBERRY CREEK AREA
NEWBERRY CREEK BAY
NEGRO AREA
WASHITA POINT SECTION
PRESTON BEND SEC.
DENISON DAM
OKLAHOMA
TEXAS
SECONDARY · AREAS ·
OKLAHOMA AND TEXAS
SUGGESTED · DEVELOPMENT
PART OF THE MASTER PLAN FOR
DENISON · DAM · RECREATIONAL · AREA
GRAPHIC SCALE AS NOTED
DRAWN BY DENISON DAM AND RESERVOIR RECREATIONAL PLANNING PROJECT
U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
DRAWING NUMBER
SHEET
18

Figure 33.

land solely for this purpose does not seem warranted. Any plans for upland game management on a broad scale should be included in long-range planning for the region, but not apart from it.

Wildlife sanctuary. It would be desirable to declare the entire Denison Dam Recreational Area a sanctuary for wildlife under uniform laws and regulations, the only exception being hunting of ducks and geese on certain parts of the reservoir as previously mentioned. This would afford much-needed protection to birds and mammals, including quail, dove, squirrel, and fur bearers. The public would have an opportunity to see certain species of mammals which have declined in numbers due to hunting and trapping. Such a management program would compensate to some degree for destruction of the river bottomland wildlife habitats by creation of the reservoir.

The visitor who thinks of wildlife in terms of big game may be disappointed in the Denison Area. However, most visitors should enjoy seeing ducks and geese in flight, a group of egrets hunting frogs in a bay, a flock of pelicans driving a school of fish, or even a squirrel scolding from a tree. The most impressive water-bird displays will occur in spring and autumn rather than in summer, the season of greatest recreational use. Under protection, many species of wildlife of the Denison Area should become accustomed to man and constitute a major attraction for visitors.

Mosquito control. Coppice growth in certain shoreline and shallow-water areas will create a problem because the sprouts will likely form a dense growth making ideal breeding places for mosquitoes, including the malaria mosquito (*Anopheles quadrimaculatus*). On Tennessee Valley Authority reservoirs, removal of coppice is a perpetual maintenance problem, and large sums have been spent in controlling this objectionable growth. Biological methods of mosquito control should be practiced whenever feasible.

Interpretive program. In addition to public desire for information concerning the dam, powerhouse, flood-control measures, and recreational developments, it is likely that visitors will wish to know more about the history of the region and its natural features. A demand for a naturalist sevice could be met through the media of exhibits, lectures, and field trips aimed to give visitors a maximum understanding and appreciation of these features. Mounted specimens of water birds present in the area might be exhibited for identification purposes. The story of bird migration might be presented through a discussion of waterfowl flyways. The Central Flyway could be featured with maps, diagrams, and other graphic means showing the route and the nesting and wintering areas of waterfowl which frequent the reservoir. The possibilities for trailside exhibits and self-guiding nature trails in the Preston Bend and Washita Point Sections should be explored to determine the suitability of these areas for this type of interpretive treatment.

Historic sites. The cultural and scientific resources of the area are sufficiently distinctive and important to justify the establishment of a museum group for orientation and interpretive purposes, in addition to any facilities that the Army Engineers or other agency may provide at the dam for explanation of the flood control and power features of the project. The suggested location for the museum is

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The suggestions for floating facilities are intended to serve as a guide for the style and type of construction. The floating cabin, boat slip floats, and boat shelters would serve as an added convenience to boat owners, and are adaptable for the use of private individuals as well as for public use in the development areas. The boat slip floats are designed in two unit sizes so that they may be assembled to accommodate boats of varying sizes.

The concession barge is for use in the principal development area marinas to facilitate excursion boat and fishing operations. The repair barge is intended to serve as a floating workshop, equipped with traveling crane, to facilitate removal and repair of motors and superstructure work, and would be located in the vicinity of the service areas.

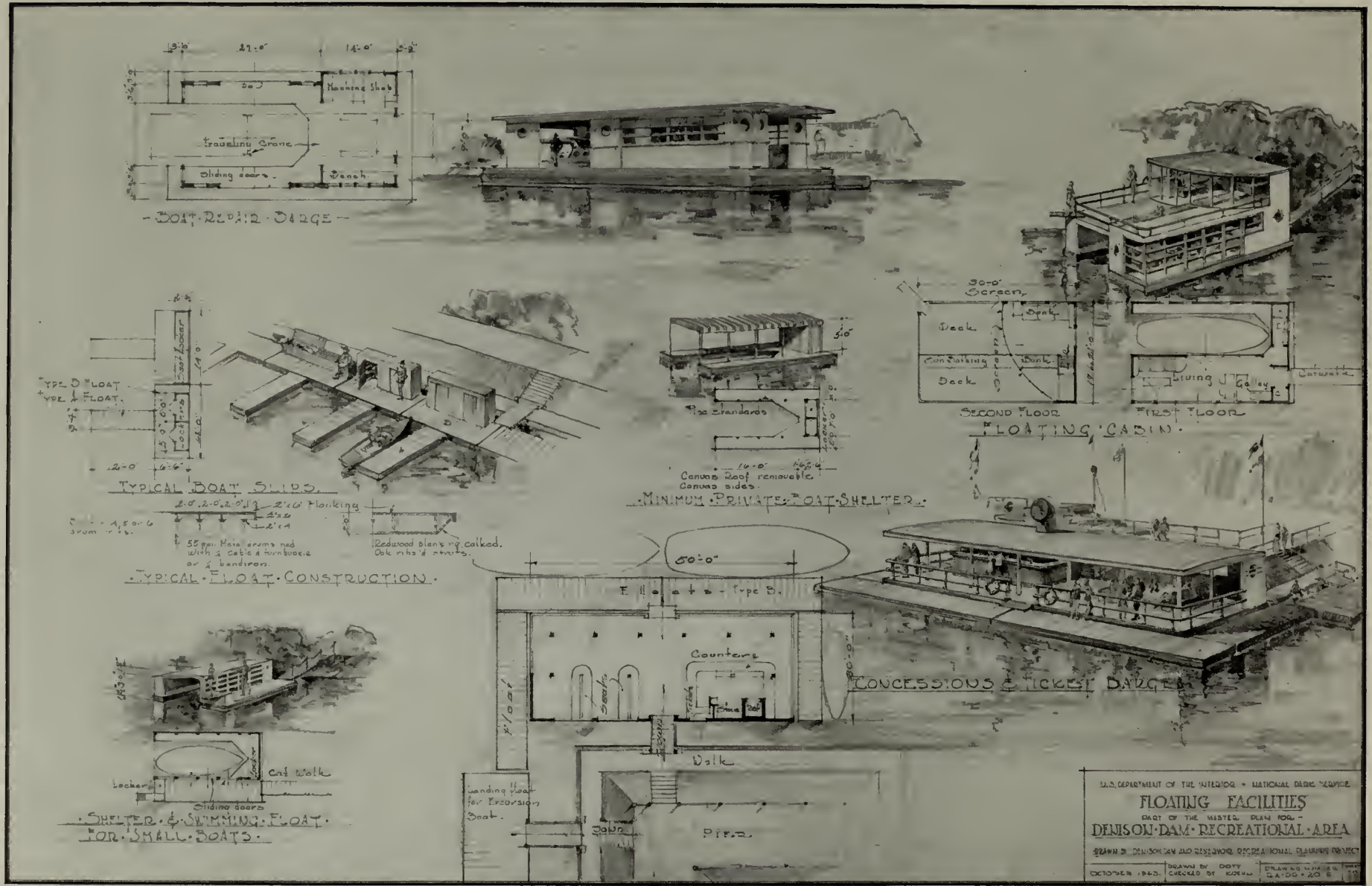
Boat Repair Barge
Traveling Crane
Sliding doors
Bench
Typical Boat Slips
Typical Float Construction
Minimum Private Float Shelter
Second Floor
First Floor
Floating Cabin
Concessions & Ticket Barge
Shelter & Swimming Float for Small Boats
Locker
Cat walk
Sliding doors
Counters
Walk
Pier
U.S. Department of the Interior • National Park Service
Floating Facilities
Dillon Dam Recreational Area

Figure 34.

on the high ground which forms the neck of the Preston Bend Peninsula, as indicated in figure 19, page 61. This location is near the concentration of historical sites in the vicinity of the old town of Preston, Tex., most of which will be inundated, and is well situated in relation to proposed recreational developments on the other parts of the peninsula. While no attempt has been made to discover the exact location of the old Marcy Trail and old Texas Road in this immediate vicinity, it is believed that one or more of the old roads passed the proposed site for the museum group as there are visible indications of them in the area between Coffee's Crossing and the nearest high ground, and also along the ridge which will form the neck of the peninsula. The museum should form the center around which the program of interpretation of cultural and scientific features should be developed. An interpretive program, similar to the type conducted in the national parks, is recommended.

Preston. Considerable salvaged material that might constitute a valuable contribution to the museum group might be obtained from the historic structures at Preston which have been razed in preparation for impoundment of reservoir waters. Trained historians should check the old road locations. Text markers might be erected at appropriate places.

Butterfield Trail Stage Crossing. The Butterfield Route and Colbert's Ferry Site are adjacent to the proposed Denison Dam Recreational Area, and it is believed that any effort to preserve, mark, and publicize these important historical features would add to the interest of the public in the area, and would at the same time be a valuable part of the larger movement to coordinate preservation activities along this famous trail in the States of Missouri, Arkansas, Oklahoma, Texas, New Mexico, Arizona, and California. Acquisition of additional land is not considered necessary.

Camp Washita. Appropriate text markers pertaining to the nearby inundated site of Camp Washita and markers for the old Marcy's Trail are recommended.

Governor Overton's Home. No development work appears to be needed. The grave of Governor Overton in the new Willis Cemetery will be a point of interest for visitors. The story of the part played by Governor Overton and Governor Burney in the history of this section of the old Indian Territory should be included in the interpretive program offered by the management of the Denison Dam Recreational Area.

Tishomingo. There appears to be no need for the Federal Government to undertake any work involving restoration or preservation in the town of Tishomingo. Cooperation with the town and with persons and agencies interested in study and interpretation of the local historic features is recommended. Marker texts concerning historic events of the locality might be appropriately located in the town or in the proposed Chickasaw Area, discussed on page 13.

Scientific sites. Certain archeological sites in the reservoir basin have been recommended for excavation in order that valuable archeological material might be salvaged before the sites are inundated (ch. II, pp. 24–28). Additional investigation and excavation should be carried out over the entire area, and the story should be presented to the visiting public. It has been shown that the region around the reservoir offers archeological materials which are significant, not only for the immediate area, but also in connection with archeological research in the Southwest, the Plains, and the South-

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Three suggestions for vacation cabins adaptable for private ownership or for the concessioner's rental cabin areas in the principal developments are presented in plan and sketch elevation as a guide for architectural design and construction. Grade "A" cabins provide sleeping accommodations for four persons, kitchen, bath, and car port facilities. Grade "B" cabins offer sleeping accommodations for two or three persons, and kitchen and bath.

Hotel-type rooms without housekeeping facilities should be provided in two-story overnight lodges in the principal development areas.

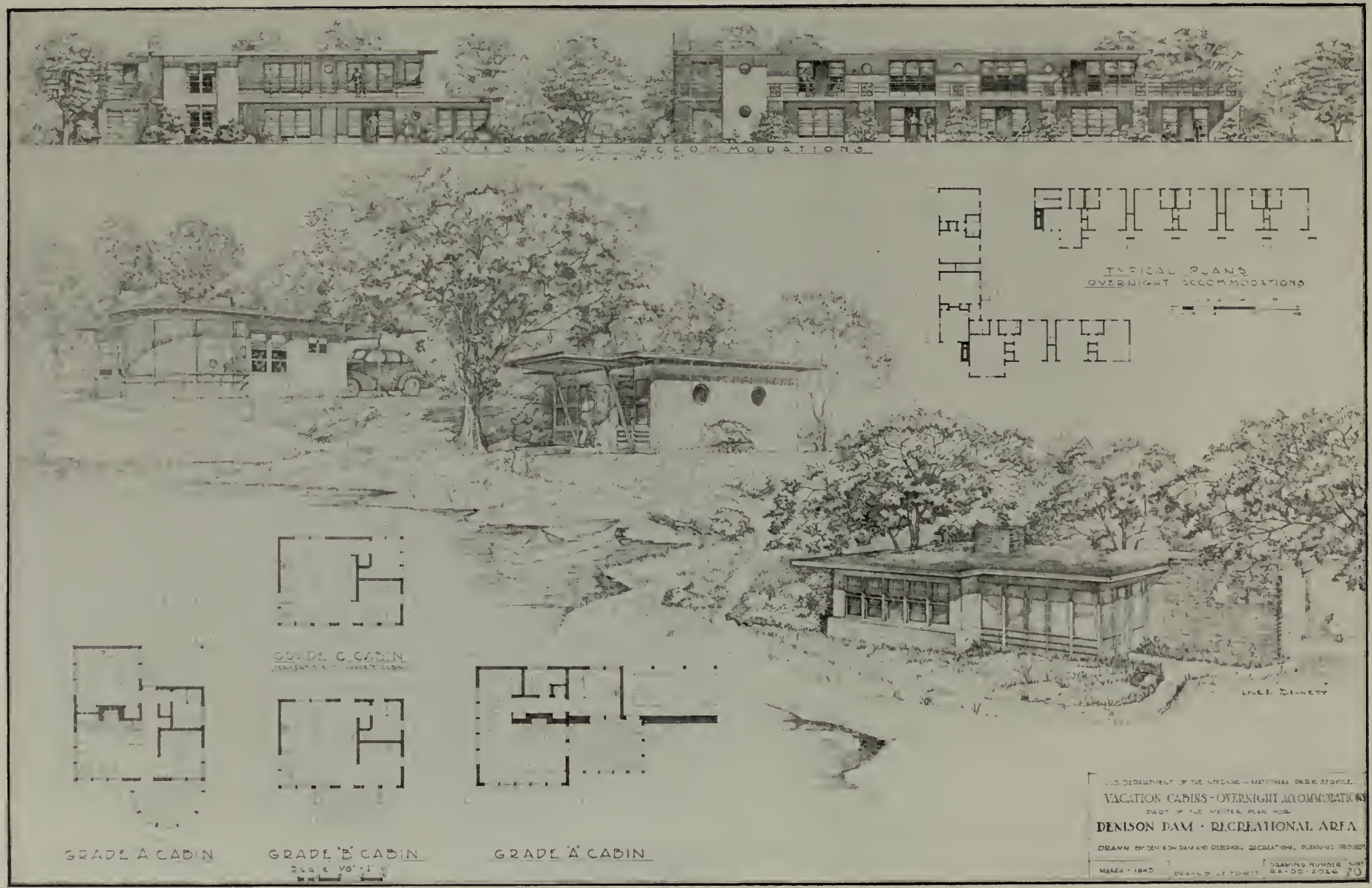
OVERNIGHT ACCOMMODATIONS
TYPICAL PLANS
OVERNIGHT ACCOMMODATIONS
GRADE C CABIN
GRADE A CABIN
GRADE 'B' CABIN
GRADE 'A' CABIN
VACATION CABINS - OVERNIGHT ACCOMMODATIONS
DENISON DAM · RECREATIONAL AREA

Figure 35.

east. Some sites might be suited to development as exhibits in place.

Surface formations within the proposed boundaries of the Denison Dam Recreational Area are not of the spectacular type that would provoke a general interest in geology. There is, however, a broad interest in geology which centers around prospective discovery of oil. People of Texas and Oklahoma are oil-minded. The average person understands that geology usually dictates the location of wildcat test wells, but the story of just how geologists work in attempting to locate oil in underground traps formed by faults or folds is not generally understood. Visitors to the oil country from non-oil-producing States frequently display an intense interest and considerable curiosity in the story of black gold, poverty to riches, and boom towns. Since oil has been discovered and is now being produced from wells on the area, an interesting presentation of the geology of the area could be offered through exhibits in the museum. Producing wells on the area, especially those below the dikes, would be of interest to some sightseers.

Forest conservation should be given continuous study and attention. Some reforestation will be necessary in special-use areas and in some sections where soil-erosion control is needed. Much of the forest growth is scrubby, but if given proper protection it will eventually reestablish itself. Timber cutting above elevation 620 and the destruction of wildflowers should not be permitted. Grazing and farming, except in some locations as a war emergency, should not be permitted where such land use would interfere with the long range conservation program. Forest fire and prairie fire hazards in the area are considered serious because there will be periods when dry grasses and leaves will be highly inflammable. Protective measures similar to those used in the national parks and monuments are recommended.

Preliminary Estimates of Cost, which are given in the table below, are based upon regular contract prices for similar construction in the locality as of early 1943. About 60 percent of the estimated cost of development is for labor, and 40 percent is for materials.

Summary of estimates of cost

Development:	
Preston Bend Section:	
Preston Bend Area	$1,842,000
Grandpappy Point Fishing Village	227,000
Negro Area	182,000
Willis Crossing Area	300,000
Washita Point Section:	
Washita Point Area	1,910,000
Catfish Bay Fishing Village	145,000
Newberry Creek Area	184,000
Fort Washita Historical Area	42,000
Chickasaw Area	140,000
Hauani Creek Area	101,000
Scenic access road (Dam to Preston Bend Area)[1]	440,000
Temporary facilities	100,000
Total	5,613,000
Acquisition	590,000
Grand total	6,203,000

[1] Part of this proposed road is outside the proposed Denison Dam Recreational Area.

Temporary Facilities will be required. Unquestionably many persons will desire to use the reservoir and shorelands for recreational purposes as soon as impoundment forms a sizable body of water, long before the reservoir is completely filled. It is reasonable to assume that by the time the water reaches the normal power-pool level, the recreational use will be considerable even though no public facilities are available.

If adequate facilities are not furnished within a reasonable time, especially those facilities providing access, safety, and sanitation, there will be pressure for permits for private developments of every conceivable type, and for commercial developments of a temporary nature. If permits are granted for such private and commercial developments, even as a temporary expedient, it will be difficult to eliminate the permittees at a later date. There will be pressure from individual owners of lands adjoining the Federal fringe of shorelands (some of which will be only 40-foot lots) for access by private roads at points most convenient to each landowner. The granting of such access would result in scores of improperly located and improperly maintained roads and trails leading to the water, and this would result in serious erosion and other damage to Federal property. Since pedestrian access will be

possible at most locations, it is believed that access by private roads should be held to a minimum. All special uses and special rights of access should be granted by permits issued by the administering agency.

It is recommended, therefore, that the Federal Government provide on a limited scale and at critical sites not later than May 1, 1944, access to the reservoir and inexpensive temporary facilities such as drinking water, toilets, portable dressing rooms for swimmers, boat landings, and stands for the sale of refreshments. Such temporary facilities should be operated to meet the minimum needs until such time as facilities of a more permanent type can be provided. An item of $100,000 has been included in the estimate for these temporary facilities.

Post-War Development. If the recreational resources of the area are to be properly conserved and utilized, it is urgent that the temporary facilities be eliminated as soon as possible after the war and replaced by units of permanent facilities that will permit satisfactory use and operation. Since it is expected that the area will be used extensively within the next few years, the construction of permanent facilities should be undertaken on a large scale rather than developing them on a piecemeal basis over a long term of years. In a large national park, remote from concentrations of population, where scenic beauty is the principal value and where control is relatively easy, development on a piecemeal basis and opening to the public of only those portions where facilities are completed, may be fairly satisfactory. The problem is different at the Denison Dam Area because a large recreational lake will suddenly be available to large numbers of persons where nothing of that nature existed before, and where the control problem will be far more difficult. The unfenced narrow strip of Federal land around the shores will not be an adequate barrier as long as the Government has little or nothing to offer toward meeting the recreational needs.

Administration. While this report is being prepared, the Denison Dam is being constructed by the War Department; and Congress has granted no specific authorization for administration of the project after completion—for flood control, power generation, or any other purpose. Executive orders issued in July and August 1943, authorizing the War Department to administer the project and to generate electric power for the duration of the war, and placed distribution of the power under the jurisdiction of the Secretary of the Interior.

It is assumed that the dam and other features within its immediate vicinity will continue to be administered by the War Department or by some other Federal agency, and that whatever agency is given this responsibility also will retain such control over the entire reservoir area as is essential for realizing the primary purposes of flood control and power generation.

The proposed Denison Dam Recreational Area, which includes the reservoir and shorelands outside the immediate vicinity of the dam, plus the additional recreational lands recommended for acquisition, should be placed under unified administration of one Federal agency in order to achieve uniform and harmonious policies, standards, and regulations relating to both development and operation.

Such an arrangement would not preclude the possibility of entering into agreements with other Federal, State, or local agencies for the administration of specific recreational developments, as has been done by the Tennessee Valley Authority in connection with certain of its reservoirs. It also would not preclude making desirable cooperative arrangements with other Federal agencies, such as the Fish and Wildlife Service, Public Roads Administration, and Public Health Service, and corresponding State Agencies, for assistance in their specialized fields.

Staff. The agency authorized to administer the project will need a staff to continue planning, acquire lands, execute developments, and finally, to operate and maintain the area when it is ready for visitors. After development has been completed, technical assistance will be needed for direction of conservation practices, for research, and for interpretation of the various features to the public. Full time personnel in all of the fields involved will not be necessary, as certain phases of the work may be performed by consultants and some technical advice may be obtained from other Federal, State, and semipublic agencies. There should be available from various sources, however, personnel with ap-

propriate training and experience in the fields of planning, construction, operation, history, geology, archeology, wildlife management, forestry, soil and moisture conservation, public health and sanitation, navigation, law, land acquisition, and fiscal matters.

Planning. The master plan should be kept up-to-date and coordinated with plans of other agencies. Surveys, research, and preparation of detailed plans and working drawings may then go forward in proper sequence with full knowledge of just where each specific item or facility will fit into the ultimate development scheme.

Planning should be a continuing operation as it is a highly important factor in the proper utilization of the recreational resources of this area. The amount and type of planning work will vary from time to time, but personnel should be sufficient at all times to keep well ahead of anticipated construction in preparation of working drawings and estimates, and to provide technical supervision of construction under way.

The development program, except for temporary facilities, must be postponed until the close of the war.

All roads, utilities, important structures, and other facilities which are for public use should be developed by the administering agency. Summer homes, certain accommodations for semipublic and private organizations, and possibly some minor developments for the concessioner may be developed by private interests in accordance with prescribed standards and under Government control on land leased from the Government.

It is possible that after the war some form of public works program will be inaugurated to relieve unemployment during transition to a peacetime economy. Development of recreational facilities as planned by this project might fit admirably into such a program in an arrangement similar to that between the National Park Service, the Civilian Conservation Corps, and other public agencies from 1933 to 1942. During that period many recreational areas throughout the Nation were successfully planned and developed by these agencies on a cooperative basis. Basic plans, which are reproduced in this report, together with detailed working drawings which could be quickly prepared for a number of developments, would enable the administering agency to start actual construction and development work at this project on short notice.

Operation. The Denison Dam Recreational Area is planned for administration by a Federal agency, with the operation of certain visitor facilities by one or more principal concessioners under a system similar to that used in most of the national parks.

There will be two phases of management: (1) The general custody and administration of the entire area and (2) the operation of certain facilities and provision of certain services which can best be accomplished on a concession basis by individuals or some form of private commercial organization. Whether the recreational developments, in whole or in part, are administered under agreement by the States or their political subdivisions, it should be the responsibility of the Federal administering agency to see: (1) That the entire area is provided with fire and police protection, (2) that health, safety, and other regulations are enforced, (3) that roads, trails, and utilities are protected and maintained, (4) that facilities such as picnic grounds, campgrounds, playfields, and museums are provided, (5) that an interpretive program is furnished, and (6) that private boat-docking facilities are properly controlled. The concessioner should operate facilities which offer special services such as restaurants, lodges, cabins, bathhouses, public-boating facilities, golf courses, riding stables, and places for selling curios, fishing tackle, bait, and supplies.

It is apparent that the concessioners in an area of the magnitude of the Denison Dam Recreational Area must have considerable financial backing. The initial investment in equipment and furnishings for the varied types of structures and facilities necessary for the proper operation of the area will require considerable funds. The National Park Service has found that the most successful and satisfactory concession operation may be expected from having only one responsible, well-financed concessioner on a profit-sharing basis, rather than a large number of small concessioners for the various facilities and services. However, because the Denison Project is located in two States and is very extensive, more than one concessioner may prove more satisfactory in this particular instance. The concession contract should give to the administering agency the authority to

control the various services to be furnished and the prices to be charged.

A new system, which is being tried out and which offers promising results, is concession operation by a well-managed nonprofit-distributing membership corporation sponsored by, and under the strict supervision of, the National Park Service. In 1938 there was formed in the Mammoth Cave area in Kentucky a nonprofit-distributing agency known as the Mammoth Cave Operating Committee which operated facilities until the establishment of the area as the Mammoth Cave National Park. During this period the committee donated out of profits nearly $85,000 for the purchase of park land. In 1941, these facilities were turned over to the newly organized National Park Concessions, Inc., a nonprofit-distributing membership corporation. It is the policy of the National Park Service to designate this corporation to operate all Government-owned facilities in newly established national park areas. Consideration might be given to such a policy by the agency charged with administering the Denison Dam Recreational Area.

It is recommended that the same kinds of facilities and services be made available here for free public use as are usually offered in public parks. No fee should be required for such activities as sightseeing, hiking, picnicking, camping in campgrounds where only water and sanitary facilities are provided, and swimming in the lake. Nominal fees probably should be charged for permits for use of privately owned noncommercial boats to cover cost of safety inspection.

Finance. There is ample precedent where Congress has authorized the expenditure of Federal funds for land acquisition and recreational developments on similar projects, such as the TVA reservoirs and Boulder Dam which produce hydroelectric power for sale and have other self-liquidating features.

Estimated land and development costs are summarized on page 94. After well rounded and workable development units have been completed, the annual administrative and maintenance costs should be somewhere between $150,000 and $200,000. Appropriations for administration, protection, and operation of some of the National Park Service areas for the 1942 fiscal year are listed for comparison:

Boulder Dam National Recreational Area (new and partially developed)	$98,840
Carlsbad Caverns National Park	110,390
Grand Canyon National Park	140,510
Rocky Mountain National Park	124,215
Yellowstone National Park	467,840

Areas such as the proposed Denison Dam Recreational Area usually are only partially self-supporting In normal times revenue from the national parks as a whole is equal to about 70 percent of their total operation and maintenance costs.

Legislation. As previously mentioned, Federal legislation will be needed to authorize some agency to acquire additional land, and to develop, maintain, and operate the recreational features of the Denison Dam Recreational Area as proposed in the plan. The War Department does not believe it is authorized to spend project funds for the purchase of additional recreational lands if such lands are not required for the primary purposes of the project.

Since the Denison Dam Recreational Area lies in two States, visitors frequently will be subject to the laws and regulations of both States covering such matters as hunting and fishing licenses, open seasons, size limits, bag limits, and boat operation. The situation is further complicated by the fact that in the reservoir basin the State boundary line is the south cut bank of Red River. This meandering boundary line (shown on the development plan, p. 55) will be inundated by the waters of the reservoir and frequently it will be impossible to determine whether persons in boats on the Red River arm of the reservoir are in Texas or in Oklahoma. A similar situation exists on the Washita River arm of the reservoir in Oklahoma, since the Washita River forms the boundary between counties and the meandering boundary line as now established will be inundated.

Uniform laws and regulations affecting the recreational use of the reservoir and surrounding shorelands would be desirable as they would eliminate a source of confusion and the possibility of unpleasant experiences on the part of visitors who reside in Texas or Oklahoma and tourists who are nonresidents of either State. Preliminary investigation indicates that a desirable and reasonable uniformity of laws and regulations affecting public recreational use of the area might be attained through a com-

pact between the two States, as authorized by the act of June 23, 1936 (49 Stat. 1894). In the act of June 28, 1938 (52 Stat. 1215) authorizing the Denison Dam Project, proprietary rights to the waters are reserved to the States of Oklahoma and Texas. In March 1943, the Texas Legislature authorized the Governor to appoint a commission to work out with a similar commission from Oklahoma and a representative of the Federal Government the details of such a proposed compact. The Oklahoma Legislature adjourned without authorizing appointment of a commission for that State, but it is understood that the Governor of Oklahoma already has that power and will appoint such a commission. The Texas Legislature also placed control of fish and game in the Texas portion of the reservoir area under the State Game, Fish and Oyster Commission.

Further study should be given to the subject of Federal, State, and local legislation needed to make possible the full use and enjoyment of the recreational resources of the area by the public.

Relations with other agencies. Regardless of the type of agency placed in charge of recreational administration of the area after it is ready for visitors, an important function of that agency will be coordination of activities of other public, semipublic, and private agencies which will be concerned with various matters affecting recreational use of the area.

Activities of some of the agencies will be of a mandatory nature. Other agencies will have an interest also and may be able to offer valuable cooperation and assistance, but ordinarily they would not participate in a project of this kind unless requested to do so by the custodial agency. For example, a county public health department might be able to render valuable service, but might not be expected to concern itself with the operation of a Federal area unless requested to do so. Because of the variety and technical nature of many of the problems, a policy of seeking counsel, advice, and cooperation from numerous agencies and institutions will pay dividends in results accomplished within the area itself. A policy of cooperating with other agencies is also an important means of maintaining favorable public relations.

Public relations. Sustained favorable public opinion is just as necessary for successful administration of a large publicly owned recreational area as it is for a private business enterprise. Efficiency and economy in management of the area are not sufficient. Every possible legitimate means should be used to maintain public support. Favorable public opinion is something that does not just happen; it must be planned and constantly cultivated as an important part of the administrative program.

The best opportunity to make and keep friends for the area will lie in the administration's personal contact with the 600,000 or more individuals who will probably visit the area annually. People usually go to a park to have a good time and they respond readily to intelligent management of programs designed to enable the greatest number to take advantage of the recreational opportunities offered and to make them feel welcome at all times. The proper use of the facilities requires a certain amount of control over the conduct of visitors, but this can be accomplished without pushing people around and without use of too many "Don't" and "Warning" signs. The agency which is designated to administer the recreational features of the Denison Dam Recreational Area will have an opportunity to take advantage of counsel and advice from other public agencies which have had many years of experience in handling large crowds of visitors at public parks. Advice on typical attitudes, reactions, and other characteristics of park visitors should be of considerable value at this new area.

Successful administration of the Denison Dam Recreational Area over a term of years will depend to a large extent upon the effectiveness of the public relations program.