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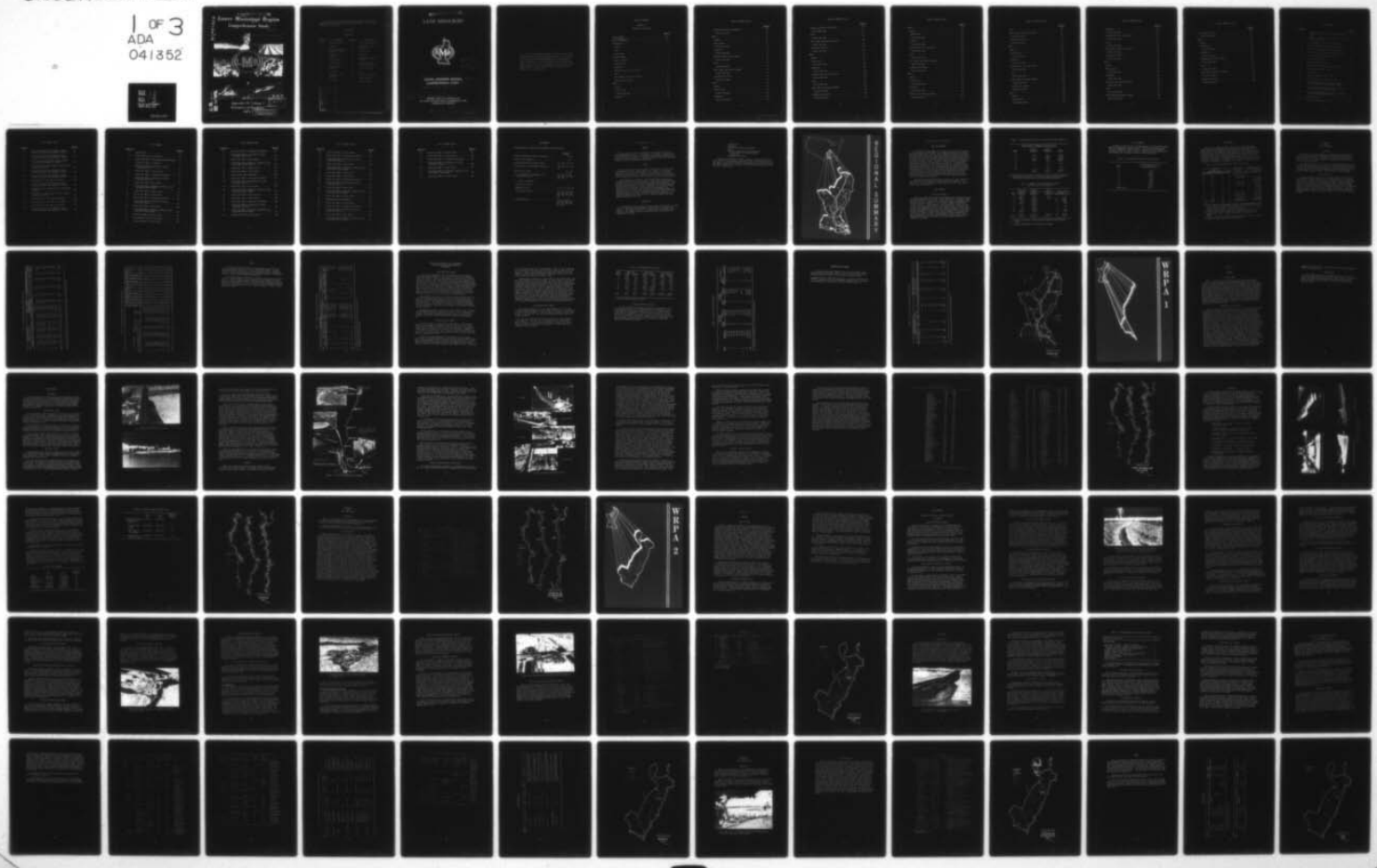

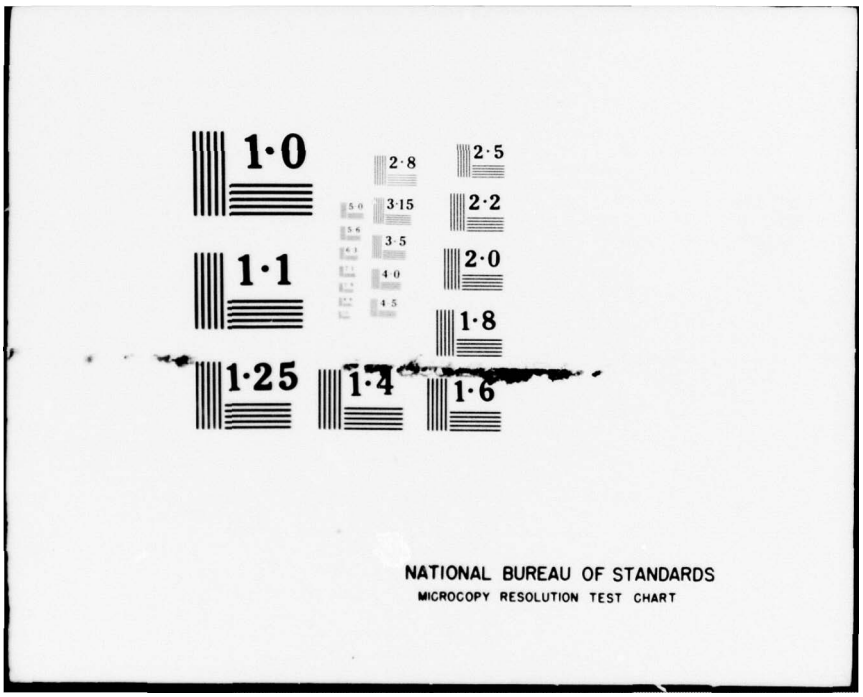
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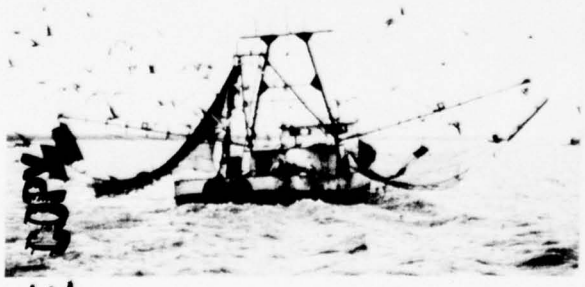

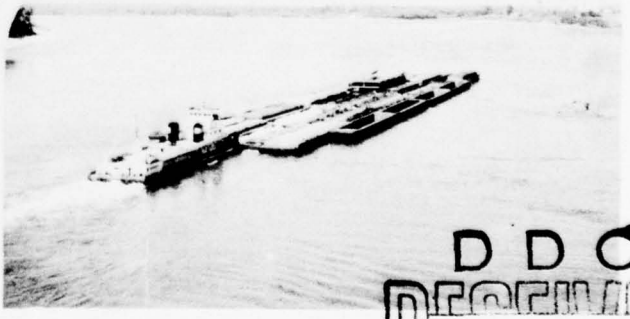

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Inventory of Facilities
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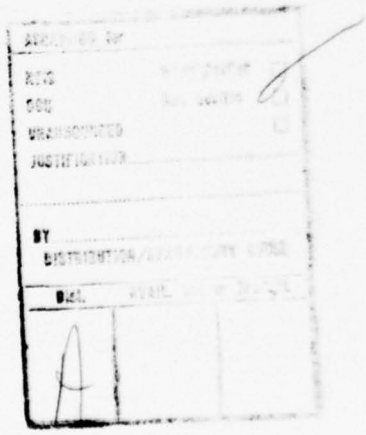
This appendix is one of a series of 22 documents comprising the complete Lower Mississippi Region Comprehensive Study. A list of the documents is shown below.

Main Report

Appendixes

Appendix	Description	Appendix	Description
A	History of Study	K	M and I Water Supply
B	Economics	L	Water Quality and Pollution
C	Regional Climatology, Hydrology & Geology	M	Health Aspects
D	Inventory of Facilities	N	Recreation
E	Flood Problems	O	Coastal and Estuarine Resources
F	Land Resources	P	Archeological and Historical Resources
G	Related Mineral Resources	Q	Fish and Wildlife
H	Irrigation	R	Power
I	Agricultural Land Drainage	S	Sediment and Erosion
J	Navigation	T	Plan Formulation
		U	The Environment



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LAND RESOURCES

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Appendix D, Volume I.

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Inventory of Facilities.

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INTRODUCTION

PURPOSE

This is one of a series of appendixes to the Lower Mississippi Region Comprehensive Study. Its purpose is to provide a reference publication describing both natural and manmade water-related facilities in the Lower Mississippi Region. It provides specific data about individual projects as well as generalized information.

SCOPE

Projects described in this appendix include those existing, under construction, and those planned but not yet started. Some inactive authorized projects are also included in the inventory to show that construction or planning has taken place but for some reason the project was not constructed or that it was constructed and then not maintained.

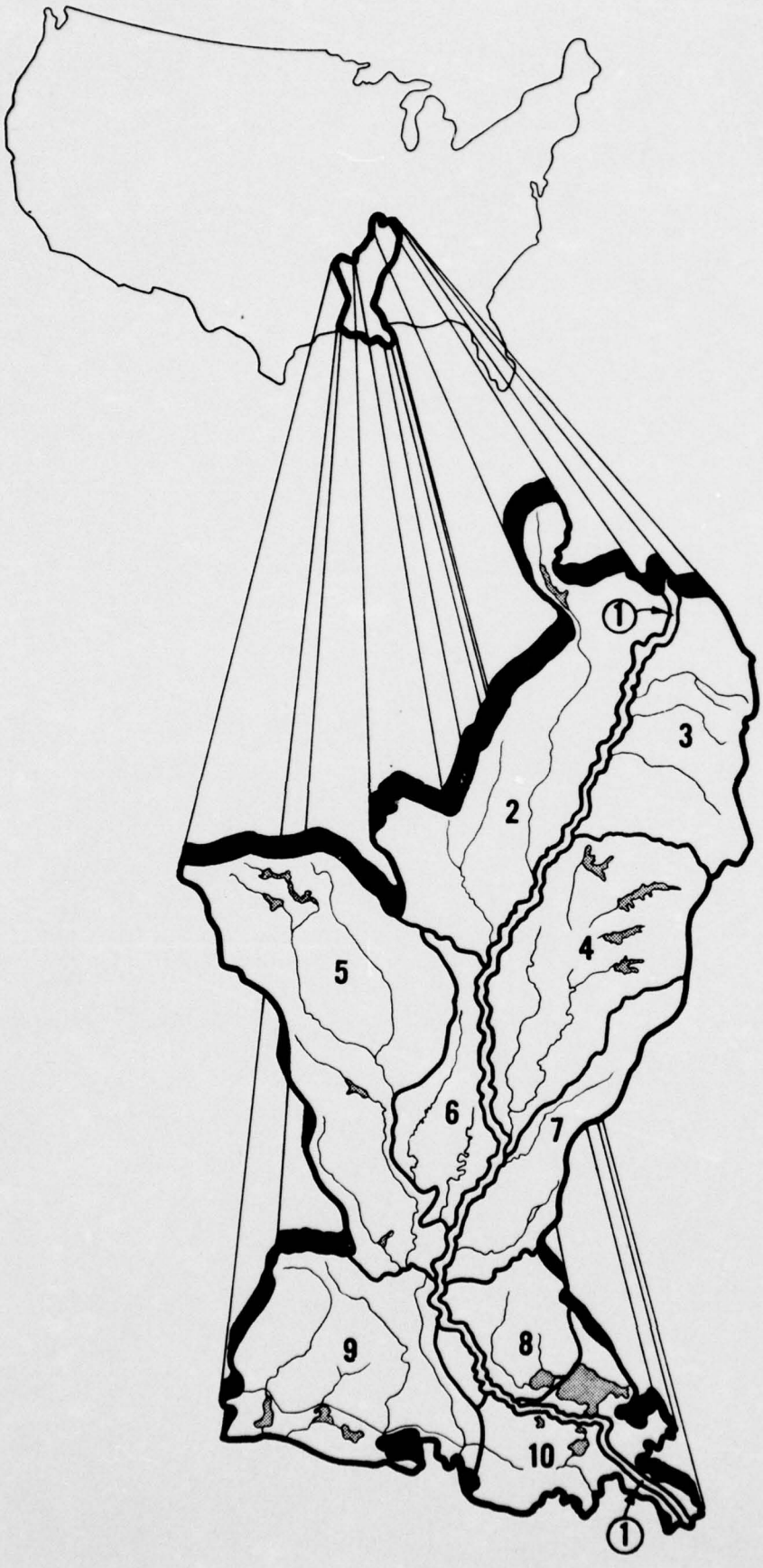
The inventory is incomplete, covering only those projects and facilities with readily available data. Funding and time limitations precluded extensive research in obtaining additional information. Those projects not included are primarily non-Federal flood control projects and recreation facilities. Limited information was available on water supply and sewage treatment facilities and on archeological and historic sites. Because of the variation in data available, there are inconsistencies in the detail describing projects and facilities in the different categories. Unless specifically designated otherwise, all data are current through June 30, 1971. Status of projects has been updated through June 30, 1973.

ORGANIZATION

The Lower Mississippi Region, for the purpose of this study, is divided into 10 hydrologic subareas known as Water Resource Planning Areas (WRPA's). The information herein is organized in a like manner, with a section for each WRPA. Facilities described within each section are categorized as follows:

Flood Control
Navigation
Recreation and Fish and Wildlife
Power
Municipal, Industrial, and Agricultural
Water Supply and Sewage Treatment
Facilities
Archeology and History

Information throughout the entire appendix is presented basically with a series of brief general narratives, tables, and map indexes. The map indexes, which briefly describe individual projects, project features, and natural facilities, are keyed to color coded maps which display the facilities schematically.



REGIONAL SUMMARY

REGIONAL SUMMARY

AREA OF INVENTORY

The Lower Mississippi Region, for which this inventory of facilities is made, includes the following: the drainage area of the Mississippi River below the mouth of the Ohio River except for portions of the White, Arkansas, and Red Rivers, the Louisiana coastal area between the drainage divides of the Pearl and Sabine Rivers; and the flood-protected area at Cairo, Illinois. The 102,404 square miles covered by the region occupy portions of seven states: Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee (see figure 1). The principal stream in the region, the Mississippi River, drains 41 percent of the continental United States. The drainage area of the entire Mississippi River Basin covers all or part of 31 states and two Canadian provinces. Approximately one-third of the Lower Mississippi Region is located within the relatively flat and extremely fertile alluvial valley of the Mississippi River. The area adjacent to the valley varies from the gentle relief of the Bayou Meto Basin to the more rugged, mountainous area in the Ouachita River Basin.

There are eight Standard Metropolitan Statistical Areas (SMSA's) in the region having populations of 50,000 or greater: Memphis, Tenn., Pine Bluff, Ark., and Alexandria, Baton Rouge, Lafayette, Lake Charles, Monroe, and New Orleans, La.

FLOOD CONTROL

Structural Measures

Structural improvements which reduce damages from flooding have been constructed throughout the region by the joint efforts of Federal, State, and local agencies. Tables 1 and 2 summarize Federal improvements which include levees and floodwalls (3,780.2 miles), channel improvements (11,554.5 miles), 37 pumping plants, and flood control reservoirs with a total storage capacity of about 6,028,000 acre-feet. In addition to the Federally sponsored projects listed, there are numerous flood control projects throughout the basin which have been constructed by state and private individuals or organizations for the purpose of providing flood protection to specific areas. These projects, with the exception of those constructed by the Louisiana Department of Public Works, were not inventoried but play an important role in the overall flood control program of the region.

Table 1 - Flood Control Storage, 1970, Lower Mississippi Region 1/

WRPA	Flood Control - Storage in 1,000 Acre-Feet		
	Major Reservoir	Small Reservoir	Totals
1	-	-	-
2	582.0	48.9	630.9
3	-	188.6	188.6
4	3809.0	262.2	4072.0
5	972.4	40.9	1013.3
6	-	-	-
7	-	62.2	62.2
8	-	-	-
9	-	61.3	61.3
10	-	-	-
	5364.2	664.1	6028.3

1/ Additional storage exists in tributary regions, lowering stages on main stem Mississippi River floods and aiding forecasting.

Table 2 - Summary of Local Protection Projects, 1970 Lower Mississippi Region 1/

WRPA	Levees and Floodwalls (Miles)	Channel Improvement 2/ (Miles)	Bank Stabilization (Miles)	Pumping Plants (No.)	Pumping Plants (Total c.f.s.)
1	1,525.0	954.0	971.0	-	-
2	668.8	987.5	41.1	5	14,000
3	22.3	1,054.0	-	13	8,237
4	260.8	3,451.8	-	3	1,465
5	262.5	436.2	-	5	565
6	-	2,035.7	-	-	-
7	0.8	526.4	-	1	100
8	-	225.9	-	-	-
9	526.0	1,811.0	-	9	3,102
10	514.0	72.0	-	1	154
Total	3,780.2	11,554.5	1,012.1	37	27,623

1/ Consists of projects in both upstream watersheds and principal reaches.

2/ Channel improvement for navigation not included.

Land Treatment

Presently, 19,127,000 acres of land located in the Lower Mississippi Region are adequately treated to reduce erosion and sedimentation and aid in the reduction of surface runoff. Data on acres with adequate treatment by WRPA are shown in table 3. Additional data on land use and land treatment are included in the Land Resources Appendix.

Table 3 - Land Treatment, Lower Mississippi Region

WRPA	Lands Adequately Treated Acres (1,000's)
1	0
2	3,594
3	2,617
4	1,968
5	3,057
6	940
7	1,325
8	1,268
9	2,535
10	1,823
Region Total	19,127

NAVIGATION

There are 17 significant public ports in the Lower Mississippi Region which moved an estimated 217,951,000 tons of freight in 1970. Total traffic in the region for 1970 was 84,024,502,000 ton-miles, 84 percent of which was along the Mississippi River. There are 2,966 miles of shallow draft and 452 miles of deep draft navigation channels and 20 navigation locks in the Lower Mississippi Region. WRPA's 1 and 9 contain about 47 percent of all shallow draft channels and 82 percent of all deep draft channels. Only WRPA's 1, 9, and 10 contain any deep draft channels. A tabulation of navigation data by WRPA's is shown in table 4.

Table 4 - Existing Maintained Navigation Improvements

WRPA	Length Channels (Miles) Shallow Draft	Length Channels (Miles) Deep Draft	Number Locks	Estimated 1970 Traffic Ton-Miles	Ports 1/ Number	Ports 1/ Est. 1970 Traffic, Tons
1	720	271	0	70,977,000,000	0	-
2 2/	328	0	4	324,000,000 3/	4	6,507,000
3	0	0	0	-	3	10,321,000 4/
4	189	0	0	24,542,000	3	5,929,000
5	351	0	4	80,688,000	0	952,000
6	0	0	0	-	1	2,361,000
7	0	0	0	-	1	847,000
8	273	0	2	1,013,995,000	1	45,536,000
9	705	100	4	8,657,813,000	2	21,824,000
10	400	81	6	2,946,464,000	1	123,674,000
Total	2,966	452	20	84,024,502,000	17	217,951,000

1/ Ports in WRPA 1 are included in listings for adjoining WRPA's. No small private facilities are included. Private ports are included in data presented on table 5 navigation appendix.

2/ Figures include Arkansas River (135 miles) within limits of WRPA 2.

3/ Traffic shown is that on White River from Batesville, Ark. to Arkansas Post Canal. Arkansas River traffic not available for WRPA 2.

4/ Traffic includes 1970 tonnage for Memphis Harbor (Tennessee Chute) Wolf River, and estimates for Hickman Harbor.

RECREATION
AND
FISH AND WILDLIFE

Recreation

The Lower Mississippi Region has 1,218,429 acres of land available for outdoor recreation, including 912,790 acres Federally owned, 150,479 acres owned by State government, and 83,061 acres of quasi-public, County, or locally controlled. Additionally, there are 72,099 acres in private ownership.

The region also has 1,952,392 acres of slackwater and about 7,699 miles of stream suitable for recreation. Developed recreation facilities include 4,684 acres for camping, 3,486 acres for picnicking, 1,495 acres for swimming, 735 acres for boat launching ramps, and 8,968 acres for playing outdoor games and sports. Table 5 shows this data by WRPA.

Fish and Wildlife

Fish and wildlife resources in the region include 837,000 acres of lakes between 2 and 40 acres in size, 2,230,000 acres of lakes larger than 40 acres in size, and 8,653 miles of fishable streams. Ponds under 2 acres in size have not been inventoried. Water-related facilities include State ownership of five wildlife refuges, 67 wildlife management areas, five fish hatcheries, 28 managed fishing lakes, five waterfowl refuges, 21 parks, one forest, and 14 public access areas. Federally owned facilities include 11 wildlife refuges, one fish hatchery, three waterfowl refuges, three parks, and 10 forests. Table 6 shows this data by WRPA.

Table 5 - Lower Mississippi Region Recreation Data

WRPA	Lands Available For Recreation (Acres)					Waters Suitable For Recreation		Developed Facilities (Acres)				
	Private	Local	State	Federal	Total[1/]	Slackwater (Acres)	Streams (Miles)	Camping	Picnicking	Swimming	Ramps	Outdoor Games & Sports
1						90,000						
2	32,067	7,690	41,997	40,230	121,984	91,214	1,203	2,635	1,000	141	43	3,576
3	6,093	10,476	40,720	9,390	66,679	40,340	822	71	619	238	20	1,686
4	2,770	4,331	13,682	280,000	300,783	73,676	1,100	243	305	112	176	21
5	17,511	7,241	17,673	364,950	407,375	174,783	1,931	1,504	832	319	212	1,935
6	6,318	16,868	359	0	23,545	32,262	536	37	83	71	37	183
7	3,072	11,329	28,429	210,080	252,910	38,562	450	84	152	24	58	54
8	2,589	6,709	1,019	10	10,327	73,080	400	65	122	92	41	353
9	1,006	8,791	5,499	8,000	23,296	399,529	928	39	292	324	108	370
10	673	9,636	1,101	130	11,530	938,946	329	6	81	174	40	790
Total	72,099	83,061	150,479	912,790	1,218,429	1,952,392	7,699	4,684	3,486	1,495	735	8,968

1/ Of this total, 99,000 acres were considered to be firm supply for recreation in 1970.

Table 6 - Lower Mississippi Region Fish and Wildlife Data

WRPA	Lakes (Acres)		Fishable Streams (Mi.)	Wetlands Acres	Forest Lands Acres	State Owned Facilities								Federally Owned				
	2 to 40 Ac	Over 40 Ac				W/life refuges	W/life mgmt. areas	Fish hatcheries	Mg'd. fish. lakes	W/fowl refuges	Parks	Forests	Public access	W/life refuges	Fish hatcheries	W/fowl refuges	Parks	Forests
1		368,000	954		879,000		5			1			2	2				1
2	98,000	91,000	1,203	205,000	2,634,000		12	1	6		5	1	3	3	1			2
3	32,000	40,000	822	41,000	2,310,000		13	1	8	1	4			3				1
4	133,000	74,000	1,100	97,000	3,223,000		12		1	3	5		8			1	1	2
5	76,000	175,000	1,931	791,000	10,228,000			1	13					1			1	2
6	40,000	32,000	536	85,000	831,000	1	3	1			2							
7	56,000	38,000	450	49,000	2,510,000		3				1		1				1	1
8	45,000	73,000	400	395,000	2,265,000		1											
9	138,000	400,000	928	1,236,000	3,442,000	3	10				2					2		1
10	219,000	939,000	329	1,566,000	1,315,000	1	8	1			2			2				
Total	837,000	2,230,000	8,653	4,465,000	29,637,000	5	67	5	28	5	21	1	14	11	1	3	3	10

POWER

At the end of 1970, there were 37 steam-electric and three hydroelectric generating plants in the Lower Mississippi Region. Nineteen used river water as a coolant, 20 used wells and one used a combination thereof. Total installed capacity was 10,909,900 kilowatts. Net generation for 1970 was 50,744,364,000 kilowatt-hours.

Those plants added or definitely planned for construction after 1970 total 27. These include 18 steam-electric, four gas turbine, one hydroelectric, and four nuclear plants. Seventeen of these additions will use river water for coolant, five will use wells and one a combination thereof. Capacity of these additions will be 11,589,400 megawatts. Table 7 shows power data by WRPA.

Table 7 - Lower Mississippi Region Power Data

WRPA	Existing Plants									Planned Additions 1/							
	No. Plants	Type			Source of Water			Installed Capacity (MW)	Net Generation (1,000 KWH) 1970	No. Plants	Type				Source of Water			Capacity (MW)
		S	GT	H	River	Wells	Comb.				S	GT	H	N	River	Wells	Comb.	
2	6	6			2	3	1	1,228.6	6,295,169	2	2				2			1,250.0
3	1	1			1			990.0	4,857,213	2		2						620.8
4	7	7			2	5		863.8	4,036,880	2	1	1 2/			1		1	750.0
5	7	4		3	6	1		1,481.2	5,460,245	5	3	1	1		3	1		473.1
6	0									0								
7	1	1				1		66.0	292,452	1			1		1			1,250.0
8	2	2			1	1		1,422.4	7,606,356	6	4		2		4	2		3,190.0
9	8	8			2	6		1,888.8	6,982,903	2	2				1	1		433.5
10	8	8			5	3		2,969.1	15,213,146	7	6		1		5	1		3,622.0
Total	40	37	0	3	19	20	1	10,909.9	50,744,364	27	18	4	1	4	17	5	1	11,589.4

1/ Includes all additions planned and constructed after CY 1970.

2/ Combination gas turbine and steam.

MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL WATER SUPPLY AND SEWAGE TREATMENT FACILITIES

Municipal Water Supply

Total water withdrawn in 1970 for municipal use in the Lower Mississippi Region amounted to 616.7 MGD, with the lowest withdrawal occurring in WRPA 6, which is approximately 61 percent rural, and the highest withdrawal, 184.7 MGD in WRPA-10, which is approximately 83 percent urban (see table 8.) Of the 616.7 MGD withdrawn for municipal use in the region, 206.0 MGD, or approximately 34 percent, was from streams, and 410.7 MGD, or approximately 66 percent, was from underground sources. The average daily per capita use in the WRPA's ranged from 78 GPD in WRPA 6, one of the more rural and less populous areas, to 164 GPD in WRPA 10, which is the most urbanized area. Consumption rate in this study has been assumed to be 37 percent, which according to the Water Resources Council, is a realistic figure for municipalities.

Approximately two-thirds of the water withdrawn for municipal purposes was from underground sources, generally of good quality and required relatively little treatment, such as chlorination, aeration, and iron removal. The remaining one-third of the water withdrawn for municipal use was from streams and required more extensive treatment, usually coagulation, sedimentation, filtration, taste and odor removal, and sterilization.

Throughout the region, an average of 63 percent of water withdrawn for municipal purposes was returned to streams. The 37 percent not returned is considered consumed and involves water losses in lines as leakage, evaporation, water used in lawn sprinkling, firefighting, etc.

Industrial Water Supply

In 1970, a total of 5,419.8 MGD was withdrawn to supply all the WRPA's in the region with water for industrial purposes. The lowest withdrawal, 38.8 MGD, was in WRPA 2 which has relatively few industries (none of which are major water consumers) and the highest withdrawal, 2,038.8 MGD, was in WRPA 10. This is the most industrialized WRPA, and most of its industries require large amounts of water in their processes and for cooling (see table 8).

Of the 5,419.8 MGD withdrawn for industrial use in the region, 4,598.2 MGD, or approximately 85 percent, was from surface sources, 821.6 MGD, or approximately 15 percent, was from underground sources. Approximately 20 percent of the total withdrawal for industrial use, 1,065.2 MGD, was brackish water almost entirely from surface sources. Practically

all of the brackish water was used in WRPA's 9 and 10, which occupy the coastal region of Louisiana, and much of this water was used in cooling processes. WRPA 9, which includes the industrial complex in the Lake Charles, La. area, used approximately 96 percent, 1,024.3 MGD, of the brackish water withdrawn in the whole region.

Approximately 73 percent, or 3,367.4 MGD, of the surface water withdrawn for industrial use in the region, was used in WRPA's 8 and 10 and was withdrawn from the main stem of the Mississippi River, which runs through the entire length of both WRPA's which are highly industrialized along most of that length of stream. Since practically two-thirds of the water withdrawn in the region for industrial purposes is from surface sources, 73 percent of which is from the Mississippi River, some degree of treatment was applied, depending upon its use and/or the type product manufactured. Food-processing industries require water to be treated to meet drinking-water standards, while some industries requiring water mostly for cooling purposes may need only pH adjustment or anti-corrosion treatment. Of the water withdrawn in the region for industrial purposes, return flows may vary from approximately 60 percent to 97 percent depending on the type industry and product manufactured.

Agricultural Water Supply

Total water withdrawn in 1970 for agricultural uses in the Lower Mississippi Region amounted to 4,879.7 MGD, with the lowest withdrawal, 5.3 MGD, occurring in WRPA 10, and the highest withdrawal, 2,493.6 MGD, in WRPA 2 (see table 8). Rice and fish farming account for high withdrawals in WRPA 2.

Of the 4,879.7 MGD withdrawn for agricultural use in the region, 3,395.4 MGD, or 70 percent, was from ground sources; 1,484.3 MGD, or about 30 percent, was from underground sources. Ground water withdrawals in WRPA 2 accounted for 62 percent of the entire groundwater withdrawals for the region.

Table 8 - 1970 Regional Water Use 1/

WRPA Source	Municipal		Industrial		Agricultural	
	Ground	Surface	Ground	Surface	Ground	Surface
2	32.6	2.1	33.7	5.1	2,119.6	374.0
3	141.8	0.0	94.6	3.5	6.3	30.8
4	53.8	0.0	49.1	37.5	174.5	130.1
5	37.5	16.8	119.3	87.4	250.0	123.1
6	7.5	0.6	28.4	33.1	118.7	37.7
7	12.0	0.0	73.1	0.5	3.6	5.4
8	54.5	0.7	159.3	1,354.9	3.3	3.2
9	65.1	6.9	237.8	1,063.7	717.1	777.0
10	5.8	178.9	26.3	2,012.5	2.3	3.0
Total	410.7	206.0	821.6	4,598.2	3,395.4	1,484.3

1/ Daily average withdrawal in MGD.

Sewage Treatment Facilities

In 1970, primary and secondary treatment was provided for 294 of the communities that utilized a municipal water distribution system. These treatment facilities provided services to 2,715,482 persons or 60 percent of the population. There were 949,098 persons in 40 communities with populations of 1,000 or greater who were not provided any centralized sewage treatment; however, since 1970 when these data were collected, significant progress has been made in providing additional treatment facilities.

Table 9 - Sewage Treatment Facilities

WRPA	Population	Secondary Treatment		Primary Treatment		No Treatment 1/	
		Number Plants	Population Served	Number Plants	Population Served	Number Communities	Population
2	335,342	61	284,768	6	15,219	0	0
3	1,047,871	38	207,291	5	23,163	2	649,422
4	366,120	35	144,345	3	6,338	5	107,253
5	455,003	34	295,477	4	18,939	1	14,868
6	105,003	16	72,094	1	1,980	1	6,183
7	90,602	8	28,574	0	0	1	19,712
8	428,682	11	49,445	5	209,504	0	0
9	542,206	46	421,970	0	0	26	113,697
10	1,123,675	21	366,799	1	593,471	4	37,963
Total	4,494,504	270	1,870,763	25	868,614	40	949,098

1/ Only denotes communities of 1,000 or greater population.

ARCHEOLOGY AND HISTORY

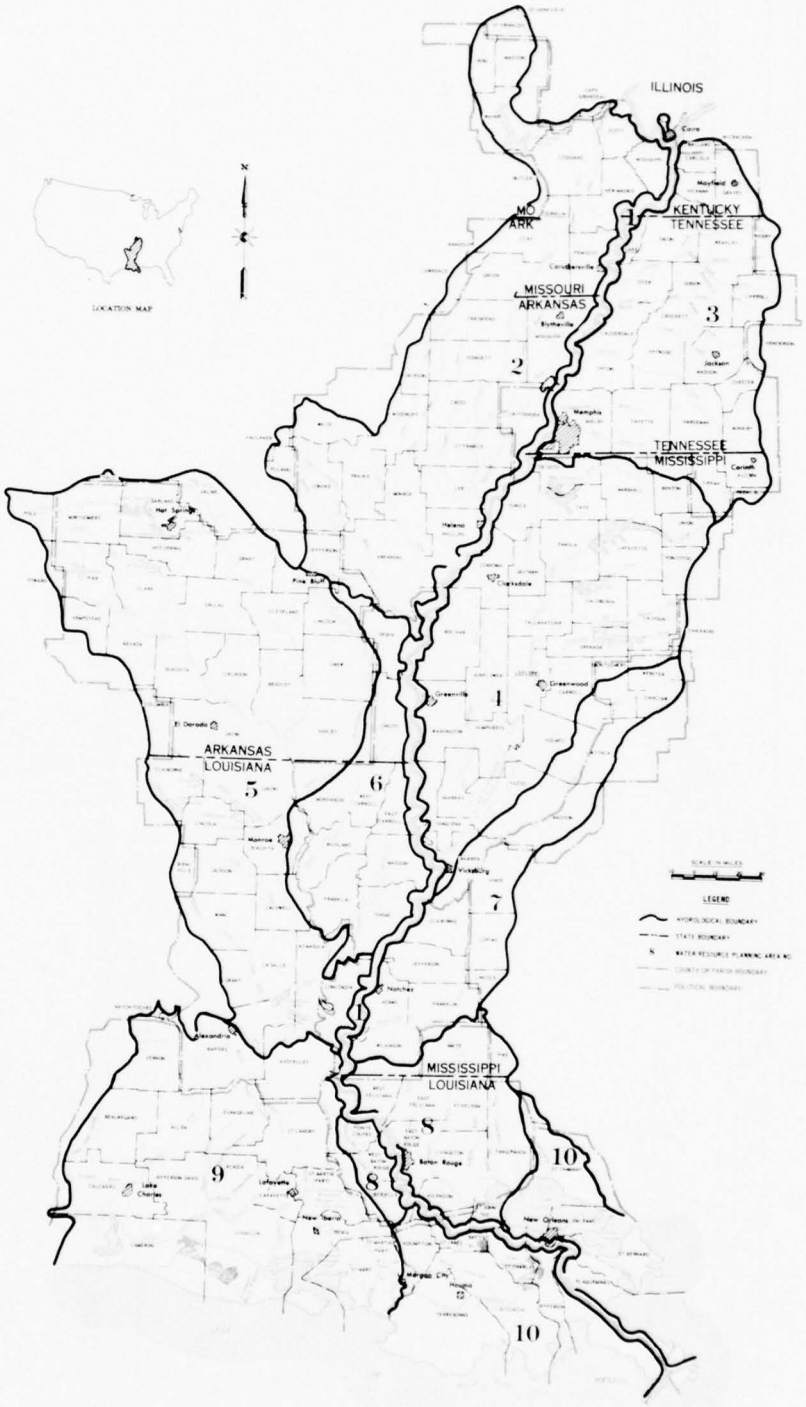
In the Lower Mississippi Region, 237 sites of historical significance have been identified. These include 174 sites listed on the National Register of Historic Places and 40 roads and trails.

Archeological sites identified total 5,447. Of these, 44 percent are in WRPA 2, making it the best-known WRPA, archeologically. Historical and archeological resource data is shown by WRPA in Table 10.

Table 10 - Historical and Archeological Resource Data

1/ WRPA	Historical Resources				Archeological Resources						
	No. Sites	Listed On National Register	Historic: Roads & Trails	Other Significant Historic Sites	No. Sites	Archeological Period					
						Historic	Mississippian	Woodland	Archaic	Paleo	Unknown
2	41	28	7	6	2,374	14	354	647	440	41	878
3	25	18	0	7	493	0	104	179	130	5	75
4	27	26	0	1	843	2	153	325	46	0	317
5	28	12	14	2	935	9	311	280	173	5	157
6	6	1	4	1	200	1	51	66	9	0	73
7	32	29	1	2	104	2	8	2	0	0	92
8	24	18	5	1	116	7	16	20	13	0	60
9	20	11	9	0	140	1	12	43	1	0	83
10	35	34	0	1	242	0	33	74	2	0	133
Total	238	177	40	21	5,447	36	1,042	1,636	814	51	1,868

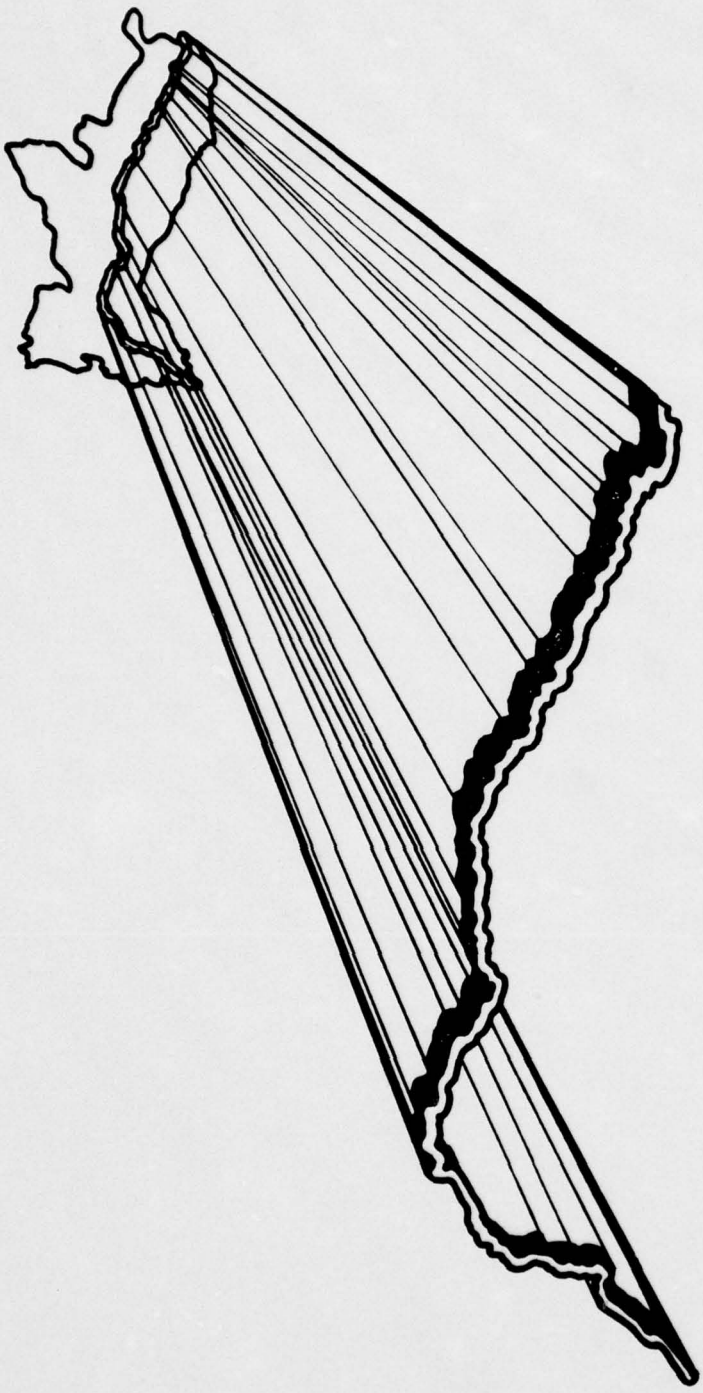
1/ Sites in WRPA 1 are included with those in adjacent WRPA's.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

REGIONAL MAP

FIGURE 1



WRPA 1

W R P A 1

GENERAL

Area of Study

WRPA 1 is the main stem of the Mississippi River below the mouth of the Ohio River, extending to and including the levees or to the river's top bank where levees do not exist. The WRPA covers 2,435 square miles, or two percent of the total area in the region. Major tributaries of the Mississippi River include the St. Francis, portions of the White and Arkansas, and the Obion-Forked Deer Rivers in the northern section of the region and the Yazoo and Big Black Rivers in the southern section. The Atchafalaya River, the only major distributary of the Mississippi River, carries a portion of that stream's flow along with flows from the Red and Ouachita-Black Rivers. Timber production and livestock grazing constitute the major uses of the land. Much of the land below Baton Rouge, Louisiana, has been put to industrial use. This area has industrial development based on abundant resources of petroleum, salt, and sulphur; and seaport activities.

Hydrologic Characteristics

From the mouth of the Ohio River at Cairo, Illinois, the Mississippi River follows a sinuous path approximately 954 miles long before discharging into the Gulf of Mexico. The river averages 4,800 feet in width and its average slope is about 3-1/2 inches per mile. Channel characteristics of the river generally fall into three categories that correspond with what may be called the northern, central, and southern sections. In the northern section, from the mouth of the Ohio River to Helena, Arkansas, the river's channel is broad and shallow with many sand bars and islands. The slope is steep compared to that of downstream sections and changes in channel shape are rapid. There are several long, relatively straight reaches in this section. The river channel of the central section, Helena, Arkansas, to Angola, Louisiana, is deeper and narrower and has fewer sand bars and islands than that in the northern section. The channel is sinuous and therefore few long reaches have developed. Several natural cutoffs have occurred. In the southern section, Angola, Louisiana, to the Gulf of Mexico, the channel continues to deepen and become narrower as the slope decreases. In this section, the channel is more permanent as its meandering decreases. Very few sand bars develop and banks are composed of progressively finer deposits. A well-defined characteristic of WRPA 1 is the formulation of natural levees of heavy sediments near its banks. This results in drainage away from the stream to low ground near the valley walls, and bottom land drainage by streams running parallel to the main stem and joining it

through major tributaries or at points where the main stem meanders close to the valley wall.

Organization

Flood control, navigation, recreation, and fish and wildlife facilities within WRPA 1 are described in this section. Power, water supply and sewage treatment facilities, and archeological and historical sites related to WRPA 1 are described in sections for adjoining WRPA's.

FLOOD CONTROL

Authority

The Flood Control Act of 1928 authorized the expenditure of $325 million for construction of a Federal project to provide flood control in the alluvial valley of the lower Mississippi River and navigation from Cairo, Ill., to New Orleans, La. Local interests were charged with furnishing rights-of-way for levees and maintaining them after construction. Subsequent legislation has resulted in many modifications to the 1928 Act.

Description of Plan

The flood control plan is designed to control the "project flood." At Cairo, the project flood is estimated at 2,360,000 cubic feet per second (c.f.s.). The project flood is 11 percent greater than the record flood of 1927 at the mouth of the Arkansas River and 29 percent greater (3,030,000 c.f.s.) at the latitude of Red River Landing about 60 miles below Natchez, Miss.

The comprehensive flood control plan is a blending, in carefully selected quantities, of a number of features, each of which performs a contributing function and all of which together, when completed, will protect a large part of the alluvial valley from the project flood.

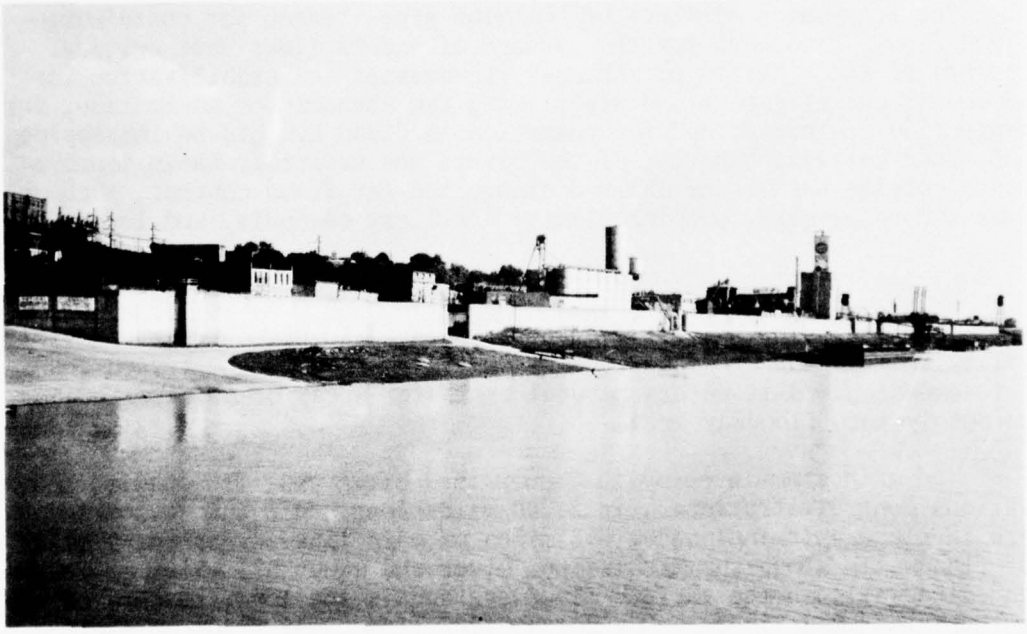
The four major elements of the plan are: Levees for containing flood flows; floodways for the passage of excess flows past critical reaches of the Mississippi; channel improvement and stabilization for improving the alignment and stabilizing the channel for navigation, for protection of levees, and for reduction in flood heights by increasing the flood carrying capacity of the river; and tributary basin improvements outside WRPA 1 for major drainage and for flood control, such as dams and reservoirs, pumping plants, auxiliary channels, and levees.

Main Stem Levees

The Mississippi River levees are designed to protect the alluvial valley against the project flood by confining flow to the leveed channel, except where it enters natural backwater areas or is diverted purposely into floodway areas.

The main stem levee system, comprised of levees, floodwalls, and various control structures, is 2,200 miles long. All but 28.3 miles are in place. It includes 1,518 miles of main line levees and 7 miles of floodwalls along the Mississippi River and about 671 miles of levees and floodwalls in the various floodways and in the lower reaches of the Arkansas and Red Rivers. During the 1973 flood, 168 miles of these

Mississippi River Levee.
Landside seepage berm under construction.



Floodwall at Vicksburg.

levees were raised because of subsidence of some sections and the fact that some levees had not been brought up to authorized grade.

The levee line on the west bank begins just south of Cape Girardeau, Mo., and, except where the waters of the St. Francis and the Arkansas-White join the Mississippi, with its incorporated structures, extends unbroken to the Gulf of Mexico. On the east bank of the river, levees alternate with high bluffs to give protection from floods.

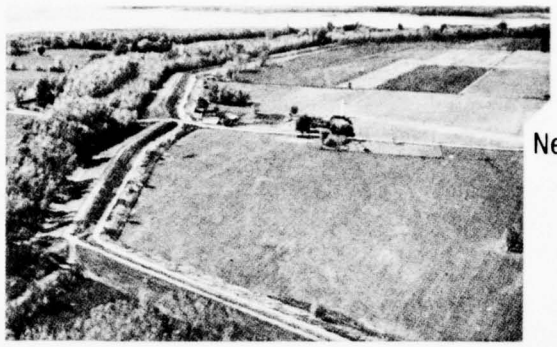
There are 19 miles of main line levee along the Little River Diversion Canal just southwest of Cape Girardeau. From Commerce, Mo., about 10 miles below Cape Girardeau, the west bank levee is continuous to the mouth of the St. Francis River just above Helena, Ark. Another levee line begins at Helena and protects the front of the White River Basin. The longest continuous levee line in the Mississippi River and Tributaries project, and probably in the world, begins at high ground near Pine Bluff, Ark., follows the south bank of the Arkansas River to its mouth, and continues down the Mississippi to its terminus in the vicinity of Venice, La., a distance of more than 650 miles. There are navigation locks through this levee line just above Torras, at Port Allen, at two locations near New Orleans, and at Empire, all in Louisiana.

Levees around Cairo extend 11 miles along the east bank of the Mississippi River and 10 miles along the Ohio River front. A 22-mile levee line begins at Hickman, Ky., and extends into upper West Tennessee. Another 37 miles of levee line extends southward from Tiptonville, Tenn., to the Obion River. It is planned to extend it another 7 miles below the mouth of the Obion River. Beginning just below Memphis at the head of the Yazoo Basin, there is a continuous 270-mile levee line to just above Vicksburg, Miss., where it connects to the Yazoo Backwater Levee. The east bank is largely hilly with a narrow flood plain from Cairo to Hickman, from 5 miles above Memphis to Memphis, and from Vicksburg to Baton Rouge, where the levee line begins again and runs continuously for 172 miles to Bohemia, La.

The levees are constructed by the Federal Government, but, after completion, are transferred to local interests for maintenance and operation, except for Government assistance as necessary during major floods. Periodic inspections of maintenance are made by U. S. Army Corps of Engineers personnel, as it is essential that the levees be maintained in good condition for their proper functioning in the flood control plan.

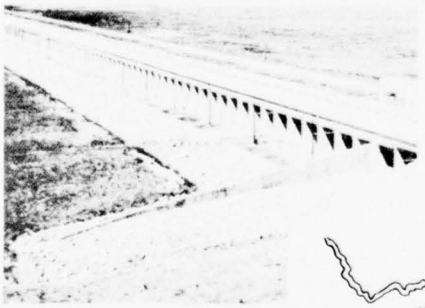
Floodways

When major floods occur and the carrying capacity of the Mississippi River leveed channel is exceeded, relief outlets through floodways are utilized as well as the storage capacity of the flat



Front line levee of Birds Point-New Madrid Floodway

Old River control structures



and Morganza structure

control the passage of part of the Mississippi's flow into the . . .

Atchafalaya Basin Floodway

Bonnet Carre Spillway passes some of the floodwaters into Lake Pontchartrain through leveed floodway

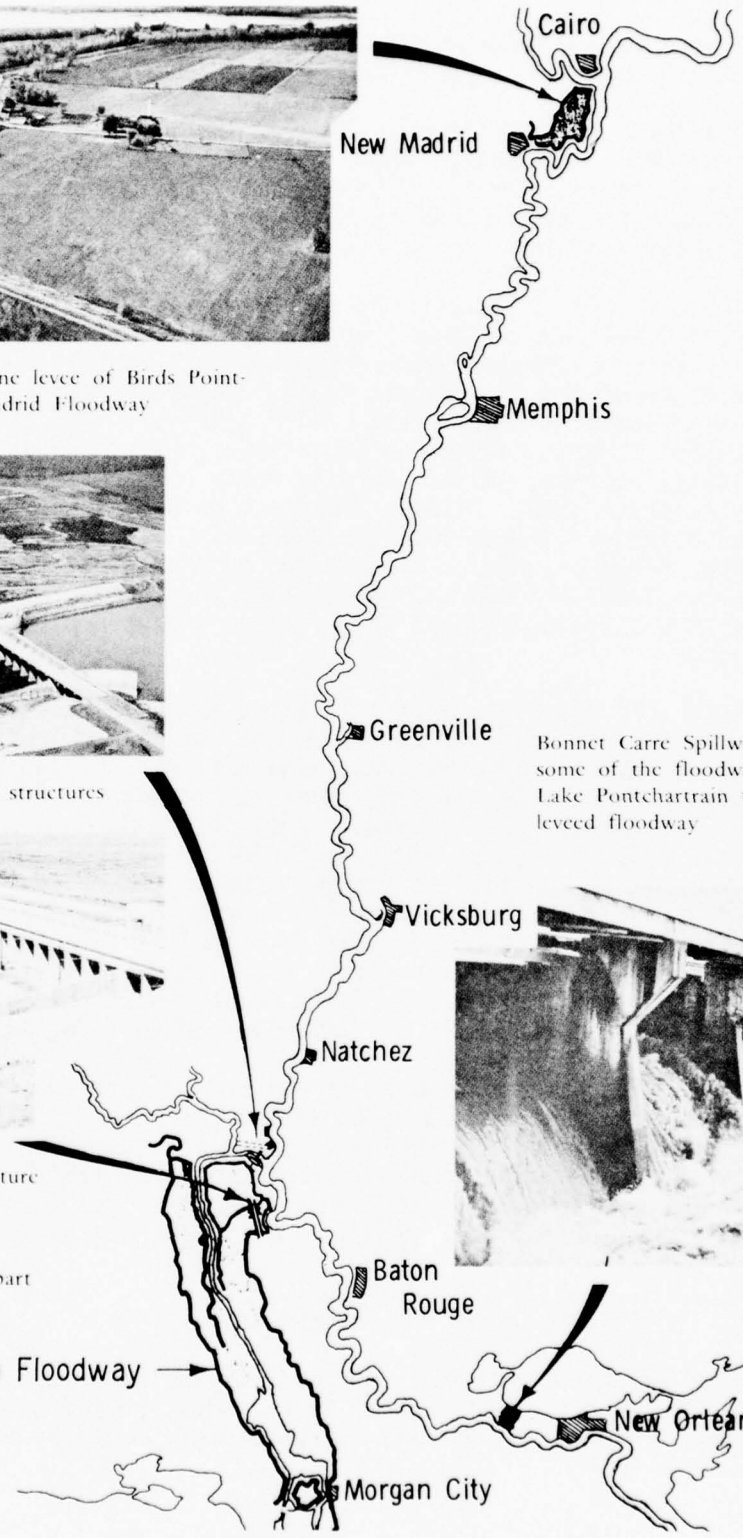


Figure 1-a Control Structures and Floodways

lowlands at the junctions of tributaries with the Mississippi. These are called "backwater areas" and are, in effect, "mid-river reservoirs" that store water during times of flood. They are protected from lesser floods by levee systems that are overtopped by major floods.

From Cairo to New Madrid, Mo., the east bank bluffs and the levee as originally built on the west bank left only a narrow channel through which the river could flow at flood stage. To protect the city of Cairo and to reduce the flood heights to which the controlling levees on the Missouri side would otherwise be subjected, the project provides for a setback levee about 5 miles west of the riverfront levee through this reach. The strip between this setback levee and the levee adjacent to the river forms what is known as the Birds Point-New Madrid Floodway, operated only at extremely high stages. Water enters the floodway through "fuse plugs" in the old front levee opposite Cairo and reenters the main river just above New Madrid. The floodway was operated in 1937 and was of material aid in reducing flood heights at and above Cairo.

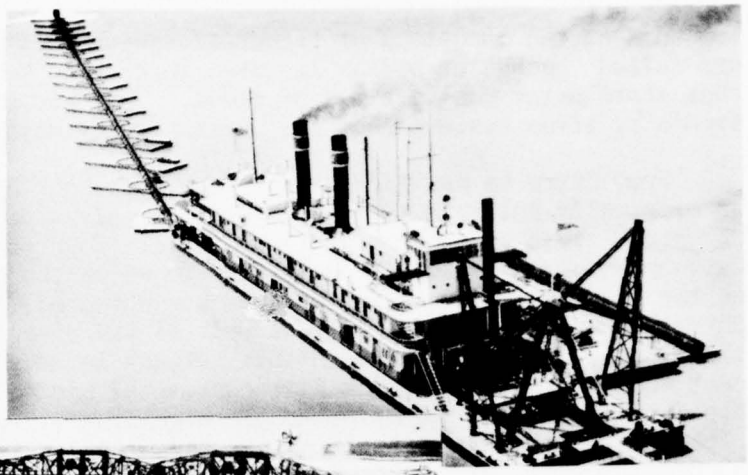
At the latitude of Red River Landing, the project flood is estimated at 3,030,000 c.f.s. The project provides for dividing this great quantity of water, with 1,500,000 c.f.s. of the flow continuing down the main river channel, the remaining 1,530,000 c.f.s. being diverted to the Morganza and West Atchafalaya Floodways and to the Atchafalaya River.

Of the 1,500,000 c.f.s. flowing down the main channel below Morganza Floodway, 250,000 c.f.s. are to be diverted to Lake Pontchartrain and the Gulf through the Bonnet Carre Spillway, located about 25 miles above New Orleans. The remaining 1,250,000 c.f.s. will continue down the river to the mouth. This spillway has been operated in 1937, 1945, 1950, and again in 1973.

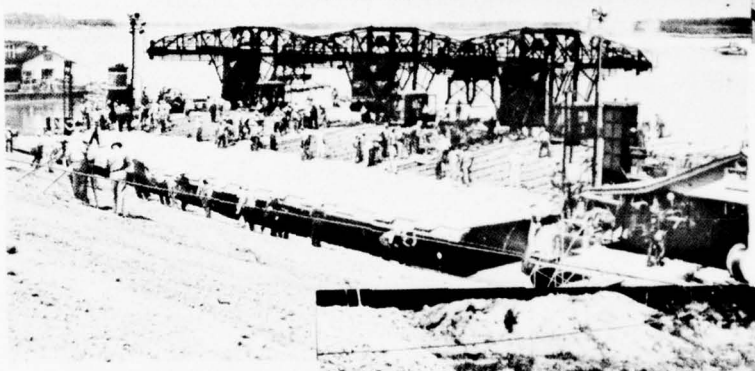
That portion of the flow diverted from the main channel in the vicinity of Old River is carried by the Atchafalaya River, the Morganza Floodway, and West Atchafalaya Floodway. The Morganza and the West Atchafalaya Floodways follow guide levees on opposite sides of the Atchafalaya River until the end of the levee system along the Atchafalaya River is reached; there they merge into a single broad floodway which passes the flow to the Gulf through two outlets, Wax Lake and Berwick Bay. In major floods, water would enter the Morganza Floodway through a control structure just above Morganza, La. This spillway was opened in 1973 to protect Old River Structure which had a collapsed wingwall.

Channel Improvement and Stabilization

The initial authorization provided for a minimum program of progressive channel stabilization and river regulation for levee protection

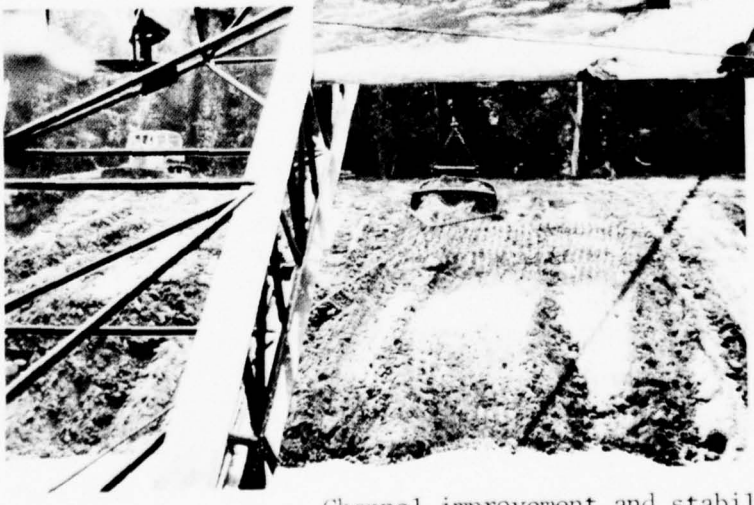


DREDGING



BANK PROTECTION

STONE DIKE



BANK GRADING

Channel improvement and stabilization.

and maintenance of navigation channels to be accomplished by revetment and contraction works. From 1928-1936 most of the channel improvement resources were devoted to protection of main line levees. Originally, the plan provided for west bank floodways in the area between the Arkansas River and Old River, since the project flood would have required raising levee heights in unsafe amounts. In the early 1930's, a program of channel cutoffs was inaugurated, and by 1941, the cutoffs had demonstrated their worth by lowering the river stages over 12 feet at Arkansas City and 6 feet at Vicksburg. It is estimated that stages now are lowered as much as 15 feet at Arkansas City and 11 feet at Vicksburg. There were 16 such cutoffs which, combined with other channel shortenings during the period, reduced the river distance from Memphis to Baton Rouge by 170 miles. Success of the cutoffs made it practical to confine the project flood in the reach between the Arkansas and Old Rivers by a moderate increase in levee grade and section, and the authorized project was revised by Congress in 1941 to omit the previously authorized Eudora Floodway and provide for the confinement of the flood by levees. No other cutoffs have been made on the Mississippi, but they are being made on tributary streams.

Stabilization and protection of the riverbanks is important to the flood control and navigation plan, serving to protect flood control features and to ensure the desired alignment of the river's navigation channel.

To date, the most economical and effective means of protecting the banks to prevent caving and erosion is revetment composed of an articulated concrete mattress underwater and stone (riprap) paving above the water, both placed on a graded bank. The mattress is composed of 20 individual concrete blocks or slabs, each 4 feet long, 14 inches wide, and 3 inches thick, which are cast into unit squares 4 feet wide and 25 feet long, using corrosion-resistant reinforcing fabric. These unit squares are assembled on the launching ways of a specially designed sinking barge, fastened together to form a mattress 140 feet in width along the riverbank. After the first launch is anchored to the bank and lowered by moving the sinking barge out into the river 25 feet, another launch is assembled on the deck and fastened to the first. This method of assembly is repeated until the mattress is long enough to extend beyond the deepest water. The procedure is then repeated with each succeeding mattress overlapping the previous mattress like shingles on a roof. Normally, the entire bend is revetted from the upstream point where the channel crosses to the opposite bank. As of June 30, 1972, 643 miles of revetment are in place and operative.

Casting of the articulated concrete mat squares is carried on by contract at Government-owned and leased casting fields located along the lower Mississippi River at Cates Landing, Tenn., Caruthersville, Mo., Richardsons Landing, Tenn., Helena, Ark., Greenville, Miss., and Delta, Vidalia, and St. Francisville, La. The locations of the fields afford the most economical transportation to the site of construction. The

eight fields have a total storage capacity of 1,300,000 squares, about 2,500 acres of concrete mattress.

Under the present system of operations, the contractor furnishes all materials, except the reinforcing fabric and forms. The mats are cast under the supervision and inspection of Government forces. Transportation of the finished mats to the site of construction is performed by Government hired labor forces. Bank grading and sinking of the underwater mattress is performed by hired labor and upper bank paving is performed by contract. Revetment systems and their operative lengths are shown on the map index on page 34 and on the map at the end of this section.

Stone dikes are used to obtain accretion or arrest migration of sandbars. This regulates or contracts the width of the low-water channel and directs it into favorable alignment. Dikes are usually constructed in the convex part of bends and where the channel crosses to the opposite shore. They are also employed to assist in closing secondary channels and chutes. As of 1970, 115 miles of dikes have been completed. A listing of dike systems and operative lengths is shown on Table 11.

Dredging is used to assist in obtaining the planned alignment and to clear away all remaining obstructions in the channel. Cutterhead-type dredges dig and remove material from the channel, discharging it through a long pipeline and depositing it out of the channel. This material is used where it is needed for filling dike fields and closing secondary channels.

The Flood Control Act of 1928 authorized work that would give the various basins protection against Mississippi River floods only, although the tributary streams within the basin caused frequent flood damage which could not be prevented by the main stem Mississippi River protective works. Later amendments to this Act have authorized work that provides alleviation of the tributary flood problems. Tributary basin improvements are discussed under the headings of the WRPA's in which they are located.

Benefits from the Project

Because of the complicated nature of this comprehensive project and the large and diverse area affected, it is difficult to enumerate all the benefits resulting from its construction. When it is completed, it will give full flood protection to about 15,117,000 acres of land, partial protection to an additional 1,923,000 acres, and material benefit through major drainage improvement to about 2,700,000 acres. Also, it provides indirect flood control and navigation benefits to the entire central portion of the United States.

Since 1928, when the present project was authorized, there has been, with one exception, no failure of flood control works and no general overflow of the valley, despite high waters that have reached record stages at some points within the valley. This long period of freedom from flood damage has created a feeling of security in the valley which did not exist previously. The result has been a tremendous advance in the social and economic development of this part of the nation.

The effectiveness of the completed flood control works and the soundness of the plan have been amply demonstrated during high-water periods. For example, although the flood of 1927 is generally considered to be the greatest flood to occur in the lower Mississippi valley in modern times, the flood of 1937 was greater in the area between Cairo and Memphis. In the lower reaches of the river, the control works were given a severe test by the flood of 1945 and again in 1950. The most recent severe flood experienced in the lower Mississippi valley was that of 1973 when, although high damage estimated at about $725 million occurred in unprotected backwater and tributary areas, the main stem Mississippi River levees and completed tributary works prevented damages estimated at about $12.8 billion. Flood damages prevented in a two month period in 1973 were enough to pay for the project several times over. Since 1928, the project is estimated to have prevented flood damage of more than $21.7 billion, based on the state of development and price index at the time the individual floods occurred.

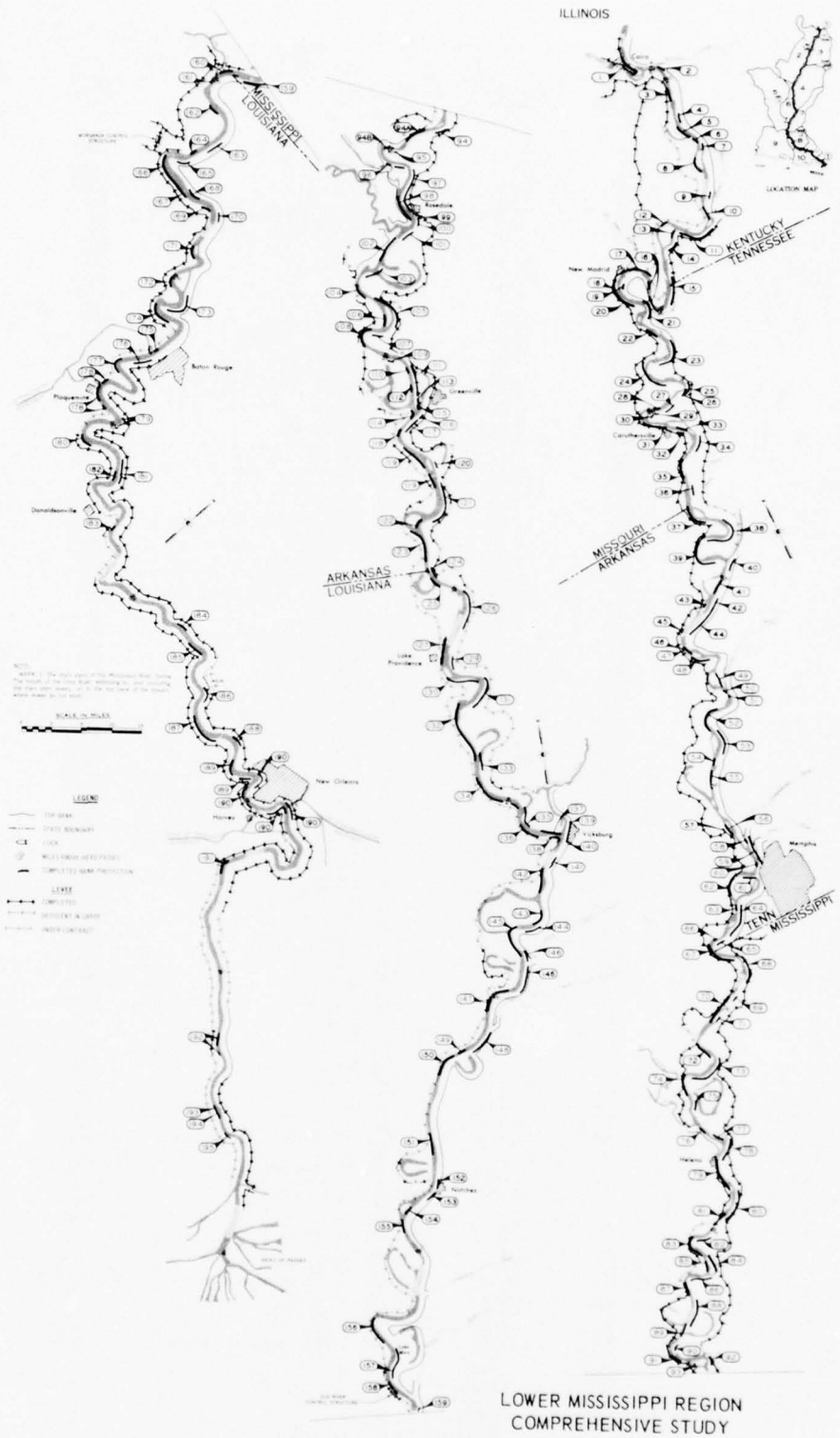
Table II - Mississippi River Dike Systems, 30 June 1970

Name	1962 River Mile AHP	Operative Length Feet
Island 1, Ky.	948L	14,960
Pritchard, Mo.	944R	9,280
Campbell, Ky.	942L	2,610
Island 9, Ky.	906L	7,010
Ruddles Point, Mo.	874R	8,040
Stewart Towhead, Mo.	871R	18,300
Below Cherokee, Tenn.	866L	5,620
Hathway, Tenn.	854L	13,670
Caruthersville-Linwood Bend, Mo.	844R	17,100
Island 20, Mo.-Tenn.	831R	18,080
Head of Island 21, Tenn.	828L	5,460
Island 21 Chute, Tenn.	824L	3,170
Wrights Point, Ark.	820R	12,050
Below Tamm Bend, Tenn.	813L	8,470
Island 25, Ark.	804R	5,000
Forked Deer, Tenn.	798L	8,550
Ashport-Golddust, Ark.	795R	17,330
Kate Aubrey, Tenn.	791R	8,620
Lookout, Tenn.-Ark.	771R	5,500
Densford, Tenn.	757L	7,780
Poker Point, Ark.	748R	8,440
Randolph Point, Tenn.	747L	16,760
Redman Point, Tenn.-Ark.	743R	7,750
Above Loosahatchie, Tenn.	742L	7,550
Loosahatchie Bar, Tenn.	739R	3,950
Robinson Crusoe, Tenn.	738R	21,090
Hopefield Point, Ark.	736R	1,330
Dismal Point, Ark.	724R	19,510
Armstrong, Ark.	720R	18,730
Coahoma, Tenn.	718L	4,260
Cat Island, Ark.	710R	9,730
Seypel, Ark.	705R	11,640
Pickett, Miss.	704R	7,180
Porter Lake, Ark.	701R	7,920
Buck Island, Miss.	700L	6,970
Basket Bar, Ark.	696R	5,090
Commerce, Miss.	694L	5,700
St. Francis Towhead, Ark.	671L	3,380
Prairie Point, Ark.	668R	7,430
Friars Point, Ark.	652L	6,870
Kangaroo Point, Ark.	648R	5,730
Island 63, Miss.	640L	6,120
Island 62, Ark.	638R	13,095
Island 64, Ark.	630R	7,270
Sunflower, Ark.	627L	5,520
Henrico, Ark.	603R	6,310
Island 70, Miss.	607.5L	9,880
Smith Point, Miss.	600L	4,777
Montgomery Towhead, Ark.	592R	6,081
Terrene, Miss.	589.5L	7,921
Malone Field, Ark.	585R	7,090
Chicot Landing, Ark.	564.5R	13,035
Ashbrook Cutoff, Miss.	549L	8,728
Ashbrook-Miller Bend, Ark.-Miss.	547L&R	10,799
Island 82-Miller Bend, Ark.-Miss.	544L&R	13,902
Leland Neck, Miss.	540.5L	4,315
Tarpley Cutoff, Miss.-Ark.	540.3R	5,100
Leland Bar, Miss.	538R	14,465
Island 84, Ark.	532.5L	4,580
Walnut Point, Miss.	524.6L	4,725
Seven Oaks, Ark.	523.5R	5,570
Island 86, Ark.	520.2R	6,592
Leota, Miss.	514L	7,571
Cracraft, Ark.	512.5R	3,720
Cracraft Lower, Ark.	510R	5,294
Wilson Point, La.	500R	3,592
Baleshed Landing, Miss.	493L	8,388
Ben Lomond, Miss.	487.2L	15,359
Ajax Bar, Miss.	482L	19,044
Racetrack Towhead	431R	1,752
Below Racetrack, Miss.	430.5L	5,808
Yucatan, La.	410.1R	7,938
Waterproof, La.	379R	8,180
TOTAL		609,131

Project Map Index - WRPA 1 - Mississippi River Revetments, 30 June 1970

No.	Name	1962 River Mile AHP	Operative Length Feet
1	Cache-Cairo, Ill.	958R	22,702
2	Wickliffe, Ky.	953L	8,455
3	Pritchard, Mo.	948R	15,045
4	Campbell, Ky.	943L	6,865
5	Island 3 & 4, Ky.	940R	15,580
6	Belmont, Mo.	938R	5,785
7	Columbus, Ky.	937L	3,825
8	Wolf Island, Ky.	934R	13,335
9	Williams, Ky.	927L	7,745
10	Beckwith Bend, Mo.	924R	14,588
11	Hickman-Reelfoot, Ky.	919L	41,969
12	Bend of Island 8, Mo.	914R	9,800
13	Island 8, Ky.	914R	7,725
14	Chute of Island 8, Ky.	913L	12,620
15	Island 9, Ky.-Tenn.	905L	20,075
16	Slough Landing Neck, Tenn.-Ky.	899L	28,960
17	LaForge, Mo.	892R	20,710
18	New Madrid, Mo.	880R	5,559
19	Kentucky Point	887L	4,487
20	New Madrid Bend, Mo.	886R	30,105
21	Below Toneys Towhead, Tenn.	879L	20,895
22	Linda, Mo.	876R	11,950
23	Merriwether-Cherokee, Tenn.	869L	39,815
24	Little Cypress Bend, Mo.	864R	32,240
*25	Bend of Island 14, Tenn.	859L	12,050
26	Lee Towhead, Mo.	859L	8,690
27	Fritz Landing, Tenn.	857L	15,670
28	Robinson Bayou, Mo.	852R	11,360
29	Hathaway Landing, Tenn.	852L	1,000
30	Island 15, Tenn.	851L	3,895
31	Gayoso-Caruthersville, Mo.	848R	25,600
*32	Bells Point, Mo.	845R	9,420
33	Baker Towhead, Tenn.	845L	7,057
34	Linwood Bend, Tenn.	841L	14,850
35	Island No. 18, Mo.	836R	22,170
36	Heloise, Tenn.	831L	12,935
37	Huffman-Hickman, Ark.-Tenn.	826R	26,984
38	Obion-Tawn, Tenn.	819L	39,505
39	Barfield, Ark.	808R	42,040
40	Bend of Island 25, Tenn.	803L	22,730
41	Island 26, Tenn.	798L	15,690
42	Ashport, Tenn.	795L	6,828
43	Kate Aubrey, Tenn.	793R	2,500
*44	Keyes Point, Tenn.	791L	29,294
*45	Osceola, Ark.	786R	9,823
*46	Osceola, Ark. (Rock Groins)	786R	1,350
47	Island 30, Tenn.	786R	13,348
48	Bullerton Bar, Ark.	782R	27,520
49	Sunrise Towhead, Tenn.	776R	13,565
50	Lookout, Tenn.	774R	5,005
51	Lookout Bar, Tenn.	772R	2,990
52	Chute of Island 35, Tenn.	764R	29,190
53	Cedar Point-Densford, Tenn.	759L	20,190
54	Dean Island, Ark.	756R	7,555
55	Brandywine, Ark.-Tenn.	750R	18,060
56	Island 40, Tenn.	744R	28,850
*57	St. Clair, Ark.	742R	2,930
58	Loosahatchie Bar, Tenn.	740R	2,070
59	Loosahatchie-Memphis, Tenn.	737L	31,293
60	Hopefield Point, Ark.-Tenn.	736R	5,505
61	Presidents Island, Tenn.	733L	12,755
62	Bauxippi-Wyanoke, Ark.	730R	25,500
63	Dismal Point, Ark.	724R	7,200
64	Ensley, Tenn.	723L	36,566
65	Coahoma, Tenn.	717L	9,270
66	Cow Island Bend Upper, Ark.	716R	7,003
67	Cow Island Bend, Ark.	714R	22,274
68	Norfolk-Star, Miss.	709R	35,582
69	Pickett, Ark.-Miss.	703L	12,575
70	Porter Lake, Ark.	700R	33,805
71	Commerce, Miss.	695L	11,615
72	Peters, Ark.	692R	25,690
73	Mhoon Bend, Miss.	685L	35,828
74	Walnut Bend, Ark.	680R	27,220
75	Harbert Point, Miss.	675L	8,065
76	St. Francis, Ark.	672R	13,515
77	Flower Lake, Miss.	667L	12,740
78	Trotters Landing, Miss.	665L	32,905
79	Helena, Ark.	660R	36,460
80	Delta-Friars Point, Miss.	655L	30,090
81	Westover, Ark.	650R	12,730
82	Horseshoe, Miss.	647L	16,385
83	Oldtown Bend, Ark.	644R	25,995
84	Island 63 Bar, Ark.	639L	18,820
85	Island 62, Ark.	638R	9,030
86	Burke Landing, Miss.	637L	19,070
87	Fair Landing, Ark.	632R	16,850
88	Rescue Landing, Ark.-Miss.	629L	27,020
89	Ludlow, Ark.	626R	10,380
90	Island 67, Miss.	621L	7,625
91	Knowlton, Ark.	620R	16,000
92	Cessions, Miss.	615.5L	10,910
93	Cessions Towhead, Ark.	615L	8,455
94	Dennis, Miss.	611.5	14,520
94A	Henrico, Ark.	605R	25,040
94B	Scrubgrass Bend, Miss.	600L	5,075
95	Smith Point, Miss.	601.5L	8,800
96	Big Island, Ark.	598R	16,515
97	Victoria-Terrene, Miss.	593L	29,245
98	Klondike, Ark.	588.5R	21,120
*99	Riverton, Miss.	586L	12,500
100	Rosedale Bend, Ark.	584.8L	3,510
101	Prentiss, Miss.-Ark.	582.5L	20,315
102	Ozark, Ark.-Miss.	578R	22,015
103	Catfish Point, Miss.-Ark.	573L	20,075
104	Cypress Bend, Ark.	568.5R	26,585
105	Eutaw-Mounds, Miss.	563.5L	29,818
106	Pair O'Dice, Ark.	561R	9,095
107	Huntington Point, Miss.	556L	10,045
108	Ark. City-Yellow Bend, Ark.	553R	40,560
109	Ashbrook Island, Miss.	549R	3,455
110	Island 82, Ark.	546R	3,080
111	Miller Bend, Miss.	544L	29,360
*112	Tarpley Island, Miss.	542.5R	2,000
*113	Leland Cutoff, Ark.	539.5L	1,300
114	Spanish Moss, Ark.	539R	4,580
115	LaGrange Towhead, Miss.	538R	9,130
116	Warfield Point, Miss.	537L	4,320
117	Island 84, Ark.-Miss.	535L	15,475
118	Vaucluse, Ark.	534R	4,300
119	Sunnyside-Lakeport, Ark.	530R	33,685
120	American Cut-off, Ark.-Miss.	526L	2,980
121	Walnut Point-Kentucky Bend, Miss.	519.5L	45,655
122	Worthington, Miss.-Ark.	514R	8,350
123	Cracraft, Ark.	511R	22,210
124	Carolina, Miss.	507.5L	11,080
125	Sarah Island-Opposum Point, La.-Miss.	503R	16,970
126	Mayersville, La.-Miss.	497L	31,462
127	Baleshed-Stack Island, Miss.-La.	488R	38,850
*128	Lake Providence, La.	489R	11,600
129	Ben Lomond, Miss.	486.5L	10,235
130	Hagaman, La.	481R	37,756
131	Fitler-Cottonwood, Miss.	474.5L	28,427
132	Goodrich, La.	467.5R	32,300
133	Belle Island, La.-Miss.	460.5L	23,160
134	Milliken Bend, La.	453R	44,650
135	Marshall-Brown's Point, La.-Miss.	446.5L	19,580
136	False Point, La.	443R	12,860
137	Kings Point-Opposite Delta Point, Miss.-La.	439L	19,330
138	Delta Point, La.	437.5R	7,060
139	Vicksburg Harbor, Miss.	437.5L	7,350
140	Barge Line Terminal, Miss.	437L	5,040
141	Racetrack, Miss.	433L	13,935
142	Reid Bedford, La.	429R	18,392
143	Diamond, La.-Miss.	423R	12,125
144	Lake Karnac, Miss.-La.	419L	19,260
145	Point Pleasant, Miss.-La.	413.5R	32,345
146	Grand Gulf, Miss.	403L	30,915
147	Hardscrabble, La.	398R	22,550
148	Goldbottom, Miss.	392L	23,300
149	Browns Field, La.	388R	7,600
150	Kemp Bend, La.	383.5R	19,180
151	Gibson, La.	371.5R	9,518
252	Natchez Front, Miss.	364L	6,045
153	Carthage, Miss.	361.5L	6,180
154	Natchez Island, Miss.	357.5R	2,180
155	Morville, La.	355.5R	5,730
156	Bougere Bend, La.	329R	20,805
157	Palmetto	321.5L	25,914
158	Coochie	317R	14,660
159	Port Adams	308.5L	17,219
160	Above Old River	304.5R	4,800
161	Carr Point	303.5R	8,600
162	Hog Point	296R	8,673
163	Greenwood Bend	289L	14,987
164	Brunette Point	285R	8,038
165	Iowa Point	282L	11,375
166	Morganza	279R	20,513
167	Boles Point	274.5R	16,094
168	Arrow Bend	271.5L	13,600
169	Red Store	269R	7,830
170	Bayou Sara, La.	265L	4,780
171	Grand Bay	257.5R	7,090
172	Arbroth	250R	13,190
173	Springfield Bend	244L	25,690
174	Allendale	238R	17,940
175	Port Allen	230.5R	5,220
176	Arlington	226.5L	12,244
177	Missouri Bend	222R	16,193
178	Plaquemine Bend	209R	29,885
179	St. Gabriel	201L	14,371
180	White Castle	193R	7,282
181	New River Bend	185L	22,154
182	Philadelphia Point	183R	5,379
183	St. Alice	165R	3,492
184	Reserve	138.1L	6,032
185	Lucy	136R	11,916
186	Good Hope	125.5L	14,980
187	Luling	119R	21,523
188	Kenner	113.7L	9,089
189	Avondale Bend	108.5R	22,371
190	New Orleans Harbor (Combined)	92.7-103.6L&R	72,801
191	Jesuit Bend	68R	9,185
192	Port Sulphur	59R	7,508
193	Tropical Bend	28R	11,600
194	Buras	25.1R	6,867
195	Lower Childress-Fort Jackson	21.5R	7,124
	TOTAL		3,238,649

*Dead Revetment



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

LEVEES, REVETMENTS AND DIKE SYSTEMS

WRPA 1

FIGURE 2

NAVIGATION

In 1896, Congress authorized a navigation channel on the Mississippi River 9 feet deep and 250 feet wide at low water between Cairo, Illinois, and Head of Passes. In 1928, the authorized width was increased to 300 feet, and in 1944, the authorized channel depth from Cairo to Baton Rouge was increased to 12 feet at low water, with the authorized width remaining at 300 feet. The 12-foot channel is to be obtained by a program of bank stabilization and maintained by dredging. A 9-foot depth is now being maintained.

After the mouth of the Mississippi River was opened and maintained in a navigable state, Congress authorized in 1945 (H.D. 215, 76th Congress, 1st Session) the development of a navigation channel for oceangoing traffic in the lower reaches of the river. In the 1945 Act and also in the River and Harbor Act of 1962, several separate projects for the Mississippi River, Baton Rouge to New Orleans, South Pass and Southwest Pass were combined. The depths and widths of the channel between Baton Rouge and the Gulf of Mexico are as follows. Plane of reference is low water.

Baton Rouge to New Orleans - 40 feet by 500 feet, 129.4 miles long

Port of New Orleans - 35 feet by 1,500 feet, with portion 40 feet by 500 feet, 17.3 miles long

New Orleans to Head of Passes - 40 feet by 1,000 feet, 86.7 miles long

In Southwest Pass - 40 feet by 800 feet, 21.2 miles long

In Southwest Pass Bar Channel - 40 feet by 600 feet

In South Pass - 30 feet by 450 feet, 13.5 miles long

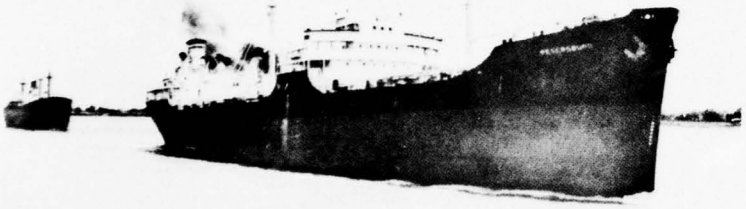
In South Pass Bar Channel - 30 feet by 600 feet

Mississippi River-Gulf Outlet - 36 feet by 500 feet, 76 miles long

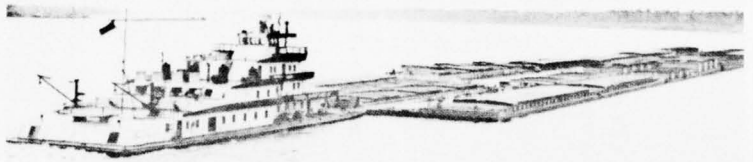
Navigation depths on the lower Mississippi River are maintained, when necessary, by dredging. The Mississippi River is actually a series of pools and bars, or "crossings," which occur where the stream current crosses from one side of the river to the other and deposits sand in the form of bars. So, it is the depth available at the crossings that determines the navigation depths available, and this is the depth maintained by the Corps of Engineers. Actually, in the pools very great depths exist. The number of crossings dredged and

Inner Harbor Navigation Canal Lock, New Orleans.

Typical diversified commercial tow.



Oceangoing ship below Baton Rouge.



M/V United States.

Mississippi River navigation.

redredged, and the amount of dredging required in any one low-water season, depends largely upon the duration of the low-water season and the frequency of stage fluctuations during the low-water season. All of these factors directly affect the stability of the dredge cuts in the sandy bed of the Mississippi River.

The dredging required to maintain a 9-foot channel between Cairo and Baton Rouge in a period of one year, ranges from about 30 million cubic yards to 70 million cubic yards. Four dustpan dredges move the bulk of this material, and large cutterhead hydraulic dredges perform special work such as removal of compact clay or gravel formations and old revetments and pile dike obstructions.

Improved channels, towboats and barges, and harbor terminal facilities have also made enormous contributions to the growth in inland waterways traffic. Many port cities in the Mississippi Valley have constructed, or are building, modern river-rail-truck terminals, storage facilities, warehouses, and other improvements designed to accommodate the shipment of materials by water. Listings of these facilities are made under paragraphs describing navigation facilities in adjoining WRPA's.

A comparison of river port tonnages and total waterborne commerce is shown in tables 12 and 13.

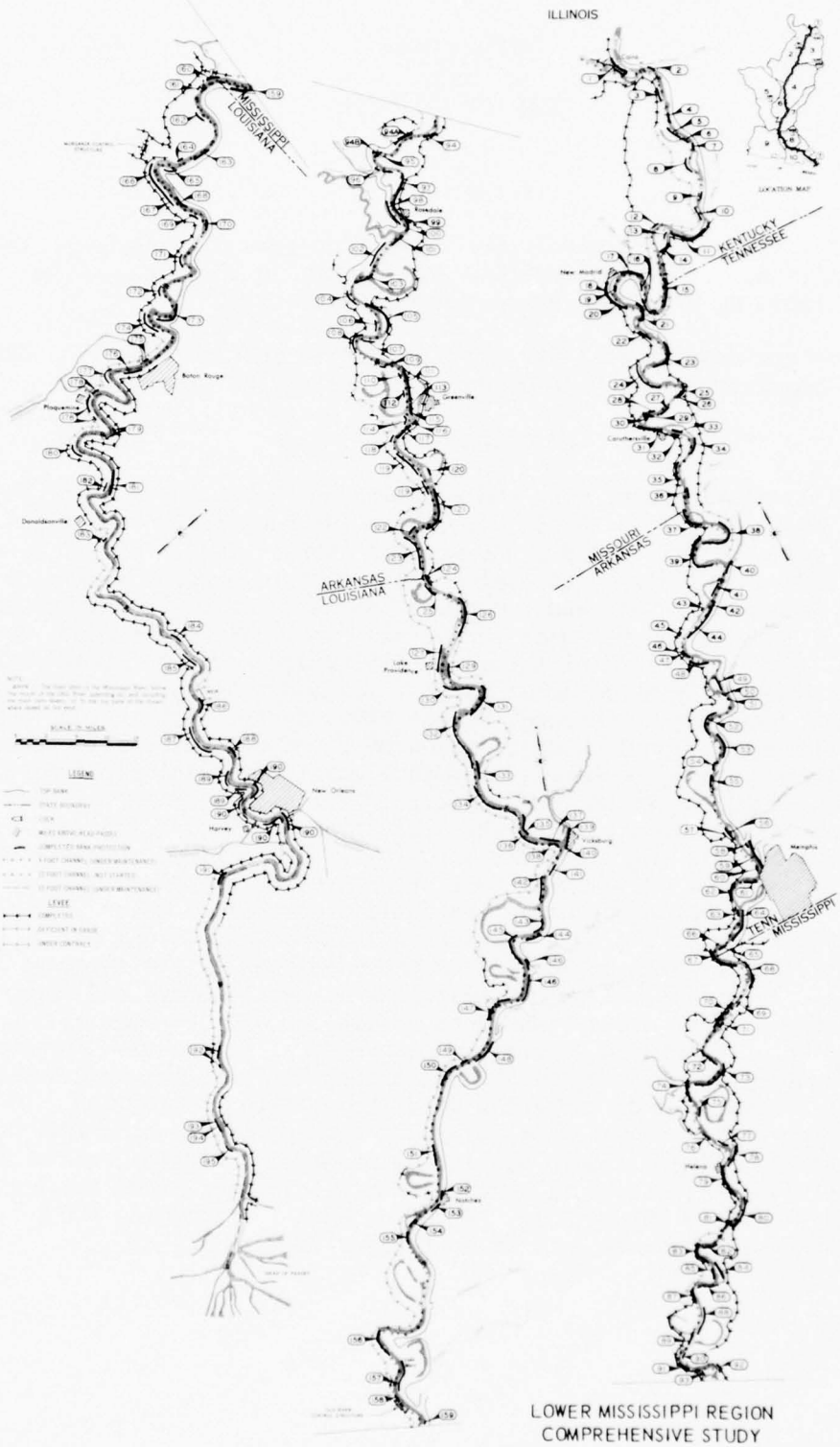
Navigation benefits are derived from all components of the overall plan of developing the Mississippi River. The contribution of each element to the overall plan is inseparably related to that made by others. Therefore, their benefits are inseparable and a composite benefit/cost ratio for WRPA 1 is necessary. The total Federal cost for all mainstem components including levees and channel improvements is $2,001,548,000. Non-Federal cost is $361,768,000. Average annual navigation benefits are $338,388,000. The composite benefit/cost ratio is 16.2 to 1.

Table 12 - Port Tonnages

	1961	1970	Percent Increase
Memphis	6,876,731	10,017,785	46
Helena	1,873,930	2,195,436	17
Greenville	1,016,549	1,701,940	67
Lake Providence		446,782	-
Vicksburg	1,002,720	2,035,182	103
Natchez	521,713	489,156	-6
Baton Rouge	28,712,071	45,535,281	59
New Orleans	61,313,877	123,674,208	102

Table 13 - Waterborne Commerce (Short Tons)

	1961	1970	Percent Increase
Mississippi River Mouth of Passes to Cairo	114,729,777	220,037,313	92
Cairo to Baton Rouge	42,500,033	85,882,706	102
Baton Rouge to New Orleans	58,140,235	131,669,886	126
New Orleans to Mouth of Passes	85,619,463	157,597,436	84



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

NAVIGATION

WRPA 1

FIGURE 3

RECREATION
AND
FISH AND WILDLIFE

Recreation

WRPA 1 is used extensively for recreation pursuits, although there is virtually no recreation facility development in this area. The frequent flooding precludes any permanent structures.

There are approximately 90,000 acres of recreation water in WRPA 1, the most popular, for recreation purposes, being the oxbow lakes.

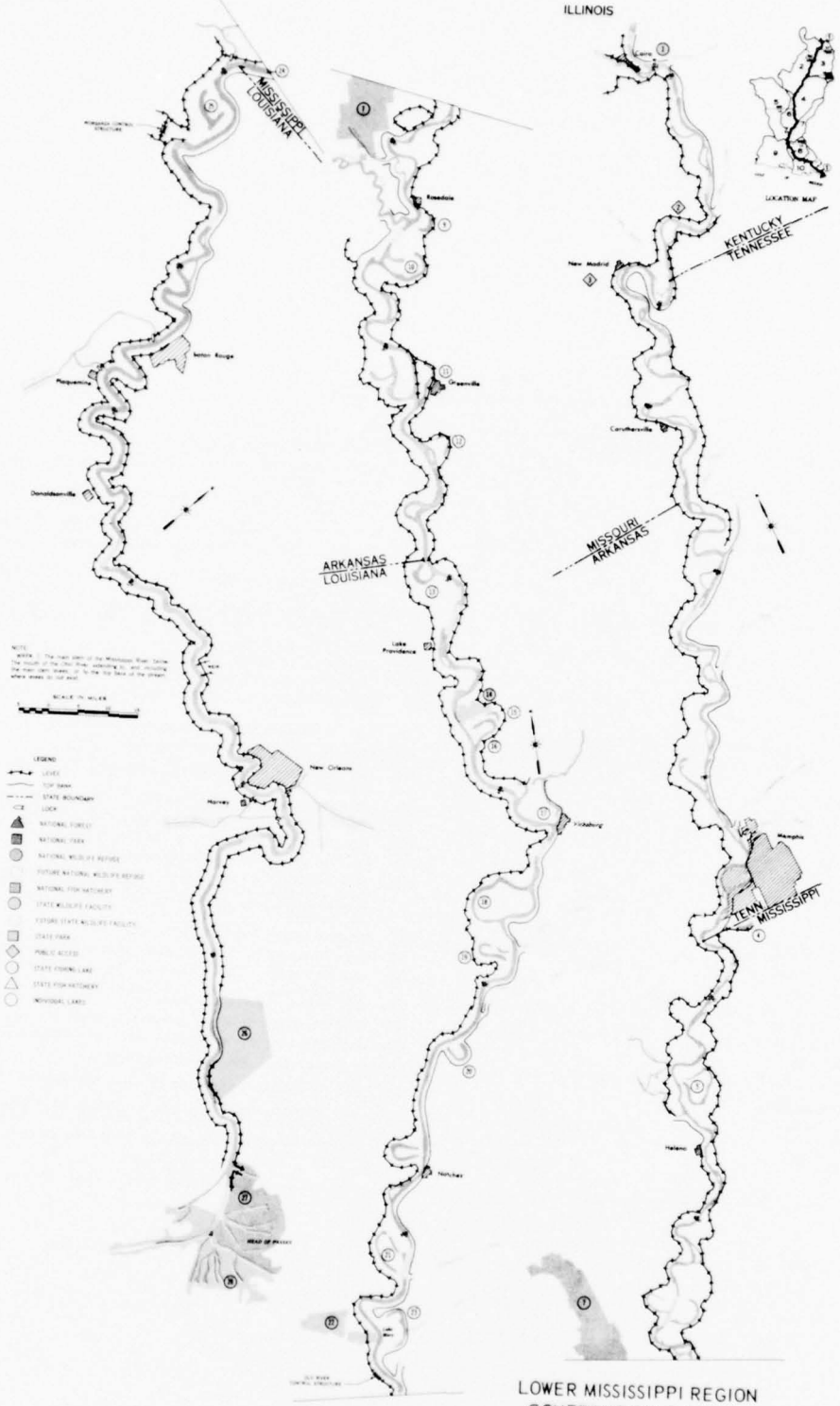
Fish and Wildlife

WRPA 1 water-related fish and wildlife resources include 368,000 acres of water over 40 acres in size which includes the 954 miles of the Mississippi River, and 879,000 acres of forest land. WRPA 1 water-related fish and wildlife facilities include state ownership of five wildlife management areas and two public access areas. Federally owned facilities include one national forest and two wildlife refuges. However, only small portions of these facilities are actually within WRPA 1, as they are shared with adjacent WRPA's. In addition to existing facilities, Congress authorized, by the Flood Control Act of 1965, under the Comprehensive Plan for modification of flood control and improvement of the lower Mississippi River, a project entitled "Mississippi Delta Region." The objective of this project is the establishment of an ecological regimen favorable to the production of oysters, shrimp, fish, fur-bearing animals and migratory waterfowl. The project consists of four gated water-or salinity-control structures in the Mississippi River levees, with connecting channels that will divert fresh water from the Mississippi River to the bays and marshes of the Mississippi Delta. Control structures will be located on the east bank of the river at Bohemia and Scarsdale and on the west bank at Myrtle Grove and Homeplace. Costs of the project are estimated to be $16,300,000 (30 June 1971), to be shared equally between Federal and non-Federal interests. Numerous private hunting and fishing facilities exist, but have not been inventoried. All areas are capable of supplying wildlife-oriented recreation. Wildlife-oriented recreation consists of nature study, especially bird watching, and nature photography. Such use is nonconsumptive within certain limits. Freshwater fishing, waterfowl hunting, and wildlife-oriented recreation demands are unknown for WRPA 1. Demand on WRPA 1 originates from adjacent WRPA inhabitants, and in most cases is very high.

PROJECT MAP INDEX

Recreation, Fish, and Wildlife Facilities - WRPA 1

Map Location No.	Name of Project	Agency	Project Use	Description
15.	Albamarle Lake		F&W	High F&W rating. 740-ac. Miss. R. oxbow lake. Good fishing & waterfowl hunting.
1.	Ballard County Wildlife Mgmt. Area (Mitchell Tract)	Ky. Dept. of Fish & Wildlife Resources	F&W	High F&W rating. 245 ac. Excellent waterfowl hunting. Some fishing use.
26.	Bohemia Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 35,000 ac. Excellent waterfowl hunting & fishing.
17.	Centennial Lake		F&W	High F&W rating. 352-ac. Miss. R. oxbow lake. Waterfowl hunting & fishing.
16.	Chotard Lake		F&W	High F&W rating.980-ac.Miss.R. oxbow lake. Excellent fishing & waterfowl use.
27.	Delta National Wildlife Refuge	US Fish & Wildlife Svc	F&W	High F&W rating. 48,788-ac. waterfowl refuge. Heavy waterfowl use, good sport fishing. Great capacity for wildlife-oriented rec.use.
2.	Dorena Access Area	Mo. Dept. of Conservation	F&W	High F&W rating. Public launching area.
13.	Gassoway Lake		F&W	High F&W rating. 800 ac. Fishing & waterfowl usage.
21.	Glasscock Lake		F&W	High F&W rating. 1,273 ac. Waterfowl use & fishing.
4.	Horn Lake		F&W	High F&W rating. 850-ac. Miss. R. oxbow lake. High fishing use.
14.	Issaquena Wildlife Mgmt. Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 13,000 ac. Waterfowl & some fishing use.
29.	Joseph Hunter Moore Access Area	Mo. Dept. of Conservation	F&W	High F&W rating. Public Launching Ramp.
9.	Lake Beulah		F&W	High F&W rating. 980-ac. Miss. R. oxbow lake. High fishing & waterfowl use.
11.	Lake Ferguson		F&W	High F&W rating. Miss. R. oxbow lake. Fishing & waterfowl use.
12.	Lake Lee		F&W	High F&W rating. 1,096 ac. High waterfowl & fishing use.
23.	Lake Mary		F&W	High F&W rating. 2,250 ac. High waterfowl & fishing use.
10.	Lake Whittington		F&W	High F&W rating. 4,000 ac. High waterfowl & fishing use.
24.	Mississippi River		F&W	High F&W rating. 954 mi. Nationally important. Contributed indirectly. Waterfowl use high, fishing provided in large amounts. Fishery resource far below optimum because of pollution & land use practice.
3.	New Madrid Bend Access	Mo. Dept. of Conservation	F&W	High F&W rating. Public launching ramp.
25.	Old River Lake		F&W	High F&W rating. 4,160 ac. Excellent fishing. Waterfowl use.
18.	Palmyra Lake		F&W	High F&W rating. 1,773 ac. Excellent fishing. Waterfowl use.
28.	Pass-a-Loutre Waterfowl Management Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 65,000 ac. Excellent waterfowl hunting. Good fishing. Difficult access.
22.	Red River Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 16,977 ac. Waterfowl hunting & fishing.
20.	Rodney Lake		F&W	High F&W rating. 666-ac. Miss.R. oxbow lake. Fishing & waterfowl.
30.	S. P. Reynolds Access Area	Mo. Dept. of Conservation	F&W	High F&W rating. Public Launching Ramp.
5.	Tunica Cut-Off		F&W	High F&W rating. 3,152-ac. Miss.R. oxbow lake. Waterfowl & fishing.
7.	White River Natl. Wildlife Refuge	US Fish & Wildlife Svc	F&W	High F&W rating. 113,000 ac. Waterfowl refuge. Excellent fishing. One of few remain. natural areas in the lower valley of lg. size.
19.	Yucatan Lake		F&W	High F&W rating. 1,997-ac. Miss. R. oxbow lake. Waterfowl use & fishing.

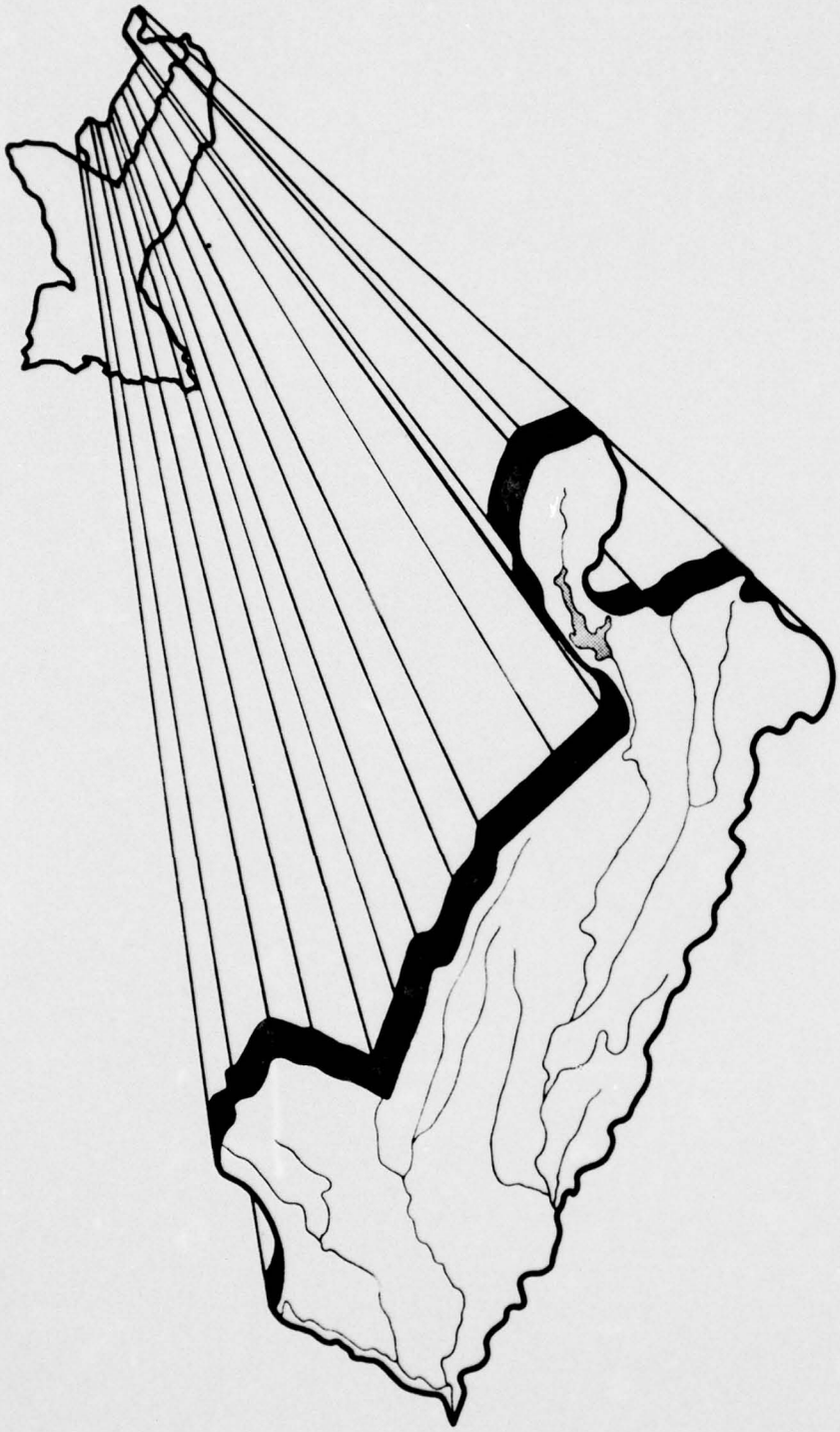


LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

RECREATION AND FISH AND WILDLIFE

WRPA 1

FIGURE 4



WRPA 2

W R P A 2

GENERAL

Area of Study

WRPA 2 is primarily composed of the drainage basins of the St. Francis River, Bayou Meto, the lower reaches of the White River, and the Arkansas River below Pine Bluff, Arkansas. The area, which consists primarily of alluvial lands, covers 16,722 square miles in the States of Arkansas and Missouri and accounts for 16 percent of the total area in the Lower Mississippi Region. The southern boundary of the WRPA is formed by the right bank levee of the Arkansas River below Pine Bluff. The western boundary is formed by the divides of the Arkansas River Basin above Pine Bluff and the drainage basin of the upper reaches and tributaries of the White River. The border to the north is formed by the Castor River diversion channel and the drainage divides of the upper Castor and Meramec River Basins. The eastern boundary is formed by the main stem levee of the Mississippi River. The most notable physiographic feature is Crowley's Ridge, a line of hills extending lengthwise through and in the middle of the St. Francis River Basin. Other features include Sikeston Ridge and Malden-Kennett Prairie, low-lying terraces on the alluvial plain east of Crowley's Ridge. Principal tributaries of the major streams mentioned above are the Cache, L'Anguille, and Little Rivers. Major cities in the study area are Blytheville, West Memphis, Forrest City, and Jonesboro in Arkansas, and Sikeston and Caruthersville in Missouri.

Approximately 640,000 people, about 10 percent of the Lower Mississippi Region population, reside in the area. Urban population as a percent of total population was 40 percent in 1970. Significant economic activities in the area include agriculture, mining, manufacturing, and service industries. The major manufacturing categories are food and kindred products, primary metals, chemical and allied products, and textile mill products. Another significant segment of the area's economy is agriculture. Major agricultural pursuits include production of soybeans, rice, corn, wheat, and cotton.

Hydrologic Characteristics

The major drainage areas in the WRPA include the St. Francis River Basin and the lower portions of the White and Arkansas River Basins. Of these drainage areas, only the St. Francis Basin is completely contained in WRPA 2. Streams originating within the WRPA, including the St. Francis River, carry the WRPA's average run-off of 16 inches per year or about 20,000 c.f.s.

The St. Francis River originates in the hills of southeastern Missouri and flows a sinuous, sometimes deteriorating channel 475 miles to join the Mississippi River near Helena, Arkansas. In many locations, low water as well as flood flows are forced into artificial channels formed by old borrow pits. Below Wappapello Dam, located at the foot of the hills, the river traverses a partially leveed floodway to the gap in Crowley's Ridge, thence through a leveed floodway and a combination natural-artificial channel complex, south of its mouth on the Mississippi River. The overall stream gradients of the St. Francis River are 3.0 feet per mile in the upper reaches to about 0.5 foot per mile in the lower reaches. These are greater than those of either the White or Arkansas Rivers.

Included in WRPA 2 are the lower 169 miles of the White River and its tributary area below the vicinity of Georgetown, Arkansas. Flow in these tributaries is sluggish through broad, shallow valleys in winding channels which are approximately parallel to the main stream. The bottom lands are characterized by swamps, bayous, lakes, and abandoned stream channels.

The Arkansas River from Pine Bluff, Arkansas to its mouth, a distance of about 110 miles, is included in WRPA 2. The area of the Arkansas River Basin lying in WRPA 2 collects about 14 inches of runoff per year, most of which is collected by the river's principal tributary in the area, Bayou Meto.

The majority of streamflow originating in WRPA 2 is produced by the St. Francis and White River Basins. Wappapello Dam provides some regulation on the St. Francis River. Flow of the White River originating outside WRPA 2 is partly regulated by upstream reservoirs.

FLOOD CONTROL

Arkansas River Levees (Lower), Arkansas

(See WRPA 6)

Augusta-Clarendon, Arkansas

The Flood Control Act of August 18, 1941 (House Document 98, 76th Congress, 1st Session), as amended July 24, 1946, transferred authorization from "Flood Control, General," to "Flood Control, Mississippi River and Tributaries." This Act provides for flood protection from White River for agricultural lands and communities in Woodruff, Monroe, and Prairie Counties east of that stream, a local protection levee at Georgetown and in the east bank levee.

The levee extends from the vicinity of Augusta (mile 203) downstream to about Clarendon (mile 100) and gives protection to 217,000 acres on the east side of the river, of which 85,000 acres are under cultivation.

The authorized levee, when completed, will be 49.2 miles long. Through June 30, 1971, 39.5 miles extending from the Kitty Burns levee downstream to 3.5 miles below the Chicago, Rock Island, and Pacific railroad crossing opposite Devalls Bluff, have been built to approved grade and section.

The total cost is $2,054,824. This includes $608,286 "Flood Control, General" funds, and $68,366 for maintenance. Accumulated flood control benefits through June 30, 1971 (estimated) are $7,004,000.

Big Creek and Tributaries, Arkansas

The Flood Control Act of May 15, 1928, as amended by Public Law 82-298, approved October 27, 1965, authorized flood control and improvement of drainage in the basin drained by Big Creek, a tributary of the White River.

Big Creek Basin, between Brinkley and Helena, covers 1,060 square miles in St. Francis, Monroe, Lee, and Phillips Counties. Former drainage improvements by local interests of several tributaries and laterals have been ineffective due to the lack of an adequate outlet. The Flood Control Act of 1965 authorized improvement of 84 miles of Big Creek and 108 miles of the 10 major laterals at Federal expense. Local interests will provide rights-of-way and highway bridges and will maintain the works after completion. Appropriate measures will be included to minimize fish and wildlife losses. Good agricultural

drainage will be obtained on more than 300,000 acres of productive land at an estimated Federal cost of $13,695,000. Planning was initiated in Fiscal Year 1969, and the cost of the project through June 30, 1971 was $259,703. Estimated average annual benefits are $1,050,000.

Big Creek Watershed, Arkansas

Located in Craighead and Greene Counties, Ark., this 72,966-acre Public Law 566 project was authorized in 1961. The main project features are: (1) 3,064 acres of critical area (woodland) planting and 24,185 acres of land treatment measures costing an estimated $565,251; (2) 21 floodwater retarding dams; (3) one multi-purpose dam for floodwater retardation and recreation; (4) basic recreation facilities; (5) .45 mile of streambank protection, and (6) 8.8 miles of channel improvement. There are 38.21 miles of drainage area above the dams; 16,930 acre-feet of floodwater storage; 3,670 acre-feet of sediment storage; and 2,118 acre-feet of recreation storage. The total estimated project costs are $2,500,021 ($1,652,462 Federal and $847,559 non-Federal). Flood plain lands to be benefitted are 13,448 acres. Initial economic studies indicate average annual damages that will be prevented are $110,915, and total average annual benefits are $358,833. The benefit-cost ratio is 3.6 to 1. The project is 90 percent complete.

Big Slough Watershed, Arkansas

Located in Clay and Greene Counties, Ark., this 70,160-acre Public Law 566 project was authorized in 1965. The main project features are: (1) 675 acres critical area (woodland) planting, 220 acres critical area (open land) planting, and 26,191 acres of land treatment measures costing an estimated $647,118; (2) 24 debris basins; (3) 11 floodwater retarding dams; and (4) 18.6 miles of channel improvement. There are 24.63 square miles of drainage area above the dams and a total storage of 12,690 acre-feet (3,248 acre-feet sediment and 9,442 acre-feet floodwater). The normal pool surface area is 628 acres. Estimated project costs are $3,182,039 ($2,317,261 Federal and $864,778 non-Federal). Flood plain lands to be benefitted are 17,288 acres. Initial studies indicate average annual damages that will be prevented are $170,383 and total average annual benefits are $196,861. The benefit-cost ratio is 1.6 to 1. Construction has not been started and the project is inactive.

Cache River Basin, Missouri and Arkansas

The project was authorized by the Flood Control Act of May 17, 1950 (Public Law 516, 81st Congress); Senate Document 88, 81st Congress, 1st Session, and modified by the Water Resources Development Act of 1974 (Public Law 93-251, 93rd Congress).

Typical watershed project - Kudzu keeps down willow growth and protects banks. Adequate drainage and flood protection increase land productivity.

The plan provides for improvement of 140 miles of Cache River, 14.6 miles of smaller tributaries, and 76.9 miles of Bayou DeView. Seventy thousand acres of lands are to be acquired by fee or easement for fish and wildlife, recreation, and environmental purposes. The project will reduce flooding and provide drainage outlets on about 788,500 acres of land, (646,000 acres are farmlands and urban lands).

Construction was initiated in 1972. Irrespective of the recently authorized land acquisition measures, flood control features will yield estimated average annual benefits of $15,302,900 with estimated average annual cost of $3,255,000 -- resulting in a benefit-to-cost ratio of 4.7 to 1.

Caney Creek Watershed, Arkansas

Located in Cross County, Ark., this 39,680-acre Public Law 566 project was authorized in 1957. The main project features are: (1) 250 acres of critical area (woodland) stabilization and 13,100 acres of land treatment measures costing an estimated $235,331; (2) seven floodwater retarding dams; and (3) 38.9 miles of channel improvement. There are 11.71 square miles of drainage area above the dams and a total

storage of 5,592 acre-feet (1,842 acre-feet sediment and 3,750 acre-feet floodwater). Normal pool surface area is 291 acres; estimated cost is $363,480. The total estimated project costs are $1,133,270 ($764,649 Federal and $368,621 non-Federal). Flood plain lands benefitted are 18,428 acres. Estimated average annual damages prevented are $147,661; estimated total average annual benefits are $149,166. The benefit-cost ratio is 3.2 to 1. The project is complete.

Clarendon Levee, Arkansas

The Clarendon levee, located on the east or left bank of the White River 100 miles above the mouth, is U-shaped and is about 6 miles long. Nine corrugated metal pipes with flap gates extend through the levee, and a locally owned pumping station provides interior drainage. Local interests constructed the original levee and installed the drainage culverts between 1890 and 1922. The levee was enlarged, the drainage culverts extended, and the old flap-type gates were reinstalled during 1935-1937 by local interests, under the Corps of Engineers technical assistance and supervision. This work was done as a WPA relief project. It was completed in 1938 and transferred to local interests for operation and maintenance. The Federal construction cost of the project was $227,364. Total cumulative flood control benefits, through June 30, 1971, are estimated at $736,000.

The Flood Control Act of May 15, 1928, as amended by Public Law 89-298, approved October 27, 1965, authorized improvement of this flood protection system by enlargement of the existing levee, the extension of culverts and replacement of floodgates. The improvement will consist of modifying the levee section by construction of a riverside enlargement to provide a 10-foot crown width and 1 on 3.5 side slopes and extending the drainage culverts through the enlarged levee. Additionally, the six outmoded and inoperative flap gates will be replaced by positive-action, lift-type gates and bank protection has also been added.

Advanced planning of this project was completed in November 1971. The total estimated Federal costs are $396,000 and the Federal cost through June 30, 1971 is $64,927. The estimated average annual benefits are $80,300. The benefit-cost ratio is 2.7 to 1. Advance planning was completed in November 1971. Initial construction funds were appropriated in FY 1972, and construction is underway.

Crooked Lake Bayou Watershed, Arkansas

Located in Mississippi County, Ark., this 18,700-acre Public Law 566 project was authorized in 1964. The main project features are: (1) 16,000 acres of land treatment measures costing an estimated $318,262; (2) 37.7 miles of channel improvement; and (3) one pumping plant. The total estimated project costs are $1,545,162 ($983,191

Federal and $561,971 non-Federal). Flood plain lands to be benefitted are 18,210 acres. Initial economic studies indicate average annual damages that will be prevented are $68,046, and total average annual benefits are $132,056. The benefit-cost ratio is 1.6 to 1. Construction has not been started and the project is inactive.

Des Arc, Arkansas, Local Protection

Flood Control Act, May 15, 1928, (House Document 90, 70th Congress, 1st Session)-(108, 73d Congress, 1st Session), as amended by subsequent acts, as modified and expanded by House Document 485, 81st Congress, 1st Session, approved May 17, 1950, provides for protection of Des Arc, Ark. from White River floodwaters. This project is located on the right bank of the White River about 147 miles above its mouth. The principal features of the project are: (1) an earth levee about 7,700 feet long; (2) a sewage pump with a capacity of 350 gallons per minute (g.p.m.); (3) a storm water pump with a capacity of 30 cubic feet per second (c.f.s.); (4) two 60-inch-diameter culverts (gravity flow) with floodgates; and (5) a sump area of 92 acre-feet storage.

The project was completed on March 25, 1954, at a cost of $178,925. Estimated flood damages prevented through June 30, 1971 are $24,260.

Des Arc Bayou Watershed, Arkansas

Authorized in 1969, this 65,485-acre Public Law 566 project is located in White County, Ark. The main project features are: (1) 39,190 acres of land treatment measures costing an estimated $650,779; (2) four floodwater retarding dams; (3) one multi-purpose dam for floodwater and recreation; and (4) 11.1 miles of channel improvement. There are 50.41 square miles of drainage area above the dams; 13,620 acre-feet of floodwater storage; 6,543 acre-feet of sediment storage; and 1,996 acre-feet of recreation storage. The estimated project costs are $2,562,495 ($1,746,595 Federal and $815,900 non-Federal). Flood plain lands to be benefitted are 6,430 acres. Initial economic studies indicate that average annual damages that will be prevented are $56,320 and total average annual benefits are $116,850. The benefit-cost ratio is 1.8 to 1. The project is 40 percent complete.

Devalls Bluff, Arkansas

The Flood Control Act of August 18, 1941 (House Document 98, 76th Congress, 1st Session), as amended July 24, 1946, provides for raising and extending the small front levee at DeValls Bluff to a grade equivalent to 40.3 feet on the DeValls Bluff gage of elevation 193.3 feet, mean sea level (m.s.l.). The principal features of the project are: (1) an earth levee about 500 feet long; (2) three pumps with a total

capacity of 125 c.f.s.; (3) one emergency pump with a capacity of 18 c.f.s.; (4) two 66-inch-diameter culverts (gravity flow) with floodgates, and (5) a sump area of 4.6 acre-feet storage.

The project was completed on June 13, 1952, at a cost of $231,215. Estimated flood damages prevented through June 30, 1971 are $209,300.

Fish Bayou Watershed, Arkansas

Located in Crittenden and St. Francis Counties, Ark., this 36,242-acre Public Law 566 project was authorized in 1970. The main project features are: (1) 25,346 acres of land treatment measures costing an estimated $664,403; and (2) 35 miles of channel improvement. The total estimated project costs are $1,462,125 ($588,382 Federal and $873,743 non-Federal). Flood plain lands to be benefitted are 26,567 acres. Initial economic studies indicate average annual damages that will be prevented are $89,630 and total average annual benefits are $175,980. The benefit-cost ratio is 2.8 to 1. Construction has not started.

Grand Prairie Region and Bayou Meto Basin, Arkansas

The Flood Control Act of May 15, 1928, as amended by the Act of May 17, 1950 and further amended by the Act of October 27, 1965 provides for channel improvements for flood control and drainage on Bayou Meto and Little Bayou Meto and tributaries, and supplemental water supply for agricultural purposes in the Grand Prairie area.

Channel improvements totalling about 150 miles would provide outlets for major drainage and reduce the frequency and duration of overflow. The second part of the authorization, water supply for the Grand Prairie Region, would consist of a system of trunk irrigation canals and laterals fed by a pumping plant in White River. The Act required that local interests repay about 60 percent of the total cost of the water supply project, estimated in 1950 to total about $26 million. A 1964 Senate Resolution directed a restudy of reports on this project to determine whether the project should be modified. Pending completion of this review, no construction has been initiated. The present estimated cost of the flood control work is $18,800,000 and for water supply is $45,600,000.

Larkin Creek Watershed, Arkansas

Located in Lee and St. Francis Counties, Ark., this 35,758-acre Public Law 566 project was authorized in 1969. The main project features are: (1) 26,300 acres of land treatment measures costing an estimated $851,992; and (2) 48 miles of channel improvement. The total estimated project costs are $1,697,118 ($630,126 Federal and $1,066,992

non-Federal). Flood plain lands to be benefitted are 28,067 acres. Initial economic studies indicate average annual damages that will be prevented are $66,534 and total average annual benefits are $128,500. The benefit-cost ratio is 2.3 to 1. Construction has not been started.

Lee-Phillips Watershed, Arkansas

Located in Lee and Phillips Counties, Ark., this 83,504-acre Public Law 566 project was authorized in 1964. The main project features are: (1) 26,097 acres of land treatment measures costing an estimated $438,655; and (2) 110 miles of channel improvement. The total estimated project costs are $2,070,746 ($1,267,719 Federal and $803,027 non-Federal). Flood plain lands to be benefitted are 40,945 acres. Initial economic studies indicate that average annual damages that will be prevented are $403,134 and total average annual benefits are $537,226. The benefit-cost ratio is 3.4 to 1. The project is under construction.

Marked Tree Siphon, Marked Tree, Arkansas, in operation, St. Francis River.

Poinsett Watershed, Arkansas

Located in Craighead and Poinsett Counties, Ark., this 51,326-acre Public Law 566 project was authorized in 1969. The main project features are: (1) 18 acres of critical area (openland) stabilization and 26,800 acres of land treatment measures costing an estimated $1,069,926; (2) 54 floodwater retarding dams; and (3) 56 miles of channel improvement. There are 20.84 square miles above the dams and a total storage of 7,868 acre-feet (2,658 acre-feet sediment and 5,210 acre-feet floodwater). Normal pool surface area is 513 acres. The total estimated project costs are $4,859,150 ($3,658,144 Federal and $1,201,006 non-Federal). Flood plain lands to be benefitted are 15,901 acres. Initial economic studies indicate average annual damages that will be prevented are $301,617 and total average annual benefits are $320,326. The benefit-cost ratio is 1.8 to 1. The project is 10 percent complete.

St. Francis Basin, Arkansas and Missouri

This project, authorized by Flood Control Act, May 15, 1928, as amended by the acts of June 15, 1936; August 18, 1941; May 17, 1950; October 27, 1965; and August 13, 1968, will control the floods along the St. Francis and Little Rivers and pass these floodwaters safely into the Mississippi River.

The total estimated Federal cost is $203 million, of which $81,564,875 had been expended by June 30, 1971. Estimated average annual benefits are $19,499,400. Main features of the overall project are shown in paragraphs below.

Lake Wappapello

Lake Wappapello, located on the St. Francis River in Wayne County, Mo., is a principal feature of the comprehensive plan for the control of floods in the St. Francis River basin project. It was placed in operation in June 1941. Its overall designed effectiveness is dependent upon downstream levees and other flood-control works in the alluvial valley, some of which are not as yet under construction.

The Wappapello Dam is a compacted earthfill structure extending across the St. Francis valley for a distance of 2,700 feet and rising to a height of 109 feet above the streambed. The lake controls a drainage area of 1,310 square miles. It has a total storage capacity of 613,000 acre-feet, of which 582,000 acre-feet are allocated to flood control and 31,000 acre-feet to permanent conservation. The flood-control pool, when filled, has an area of 23,000 acres. The conservation pool has an area of 8,200 acres. Release of water is regulated by means of three gates in the control structure, electrically operated with power supplied by a small hydroplant.

Lake Wappapello near Poplar Bluff, Missouri,
St. Francis River.

The estimated total cost of the lake, including recreational facilities, is $9,430,000. Total cost to June 30, 1971 is $8,207,393 for new work and $4,287,084 for operation and maintenance.

Levees and Drainage Improvements

There are 438 miles of levees authorized in the project, of which 427 have been constructed to grade and section. A total of 860 miles of drainage improvements are authorized, 344 miles of which are completed or under contract. Included in these improvements are two leveed floodways, one along the St. Francis River to the Poinsett-Cross County line southwest of Marked Tree, and one along Little River in northeast Arkansas, which joins the St. Francis Floodway north of Marked Tree.

Also included within this project is the W. G. Huxtable Pumping Plant which will provide flood relief within the basin from flood waters from the Mississippi River. This 12,000 c.f.s. pumping plant, located near Marianna, Arkansas, is now under construction and will be one of the largest of its type in the world when completed.

Upper Culotches Bay Watershed, Arkansas

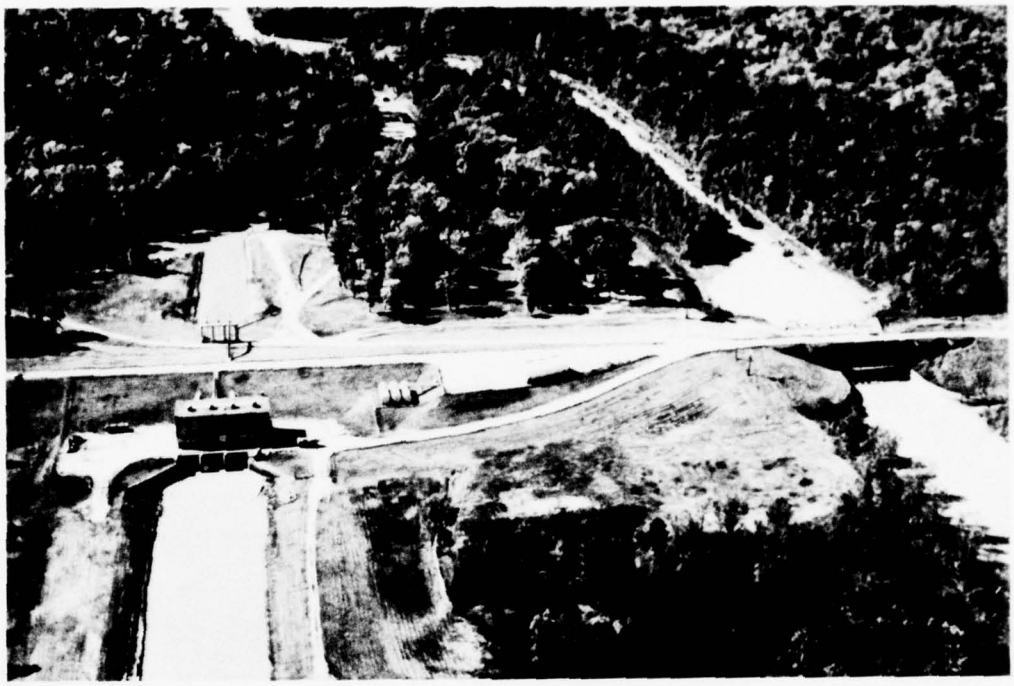
Located in Prairie and Woodruff Counties, Ark., this 38,969-acre Public Law 566 project was authorized in 1959. The main project features are: (1) 21,140 acres of land treatment measures costing an estimated $521,195; and (2) 50.2 miles of channel improvement. The total estimated project costs are $986,387 ($326,077 Federal and $660,310 non-Federal). Flood plain lands to be benefitted are 25,117 acres. Initial economic studies indicate average annual damages that will be prevented are $96,115 and total average annual benefits are $192,105. The benefit-cost ratio is 4.8 to 1. Construction has not been started and the project is inactive.

White River Backwater, Arkansas

The Flood Control Act, May 15, 1928 (House Document 90, 70th Congress, 1st Session), as amended, authorized the White River backwater levee. This levee is 40.2 miles long, is completed to project grade and section, and connects at each end to the main Mississippi River levee system. It protects some small urban centers and about 145,500 acres of farmland of which about 78 percent is being cultivated.

The levee system contains two large floodgates, Little Island Bayou outlet structure and Deep Bayou culvert, for the evacuation of interior drainage. There are two fuseplug sections to permit this inclosed area to be used to store Mississippi River floodwaters. The Little Island Bayou outlet structure and Deep Bayou culvert were authorized by Act of June 15, 1936 (House Document 159, 61st Congress, 1st Session). The Flood Control Act of July 3, 1958 (Senate Document 26, 85th Congress, 1st Session) authorized construction of Graham Burke pumping station with a capacity of 1,500 c.f.s. at the Little Island Bayou culvert location for evacuation of interior runoff when stages in White River are too high to permit gravity drainage. The project was completed in 1965. The operation of this project has been of much value in preventing flood damages due to Mississippi and White River floodwaters. It has not been used to store waters for Mississippi River floodwaters since its construction.

The cost to June 30, 1971, for new work was $10,624,501, and for maintenance, $1,331,103. The cumulative flood control benefits since partial completion of this project are estimated at $12,948,400, through June 30, 1971.



Graham Burke Pumping Station, Lower White River, Arkansas.

White River Backwater Watershed, Arkansas

Located in Desha, Monroe, and Phillips Counties, Ark., this 131,634-acre Public Law 566 project was authorized in 1966. The main project features are: (1) 60,000 acres of land treatment measures costing an estimated $2,111,993; and (2) 165 miles of channel improvement. The total estimated project costs are $4,446,770 ($1,685,610 Federal and $2,781,160 non-Federal). Flood plain lands benefitted are 119,635 acres. Initial economic studies indicate average annual damages that will be prevented are $84,586 and total average annual benefits are $232,249. The benefit-cost ratio is 1.4 to 1. The project is 80 percent complete.

PROJECT MAP INDEX
Flood Control-WRPA 2

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description 1/
11.	Augusta-Clarendon Levee, Ark.	C of E, MD	Under Const.	FC	To proj. grade & section 39.5 mi. Proj. length 49.2 mi. Est. cost $2,054,824. (H)
16.	Big Creek & Tributaries, Ark.	C of E, MD	Not Started	FC	Chan. imp. of 192 mi. Est. Fed. cost $13,695,000.
4.	Big Creek Watershed, Ark.	SCS	Est. 1974	FC, R	Proj. area, 72,966 ac. 21 floodwater dams & 1 multipurpose dam for floodwater & recreation. 45 mi. streambank prot. 8.8 mi. chan.imp. Area stab. & land treatment meas. Tot.est.proj.cost $2,500,021. (L)
2.	Big Slough Watershed, Ark.	SCS	Inactive	FC	Proj. area, 70,160 ac. 11 floodwater retard. dams. 18.6 mi. chan. imp. Area stab. & land treatment meas. Tot. est.proj. cost $3,182,039. (L)
7.	Cache River Basin, Mo. & Ark.	C of E, MD	Not Started	FC	231.5 mi. chan. imp. Tot. est. cost $47,500,000. (M)
6.	Caney Creek Watershed	SCS	1966	FC	Proj. area, 39,680 ac. 7 floodwater retard.dams. 38.9 mi. chan. imp. Area stab. & land treatment meas. Tot.est.proj. cost $1,133,270. (L)
15.	Clarendon Levee, Ark.	C of E, MD	Under Const.	FC	6.1 mi. levee enlargement, extension of culverts & replacement of 9 floodgates. Est. cost $396,000.
3.	Crooked Lake Bayou, Ark.	SCS	Inactive	FC	Proj. area, 18,700 ac. 1 pumping plant & 37.7 mi. chan. imp. Land treatment meas. Tot. Fed. est. proj. cost $1,545,162.
10.	Des Arc, Ark. Local Protection	C of E, MD	1954	FC	7,000-ft. long levee, 550 g.p.m. sewage pump, 30 c.f.s. storm water pump, 2 60" culverts with floodgates. 92 ac.-ft. surp. Cost $178,925. (H)
8.	Des Arc Bayou Watershed, Ark.	SCS	Under Const.	FC, R	Proj. area, 65,485 ac. 4 floodwater retard & 1 multipurpose dam. 11.1 mi. chan. imp. Land treatment meas. Tot.est. cost $2,562,495.(L)
14.	DeValls Bluff, Ark.	C of E, MD	1952	FC	Raising & extending existing levee to elev. 193.5, length 500 ft. 3 pumps, tot. cap. 125 c.f.s. 1 pump, 18 c.f.s. 2 60"-dia. culverts with floodgates, 4.6 ac.-ft. surp. Cost $231,215.
13.	Fish Bayou Watershed, Ark.	SCS	Not Started	FC	Proj. area, 36,242 ac. 35 mi. of chan. imp. Land treatment meas. Tot. est. cost $1,462,125. (L)
22.	Grand Prairie Region & Bayou Meto Basin	C of E, MD/YXD	Not Started	FC, I	150 mi. chan. imp. for major drainage outlets on Bayou Meto, Little Bayou Meto & Trbs. & a system of irrigation canals in Grand Prairie area fed by pumping plant in White R. Est. tot. cost $64,400,000.
12.	Larkin Creek Watershed, Ark.	SCS	Not Started	FC	Proj. area, 35,758 ac. 48 mi. chan. imp. Land treatment meas. Tot. est. cost $1,697,118. (L)
17.	Lee-Phillips Watershed, Ark.	SCS	Under Const.	FC	Proj. area, 83,504 ac. 110 mi. chan. imp. Land treatment meas. Tot. est. cost $2,070,746. (L)
5.	Poinsett Watershed, Ark.	SCS	Est. 1978	FC	Proj. area, 51,326 ac. 18 ac. critical area (openland) stab. 54 floodwater retard. dams. 56 mi. chan. imp. Area stab. & land treatment meas. Tot. est. cost $4,850,150. (L)
1.	St. Francis Basin, Ark. & Mo.	C of E, MD	Under Const.	FC	26.4 mi. chan. enlargement. 28.2 mi. chan. cleanout. (L)
1-16.	Belle Fountain Ditch, Ditch 9, Main Ditch, Pemiscot		Not Started	FC	Chan. imp. (L)
1-29.	Big Creek		1965 B.S.;1961 Mayo	FC	11.03 mi. Big Slough (L); 16.95 mi. Mayo (L).
1-13.	Big Slough & Mayo Ditches		Not Started	FC	35.1 mi. chan. imp. Blackfish (L); 16.5 mi. chan. clearing & drift removed, Fifteen-Mile Bayou (L).
1-31.	Blackfish Bayou & Fifteen-Mile Bayou		Not Started	FC	25.0 mi. clearing & cleanout. (L)
1- 2.	Castor River		Not Started	FC	No details. Authorized only. (L)
1-17.	Cockleburr Slough, Honey Cypress Ditch, Buffalo Creek & Ditch 12		Not Started	FC	38.5 mi. chan. imp. (L)
1- 7.	Ditch 1 (upper)		Not Started	FC	No details. Authorized only. (L)
1-18.	Ditch 7		Not Started	FC	20.4 mi. chan. imp. (L)
1-22.	Ditches 9 & 10		Not Started	FC	7.25 mi. chan. imp. 3.2 mi. levee. (H)
1- 9.	Ditch 12		Not Started	FC	29.2 mi. chan. imp. (L)
1-10.	Ditch 19		Under Const.	FC	No details. (L)
1-20.	Ditches 21 & 70		Not Started	FC	6.1 mi. chan. imp. (L)
1- 3.	Ditch 24		Under Const.	FC	No details. (L)
1-21.	Ditch 27		Under Const.	FC	26.46 mi. authorized (L); 14.32 mi. complete (L).
1- 8.	Ditch 251		Not Started	FC	13.4 mi. chan. enlargement. (L)
1- 5.	Dudley Ditch-Lick Creek		1964	FC	16.08 mi. (L)
1-15.	Elk Chute Ditch		1941	FC, R, F&W	Rolled earth dam, 2,700 ft. long, 109 ft. high. Conservation pool at elev. 335 w/8,200 ac. Recreation pool elev. 360 w/8,400 ac.
1- 1.	Lake Wappapello				

1/ Degree of protection indicated as follows:

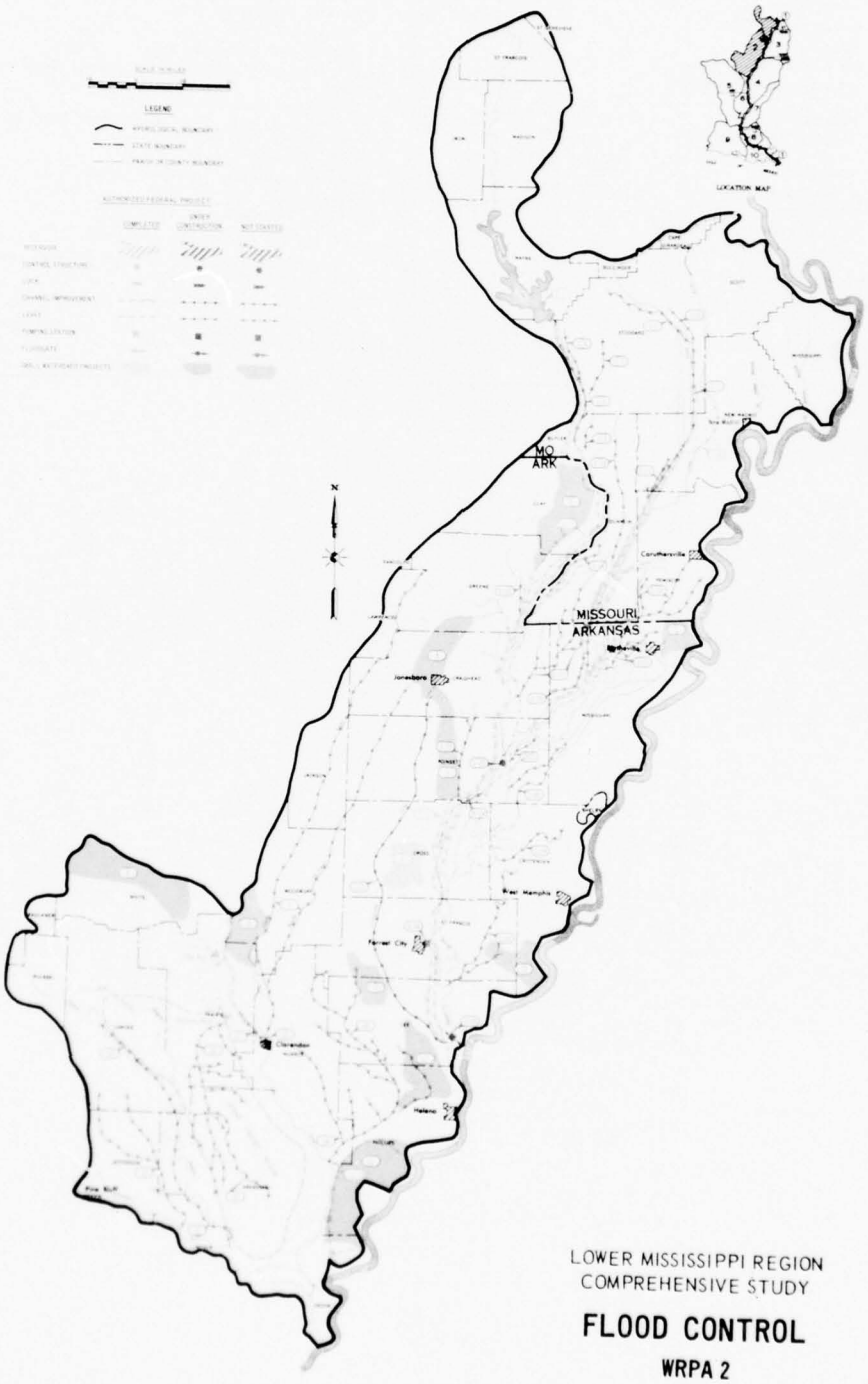
Low (L) 1 to 10 yr. frequency.
Medium (M) 10 to 50 yr. frequency.
High (H) 50 to 100 yr. frequency.

PROJECT MAP INDEX
Flood Control-WRPA 2 (continued)

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description 1/
1.	St. Francis Basin (continued) Arkansas & Missouri	C of E, MD			
1-11.	Little River Ditches 81, 66,251,259, 9, 290, 1, 256, & 281		Not Started	FC	Chan. imp. projs. 36.58 mi. complete. (M)
1-12.	Locust Creek		Not Started	FC	8.8 mi. chan. imp. (L)
1-30.	Madison Pumping Plant		Not Started	FC	No details. Authorized only.
1- 4.	Mingo Ditch		Not Started	FC	13.3 mi. chan. imp. (L)
1-24.	Oak Donnick Central Ditch		Not Started	FC	7.29 mi. chan. excavation. (H)
1-23.	Oak Donnick Control Structure		Not Started	FC	Gate structure w/2 bascules 10 ft. x 40 ft. Passes 5,000 c.f.s. open. (H)
1-25.	Rivervale Outlet		Not Started	FC	No details. Authorized only. (L)
1-19.	South End Control Structure		1968	FC, F&W	1,050 ft. in length. 970 ft. overflow dam. 80 ft. low weir. Bank protection to elev. 242. (L)
1-27.	Tulot Ditch		1962	FC	21.81 mi. chan. (L)
1-28.	Tyronza River		Under Const.	FC	35.85 mi. authorized. 22.60 mi. complete. - (L)
1-14.	Varney River		Not Started	FC	8.8 mi. chan. imp. (L)
1-32.	W. G. Huxtable Pumping Station		Under Const.	FC	12,000 c.f.s. pumping capacity. (H)
1- 6.	Wappapello-Crowleys Ridge		Not Started	FC	34.6 mi. chan. imp. 3.2 mi. levee. (H)
9.	Upper Culotches Bay, Ark.	SCS (566)	Inactive	FC	Proj. area, 38,969 ac. 30.2 mi. chan. imp. Land treatment meas. Tot. est. cost $980,387. (L)
19.	White River Backwater, Ark.	C of E, MD	1965	FC	40.2 mi. levee, connecting to Miss. R. levees. (H)
18.	White River Backwater Watershed, Ark.	SCS (566)	Est. 1972	FC	Proj. area, 131,634 ac. 165 mi. chan. imp. Land treatment meas. Tot. est. cost $4,440,770. - (L)

1/ Degree of protection indicated as follows:

Low (L) 1 to 10 yr. frequency.
Medium (M) 10 to 50 yr. frequency.
High (H) 50 to 100 yr. frequency.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

FLOOD CONTROL

WRPA 2

FIGURE 5

NAVIGATION

Arkansas River

An early project for the improvement of the Arkansas River, Arkansas and Oklahoma, was authorized by the River and Harbor Acts of July 2, 1832; April 8, 1876; March 3, 1879; June 14, 1880; July 5, 1884; August 5, 1886; August 11, 1888; June 13, 1902; and March 2, 1907. The project provided for improvements to the Arkansas River for navigation from its mouth to the Grand (Neosho) River, a distance of 465 miles, by snagging, dredging, revetments, and contracting works. Construction of permanent works for general improvement of the river was suspended in 1902 and completion of that project is not contemplated, as it is no longer required. Snagging operations were carried out until 1943 when all maintenance operations were suspended. Funds expended for construction and maintenance of the project have amounted to approximately $4,500,000.

Lock and Dam No. 1 on the Arkansas Post Canal, with Lock No. 2 at top center.

The Arkansas River Basin Comprehensive Plan, which has provided many improvements under various authorizations by Congress since the first authorization in the Flood Control Act of 1938, today is in the most extensive development phase since its inception.

The project provides for improvement of the Arkansas River Basin by construction of coordinated developments for navigation, hydroelectric power, flood control, water supply, sediment control, recreation, and propagation of fish and wildlife. Navigation features within WRPA 2 provide for a channel 9 feet deep and 250 feet wide, beginning in the Mississippi River at the mouth of the White River, then 10 miles upstream in the White River to the mouth of Wild Goose Bayou, then 9 miles by an artificial canal to Arkansas Post on the Arkansas River, then along the channel of the Arkansas River, past Pine Bluff, and the boundary of WRPA 2, for a total distance of 74 miles.

Below Pine Bluff, there are four 110-foot by 600-foot navigation locks providing a minimum depth of 9 feet. Bank stabilization is necessary for providing a navigable channel on the lower Arkansas River. This work from the Jefferson County free bridge to mile 33.7 is approximately 96 percent complete. Completed work consists of excavating 19,340,832 cubic yards for pilot channels, constructing 239,510 linear feet of dikes and 385,013 linear feet of revetments.

The total cost of the Arkansas portion of the project is $658,709,000. Cost through June 30, 1970, was $562,574,380. Terminal facilities within WRPA 2 are described on pages 71 through 75.

Helena Harbor, Arkansas

Helena Harbor, Arkansas, located on the right bank of the Mississippi River at mile 663, was approved by the Chief of Engineers in 1962 under Section 107, River and Harbor Act of July 14, 1960, as amended.

The project provides for maintenance of the access channel with a depth 9 feet below low water between miles 659 and 663 AHP by dredging and enlarging the upstream 0.6 mile to dimensions of 9 feet deep and 450 feet wide. The project is complete. The harbor channel is 3,000 feet in length. The entire harbor, including 4 miles along the main river waterfront, serves an industrial port area of 550 acres. The total cargo movement in 1970 was 2,195,436 tons. Total Federal cost of new construction through June 30, 1970, was $88,919. Maintenance cost was $332,497.

Table 14 summarizes the piers, wharves, and docks at the port by purpose for which used or type of service offered:

Table 14 - Helena Harbor Piers, Wharves and Docks

Purpose for which Used	No.
Cargo handling:	
Agricultural products - wheat and soybeans	3
Petroleum - gasoline, kerosene, distillate fuel oil, residual fuel oil, asphalt, tar, and pitches	2
Crushed stone, sand, and aggregate	1
Sulphur - liquid and acid	1
Iron and steel - plates and sheets, pipe and tube	1
Industrial chemicals - basic chemicals	2
Agricultural chemicals	1
Forest products	1

A brief description of terminal facilities along the Mississippi River adjacent to WRPA 2, including those in Helena Harbor, is shown on pages 71 and 72.

New Madrid Harbor, Missouri

The New Madrid Harbor near mile 889 on the Mississippi River was approved by the Chief of Engineers in 1968 under Section 107 of the River and Harbor Act of 1960, as amended.

The project provides for dredging a channel 9 feet deep and 150 feet wide from the head of New Madrid Bar, about mile 889 AHP, extending a length of about 9,400 feet. The project was completed in the summer of 1970. There are three existing terminals within the harbor area. The harbor serves an industrial area of approximately 200 acres. The three terminals consist of one petroleum products, one grain terminal, and one logging operation. The harbor is expected to carry approximately 700,000 tons annually. Terminal facilities within the harbor along with others along the Mississippi River in WRPA 2 are briefly described on pages 71 and 72.

Osceola Harbor, Arkansas

Osceola Harbor was approved by the Chief of Engineers in 1971 under Section 107 of the River and Harbor Act of 1960, as amended.

The recommended plan for the harbor provides for dredging a channel 9 feet deep and 250 feet wide for a length of approximately 6,500 feet. An industrial area of 97 acres will be served by the project channel. It is expected that more than 211,000 tons will move through the project

annually after completion of the project. Construction is planned to begin in Fiscal Year 1974. Existing terminal facilities at Osceola and others along the Mississippi River are described in pages 71 and 72. Funds to initiate project construction are not expected to be made available until after Fiscal Year 1972.

Pine Bluff Port, Arkansas

Pine Bluff is the first port city reached by navigation of the Arkansas River. The port facility is slightly southeast of the geographic center of the state, is 42 miles southeast of Little Rock, and is approximately 72 river miles upstream from the confluence of the Arkansas and Mississippi Rivers. The port is located on an abandoned river channel, of which 5 miles are considered navigable.

The 372-acre port is comprised of a public terminal area and the Harbor Industrial District. The entire area has been hydraulically filled to a flood-free elevation. This dredging created a channel depth of approximately 43 feet.

The Southern Pacific-Cotton Belt Railroad mainline and electronic classification yard adjoin the port site, providing excellent rail service. Within the reciprocal switching limits of Pine Bluff, the port is also served by the Missouri Pacific Railroad. The port facility is strategically located near U. S. Highway 65 and U. S. Highway 79. A variety of State roads serve the area, and commercial air transportation is 3 miles away.

Public terminal facilities at the port of Pine Bluff provide on-loading and off-loading services to industries and shippers whose volume does not justify a specialized terminal. A 40,000-square foot transit shed-warehouse is located near the 160-foot wharf to facilitate cargo handling and storage of dry materials. Liquid fertilizer is stored in four 500,000-gallon tanks, and methanol is stored in another 500,000-gallon tank. Specialized handling equipment, including a 50-ton crane is available.

Over 6,000 waterfront feet of industrial properties are contained in the Harbor Industrial District at the port of Pine Bluff. Martin Terminals, located in the harbor industrial district, operates a bulk liquid storage terminal for receiving and storing caustic soda. Service bases for the U. S. Coast Guard and Corps of Engineers are also located at the port of Pine Bluff. A tabulation of all terminal facilities within the port is included on page 75. The port started operations in May 1969. Traffic in 1970 totaled 307,419 tons.

St. Francis and L'Anguille Rivers and Blackfish Bayou, Arkansas

The original project for improvement of St. Francis River for navigation was adopted by the River and Harbor Acts of March 3, 1871; June 14, 1880; July 5, 1884; August 11, 1888; and June 13, 1902, the latter adding L'Anguille River to the improvement. The original project for L'Anguille River was adopted by the River and Harbor Act of June 18, 1878. The original project for Blackfish Bayou was adopted by the River and Harbor Act of June 25, 1910 (House Document No. 73, 61st Congress, 1st Session).

The existing project provides for the removal of snags in St. Francis River from its mouth to Marked Tree, in L'Anguille River from its mouth to Marianna, and in Blackfish Bayou from its mouth to Fifteen Mile Bayou, and maintaining the channels clear of snags and similar obstructions at the lowest navigable stage.

Maintenance of these three channels ceased in 1942, at which time the commerce on the St. Francis River was 26,641 tons, while there was no commerce on L'Anguille River or Blackfish Bayou. Current movement on the St. Francis River consists of about 3,000 tons of logs moved annually from one point on the St. Francis River to another. The existing flood control project for the St. Francis Basin includes a closure with gravity outlets and a pumping plant, presently under construction, near the mouth of the St. Francis River. This facility will prohibit movement from the St. Francis River to the Mississippi River and the Inland Waterways System.

White River, Arkansas

Original authorization for navigation on White River was given for channel maintenance by snagging, dredging, and contraction work to provide a channel 4.5 feet deep by 100 feet wide between the mouth and Batesville, 300 miles, under the River and Harbor Act approved July 13, 1892. Maintenance was discontinued after Fiscal Year 1951 due to negligible traffic; dredging and snagging resumed in 1962 for the reach between Augusta to the mouth. The existing project was modified in 1968 under the authority of Section 107 of the 1960 River and Harbor Act, as amended. This project provides for a 125-foot wide channel on the lower reach from Augusta to the mouth with a minimum depth of 5 feet and a depth of 8 feet at a stage of 12 feet on the Clarendon gage. These dimensions are currently being maintained to Augusta, Arkansas, at

river mile 199. Under the authority of the River and Harbor Act of 1892, resumption of maintenance of the existing project on the White River from Newport to Augusta, a distance of 55 miles, was approved in February 1970 for dimensions of 4.5 feet by 100 feet. Maintenance was resumed on this reach in Fiscal Year 1973. The lower 10 miles of the White River serve both the White and Arkansas River waterways and are maintained to a depth of 9 feet and a 250-foot bottom width. There has been no commercial traffic on the White River reach from Newport to Augusta since 1951. Tonnage moved on the White River from Augusta to the mouth has steadily increased from 315,172 tons in 1961 to 642,819 tons in 1970.

Terminal facilities along the White River within WRPA 2 are briefly described on page 65.

Total Federal costs of new work were $169,994. This includes $20,245 for preauthorization studies, but excludes $25,000 for early construction. Maintenance costs through June 30, 1970, are $2,783.587.

Table 15 - List of Mississippi River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 2

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
OHIO RIVER						
977R	Cairo, Ill.	Martin Oil Co.	Bulk terminal	Tanks	Pumps, pipeline	NYC RR
978R		Mikco Grain Co.	Grain	Tanks	Conveyor	NYC RR
979R		Waterfront Services, Inc.	Fuel & boat supplies	Warehouse	None	ICRR. Commercial towboat supplies
		Municipal Landing	Mooring	None	None	ICRR. Landing for handling barges; crew exchange point
		Cairo Terminal and Fleet Co.	Freight & mooring	None	None	ICRR. Landing for handling barges
		Halliday Sand and Gravel Co.	Sand & gravel	None	Derrickboat	NYC RR
923R	Dorena, Mo.	S&S Grain & Storage Co.	Grain	Tanks, elevators	Conveyor	No RR connections. Bulk grain handling; mooring
		Howell Dorena Corp.	Sand & gravel	None	Conveyor	No RR connections. Bulk sand & gravel handling
889R	New Madrid, Mo.	Sinclair Oil Co.	Petroleum products	Tanks	Dock, pumps	CB RR. Wholesale distribution
		Ralph Anderson Lbr. Co.	Logs	None	Incline	No RR connections. Small harbor for raft boats and log storage
		Cargill, Inc.	Grain	Tanks	Conveyor	No RR connections. Pile cluster mooring; barges
883R	New Madrid, Mo.	City of New Madrid	UNDER CONSTRUCTION			Aluminum plant dock and power plant dock
876R	Linda, Mo.	River Grain Co.	Grain	Tanks	Conveyor	No RR connections. Pile cluster mooring for barges
848R	Caruthersville, Mo.	Southern Terminal Co.	Petroleum products	None	Pumps	No RR connections. Bulk petroleum products; receives by barge
		Caruthersville Shipyards, Inc.	Barge building	Warehouse, shops	Ways & docks	No RR connections. 200' barges at present time
		River Oil Co.	Petroleum products	None	Pumps	No RR connections. Bulk petroleum products; receives by barge
		Texas Sales Terminal	Petroleum products	Tanks	Pumps	No RR connections. Bulk petroleum products; receives by barge
		Caruthersville Cstg. Fld. (US Army Engr Dist, Memphis)	Mooring	None	None	No RR connections. Concrete mat casting field; mooring
		Taylor Sand & Gravel Co.	Sand & gravel	None	Conveyor	Frisco RR. Bulk sand & gravel handling
		Missouri Farmers Assoc. Grain Terminal	Grain	Tanks	Conveyor	Frisco RR. Bulk grain handling by truck and barges
		James Marine Eqpt. Co.	Barge rentals	None	None	No RR connections. Barge rentals and sales
		Betz-Tipton Veneers, Inc.	Wirebound boxes manufacturing	None	Incline	Frisco RR. Private mooring for logs, boats and rafts
		Caruthersville Marine Service, Inc.	Ramp	None	None	No RR connections. Loading & unloading ramp
832R	Cottonwood Pt., Mo.	Continental Grain Co.	Grain	Tanks	Conveyor belt	No RR connections. Bulk grain handling to barges
827R	Huffman, Ark.	River Grain Co.	Grain	Tanks	Conveyor belt	No RR connections. Bulk handling truck to barge

Table 15 - List of Mississippi River Terminals, Docks, Mooring Locations, and warehouses in WRPA 2 (continued)

MP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
810R	Barfield, Ark.	Continental Oil Co.	Petroleum products	Tanks	Pumps, pipelines	Frisco RR. Bulk petroleum products; handles & manufactures ammonia products
		Farmers Soybean Co., Inc.	Grain & liquid fertilizer	Tanks, elevators	Conveyor	No RR connections. Bulk grain & fertilizer via truck & barges; barge mooring
		Blytheville River & Rail Terminal	Petroleum products	Tanks	Pumps, pipelines	No RR connections. Bulk petroleum products; mooring for barges
783R	Osceola, Ark.	Paymaster Oil Mill Co.	Soybeans and by-products	Tanks	Conveyor	Frisco RR. Bulk petroleum products; mooring for barges
		Arkansas Sand & Gravel Co.	Sand & gravel	None	Dragline	No RR connections. Bulk sand & gravel
		Wilson Sova Terminal	Grain	Tanks, warehouse	Conveyor, spout elevator	Frisco RR. Bulk grain handling
		River Grain Co.	Grain	Tanks, elevator	Conveyor, spout elevator	Frisco RR. Bulk grain handling
729R	West Memphis, Ark.	Oklahoma-Miss. River Products Line, Inc.	Bulk petroleum products	Tanks	Pumps and pipelines	MP RR. To tank cars, river, rail & trucks. Receives by pipeline
729-8R		W. K. Ingram Const. Co.	FUTURE CONSTRUCTION PROJECT			Loading and unloading dock
663R	Helena, Ark.	Helena Marine Service, Inc.	Mooring, fuel service, tug service	None	Crane	No RR connections. Complete mooring, marine supplies, fuel oil, service & barge handling equipment
		Arkansas Grain Corp.	Soybeans and by-products	Tanks; elevators	Conveyor	IC & MP RRs. Bulk grain products by barges
		Helena Cstg. Field (US Army Engr Dist, Memphis)	Mat casting & mooring	None	None	No RR connections. Mooring facilities
		Ark-La. Gas Co.	Liquid and solid fertilizers	Tanks	Pumps and pipelines	IC & MP RRs. Fertilizer plant
		Ark. Power & Light Co.	Electric power generating	None	None	IC & MP RRs. Power plant; oil unloading facilities
		Helena Terminal & Warehouse Co., Inc.	Grain, freight & petroleum products	Warehouse	Conveyor, dragline	IC & MP RRs. Bulk freight, grain & petroleum products handled & warehoused
		Arkansas Rice Growers Assoc. Corp.	Grain	Elevators, tanks	Conveyors	MP RR. Bulk grain movements & dock facilities
		Texas-Eastern Pipeline Corp.	Bulk petroleum products	Tanks	Pumps	IC & MP RRs. Bulk petroleum products, pipeline outlet & mooring facilities
663L	Helena, Ark.	IC RR Rail Transfer	Ferry transfer	None	None	ICRR. Connecting on Miss. & Ark. sides of Mississippi River
644R	Old Town Bend, Ark.	River Grain Co.	Terminal facility	Tanks	Conveyor	No RR connections. Bulk handling by trucks

Table 16 - List of White River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 2

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
143	DesArc, Ark.	River Grain Company W. Memphis, Ark.	Grain, soybeans	Tanks	Conveyor	No RR connections. Bulk grain from truck to barge or storage
126.5	DeValls Bluff, Ark.	Ark. Game & Fish Comm. Little Rock, Ark.	Access ramp	None	None	No RR connections. Access rd. & turn around on bank; concrete ramp
99	Clarendon	River Grain Company W. Memphis, Ark.	Grain, soybeans	Warehouse, tank	Conveyor	No RR connections. Bulk grain from truck to barge or storage
		Potlatch Forests, Inc. Clarendon, Ark.	Logs	None	Derrick	Cottonbelt RR. Unloading logs from barge to mill
57	St. Charles, Ark.	River Grain Company W. Memphis, Ark.	Grain, soybeans	Warehouse, tanks	Conveyor	No RR connections. Bulk grain from truck to barge or storage
		Arkansas County, Ark. DeWitt, Ark.	Gravel	None	Loading dock	No RR connections. Gravel loading facilities
200	Augusta, Ark.	M. L. Lockhart Co. Augusta, Ark.	Grain, soybeans, fertilizers	Tanks, warehouse	Conveyor	RR connections. Truck turn around
		River Grain Company W. Memphis, Ark.	Grain, soybeans	Tanks	Conveyor	Bulk grain from truck to storage
		River Sand & Gravel Co. Augusta, Ark.	Sand & gravel	None	Loading dock	No RR connections
250	Newport, Ark.	R. D. Wilmans & Sons	Grain, soybeans	Tanks	Conveyor	Bulk grain from truck to storage
		Mobley Const. Co.	Sand & gravel	None	Loading dock	Gravel loading facility

Table 17 - List of Arkansas River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 2

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
75.2L	Pine Bluff, Ark.	Bunge Corporation	Shipment of grain	1-200-ft.-diameter 1-35-ft.-diameter silos	Conveyor belt	No RR connections. 285-ft.-long row of pile dolphins
71.2R	Pine Bluff, Ark.	Martin Terminals Co.	Bulk liquids	2-one-million-gal. storage tanks	Pipeline	St. Louis SW RR. Handling lg. vols. of bulk chemicals; space to handle other products available; terminal on Lake Langhofer, 2.1 mi. from Ark. River
		Ark. River Terminals	Miscellaneous	40,000-sq.ft. warehouse, 5-liquid & dry-storage tanks	1-50-ton crane	So.Pacific RR; St.Louis SW RR; reciprocal switching w/MoPac RR. Terminal on Lake Langhofer, 2.4 mi. from Ark. River
		Mrs. Allen R. Russell	Fleeting service, above water repairs, barge cleaning, charter boats and barges	Open storage	Crane service	No RR connections. Barge to truck loading only. Terminal on Lake Langhofer, 4.1 mi.fm Ark. River
		Pine Bluff Sand & Gravel Co.	Receipt of sand	None	Conveyor belt 1-30-ton crawler clamshell crane	No RR connections. Terminal on Lake Langhofer, 4.4 mi. from Ark. River
64.5R	Pine Bluff, Ark.	Moore Terminal & Barge Co., Inc.	Oil	None	Pipeline	No RR connections. 800-ft.-long piling ehart; 600-ft.-long row of pile dolphins
54.5R	Linwood, Ark.	Bunge Corporation	Shipment of grain	1-200-ft.-diameter 1-35-ft.-diameter silos	Conveyor belt	No RR connections. 335-ft.-long row of pile dolphins
22.0R	Dumas, Ark.	Pendleton Marine	Towboat refueling, fuel gas & oil available	None	Dock & barrel loading winch	No RR connections. 600-ft.-long row of pile dolphins
20.0R	Dumas, Ark.	W. H. Carder, Inc.	Company boat & barge fleeting area, repair yard	None	None	No RR connections.

PROJECT MAP INDEX
Navigation and Harbors-WRPA 2

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description
7.	Arkansas River	C of E, LRD	Under constr.	N	Chan. 9 ft.x250ft. fm mouth White R. through upper boundary, WRPA-2. Projs. within WRPA-2 incl 4 110 ft.x600 ft. navigation locks. Total cost in Ark., $658,709,000.
5.	Helena Harbor, Ark.	C of E, MD	1963	N	Access chan. 9 ft.x450 ft. Harbor chan. 3,000 ft. long. 550-ac. ind. area. 11 cargo terminals. Cargo 2,195,436 tns. in 1970. Fed. cost $88,919.
1.	New Madrid Harbor, Mo.	C of E, MD	1970	N	Chan. 9 ft.x150 ft.x9,400 ft. Anticipated 700,000 tns. annually. Served 200-ac.ind.area. 3 terminals.
2.	Osceola Harbor, Ark.	C of E, MD	Not Started	N	Chan. 9 ft.x25 ft.x6,500 ft. Anticipated 211,000 tns. annually. 97-ac. ind. area.
6.	Pine Bluff, Ark.	C of E, VXD	1969	N	Chan. 5 mi.x approx. 43 ft. feep in old river bend-way. 372 ac. hydraulically filled to above flooding. Over 6,000 waterfront ft. 40,000-sq.ft. transit shed-warehouse. 50-tn. crane.
3.	St. Francis & L'Anguille Rivers, Ark. & Blackfish Bayou	C of E, MD		N	Clearing & snagging on all streams. Maintenance ceased 1942. 1970 traffic est. 3,000 tns.
4.	White River, Ark.	C of E, MD		N	Chan. 125 ft.x5 ft. Min. depth 8 ft. at stage 12 ft. on Clarendon gage up to mi. 199. Additional 55 mi. 4-1/2x100' approved for maintenance. 642,819 tns. in 1970.

LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

NAVIGATION

WRPA 2

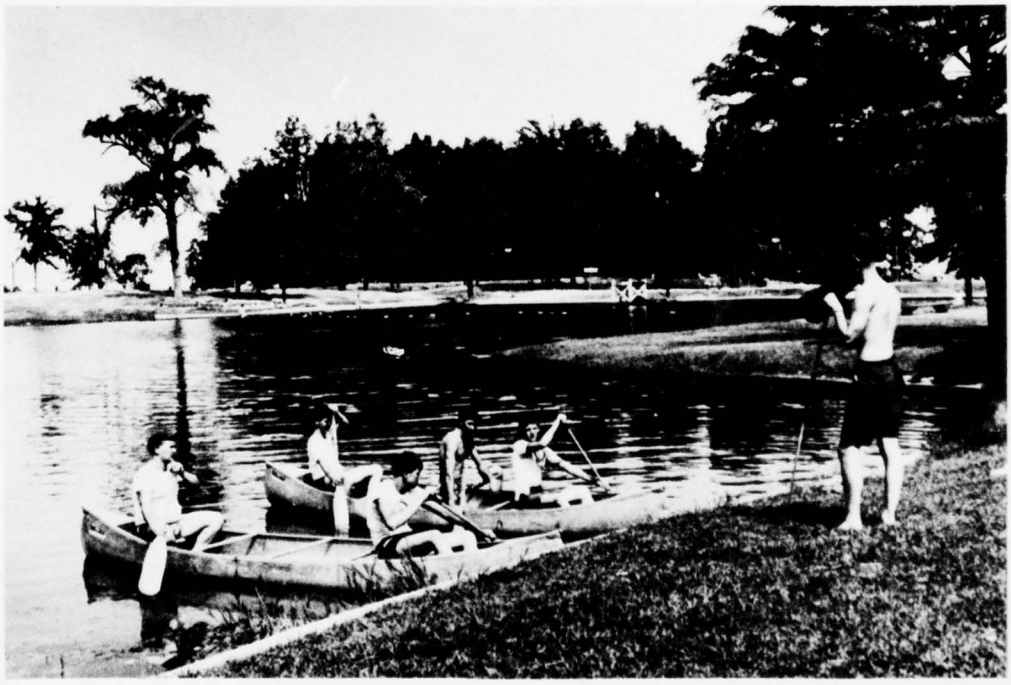
FIGURE 6

RECREATION
AND
FISH AND WILDLIFE

Recreation

WRPA 2 has 121,984 acres of land available for recreation, including 40,230 acres federally owned, 41,997 acres State owned, 92 acres of county and quasipublic lands, and 7,598 acres municipal, local government and school board lands. Additionally, there are 32,067 acres of land in private ownerships.

WRPA 2 has 91,214 acres of slack water and 1,203 miles of stream suitable for recreation. Developed recreation facilities include 2,635 acres for camping, 1,000 acres for picnicking, 3,576 acres for playing outdoor sports and games, 141 acres for swimming, and 43 acres for boat ramps.



A race seems to be just getting started in the swimming area of Crowley's Ridge State Park, Arkansas.

Fish and Wildlife

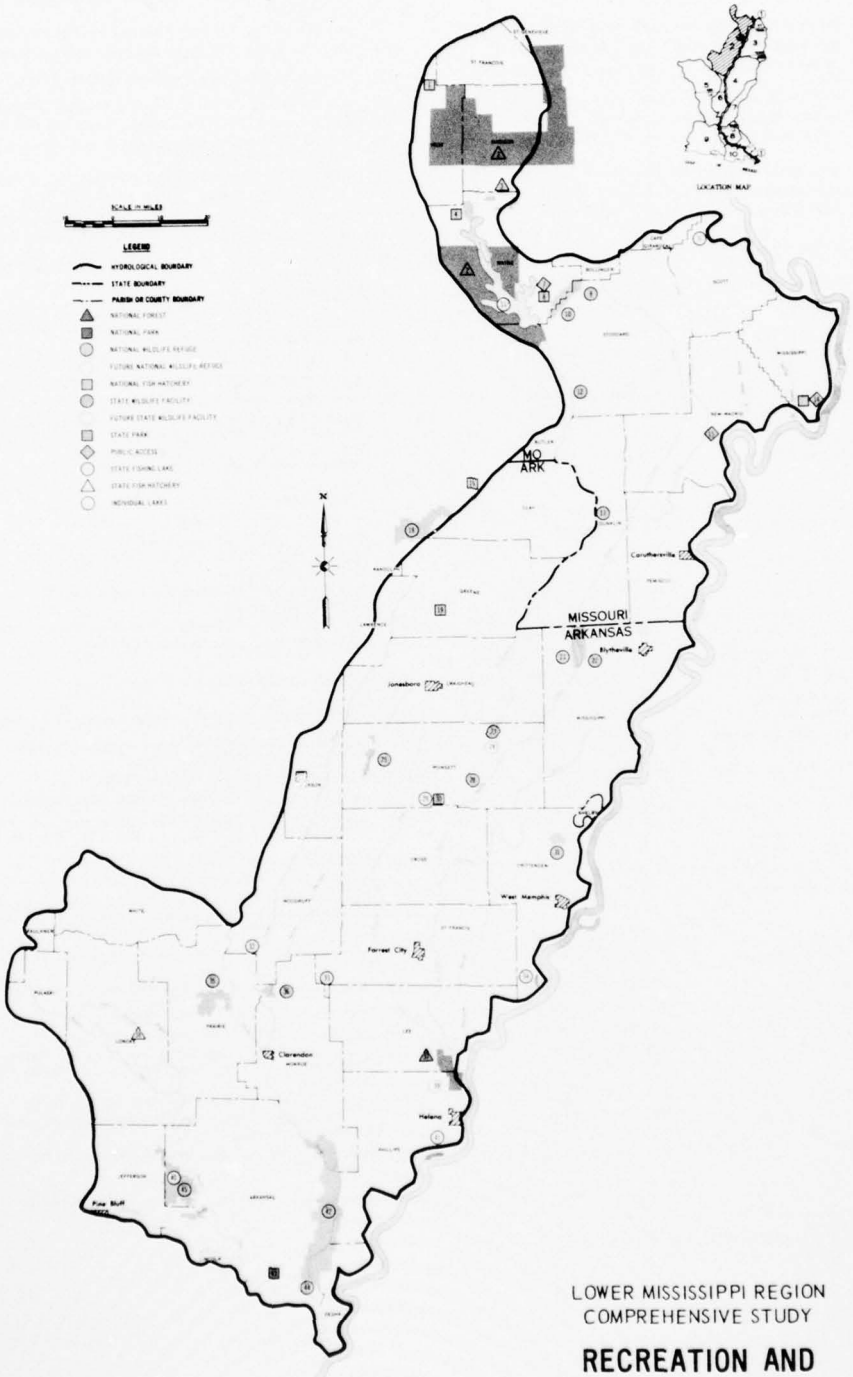
WRPA 2 water-related fish and wildlife resources include 98,000 acres of lakes between two and 40 acres in size, 91,000 acres of lakes over 40 acres in size, 1,203 miles of fishable streams, 2,634,000 acres of forest land, and 205,000 acres of wetland. Ponds under two acres in size have not been inventoried, but are abundant. Included in the lake acreage figures are two major Mississippi River oxbow lakes and Wappapello Lake, a Corps of Engineers reservoir. WRPA 2 water-related fish and wildlife facilities include State ownership of six managed fishing lakes, one fish hatchery, 12 existing and two proposed wildlife management areas, five parks, one State forest, and three public access areas. Federally owned facilities include one fish hatchery, three wildlife refuges, and two national forests. About 53 percent of the national forests' acreage and 14 percent of State owned wildlife management areas included lie outside the hydrologic boundaries of WRPA 2. Numerous private facilities in the form of fishing and hunting clubs exist but have not been inventoried. All areas are capable of supplying wildlife-oriented recreation. Fish-and-wildlife-oriented recreation consists of nature photography and wildlife study, especially bird watching. Such use is nonconsumptive within certain limits.

PROJECT MAP INDEX

Recreation, Fish, and Wildlife Facilities - ARPA 2

Map Location No.	Name of Project	Agency	Project Use	Description 1/
43.	Arkansas Post National Monument	National Park Service	R, F&W*	220 ac. Natl. monument. No hunting. Unknown fishing possibility. High WOR use.
25.	Bayou DeView Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 4,173 ac. Waterfowl hunting and fishing.
45.	Bayou Meto Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 33,636 ac. Waterfowl hunting, fishing.
17.	Ben Cash Memorial Wildlife Mgmt. Area	Mo. Dept. of Conservation	F&W	High F&W rating. 956 ac. Waterfowl hunting, fishing.
22.	Big Lake Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 12,160 ac. Waterfowl refuge. Fishing.
21.	Big Lake Natl. Wildlife Refuge	U.S. Fish & Wildlife Svc.	F&W	High F&W rating. 11,203 ac. Waterfowl hunting, fishing.
13.	Big Oak Tree State Park	Mo. State Park Board	R, F&W	1,007 ac. Unknown fishing. No hunting. High WOR use. Rec. facs. consist of nature trails.
18.	Black River Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 19,314 ac. Waterfowl hunting, fishing.
12.	Bradyville Waterfowl Area	Mo. Dept. of Conservation	F&W	High F&W rating. 269 ac. Waterfowl hunting.
2.	Clark Natl. Forest	U. S. Forest Svc.	R, F&W	Moderate F&W rating. 226,600 ac. Fishing. Unknown waterfowl use. Two developed campgrounds; camping, picnicking, fishing & swimming
3.	Coldwater State Forest	Mo. Dept. of Conservation	R, F&W	Moderate F&W rating. 4,627 ac. Unknown fishing & waterfowl use. High WOR use.
16.	Corning Natl. Fish Hatchery	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. Natl. fish hatchery.
19.	Crowley's Ridge State Park	Ark. Parks, Rec. & Travel Comm.	R, F&W*	270 ac. No waterfowl use. Unknown fishing use. High WOR use. Rec. facs. incl. camping (tent & trailer, cabins, group), picnicking, swimming, and nature trails.
36.	Dagnar Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 7,656 ac. Waterfowl hunting, fishing.
9.	Duck Creek Wildlife Mgmt. Area	Mo. Dept. of Conservation	F&W	High F&W rating. 6,035 ac. Waterfowl hunting, fishing.
14.	Dorena Access Area	Mo. State Park Board	R, F&W	Public access area. Launching ramp. High rating.
1.	Elephant Rock State Park	Mo. State Park Board	R, F&W*	131 ac. Unknown fishing. No waterfowl hunting. High WOR use. Rec. facs. incl. swimming & nature trails.
40.	Hallowell Lake, Public Fishing Lake	Ark. Game & Fish Comm.	F&W	High F&W rating. 600 ac. Public fishing lake. Intensive mgmt. & use.
41.	Horseshoe Lake		F&W	High F&W rating. 1,200 ac. Miss.R. oxbow lake. Fishing & waterfowl use.
27.	Jacksonport State Park	Ark. Parks, Rec. & Travel Comm.	R	20 ac. Rec. facs. incl. camping & picnicking.
38.	Joe Hogan State Fish Hatchery	Ark. Game & Fish Comm.	F&W	High F&W rating. State fish hatchery.
32.	Lake Des Arc, Public Fishing Lake	Ark. Game & Fish Comm.	F&W	High F&W rating. 300 ac. Public fishing lake. Intensive mgmt. & use.
33.	Lake Greenlee, Public Fishing Lake	Ark. Game & Fish Comm.	F&W	High F&W rating. 300 ac. Public fishing lake. Intensive mgmt. & use.
29.	Lake Poinsett Public Fish.Lake	Ark. Game & Fish Comm.	F&W	High F&W rating. 550 ac.public fish.lake. Intensive mgmt. & use.
30.	Lake Poinsett State Park	Ark. Parks, Rec. & Travel Comm.	R	80 ac. Rec. facs. incl. camping & picnicking.
8.	Lake Wappapello State Park			
20.	Mallard Lake Public Fish.Lake	Ark. Game & Fish Comm.	F&W	High F&W rating. 300 ac. Public fishing lake.
28.	Marked Tree Floodway Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 12,000 ac. Fishing & waterfowl hunting.
10.	Mingo Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 21,673 ac. Waterfowl refuge, fishing. Possible future wilderness area.
15.	New Madrid Bend Access Area	Mo. State Park Board	R, F&W	7 ac. Public access area. Launching ramp.
34.	Old Town Lake		F&W	High F&W rating. 900 ac. Miss.R. oxbow lake. Waterfowl use, fish.
4.	Sam A. Baker State Park	Mo. State Park Board	R, F&W*	5,138 ac. No hunt. Possible fish. High WOR use. Rec. facs. incl. swim., camp., (cabins, tent & trailer) boat., & nature trails.
39.	St. Francis Backwater Wildlife Mgmt. Area (Proposed)			Possible future high-rated wildlife facility.
24.	St. Francis Lake Wildlife Mgmt. Area (Proposed)			Possible future high-rated wildlife facility.
37.	St. Francis Natl. Forest	U. S. Forest Service	R, F&W	High F&W rating. 20,600 ac. Fishing, waterfowl use & hunting. 2 recreation areas for picnicking, camping (8 units), fishing, swimming, & boating.
23.	St. Francis Sunken Lands Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 14,700 ac. Waterfowl hunting, fishing.
44.	Trusten Holder Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 4,321 ac. Waterfowl hunting, fishing.
5.	Tywappity Community Lake	Mo. Dept. of Conservation	F&W	High F&W rating. 120 ac. Public fishing lake.
7.	Wappapello Access Area(13 sites)	Mo. State Park Board	R, F&W	Low F&W rating. 13 sites. Public access areas.
11.	Wappapello Lake	Corps of Engineers	R, F&W, PC	Completed June 1941. High F&W rating. 7,250 ac. Fishing. Possible waterfowl use. Rec. facs. incl. picnicking, camping, swimming, and boating.
31.	Wapanocca Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 5,485 ac. Waterfowl refuge. Fishing.
35.	Wattensaw Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	Low F&W rating. 16,653 ac. Wildlife Mgmt.Area. No waterfowl use. Possibly some fishing.
42.	White River Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 113,000 ac. Waterfowl refuge, fishing. High WOR use.

1/ WOR = Wildlife oriented recreation
F&W = Fish and wildlife
F&W* = Supplies only nonconsumptive fish and wildlife oriented recreation



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

RECREATION AND FISH AND WILDLIFE

WRPA 2

FIGURE 7

POWER

The six steam-electric generating plants in the area at the end of 1970 included two municipal plants, one electric power cooperative plant, and three owned by private utilities. Total installed capacity was 1,228.6 megawatts and total net generation for calendar year 1970 was 6,295,169,000 kilowatt-hours. Two plants have once-through cooling and take their water from rivers. Three plants use cooling towers and rely on wells for make-up water. The other plant uses towers with wells and river water for make-up.

Transmission lines of interconnected systems traverse the area resulting in import and export of electric power.

The City of New Madrid, Missouri placed in service a 650-megawatt plant in 1972 and will add 600 megawatts in 1977. This plant is leased to Associated Electric Cooperative Corporation of Springfield, Missouri, which will operate the plant and utilize a portion of the output on its own system.

PROJECT MAP INDEX

Power Plants - WRPA 2

Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (31 Dec 70) (MW)	Annual 1970 Production (1000 kwh)	Remarks
			Existing					
4.	Carl Bailey	Ark. Elec. Coop.	S		White	120.0	503,432.0	
1.	E. P. Coleman	Sikeston, Mo.	S	Wells		6.3 1/	31,287.0	
2.	Jim Hill	Arkansas-Missouri	S	Wells		33.0	67,406.0	
3.	Jonesboro	City of Jonesboro, Ark.	S	Wells		27.7 2/	43,998.0	
5.	Hamilton Moses	Ark. Power & Light Co.	S	Wells	L'Anguille	138.0	642,477.0	
6.	R. E. Ritchie	Ark. Power & Light Co.	S		Mississippi	903.6	5,006,569.0	

1/ Plant has 4.3-MW internal combustion auxiliary unit.

2/ Plant has 1.0-MW internal combustion auxiliary unit.

Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (MW)	Date
			Planned Additions				
7.	New Madrid	City of New Madrid 1/	S		Mississippi	650.0	January 1972
7.	New Madrid	City of New Madrid 1/	S		Mississippi	600.0	February 1977

1/ Leased to Associated Electric Cooperative.

LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

POWER

WRPA 2

FIGURE 8

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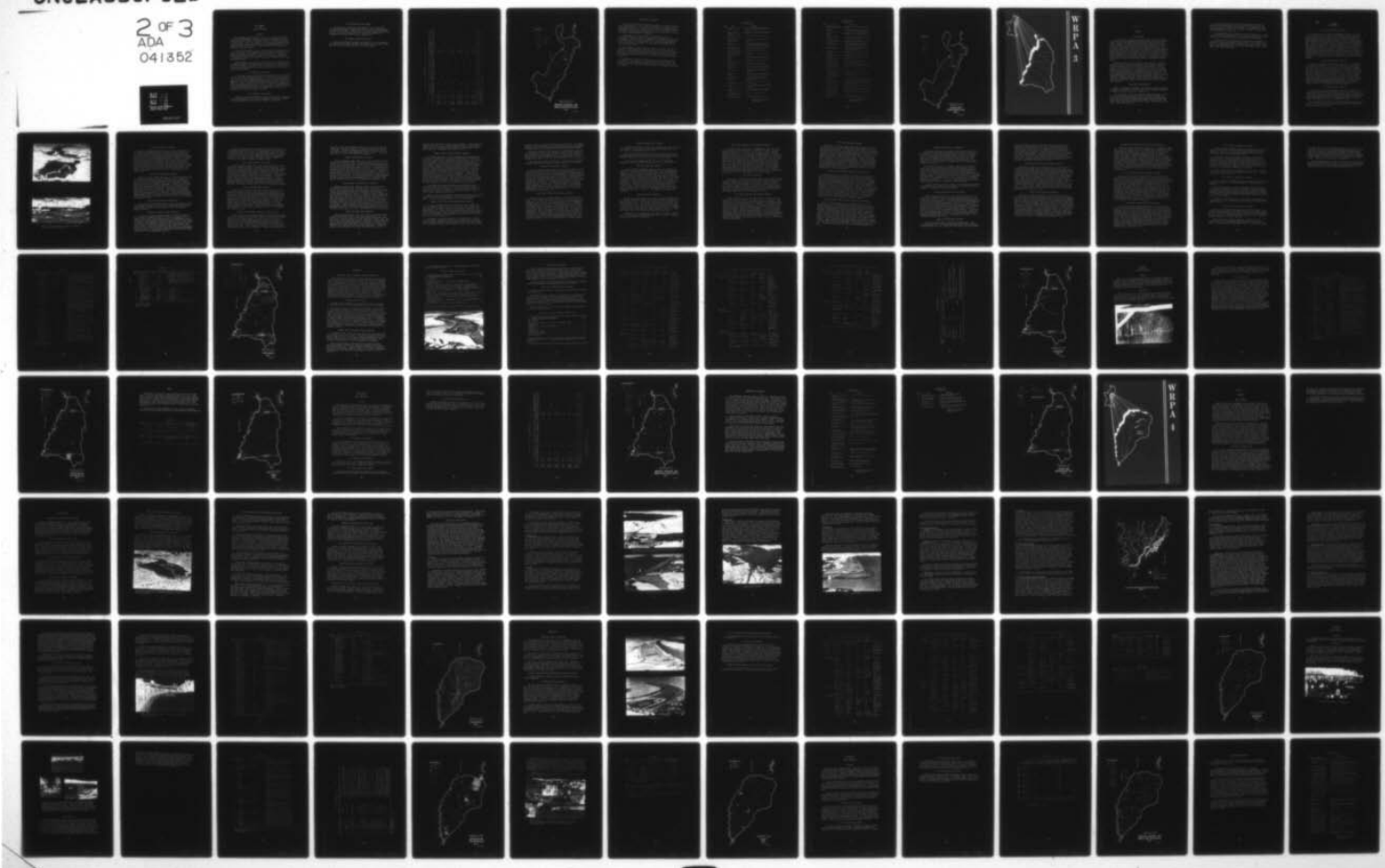

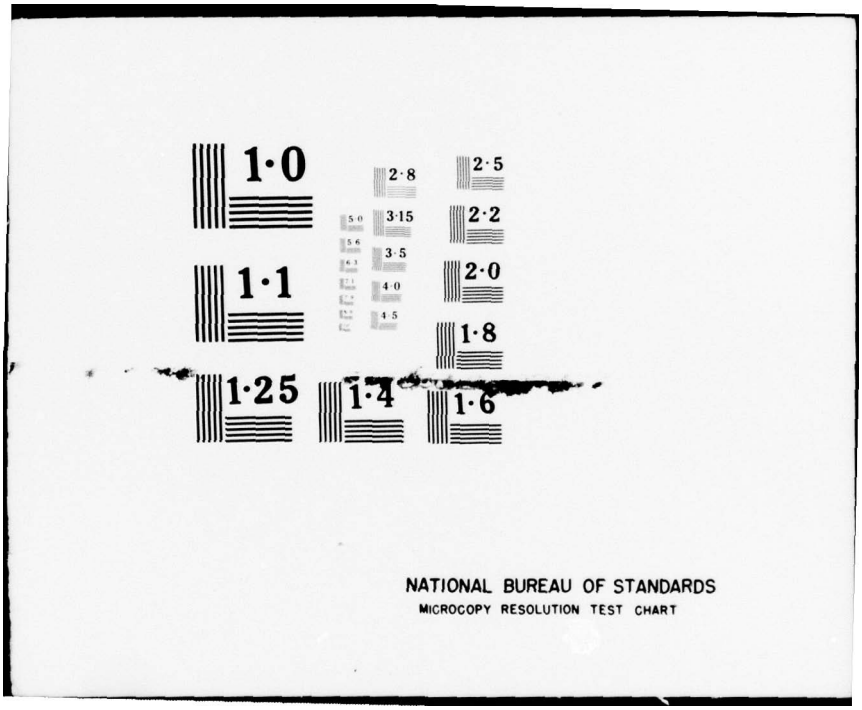
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WATER SUPPLY AND SEWAGE TREATMENT

General

Water Resources Planning Area 2 covers all or part of 38 counties in Missouri and Arkansas. Because data herein is available only on a county wide basis, hydrologic boundaries have been adjusted to conform to county lines. Twenty-six counties fall within these boundaries and are considered in municipal, industrial, and agricultural water use and sewage treatment data collection. These counties have been further subdivided into six subareas.

In 1970, within WRPA 2, 2,638.9 MGD was required to meet the municipal, industrial, and agricultural water withdrawal requirements. Of this, 85.3 percent was supplied by groundwater sources. Groundwater withdrawals accounted for 93.9 percent of the municipal water used, 91.5 percent of the industrial water used, and 85.0 percent of the agricultural water used.

Sewage treatment was provided in 41 percent of the communities and serviced 89 percent of the population which utilized the area's municipal water distribution systems in 1970. The remaining 11 percent of the municipally serviced population utilized septic tanks or their sewage was disposed untreated.

1970 Municipal Water Supply

In 1970, municipal water systems within the WRPA serviced 199 communities, which had a combined population of 335,342 people, and varied in size from 91 people at Sedgewickville, Mo., to almost 25,000 people in Jonesboro, Ark. The average daily municipal water withdrawal within the WRPA was 37.5 MGD. During July, the peak municipal water use month in 1970, the average daily use was 40.6 MGD. This water was supplied 93.9 percent from groundwater sources. The average daily withdrawals resulted in a 104 GPCD use in areas serviced by central water systems. This compares with a national average of 166 GPCD.

1970 Industrial Water Supply

Industrial activity within WRPA 2 during 1970 required a daily average water withdrawal of 110.6 MGD. Groundwater supplied 86.8 percent of this withdrawal and surface sources supplied 13.2 percent.

1970 Agricultural Water Supply

In addition to the municipal and industrial water withdrawals, agricultural withdrawals required 2488.3 MGD for use in the irrigation of 1,417,828 acres and 5.3 MGD for use in livestock and poultry raising in 1970. Of the water used, 85 and 15 percent was supplied from groundwater and surface water sources, respectively.

1970 Sewage Treatment Facilities

Primary and secondary treatment was provided in 67 of the communities that utilized a municipal water distribution system in 1970. These treatment facilities provided service for 299,987 people.

PROJECT MAP INDEX

Municipal, Industrial, and Agricultural Water Supply and Sewage Treatment Facilities - WRPA 2

Subarea / County	Population	Municipal Water Use 1/				Industrial Water Use 1/			Agricultural Water Use 1/			Sewage Treatment Facilities					
		No. systems	Withdrawal (MGD) Ground	Surface	Total	Withdrawal (MGD) Ground	Surface	Total	Withdrawal (MGD) Ground	Surface	Total	Secondary Treatment Number Plants	Secondary Treatment Population Serviced	Primary Treatment Number Plants	Primary Treatment Population Serviced	No Treatment 2/ Number Communities	No Treatment 2/ Population
2-1						5.6	2.0	7.6	63.6	11.2	74.8						
Scott	23,318	11	2.5		2.5							5	22,105				
Miss.(Mo.)	9,415	6	1.4		1.4							2	8,406				
New Madrid	12,331	14	1.0		1.0							5	7,764				
Pemiscot	19,111	16	2.0		2.0							3	13,298				
2-2						15.1	0.0	15.1	127.1	22.4	149.5						
Miss.(Ark.)	34,992	19	4.8		4.8							5	36,492	1	1,582		
Lee	5,840	2	.6		.6							-	-	1	6,196		
Phillips	24,848	6	3.1		3.1							4	24,612				
2-3						3.8	1.5	5.3	106.0	18.7	124.7						
Iron	3,568	6	.3	.3	.6							1	1,452				
Madison	4,725	3	.1	.5	.6							1	3,799				
Wayne	2,762	3	.6		.6							-	-				
Stoddard	13,219	7	.2		.2							3	9,249				
Dunklin	20,090	10	2.8		2.8							4	18,689				
2-4						6.3	0.4	6.7	466.4	82.3	548.7						
Clay	8,397	10	.7		.7							2	5,770				
Greene	11,870	3	1.1		1.1							1	10,639				
Craighead	29,484	13	2.9		2.9							1	27,050	1	1,076		
Poinsett	13,994	9	1.5		1.5							4	12,923				
Cross	8,433	4	.9		.9							1	6,696	1	1,731		
St.Francis	17,702	7	1.3		1.3							2	14,393				
2-5						.9	1.1	2.0	423.9	74.8	498.7						
Jackson	10,698	8	.7		2.5							1	7,725	1	1,731		
White	16,157	11	.2	1.8	2.0							5	17,050				
Woodruff	5,705	5	1.3		1.3							2	3,035				
2-6						2.0	0.1	2.1	932.6	164.6	1097.2						
Lonoke	10,960	9	1.0		1.0							3	8,263	1	2,903		
Prairie	4,244	5	.3		.3							2	3,319				
Monroe	8,164	5	.5		.5							2	7,838				
Arkansas	15,315	7	1.3		1.3							2	14,201				
Total	335,342	199	33.2	2.6	37.5	33.7	5.1	38.8	2119.6	374.0	2493.6	61	284,768	6	15,219		

1/ All figures are daily averages.

2/ Only denotes communities of 1,000 or greater population.

LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL WATER SUPPLY

WRPA 2

FIGURE 9

ARCHEOLOGY AND HISTORY

In all of the Lower Mississippi Valley, WRPA 2 is probably the best know, archeologically. Over half of the archeological sites are well enough known that it is possible to make cultural and temporal statements concerning the prehistoric occupation of the area. The history of the development of Mississippian Period culture lies in this area - a way of life that spread throughout the Southeast.

Archeological sites identified in this WRPA total 2,374: 14 historic, 354 Mississippian, 647 woodland, 440 archaic, 41 paleo, and 878 unknown. Figure 10 shows the number of sites occupied during each period by county. Since some of the sites have been occupied during more than one period, the number of sites shown on the figure do not agree with those above.

Recent historic sites are not as abundant as in some other WRPA's, although it would take little searching in any of the older towns or villages to find buildings and sites that are at least locally important. Many roads and trails in the area were nationally significant, and in many instances, their exact route can be traced through the undeveloped countryside.

The northern portion of the area varies scenically from the flat flood plains in the south, and is characterized by Sikeston Ridge and Crowley's Ridge that protrude prominently above the valley floor. Crowley's Ridge is cut by four water gaps that add to the aesthetic character of the area.

PROJECT MAP INDEX
Historic Sites - WRPA 2

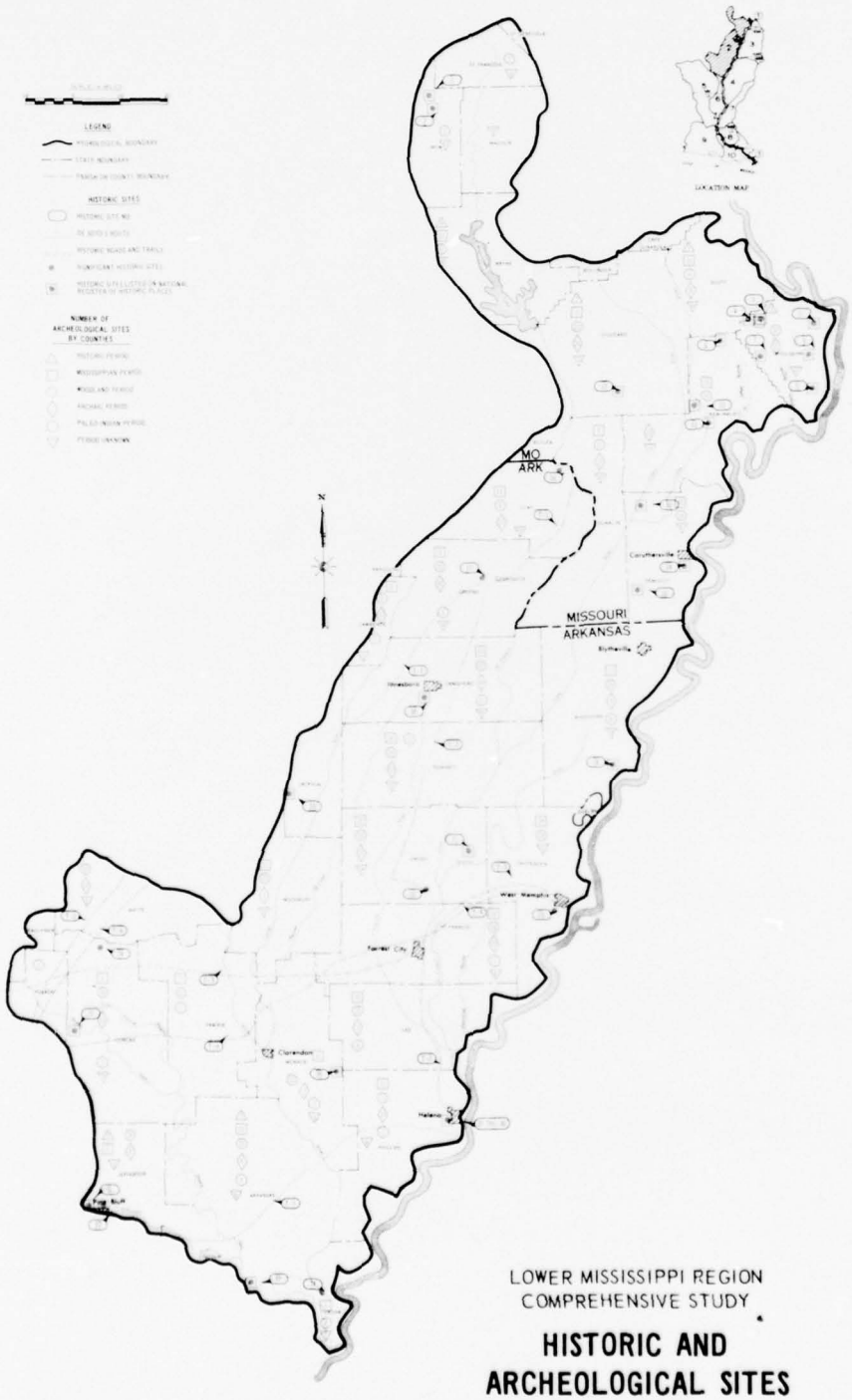
Map No.	Name		Description
28	Allin House Phillips County, Arkansas	NR	Located at 515 Columbia Street, Helena. An unusually designed antebellum plan with wooden trim.
33	Arkansas Post National Memorial Arkansas County, Arkansas	NR-NP	Site of first French settlement in Lower Mississippi Valley. Located 8 miles south of Gillette.
9	Beckwith's Fort Mississippi County, Missouri	NR	Archeological site vicinity Wolf's Island.
T-3	Butterfield-Overland Stage Coach Road Arkansas		Main route of travel between Memphis and Fort Smith, Arkansas.
24	Camp Nelson Lonoke County, Arkansas		Texas Cavalry campground and memorial to Texas and Arkansas unknown soldiers. Located 4 miles south of Austin and west of Cabot.
16	Chalk Bluff Battlefield Clay County, Arkansas		Early crossing site of St. Francis River and site of Civil War skirmish, 1863.
8	Crosno Fortified Village Mississippi County, Missouri	NR	Archeological site located 1 mile south of Crosno.
15	Denton Mound and Village Pemiscot County, Missouri	NR	Archeological site located 1 mile northeast of Denton.
T-7	De Soto's Route Arkansas		Historic trail followed by De Soto in 1541-42. See WRPA #5 for trail description.
31	Du Bocage Jefferson County, Arkansas	NR	House built during early 1800's located at Pine Bluff.
18	Frierson House Craighead County, Arkansas	NR	Example of post-Civil War townhouse. Located at 1112 S. Main Street, Jonesboro.
1	Fort Davidson Iron County, Missouri	NR	Site of Civil War Battle of Pilot Knob, 1864. Located on Highway 21 south of county road V.
17	Gainesville Green County, Arkansas		Historic Delaware Indian Village--later a stage and transfer stop between Cairo and Fort Smith.
T-1	Gainesville Road Arkansas		Historical trade route from Jacksonport, Arkansas, into Missouri via Gainesville, Arkansas.
T-2	Helena-Wittsburg Road (Buffalo Trail) Arkansas		Early game and Indian trail, generally following Crowley's Ridge was used by settlers extensively. Part of old trail is now a highway route.
7	Hoecake Village Mississippi County, Missouri	NR	Archeological site located 7 miles southeast of East Prairie.
23	Hopefield Crittenden County, Arkansas		Site of old Spanish fort and first established settlement in Crittenden County. Located south of W. Memphis.
32	Hudson-Grace-Borreson House Jefferson County, Arkansas	NR	Multiple-owner house depicting different architectural themes. Located in Pine Bluff.
10	Hurricane Ridge Site New Madrid County, Missouri	NR	Located 3 miles northeast of Catron.
20	Jacksonport State Park Jackson County, Arkansas	NR	Site of early prosperous commercial center from 1833-1870's.

(NR--This site is on the National Register of Historic Places)
(NP--National Park)

PROJECT MAP INDEX
Historic Sites - WRPA 2
(Continued)

Map No.	Name		Description
11	Lilbourn Fortified Village New Madrid County, Missouri	NR	Archeological site located within city limits of Lilbourn.
T-5	Long's Trail Arkansas		Route followed by Stephen Long in 1817-18 during his exploration of the Arkansas River.
26	Louisiana Purchase Survey Marker Arkansas	NR	Common corner for three counties (Lee, Phillips, and Monroe). Located east of Blackton.
T-4	Memphis-Little Rock Road Arkansas		Old Military route over which Choctaw and Chickasaw Indians were moved to Oklahoma.
3	Missouri Pacific Depot Mississippi County, Missouri	NR	Located in Charleston east of the intersecting branches of the M-P Railroad tracks.
34	Montgomery Point Desha County, Arkansas		Early French settlement at important river landing. Located at mouth of White River on the Arkansas bank of the Mississippi.
29	Moore-Hornor House Phillips County, Arkansas	NR	One of earliest Victorian structures in the State. Situated on site of Battle of Helena. Located at 323 Beach Street.
14	Murphy Mound Pemiscot County, Missouri	NR	Archeological site on County Route D, south of Caruthersville.
19	Nodena Site Mississippi County, Arkansas	NR	Temple mounds with more than 1,500 burials. Located south edge of Wilson.
5	O'Bryan Ridge Mississippi County, Missouri	NR	Archeological district located 2 miles south of Wyatt.
21	Parkin Indian Mound Cross County, Arkansas	NR	Temple mound culture archeological site located on north edge of Parkin.
27	Pillow, Jerome B.,House Phillips County, Arkansas	NR	Located at 718 Perry Street in Helena. Outstanding example of high Victorian Period structures.
12	Rich Woods Archeological Site Stoddard County, Missouri	NR	Site located 2 miles north of Bernie.
2	St. Paul's Episcopal Church Iron County, Missouri	NR	Rare example of Gothic architecture. Located in Ironton.
6	Sikeston Fortified Village Archeological Site New Madrid County, Missouri	NR	Significant archeological site located 2 miles southeast of Sikeston.
T-6	Southwest Trail Arkansas		First trail in Arkansas regularly traveled by white man from St. Louis into the southwest area.
4	Swank, Jacob,House Mississippi County, Missouri	NR	Located 0.2 miles west of Charleston on U.S. 60/62. Rare example of soft-fired red brick Classical Revival style structure.
30	Tappan, James C., House Phillips County, Arkansas	NR	Two-story Greek Revival house built by General Tappan. Located at 717 Poplar Street, Helena.
25	Toltec Indian Mounds Lonoke County, Arkansas	NR	Late Woodland Period site. Three mounds--two the largest in Arkansas. Located in Scott vicinity.
13	Wallace, J. M., Site (Wardell Mounds) Pemiscot County, Missouri	NR	Archeological site located 1 mile southwest of Wardell.
22	Wittsburg Cross County, Arkansas		Site of French fort and one of the few permanent crossings of the St. Francis River.

(NR--This site is on the National Register of Historic Places)
(NP--National Park)

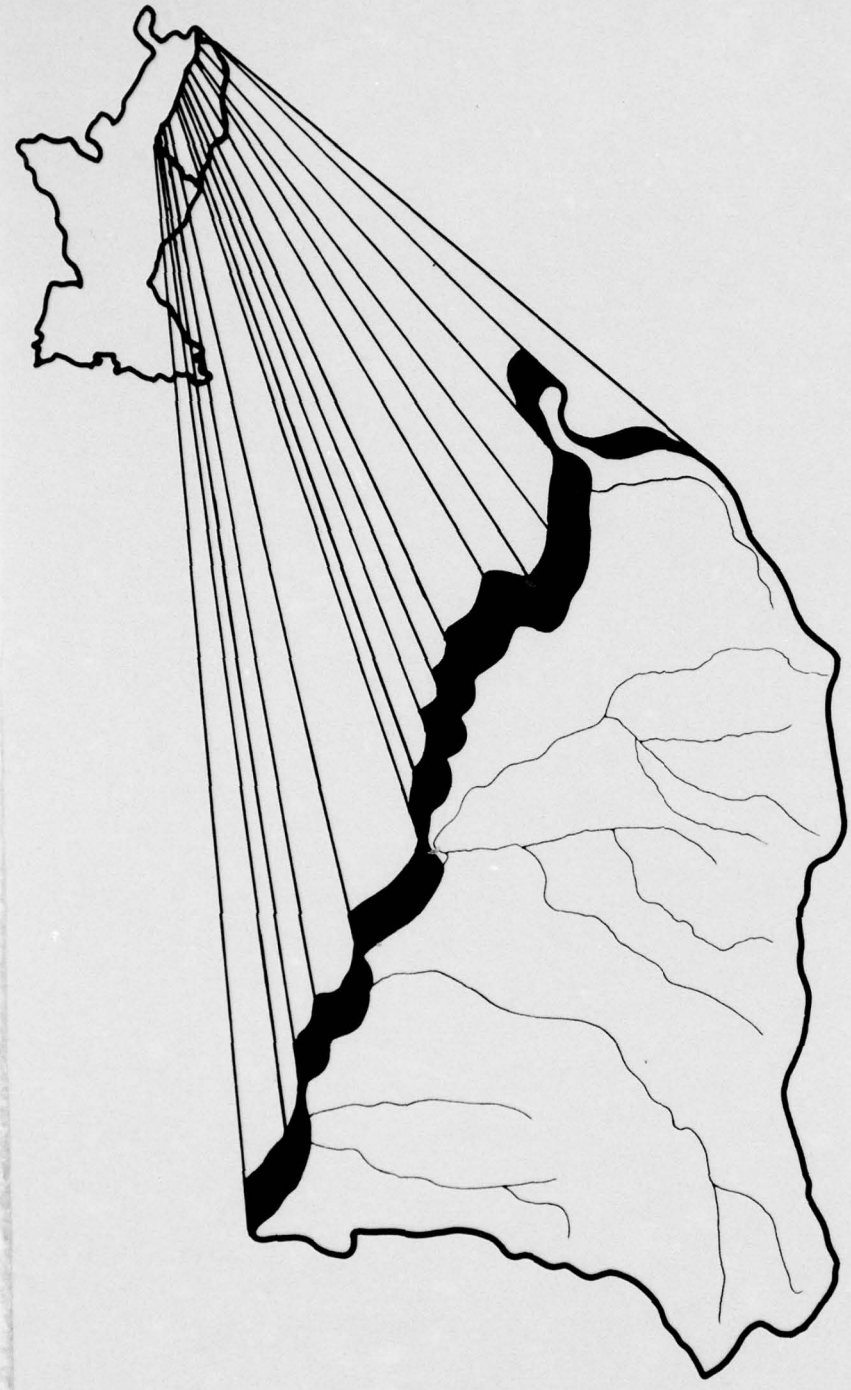


LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORIC AND ARCHEOLOGICAL SITES

WRPA 2

FIGURE 10



WRPA 3

W R P A 3

GENERAL

Area of Study

WRPA 3 consists of drainage basins of streams in the western portions of Kentucky and Tennessee and includes the area in the vicinity of Cairo, Illinois. The study area covers 10,653 square miles in the States of Tennessee, Kentucky, Mississippi, and Illinois and occupies 10 percent of the total area in the Lower Mississippi Region. Over 90 percent of the area in the WRPA is in uplands having soils consisting of pleistocene loams, loess, gravels, and sand. The north and east boundaries are formed by the divides of the Ohio and Tennessee River Basins, respectively. The border to the south is created by the divides of the Tombigbee and Yazoo River Basins. The main line levee of the Mississippi River forms the western boundary. The principal streams in the area are the Obion, Forked Deer, Hatchie, Loosahatchie, and Wolf Rivers.

Memphis, Tennessee, is the largest city in the WRPA. Smaller cities in the area include Jackson, Tennessee; Corinth, Mississippi; Mayfield, Kentucky; and Cairo, Illinois. Approximately 1,258,000 people, about 20 percent of the population of the Lower Mississippi Region, reside in the area. Urban population in 1970 was 70 percent of the total WRPA population. Significant economic activities in the area include agriculture, manufacturing, and service industries. The major manufacturing categories are food and kindred products, chemical and allied products, paper and allied products, and textile mill products. Agricultural output accruing from WRPA 3 ranks third in the Lower Mississippi River Basin. Major crops include cotton, soybeans, corn, and hay.

Hydrologic Characteristics

WRPA 3 is drained by four major river systems, the Obion, Hatchie, Loosahatchie, and Wolf River Basins, which carry the WRPA's average of 19 inches of run-off per year, or 13,800 c.f.s.

The Obion River, whose stream gradients range from about 3.3 feet per mile in the upper reaches to about 0.4 foot per mile near the Mississippi River, rises along the Mississippi River-Tennessee River Divide and flows westerly through flood plains varying in width from one to three miles to enter the alluvial valley. The principal tributary is the Forked Deer River.

The stream gradient of the Hatchie River ranges from about 2.4 feet per mile in the upper reaches in Mississippi to about 0.9 foot per mile in the lower reaches in Tennessee. The predominantly hilly area surrounding the river and its tributaries results in small floodplains and alluvial valley areas.

The Loosahatchie and Wolf Rivers have stream gradients of 2.0 and 2.8 feet per mile, respectively. These streams, along with their tributaries, flow in a westerly direction through narrow floodplains.

The majority of the streamflow which originates within WRPA 3 is produced by the Obion and Hatchie River Basins. At the present time, there is no regulation by dams on streams in this area. There is presently a dam under construction by the Soil Conservation Service on the Middle Fork of the Obion River.

FLOOD CONTROL

Bear Creek Watershed, Tennessee

Located in Fayette, Haywood, and Hardeman Counties, Tenn., this 31,500-acre Public Law 566 project was authorized in 1960. The main project features are: (1) 8,605 acres of critical area stabilization and land treatment measures costing an estimated $243,160; (2) eight floodwater retarding dams; and (3) 20.6 miles of channel improvement. There are 20.86 square miles of drainage area behind the dams with a total storage of 7,329 acre-feet (1,090 acre-feet sediment and 6,239 acre-feet floodwater). Normal pool surface area is 253 acres. The total project costs are $1,090,147 ($810,078 Federal and $280,069 non-Federal). Flood plain lands to be benefited are 3,315 acres. Initial economic studies indicate the total average annual damages that will be prevented are $70,546 and total annual benefits are $97,177. The benefit-cost ratio is 2.4 to 1. The project is 25 percent complete. In 1969, it was placed in an inactive status because of lack of local interest.

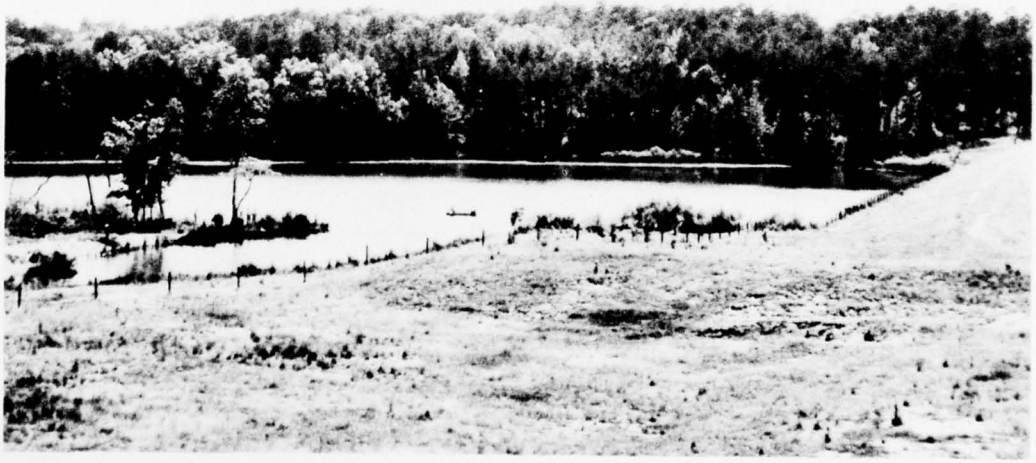
Cane Creek Watershed, Tennessee

Located in Lauderdale County, Tenn., this 57,000-acre Public Law 566 project was authorized in 1961. The main project features are: (1) 11,906 acres of critical area stabilization and land treatment measures costing an estimated $535,000; (2) 10 floodwater retarding dams; and (3) 45 miles of channel improvement. There are 28.84 square miles of drainage area above the dams with a total storage of 9,004 acre-feet (1,304 acre-feet sediment and 7,700 acre-feet floodwater). Normal pool surface area is 493 acres. The total estimated project costs are $3,465,500 ($2,584,100 Federal and $881,400 non-Federal). Flood plain lands to be benefited are 6,593 acres. Initial economic studies indicate total annual damages that will be prevented are $319,775, and total annual benefits are $332,228. The benfit-cost ratio is 2.1 to 1. The project is 75 percent complete.

Cottonwood Slough, Illinois

An emergency flood control project, authorized by Public Law 99, 84th Congress, provided for a 6-foot by 6-foot by 112-foot-long, concrete box culvert to replace a deteriorated section of an existing 7-foot-diameter corrugated-metal pipe under the Cache River levee near its mouth at Mound City, Ill. The culvert, which passes Cottonwood Slough flows through the levee, was completed in 1970.

Under authority of Section 205, of the 1948 Flood Control Act, as amended, a pumping station was constructed to pump flows from Cottonwood Slough into the Ohio River.



Aerial views of floodwater retarding structures on typical Public Law 566 projects.

Cub Creek Watershed, Tennessee

Located in Hardeman County, Tenn., this 10,719-acre Public Law 566 project was authorized in 1961. The main project features are: (1) 3,511 acres of critical area stabilization and land treatment measures costing an estimated $87,916; (2) three floodwater retarding dams; and (3) 9.7 miles of channel improvement. There are 7.45 square miles of drainage area above the dams with a total storage of 2,342 acre-feet (346 acre-feet sediment and 1,996 acre-feet floodwater). Normal pool surface area is 88 acres. The total estimated project costs are $445,548 ($341,286 Federal and $104,262 non-Federal). Flood plain lands benefited are 944 acres. Estimated average annual damages prevented are $27,051; total estimated average annual benefits are $27,967. The benefit-cost ratio is 1.9 to 1. The project was completed in 1971.

Cypress Creek Watershed, Tennessee

Located in Weakley County, Tennessee, this 25,870-acre Public Law 566 project was authorized in 1960. The main project features are: (1) 9,991 acres of critical area stabilization and land treatment measures costing an estimated $291,500; (2) 12 floodwater retarding dams; and (3) 32 miles of channel improvement. There are 11.80 square miles of drainage area above the dams with a total storage of 3,829 acre-feet (748 acre-feet sediment and 3,081 acre-feet floodwater). Normal pool surface area is 223 acres. The total estimated project costs are $1,775,500 ($1,433,300 Federal and $342,200 non-Federal). Flood plain lands benefited are 2,316 acres. Total estimated average annual damages prevented are $66,370; total estimated average annual benefits are $82,674. The benefit-cost ratio is 1.4 to 1. The project was completed in 1970.

Dyer County, Tennessee, Setback Levee

This emergency flood control project, authorized by Public Law 99, 84th Congress, consists of 2.28 miles of levee along the Mississippi River, Chute of Island 21, in Dyer County, Tenn. The levee was completed in 1969.

Dyersburg, Tennessee, Local Protection

This project, authorized under Section 205 of the Flood Control Act of 1948, as amended, consists of a levee, a floodgate, and a pumping station which provide protection for the southeastern portion of Dyersburg, Tenn. against floods occurring on the North Fork, Forked Deer River. The protected area comprises about 180 acres, within which are more than 200 dwellings, several business establishments, and a public school. The work was completed in June 1962, at a total construction cost of some $230,000, of which about $22,000 was contributed by local interests. The completed project has prevented flood damages amounting to $53,400 through June 30, 1971.

Additional improvements were authorized for the Finley Street area of Dyersburg, Tennessee, in 1972, also under authority of Section 205 of the Flood Control Act of 1948. The improvements which will protect 370 urban acres from North Fork, Forked Deer River floods will consist of about 1 mile of levee, interior drainage channels, a gated outlet, and a 100-c.f.s. pumping station. The project has been funded for construction and work is scheduled to begin in 1974.

Grays Creek Watershed, Mississippi

Located in Benton County, Miss., this 23,638-acre Public Law 566 project was authorized in 1959. The main project features are: (1) 14,376 acres of critical area stabilization and land treatment measures costing an estimated $535,653; (2) 10 floodwater retarding dams; and (3) 17.8 miles of channel improvement. There are 13.31 square miles of drainage area above the dams with a total storage of 4,500 acre-feet (455 acre-feet sediment and 4,045 acre-feet floodwater). Normal pool surface area is 127 acres. The total estimated project costs are $1,139,714 ($649,163 Federal and $490,551 non-Federal). Flood plain lands benefited are 2,511 acres. Estimated average annual damages prevented are $102,381; total estimated average annual benefits are $107,493. The benefit-cost ratio is 2.5 to 1. The project is complete.

Houser Creek Watershed, Tennessee

Located in Obion County, Tenn., this 21,490-acre Public Law 566 project was authorized in 1961. The main project features are: (1) 1,171 acres of critical area stabilization and land treatment measures costing an estimated $70,860; (2) two floodwater retarding dams; and (3) 13.6 miles of channel improvement. There are 3.09 square miles of drainage area above the dams with a total storage of 1,065 acre-feet (146 acre-feet sediment and 919 acre-feet floodwater). Normal pool surface area is 57 acres. The total estimated project costs are $605,730 ($435,231 Federal and $170,499 non-Federal). Flood plain lands benefited are 3,923 acres. Total estimated average annual benefits are $60,933. The benefit-cost ratio is 2.5 to 1. The project was completed in 1970.

Indian Creek Watershed, Tennessee and Mississippi

Located in Fayette and Hardeman Counties, Tenn. and Benton County, Miss., this 22,000-acre Public Law 566 project was authorized in 1958. The main project features are: (1) 5,701 acres of critical area stabilization and land treatment measures costing an estimated $168,270; (2) four floodwater retarding dams; and (3) 15.3 miles of channel improvement. There are 13.95 square miles of drainage area above the dams with a total storage of 4,440 acre-feet (893 acre-feet sediment and 3,547 acre-feet floodwater). Normal pool surface area is

205 acres. The total estimated project costs are $596,540 ($411,384 Federal and $185,156 non-Federal). Flood plain lands benefited are 1,593 acres. Estimated average annual damages prevented are $23,512 and total estimated average annual benefits are $34,530. The benefit-cost ratio is 1.8 to 1. The project is complete.

Johnson Creek Watershed, Tennessee

Located in Madison County, Tenn., this 22,610-acre Public Law 566 project was authorized in 1956. The main project features are: (1) 17,720 acres of critical area stabilization and land treatment measures costing an estimated $282,235; (2) five floodwater retarding dams; and (3) 15.4 miles of channel improvement. There are 16.3 square miles of drainage area above the dams with a total storage of 5,033 acre-feet (1,291 acre-feet sediment and 3,742 acre-feet floodwater). Normal pool surface area is 117 acres. The total estimated project costs are $657,757 ($355,855 Federal and $301,902 non-Federal). Flood plain lands benefited are 1,374 acres. Estimated average annual damages prevented are $33,795 and estimated average annual benefits are $65,391. The benefit-cost ratio is 1.63 to 1. The project was completed in 1965.

Lewis-Hunsacker Creek Watershed, Tennessee

Authorized in 1966, this 37,400-acre Public Law 566 project is located in Dyer County, Tenn. The main project features are: (1) 11,200 acres of critical area stabilization and land treatment measures costing an estimated $303,600; (2) 14 floodwater retarding dams; (3) one multiple-purpose reservoir for floodwater and recreation; (4) basic recreation facilities; and (5) 55.8 miles of channel improvement. There are 21.15 square miles of drainage area above the dams with a total storage of 7,165 acre-feet (1,507 acre-feet sediment and 5,228 acre-feet floodwater) and 430 acre-feet for recreation. The total estimated project costs are $2,637,000 ($1,742,900 Federal and $894,100 non-Federal). Flood plain lands to be benefited are 7,960 acres. Initial economic studies indicated average annual damages that will be prevented are $128,244, and total average annual benefits are $223,823. The benefit-cost ratio is 1.9 to 1. Construction has not been started.

Mathis Creek Watershed, Tennessee

Located in Tipton County, Tenn., this 12,400-acre Public Law 566 project was authorized in 1971. The main project features are: (1) 5,324 acres of critical area stabilization and land treatment measures costing an estimated $234,500; (2) three floodwater retarding dams; and (3) 19.7 miles of channel improvement. There are 7.52 square miles of drainage area above the dams with a total storage of 2,783 acre-feet (889 acre-feet sediment and 1,894 acre-feet floodwater). Normal pool surface area is 118 acres. The total estimated project costs are

$683,500 ($412,400 Federal and $271,100 non-Federal). Flood plain lands benefited are 1,790 acres. Initial economic studies indicate annual damages that will be prevented are $40,869, and total annual benefits will be $53,743. The benefit-cost ratio is 3.1 to 1.

Memphis Harbor (Tennessee Chute), Tennessee

This project provides a safe and adequate harbor development in the vicinity of Memphis and is a part of the project for improvement of the Mississippi River as adopted by the Flood Control Act of May 15, 1928, as amended. Closure of the head of Tennessee Chute and a by-pass channel of the Mississippi River provides road and railroad access to Presidents Island. The island was originally of limited usefulness due to periodic inundation and increasing encroachment by the main channel. The project also provided revetment and dikes to stabilize the caving banks, and dredge filling has raised an area 21,000 feet long and 2,000 feet wide above the maximum expected flood level to furnish industrial sites for the city of Memphis. In providing the industrial fill material, the dredging created an access and harbor channel which combines with the closed and improved Tennessee Chute to give a large protected harbor. Rapid increase in terminals developed by local interests for industries and general water transportation had brought 20 terminal facilities into operation by June 30, 1970.

A large additional industrial area on the mainland opposite Presidents Island is protected from flooding by an 11-mile-long levee and a 900 cubic feet per second (c.f.s.) pumping station. Local interests will develop the industrial areas, construct all railroads, roads, docks, terminals, and utilities.

About 960 acres on Presidents Island have been turned over to local interests for industrial development. The project was completed in 1967. The total cost through June 30, 1971 was $19,146,600.

Memphis, Wolf River, and Nonconnah Creek, Tennessee

The project, authorized by the Flood Control Act of August 28, 1937, as amended by Flood Control Act of July 24, 1946, provides for construction of floodwalls, levees, and revetments; modified by Civil Appropriations Act, June 28, 1939, to include pumping stations, reservoirs, and outlet works, for the protection of industries and population of the city of Memphis and the suburban areas from overflow by floodwaters of the Mississippi River.

This project as a whole consists of a continuous line of flood protection works, comprised of 43,500 feet of earth levees and 17,000 feet of concrete floodwalls along Wolf River, earth levee on the right bank of Nonconnah Creek, and seven pumping stations and eight reservoirs

to provide interior drainage during periods of high water. Two pumping stations are for the removal of interior drainage, two are for disposal of sewage, and three are combination stations used for both purposes.

The project provides flood protection to approximately 4,400 acres of residential areas and highly developed industrial areas along Wolf River and 912 acres along Nonconnah Creek. Average stage variations of the Mississippi River at Memphis, Tenn., from extreme low water to bankfull and to project flow line, are 39 feet and 61 feet, respectively.

The project was completed in 1958 at a total cost of $11,141,199. Estimated flood damages prevented through June 30, 1971 are $133,500.

Meridian Creek Watershed, Tennessee

Located in Madison County, Tenn., this 12,300-acre Public Law 566 project was authorized in 1959. The main project features are: (1) 4,363 acres of critical area stabilization and land treatment measures costing an estimated $129,024; (2) three floodwater retarding dams; and (3) 8.3 miles of channel improvement. There are 8.11 square miles of drainage area above the dams with a total storage of 2,496 acre-feet (507 acre-feet sediment and 1,989 acre-feet floodwater). Normal pool surface area is 109 acres. The total estimated project costs are $618,724 ($500,038 Federal and $118,686 non-Federal). Flood plain lands benefited are 1,377 acres. Initial economic studies indicate average annual damages that will be prevented are $17,026 and total annual benefits are $23,789. The benefit-cost ratio is 1.24 to 1. The project was completed in 1971.

Middle Fork-Obion River Watershed, Tennessee

Located in Henry and Weakley Counties, Tenn., this 74,025-acre Public Law 566 project was authorized in 1963. The main project features are: (1) 27,404 acres of critical area stabilization and land treatment measures costing an estimated $904,877; (2) 12 floodwater retarding dams; and (3) 37 miles of channel improvement. There are 52.43 square miles of drainage area above dams with a total storage of 17,912 acre-feet (3,128 acre-feet sediment and 14,784 acre-feet floodwater). Normal pool surface area is 459 acres. The total estimated project costs are $3,085,927 ($2,204,411 Federal and $881,516 non-Federal). Flood plain lands to be benefited are 10,495 acres. Initial economic studies indicate average annual damages that will be prevented are $61,176 and total annual benefits are $143,581. The benefit-cost ratio is 1.7 to 1. The project is 90 percent complete.

Mounds and Mound City, Illinois

The Mounds and Mound City project was authorized by Public Law 738, 74th Congress, adopted June 22, 1936, as amended by Public Law 761, 75th Congress, and approved June 28, 1938.

This project provides protection of the area north of the Cairo Drainage District by 6.6 miles of levees extending from Cairo drainage district along the Ohio and Mississippi Rivers to high ground.

The project was completed in 1961 at a cost of $4,541,000. Cumulative estimated benefits through June 30, 1971 are $4,965,970.

Mud Creek Watershed, Tennessee

Located in Obion and Weakley Counties, Tenn., this 48,000-acre Public Law 566 project was authorized in 1969. The main project features are: (1) 12,290 acres of critical area stabilization and land treatment measures costing an estimated $717,400; (2) 10 floodwater retarding dams; and (3) 68.6 miles of channel improvement. There are 26.75 square miles of drainage area above the dams with a total storage of 11,656 acre-feet (4,186 acre-feet sediment and 7,470 acre-feet floodwater). Normal pool surface area is 515 acres. The total estimated project costs are $2,759,600 ($1,792,100 Federal and $967,500 non-Federal). Flood plain lands to be benefited are 8,700 acres. Initial economic studies indicate that average annual damages that will be prevented are $177,310 and total annual benefits are $196,597. The benefit-cost ratio is 2.4 to 1. This project is now under construction.

Mud Lake Outlet, Tennessee

The Mud Lake outlet project, as described in House Document 91-414, was approved by House and Senate Public Works Committees resolutions dated December 15 and 17, 1970, under provisions of Section 201 of the 1965 Flood Control Act. This project, located south of Reelfoot Lake in Obion County, Tenn., will provide flood protection for 1,575 acres of land in the Mud Lake area. It consists of 2,000 feet of new channel leading from the present Mud Lake outlet channel to a 150-c.f.s. pumping station, which will discharge into the Mississippi River.

Construction of this project has not started. Estimated Federal cost is $456,000 and estimated non-Federal cost is $15,000. Estimated average annual benefits are $36,200.

Muddy Creek Watershed, Mississippi and Tennessee

Located in Tippah County, Miss., and Hardeman County, Tenn., this 80,795-acre Public Law 566 project was authorized in 1958. The main project features are: (1) 11,142 acres of critical area (woodland) stabilization and 22,190 acres of land treatment measures costing an estimated $1,271,939; (2) 27 floodwater retarding dams; (3) one multiple-purpose dam for floodwater and recreation; (4) minimum basic recreation facilities; and (5) 38.1 miles of channel improvement. There are 49.11 square miles of drainage area above the dams with a total storage of 17,977 acre-feet (2,688 acre-feet sediment, 13,888 acre-feet floodwater, and 1,401 acre-feet recreation). The total estimated project costs are $3,640,613 ($2,308,906 Federal and $1,331,707 non-Federal). Flood plain lands to be benefited are 8,226 acres. Initial economic studies indicate that average annual damages that will be prevented are $210,785 and total annual benefits are $312,577 acres. The benefit-cost ratio is 2.3 to 1. The project is 50 percent complete.

Nixon Creek, Tennessee

Nixon Creek, a tributary of the south fork of the Forked Deer River in western Tennessee, is located entirely within Haywood County, where it has its source near Brownsville. The project, authorized under Section 205 of the Flood Control Act of 1948, as amended, consists of 11.7 miles of channel improvement. About 8.5 miles of work was done on Nixon Creek and 3.2 miles on Meridian Creek, its principal tributary. This work was completed in December 1951 at a total cost of $62,800. The average annual benefits are estimated at $15,600.

North Fork Obion River Watershed, Tennessee

Located in Henry County, Tenn., this 61,300-acre Public Law 566 project was authorized in 1969. The main project features are: (1) 21,000 acres of critical area stabilization and land treatment measures costing an estimated $1,247,600; (2) 17 floodwater retarding dams; and (3) 62.3 miles of channel improvement. There are 36.90 square miles of drainage area above the dams, total storage, 14,634 acre-feet (6,600 acre-feet sediment, 8,034 acre-feet floodwater). Normal pool surface area is 569 acres. The total estimated project costs are $4,182,600 ($3,054,500 Federal and $1,128,100 non-Federal). Flood plain lands to be benefited are 8,000 acres. Initial economic studies indicate average annual damages that will be prevented are $189,300 and total annual benefits are $221,600. The benefit-cost ratio is 1.5 to 1. The project has not been completed.

Obion Creek Watershed, Kentucky

Authorized in 1958, this 206,108-acre Public Law 566 project is located in Carlisle, Fulton, Graves, and Hickman Counties, Ky. The main project features are: (1) 1,103 acres of critical area stabilization and 121,000 acres of land treatment measures costing an estimated $4,118,700; (2) 14 floodwater retarding dams; and (3) 43.8 miles of channel improvement. There are 42.21 square miles of drainage area above the dams with a total storage of 7,139 acre-feet (1,629 acre-feet sediment and 5,510 acre-feet floodwater). Normal pool surface area is 454 acres. The total estimated project costs are $6,104,300 ($2,142,600 Federal and $3,961,700 non-Federal). Flood plain lands to be benefited are 14,100 acres. Initial economic studies indicate average annual damages that will be prevented are $94,900 and total annual benefits are $187,400. The benefit-cost ratio is 1.2 to 1. The project is 48 percent complete.

Porters Creek Watershed, Tennessee and Mississippi

Authorized in 1960, this 44,600-acre Public Law 566 project is located in Hardeman County, Tenn. and Benton and Tippah Counties, Miss. The main project features are: (1) 11,376 acres of critical area stabilization and land treatment measures costing an estimated $389,389; (2) 13 floodwater retarding dams; (3) one multiple-purpose dam for floodwater and recreation; and (4) 23.9 miles of channel improvement. There are 25.90 square miles above the dams with a total storage of 9,282 acre-feet (1,479 acre-feet sediment, 7,292 acre-feet floodwater, and 511 acre-feet recreation). The total estimated project costs are $1,727,244 ($1,250,412 Federal and $476,832 non-Federal). Flood plain lands to be benefited are 5,686 acres. Initial economic studies indicate average annual damages that will be prevented are $113,033 and total annual benefits are $134,355. The benefit-cost ratio is 2.2 to 1. The project is 90 percent complete.

Reelfoot-Indian Creek Watershed, Tennessee and Kentucky

Located in Obion County, Tenn. and Fulton County, Ky., this 82,660-acre Public Law 566 project was authorized in 1960. The main project features are: (1) 6,799 acres of critical area stabilization and land treatment measures costing an estimated $474,129; (2) 15 floodwater retarding dams; and (3) 35.6 miles of channel improvement. There are 86.54 square miles above the dams with total storage of 25,158 acre-feet (5,507 acre-feet sediment and 19,651 acre-feet floodwater). Normal pool surface area is 1,033 acres. The total estimated project costs are $2,822,276 ($1,773,365 Federal and $1,048,911 non-Federal). Flood plain lands to be benefited are 6,004 acres. Initial economic studies indicate average annual damages prevented are $205,836 and total annual benefits are $262,687. The cost-benefit ratio is 2.6 to 1. Construction was started in 1964 with estimated completion in 1976.

Reelfoot Lake-Lake No. 9, Tennessee

The Reelfoot Lake project was authorized by the Flood Control Act of September 3, 1954 (Senate Document 160, 83d Congress, 2d Session), to provide flood control and improve drainage in the Reelfoot Lake area. Of the original plan, construction of 19.72 miles of channel improvement for Running Reelfoot Bayou was completed in 1962 at a Federal cost of $439,434 and a non-Federal cost of $261,000. The completed works have prevented an estimated $921,900 in flood damages through June 30, 1971.

The Reelfoot Lake-Lake No. 9 project, authorized by House and Senate Public Works Committees resolutions dated December 15 and 17, 1970, under provisions of Section 201 of the 1965 Flood Control Act, replaces the unconstructed portion of the original Reelfoot Lake project. This project consists of 6.3 miles of channel improvement of Bayou du Chien, 3.0 miles of diversion channel to the Lake No. 9 channel, and improvement of approximately 9.0 miles of the Lake No. 9 channel to Lake No. 9. An additional 2.0 miles of new channel will divert flow northward into Lake No. 9. A 500-c.f.s. pumping station will discharge runoff collected in Lake No. 9 into the Mississippi River.

Estimated Federal cost of this project is $2,540,000 and estimated non-Federal cost is $1,330,000. Estimated average annual benefits are $435,000. Construction has not been started.

Roberson Creek Watershed, Mississippi

Located in Benton County, Miss., this 25,910-acre Public Law 566 project was authorized in 1969. The main project features are: (1) 15,144 acres of critical area stabilization and land treatment measures costing an estimated $464,029; (2) eight floodwater retarding dams; and (3) 23.5 miles of channel improvement. There are 10.0 square miles of drainage area above the dams with a total storage of 3,166 acre-feet (1,131 acre-feet sediment and 2,035 acre-feet floodwater). Normal pool surface area is 157 acres. The total estimated project costs are $1,621,174 ($1,123,778 Federal and $497,396 non-Federal). Flood plain lands to be benefited are 5,020 acres. Initial economic studies indicate average annual damages that will be prevented are $103,559 and total annual benefits are $115,777. The benefit-cost ratio is 2.1 to 1. Estimated completion date is 1975.

Spring Creek Watershed, Tennessee

Located in Carroll, Henry, and Weakley Counties, Tenn., this 61,400-acre Public Law 566 project was authorized in 1964. The main project features are: (1) 19,253 acres of critical area stabilization

and land treatment measures costing an estimated $938,681; (2) 15 floodwater retarding dams; and 53.9 miles of channel improvement. There are 43.63 square miles of drainage area above the dams with a total storage of 13,170 acre-feet (1,963 acre-feet sediment and 11,207 acre-feet floodwater). Normal pool surface area is 540 acres. The total estimated project costs are $2,938,681 ($2,079,491 Federal and $859,190 non-Federal). Flood plain lands to be benefited are 8,241 acres. Initial economic studies indicate average annual damages that will be prevented are $64,070 and total annual benefits are $159,363. The benefit-cost ratio is 1.9 to 1.

Tipton County-Indian Creek Watershed, Tennessee

Authorized in 1969, this 62,300-acre Public Law 566 project is located in Tipton County, Tenn. The main project features are: (1) 21,330 acres of critical area stabilization and land treatment measures costing an estimated $1,189,300; (2) 13 floodwater retarding dams; (3) one multiple-purpose dam for floodwater and recreation; (4) basic recreation facilities on 75 acres; and (5) 74.8 miles of channel improvement. There are 43.14 square miles of drainage area above the dams with a total storage of 19,749 acre-feet (7,646 acre-feet sediment, 11,479 acre-feet floodwater, and 624 acre-feet recreation). The total estimated project costs are $4,862,000 ($2,878,100 Federal and $1,983,900 non-Federal). Flood plain lands to be benefited are 8,590 acres. Initial economic studies indicate average annual damages that will be prevented are $194,514 and total annual benefits are $338,946. The benefit-cost ratio is 2.3 to 1.

Thompson Creek Watershed, Tennessee

Authorized in 1958, this 18,700-acre Public Law 566 project is located in Henry and Weakley Counties, Tenn. The main project features are: (1) 8,129 acres of critical area stabilization and land treatment measures costing an estimated $186,305; (2) five floodwater retarding dams; (3) one multiple-purpose dam for floodwater and fish and wildlife; and (4) 17.5 miles of channel improvement. There are 8.44 square miles of drainage area above the dams with a total storage of 3,835 acre-feet (564 acre-feet sediment, 2,012 acre-feet floodwater, and 1,259 acre-feet for fish and wildlife). The total estimated project cost is $700,432 ($452,498 Federal and $247,934 non-Federal). Flood plain lands benefited are 1,800 acres. Estimated average annual damages prevented are $10,365 and estimated total annual benefits are $30,884. The benefit-cost ratio is 1.45 to 1. The project was completed in 1969.

Tuscumbia Creek Watershed, Mississippi and Tennessee

Located in Alcorn and Prentiss Counties, Miss. and McNairy County, Tenn., this 223,146-acre Public Law 566 project was authorized in 1965. The main project features are: (1) 177,240 acres of critical area stabilization and land treatment measures costing an estimated $2,821,278; (2) 22 floodwater retarding dams; and (3) 130.5 miles of channel improvement. There are 98.41 square miles behind the dams with a total storage of 40,701 acre-feet (11,391 acre-feet sediment and 29,310 acre-feet floodwater). Normal pool surface area is 1,896 acres. The total estimated project costs are $7,686,766 ($4,710,602 Federal and $2,976,164 non-Federal). Flood plain lands to be benefited are 32,245 acres. Initial economic studies indicate average annual damages that will be prevented are $343,539 and total annual benefits are $366,556. The benefit-cost ratio is 2.1 to 1. The project has not been started.

West Fork Mayfield Creek Watershed, Kentucky

Authorized in 1969, this 48,000-acre Public Law 566 project is located in Carlisle and Graves Counties, Ky. The main project features are (1) 200 acres of critical area (open land) stabilization and 26,120 acres of land treatment measures costing an estimated $1,199,400; (2) 51 floodwater retarding dams; (3) one multiple-purpose dam for floodwater and recreation; (4) basic recreation facilities; and (5) 15.4 miles of channel improvement. There are 28.41 square miles of drainage area above the dams with a total storage of 7,929 acre-feet (2,331 acre-feet sediment, 5,181 acre-feet floodwater, 417 acre-feet recreation). The total estimated project costs are $3,388,000 ($2,066,500 Federal and $1,321,500 non-Federal). Flood plain lands to be benefited are 7,300 acres. Initial economic studies indicate average annual damages that will be prevented are $75 thousand and total annual benefits are $125,700. The benefit-cost ratio is 1.2 to 1. This project is now under construction.

West Hatchie Creek Watershed, Mississippi

Located in Alcorn and Tippah Counties, Miss., this 47,874-acre Public Law 566 project was authorized in 1959. The main project features are: (1) 37,200 acres of critical area stabilization and land treatment measures costing an estimated $673,067; (2) eight floodwater retarding dams; and (3) 41.6 miles of channel improvement. There are 36.56 square miles of drainage area above dams with a total storage of 11,737 acre-feet (1,035 acre-feet sediment and 10,702 acre-feet floodwater). Normal pool surface area is 340 acres. The total estimated project costs are $1,478,896 ($922,239 Federal and $556,657 non-Federal). Flood plain lands benefited are 11,548 acres. Estimated average annual damages prevented are $111,494 and estimated total annual benefits are $123,071. The benefit-cost ratio is 2.6 to 1. The project was completed in 1970.

West Kentucky Tributaries, Kentucky

The West Kentucky tributaries project was authorized by the Flood Control Act of May 15, 1928, as modified and expanded by the Flood Control Act of October 27, 1965 (House Document 308, 88th Congress, 2d Session), Public Law 89-298, 89th Congress.

This project provides for channel enlargement of Obion Creek from the Illinois Central Railroad bridge at Pryorsburg (mile 47) downstream to mile 35, enlargement and realignment below this point to mile 8, and enlargement of the existing channel between mile 8 and the Mississippi River. The plan will require the alteration or construction of four railroad bridges, one state highway bridge and four pipelines. Preconstruction planning is in progress.

Average annual benefits are estimated to be $356,600. Estimated Federal cost is $4,390,000 and estimated non-Federal cost is $781,000. Benefit-cost ratio is 1.7 to 1.

West Tennessee Tributaries, Tennessee

The West Tennessee Tributaries project was authorized by the Flood Control Act of June 30, 1948 (House Document 627, 80th Congress, 2d Session).

This project provides for channel realignment, flood control and improvement of drainage of a total of 225.1 miles (improved mileage) along the Obion and Forked Deer Rivers and their principal tributaries, including the areas affected by Mississippi River backwater. A total of 72.9 miles of channel improvements was completed as of June 30, 1973, at a cost of $3,765,800.

Estimate of total Federal cost is $27,800,000. Estimated average annual benefits of the completed project are $2,663,000. Benefit-cost ratio is 1.6 to 1.

Wolf River and Tributaries, Tennessee

Wolf River drains about 824 square miles in western Tennessee and northern Mississippi and joins the Mississippi River at Memphis, Tenn. The plan for flood control, authorized by the Flood Control Act approved by July 3, 1958, is a feature of the Mississippi River and Tributaries project adopted May 15, 1928, as amended.

Work on the project began in June 1960. Completed features include 21.9 miles of realigned and enlarged Wolf River from Grays Creek at unimproved mile 38 downstream to mile 3.5, a diversion channel

from that point 0.8 mile westward into the Mississippi River, a roadway levee closure across the original channel at the head of the diversion, 2.8 miles of realigned and enlarged tributary Fletcher Creek, an interceptor sanitary sewer constructed by local interests along old Wolf River below the closure, an erosion control structure at the entrance of Fletcher Creek, and the alteration of a railroad bridge. Federal work on the project is completed.

The cost through June 30, 1971 was $1,723,600 from Federal funds and $404,300 from non-Federal funds. The project has prevented flood damages through June 30, 1971, amounting to about $426,144, and accomplished savings on dredging costs totaling $359,780.

PROJECT MAP INDEX
Flood Control-WRPA 3

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description 1/
25.	Bear Creek Watershed, Ark.	SCS	Inactive	FC	Proj. area, 31,500 ac. 8 floodwater retard. dams. 20.6 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $1,090,147. (L)
20.	Cane Creek Watershed, Tenn.	SCS	Est. 1972	FC	Proj. area, 57,000 ac. 10 floodwater retard. dams. 45 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $3,465,500. (L)
2.	Cottonwood Slough, Ill.	C of E, MD	1970	FC	Pumping plant & 6'x6' conc. box. 112 ft. length connected to 7-ft.-diameter corrugated-metal pipe 98 ft. length. (H)
29.	Cub Creek, Tenn.	SCS	1971	FC	Proj. area, 10,719 ac. 3 floodwater retard. dams. 9.7 mi. stream chan. imp. Area stab. & land treatment meas. Tot. est. proj.cost $445,548 (L)
10.	Cypress Creek Watershed, Tenn.	SCS	1970	FC	Proj. area, 25,870 ac. 12 floodwater retard. dams. 32 mi. chan. imp. Area stab. & land treatment meas. Tot. est. proj. cost $1,775,500. (L)
19.	Dyer County, Tenn. Setback Levee	C of E, MD	1969	FC	2.28 mi. levee. (H)
17.	Dyersburg, Tenn. Local Protection	C of E, MD	1962	FC	26 c.f.s. pumping sta. & 1.7 mi. levee. Cost $230,000. Studies underway for addnl. imp. (H)
32.	Graves Creek Watershed, Miss.	SCS	1970	FC	Proj. area, 23,638 ac. 10 floodwater retard. dams. 17.8 mi. chan. imp. Area stab. & land treat. meas. Tot. est.proj.cost $1,139,714. (L)
8.	Houser Creek Watershed, Tenn.	SCS	1968	FC	Proj. area, 21,490 ac. 2 floodwater retard. dams. 13.6 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $605,730. (L)
31.	Indian Creek Watershed, Tenn. & Miss.	SCS	1965	FC	Proj. area, 22,000 ac. 4 floodwater retard. dams. 15.3 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $596,540.
23.	Johnson Creek Watershed, Tenn.	SCS	1965	FC	Proj. area, 22,610 ac. 5 floodwater retard. dams. 15.4 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $657,757. (L)
18.	Lewis-Hunsacker Creek, Tenn.	SCS	Not started	FC, R	Proj. area, 37,400 ac. 14 floodwater retard. dams & 1 multipurpose dam. 55.8 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $2,637,000. (L)
21.	Mathis Creek Watershed, Tenn.	SCS	Not started	FC	Proj. area, 12,400 ac. 3 floodwater retard. dams. 19.7 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $683,500. (L)
26.	Memphis Harbor, (Tenn. Chute) Tenn.	C of E, MD	1967	FC	Hydraulic fill 21,000 ft.x2,000 ft., closure of head of Tenn. Chute, revetment, wavewash protection & dikes. Ensley portion includes 11 mi. levees & 900 c.f.s. pumping sta. Cost thru June 30, 1971 $19,146,600.
27.	Memphis, Wolf River & Nonconnah Creek, Tenn.	C of E, MD	1958	FC	43,500 ft. levees, 17,000 ft. conc. floodwalls along Wolf River, levee along Nonconnah Cr. & 6 pump. stas. as follows: (1) Cypress Cr., storm water only, 3,120 c.f.s. (2) May St., sewage only, 2 pumps, ea. 1,200 g.p.m. (3) Fairfax Cr., sewage only, 4 6,000-g.p.m. pumps. (4) Marble Bayou, storm water, 220 c.f.s., 9,000 g.p.m. (5) Nonconnah Cr., storm-water, 5 pumps tot. 1,440 c.f.s., sewage, 3 pumps,ea. 2,900 g.p.m. (6) Workhouse Bayou, stormwater, 4 pumps, tot. 520 c.f.s. (7) Bayou Gayoso, 1,500 c.f.s., storm water. Tot. cost $11,141,199.
24.	Meridian Creek Watershed, Tenn.	SCS	1971	FC	Proj. area, 12,500 ac. 3 floodwater retard. dams. 8.3 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $618,724. (L)
14.	Middle Fork-Obion River Watershed, Tenn.	SCS	1972	FC	Proj. area, 74,025 ac. 12 floodwater retard. dams. 37 mi. chan. imp. 37 mi. chan. imp. Area stab. & land treat. meas. Tot. proj. cost $3,085,927. (L)
1.	Mounds & Mound City, Ill.	C of E, MD	1961	FC	Approx. 5.1 mi. levee & floodwall. Cost $4,541,000. (H)
13.	Mud Creek Watershed, Tenn.	SCS	Not started	FC	Proj. area, 48,000 ac. 10 floodwater retard. dams. 68.6 mi. chan. imp. (L) except in vic. of Dresden, Tenn. Area stab. & land treat. meas. Tot. est. proj. cost $2,759,600. (H)
16.	Mud Lake Outlet, Tenn.	C of E, MD	Not Started	FC	2,000 ft. new chan. & 150 c.f.s. pump. sta. Est. cost $456,000 Federal & $15,000 non-Federal. (L)
34.	Muddy Creek Watershed, Miss. & Tenn.	SCS	Est. 1978	FC, R	Proj. area, 80,795 ac. 27 floodwater retard. dams & 1 multipurpose dam. 38.1 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $3,640,613. (L)
11.	North Fork Obion River Watershed, Tenn.	SCS	Est. 1975	FC	Proj. area, 61,300 ac. 17 floodwater retard. dams. 62.3 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $4,182,600. (L)
5.	Obion Creek Watershed, Ky.	SCS	Est. 1972	FC	Proj. area, 206,108 ac. 14 floodwater retard. dams. 43.8 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $6,104,500. (L)
30.	Porters Creek Watershed, Tenn. & Miss.	SCS	Est. 1972	FC, R	Proj. area, 44,600 ac. 13 floodwater retard. dams & 1 multipurpose dam. 25.9 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $1,727,244. (L)
7.	Reelfoot Indian Creek Watershed, Tenn. & Miss.	SCS	--	FC	Proj. area, 82,660 ac. 15 floodwater retard. dams. 35.6 mi.chan.imp. Area stab. & land treat. meas. Tot. est. proj. cost $2,822,276. (L)
6.	Reelfoot Lake-Lake No. 9, Tenn.	SCS	Not Started	FC	Chan. cleanout & construction. (L)
33.	Roberson Creek Watershed, Miss.	SCS	1975	FC	Proj. area, 25,910 ac. 8 floodwater retard. dams. 23.5 mi. chan.imp. Area stab. & land treat. meas. Est. cost $1,621,174. (L)
15.	Spring Creek Watershed, Tenn.	SCS	--	FC	Proj. area, 61,400 ac. 15 floodwater retard. dams. 53.9 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $2,938,681.
22.	Tipton County-Indian Creek Watershed, Tenn.	SCS	--	FC	Proj. area, 62,300 ac. 13 floodwater retard. dams & 1 multipurpose dam. 74.8 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $4,862,000. (L)

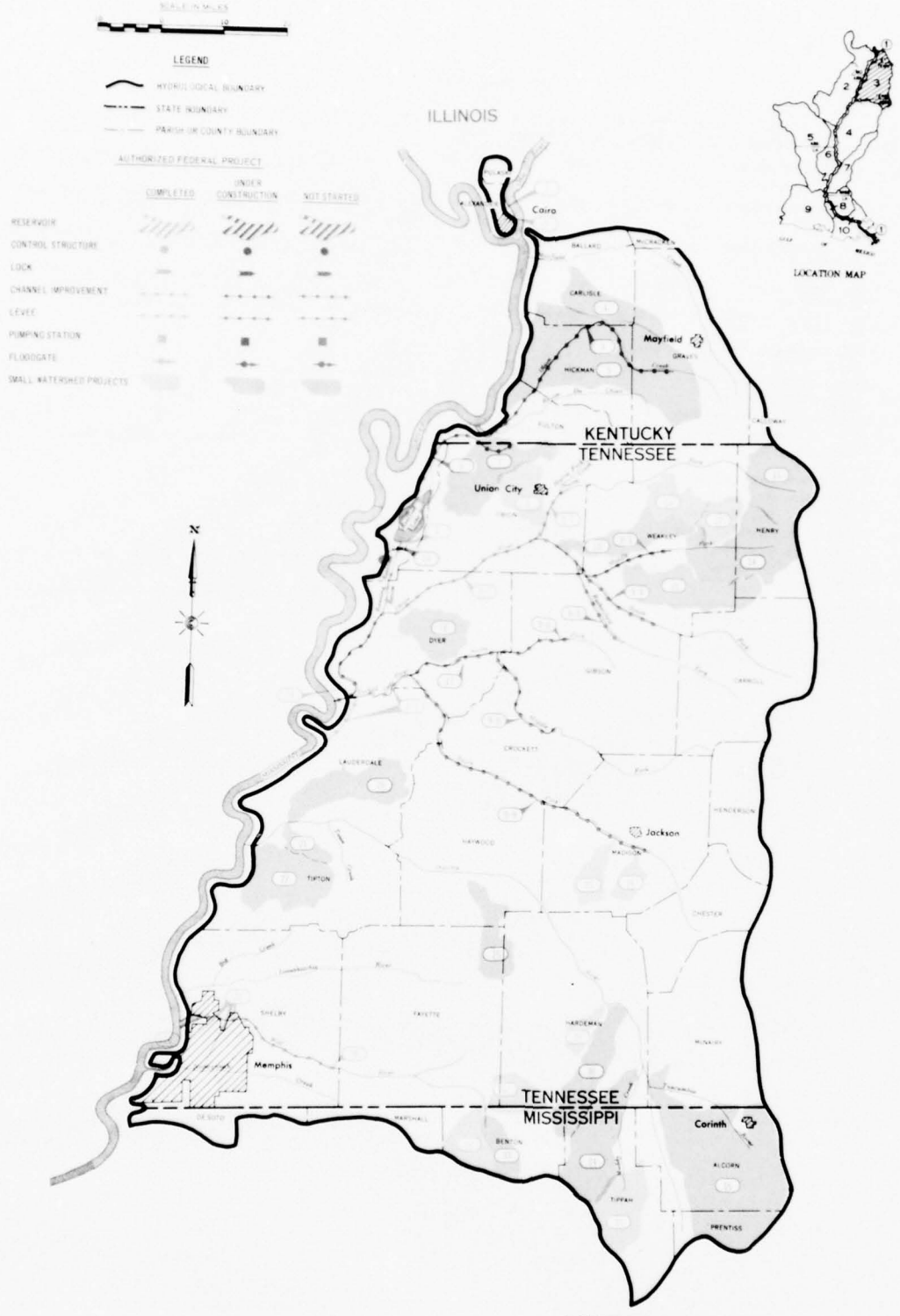
1/ Degree of protection indicated as follows:
Low (L) 1 to 10 yr. frequency.
Medium (M) 10 to 50 yr. frequency.
High (H) 50 to 100 yr. frequency.

PROJECT MAP INDEX
Flood Control-WRPA 3 (continued)

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description 1/
12.	Thompson Creek Watershed, Tenn.	SCS	1969	FC, F&W	Proj. area, 18,700 ac. 5 floodwater retard. dams & 1 multipurpose dam. 17.5 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $700,432. (L)
35.	Tuscumbia Creek Watershed, Miss. & Tenn.	SCS	Not started	FC	Proj. area, 225,146 ac. 22 floodwater retard. dams. 130.5 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $7,686,766. (L)
4.	West Fork-Mayfield Creek Watershed, Ky.	SCS	Not started	FC, R	Proj. area, 48,000 ac. 51 floodwater retard. dams & 1 multipurpose dam. 15.4 mi. chan. imp. Area stab. & land treat meas. Tot. est. proj. cost $3,388,000. (L)
36.	West Hatchie Creek Watershed, Miss.	SCS	1970	FC	Proj. area, 47,874 ac. 8 floodwater retard. dams. 41.6 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $1,478,896. (L)
3.	West Kentucky Tributaries, Ky.	C of E, MD	Not Started	FC	Enlargement & realignment of 47 mi. of Obion Creek. (L)
9.	West Tennessee Tributaries, Tenn.	C of E, MD			
9- 7.	Main Stem Forked Deer River		1966	FC	8.2 mi. chan. imp. (L)
9- 2.	Main Stem Obion River		Under Const.	FC	34.6 mi. chan. imp. to date. (L)
9- 8.	Middle Fork, Forked Deer River		Under Const.	FC	0.0 mi. to date. (L)
9- 3.	Middle Fork, Obion River		Under Const.	FC	0.0 mi. chan. imp. to date. (L)
9-10.	Nixon Creek, Tenn.		1951	FC	11.7 mi. chan. imp., 8.5 mi., Nixon Cr. & 3.2 mi., Meridian Cr. Tot. cost $62,800.
9- 6.	North Fork, Forked Deer River		Under Const.	FC	0.0 mi. to date. (L)
9- 1.	North Fork, Obion River		1968	FC	10.9 mi. chan. imp. (L)
9- 5.	Rutherford Fork, Obion River		Under Const.	FC	7.4 mi. chan. imp. to date. (L)
9- 9.	South Fork, Forked Deer River		Under Const.	FC	4.6 mi. to date. (L)
9- 4.	South Fork, Obion River		Under Const	FC	6.0 mi. chan. imp. to date. (L)
28.	Wolf River & Tributaries, Tenn.	C of E, MD	1964	FC	.8 mi. diversion chan., closure dam, and 24.7 mi. chan. imp. Cost $2,127,900.

1/ Degree of protection indicated as follows:

Low (L) 1 to 10 yr. frequency.
Medium (M) 10 to 50 yr. frequency.
High (H) 50 to 100 yr. frequency.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

FLOOD CONTROL

WRPA 3

FIGURE 11

NAVIGATION

Forked Deer River, Tennessee, Including South Fork

The Forked Deer River project was first approved by the River and Harbor Act of August 2, 1882, and was based on a report of an examination of South Fork, dated December 16, 1880. The operations proposed were open-channel work to maintain a satisfactory channel year around. This project was set aside in view of the fact that the desired results could not be accomplished by the method. The present project is based on the provisions of the Act of March 3, 1899, and provides only for maintenance of the channel in a navigable condition by the removal of surface obstructions from time to time as necessary. Commercial statistics are not available; however, the bulk of the commerce up to 1912 consisted of timber products. Currently, there is no commerce on the streams, and maintenance of navigation projects has ceased.

Hickman Harbor, Kentucky

Hickman Harbor, Kentucky, was approved by the Chief of Engineers in 1962 under Section 107, River and Harbor Act of 1960, as amended.

The project consists of dredging and maintaining a harbor channel 250 feet wide with a depth of 9 feet below low water, from the main channel of the Mississippi River at mile 922 AHP. The harbor is 6,000 feet in length with the upper 600 feet forming a turning basin 500 feet wide. The project serves existing terminal facilities for handling petroleum products, sand and gravel and grain. There is, in addition, 0.2 mile of surfaced public mooring and launching area. Total waterfront industrial area served is approximately 130 acres. Total Federal cost through June 30, 1970, was $149,827. Annual tonnage is estimated to be approximately 200,000 tons. See Table 20 for description of terminal facilities at Hickman Harbor and along the Mississippi River adjacent to WRPA 3.

Memphis Harbor (Tennessee Chute), Tennessee

The Memphis Harbor (Tennessee Chute) project was authorized by the Flood Control Act of July 24, 1946. The project consists of off-river harbor channels 12 feet by 300 feet, totalling approximately 9 miles, a 960-acre industrial fill on Presidents Island, and protection from flooding of 6,800 acres to be used for industrial development.

Work on the Presidents Island phase of the project included approach embankment, closure dam, industrial embankment, pile dikes, and wavewash protection. The Easley portion of the project consisted of 11 miles of levee and a pumping station. This project, including the Nonconnah Creek Sewer Extension, was completed in 1967 at a cost of $18,736,431.

Table 18 summarizes the piers by primary purpose for which used or type of service offered.

Table 18 - Memphis Harbor Piers

Primary Purpose for Which Used	No.
Cargo handling:	
Agricultural products - corn, wheat, soybeans, grain, mill products	10
Petroleum - gasoline jet fuel, distillate fuel oil, kerosene, residual fuel, lubricating oils and greases, naptha, mineral spirits, solvents, asphalt, tar & pitches, liquified petroleum.	23
Crushed stone, sand, and aggregate - building cement	6
Sulphur	0
Iron & steel - manganese, iron & steel ingots & forms, bars, rods, angles, plates & sheets, pipe & tube, ferro alloys & scrap	7
Industrial chemicals - alcohol, sodium hydroxide, crude products basic chemicals	14
Agricultural chemicals - nitrogenous fertilizer, superphosphate & fertilizers N.E.C.	20
Forest products - veneer, plywood, & worked wood	2

Total traffic moved through the harbor in 1970 was 10,017,785 tons.

Memphis Harbor, Tennessee.

Obion River, Tennessee

The Obion River navigation project was based on a survey made in 1891, and was adopted by the River and Harbor Act of July 13, 1892. The scope of the work was to obtain a 3-foot navigation channel at low water by means of open-channel work. During calendar year 1910, commerce on this stream amounted to 18,638 tons, consisting almost entirely of timber products. The project was recommended for abandonment in 1926 in House Document No. 467, 69th Congress, 1st Session.

There has been no commercial navigation on the Obion River in many years, and maintenance of the navigation project has ceased.

Wolf River (Memphis Harbor), Tennessee

Wolf River (Memphis Harbor), Tennessee, was authorized by the 1958 Flood Control Act.

The project provides a channel 9 feet deep at low water from the mouth to mile 3.0 (15,840 feet), with bottom widths of 250 feet from the mouth to Keel Avenue and 200 feet from Keel Avenue to mile 3.0. There are 21 terminals along the project channel which occupy approximately 130 industrial acres. A description of terminal facilities along Wolf River is shown on Table 20.

Table 19 summarizes the piers by primary purpose for which used or type of service offered:

Table 19 - Wolf River (Memphis Harbor) Piers

Primary Purpose for Which Used	No.
Cargo handling:	
Agricultural products - corn, oats, soybeans, wheat	7
Petroleum	1
Crushed stone, sand, and aggregate	1
Sulphur	0
Iron & steel	8
Industrial chemicals	0
Agricultural chemicals	0
Forest products	4

The cargo movement in 1970 was 1,118,115 tons, and has been averaging 1,000,000 tons annually. Total Federal cost through June 30, 1970, was $2,735,924.

Table 20 - List of Mississippi River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 3

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
951L	Wickliffe, Ky.	John F. Beasley Constr. Co. Yards	Turning basin & eqpt storage area dock	Warehouse	Crane dragline	No RR connections. Equipment handling & storage
922L	Hickman, Ky.	West Ky. Lumber Co.	Logs	None	Crane barge	ICRR. Handles logs from barge to sawmill
		Central States Ddg. Co.	Sand & gravel	None	Draglines	No RR connections. Barge, truck & rail handling of sand & gravel
		Lattus Sand & Gravel Co.	Sand & gravel	None	Crane barge	No RR connections. Barge, turck & rail handling of sand & gravel
		Robinson Grain Co.	Grain	Tanks, elevators	Conveyor	ICRR. Truck & barge grain handling
		Fred Stokes Oil Co.	Petroleum products	Tanks	Pipeline	ICRR. Bulk petroleum products; receives by barge
921L		River Grain Co.	Grain	Tanks, elevators	Conveyor	No RR connections. Bulk grain handling
900L	Cates, Tenn.	Cates Casting Field (US Army Engr Dist, Memphis)	Mooring	None	None	No RR connections. Concrete mat casting fld.
871L	Tintonville, Tenn.	West Tenn. Soya Mill, Inc.	Grain	Elevators, tanks	Conveyor	No RR connections.
		Richardsons Casting Fld.	Mooring	None	None	No RR connections. Concrete mat casting fld.
870L	Ridgeley, Tenn.	Reelfoot Terminal Co.	FUTURE CONSTRUCTION PROJECT			Mooring facilities for handling grain, fertilizer, liquids, etc.
838L	Booth Pt., Tenn.	River Grain Co.	Grain	Tanks	Conveyors	No RR connections. Pile cluster mooring; ship via barges
831L	Heloise, Tenn.	Heloise Grain Co., Inc.	Grain	Tanks	Conveyor belt	No RR connections. Pile cluster mooring; ship via barges
818L	Tamm, Tenn.	Continental Grain Co.	Grain	None	Conveyor belt	No RR connections. Pile cluster mooring; ship via barges
793L	Golddust, Tenn.	Golddust Grain Co.	Grain	Tanks	Conveyor	No RR connections. Bulk grain handling by barges
770L	Randolph Landing, Tenn.	Martha-Mac Corp.	Marine construction	Warehouse	None	No RR connections. Mooring area, minor repairs facilities
		McAlister Constr. Co.	Barge & boat rentals	None	None	No RR connections.
768L	Richardson Landing, Tenn.	Richardsons Cstg. Fld. (US Army Engr Dist, Memphis)	Mat casting & mooring	None	None	No RR connections. Mooring services
		Central States Ddg. Co.	Sand & gravel	None	None	No RR connections. Mooring facilities
739L	Memphis, Tenn.	Lucy-Woodstock Utility District	Pipeline for chemicals	Tanks	Pipelines	No RR connections. Chemical storage tanks for E I duPont Co.
WOLF RIVER (Memphis Harbor)						
736L	Memphis, Tenn.	Waterways Oil Co.,Inc.	Marine fuels	None	Pump barge	No RR connections. Fuel barge mooring location
		Waterways Marine, Inc.	Marine services	Warehouse	None	ICRR. Overnight crew accommodations
		Warner & Tamble Co.	Tug & transfer service; salvage service	Wharfboat, mooring	Derrickboat, salvage eqpt.	No RR connections. Ship-to-shore radiophone service & barge rentals
		Memphis Queen Excursion Boat	Excursion boats	None	None	No RR connections. Mooring facilities
		Memphis Yacht Club	Private boat mooring	None	None	No RR connections.

Table 20 - List of Mississippi River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 3 (continued)

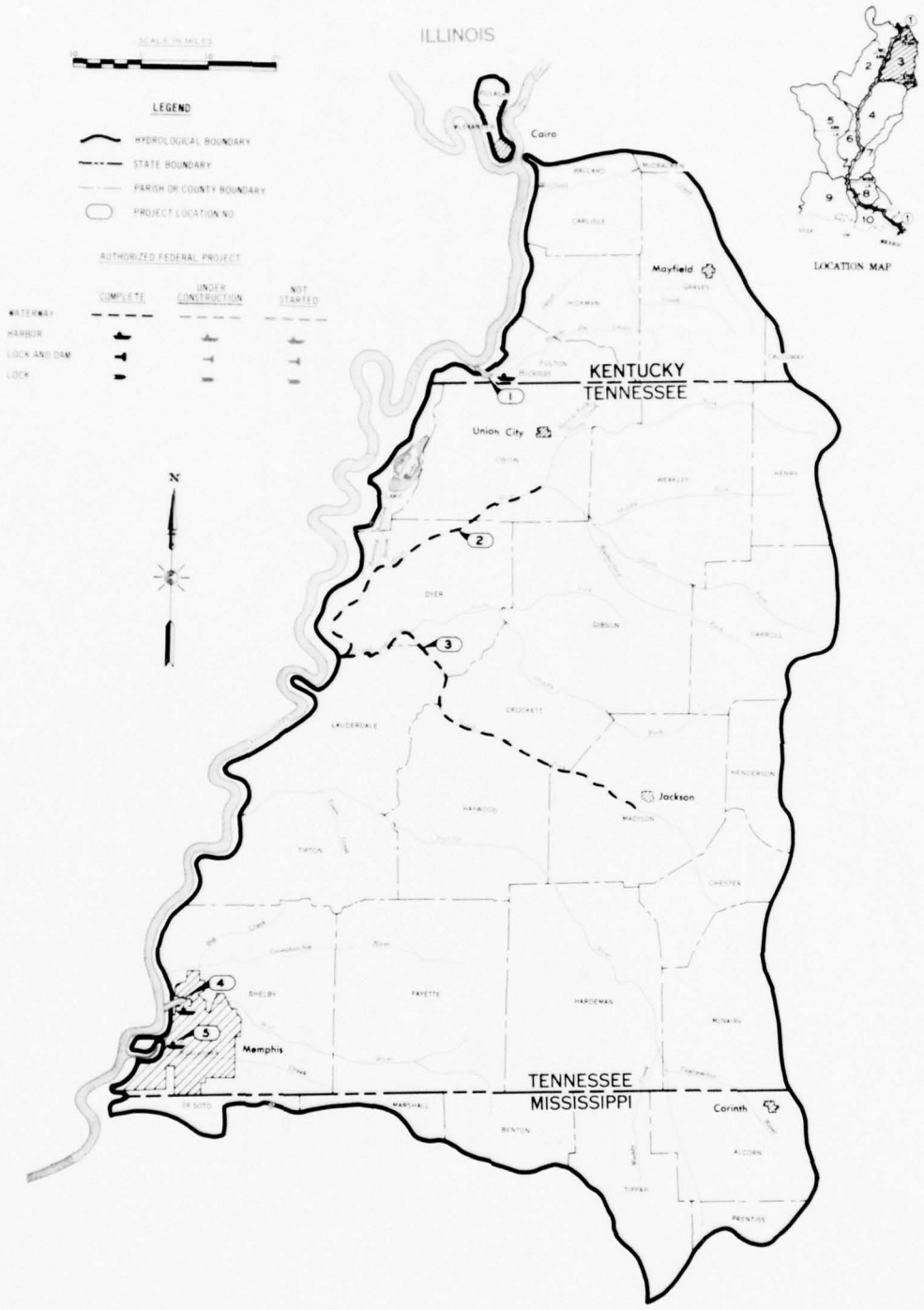
MP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
736L	Memphis, Tenn.	Jones & Laughlin Steel Co.	Iron & steel products	Warehouse	Special handling equipment	ICRR. Branch distribution
		Marquette Cement Co.	Bulk cement	Silo	Air conveyor	ICRR. Bulk and packaged cement
		Memphis River Terminal, Inc.	Bulk & packaged commodities; cargo	Warehouse	Cranes, buckets	IC & SSW RRs. Barge loading & unloading; cleaning facilities
		US Coast Guard	Depot	Warehouse	Crane, tramway	ICRR. Aids to navigation; group command staff
		Missouri-Portland Cement Co.	Bulk cement	Silo	Conveyor screw	ICRR. Bulk & packaged cement
		Cargill Co., Inc.	Grain	Warehouse	Conveyors	ICRR. Bulk grain handling
		Anderson-Tully Lbr. Co.	Logs	Outside storage	Derrickboat & conveyor	ICRR. From barge to sawmill.
		Patton-Tully Trans. Co.	River constr.	None	Mooring eqpt. & heavy eqpt. repairs	ICRR. Also barge & boat rentals
		Cargill Co., Inc.	Molasses storage and sales	Tanks	Pumps, pipelines	ICRR. Receives by barge & distribution by trucks & rail
		Continental Grain Co.	Grain	Tanks, elevators	Conveyors	ICRR. Stores & ships by rail, barge & truck
		Ford Construction Co.	Waterways constr.	None	Cranes	No RR connections. Contract revetment repair work
MISSISSIPPI RIVER						
734L	Port of Memphis Memphis, Tenn.	Frankie & Johnnie Boat Store	Supplies & refueling	Warehouse	None	No RR connections. Commercial towboat supplies
		American Oil Co.	Bulk petroleum products	Tanks, warehouse	Pumps, pipelines	Frisco RR. Truck, barge & tank car movements
		Humble Oil Co.	Bulk petroleum products	Tanks, warehouse	Pumps, pipelines	Frisco RR. Truck, barge & tank car movements
		Lion Oil Co.	Bulk petroleum products	Tanks, warehouse	Pumps, pipelines	Frisco RR. Truck, barge & tank car movements
733L		Martha-Mac Corporation	Ramp	None	None	No RR connections. Load & unload barges
		Waxler Towing Co.	Petroleum products, general towing	None	None	No RR connections. Boat and barge repairs; boat and barge rentals
		Davis Constr. Co.	Waterways constr.	None	None	No RR connections. Mooring area, minor repairs facilities
MEMPHIS HARBOR (McKellar Lake)						
725L	Memphis, Tenn.	Thomas H. Allen Steam Generating Plant	Electric power generating	Outside coal storage; mooring	Conveyor	ICRR. Barge-to-plant bulk coal movement
		Ensley Engineer Yard (US Army Engr Dist, Memphis)	Repair & maintenance Layup & mooring	Warehouses, shops	Cranes, dragline loco cranes & derrickboats	ICRR. Can make emergency repairs to marine eqpt. on approval of Div Engr
		Gulf Oil Corporation	Petroleum products	Tanks, warehouse	Pumps & pipelines	ICRR. Tank car, truck & barge handling
		Delta Refining Co. (Earth Resources Co.)	Petroleum products	Tanks, warehouse	Pumps & pipelines	ICRR. Tank car, truck & barge handling; receives & refines crude oil
		Pure Oil Co.) Use same Shell Oil Co.) unloading Texas Co.) pump barges	Petroleum products	Tanks, warehouse	Pumps & pipelines	IC & MP RRs. Tank car, truck & barge handling

Table 20 - List of Mississippi River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 3 (continued)

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
725L	Memphis, Tenn.	St. Louis Terminal Dist. Co.	Public terminal	Tanks, warehouse, open storage	Ramp & loading dock	IC, MP & Frisco RRs. General transfer point; dry cargo & barge cleaning facilities
		Sinclair Refining Co.	Petroleum products	Tanks, warehouse	Pumps & pipelines	IC, MP & Frisco RRs. Load & unload tank cars, trucks & barges
		Koppers Co., Inc.	Coal tar products	Tanks	Pumps & pipelines	IC, MP & Frisco RRs. Load & unload tank cars, trucks & barges
		Agrico Chemical Co. (Continental Oil Co.)	Fertilizer products	Tanks	Pumps & pipelines	IC, MP & Frisco RRs. Liquid ammonia handled by truck & tank cars
		Western Tar Products Corp.	Wood preservatives	Tanks	Dock; pumps & pipelines	IC, MP & Frisco RRs. Tar products handled from barge to truck & tank cars
		Island Terminal Co.	Steel products	Outside storage	Crawler, rail cranes, stiffleg derrick	IC, MP & Frisco RRs. Storage & distribution for several steel companies
		ADM Grain Co.	Grain	Tanks, elevator	Conveyor	IC, MP & Frisco RRs. Bulk grain handling
		Cargill, Inc.	Grain	Tanks, elevator	Conveyor	IC, MP & Frisco RRs. Bulk grain handling
725L	Memphis, Tenn.	Memphis Terminal Corp.	Liquid fertilizer	Tanks	Pipelines	IC, MP & Frisco RRs. Storage & distribution point
		Union Texas Petroleum Co. (Allied Chemical Corp.)	Gasoline & propane products	Tanks	Pumps & pipelines	IC, MP & Frisco RRs. Bulk distributor of petroleum products
		Ashland Oil & Refining Co. (Bronoco S & C Co.)	Chemicals & solvents	Tanks, warehouse	Pumps & pipelines	IC, MP & Frisco RRs. Deliveries & storage; bulk products distribution via truck & tank car
		Cook Grain Co., Inc.	Grain	Tanks, elevators	Conveyor	IC, MP & Frisco RRs. Trucks, rail & barge movements
		Trumbull Asphalt Co. of Delaware	Bulk liquid asphalt	Tanks	Pumps, pipeline	No RR connections. Tanks to trucks
		River Cement Co.	Cement	Silos	Pumps	No RR connections. Wholesale distribution
		Chicago Bridge & Iron Co.	Finished manufactured pressure vessels	Outside storage	Crane	IC, MP & Frisco RRs. Barge handling facilities

PROJECT MAP INDEX
Navigation and Harbors-WRPA 3

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description
3.	Forked Deer River, Tenn.	C of E, MD		N (inactive)	Removal of surface obstructions.
1.	Hickman Harbor, Ky.	C of E, MD		N	Chan. 250 ft.x9 ft.x6,000 ft. 500 ft.x600 ft. turning basin. Serves 130 ac. ind. area. Est. 200,000 tns. annually. Fed. cost $149,827.
5.	Memphis Harbor (Tennessee Chute), Tenn.	C of E, MD	1967	N, FC	Chan. 9 mi.x12 ft.x300 ft. Serving 6,800 ac. ind. area. 20 docks on project chan. 10,017,785 tns. in 1970. Fed. cost $18,736,431.
2.	Obion River, Tenn.	C of E, MD		N (abandoned)	3 ft. min. depth by open channel work.
4.	Wolf River (Memphis Harbor), Tenn.	C of E, MD		N	Chan. 250 ft.x9 ft. x 15,840 ft. Serves 130 ac. ind. area & 20 terminals. 1,118,115 tns. in 1970. (Incl. in Memphis Harbor traffic). Fed. cost through June 30, 1970, $2,735,924.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

NAVIGATION

WRPA 3

FIGURE 12

RECREATION
AND
FISH AND WILDLIFE

General

WRPA 3 has a high human population density, demanding extensive and intensive use of its limited recreation, fish, and wildlife resources. The WRPA's 1,218,700 inhabitants are centered around Memphis, Tenn., the extreme southwest portion of the WRPA. With the exception of the Mississippi River and Reelfoot Lake, WRPA 3 lacks large water areas for recreation, fish, and wildlife usage.

Recreation

WRPA 3 has 66,679 acres of land available for outdoor recreation recreation, including 9,390 acres federally owned, 40,720 acres State owned, 3,873 acres of county and quasipublic lands, and 6,603 acres municipal, local government, and school board lands. Additionally, there are 6,093 acres in private ownerships.

Reelfoot Lake State Park, Tennessee.

WRPA 3 has 40,340 acres of slack water and about 822 miles of stream suitable for recreation. Developed recreation facilities include 71 acres for camping, 619 acres for picnicking, 1,686 acres for playing outdoor sports and games, 238 acres for swimming, and 20 acres for boat ramps.

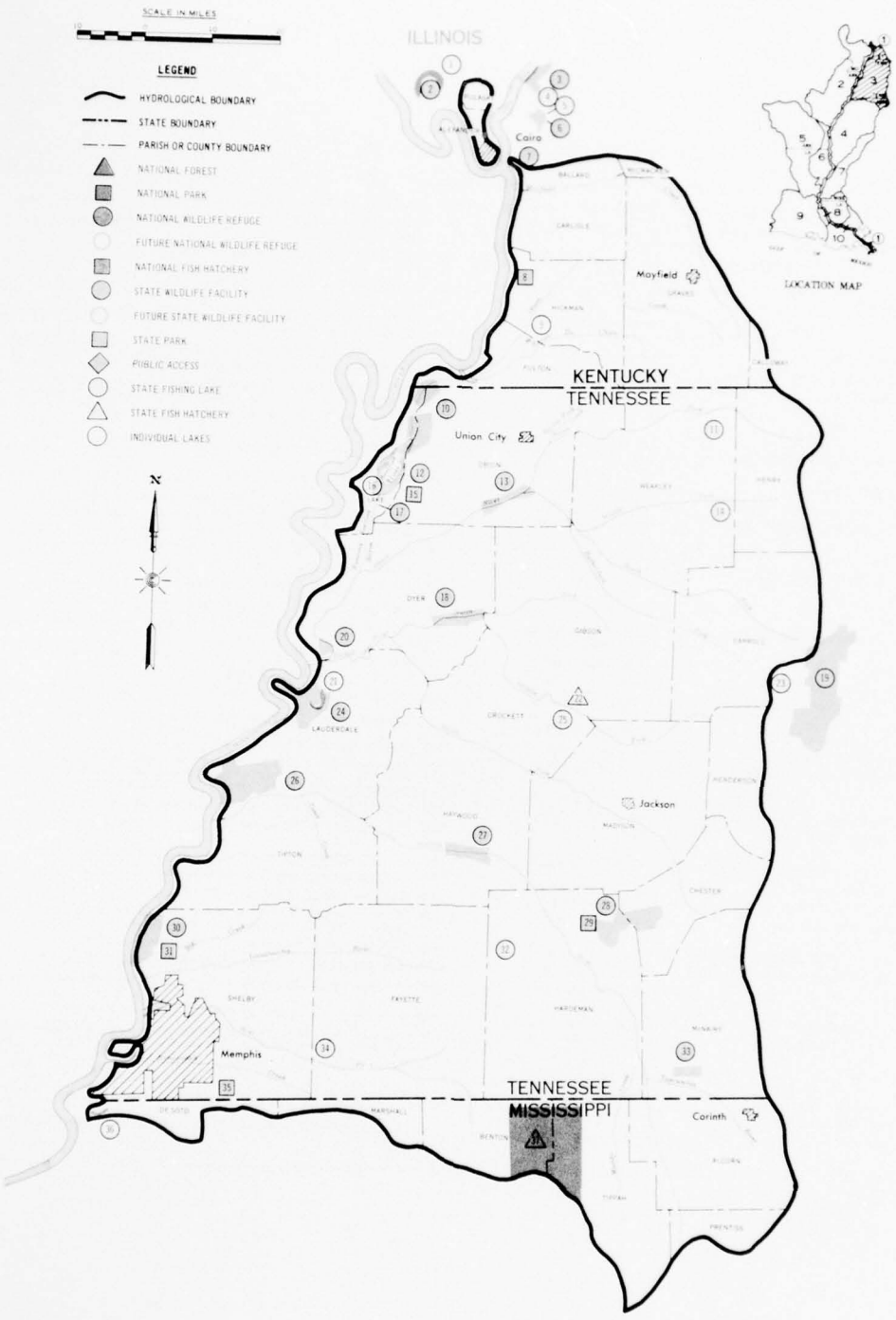
Fish and Wildlife

WRPA 3 water-related fish and wildlife resources include 32,000 acres of lakes between two and 40 acres in size, 40,000 acres of lakes over 40 acres in size, 822 miles of fishable streams, 2,310,000 acres of forest land, and 41,000 acres of wetland. Ponds under two acres in size have not been inventoried, but are abundant. Included in the lake acreage figures is Reelfoot Lake, the only notable lake in the area, formed by the New Madrid earthquake. WRPA 3 water-related fish and wildlife facilities include State ownership of one fish hatchery, 13 wildlife management areas, one waterfowl refuge, four parks, and eight managed fishing lakes. About nine percent of the State owned wildlife management areas and the waterfowl refuge lie outside the hydrologic boundaries of WRPA 3. Federal facilities include three national wildlife refuges and a portion of one national forest. Numerous private facilities in the form of fishing and hunting clubs exist, but have not been inventoried. All areas are capable of supplying varying amounts of wildlife-oriented recreation. Fish-and-wildlife-oriented recreation consists of nature photography and wildlife study, especially bird watching. Such use is nonconsumptive within certain limits.

PROJECT MAP INDEX
Recreation, Fish, and Wildlife Facilities - WRPA 3

Map Location No.	Name of Project	Agency	Project Use	Description 1/
5.	Ballard Co. Wildlife Mgmt. Area Headquarters Tract	Ky. Dept. of Fish & Wildlife Resources	F&W	High F&W rating. 7,861 ac. Fishing. Waterfowl hunting.
7.	Ballard Co. Wildlife Mgmt. Area Mitchell Tract	Ky. Dept. of Fish & Wildlife Resources	F&W	High F&W rating. 245 ac. Waterfowl hunting.
6.	Ballard Co. Wildlife Mgmt. Area Peal Tract	Ky. Dept. of Fish & Wildlife Resources	F&W	High F&W rating. 1,576 ac. Waterfowl hunting. Fishing.
33.	Big Hill Pond Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	Moderate F&W rating. 3,000 ac. Wildlife mgmt. area. No waterfowl hunting. Possible fishing.
14.	Carroll Lake	Tenn. Game & Fish Comm.	F&W	High F&W rating. 100 ac. Public fishing lake. Intensive mgmt.& use.
28.	Chickasaw Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	Moderate F&W rating. 11,215 ac. No waterfowl hunting. Possible fish.
29.	Chickasaw State Park	Tenn. Div. of State Parks	R, F&W*	250 ac. No hunting. No fishing. High WOR use. Rec. facs. include camping (cabins & tent-trailer), picnicking, boating, & swimming.
21.	Chisholm Lake		F&W	High F&W rating. Miss. R. oxbow lake. 200 ac. Good fishing. Possible waterfowl use.
8.	Columbus Belmont Battlefield State Park	Tenn. Div. of State Parks	F&W*	Low F&W rating. No hunting. No fishing. High WOR use.
11.	Garrett Lake	Tenn. Game & Fish Comm.	F&W	High F&W rating. 183 ac. Public fishing lake. Intensive mgmt.& use.
13.	Gooch Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	High F&W rating. 6,160 ac. Waterfowl hunting. Possible fishing.
27.	Hatchie Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 11,055 ac. Waterfowl refuge. Some fishing. Heavy WOR use.
34.	Herb Parsons Lake	Tenn. Game & Fish Comm.	F&W	High F&W rating. 177 ac. Public fishing lake. Intensive mgmt. & use.
37.	Holly Springs Natl. Forest	U. S. Forest Svc.	R, F&W	Moderate F&W rating. 7,800 ac. Possibly some waterfowl hunt. Fishing.
36.	Horn Lake		F&W	High F&W rating. Miss. R. oxbow lake. 850 ac. Fish & waterfowl.
1.	Horseshoe Lake		F&W	High F&W rating. Miss. R. oxbow lake. Fish. & waterfowl use.
2.	Horseshoe Lake State Waterfowl Area	Ill. Dept. of Conservation & Wildlife Resources	F&W	High F&W rating. 7,001 ac. Waterfowl refuge. Fishing. High WOR use.
25.	Humboldt Lake	Tenn. Game & Fish Comm.	F&W	High F&W rating. 87 ac. Public fish. lake. Intensive mgmt. & use.
22.	Humboldt State Fish Hatchery	Tenn. Game & Fish Comm.	F&W	High F&W rating. Fish hatchery.
17.	Lake Isom Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 1,846 ac. Waterfowl refuge. Some fish. High WOR use.
26.	Lower Anderson-Tully Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	High F&W rating. 12,000 ac. Waterfowl hunting, fishing.
23.	Maples Creek Lake	Tenn. Game & Fish Comm.	F&W	High F&W rating. 90 ac. Public fishing lake. Intensive mgmt. & use.
31.	Meeman-Shelby Forest State Park	Tenn. Div. of State Parks	R, F&W*	Low F&W rating. 12,500 ac. No fish. No hunt. High WOR use. Rec. facs. incl. boating, picnicking, camping (cabins, group lodge, tent-trailer), nature trails, playing field, & horseback riding.
20.	Moss Island Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	High F&W rating. 3,200 ac. Waterfowl hunting, fishing.
9.	Murphy's Pond	Private	F&W	High F&W rating. 300 ac. water. 2,000 ac. swamp. Unique ecological area.
19.	Natchez Trace Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	Moderate F&W rating. 43,000 ac. No waterfowl hunting. Fishing.
16.	Reelfoot Lake		F&W	High F&W rating. 10,000 ac. Natural lake. Heavy waterfowl use & fish.
10.	Reelfoot Lake Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 11,626 ac. High WOR use.
15.	Reelfoot Lake State Park	Tenn. Div. of State Parks	R, F&W	310 ac. Fishing. No hunting. WOR use. Rec.facs. incl. boating, swimming, picnicking, playing field, and camping.
12.	Reelfoot Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	High F&W rating. 23,750 ac. Waterfowl hunting, fishing.
30.	Shelby Forest Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	High F&W rating. 20,000 ac. Waterfowl hunting, fishing.
4.	Shelby Lake	Ky. Dept. of Fish & Wildlife Resources	F&W	Moderate F&W rating. 80 ac. Public fishing lake. Intensive use.
18.	Tigrett Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	High F&W rating. 3,862 ac. Fishing, waterfowl hunting.
35.	T.O. Fuller State Park	Tenn. Div. of State Parks	R	1,000 ac. Rec. facs. incl. swimming, picnicking, camping(group,tent-trailer), playing field, & golf course.
5.	Turner Lake	Ky. Dept. of Fish & Wildlife Resources	F&W	Moderate F&W rating. 100 ac.
24.	Upper Anderson-Tully Wildlife Mgmt. Area	Tenn. Game & Fish Comm.	F&W	High F&W rating. 18,000 ac. Waterfowl hunting, fishing.
32.	Whiteville Lake	Tenn. Game & Fish Comm.	F&W	High F&W rating. 18,000 ac. Public fishing lake. Intensive mgmt.& use.

1/ WOR = Wildlife oriented recreation
F&W = Fish and wildlife
F&W* = Supplies only nonconsumptive fish and wildlife oriented recreation



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

RECREATION AND FISH AND WILDLIFE

WRPA 3

FIGURE 13

POWER

The Thomas H. Allen plant, with installed capacity of 990.0 megawatts is the lone steam-electric generating plant in the area. This plant, operated by the Tennessee Valley Authority under lease agreement with the City of Memphis, had a net generation of 4,857,213,000 kilowatt-hours in 1970. The plant uses once-through cooling with water drawn from McKellar Lake, a closed-end arm of the Mississippi River. More than 600.0 megawatts of gas turbine capacity has been added to the plant since 1970.

Practically all power requirements in the area are met through transmission and distribution facilities of the Tennessee Valley Authority.

PROJECT MAP INDEX
Power Plants - WRPA 3

Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (31 Dec 70) (MW)	Annual 1970 Production (1000 kwh)	Remarks
			Existing					
1.	Thomas H. Allen	City of Memphis 1/	S	McKellar Lake		990.0	4,857,213.0	

1/ Operated by Tennessee Valley Authority under lease agreement.

Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (MW)	Date
			Planned Additions				
1.	Thomas H. Allen	TVA	GT			382.4	1971
1.	Thomas H. Allen	TVA	GT			238.4	1972

LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

POWER

WRPA 3

FIGURE 14

WATER SUPPLY AND SEWAGE TREATMENT

General

Water Resources Planning Area 3 covers all or part of 30 counties in Illinois, Kentucky, Tennessee, Mississippi, and Arkansas. Because data herein is available only on a county wide basis, hydrologic boundaries have been adjusted to conform to county lines. Twenty-three counties fall within these boundaries and are considered in municipal, industrial, and agricultural water use and sewage treatment data collection. These counties have been further subdivided into six subareas.

In 1970, within WRPA 3, 401.8 MGD was required to meet the municipal, industrial, and agricultural water withdrawal requirements. Of this, 91.1 percent was supplied by groundwater sources. Groundwater withdrawals accounted for all of the municipal water used, 97.9 percent of the industrial water used, and 17.0 percent of the agricultural water used.

Sewage treatment was provided in 41 percent of the communities and serviced 22 percent of the population which utilized the area's municipal water distribution systems in 1970. The remaining 78 percent of the municipally serviced population utilized septic tanks or their sewage was disposed untreated.

1970 Municipal Water Supply

In 1970, municipal water systems within the WRPA serviced 119 communities, which had a combined population of 1,047,871 people, and varied in size from 155 people at West Tennessee Water Company, to 1,207,423 people in Memphis, Tenn. The average daily municipal water withdrawal within the WRPA was 141.9 MGD. During July, the peak municipal water use month in 1970, the average daily use was 149.9 MGD. All of this water was supplied from groundwater sources. The average daily withdrawals resulted in a 128 GPCD use in areas serviced by central water systems. This compares with a national average of 166 GPCD.

1970 Industrial Water Supply

Industrial activity within WRPA 3 during 1970 required an average water withdrawal of 98.0 MGD. Groundwater supplied 96.4 percent of this withdrawal and surface sources supplied 3.6 percent.

1970 Agricultural Water Supply

In addition to the municipal and industrial water withdrawals, agricultural withdrawals required 28.8 MGD for use in the irrigation of

14,763 acres and 8.3 MGD for use in livestock and poultry raising in 1970. Of the water used, 17 and 83 percent was supplied from groundwater and surface water sources, respectively.

1970 Sewage Treatment Facilities

Primary and secondary treatment was provided in 43 of the communities that utilized a municipal water distribution system in 1970. These treatment facilities provided service for 230,454 people. There were, however, two communities with populations over 1,000 that did not provide any centralized sewage treatment.

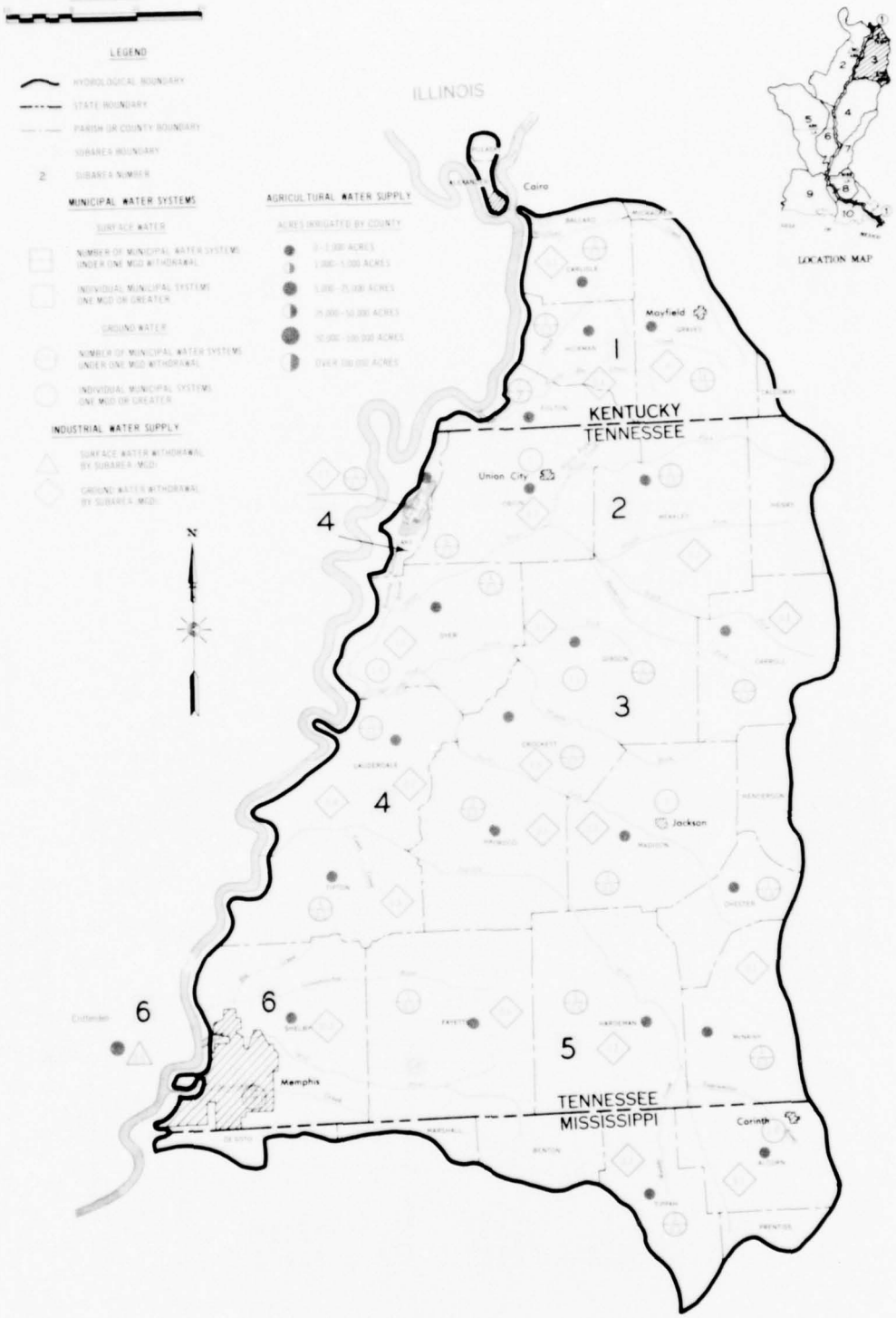
PROJECT MAP INDEX

Municipal, Industrial, and Agricultural Water Supply and Sewage Treatment Facilities - WRPA 3

Subarea County	Population	Municipal Water Use 1/				Industrial Water Use 1/			Agricultural Water Use 1/			Sewage Treatment Facilities					
		No. systems	Withdrawal (MGD)			Withdrawal (MGD)			Withdrawal (MGD)			Secondary Treatment		Primary Treatment		No Treatment 2/	
			Ground	Surface	Total	Ground	Surface	Total	Ground	Surface	Total	Number Plants	Population Serviced	Number Plants	Population Serviced	Number Communities	Population
3-1						4.5		4.5	0.2	0.9	1.1						
Carlisle	2,260	3	.2		.2							1	1,049				
Fulton	9,620	2	2.0		2.0							2	6,298				
Graves	20,030	14	1.6		1.6							1	10,724				
Hickman	2,740	2	.2		.2							1	1,618				
3-2						11.0		11.0	2.6	12.9	15.5						
Carroll	16,266	7	1.2		1.2							2	8,534				
Obion	21,832	7	3.3		3.3							3	16,057				
Weakley	15,209	5	1.9		1.9							4	12,222	1	2,050		
Dyer	28,871	5	3.8		3.8							1	2,124	1	14,523		
3-3						7.0		7.0	1.6	7.5	9.1						
Gibson	34,663	9	4.2		4.2							6	26,930				
Crockett	9,447	7	.7		.7							1	2,499	1	1,474		
Madison	42,562	4	3.3		3.3							1	39,996				
Haywood	8,637	2	.8		.8							1	7,011				
Chester	3,500	1	.4		.4							1	3,581				
3-4						1.6		1.6	0.4	1.8	2.2						
Lauderdale	11,286	7	1.5		1.5							2	7,117				
Tipton	12,212	4	.3		.3							2	7,082				
Lake	3,935	3	.7		.7							1	1,657				
3-5						10.1		10.1	1.4	7.1	8.5						
Fayette	3,540	5	.3		.3							1	1,816				
Hardeman	11,506	6	2.5		2.5							1	6,674				
McNairy	4,200	4	.8		.8							1	3,495				
Tippah	3,985	2	.3		.3									1	3,482		
Alcorn	11,450	1	1.8		1.8							1	11,581				
3-6						60.3	3.5	63.8	0.1	0.6	0.7						
Shelby	722,014	19	110.1		110.1							3	26,080			1	623,530
Crittenden	48,106											1	3,146	1	1,634	1	25,892
Total	1,047,871	119	141.9		141.9	94.5	3.5	98.0	6.3	30.8	37.1	38	207,291	5	23,163	2	649,422

1/ All figures are daily averages.

2/ Only denotes communities of 1,000 or greater population.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL WATER SUPPLY

WRPA 3

FIGURE 15

ARCHEOLOGY AND HISTORY

Environmentally and archeologically, WRPA 3 is considerably different from all others in the Lower Mississippi Valley. The alluvial plain is quite narrow, in some cases the bluffs come right to the banks of the river. Indians occupied the area from the beginning of human history in the valley, but the environmental differences of the hill country brought about differences in cultural patterns. Despite its obvious significance archeologically, little is known of the cultural history of the area. Only 493 sites are on record in the area, and 75 of these are so poorly known that nothing can be said of their cultural relationships, yet two of the known sites are considered so significant as to be owned and administered by the State.

Sites identified in this WRPA include: 104 Mississippian, 179 woodland, 130 archaic, 5 paleo, and 75 unknown. Figure 16 shows the number of sites occupied during each period by county. Since some of the sites have been occupied during more than one period, the number of sites shown on the figure do not agree with those above.

Probably the most significant historical area centers in the city of Memphis, with its historic houses and the famous Beale Street Historic District that gave rise to the era of the "blues" in American music. Early explorers left their mark on this area, much as they did throughout the length of the Mississippi. George Rogers Clark, of Lewis and Clark fame, established an outpost in Ballard County; LaSalle constructed a fort near the mouth of the Hatche River in the late 17th century; and others of equal fame traversed the area.

Like most States in the region, those bordering on the Mississippi River present outstanding examples of scenic attractions wherever the river can readily be seen. The high bluffs overlooking the Mississippi present many spots of scenic beauty, capitalized on by road builders of both Tennessee and Kentucky. The "Great River Road" presents outstanding vistas through western Kentucky, bringing memories of the days of Mark Twain and the sternwheelers.

PROJECT MAP INDEX
Historic Sites - WRPA 3

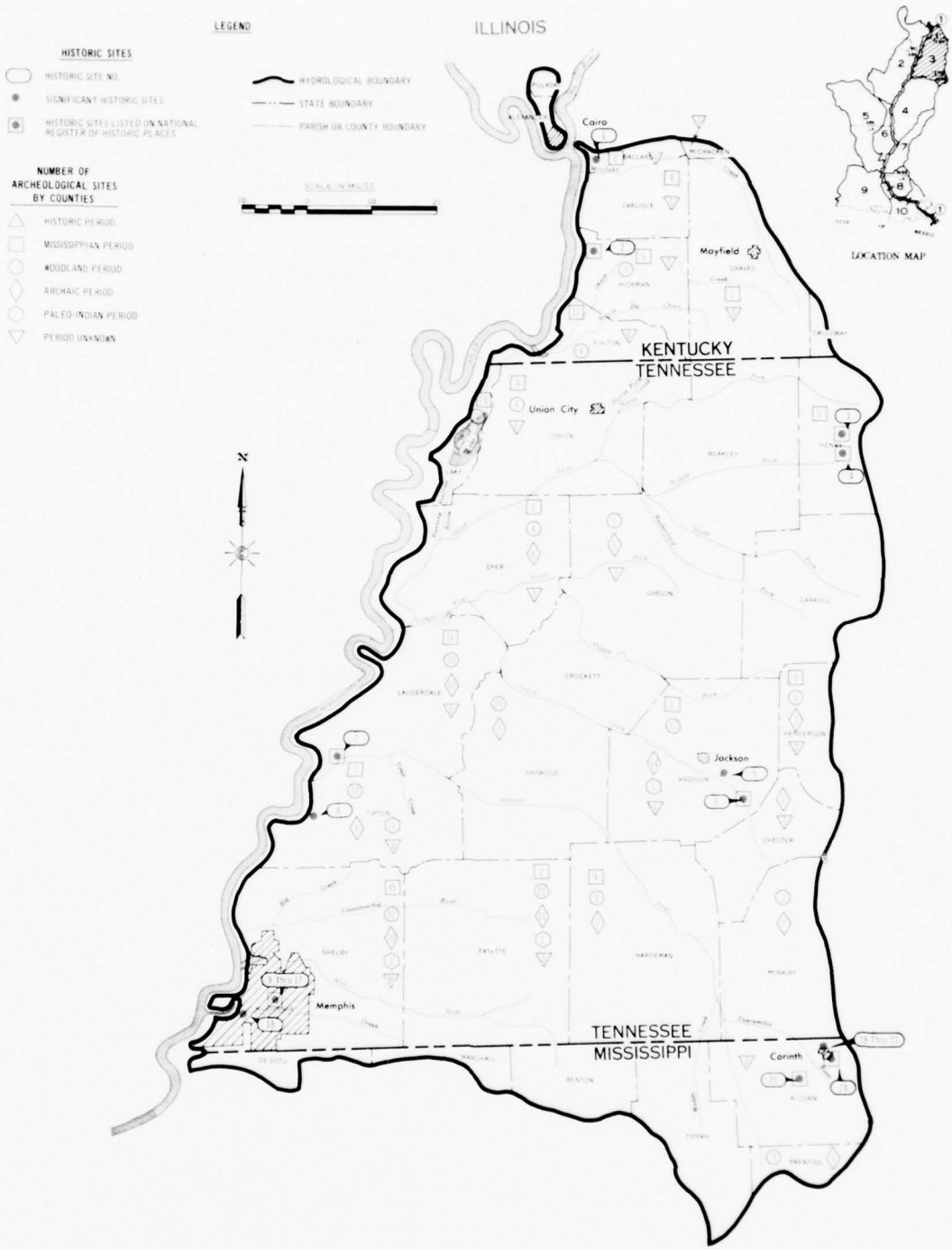
Map No.	Name		Description
9	Beale Street Historic District, Memphis Shelby County, Tennessee	NR	Beale Street from Main to Fourth Streets.
19	Beauregard Headquarters, Corinth Alcorn County, Mississippi		Headquarters used by Confederate General P.G.T. Beauregard in 1862.
5	Casey Jones Home and Railroad Museum Madison County, Tennessee	NR	Home of Johnathan Luther (Casey) Jones, Engineer of the "Cannonball Express," see WRPA 4.
10	Chucalissa Indian Village Shelby County, Tennessee	NR	Prehistoric Indian town (900 A.D.--1600 A.D.). Located on Mitchell Road in Memphis.
2	Columbus-Belmont Battlefield Hickman County, Kentucky	NR	Site of Civil War battle in 1861. Called "The Gibraltor of the West."
20	Curlee Home, Corinth Alcorn County, Mississippi		Used as headquarters for Confederate Generals Bragg and Hood and Union General Halleck in 1862.
11	First Baptist Church, Memphis Shelby County, Tennessee	NR	Built in 1869.
18	Fort Assumption Site Shelby County, Tennessee		Site of fort erected in 1739 by le Mayne as base of operations against Chickasaw Indians.
1	Fort Jefferson Ballard County, Kentucky		George Rogers Clark outpost established in 1782.
7	Fort Pillow Lauderdale County, Tennessee	NR	Horseshoe-shaped fort built by the Confederates in late 1861. Located on Tennessee 87, 45 miles northeast of Memphis.
8	Fort Prudhomme Site Tipton County, Tennessee		Site of fort built by LaSalle in 1682 on his first voyage down the Mississippi River.
24	Fort Robinette Site, Corinth Alcorn County, Mississippi	NR	Scene of bitter fight for Corinth on October 5, 1862.
12	Hunt-Phelan Home, Memphis Shelby County, Tennessee	NR	Built in 1830. Grant headquarters.
25	Jacinto Courthouse Alcorn County, Mississippi	NR	One of oldest surviving courthouses in Mississippi.
13	Lee and Fontaine Houses of the James Lee Memorial, Memphis Shelby County, Tennessee	NR	Second Empire architecture.
14	Magevney House Shelby County, Tennessee	NR	Oldest surviving dwelling in Memphis constructed in 1836--little changed. Located at 198 Adams Street.
23	Oak Home, Corinth Alcorn County, Mississippi		Headquarters for General Polk in 1857.
6	Pinson Mounds Archeological Site Madison County, Tennessee	NR	Two large temple mounds--an effigy mound and extensive earthworks.
4	Porter House Henry County, Tennessee	NR	Home of former Governor James Porter. Located at 407 S. Dunlap Street, Paris.
15	Randolph House, Memphis Shelby County, Tennessee	NR	Built in mid-1870's. Last remaining Italianate dwelling.
21	Reynolds Home, Corinth Alcorn County, Mississippi		Used as hospital in 1862.

(NR--This site is on the National Register of Historic Places)
(NP-National Park)

PROJECT MAP INDEX
Historic Sites - WRPA 3
(Continued)

Map No.	Name		Description
22	Rose Cottage, Corinth Alcorn County, Mississippi		General Johnson's headquarters during Battle of Shiloh in 1862.
16	Tri-State Bank, Memphis Shelby County, Tennessee	NR	Original publishing house of W.C. Handy, song writer. Later converted to a bank.
17	Victorian Village District Shelby County, Tennessee	NR	Located in Adams and Jefferson Streets in Memphis. Contains nine architecturally significant houses.
3	Work Farm Site Henry County, Tennessee	NR	Pre-Columbian 25-acre site with seven mounds and a plaza. Located 4 miles northwest of Whitlock, Tennessee.

(NR--This site is on the National Register of Historic Places)
(NP--National Park)

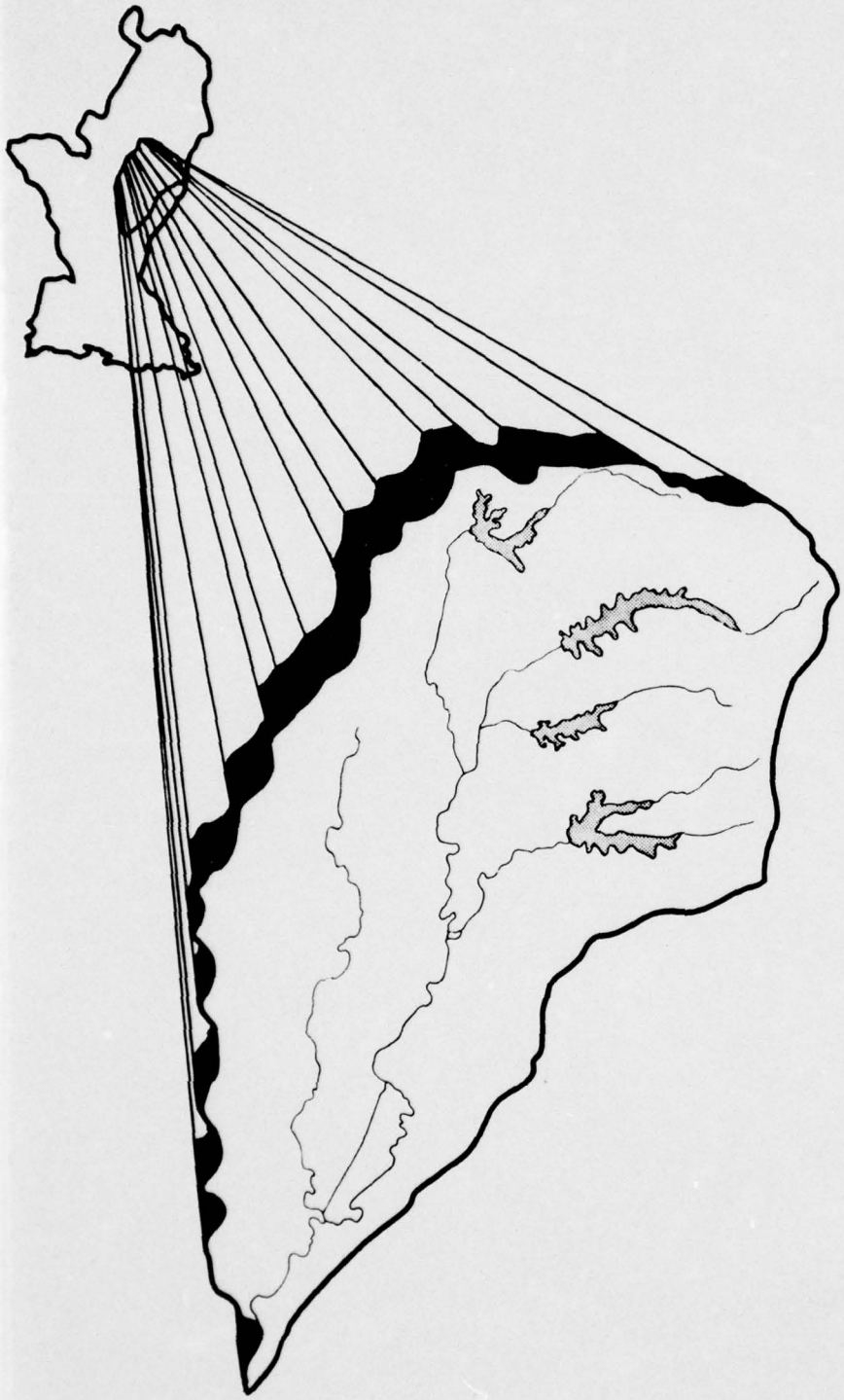


LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORIC AND ARCHEOLOGICAL SITES

WRPA 3

FIGURE 16



WRPA 4

W R P A 4

GENERAL

Area of Study

WRPA 4 comprises the drainage basin of the Yazoo River and its tributaries and occupies approximately the northwest quarter of the State of Mississippi. The study area covers 13,355 square miles or 13 percent of the total area in the Lower Mississippi Region. The area is bordered on the west by the east bank Mississippi River levee and on the north by the drainage divides of the Wolf and Hatchie River Basins. The east and south boundaries are formed by the drainage divides of the Tombigbee and Big Black River basins, respectively. The Yazoo-Tallahatchie-Coldwater River system forms the principal drainage artery of the basin with major tributaries being the Yalobusha, Yocona, Little Tallahatchie, and Big Sunflower Rivers and Steele Bayou.

The largest cities in the study area are Greenville, Vicksburg, Greenwood, and Clarksdale, Mississippi. The population of the WRPA in 1970 was about 638,000 - almost 10 percent of the total population of the Lower Mississippi Region. Sixty-three percent of the population in the WRPA was rural and 37 percent was urban. The economy of the area is based primarily on agricultural activities. The manufacturing, forestry, fishery, and numerous other industries, however, also make considerable contribution to the area's economy. Seventy-two percent of the area is in crop and pasture lands and farm forests. The major crops are cotton, soybeans, rice, and small grains. Raising beef cattle and hogs are the major livestock enterprises. The major manufacturing industries in the area are the lumber and furniture, textile mill, apparel and other textile and machinery industries.

Hydrologic Characteristics

The principal drainage system of WRPA 4 is the Yazoo-Tallahatchie-Coldwater system which consists of the lower 46 miles of the Coldwater River, 84 miles of Tallahatchie River, and the 169 miles of Yazoo River. The lower 169 miles of the system is deeply entrenched throughout its length, having banks from 30 to 45 feet high and channel widths of 300 to 500 feet. The lower channel is relatively stable with stream gradients ranging from 0.2 to 0.3 foot per mile and average and maximum velocities at three and five feet per second. Much of the streamflow which is generated within the WRPA originates in the tributary basins in the hill area. The principal hill tributaries, Coldwater, Little Tallahatchie, Yocona, and Yalobusha Rivers, rise in north-central Mississippi and flow westerly or southwesterly to form or join the main stem of the Yazoo River system. The average gradient of the hill streams is 1.5

feet per mile. The flows discharged from the principal hill tributaries are completely controlled by the operation of Grenada, Enid, Sardis, and Arkabutla Reservoirs. These reservoirs control about 60 percent of the total drainage area of the Yazoo system at Greenwood, Mississippi.

The principal alluvial valley streams are the Big Sunflower River and Steele Bayou. These streams and their tributaries are characterized by relatively flat gradients and small velocities. Stream gradients in the area vary from 0.25 to 0.5 foot per mile.

FLOOD CONTROL

Beaver Dam Bayou Watershed, Mississippi

Located in Sunflower County, Miss., this 28,960-acre Public Law 566 project was authorized in 1956. The main project features are: (1) 23,000 acres of land treatment measures costing an estimated $370,677 and (2) 53 miles of channel improvement. The total estimated project costs are $772,745 ($273,130 Federal and $499,615 non-Federal). Flood plain lands benefited are 9,345 acres. Total estimated average annual damages prevented are $27,540 and total estimated annual benefits are $63,728. The benefit-cost ratio is 2.8 to 1. The project was completed in 1971.

Buck Island Watershed, Mississippi

Located in Tunica County, Miss., this 27,820-acre Public Law 566 project was authorized in 1963. The main project features are: (1) 11,100 acres of land treatment measures costing an estimated $236,371 and (2) 39 miles of channel improvement. The total estimated project costs are $681,626 ($301,829 Federal and $379,797 non-Federal). Flood plain lands benefited are 10,758 acres. Estimated average annual damages prevented are $19,575; total annual benefits are $39,150. The benefit-cost ratio is 1.7 to 1. The project was completed in 1967.

Central Bogue Phalia Watershed, Mississippi

Located in Bolivar and Washington Counties, Miss., this 64-778-acre Public Law 566 project was authorized in 1962. The main project features are: (1) 35,200 acres of land treatment measures costing an estimated $304,801 and (2) 112 miles of channel improvement. The total estimated project costs are $733,165 ($247,022 Federal and $486,143 non-Federal). Flood plain lands to be benefited are 28,582 acres. Initial economic studies indicate average annual damages that will be prevented are $53,358 and total annual benefits are $94,016. The benefit-cost ratio is 3.3 to 1. The project is 50 percent complete.

Harris Bayou Watershed, Mississippi

Located in Coahoma County, Miss., this 20,430-acre Public Law 566 project was authorized in 1966. The main project features are: (1) 17,700 acres of land treatment measures costing an estimated $235,740 and (2) 36 miles of channel improvement. The total estimated project costs are $605,572 ($267,026 Federal and $338,546 non-Federal). Flood plain lands benefited are 6,911 acres. Estimated average annual damages prevented are $43,448 and total annual benefits are $77,243. The benefit-cost ratio is 3.8 to 1. The project is complete.

Home Cypress Bayou Watershed, Mississippi

Located in Coahoma, Sunflower, and Tallahatchie Counties, Miss., this 42,340-acre Public Law 566 project was authorized in 1966. The main project features are: (1) 33,200 acres of land treatment measures costing an estimated $529,546 and (2) 69 miles of channel improvement. The total estimated project costs are $1,197,985 ($498,547 Federal and $699,438 non-Federal). Flood plain lands to be benefited are 13,217 acres. Estimated average annual damages that will be prevented are $48,323 and estimated average annual benefits are $109,767. The benefit-cost ratio is 2.9 to 1. The project was completed in 1972.

Indian Bayou Watershed, Mississippi

Located in Issaquena and Sharkey Counties, Miss., this 34,894-acre Public Law 566 project was authorized in 1965. The main project features are: (1) 15,100 acres of land treatment measures costing an estimated $261,240 and (2) 41 miles of channel improvement. The total estimated project costs are $643,609 ($267,997 Federal and $375,612 non-Federal). Flood plain lands benefited are 22,444 acres. Estimated average annual damages prevented are $30,651 and total average annual benefits are $61,302. The benefit-cost ratio is 3.0 to 1. The project was completed in 1970.

Aerial view of floodwater retarding structure on typical watershed project.

Little Tallahatchie River Watershed, Mississippi

The Flood Control Act, Public Law 534, passed in 1944, authorizes the Department of Agriculture to assist with flood prevention in 11 large river basins. The Little Tallahatchie River is one of the 11 basins. In 1946, appropriations were made to begin work on the project. Work started in 1947.

The project covers 963,977 acres above Sardis Lake (80 percent privately owned, 10 percent National Forest, and 10 percent reservoir land). The principal problems are floodwater and sediment damage to agriculture land.

The Flood Control Act gives the Soil Conservation Service the task of providing technical assistance for watershed planning, farm planning, and designing and applying of measures. Also, the act gives the Forest Service the task of assisting in watershed planning and applying of woodland practices. The technical assistance is provided by the local soil conservation districts and watershed drainage districts. All projects must be sponsored by a local district. Also, financial help is available from several other sources. Presently, the program and the planning and installing of measures are about the same as that provided by Public Law 566.

Principal measures installed under the Flood Control Act are land treatment measures for watershed protection and flood prevention and structural measures. Structural measures include floodwater retarding dams, channel improvements, grade stabilization structures, and multiple-purpose reservoirs.

Project land treatment measures for watershed protection are: (1) 169,932 acres of conservation cropping system; (2) 61,886 acres of pasture planting; (3) 87,449 acres of pasture renovation; (4) 82 miles of diversions; (5) 1,234 miles of terraces; (6) 997 miles of drainage mains and laterals; (7) 1,381 miles of drainage field ditches; and (8) 6,206 ponds.

Project land treatment measures for flood prevention are: (1) 245,870 acres of critical area planting (66,202 acres of grasses and 179,668 acres of trees); (2) 4,423 debris basins; (3) 1,111 grade stabilization structures; (4) 647 miles of diversions; (5) 652 miles of roadside erosion control; and (6) 389 miles of streambank protection.

Major project structural measures are: (1) 102 floodwater retarding dams; (2) one multiple-purpose reservoir for floodwater and recreation; and (3) 250 miles of channel improvements. There are about 211 square miles above the dams with a total storage of 58,300 acre-feet (6,700 acre-feet sediment, 50,772 acre-feet floodwater, and 828 acre-feet recreation). Normal pool area is 1,804 acres and the recreation pool is 259 acres. As planning continues, other structural measures will probably be added.

The total estimated project cost is $16 million with local interests providing about 50 percent. Flood plain lands benefited are about 80 thousand acres. Estimated average annual damages prevented are $720 thousand and estimated average annual benefits are $1,300,000. The project is 85 percent complete.

Moorhead Bayou Watershed, Mississippi

Located in Sunflower County, Miss., this 21,896-acre Public Law 566 project was authorized in 1970. The main project features are: (1) 4,900 acres of land treatment measures costing an estimated $335,105 and (2) 41 miles of channel improvements. The total estimated project costs are $1,185,185 ($464,277 Federal and $720,908 non-Federal). Flood plain lands to be benefited are 21,896 acres. Total estimated average annual damages that will be prevented are $54,785 and total estimated annual benefits are $123,937. The benefit-cost ratio is 2.4 to 1. The project has not been started.

Tri-County Hopson Bayou Watershed, Mississippi

Located in Coahoma, Quitman, and Tallahatchie Counties, Miss., this 28,970-acre project was authorized in 1969. The main project features are: (1) 23,100 acres of land treatment measures costing an estimated $472,319 and (2) 56 miles of channel improvement. The total estimated project costs are $1,179,305 ($594,824 Federal and $584,481 non-Federal). Flood plain lands to be benefited are 8,939 acres. Total estimated average annual damages that will be prevented are $80,660; total annual benefits are $105,949. The benefit-cost ratio is 2.9 to 1. This project is now under construction.

Upper Bogue Phalia Watershed, Mississippi

Located in Bolivar and Washington Counties, Miss., this 219,351-acre project was authorized in 1962. The main project features are: (1) 120 thousand acres of land treatment measures costing an estimated $1,074,955 and (2) 320 miles of channel improvement. The total estimated project costs are $2,861,122 ($1,020,835 Federal and $1,840,287 non-Federal). Flood plain lands to be benefited are 74,241 acres. Total estimated average annual damages to be prevented are $244,608; total annual benefits are $451,116. The benefit-cost ratio is 4.4 to 1. The project is 80 percent complete.

Upper Quiver River and Blue Lake Watershed, Mississippi

Located in Tallahatchie County, Miss., this 58,087-acre project was authorized in 1963. The main project features are: (1) 33,900 acres of land treatment measures costing an estimated $245,361 and (2) 55 miles of channel improvements. The total estimated project costs

are $768,410 ($355,107 Federal and $413,303 non-Federal). Flood plain lands benefited are 16,043 acres. Total estimated average annual damages prevented are $36,941; total annual benefits are $73,882. The benefit-cost ratio is 2.8 to 1. The project was completed in 1967.

Yazoo Basin, Mississippi

The basin of the Yazoo River lies in northern Mississippi, extending from the Mississippi-Tennessee state line southward to the latitude of Vicksburg. It occupies an area of 13,400 square miles, of which 6,600 square miles are in the alluvial valley of the Mississippi River, and the remaining 6,800 square miles are rolling to rugged hill lands. Work described herein is a part of the Mississippi River and Tributaries Project which authorizes control of floods and navigation improvements of the Lower Mississippi River and its tributaries. The original authorization was the Flood Control Act of May 15, 1928. This law has been amended many times. Eight amendments authorize the three components of the Yazoo Basin Project - The Yazoo Headwater Area, the Yazoo Backwater Area, and the Big Sunflower Area. These authorizations are the Flood Control Acts of June 15, 1936; August 28, 1937; June 28, 1938; August 18, 1941; December 22, 1944; July 24, 1946; October 23, 1962; and October 27, 1965. The adopted overall plan of improvement includes protection against headwater floods of streams in the basin, protection against backwater floods of the Mississippi, and major drainage in the delta area. Specific features are discussed in the following paragraphs.

Main Stem

The Main Stem feature includes channel and levee improvements on the Coldwater-Tallahatchie-Yazoo Rivers from Arkabutla Lake near Memphis, Tenn., to near Vicksburg, Miss., where the Yazoo River enters the Mississippi River. These streams serve as the drainage outlet for 6,600 square miles of hill drainage area (60 percent controlled by four flood control reservoirs) and 2,300 square miles of delta land.

Improvements on the main stem rivers were begun in 1939. Channel work has consisted primarily of clearing and snagging and cutoffs to speed the passage of flood flows. Levee construction will contain the larger flood flows where required. On the Yazoo River, extending from Vicksburg, Miss., to Greenwood, Miss., 160.2 miles of channel work (including nine cutoffs) and 107.7 miles of levee construction are complete. An additional 54.9 miles of levee remain to be constructed. Work on the Tallahatchie River includes 73.5 miles of completed channel improvements. Future work includes construction of one channel cutoff and 30.4 miles of levee. Eighteen cutoffs have been constructed along Tallahatchie River.

The Coldwater River part of the Main Stem feature includes 54.6 miles of channel improvements (36 cutoffs) and 72.0 miles of levee construction. All channel work and 40.0 miles of levee are complete. The Main Stem feature also includes 4.8 miles of future channel construction on the Bear Creek Diversion.

The present estimated cost of this feature is $28,100,000 of which $16,350,000 has been expended through June 30, 1971. Future levee work depends largely on the future of the Upper Auxiliary Channel. Project works in the headwater area, including the main stem, four reservoirs, and other features, have prevented $71,037,000 in flood damages through June 30, 1971. When complete, this work will protect 1,209,000 acres and substantially benefit 303,000 acres.

Arkabutla Lake

The dam creating Arkabutla Lake is located on Coldwater River about 25 miles south of Memphis, Tenn. The dam is an 11,500-foot earthfill structure with a height of 95 feet above the streambed. The lake has a flood control storage capacity of 493,500 acre-feet. This is equivalent to 9.3 inches of runoff from the 1,000-square mile drainage area above the dam. At maximum flood control pool, the lake has a surface area of 32 square miles and extends some 16 miles up the valley.

The dam has been in operation since 1943 and has prevented $7,882,000 in flood damage, through June 30, 1971. Public use facilities at the lake are under construction. The total "Mississippi River and Tributaries" (MR&T) cost of Arkabutla Lake is $12,620,000, of which $12,373,000 has been expended as of June 30, 1971. Visitors for fishing and recreation totaled 1,235,000 in 1971. A continuing increase in attendance is anticipated because of the proximity of the lake to Memphis.

Enid Lake

Enid Lake is located some 26 miles north of Grenada, Miss., on the Yocona River. It controls the runoff from 560 square miles of hill lands. The dam, an earthfill structure, is 8,400 feet long with a height of 99 feet above the streambed. At maximum flood control pool, the lake has a storage capacity of 602,400 acre-feet of flood control storage. At this elevation, the lake extends up the Yocona River valley some 18 miles with a surface area of 44 square miles. This flood control storage is equivalent to 20.2 inches of runoff over the drainage area.

Public use facilities are the only portion of the project feature not complete. The total estimated MR&T cost for Enid Lake is $15,540,000 of which $15,430,000 had been expended on June 30, 1971.

Arkabutla Lake and Dam showing spillway in foreground and dam and lake in background.

Enid Lake and Dam.

Enid Lake has provided flood control benefits to portions of the Yazoo Basin since 1952 when the dam was completed. Flood damages prevented through June 30, 1971 amount to $5,076,000. Recreation at Enid Lake has become an important project purpose in recent years with 1,036,000 visitors in 1971.

Grenada Lake

This lake is located on Yalobusha River about 3 miles northeast of Grenada, Miss. The earthfill dam is 13,900 feet long with a height of 102 feet above the streambed. Early plans for flood control in the Yazoo Basin included three dams on Yalobusha and Skuna Rivers to provide 1,431,000 acre-feet of flood control storage. However, the site selected for Grenada Lake provides 1,251,700 acre-feet of flood control storage and eliminated the need for additional dams in the Yalobusha River watershed. At maximum pool, the lake provides storage for 17.8 inches of runoff from the 1,320-square-mile drainage area. The lake extends up the Yalobusha River valley 22 miles and up the tributary of Skuna River valley 19 miles with a surface area of 100 square miles. The minimum lake at conservation pool has a surface area of 15 square miles and extends about 7 miles upstream.

Grenada Lake and Dam.

The lake was put into operation in 1954 and has provided $9,530,000 of flood control benefits in the Yazoo Basin through June 30, 1971. The estimated MR&T cost of Grenada Lake is $32,120,000. Public use facilities are under construction with a remaining cost of $446,000. Some 2,636,000 visitors in 1971 make Grenada Lake the most popular of the four flood control lakes in the Yazoo Basin project for recreation and fishing.

Sardis Lake

This lake is located on the Little Tallahatchie River about 11 miles northeast of Batesville, Miss. The dam was constructed by hydraulic fill, 15,300 feet long and 117 feet above the streambed. The lake has a storage capacity of 1,461,900 acre-feet of storage for flood control. This is the equivalent of 17.7 inches of runoff in the 1,545 square mile drainage area controlled by the dam. At maximum flood control pool, the lake extends more than 30 miles up the valley with a surface area of 90 square miles. At conservation pool, the surface area of the lake is 17 square miles.

With the exception of public use facilities, which are under construction, this feature was completed in 1940. The total estimated MR&T cost of Sardis Lake is $12,560,000 of which $400,000 remains for construction of the public use facilities.

Sardis Lake and Dam

Sardis Lake has provided flood control benefits to the Yazoo Basin Delta for more than thirty years. Flood damages prevented through June 30, 1971 total $27,388,000. The attendance at Sardis Lake for recreation and fishing in 1971 was 2,463,000.

The Yazoo Navigation project, authorized by the River and Harbor Act of 1968 will increase the authorized storage in Sardis Lake by 600,000 acre-feet, for navigation. This work has not been initiated.

Local Protection Works

Belzoni. This feature of the project includes 0.1 mile of levee, 0.5 mile of concrete floodwall, and several drainage structures. The project works tie to the west bank Yazoo River levee system. The Belzoni Local Protection Works provides flood protection to the city of Belzoni from headwater floods on the Yazoo River. The work was completed in 1959 at a Federal cost of $317,000.

Greenwood. The city of Greenwood is protected from Yazoo River flooding by these works. The 22.5 miles of levees and floodwalls protecting the city were constructed in the 1940's. Additional protection to the city will be provided by the diversion of Big Sand Creek, a tributary of Pelucia Bayou into the Yalobusha River. Pelucia Bayou runs through Greenwood and presents a constant threat of flooding and bank erosion. The diversion of Big Sand Creek consists of a leveed floodway 2.9 miles long with erosion control structures and related works. This work is now under construction. The Greenwood Local Protection Works includes drainage improvements inside the leveed portion of the city and a 675 cubic feet per second (c.f.s.) pumping station to evacuate storm drainage during high stages on the Yazoo River.

The total estimated cost of the Greenwood Local Protection Works is $6,540,000, of which $4,116,000 had been expended by June 30, 1971. This protection to the city has been a key factor in the development of Greenwood as a center of trade in the Yazoo Delta.

Yazoo City. The Yazoo City Local Protection is a feature of the Yazoo Basin project authorized by the Flood Control Act of June 15, 1936, as amended.

This project feature provides flood protection from headwater flooding of Yazoo River to low-lying lands of Yazoo City. The construction, completed in 1957, includes two cutoffs on Yazoo River totaling 1.6 miles in length, 4.1 miles of levees, drainage structures, and a 540-c.f.s. pumping station. The construction ties to the Yazoo River levee system to the north. The cost of the Yazoo City Local Protection is $2,206,000.

Tributaries

The tributaries in the Yazoo Headwater Area include streams originating in the hills as well as streams with their entire drainage area in the delta. Work on hill streams is closely coordinated with Soil Conservation Service projects for construction of floodwater retarding structures in the hill drainage area of several streams. Several tributary streams have local levee systems that are inadequate to contain the larger runoffs from the hills. Authorized project works on the tributary streams include 459 miles of channel improvements and 159 miles of levees. To date, 244 miles of channel and 22 miles of levee are complete. Major tributary streams include Little Tallahatchie River (below Sardis Lake), Yalobusha River (below Grenada Lake), Yocona River (below Enid Lake), Cassidy Bayou, Big Sand Creek, Pelucia Creek, Tillatoba Creek, Hillside Floodway, Alligator-Catfish Bayous, and Whiteoak Bayou. One pumping plant with a 250-c.f.s. capacity was constructed on McKinney Bayou to pump water over the Mississippi River levee.

The estimated cost of the Tributaries is $58,400,000 of which $17,568,000 had been expended through June 30, 1971.

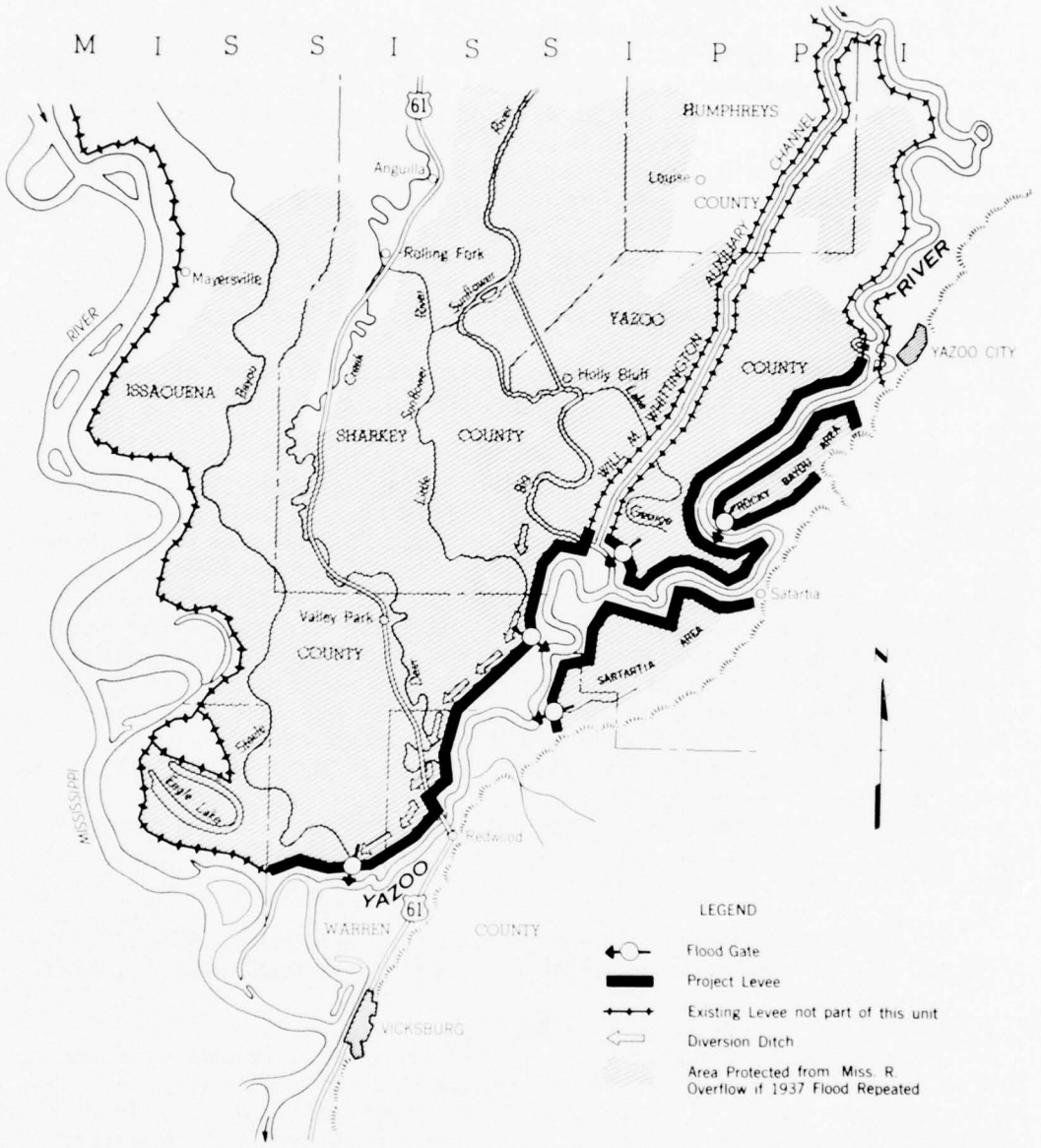
Upper Auxiliary Channel

The Upper Auxiliary Channel is the largest feature in the Yazoo Headwater Area not under construction. This channel will be an upstream extension of the Whittington Auxiliary Channel and is an integral part of the dual channel system of flood control. The channel, as authorized, will take a substantial portion of flood flow out of the Tallahatchie River and pass it down to the Yazoo River near the head of the Whittington Auxiliary Channel. The project includes a channel 63 miles long with 56 miles of parallel levees where necessary to contain flood flows. Construction of this channel will lower design flows on Tallahatchie and Yazoo Rivers by as much as 5-1/2 feet. It will eliminate the need for several miles of levee along Tallahatchie River and reduce the height of other levees to be constructed. Because of extensive local opposition to the authorized route, various alternative locations for the channel are being considered, including the use of historical channels.

The estimated cost of the Upper Auxiliary Channel is $32,330,000, of which $67,800 had been expended for planning through June 30, 1971.

Will M. Whittington Auxiliary Channel

Because of the complex nature of the control of headwater flooding in the Yazoo River Basin, the Flood Control Act of 1936 gave the Chief of Engineers the authority to substitute levees, floodways, and/or auxiliary channels for any or all of the seven reservoirs authorized by that act. Much of the flood control planning for the Yazoo River Basin has included the creation of a dual channel system to divide flows. The Whittington Auxiliary Channel is the lower portion of this dual channel system. It is a new channel some 30.8 miles long with 61.3 miles of parallel levees. The channel is designed to take a major portion of flood flow out of the Yazoo River near Silver City, Miss., and pass it down to reenter the Yazoo River near the mouth of



YAZOO BACKWATER FEATURE

FIGURE 17

Big Sunflower River. Maximum flood stages will be reduced by as much as 7 feet by this auxiliary channel.

The channel was completed in 1962 at a Federal cost of $10,951,000. It has proven very successful in reducing flooding in the lower part of the Yazoo River Basin. A fish and wildlife enhancement feature, authorized by the Flood Control Act of October 27, 1965 has not been constructed.

Yazoo Backwater

The Yazoo Backwater feature of the Yazoo Basin project was authorized by the Flood Control Act of August 18, 1941, as amended by the acts of December 22, 1944 and October 27, 1965. The addition of the Muddy Bayou Control Structure was authorized by the Chief of Engineers on March 3, 1970.

This project feature will provide protection to about 1,550 square miles of delta lands in the lower end of the Yazoo Basin from Mississippi River backwater except for the most extreme floods. The construction includes 97.5 miles of levee, 39.9 miles of channel, several drainage structures and a control structure in Muddy Bayou to permit control of water inflow into Eagle Lake to protect its high fishery value. The project works will provide protection to four separate subareas as described below.

Yazoo Area. About 82 percent of the entire backwater area, designated as the Yazoo Area, lies west of the Will M. Whittington Auxiliary Channel and the lower reach of the Yazoo River. The Big Sunflower and Little Sunflower Rivers, Deer Creek, and Steele Bayou flow through this area. Construction is underway to provide 30.5 miles of connecting levee between the lower limits of the Mississippi River east bank levee and the west levee of the Will M. Whittington Auxiliary Channel. About 18 miles of levee have been completed. The levee grade was established to protect the area from all but extreme backwater floods from the Mississippi River which would overtop the levee, and utilize the basin for storage during flood stages on the Mississippi River. Interior drainage will be evacuated by drainage structures at the Little Sunflower River and at Steele Bayou. Connecting channels will be constructed from the Big Sunflower River to the Little Sunflower River and from there to Steele Bayou, intercepting Deer Creek. The Steele Bayou Drainage Structure was completed in January 1969 and has been operated since then. The 12-mile reach of levee constructed between the Mississippi River levee and the Deer Creek ridge provides interim protection to lands west of the ridge. Flood damages prevented since beginning operation are estimated at $125,000 through June 30, 1971.

Several construction contracts are presently in progress, including construction of the large drainage structure at Little Sunflower River. Planning was initiated on the Muddy Bayou Control Structure in July 1971.

Satartia Area. This area comprises about 26,700 acres of alluvial lands just south of and including the town of Satartia. The plan of protection includes a 19.4 mile levee and a drainage structure to evacuate interior drainage from the protected area. Part of the levee will be constructed to a grade that would be overtopped by extreme backwater floods. Construction was started in October 1972.

Carter Area. The portion of the Yazoo Backwater lying east of the Will M. Whittington Auxiliary Channel and west of the Yazoo River is referred to as the Carter Area. This area comprises about 161 square miles of delta lands. The plan for protection of this area includes a levee 29.3 miles long which will extend from the lower terminus of the east bank Will M. Whittington Auxiliary Channel levee to a connection with the existing Yazoo River Headwater levee opposite Yazoo City. Interior drainage will be carried through a new channel connecting Lake George to a drainage structure for evacuating these waters through the levee. The Carter Area will be protected from the maximum flood of record. Construction has not started in this area.

Rocky Bayou Area. This area comprises about 22 square miles of alluvial land east of the Yazoo River, between the latitudes of Yazoo City and Satartia. The plan of protection includes the enlargement of some 18.3 miles of existing levee to project grade and section. A larger capacity floodgate will be constructed to replace the existing structure. The area will be protected from the maximum flood of record. Construction has not started in this area. The improvement of Rocky Bayou in this area is authorized under the Tributaries feature of the Yazoo Basin project. The plan includes 0.1 mile of channel improvement riverward of the drainage structure and 7.7 miles of channel enlargement landward of the structure. The improvement is to be done after the drainage structure is completed as part of the Yazoo Backwater levee.

The present estimated cost of the Yazoo Backwater feature is $43,971,000 of which $43,900,000 is Federal cost. Expenditures through June 30, 1971 total $13,613,000.

Big Sunflower River, Etc.

The Big Sunflower feature of the Yazoo Basin project was authorized by the Flood Control Act of December 22, 1944. The Flood Control Act of July 24, 1946 incorporated the feature into the MR&T project. The acts of May 17, 1950; October 23, 1962; and October 27, 1965 further modified the authorized project works. Additional improvements in Steele Bayou, Main Canal, and Black Bayou were authorized by resolutions of the House and Senate Public Works Committees on December 15 and 17, 1970, respectively, under the authority of Section 201 of the Flood Control Act of October 27, 1965.

The original authorizations provide for 592 miles of channel improvements on streams in the Big Sunflower Basin for flood control and drainage improvements on 4,100 square miles of alluvial lands. Major streams included are Big Sunflower River, Little Sunflower River, Bogue Phalia, Quiver River, Hushpuckena River, Steele Bayou, Main Canal, and several other smaller streams. All of this work has been completed. The Flood Control Act of October 27, 1965 authorized further channel modifications on Steele Bayou and certain of its tributaries and on Quiver River and Gin and Muddy Bayous. Some 44.4 miles of this work has been completed. The additional work in the upper Steele Bayou Basin, authorized in 1970, includes an additional 18 miles of channel modification on Black Bayou.

Construction of this feature began in 1947 and has been active since that time. The estimated cost of the Big Sunflower feature is $28,300,000 Federal and $352,000 non-Federal. $12,296,000 had been expended through June 30, 1971.

Yazoo River Watershed, Mississippi

The Flood Control Act, Public Law 534, passed in 1944 authorizes the Department of Agriculture to assist with flood prevention in 11 large river basins. The Yazoo River Basin is one of the 11 basins. In 1946, appropriations were made to begin work on the project. Work started in 1947.

The project covers 3,942,197 acres of hill and delta areas. The hill area totals 3,026,582 acres; the delta area totals 719,797 acres. In addition, 195,818 of the total acres are in the reservoir areas of the Corps of Engineers. The principal problems are floodwater and sediment damage to agricultural land.

The Flood Control Act gives the Soil Conservation Service the task of providing technical assistance for watershed planning, farm planning, and designing and applying measures. Also, the act gives the Forest Service the task of assisting in watershed planning and applying of woodland practices. The technical assistance is provided to local soil conservation districts and watershed drainage districts. All projects must be sponsored by a local district. Financial assistance to districts is also available from several sources. Presently, the program and the planning and installing of measures are about the same as that provided by Public Law 566.

Principal measures installed under the Flood Control Act are land treatment measures for watershed protection and flood prevention and structural measures. Structural measures included floodwater retarding dams, channel improvements, grade stabilization structures, and multiple-purpose reservoirs.

Project land treatment measures for watershed protection are: (1) 585,089 acres of conservation cropping system; (2) 930,599 acres of pasture planting; (3) 420,619 acres of pasture renovation; (4) 473 miles of diversions; (5) 1,371 miles of terraces; (6) 2,731 miles of drainage mains and laterals; (7) 5,087 miles of drainage field ditches; and (8) 24,240 ponds.

Project land treatment measures for flood prevention are: (1) 906,903 acres of critical area planting (245,809 acres of grasses and 661,094 acres of trees); (2) 14,610 debris basins; (3) 11,830 grade stabilization structures; (4) 2,367 miles of diversions; (5) 4,096 miles of roadside erosion control; and (6) 2,047 miles of streambank protection.

Major project structural measures are: (1) 304 floodwater retarding dams and (2) 1,200 miles of channel improvements. There are about 812 square miles above the dams with a total storage of 259,205 acre-feet (47,370 acre-feet sediment and 211,835 acre-feet floodwater). The normal pool area is 8,161 acres. As planning continues, other structural measures will probably be added.

The total estimated project cost is $110 million with local interests providing about 55 percent. Flood plain lands benefited will be about 600 thousand acres. Estimated average annual damages that will be prevented are $6,200,000 and estimated average annual benefits are $9 million. The project is 75 percent complete.

Bank stabilization on Upper Big Sand Creek, Yazoo River Watershed Project.

PROJECT MAP INDEX
Flood Control - WRPA 4

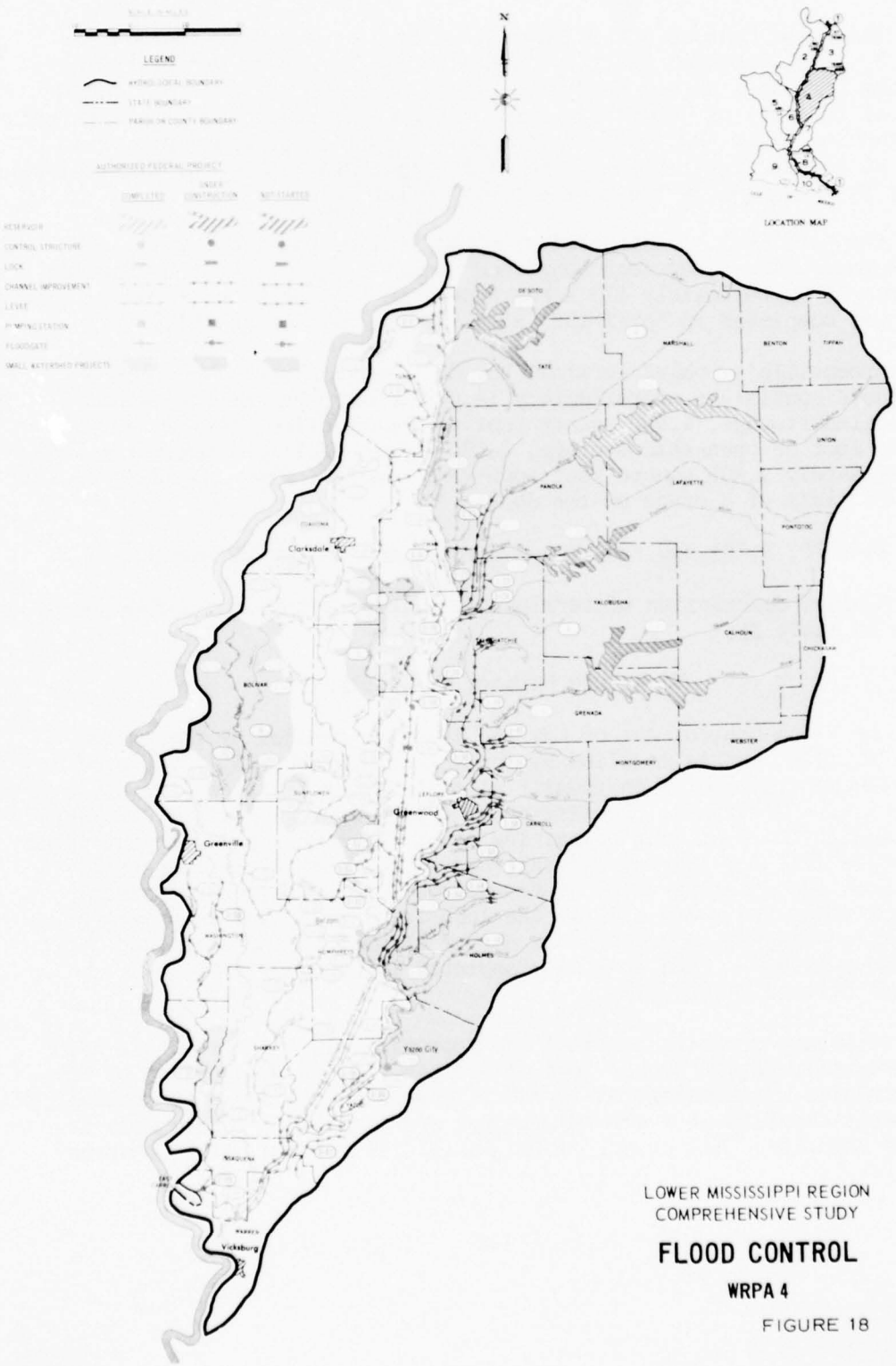
Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description 1/
11.	Beaver Dam Bayou Watershed, Miss.	SCS	1971	FC	Proj. area, 28,960 ac. 53 mi. chan. imp. Area stab. & land treat. meas. Tot. est. proj. cost $772,745.
2.	Buck Island Watershed, Miss.	SCS	1967	FC	Proj. area, 27,820 ac. 39 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $681,028.
10.	Central Bogue Phalia Watershed, Miss.	SCS	Est. 1972	FC	Proj. area, 64,778 ac. 112 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $733,165. (L)
5.	Harris Bayou Watershed, Miss.	SCS	1970	FC	Proj. area, 20,430 ac. 36 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $605,572.
7.	Home Cypress Bayou Watershed, Miss.	SCS	1972	FC	Proj. area, 42,340 ac. 69 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $1,197,985. (L)
13.	Indian Bayou Watershed, Miss.	SCS	1970	FC	Proj. area, 34,804 ac. 41 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $643,609. (L)
3.	Little Tallahatchie River Watershed, Miss.	SCS	Est. 1977	FC, R	Proj. area, 963,977 ac. 102 floodwater retard. dams & 1 multipurpose dam for floodwater & rec. use. 250 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $16 million. (L) See rec. data sheet.
12.	Moorhead Bayou Watershed, Miss.	SCS	Not started	FC	Proj. area, 21,896 ac. 41 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $1,185,185. (L)
6.	Tri-County Hopson Bayou Watershed, Miss.	SCS	Not started	FC	Proj. area, 28,970 ac. 56 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $1,179,305. (L)
9.	Upper Bogue Phalia Watershed, Miss.	SCS	Est. 1973	FC	Proj. area, 219,351 ac. 320 mi. chan. imp. Land treat. meas. Tot. est proj. cost $2,861,122. (L)
8.	Upper Quiver River & Blue Lake Watershed, Mi-s.	SCS	1967	FC	Proj. area, 58,087 ac. 55 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $768,410. (L)
1.	Yazoo Basin, Miss.	C of E, VXD			
1-63.	Abiaca Creek Chan. Imp. & Levees		Not Started	FC	16.4 mi. levees. (H) 7.7 mi. chan. imp. (L) Cost $3,970,000.
1-60.	Alligator-Catfish Bayou Chan. Imp.		Not Started	FC	8.3 mi. Cost $1,300,000. (L)
1- 9.	Arkabutla Canal Chan. Imp.		1948	FC	.4 mi. Cost $20,200. (L)
1- 2.	Arkabutla Lake		1943	FC,R,F&W	Earthfill dam 95 ft. high, 11,500 ft. long. 493,000 ac.-ft. storage for FC. 1,000 sq. mi. drainage area. Cost $12,620,000. (H)
1-39.	Ascalmore Tippo Creek Chan. Imp. & Levees		Not Started		23 mi. chan. imp. 11 mi. levee constr. Cost $2,350,000. (H)
1-61.	Bear Creek Chan. Imp.		Not Started	FC	4.8 mi. Cost $560,000. (L)
1-70.	Bear Creek Diversion		Not Started	FC	Chan. Imp. Cost $615,000. (L)
1-72.	Belzoni Protection Works		1959	FC	.1 mi. levee. .5 mi. floodwall. 7 floodgates. Cost $317,000. (H)
1-22.	Big Sunflower River Chan. Imp.		1968		195.9 mi. Cost $2,500,000.
1-68.	Black Bayou Chan. Imp.		1964		4.4 mi. Cost $32,000.
1-12.	Bobo Bayou Area Chan. Imp.		1962	FC	16.1 mi. chan. imp. .4 mi. floodwall. Cost $1,160,000.
1-45.	Bogue Hasty Chan. Imp.		1960		6.5 mi. Cost $215,000.
1-33.	Bogue Phalia Chan. Imp.		1964		93.3 mi. Cost $1,750,000.
1-79.	Carter Area Imp.		Not Started	FC	24.3 mi. levees. 2 mi. chan. imp. Drainage structure. Cost $5,165,000.
1-17.	Cassidy Bayou Chan. Imp.		1942-44	FC	64.0 mi. Cost $5,900,000. (L)
1-64.	Chicopa Creek Chan. Imp. & Levees		Not Started		7.0 mi. chan. imp. 5.8 mi. levees. Cost $985,000. (H)
1-44.	Clear Creek Chan. Imp.		1963		14.0 mi. Cost $300,000.
1-14.	Coldwater River Chan. Imp.		1943	FC	54.6 mi. Cost $1,270,000. (L)
1- 5.	Coldwater River Levees		1964	FC	40 mi. complete. ($3,065,000)(H); 32 mi. auth.($2,460,000) (H) Cost $5,525,000.
1-10.	David-Burrell Bayou Chan. Imp.		1959		40.4 mi. Cost $540,000.
1-69.	Dawson Bayou Chan. Imp.		1964		11.5 mi. Cost $88,000.
1-53.	Deer Creek Chan. Imp.		1947		7.0 mi. Cost $70,000.
1-73	Ditchlow Bayou Chan. Imp.		1965		4.2 mi. Cost $118,000.
1-78	Dowling Bayou Chan. Imp.		1966		7.8 mi. Cost $44,000.
1-18	Enid Lake, Yocona River		1951	FC,R,F&W	Earthfill dam 99 ft. high, 8,400 ft. long. 602,400 ac.-ft. storage for FC. 560 sq. mi. drainage area. Cost $15,540,000.
1-41.	Fighting Bayou Chan. Imp.		1961		4.0 mi. Cost $36,000.
1-59.	Gin & Muddy Bayous Chan. Imp.		1968		12.3 mi. Cost $330,000.
1-56.	Greenwood Local Protection				2.4 mi. chan. imp. 28 mi. levees. .4 mi. floodwall. Cost $6,540,000.
1-29.	Grenada Lake		1954	FC,R,F&W	Earthfill dam 102 ft. high, 13,400 ft. long. 1,251,700 ac.-ft. storage for FC. 1,320 sq. mi. drainage area. Cost $32,120,000.
1-20.	Harris Bayou Chan. Imp.		1963		21.0 mi. Cost $133,000.
1-74.	Hillside Floodway Chan. Imp. & Levees		Under constr.		15.5 mi. levees. 11 mi. chan. imp. Drainage structure. Cost $7,800,000 (1971).
1-25.	Hurricane Bayou Chan. Imp.		Not Started		4.5 mi. Cost $320,000 (1971).
1-21.	Hushpuckena River Chan. Imp.		1964		27.5 mi. Cost $183,000.
1-46.	Jones Bayou Chan. Imp.		1963		7.5 mi. Cost $285,000.
1- 1.	Lake Cormorant Chan. Imp.		Not Started		20.9 mi. Cost $3,230,000.
1-82.	Little Sunflower River Chan. Imp.		1959		21.6 mi. Cost $130,000.
1-16.	Little Tallahatchie River Chan. Imp. & Levees		1953		48 mi. chan. imp. 40.6 mi. levees.
1-65.	Main Canal No. 9 Chan. Imp.		1960		21.1 mi. Cost $515,000.
1-47.	Marsh Bayou Chan. Imp.		1962		4.0 mi. Cost $24,000.

1/ Degree of protection indicated as follows: Low (L) 1 to 10 yr. frequency.
Medium (M) 10 to 50 yr. frequency.
High (H) 50 to 100 yr. frequency.

PROJECT MAP INDEX
Flood Control - WRPA 4 (continued)

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description 1/
1.	Yazoo Basin, Miss. (continued)	C of E, VXD			
1- 3.	McKinney Bayou Chan. Imp. Pumping Plant		1963		3.5 mi. chan. imp. 250 c.f.s. pumping plant. Cost $479,000.
1-11.	Mill Creek Chan. Imp.		1965		7.8 mi. Cost $50,000.
1-35.	Mound Bayou Chan. Imp.		1964		5.2 mi. Cost $30,000.
1-28.	Opossum Bayou Chan. Imp.		Not Started		20.8 mi. Cost $2,250,000.
1-37.	Parks Bayou Chan. Imp.		1962		9.4 mi. Cost $90,000.
1-58.	Pelucia Creek Chan. Imp. & Levees		Not Started		6.4 mi. chan. imp. 23.1 mi. levees. Cost $2,750,000.
1-54.	Porter's Bayou Chan. Imp.		1964		12.5 mi. Cost $40,000.
1-49.	Potacocowa Creek Levees		Not Started		4.1 mi. Cost $300,000.
1-52.	Quiver River Chan. Imp.		1966		94.3 mi. Cost $308,000.
1-86.	Rocky Bayou Area Imp.		Not Started		7.8 mi. chan. imp. 18.3 mi. levees. Drainage structure. Cost $3,210,000.
1- 8.	Sardis Reservoir Little Tallahatchie River		1946	FC,R,F&W	Earthfill dam 117 ft. high, 15,300 ft. long. 1,462,000 ac.-ft. storage for FC. 1,545 sq. mi. drainage area. Cost $12,560,000.
1-87.	Satartia Area Imp.		Not Started		19.4 mi. levees. Drainage structure. Cost $5,070,000.
1-34.	Snake Creek Chan. Imp.		1961		9.8 mi. Cost $120,000.
1-80.	Steele Bayou Chan. Imp.				54.9 mi. Cost $616,300,000.
1-48.	Tallahatchie River Chan. Imp.		1943		114 mi. Cost $775,000.
1-36.	Tallahatchie River Levees				31 mi. Cost $1,204,000.
1-76.	Tchula Lake Chan. Imp.		1964		26.4 mi. Cost $1,000,000.
1-51.	Yalobusha River (LB) & Teoc Creek Levees		Not Started		11.3 mi. Cost $1,325,000.
1-24.	Tillatoba Creek Levee		Not Started		5.9 mi. Cost $2,245,000.
1-55.	Turkey Bayou Chan. Imp.		1962		5.6 mi. Cost $23,000.
1-75.	Twin Lakes Bayou Chan. Imp.		1965		2.5 mi. Cost $100,000.
1-38.	Upper Auxiliary Chan. Imp. & Levees		Not Started		63.0 mi. chan. imp. 56.0 mi. levees. Cost $32,330,000 (1971).
1- 7.	Whiteoak Bayou Chan. Imp.		Not Started		55.9 mi. Cost $2,500,000.
1-83.	Will M. Whittington Aux. Chan. Imp. & Levees		1962		20.8 mi. chan. imp. 61.5 mi. levees. Cost $10,951,000.
1-40.	Yalobusha River Chan. Imp.		1953		64 mi. Cost $1,813,000.
1-50.	Yalobusha River Levees (RB)		Not Started		14.0 mi. Cost $1,535,000.
1-88.	Yazoo Area Imp.		Under constr.		26.3 mi. chan. imp. 30.5 mi. levees. 3 drainage structures. Cost $26,800,000.
1-84.	Yazoo City Protection Works		1957	FC	Cutoffs, levees, sanitary sewer & pumping plant, & storm pumping plant. Total est. project cost, $2,205,600 (H)
1-85.	Yazoo River Chan. Imp.		1956		160.2 mi. Cost $1,800,000.
1-89.	Yazoo River Levees				107.7 mi. complete. 54.9 mi. auth. Cost to date $3,995,000. Remaining cost $5,105,000.
1-19.	Yocona River Chan. Imp.		1952		1.8 mi. Cost $241,300.
4.	Yazoo River Watershed, Miss.	SCS	Est 1980	FC	Proj. area, 3,942,197 ac. delta & upland area. 304 floodwater retard. dams. 1,200 mi. chan. imp. Land treat. meas. Tot. est. proj. cost $768,410. (L)

1/ Degree of protection indicated as follows:
Low (L) 1 to 10 yr. frequency.
Medium (M) 10 to 50 yr. frequency.
High (H) 50 to 100 yr. frequency.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

FLOOD CONTROL

WRPA 4

FIGURE 18

Greenville Harbor, Mississippi

The Flood Control Act of May 15, 1928, as amended by the Act of July 3, 1958, provides for the construction of a harbor and port area on Lake Ferguson, an old bendway of the Mississippi River, just southwest of the city of Greenville. The work consisted of dredging a harbor and turning basin 500 feet wide and 10,000 feet long to a depth of 12 feet at lowest river stages. The harbor is connected to the Mississippi River by a channel of the same depth, 250 feet wide.

The port area, constructed with the dredged spoil material, is 1,000 feet wide, 5,000 feet long, and about 25 feet high, thus forming an area of approximately 115 acres free from the danger of floods. This work was completed in April 1963 at a Federal cost of $2,864,516.

Greenville's public terminal has 3.1 usable acres. Warehouses available consist of approximately 14,000 square feet of dew-point controlled storage, 4,000 square feet of uncontrolled storage, 5,000 square feet of open-shed storage, 2,000 square feet floating barge and approximately 9,000 square feet open-yard storage. The unloading equipment consists of a crane on the dock.

In 1970, 1,701,940 tons moved through the Greenville Harbor.

A brief description of terminal facilities within the harbor is shown on Table 21.

Vicksburg Harbor, Mississippi

The Flood Control Act of May 15, 1928, as amended by the Act of July 24, 1946, and as modified by the Act of September 3, 1954, provides for the construction of an industrial site, generally along the north bank of Lake Centennial, consisting of a fill approximately 1,000 feet wide and 10,700 feet long containing about 245 acres above project flood height, a fill for highway and railroad approaches to the industrial fill from the existing adjacent transportation facilities, a harbor channel along the south side of the industrial fill, and an approach navigation channel connecting the harbor channel to the existing Vicksburg Harbor. This work was completed in December 1960 at a Federal cost of $4,664,515.

Vicksburg's public terminal has approximately 4.5 acres. It has approximately 60,000 square feet of storage, 30,000 square feet of this is insulated warehousing and 10,000 is open-shed storage. The unloading equipment consists of a covered canopy, overhead gantry crane with a 10-ton capacity. Additional public facilities are now being constructed.

Greenville Harbor.

Vicksburg Harbor.

In 1970, 2,036,182 tons moved through Vicksburg Harbor.

A brief description of terminal facilities at Vicksburg Harbor is shown on Table 21.

Yazoo River, Mississippi

The existing 4-foot navigation project on the Yazoo River, authorized by the River and Harbor Act of March 3, 1873, was modified by the River and Harbor Act of August 13, 1968, for a 9-foot navigation channel from the mouth to Greenwood. The new project includes an 84-foot by 600-foot lock, a tainter gated dam, and an uncontrolled navigation pass near Vicksburg; channel realignment and dredging; addition of 600,000 acre-feet of storage in the existing Sardis Lake; and revision of regulation schedules for flood control storage in the existing Sardis, Enid, and Grenada Lakes. Present project dimensions are 6.5 feet deep by 98.5 feet wide from mouth to mile 9.3 and 4 feet or less in depth from mile 9.3-189.

No funds have been appropriated to begin the new project.

In 1970, 24,542,011 ton miles were recorded on the Yazoo River. Terminal facilities along the Yazoo River are shown on Table 22.

Table 21 - List of Mississippi River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 4

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
687L	Mhoon Lower Lt.,, Miss.	Planters Oil Co.	FUTURE CONSTRUCTION PROJECT			Port facility for Tunica
663L-R	Helena, Ark.	ICRR Rail Transfer	Ferry transfer	None	None	ICRR. Connecting on Miss. & Ark. sides of Miss. River
655L	Delta, Miss.	Pure Oil Co.	Petroleum products	Tanks	Pumps & pipelines	No RR connections. Bulk handling by truck and barges
609L	Hurricane Pt., Miss.	River Grain Co.	Grain terminal	Tanks	Conveyor	No RR connections. Mooring facilities
537L	Lake Ferguson Greenville, Miss.	US Army Engr Dist, Vicksburg	Loading dock	Storage area	Floating derrick and dragline	ICRR. Mooring dolphins
		US Army Engr Dist, Vicksburg	Mat casting area	None	Dragline	ICRR. Pier
		Vest Towing Co.	Towing service	None	None	No RR connections. Landing barge
		Brent Marine & Supply Co.	Marine repair	None	Dragline	No RR connections. Landing barge
		Brent Towing Company	Towing service	None	None	No RR connections. Landing barge
		Farmers Grain & Marketing Terminal	Grain loading	Grain storage tanks	Elevator & conveyor	No RR connections. Mooring dolphins
		Miller Oil Purchasing Company	Bulk petroleum products	Petroleum storage tanks	Dock & pipeline	ICRR. Mooring dolphins
		Escambia Chemical Corp.	Chemical stroage	Storage	Cargo handling pumps & pipeline	ICRR. Docking facilities
		Miss. Marine Corp.	Ship building	Warehouses	None	No RR connections. Office & launching area
		Greenville Shipbuilding Corp.	Vessel constr.	None	None	No RR connections. Docking facilities & launching area
		Greenville Transportation Company	Towing & barge handling service	None	None	No RR connections. Office & landing barge
537L	Greenville, Miss.	Williams Bros. Diesel Service	Diesel repair	None	None	No RR connections. Landing area
		Greenville Fuel Service	Boat store and marine refueling	Store	None	No RR connections. Store & office, landing barge
		Greenville Sand & Gravel Company	Sand and gravel	None	Dragline and conveyor	ICRR. Spar barge
537L	Lake Ferguson Greenville, Miss.	Wagren Barge Company	Towing service	None	None	No RR connections. Concrete ramp & office
		Republic Towing Company	Towing service	None	None	No RR connections. Office
		Republic Oil Company	Bulk petroleum products	Petroleum storage tanks	Pumps & pipeline	ICRR. Mooring dolphins
		Texas Company	Bulk petroleum products	Petroleum products	Pumps	ICRR. Mooring dolphins
		Lemay Barge & Supply Company	Vessel constr.	None	None	No RR connections. Launching area
		Marvin Couey Harbor Service	Marine supplies and service	None	None	No RR connections
		Delta Towing Company	Towing service	None	None	No RR connections. Office
		Chicago Mill & Lbr. Co.	Lumber mill	Log & lumber storage	Log conveyor, derrick barge	ICRR.
		River Grain, Inc.	Grain	Grain storage	Conveyor & elevator	ICRR. Dolphins, spar barge

Table 21 - List of Mississippi River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 4 (continued)

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
537L	Lake Ferguson Greenville, Miss.	Valley Towing Company	Towing service	None	None	No RR connections. Office & landing barge
		Warfield Towing Company	Towing service	None	None	No RR connections. Office
		Greenville Port Terminal	Cargo handling	Cargo shelter	Dragline	ICRR. Ramp & landing barge, dolphins
		Marine Welding & Repair Works	Dry dock service	Warehouse	Dragline, dry dock	No RR connections
		Greenville Towing Company	Towing service	None	None	No RR connections. Office
		U. S. Gypsum	Wood by-products	None	None	ICRR. Ramp and deadmen
		Standard Oil Company	Bulk petroleum products	Petroleum storage	Pumps	ICRR. Spar barge
		Greenville Yacht Club	Mooring for small boats	None	None	No RR connections.
		MERC-Marina	Small boat dock & refueling company	None	None	No RR connections. Floating moorings facilities
		DX Sunray Oil Co.	Bulk petroleum products	Petroleum storage tanks	Pumps & pipelines	ICRR. Mooring dolphins
		City of Greenville, Miss.	Ramp & mooring	None	None	No RR connections. Concrete ramp and deadmen
		Gulf Oil Company	Bulk petroleum products	Petroleum storage tanks	Pumps & pipeline	ICRR. Mooring dolphins
		US Coast Guard	Aids to navigation	Ofc. & storage bldg.	Tramway	No RR connections. Mooring dolphins
		Warren Petroleum Corp.	Bulk petroleum products	None	2 pipelines	No RR connections. Dolphins, dock barge
498L	Mayersville, Miss.	Miller Landing Elevator Co.	Grain loading	Grain storage tanks	Elevator and conveyor	No RR connections. Mooring facilities
494L	Mayersville, Miss.	Sohio Petroleum Co.	Oil terminal	Storage tanks	Pumps, floating barge & pipeline	No RR connections. Mooring dolphins
437L	Vicksburg Harbor	Paymaster Oil Mill Company	Grain terminal facility	Warehouse and storage tanks	Elevator and conveyor	ICRR. Mooring dolphins & office
		Billups Western Petroleum Co.	Bulk petroleum products	Petroleum storage tanks	Pumps & pipeline	ICRR. Landing barge and office
		Vicksburg Terminal Elevator	Grain	Grain storage	Conveyor	ICRR. Landing barge
		Warren County Port Commission	Terminal facilities	Cargo storage and warehouse	Gantry crane	ICRR. Mooring facilities
		Mississippi Aggregate Company	Lime terminal	Hopper	Dock barge pump and pipeline	ICRR
		Big River Shipbuilding, Inc.	Ship building	Vessel constr. building	None	No RR connections. Launching area and office
		US Coast Guard	Aids to navigation	Office & storage building	Tramway	No RR connections. Mooring dolphins
		Dundee Cement Co.	Cement unloading	Cement storage tanks	Conveyor	ICRR. Mooring barge
		Hill City Towing Inc. Elevator	Grain	Grain storage	Conveyor	No RR connections. Mooring dolphins
		Hill City Boat Yard	Vessel constr.	None	None	No RR connections. Launching area

Table 21 - List of Mississippi River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 4 (continued)

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
437L	Vicksburg, Miss.	Anderson-Tully Lbr. Co.	Landing	None	None	ICRR
		Vicksburg Yacht Club	Str. Sprague Tourist attraction	None	None	No RR connections. Mooring, gas and water facilities
		E. J. Platte Fisheries	Small boat rental	None	None	No RR connections
		Vicksburg Public Mooring	Small craft mooring facilities	None	Floating dock	No RR connections
		City of Vicksburg	Public loading and unloading ramp	None	None	No RR connections Small craft launching ramp
		Vicksburg Terminal Elevator	Grain	Grain storage	Elevator and conveyor	ICRR. Spar barge
		Hill City Mills	Grain	Warehouse	Elevator and conveyor	ICRR. Spar barge
		Anderson-Tully Lbr. Co.	Lumber mill	None	Crane, log conveyor	ICRR
		Standard Oil Co. Fairground St.	Bulk petroleum products	Petroleum storage tanks	Pumps	ICRR. Spar barge
		Southland Oil Co.	Bulk petroleum products	Petroleum storage tanks	Pumps	ICRR. Spar barge
437L	Above Vicksburg Bridge	Central Industries	Freight loading and unloading	Warehouses	Crane and conveyor	ICRR
437L	Vicksburg Harbor	US Army Engr Dist, Vicksburg	Mooring storage	Warehouses	Crane derrick barge and floating barge	ICRR. Service for Govt vessels only
		Oliver Electric Manufacturing Co.	Electrical equipment assembly plant	Warehouse	None	ICRR
436L	Above Vicksburg Bridge	Vicksburg Mid-River Services	Marine supplies and services	Offices & barge	Contact vessel, refueling barge	No RR connections
		Miller Oil Purchasing Company	Bulk petroleum products	Petroleum storage tanks	Pipeline	No RR connections
		Arkansas Fuel Oil Co.	Bulk petroleum products	Petroleum storage tanks	Pumps and hoses	No RR connections. Spar barge
435L	Below Vicksburg Bridge	Vicksburg Terminal Company, Inc.	Bulk petroleum products	Petroleum storage tanks	Pipeline	No RR connections. Mooring dolphins
434L	Cypress Bunch Light	Miss. Power & Light Company Dock	Private dock	None	None	No RR connections. Water intake structure dolphin & mooring tower
426L	Oak Bend Landing, Miss.	R. G. LeTourneau, Inc.	Heavy equipment manufacturing	None	Floating crane	No RR connections. Manufacturing offshore drilling platforms

Table 22 - List of Yazoo River Terminals, Docks, Mooring Locations, and Warehouses in WRPA 4

Mileage Above Vicksburg City Front	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
184L	Greenwood, Miss.	Kelly Realty & Ins. Co.	Mooring for boat repairs	None	None	No RR connections
176L	Greenwood, Miss.	Co-op Elevator Co.	Grain loading	Grain storage	Conveyor	No RR connections. Mooring dolphins
126R	Belzoni, Miss.	Belzoni Oil Works	Grain loading	Grain storage	Conveyor	ICRR. Dock & mooring
		Farmers Elevator	Grain loading	Grain storage	Conveyor	ICRR. Mooring dolphins
74L	Yazoo City, Miss.	Yazoo County Port Commission	Dry & liquid cargo loading & unloading	Warehouse	Pipeline	ICRR. Docks (2) and mooring dolphins
		River Grain Company	Grain loading	Grain storage	Conveyor	No RR connections. Mooring dolphins
45L	Satartia, Miss.	Dixie Farm	Grain loading	Grain storage	Conveyor	No RR connections. Mooring dolphins

PROJECT MAP INDEX
Navigation and Harbors-WRPA 4

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description
1.	Greenville Harbor, Miss.	C of E, VXD	1965	N	Chan. 12 ft.x500 ft.x10,000 ft. Connecting chan. 250 ft. wide. Serves 115 ac. ind. area. 1,701,940 tns. in 1970.
3.	Vicksburg Harbor, Miss.	C of E, VXD	1960	N	Chan. 12 ft.x300 ft. Serves 245 ac. ind. area. Fed. cost $4,664,515. 2,036,182 tns. in 1970.
2.	Yazoo River Navigation Project, Miss.	C of E, VXD	Not started	N	Exist. proj. dim., 6.5 ft. x 98.5 ft. to mi. 9.3. 4 ft. or less in depth from mi. 9.3 to mi. 189. Auth. proj. chan. 9 ft.x150 ft. from mouth to Greenwood, Miss. Incls 84 ft.x600 ft. lock, tainter gated dam & uncontrolled nav. pass. 24,342,011 tn.-mi. in 1970.

LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

NAVIGATION

WRPA 4

FIGURE 19

RECREATION
AND
FISH AND WILDLIFE

General

Human population density in this WRPA is about average with the entire region. WRPA 4 has an abundance of large reservoirs, oxbow lakes, and streams.

Recreation

WRPA 4 has 300,783 acres of land available for outdoor recreation, including 280,000 acres federally owned, 13,682 acres State owned, 2,102 acres of county and quasipublic lands, and 2,229 acres municipal, local government and school board lands. Additionally, there are 2,770 acres in private ownerships.

WRPA 4 has 73,676 acres of slack water and about 1,000 miles of stream suitable for recreation. Developed recreation facilities include 243 acres for camping, 305 acres for picnicking, 21 acres for playing outdoor sports and games, 112 acres for swimming, and 176 acres for boat ramps.

Recreation activities at Grenada Lake.

Sardis Lake with its Lower Lake Area is one of the most popular recreation sites in Mississippi. Campers, swimmers, sunbathers, picnickers, and boaters delight in the clean water, white sandy beaches, and public use facilities available. The top photo shows the relationship of Lower Lake to the dam and Sardis Lake. Other photos show some of the intensive use this area receives.

Fish and Wildlife

WRPA 4 water-related fish and wildlife resources include 133,000 acres of lakes between two and 40 acres in size, 74,000 acres of lakes over 40 acres in size, 1,100 miles of fishable streams, 3,223,000 acres of forest land, and 97,000 acres of wetland. Ponds under two acres in size are abundant in the upland areas; however, they have not as yet been inventoried. Included in the lake acreage figures are four large Corps of Engineers reservoirs and 15 Mississippi River oxbow lakes. WRPA 4 water-related fish and wildlife facilities include State ownership of 12 wildlife management areas, three waterfowl refuges, five parks, eight

access areas, and one managed fishing lake. Federally owned facilities include one existing and one proposed national wildlife refuge, three national forests, and one national park. About seven percent of the national forest acreage is outside the hydrologic boundaries of WRPA 4. Numerous private fishing and hunting clubs exist but have not been inventoried. All areas are capable of supplying wildlife-oriented recreation, such as nature photography and nature study, especially bird watching. Such use is generally nonconsumptive.

PROJECT MAP INDEX
Recreation, Fish, and Wildlife Facilities - RBPA 4

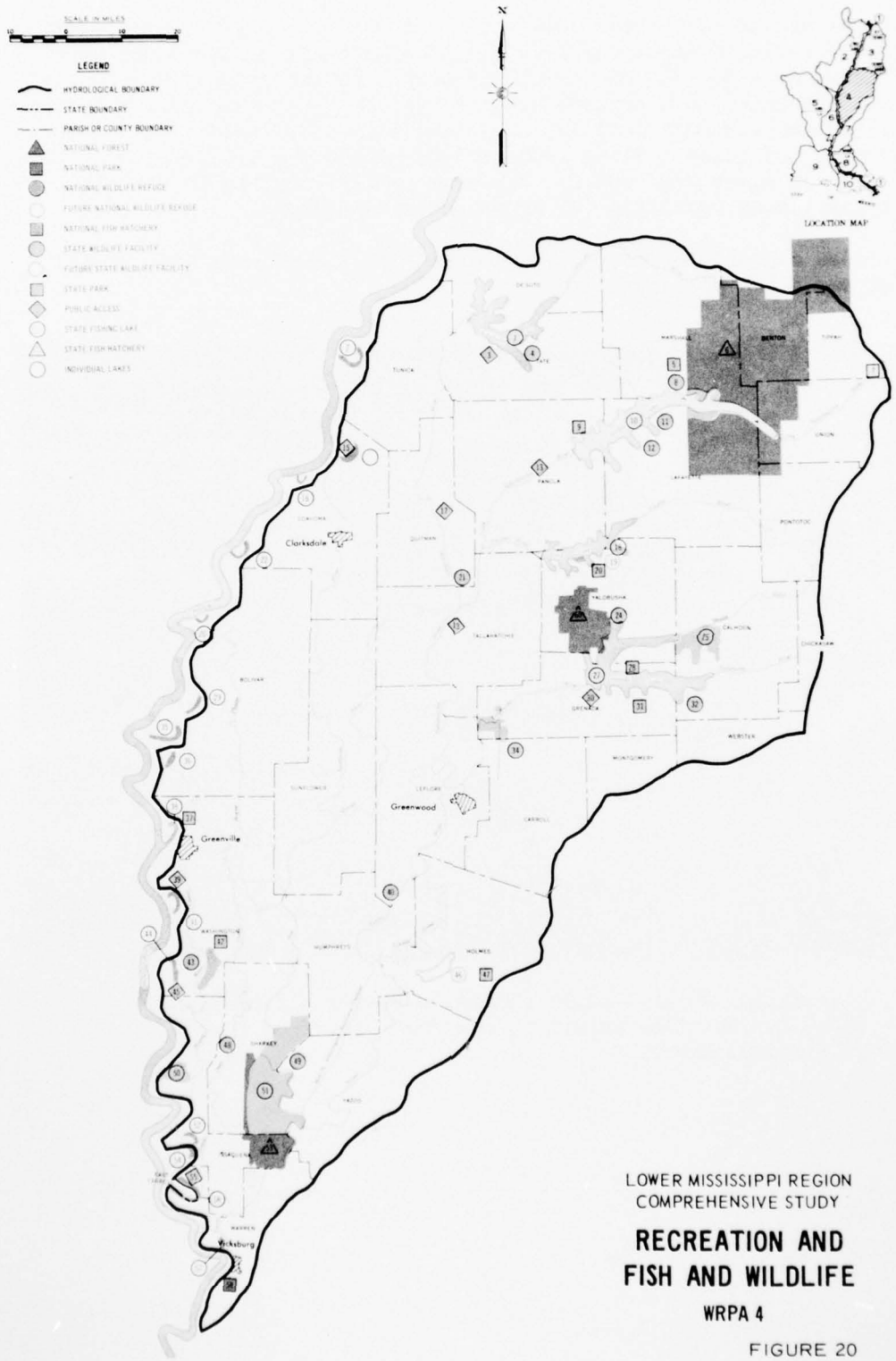
Map Location No.	Name of Project	Agency	Project Use	Description 1/
52.	Alhamarle Lake		F&W	High F&W rating. 563 ac. Miss.R. oxbow lake. Heavy fish & waterfowl use.
1.	Arkabutla Lake	Corps of Engineers	R, F&W, FC	Completed 1943. High F&W rating. 11,870 ac. Reservoir. High fish. & waterfowl use. Rec. facs. incl. camping (80 units), picnicking (251 units), 5 boat launching ramps, 16 comfort stations & swimming beach.
3.	Arkabutla Public Access Area	Corps of Engineers	R, F&W	Public access area, launching ramp.
4.	Arkabutla Waterfowl Refuge	Miss. Game & Fish Comm.	F&W	High F&W rating. 2,200 ac. Waterfowl refuge. High WOR use.
25.	Calhoun County Wildlife Mgmt. Area	Miss. Game & Fish Comm.	F&W	Moderate F&W rating. 9,000 ac. No waterfowl use. No fishing.
28.	Carver Point State Park	Miss. Park System	R, F&W	750 ac. Fishing. Located on Grenada Lake. Rec. facs. incl. swimming, boating, picnicking, camping (cabins, group camps).
57.	Centennial Lake		F&W	High F&W rating. High waterfowl use. High WOR. Considerable fishing. Miss. R. oxbow lake.
54.	Chotard Lake		F&W	High F&W rating. 980 ac. Miss. R. oxbow lake. Heavy fishing use. Good waterfowl area.
17.	Coldwater Public Access Area	Miss. Game & Fish Comm.	R, F&W	Public access. Launching ramp. 2-ac. site.
53.	Delta Natl. Forest	U. S. Forest Svc.	R, F&W	High F&W rating. 59,000 ac. Large tract bottomland hardwood, one of few in entire Miss. R. alluvial valley. High use for waterfowl, one greentree reservoir 1,700 ac., fish & WOR. 2 rec. areas (8 units) for camping, picnicking, fishing, boating and hiking. Some stands of virgin timber.
22.	DeSoto Lake		F&W	High F&W rating. 1,525 ac. Miss. R. oxbow lake. High waterfowl & fishing use.
7.	Dumas Lake	Miss. Game & Fish Comm.	F&W	High F&W rating. 32 ac. Public owned & managed fishing lake. Receives intensive use.
56.	Eagle Lake		F&W	High F&W rating. 4,600 ac. Miss. R. oxbow lake. Known nationally for fine game fish. Good waterfowl use. Considerable WOR use.
55.	Eagle Lake Public Access Area	Miss. Game & Fish Comm.	R, F&W	Public access. Launching ramp.
19.	Enid Lake Wildlife Mgmt. Area (Proposed)			Proposed high F&W rated wildlife mgmt. area.
18.	Enid Lake	Corps of Engineers	R, F&W, FC	Completed 1952. High F&W rating. 16,800 ac. Reservoir. High fishing & waterfowl use. Rec. facs. incl. camping (205 units), picnicking (259 units), 11 boat launching ramps, 27 comfort stations, & a swimming beach.
27.	Grenada Lake	Corps of Engineers	R, F&W, FC	Completed 1954. High F&W rating. 34,310-ac. Reservoir. High fish & waterfowl use. Rec. facs. incl. camping (202 units), picnicking (317 units), 15 boat launching ramps, 25 comfort stations, and a swimming beach.
24.	Grenada Waterfowl Area	Miss. Game & Fish Comm.	F&W	High F&W rating. About 7,500 ac. equivalent. Area used by waterfowl & waterfowl hunters. Includes open lake water.
32.	Grenada State Refuge	Miss. Game & Fish Comm.	F&W	High F&W rating. 2,750 ac. Waterfowl refuge, good fishing use, high WOR usage.
30.	Grenada Public Access Area	Corps of Engineers	F&W	Public access and launching ramp.
46.	Hillside Floodway Natl. Wildlife Refuge (Proposed)	U. S. Fish & Wildlife Svc.	F&W	Proposed high F&W rated national wildlife refuge, primarily waterfowl. 15,600 ac.
6.	Holly Springs Natl. Forest	U. S. Forest Svc.	R, F&W	Moderate to high F&W rating. Approx. 115,600 ac. Fishing & some waterfowl use in bottomlands. Primarily upland areas. 2 rec. areas for camping (66 units), picnicking (55 units), fishing, boating, swimming, and hiking.
47.	Holmes County State Park	Miss. Park System	R	Rec. facs. including camping (cabins, group camp, tent-trailer), swimming, boating, picnicking, & nature trails. 463 ac.
16.	Horseshoe Lake		R, F&W	High F&W rating. 1,200 ac. Miss. R. oxbow lake. High fishing & waterfowl use.
31.	Hugh White State Park	Miss. Park System	R, F&W	740 ac. located on Grenada Lake. Fishing use. High WOR use.
48.	Indian Bayou Waterfowl Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 500 ac. greentree area. High waterfowl use. No fish.
50.	Issaquena Wildlife Mgmt. Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 13,000 ac. Some waterfowl & fishing use.
9.	Kyle State Park	Miss. Park System	R, F&W	740 ac. Located on Sardis Lake. Fishing & WOR usage. Rec. facs. incl camping (cabins, group camp, tent-trailer), swimming, boating, picnicking, & nature trails.
29.	Lake Beulah		R, F&W	High F&W rating. 980 ac. Miss.R. oxbow lake. High fish.& waterfowl.
36.	Lake Bolivar		R, F&W	High F&W rating. 662 ac. Miss.R. oxbow lake. High fish.& waterfowl.
38.	Lake Ferguson		R, F&W	High F&W rating. Miss.R. oxbow lake. High fishing & waterfowl use.
41.	Lake Lee		R, F&W	High F&W rating. 1,096 ac. Miss.R. oxbow lake. High fish.& waterfowl.
39.	Lake Lee Public Access Area	Miss. Game & Fish Comm.	R, F&W	Public access & launching ramp.
44.	Lake Washington		R, F&W	High F&W rating. 2,938 ac. Miss.R. oxbow lake. High fish.& waterfowl use.
45.	Lake Washington Public Access	Miss. Game & Fish Comm.	R, F&W	Public access & launching ramp.
35.	Lake Whittington		R, F&W	High F&W rating. 4,000 ac. Miss.R. oxbow lake. High fish.& waterfowl use.
40.	Leflore County Waterfowl Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 350 ac. greentree area. High waterfowl area.

1/ WOR = Wildlife oriented recreation.
F&W = Fish and wildlife.
F&W* = Supplies only nonconsumptive fish and wildlife oriented recreation.

PROJECT MAP INDEX
Recreation, Fish, and Wildlife Facilities - WRPA 4 (continued)

Map Location No.	Name of Project	Agency	Project Use	Description 1/
42.	Leroy Percy State Park	Miss. Park System	R, F&W*	2,442 ac. Possibly some fishing. High WOR use. Rec. facs. incl camping (cabins, group camp, tent-trailer), swimming, boating, picnicking, & nature trails.
34.	Malmaison River Wildlife Mgmt. Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 8,000 ac. Good waterfowl use, fishing.
14.	Moon Lake		R, F&W	High F&W rating. 1,800 ac. Miss. R. oxbow lake. High waterfowl & fishing use.
15.	Moon Lake Public Access Area	Miss. Game & Fish Comm.	R, F&W	Public access & launching ramp.
21.	O'Keefe Waterfowl Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 5,000 ac. waterfowl area. Partial greentree area. High waterfowl use.
26.	Old River Lake		R, F&W	High F&W rating. 275 ac. Miss. R. oxbow lake. Good waterfowl & fishing use.
10.	Sardis Lake	Corps of Engineers	R, F&W, FC	31,000-ac. reservoir. High fishing & waterfowl use. Rec. facs. incl camping (353 units), picnicking (374 units), 14 boat ramps, 23 comfort stations, and 3 swimming beaches.
11.	Sardis Waterfowl Area	Miss. Game & Fish Comm.	F&W	High F&W rating. Approx. 5,200-ac. hunting area, includes open lake water.
12.	Sardis Waterfowl Refuge	Miss. Game & Fish Comm.	F&W	High F&W rating. 1,800-ac. waterfowl refuge. High WOR use.
51.	Sunflower Wildlife Mgmt. Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 59,000 ac. Partial greentree. High fishing, waterfowl & WOR use. Coincides with Delta Natl. Forest.
49.	Sunflower Waterfowl Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 1,600-ac. greentree area. High waterfowl use.
13.	Tallahatchie River Public Access Area	Miss. Game & Fish Comm.	R, F&W	Public access with launching ramp.
2.	Tunica Cutoff		R, F&W	High F&W rating. 3,152 ac. Miss. R. oxbow lake. High waterfowl & fishing use.
8.	Upper Sardis Reservoir Wildlife Mgmt. Area	Miss. Game & Fish Comm.	F&W	High F&W rating. 4,700-ac. equivalent. Waterfowl area includes open lake.
58.	Vicksburg National Military Park & Cemetery	National Park Service	R, F&W	Low F&W rating. 1,740 ac. High WOR use. No fishing or hunting.
5.	Wall Doxey State Park	Miss. Park System	R	Rec. facs. including camping (cabins, group camp, tent-trailer) swimming, boating, picnicking, & nature trails. 855 ac.
37.	Winterville State Park	Miss. Park System	F&W*	Low F&W rating. 40 ac. High WOR use. No hunting or fishing.
43.	Yazoo Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 12,470 ac. No waterfowl hunting as it is a waterfowl refuge. Some fishing. High WOR use.
20.	Yocona Ridge State Park	Miss. Park System	R	Rec. facs. including boating, picnicking, camping (tent-trailer) & nature trails. 825 ac.
60.	Tombigbee Natl. Forest	U. S. Forest Service	R, F&W	Moderate to high F&W rating. 20,300 ac. fishing & some wat rfowl use in bottomlands. One rec. area for camping, picnicking ('0 units), boating & fishing. This facility, formerly pt. of Holly Springs Natl. Forest, is located in Yalobusha County, Miss.

1/ WOR = Wildlife oriented recreation.
F&W = Fish and wildlife.
F&W* = Supplies only nonconsumptive fish and wildlife oriented recreation.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

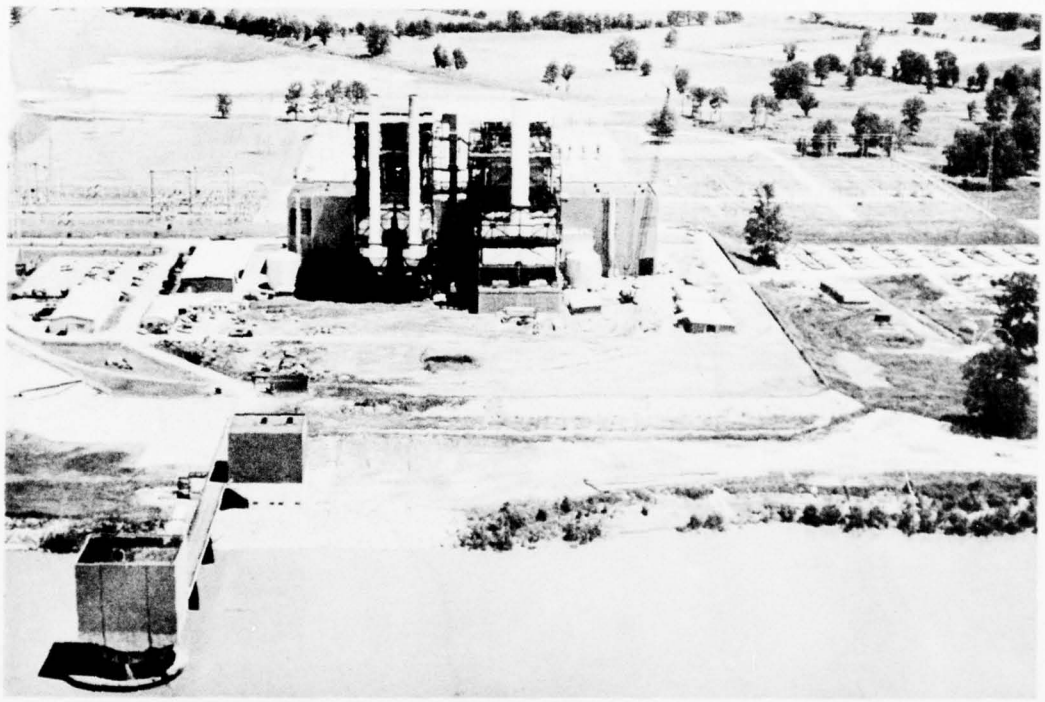
RECREATION AND FISH AND WILDLIFE

WRPA 4

FIGURE 20

At the end of 1970 there were seven steam-electric generating plants in the area with a total capacity of 863.8 megawatts, with a net 1970 generation of 4,036,880,000 kilowatt-hours. Five are municipal plants and two are units of a private utility system. One plant uses river water for once-through cooling, one plant uses river water for a combination pond and tower cooling system, five plants use cooling towers and draw make-up water from wells. The area is well covered by distribution and transmission facilities of interconnected systems.

Added capacity after 1970 includes a small combined cycle installation and a 750-MW steam plant.



Mississippi Power & Light Company's Baxter Wilson Plant.
544.7 mw installed capacity, cooling water from the
Mississippi River.

PROJECT MAP INDEX
Power Plants - WRPA 4

Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (31 Dec 70) (MW)	Annual 1970 Production (1000 Kwh)	Remarks
			Existing					
1.	Third Street	City of Clarksdale	S	Wells		11.0	39,041.0	
2.	South Plant	City of Clarksdale	S	Wells		12.5 1/	53,489.0	
3.	Delta	Miss. Power & Light Co.	S		Sunflower	220.5	523,337.0	
5.	Henderson	City of Greenwood, Miss.	S	Wells		32.7 2/	102,487.0	
7.	Baxter Wilson	Miss. Power & Light Co.	S		Mississippi	544.6	3,211,546.0	
4.	Wright	City of Greenwood	S	Wells		25.5	57,348.0	
6.	Yazoo City	City of Yazoo City, Miss.	S	Wells		19.0 3/	49,632.0	

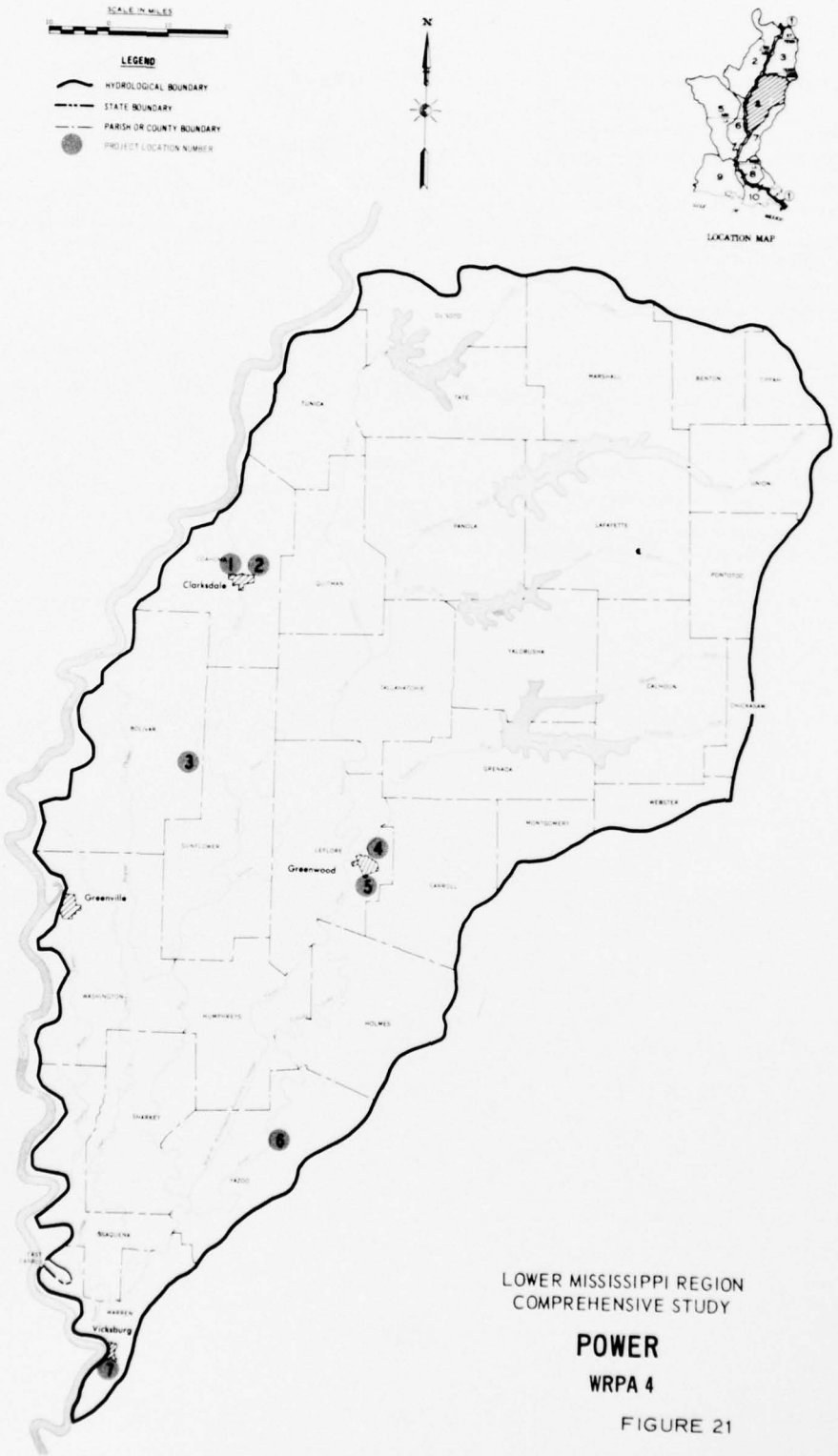
1/ Plant has 14.3-MW gas turbine auxiliary unit.

2/ Plant has 11.3-MW gas turbine auxiliary unit.

3/ Plant has 12.5-MW gas turbine auxiliary unit.

Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (MW)	Date
			Planned Additions				
2.	South Plant	City of Clarksdale	1/	Wells		25.6	1971
8.	Gerald Andrus No. 1	Miss. Power & Light Co.	S		Mississippi	750.0	January 1975

1/ Unit is combined cycle (gas turbine and steam).



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

POWER

WRPA 4

FIGURE 21

WATER SUPPLY
AND
SEWAGE TREATMENT

General

Water Resources Planning Area 4 covers all or part of 30 counties in northwestern Mississippi. Because data herein is available only on a county-wide basis, hydrologic boundaries have been adjusted to conform to county lines. Twenty-six counties fall within these boundaries and are considered in municipal, industrial, and agricultural water use and sewage treatment data collection. These counties have been further subdivided into six subareas.

In 1970, within WRPA 4, 445.0 MGD was required to meet the municipal, industrial, and agricultural water withdrawal requirements. Of this, 62.9 percent was supplied by groundwater sources. Groundwater withdrawals accounted for all of the municipal water used, 56.6 percent of the industrial water used, and 58 percent of the agricultural water used.

Sewage treatment was provided in 16 percent of the communities and serviced 41 percent of the population which utilized the area's municipal water distribution systems in 1970. The remaining 59 percent of the municipally serviced population utilized septic tanks or their sewage was disposed untreated.

1970 Municipal Water Supply

In 1970, municipal water systems within the WRPA serviced 237 communities, which had a combined population of 366,120 people, and varied in size from 33 people at Cobb, Miss., to almost 40,000 people in Greenville, Miss. The average daily municipal water withdrawal within the WRPA was 53.8 MGD. During July, the peak municipal water use month in 1970, the average daily use was 60.2 MGD. All of this water was supplied from groundwater sources. The average daily withdrawals resulted in a 147 GPCD use in areas serviced by central water systems. This compares with a national average of 166 GPCD.

1970 Industrial Water Supply

Industrial activity within WRPA 4 during 1970 required a daily average water withdrawal of 86.6 MGD. Groundwater supplied 56.6 percent of this withdrawal and surface sources supplied 43.4 percent.

1970 Agricultural Water Supply

In addition to the municipal and industrial water withdrawals, agricultural withdrawals required 304.6 MGD for use in the irrigation of 157,223 acres in 1970. Of the water used, 58 percent is supplied from groundwater and 42 percent from surface water sources. Livestock and poultry accounted for 8.6 MGD of the withdrawal in 1970.

1970 Sewage Treatment Facilities

Primary and secondary treatment was provided in 38 of the communities that utilized a municipal water distribution system in 1970. These treatment facilities provided service for 150,683 people. There were, however, five communities with populations over 1,000 that did not provide any centralized sewage treatment.

PROJECT MAP INDEX

Municipal, Industrial, and Agricultural Water Supply and Sewage Treatment Facilities - WRPA 4

Subarea / County	Population	Municipal Water Use 1/ No. systems	Municipal Water Use 1/ Withdrawal (MGD) Ground	Surface	Total	Industrial Water Use 1/ Withdrawal (MGD) Ground	Surface	Total	Agricultural Water Use 1/ Withdrawal (MGD) Ground	Surface	Total	Sewage Treatment Facilities: Secondary Treatment Number Plants	Population Serviced	Primary Treatment Number Plants	Population Serviced	No Treatment 2/ Number Communities	Population
4-1						9.5		9.5	19.6	14.7	304.6						
Tunica	3,115	2	.4		.4							2	5,010				
Tate	7,932	6	.9		.9							2	5,697				
Quitman	5,199	8	.5		.5												
Marshall	7,132	4	1.0		1.0							1	5,728				
DeSoto	22,322	20	2.1		2.1							2	4,012			1	8,931
4-2						1.6		1.6	18.5	14.0	32.5						
Union	9,414	7	1.1		1.1							1	6,426				
Tallahatchie	8,828	12	.8		.8							2	3,924				
Pontotoc	6,326	6	1.1		1.1												
Panola	14,454	17	1.9		1.9							4	8,461				
Lafayette	21,747	15	1.6		1.6							1	13,846				
Benton	1,007	3	.1		.1												
4-3						2.3		2.3	1.8	1.8	3.6						
Calhoun	10,356	18	.8		.8							2	3,880				
Yalobusha	6,328	6	1.6		1.6							2	4,509				
Grenada	15,180	9	1.5		1.5							1	9,944				
4-4						6.0		6.0	78.4	58.0	136.4						
Coahoma	26,140	10	3.3		3.3							1	21,673				
Bolivar	26,650	13	3.6		3.6							4	20,573	1	2,645		
Sunflower	21,149	11	2.4		2.4							5	15,582	2	3,693		
Humphreys	6,213	6	.6		.6												
4-5						17.7	37.5	55.2	14.4	10.9	25.3						
Leflore	26,770	8	6.9		6.9							1	2,489			1	22,400
Carroll	2,780	5	.2		.2												
Holmes	15,165	17	4.3		4.3							3	5,497				
Yazoo	14,011	9	1.9		1.9											1	10,796
Issaquena	200	1	.02		.02												
Sharkey	3,131	3	.3		.3							1	2,034				
Warren	31,503	9	6.9		6.9											1	25,478
4-6						12.0		12.0	41.8	30.7	72.5						
Washington	53,088	12	8.0		8.0							2	9,860			1	39,648
Total	366,120	237	53.8		53.8	49.1	37.5	86.6	174.5	130.1	304.6	35	144,345	3	6,338	5	107,253

1/ All figures are daily averages.

2/ Only denotes communities of 1,000 or greater population.

LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL WATER SUPPLY

WRPA 4

FIGURE 22

ARCHEOLOGY AND HISTORY

Although there has been a substantial amount of archeological research done in WRPA 4, there are still great gaps in the knowledge of prehistoric occupation.

Sites identified in this WRPA total 843: 2 historic, 153 Mississippian, 325 woodland, 46 archaic, and 317 unknown. Figure 23 shows the number of sites occupied during each period by county. Since some of the sites have been occupied during more than one period, the number of sites shown on the figure do not agree with those above.

Like much of the Lower Mississippi area, European explorers and settlers left their marks here and there, but this particular WRPA is probably best known historically for the part it played in the War Between the States. One of the best known seiges in American history was that of the city of Vicksburg and the battlements are preserved and displayed in Vicksburg National Military Park and the adjacent areas. The place of DeSoto's first view of the Mississippi, and the site of his crossing, has been identified from historical records as the mouth of the Sunflower River. No physical evidence has as yet been located, but the site has been considered for inclusion in the National Register. Further south along the Mississippi, historic sites of local, regional, and National interest appear to increase.

The western banks of the Mississippi through this area have great aesthetic potential, often not fully realized. The loessal bluffs not only afford excellent viewing opportunities, but are, in themselves, attractive landscape features. Here again, the "Great River Road" presents the traveler with many interesting views of the Mississippi and the Old South.

PROJECT INDEX
Historic Sites - WRPA-4

Map No.	Name		Description
22	Balfour House, Vicksburg Warren County, Mississippi	NR	Home of historian Emma Balfour.
16	Belmont Washington County, Mississippi	NR	One of few remaining antebellum houses in the Mississippi Delta. Located at intersections of Mississippi 1 and 438.
14	Casey Jones Wreck Site Yazoo County, Mississippi	NR	Site of the famous wreck of the Cannonball Express on April 30, 1900, at Vaughn.
27	Chickasaw Bayou Battleground Warren County, Mississippi	NR	Confederate forces defeated General Sherman at the site in 1862.
2	Civil War Earthworks at Tallahatchie Crossing Marshall County, Mississippi	NR	Federal parapets for a seven-gun battery built in 1862. Located on north bank at Tallahatchie River near Abbeville.
1	Confederate Armory Site Marshall County, Mississippi	NR	Iron foundary converted to hospital and subsequently burned. Located north of Holly Springs.
8	Confederate Earthworks Grenada County, Mississippi	NR	Three Confederate redoubts on south bank of Yalobusha River near Grenada Reservoir.
3	Faulkner, William, House Lafayette County, Mississippi	NR	Home of Nobel Prize winner from 1929 to 1963.
13	Fort Pemberton Site Leflore County, Mississippi	NR	Site of sinking of "Star of the West" in 1863.
12	George, James Z.; Law Office Carroll County, Mississippi	NR	Office of Senator George (1826-1897).
19	Holly Bluff Archeological Site Yazoo County, Mississippi	NR	Type site for Lake George Period (ca 700-1500 A.D.).
4	Hollywood Site Tunica County, Mississippi	NR	Three well-preserved mounds with evidence of daub structures. Located 5 miles southwest of Robinsonville.
18	Jaketown Site Humphreys County, Mississippi	NR	Eight small low mounds settled shortly after 1000 B.C. Located about 5 miles north of Benzoni.
10	Malmaison Site Carroll County, Mississippi	NR	Site of impressive two-storied porticoed mansion built in 1854.
11	Merrill's Store Carroll County, Mississippi	NR	Historic store building.
17	Mount Holly Washington County, Mississippi	NR	Two-story brick structure of 30 rooms built in 1855. Located near Foote.
23	Old Courthouse, Vicksburg Warren County, Mississippi	NR	Symbol of Confederate resistance in the Vicksburg campaign.
7	Parchman Place Site Coahoma County, Mississippi	NR	Large platform mound with two smaller mounds. Located about 5 miles east of Friars Point.
24	Pemberton House, Vicksburg Warren County, Mississippi	NR	Headquarters of General Pemberton during siege.
25	Planters Hall, Vicksburg Warren County, Mississippi	NR	Historic bank built in 1832.
20	Snyder's Bluff Warren County, Mississippi	NR	Site of Fort Saint Peter, built in 1719 by French missionaries. Located near Redwood on the Yazoo River.

(NR--This site is on the National Register of Historic Places)
(NP--National Park)

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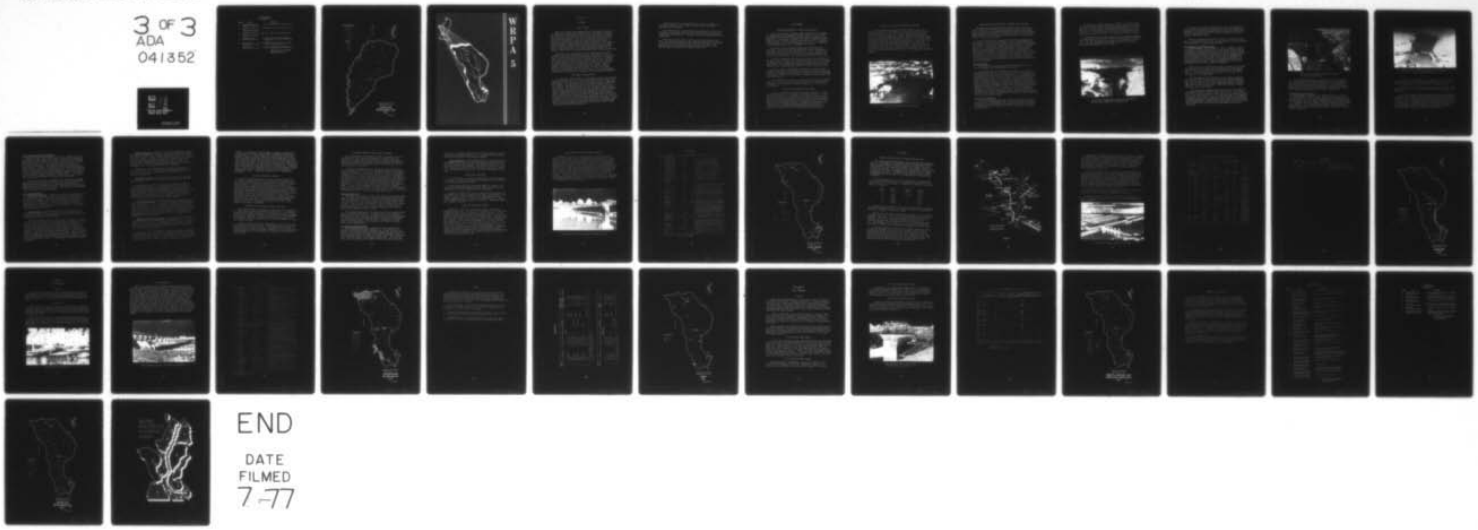

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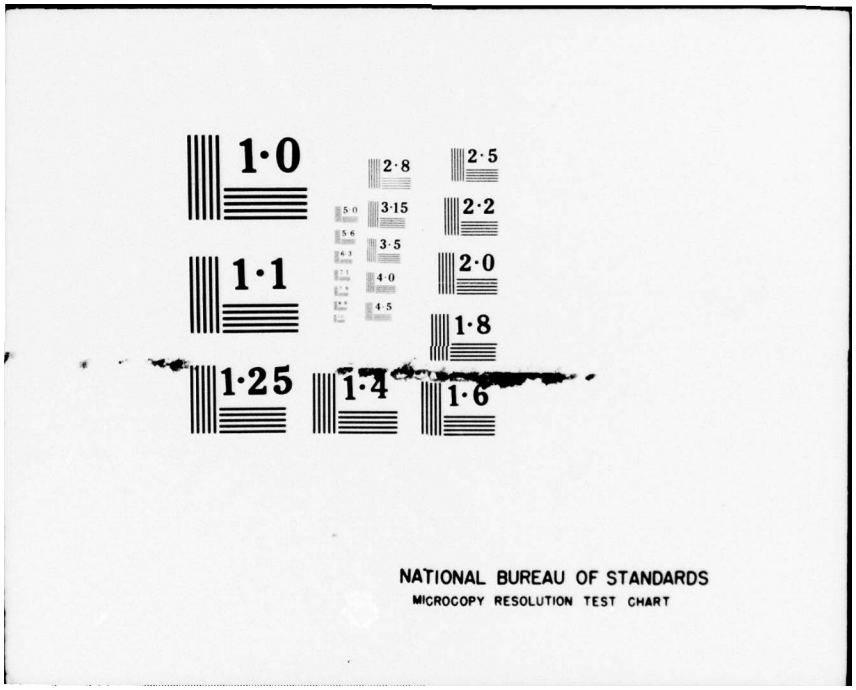
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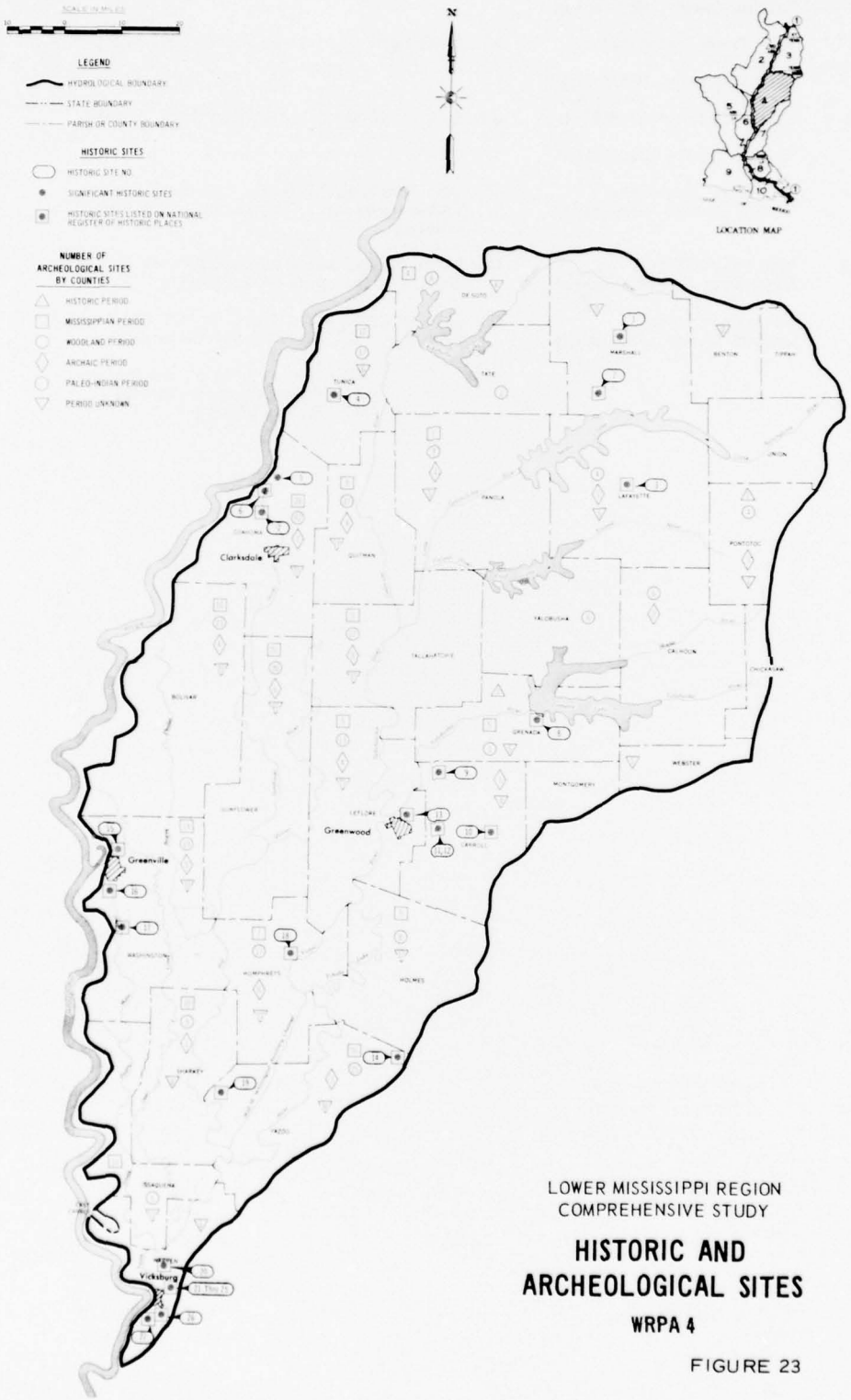
MICROCOPY RESOLUTION TEST CHART

PROJECT INDEX
Historic Sites - WRPA-4
(Continued)

Map No.	Name		Description
5	Sunflower Landing Site Coahoma County, Mississippi		Most likely crossing site by De Soto in 1541.
9	Teoc Creek Archeological Site Carroll County, Mississippi	NR	Outstanding Poverty Point, ca 1250 B.C., site.
26	Vicksburg National Military Park Warren County, Mississippi	NR-NP	Site of 47-day siege of Vicksburg in 1863.
21	Vicksburg Siege Cave Warren County, Mississippi	NR	Last remaining Civil War cave used during Vicksburg siege. Located near Vicksburg City Cemetery.
15	Winterville Site Washington County, Mississippi	NR	Large Mississippian ceremonial site located about 4 miles north of Greenville.
6	Yazoo Pass Levee Coahoma County, Mississippi	NR	Site of Civil War attempt to link Mississippi, Coldwater, Tallahatchie and Yazoo Rivers.

(NR--This site is on the National Register of Historic Places)
(NP--National Park)

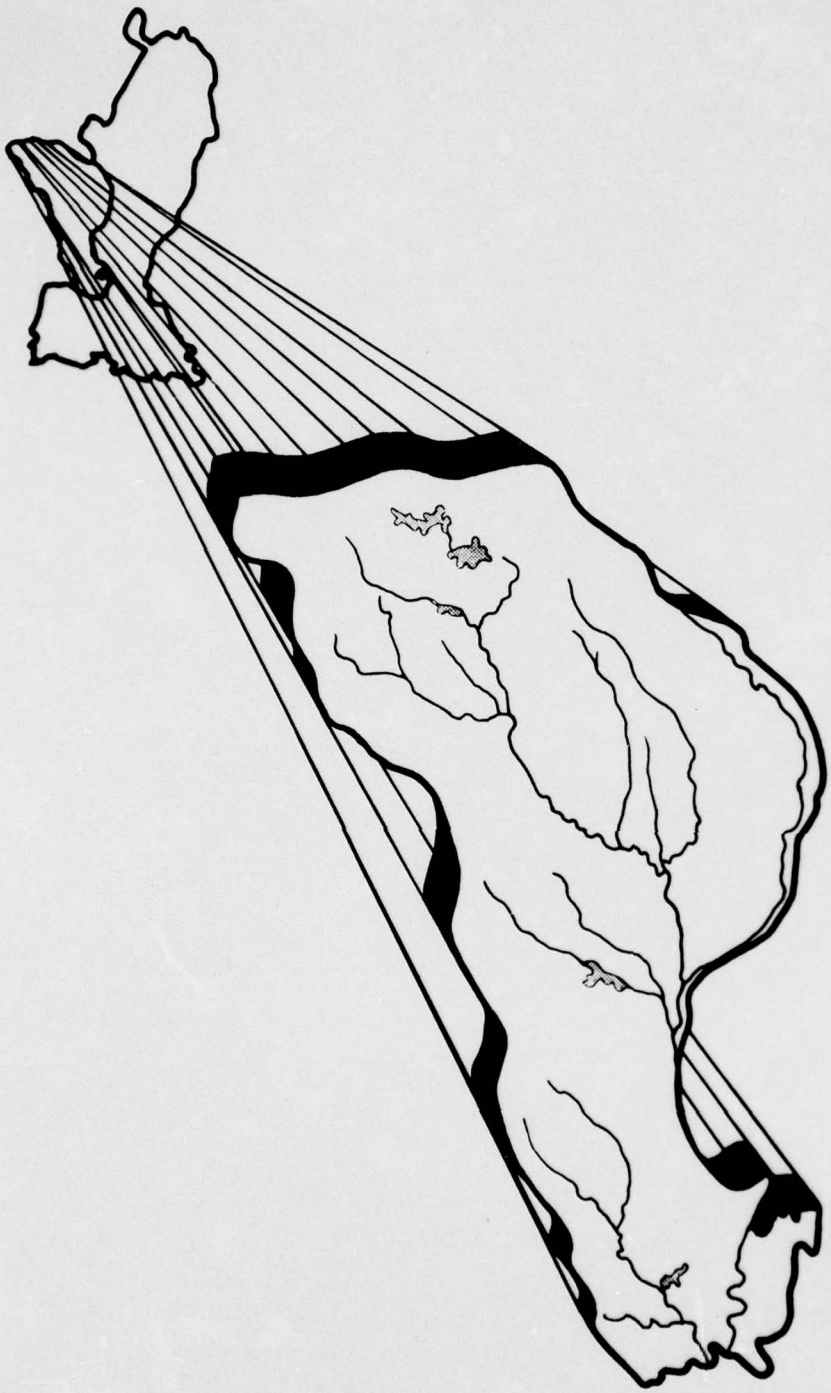


LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORIC AND ARCHEOLOGICAL SITES

WRPA 4

FIGURE 23



WRPA 5

W R P A 5

GENERAL

Area of Study

WRPA 5 is formed by the drainage basin of the Ouachita River and its tributaries, including the Red River below Hot Wells, Louisiana. The study area contains 20,413 square miles in the States of Arkansas and Louisiana, and accounts for 20 percent of the total area in the Lower Mississippi Region. The basin is bordered to the east by the divides of the Boeuf and Tensas River Basins and the east bank Mississippi River levee in Concordia Parish, Louisiana. The southern boundary extends westward from the Mississippi River levee at Black Hawk, Louisiana, to the Red River and follows the south bank of Red River to Boyce, Louisiana. The western and northern boundaries are formed by the divides of the Red and Arkansas River Basins, respectively.

The major cities in the WRPA are Pine Bluff, Hot Springs, and El Dorado, Arkansas; and Monroe, Louisiana. Population in 1970 was 821,878, almost equally divided between rural and urban. Agricultural land is one of the valuable natural resources of the area. Soybeans and cotton are the principal crops, with the production of livestock also being important. Much of the land classified as agricultural is in forests which provide an important source of income. The most commonly produced minerals are petroleum, sand, gravel, bromine, natural gas, natural gas liquids, and clay. In 1967, there were a total of 1,599 manufacturing firms in the area. The major manufacturing industries are lumber and furniture, and paper and allied products.

Hydrologic Characteristics

The principal stream in WRPA 5 is the Ouachita River, which carries the flow generated from all of the tributaries in the area between the Mississippi River levees and the Red River Basin boundary in Louisiana and Arkansas. The mean annual flow at its mouth is about 26,800 c.f.s. This, however, includes flows from the Boeuf and Tensas Rivers which drain WRPA 6. The Ouachita River rises in the Ouachita Mountains and flows through rugged terrain about 160 miles to the vicinity of Malvern, Arkansas, thence southerly for 95 miles through hilly upland areas, thence southeasterly 132 miles through wide bottoms and southerly 224 miles through the alluvial valley of the Mississippi River to enter the Red River at mile 36. Stream gradients range from 12 feet per mile in the rugged hill area to 0.9 to 0.2 foot per mile near its mouth. Channel widths vary from 300 feet in hill areas to 800 feet in the Felsenthal Basin, an area of unimproved bottom land that provides natural valley storage during periods of high water.

Major tributaries of the Ouachita River which lie in WRPA 5 are the Little Missouri, Saline, Caddo, and Little Rivers and Bayous Bartholomew and D'Arbonne.

The drainage areas of the Caddo and Little Missouri Rivers, Bayou D'Arbonne, and the upper reaches of the Ouachita River are partially controlled by DeGray, Narrows, D'Arbonne, and Blakely Mountain Reservoirs, respectively.

Red River below Hot Wells, Louisiana, is also included in the WRPA. The stream has relatively low stream gradients and flows through a low-lying area with numerous swamps, marshes, and lakes. Flows originating in that part of the Red River Basin lying outside the WRPA are partially controlled by upstream reservoirs.

FLOOD CONTROL

Louisiana Department of Public Works Projects

This section includes drainage systems authorized to be planned and constructed by the Department of Public Works on its own or in cooperation with Federal, state, and local agencies engaged in such activities. Local agencies include Police Juries, Drainage Districts, Levee Districts, and other legally constituted districts or agencies. Federal agencies are the Soil Conservation Service, U. S. Department of Agriculture, and the Corps of Engineers, U. S. Army.

The projects are local undertakings with Federal and state assistance. Division of costs in parish-wide systems constructed in the period 1942 to about 1960 was 60 percent of cost contributed by local agency and 40 percent of cost plus engineering, planning, and construction supervision by the Louisiana Department of Public Works.

Principal improvement works consisted of parish-wide planning of drainage systems to provide land drainage and protection against floods to agricultural, residential, business, and industrial areas and sites. Improvements also included major drainage streams which serve as an outlet for two or more drainage districts or parish drainage systems.

Principal works of improvement consisted of excavation of new channels, enlargement and clearing and snagging of existing canals and streams, replacement of or alteration of inadequate drainage structures at crossings, construction of low water crossings and appurtenant water control structures.

Total improvements in WRPA 5 include 739 miles of channel improvements, at a cost of $2,471,152, and a floodgate and pumping station in Huffman Creek to prevent flooding in Pineville, La. at a cost of $88 thousand.

North Concordia Watershed, Louisiana

Located in Concordia, Catahoula, and Tensas Parishes, La., this 225,000-acre Public Law 566 project was authorized in 1970. The main project features are: (1) 126,640 acres of land treatment measures costing an estimated $1,943,800, and (2) 260 miles of channel improvement. The total estimated project costs are $6,209,333 ($2,280,745 Federal and $3,928,588 non-Federal). Floodplain lands benefited are 216,250 acres. Estimated average annual damages prevented are $340,353, and total estimated annual benefits are $865,843. The benefit-cost ratio is 3.4 to 1. The project extends into WRPA 6.

North Fork of Ozan Creek Watershed, Arkansas

Located in Hempstead, Howard, and Pike Counties, Ark., this 46,434-acre Public Law 566 project was authorized in 1966. The main project features are: (1) 9,853 acres of land treatment measures costing an estimated $520,590; (2) eight floodwater retarding dams; and (3) 12 miles of channel improvement. There are 30.09 square miles of drainage area above the dams and 10,623 acre-feet of storage (1,818 acre-feet sediment and 8,805 acre-feet floodwater). Normal pool area is 255 acres. The total estimated project costs are $1,691,732 ($1,046,878 Federal and $644,854 non-Federal). Flood plain lands to be benefited are 4,315 acres. Estimated annual damages that will be prevented are $36,626 and estimated total average annual benefits are $63,341. The benefit-cost ratio is 1.5 to 1. The project is 8 percent complete.

Typical floodwater retarding structure.

Ouachita River and Tributaries, Arkansas and Louisiana

The Ouachita-Black River and its tributaries drain an area of 24,237 square miles in Arkansas and Louisiana of which 3,500 square miles are located in the Ouachita Mountains and are characterized by rugged terrain, 14,700 square miles of hilly uplands are in the Coastal Plain Province, and the remaining 6,000 square miles in the alluvial valley of the Mississippi River.

The Flood Control Acts of August 18, 1941 (House Document 427, 76th Congress, 2d Session) and December 22, 1944 (House Document 647, 78th Congress, 2d Session) and the Flood Control and Rivers and Harbors Act of May 17, 1950 (Senate Document 177, 88th Congress, 2d Session) provide for a comprehensive plan of improvement for flood control, power, and other purposes for the Ouachita River and tributaries. Additional improvements were authorized on Bayou Bartholomew by the Flood Control Act of 1960. The Flood Control Acts of October 27, 1965 and November 7, 1966 (House Document 328, 88th Congress, 2d Session) authorized closure of the existing gap in the floodwall at Monroe, La. Descriptions of the major features of this plan are shown in the following paragraphs.

Bayou Bartholomew

This feature was authorized by the Rivers and Harbors Act of 1950, as amended by the Flood Control Act of 1966.

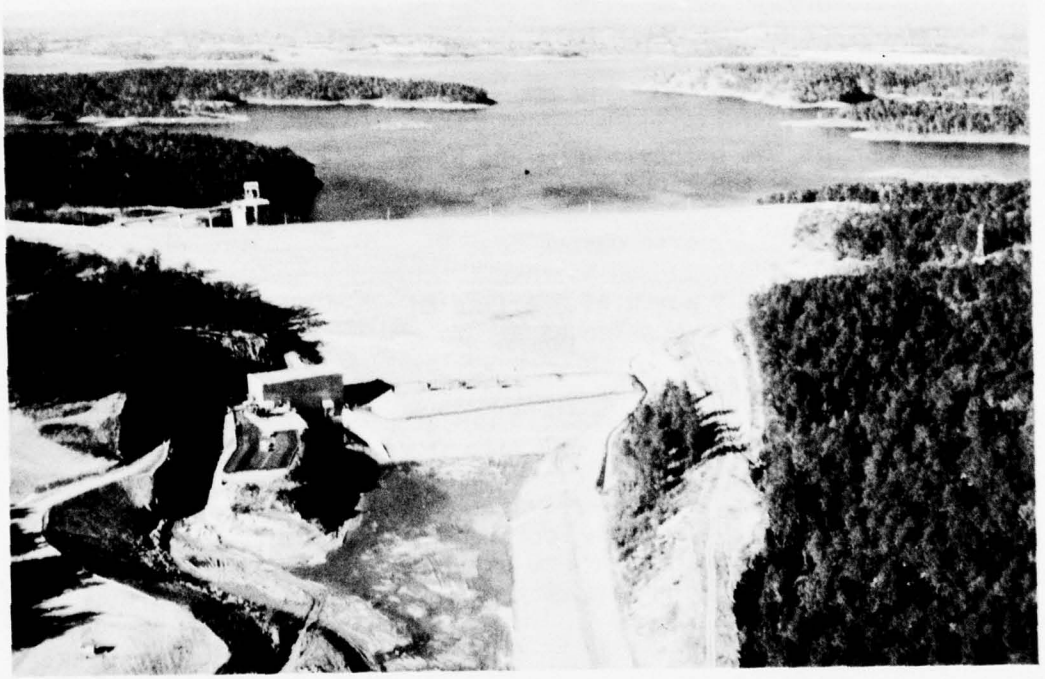
Bayou Bartholomew, originating near Pine Bluff, Ark., flows through Southeast Arkansas and Northeast Louisiana and empties into the Ouachita River just north of Sterlington, La. Its drainage area is adjacent to the Boeuf and Tensas Rivers and Bayou Macon Basin, and during highwater stages, some interchange of flow occurs among the basins at numerous places. The originally authorized project provided for clearing, snagging, and closure of highwater outlets on the main stem of Bayou Bartholomew, enlargement of Deep Bayou, and clearing and enlargement of Overflow Creek. The Flood Control Act of 1966 authorized the addition of 10 reservoirs on the west escarpment in Arkansas and six local levees in Louisiana. It also provided for deferment of all channel improvement until such time that it can be assured that the quality and quantity of the water in Bayou Bartholomew will not be adversely affected.

DeGray Lake, Caddo River

This is a multiple-purpose lake located on Caddo River, about 8 miles northwest of Arkadelphia, Ark. It was authorized by the River and Harbor Act of 1950 and the Water Supply Act of 1958. The dam is a compacted earthfill structure, 3,400 feet long and 243 feet above natural ground.

The lake has a storage capacity of 393,200 acre-feet for power, recreation, and water supply; additional storage capacity of 227,200 acre-feet for flood control; and a minimum permanent pool of 261,500 acre-feet. The dam controls the runoff from a drainage area of 453 square miles. At full power pool, the lake will cover 13,400 acres and have a shoreline of 207 miles in Clark and Hot Springs Counties.

Construction of the project began in 1962, and with the exception of recreational facilities, major portions were completed by December 1971. The lake was ready for operation for flood control in August 1969. The total estimated cost is about $63,800,000, including $4,900,000 reimbursable for water supply.



Aerial view of DeGray Lake and Dam on Caddo River shortly after completion of construction.

The lake has regulated flood flows since the in-service date for flood control in August 1969. Four floods in 1970 were reduced an average of 7-1/2 feet at Arkadelphia due to DeGray and Ouachita Lakes and were reduced an average of 3-1/2 feet at Camden due to DeGray, Ouachita, and Greeson Lakes.

Extensive recreational facilities are being constructed at this lake. See appropriate subsection for description of Power, Recreation, Fish and Wildlife, and Water Supply features.

Lake Greeson, Little Missouri River

The Flood Control Act of August 18, 1941, as amended by the Act of December 22, 1944, provides for the construction of this lake for combined power and flood control, and a power plant with an initial installation of hydroelectric generating facilities having a capacity of 17,000 kilowatts and with provisions for future enlargement of these facilities. In 1961, studies showed that the addition of a third generator of 8,500 kilowatts was economically justified and was included in the project. Power and recreation facilities are discussed in detail in the respective subsections.

Narrows Dam, which forms Lake Greeson, is located on the Little Missouri River about 5 miles north of Murfreesboro in Pike County, Ark. The dam which controls the flow from an area of 237 square miles, is a concrete gravity-type structure 941 feet long and 190 feet high at its maximum points.

The lake created by the dam has a storage capacity of 407,900 acre-feet, of which 77,600 acre-feet are in the minimum permanent pool, 202,100 acre-feet are used for power generation, and 128,200 acre-feet are used for the control of downstream floods. When the power pool is full, the lake covers 7,260 acres and has a 134-mile shoreline, all in Pike County.

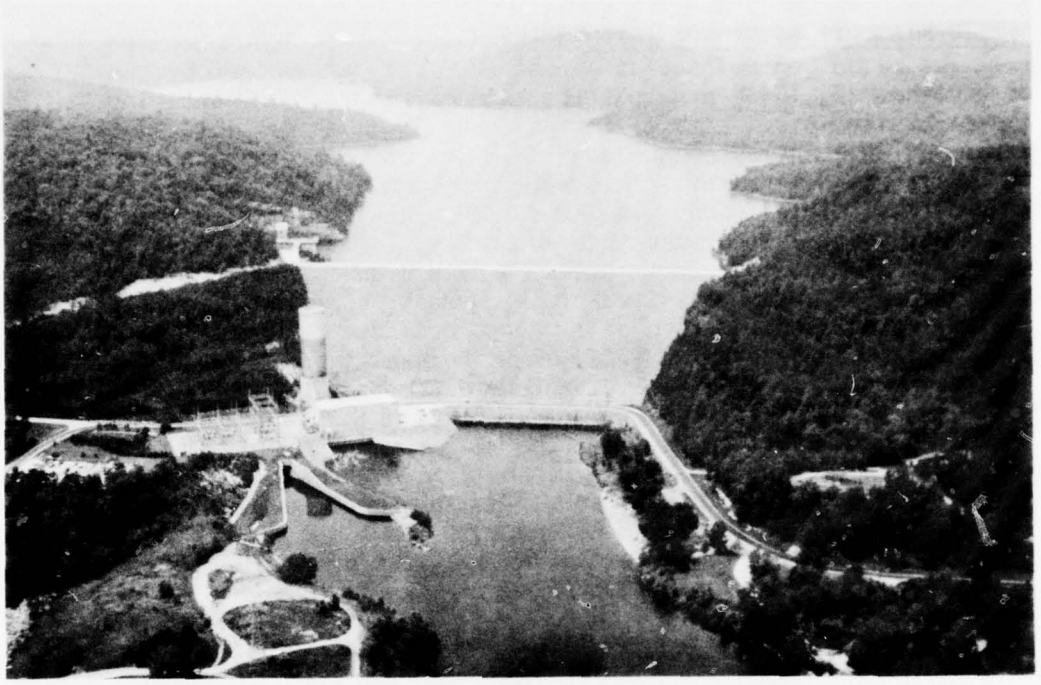
The project began regulating flood flows on the Little Missouri and Ouachita Rivers in February 1950. For the three to six floods which can be expected on these streams each year, it reduces the flood peaks on the Little Missouri by 1 to 3 feet and those on the Ouachita at Camden by about 1 foot. Also, the project operates in conjunction with downstream channel improvements on the Little Missouri River and channel improvements on Ozan and Terre Noire Creeks as a basin project. This combination has prevented basin flood damages estimated at $2,363,000.

Aerial view of Narrows Dam and Lake Greeson on Little Missouri River.

The total estimated Federal construction cost of the dam and lake is $15,920,000, including $1,810,000 for the third generating unit and $1,420,000 for recreation facilities. Of this amount, $13,275,000 has been spent for construction. An additional amount of $5,373,000 has been spent for maintenance and operation, bringing total Federal costs through June 30, 1971, to $18,648,000.

Lake Ouachita, Ouachita River

Lake Ouachita is located on the Ouachita River at the upstream end of Lake Hamilton, about 10 miles northwest of Hot Springs in Garland County, Ark. The project was authorized by the Flood Control Act of December 22, 1944. Blakely Mountain Dam, which forms the lake, is a compacted earthfill structure, 1,100 feet long and 235 feet above the streambed. Uses, other than flood control, of this multiple-purpose project are discussed in subsections on Recreation, Fish and Wildlife, and Power.



Aerial view of Blakely Mountain Dam and Lake Ouachita on the Ouachita River.

The lake has a storage capacity of 2,768,000 acre-feet, of which 617,000 acre-feet are for control of downstream floods. The dam controls the runoff from 1,105 square miles of drainage area.

Operations for flood control began in the Spring of 1953. Flood damages prevented by the operation of this project are estimated at $7,116,000.

The lake has regulated flood flows since the start of operation in February 1953 and has reduced downstream flood peaks on an average of about 4 feet at Arkadelphia and 3 feet at Camden for three to six floods per year. Flooding has been prevented on an average area of approximately 13,000 improved acres for each flood, due to the effect of the combined Lake Ouachita and Lake Greeson projects, based on 1970 conditions. Cost of the project, not including construction and development of public use facilities is $31,705,700.

Little Missouri River and Tributaries

The Flood Control Act of August 18, 1941, as amended by the Act of December 22, 1944, provides for channel clearing and snagging and the excavation of 31 cutoffs in the lower 94 miles of Little Missouri River and 20 cutoffs in the lower 14 miles of Ozan Creek, a tributary of Little Missouri River. This work was completed in 1956 at a Federal cost of $412,500. The improved channels are maintained by local interests. Under the same authority, Terre Noire Creek, another tributary of Little Missouri River was improved. This work consists of 0.9 mile enlargement of silted creek channel, snagging, repair of levee crevasses, and construction of required drainage ditches. The total cost is $133,700, of which $123,700 is Federal funds. Levee repairs were again made in 1959-1960 at a Federal cost of $143,000.

A dam and lake project is authorized to be constructed on Muddy Fork, a tributary of the Little Missouri River, about 4 miles west of Murfreesboro, in Pike County, Ark. The lake would augment other improvements in the watershed to control floods below the damsite along Muddy Fork and the Little Missouri River. The project has been placed in the "deferred for restudy" category.

Local Protection Works

Bawcomville, Louisiana. Authorized by the River and Harbor Act of 1950, this project provides protection from Ouachita River headwater and Red River backwater. The project consists of a 3.1-mile-long loop levee, two pumping plants, one 20,000-gallons-per-minute (g.p.m.) capacity and one 10,000-g.p.m. capacity, and appurtenant ditches. Construction was completed in 1955. The total cost was $253,323, of which $168,882 was Federal and $84,441 was non-Federal. Flood damages prevented total about $417,000.

Calion, Arkansas. The Flood Control Act of August 18, 1941 as amended by the Flood Control Act of May 17, 1950, provides for the construction of levees and appurtenances for the town of Calion, Calion Lumber Company property, and Lake Calion.

The Calion project, located in Union County, consists of 3 miles of earth levee, 200 feet of concrete floodwall, two floodgates, and two 201-cubic-feet-per-second (c.f.s.) pumping plants to protect the town of Calion, Lake Calion, and adjoining industrial property from Ouachita River floods. Calion is the river port for El Dorado, Ark., and this flood protection provides an area suitable for industrial expansion. The lake provides excellent recreation. The work was completed in August 1959 at a Federal cost of $970,996. Levee restoration has been accomplished at an estimated Federal cost of $98,000. This is also reported under "Work under Special Continuing Authorities, Emergency Flood Control Activities." Flood damages prevented are estimated at $286,000.

Columbia, Louisiana. Authorized by the Flood Control Act, June 22, 1936, this local protection feature at Columbia is designed to protect the town from Ouachita River headwater and from Mississippi River and Red River backwater. Features of the project consist of a 1.4-mile-long levee with appurtenant drainage structures, an outfall sewer with drainage works, floodgates and a storm sewer, and a 20,500-g.p.m. pumping plant. Three gravity outlets through the levee are a 60-inch-, a 48-inch-, and a 18-inch-diameter pipe with floodgates.

Federal cost for the Columbia project which was completed in 1939 was $204,740. Total flood damages prevented amount to $199,000. A review of the project is being conducted to determine need for additional improvements.

Jonesville, Louisiana. The local protection works at Jonesville, La., were authorized by the Flood Control Acts of June 22, 1936 and May 17, 1950.

This completed feature of the Tensas Basin project includes a 3.8-mile-long ring levee, a .3-mile-long floodwall, a 40,300-g.p.m. pumping plant, and appurtenant drainage works. The project works protect the town of Jonesville from headwater flooding on the Ouachita River and backwater flooding from the Mississippi and Red Rivers. Construction was completed in 1953, at a total cost of $620,796, including $100,000 contributed by local interests. Through June 30, 1971, the works had prevented $60,000 in flood damages.

West Monroe, Louisiana. Authorized by the River and Harbor Act of 1950, this project includes a 1.6-mile-long concrete floodwall and 5.6 miles of earth levee. The system provides protection to West Monroe from Ouachita River flooding. Construction was complete in the early 1930's, at a Federal cost of $548,895. Local interests have also constructed a 488-c.f.s. pumping station to protect against interior ponding during prolonged periods of high stages on the Ouachita River. Flood damages prevented through June 30, 1971, are included in the Ouachita River Levees project.

Ouachita River Levees, Louisiana. Construction of this feature of the comprehensive plan of improvement was authorized by the Flood Control Act of May 15, 1928, as amended in 1936 and 1950. The Flood Control Acts of October 27, 1967 and November 7, 1966 (House Document 328, 88th Congress, 2nd Session), authorized closure of the existing gap in the floodwall at Monroe, La.

On the east bank of the Ouachita River, project levees extend from Bayou Bartholomew near Bastrop, La., 111.6 miles southward to a point near Sandy Bayou, about 74 miles below Monroe. This includes 1.6 miles of concrete floodwall at Monroe. Of this authorized system, 65.6 miles have been completed to grade and section. Remaining work includes

closing a 1,750-foot gap in the floodwall at Monroe, extending the existing levee 5.7 miles to Sandy Bayou, and raising low sections of the present levee to approved grade and constructing a gravel road thereon. Completion of this system will afford protection to about 3 feet above the maximum flood of record with 3 feet freeboard. West bank protection consists of loop levees discussed in the paragraph on local protection works. The entire levee system protects some 185,000 acres of agricultural lands and 5,000 acres of urban area. Completed works have prevented an estimated $16,244,000 of flood damages through June 30, 1971. Cost of completed work is $3,405,000 Federal and $181,000 non-Federal. Additional estimated cost for completion is $2,550,000.

Ozan Creek Watershed, Arkansas

Located in Hempstead County, Ark., this 65,171-acre Public Law 566 project was authorized in 1971. The main project features are: (1) 33 thousand acres of land treatment measures costing an estimated $547,250, and (2) 22 floodwater retarding dams. There are 25.22 square miles of drainage area above the dams with a total storage of 11,724 acre-feet (2,308 acre-feet sediment, 8,464 acre-feet floodwater, and 952 acre-feet beneficial storage for mitigation purposes). The beneficial pool area is 870 acres (see Recreation and Fish and Wildlife data sheet). The total estimated project costs are $3,106,910 ($2,050,560 Federal and $1,056,350 non-Federal). Flood plain lands to be benefited are 4,200 acres. Estimated average annual damages that will be prevented are $42,000 and estimated total average annual benefits are $150,000. The benefit-cost ratio is 1.5 to 1. This project is now under construction.

Pineville Local Protection Works, Louisiana

The Pineville project is designed to protect the city of Pineville, La., and vicinity against floodwaters of the Red River. Improvements authorized by the Flood Control Act of 1941 consist of about 1.14 miles of levee, the raising and widening of 1,240 feet of railroad embankment, four drainage structures, a pumping station, and about 4,000 feet of small ditches. The major portions of this work were completed in 1951 at a cost of $232,426.

During the flood of May 1953, approximately 130 acres in the area were protected by the levee system. Total flood damages prevented by the project are estimated at $37,000. Maintenance of the project, including operation of the four drainage structures and the pumping station is the responsibility of the Red River, Atchafalaya, and Bayou Boeuf Levee District.

Red River Backwater-Tensas Basin, Louisiana

The Flood Control Act of August 18, 1941, as amended by the Act of October 27, 1965, provides the authority to protect the lower portion of the Tensas Basin from overflow by backwater originating from the Mississippi and Red Rivers. The Act of October 27, 1965 also authorized features for fish and wildlife in the Larto Lake to Jonesville and Sicily Island Areas.

The Red River Backwater Area is the lower portion of the Tensas Basin extending from the head of the Atchafalaya Basin to the general latitude of Monroe, La. The area is subject to overflow from backwater originating from the Mississippi and Red Rivers and their tributaries. Tributary streams divide the area into several subareas. The authorizing document gave the Chief of Engineers authority to provide protection to a larger area in the Red River Backwater provided that the safety and integrity of the Mississippi River levees and other works are not jeopardized. At present, four subareas are included in the authorized project. Three of these subareas are in WRPA 5 and are described below. The other subarea "South of Red River Area", is described under flood control projects in WRPA-9. The total estimated cost is $52,300,000 of which $14,067,000 has been spent through June 30, 1971.

Tensas-Cocodrie Area

This area is protected by a levee which joins the Mississippi River levee at Black Hawk, and extends westward and northward along the left bank of the Red, Black, and Tensas Rivers to the Tensas-Cocodrie Parish line and then east to tie with high ground near the upper end of Lake St. John. The 93.1 miles of levee and 2.1 miles of high natural ground protect 209,000 acres of rich, alluvial land in the area from all except the most extreme floods. Drainage improvements were made on Bayous Caney, Buckner, and Little Cross.

The existing improvements cost $8,100,000 and have prevented flood damages estimated at $4,310,000. A pumping plant to be constructed near the Bayou Cocodrie Drainage Structure is now in the planning stages. This plant will lower the height and shorten the duration of flooding within the interior sump area during times of highwater on the Red and/or Mississippi Rivers. Local interests will furnish the rights-of-way for the pumping plant.

Larto Lake to Jonesville Area

This feature provides levee protection for two separate areas located in Catahoula and LaSalle Parishes, La. These areas will be divided by the diversion channel between Catahoula Lake and Black River which is being constructed as part of the Ouachita and Black Rivers 9-foot navigation project. The upper loop levee, Larto Lake to Jonesville, will be 63 miles long and will inclose 102,000 acres. The lower loop levee, below Larto Lake, will be about 20 miles long and will inclose

8,400 acres. Drainage structures will be built to evacuate interior drainage from within the leveed areas. Construction was initiated in 1965 in the area north of the diversion channel.

Sicily Island Area. This feature consists of a loop levee which will begin near Sicily Island and extend down the west side of the Tensas River and up the east side of the Ouachita River to tie with high ground opposite Harrisonburg. The levee will be about 59 miles long. Necessary structures will be installed to drain the inclosed area. Construction has not started. The works will protect 73,000 acres.

Saline Point, Louisiana

The Saline Point, La. project, authorized by the Flood Control Act of June 22, 1936, provides for the excavation of cut-off channels in Avoyelles and Catahoula Parishes.

The existing project was incorporated under new project, "Red River below Denison Dam, Oklahoma, Texas, Arkansas, and Louisiana," authorized by the Flood Control Act of July 24, 1946.

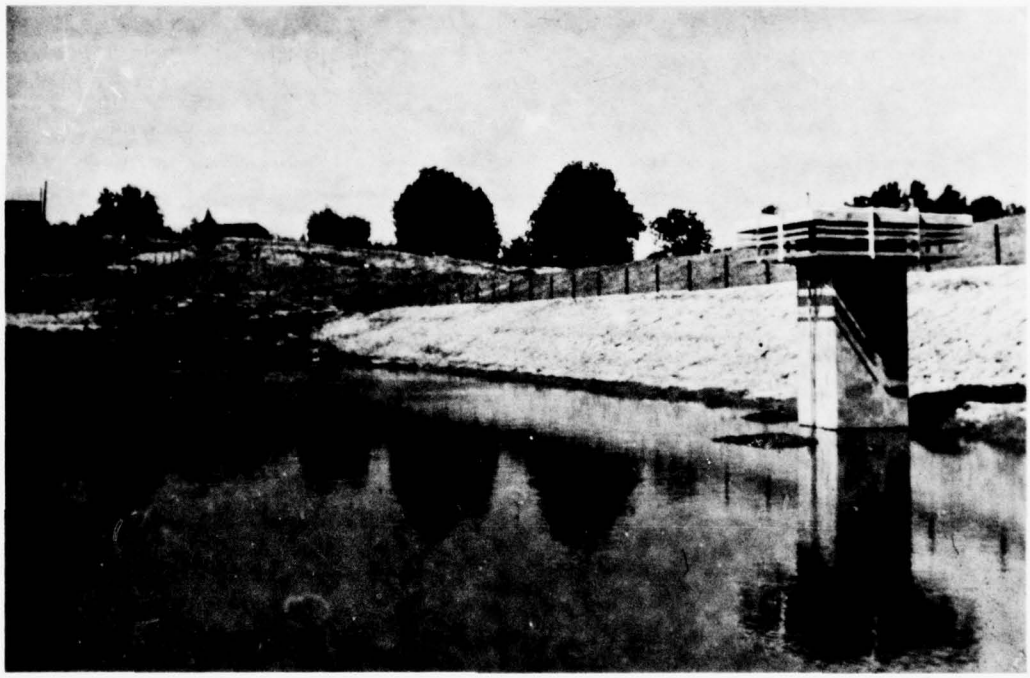
Designed to reduce flood stages by increasing the efficiency of the channel, this project consists of two cutoffs on Red River. Completed in 1942 at a cost of $124,100, the Saline and Double Eddy Cutoffs connected mile 65.5 to mile 54.0 (1938 mileage). Necessary levee setbacks were also included in the project. Cumulative benefits are estimated at $65,000.

South Fork Watershed, Arkansas

Authorized in 1970, this 45,293-acre project is located in Montgomery County, Ark. The main project features are (1) 2,275 acres of land treatment measures costing an estimated $158,200; (2) four floodwater retarding dams; and (3) one multiple-purpose dam for floodwater and water supply. There are 39.78 square miles of drainage area above the dams with a total storage of 16,102 acre-feet (2,012 acre-feet sediment, 13,260 acre-feet floodwater, 800 acre-feet municipal and industrial uses, and 30 acre-feet for mitigation purposes). (See Water Supply data sheets.) The total estimated project costs are $2,486,983 ($1,900,300 Federal and $586,683 non-Federal). Floodplain lands to be benefited are 2,109 acres. Estimated average annual damages that will be prevented are $75,000 and total estimated average annual benefits are $133,000. The benefit-cost ratio is 1.3 to 1. Construction has not been started.

Upper Ouachita River Watershed, Arkansas

Authorized in 1970, this 29,268-acre Public Law 566 project is located in Polk County, Ark. The main project features are: (1) 19 acres of critical area stabilization measures and 8,988 acres of land treatment measures costing an estimated $145,128; (2) two multiple-purpose reservoirs for flood prevention, recreation, and water supply (municipal and industrial); and (3) minimum basic recreation facilities. There are 35.92 square miles of drainage area above the dams with sediment storage of 1,466 acre-feet and floodwater storage of 10,346 acre-feet (see Water Supply and Recreation data sheets). The estimated project costs are $2,133,888 ($1,416,015 Federal and $717,873 non-Federal). Flood plain lands to be benefited are 1,201 acres. Estimated average annual damages that will be prevented are $45,616 and estimated total annual benefits are $141,932. The benefit-cost ratio is 1.3 to 1. Construction has not been started.

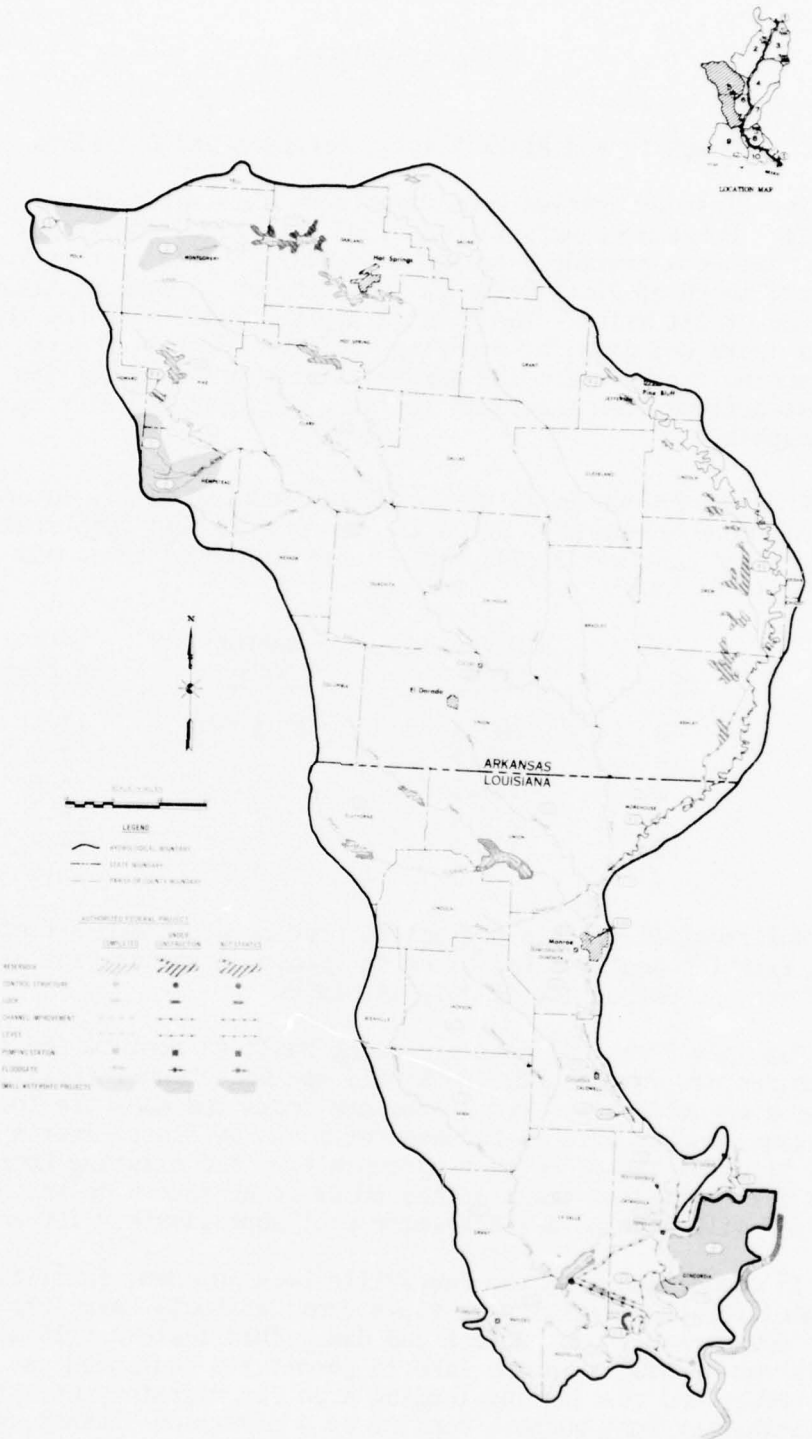


Riser and part of lake on typical watershed project.

PROJECT MAP INDEX
Flood Control - WRPA 5

Map Location No.	Name of Project	Agency	Year Complete	Project Uses	Description[1/]
6.	Louisiana Department of Public Works Projects			FC	
6-13.	Avoyelles Parish Drainage		1971		Proj. area, 565,120 ac. 238 mi. chan. imp. Cost $704,521.
6- 6.	Caldwell Parish Drainage		1971		Proj. area, 353,920 ac. 71 mi. chan. imp. Cost $164,486.
6- 7.	Catahoula Parish Drainage		1971		Proj. area, 472,960 ac. 40 mi. chan. imp. Cost $183,983.
6- 1.	Claiborne Parish Drainage		1971		Proj. area, 496,640 ac. 1/2 mi. chan. imp. Cost $183,983.
6-14.	Concorcia Parish Drainage		1971		Proj. area, 450,000 ac. 262 mi. chan. imp. Cost $671,173.
6- 9.	Grant Parish Drainage		1971		Proj. area, 430,720 ac. 1-1/2 mi. chan. imp. Cost $22,096.
6-11	Huffman Creek Floodgate No. 2, Rapides Parish		1964		Floodgate for storm runoff & prevent flooding in Pineville. Cost $54,000.
6-12.	Huffman Creek Pumping Plant, Rapides Parish		1957		Pumping capacity, 15,000 g.p.m. for storm runoff at Huffman Creek. Cost $34,000.
6- 4.	Jackson Parish Drainage		1971		Proj. area, 373,760 ac. 1/2 mi. chan. imp. Cost $1,525.
6- 8.	La Salle Parish Drainage		1971		Proj. area, 428,160 ac. 1 mi. chan. imp. Cost $3,123.
6- 3.	Ouachita Parish Drainage		1971		Proj. area, 408,960 ac. 112 mi. chan. imp. Cost $651,725.
6-10.	Rapides Parish Drainage		1971		Proj. area, 876,160 ac. 241 mi. chan. imp. Cost $720,217.
6- 2.	Union Parish Drainage		1971		Proj. area, 583,680 ac. 1/2 mi. chan. imp. Cost $4,956.
6- 5.	Winn Parish Drainage		1971		Proj. area, 621,440 ac. 33 mi. chan. imp. Cost $13,165.
9.	North Concordia Watershed, La.	SCS	Not started	FC	Proj. area, 225,000 ac. 260 mi. chan. imp. (L)
3.	North Fork, Ozan Creek Watershed, Ark.	SCS	Under constr.	FC	Proj. area, 46,434 ac. 8 floodwater retard. dams. 12 mi. chan. imp. Est. cost $229,676. (L)
4.	Ouachita River & Tributaries, Ark. & La.	C of E, VXD			
4- 3.	*Bayou Bartholomew*		Not started	FC	Clear., snag. & closure, highwater outlets on main stem. Enlarge., Deep Bayou. Clear. & enlarge., Overflow Cr. 10 reservoirs on west escarpment in Ark. & 6 local levees in La.
4-13.	Bawcomville Local Protection		1955	FC	3.1 mi. loop levee. 1 20,000-g.p.m. pump.sta. & 1 10,000-g.p.m. pump. sta. w/appurtenant ditches. Tot. cost $253,323. $168,882 Fed. $84,441 non-Fed. (H)
4- 9.	Calion Ark. Local Protection		1959	FC	3 mi. earth levee. 200 ft. conc. floodwall. 2 floodgates & pump. plant w/3.67 c.f.s. pumps. Fed. cost $970,966. Levee restor. $98,000. (H)
4-14.	Columbia, La. Local Protection		1939	FC	1.4 mi. levee. 20,500-g.p.m. pump. sta. 3 gravity structures (60-inch, 48-inch, & 18-inch pipes w/floodgates). Cost $204,740. (H)
4- 2.	DeGray Lake, Ark.		1972	FC,P,WS, R, F&W	Dam, compacted earthfill 3,400 ft. long, 243 ft. above streambed. Tot. stge. 881,900 ac.-ft. 227,200 ac.-ft. stge. for FC. Tot. est. cost $65,800,000.
4-15.	Harrisonburg to Little River Levees		1960	FC	3.9 mi. levees 8.7 mi. drainage ditches. Cost $329,300.
4-16.	Jonesville, La. Local Protection		1953	FC	3.8 mi. levee. .3 mi. floodwall w/drainage works. Fed. cost $539,000. Non-Fed. $100,000. (H)
4- 2.	Lake Greeson, Little Missouri River		Orig. 1950	FC,P,WS, R, F&W	Dam,conc. gravity-type,941 ft. long. 190 ft. above streambed. Tot.stge. 407,900 ac.-ft. 128,200 ac.-ft. for FC. Tot. est. Fed. cost $15,840,000.
4- 1.	Lake Ouachita, Ouachita River		1953	FC,P,WS, R, F&W	Dam, compacted earthfill 1,100 ft. long. 235 ft. above streambed. Tot. stge. 2,768,000 ac.-ft. 617,000 ac.-ft. for FC. Tot. est. cost except for public use facilities, $31,705,700.
4- 6.	Little Missouri River & Tributaries		1956	FC	Chan. clear. & snag. & 31 cutoffs, lower 94 mi. of L.Missouri R. & 20 cutoffs, 14 mi. of Ozan Cr. Cost $412,500. Imp.,Terre Noire Cr. by .9 mi. chan. enlarge., snag. & repair of levee crevasses, etc. Cost $133,700. $123,700, Fed. Levees repaired, 1959-60 at Fed. cost $143,000.
4-10.	Ouachita River Levees		Under constr.	FC	On E bank fm near Bastrop, 111.6 mi. S-ward to Sandy Bayou. Incl. 1.6 mi. floodwall, Monroe, La. 65.6 mi. complete, remain. is closure of 1,750 ft. gap in floodwall & ext. of levee 5.7 mi. & raising low secs. W bank consists of loop levees around Calion, Ark., West Monroe, Bawcomville, Columbia, & Jonesville, La. (H)
4-11.	West Monroe Loop Levee		Early 1930's	FC	5.6 mi. earth levee & 1.6 mi. floodwall. Tot. cost $548,895. (H)
5.	Ozan Creek Watershed, Ark.	SCS	Not started	FC, F&W	Proj. area, 65,171 ac. 22 floodwater retard.dams. See Rec. & F&W data sheets.
8.	*Pineville, La. Local* Protection Works	C of E, NOD	1951	FC	1.14 mi. levee, rais. & widen. 1,240 ft. RR emb., 4 drainage structures and 1 pump. sta. Cost $232,426.
7.	Red River Backwater, Tensas Basin, La.	C of E, VXD	Under constr.	FC, F&W	Tot. cost $52,300,000. $14,067,000 spent through June 30, 1971.
7- 3.	Tensas-Cocodrie Area		Under constr.		Levee joins Miss. R. levee at Black Hawk, ext. along WB Red, Black & Tensas R's. to high ground, Lake St. John. Length 93.1 mi. Drainage imp., Bayous Caney, Buckner & Little Cross. Pump. plants, Bayou Cocodrie in planning. (H)
7- 2.	Larto Lake to Jonesville Area		Under constr.		2 leveed areas. Upper loop, Larto Lake to Jonesville, 63 mi. long. Lower loop 20 mi. long below Larto Lake. Constr. initiated 1965. (H)
7- 1.	Sicily Island Area		Not started		Loop levee beg. near Sicily I. down W side Tensas R. up E side Ouachita R. Length 59 mi.
7- 4.	Saline Point, La.	C of E, NOD	1942	FC	2 cutoffs, Red R., connecting mi. 54.0 to mi. 65.5. Levee setbacks incl in proj.
2.	South Fork Watershed, Ark.	SCS	Not started	FC, WS	Proj. area, 45,293 ac. 4 floodwater retard. dams & 1 multipurpose dam. See Water Supply data sheets.
1.	Upper Ouachita River, Ark.	SCS	Not started	FC,WS,R	Proj. area, 29,268 ac. 2 multipurpose dams. See Water Supply & Rec. data sheets.

1/ Degree of protection indicated as follows: Low (L) 1 to 10 yr. frequency.
Medium (M) 10 to 50 yr. frequency.
High (H) 50 to 100 yr. frequency.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

FLOOD CONTROL

WRPA 5

FIGURE 24

NAVIGATION

Ouachita and Black Rivers, Arkansas and Louisiana

The first navigation improvements on this waterway were authorized in 1871. Subsequent acts through 1945 authorized additional improvements which now provide a navigable depth of 6 1/2 feet at low water from the mouth of Black River in Louisiana up to Camden, Arkansas, a distance of 351 miles. The channel depth is maintained by the operation of six locks and dams, by dredging, and the removal of logs, wrecks, overhanging trees, etc. The authority also provides for the removal of obstructions from the river for an additional 66 miles upstream to Arkadelphia.

With the exception of the canal and turning basin, authorized in 1937 to serve Felsenthal, Arkansas, the project was completed in 1926. Construction cost was $5,248,600. A tabulation of these old locks and dams is as follows:

Lock No.	River Mile	Opening Size	Lift in Feet
8	297.5	55 x 268	13.5
6	238.7	"	9.9
5	208.3	"	6.8
4	178.1	"	8.7
3	134.0	"	14.7
2	73.3	"	15.9

Modification of this project to provide a minimum 9-foot navigation depth from the mouth of Red River to Camden, Arkansas, was authorized in the River and Harbor Act of July 14, 1960.

Four new locks and dams are being built to replace the six obsolete structures now in use. The work will include channel rectification and dredging as necessary. Two of the new locks and dams are located in Louisiana, one at mile 25 between the mouth of Black River and Jonesville and the other just upstream from the existing Lock and Dam No. 3 near Columbia. Each of the locks is 84 feet wide and 600 feet long and will impound a slack-water pool approximately 100 miles long.

In connection with the Jonesville Lock and Dam, facilities will be included for the diversion of flows from Catahoula Lake into Black River downstream from the lock and dam. This feature will allow for regulation of stages in the lake to permit its continued use as a wildlife refuge and resting and feeding area for migratory waterfowl. The facilities for this purpose consist of a diversion channel, gated control structures, and a closure dam in Little River.

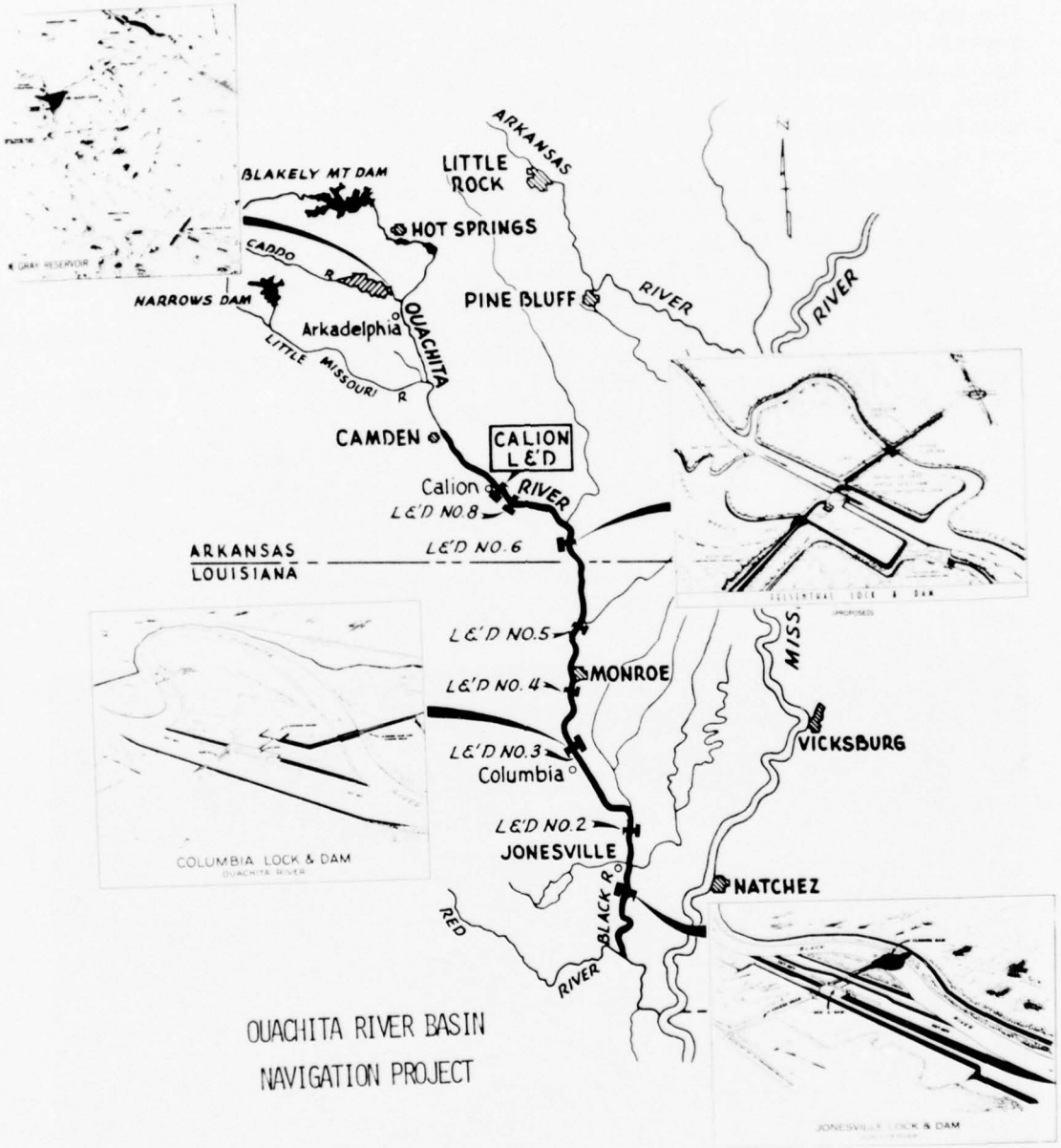

BLAKELY MT DAM
LITTLE ROCK
ARKANSAS
HOT SPRINGS
CADDO R
NARROWS DAM
Arkadelphia
OUACHITA
LITTLE MISSOURI R
PINE BLUFF
RIVER
RIVER
CAMDEN
CALION L&D
Calion
RIVER
L&D NO.8
L&D NO.6
ARKANSAS
LOUISIANA
L&D NO.5
L&D NO.4
MONROE
MISS
VICKSBURG
L&D NO.3
Columbia
L&D NO.2
JONESVILLE
NATCHEZ
BLACK R
RED
RIVER
COLUMBIA LOCK & DAM
OUACHITA RIVER
OUACHITA RIVER BASIN
NAVIGATION PROJECT

FIGURE 25

Construction of Columbia and Jonesville Locks and Dams is complete. The remaining reach of the Catahoula Lake Diversion Channel, including the control structure at Catahoula Lake, was completed in June 1972. The necessary work in the Ouachita River channel and construction of recreation features in the pools of both the Columbia and Jonesville Locks and Dams was completed in the spring of 1973. Completion of these features provides a 9-foot navigation channel to about the Louisiana-Arkansas state line.

Two of the new locks and dams will be located in Arkansas, one near existing Lock and Dam No. 6 near Felsenthal, and the other near existing Lock and Dam No. 8 near Calion. Congressional authority was granted to superimpose a 5-foot seasonally fluctuating pool on top of the Felsenthal navigation pool to maximize the fish and wildlife benefits. These locks will also be 84 feet wide and 600 feet long. Work on planning and design of the Felsenthal and Calion locks and dams is underway with an access road at Felsenthal under construction. Construction at Calion will probably begin in 1977.

The total Federal cost of this project modification is estimated to be $129,000,000. Expenditures through June 30, 1971, are $44,680,900. Traffic in 1970 totalled 80,687,939 tons.

A brief description of terminal facilities on the Ouachita and Black River and those on the Mississippi River adjacent to WRPA 5 is shown on Table 23.

Columbia Lock and Dam, Columbia, Louisiana.

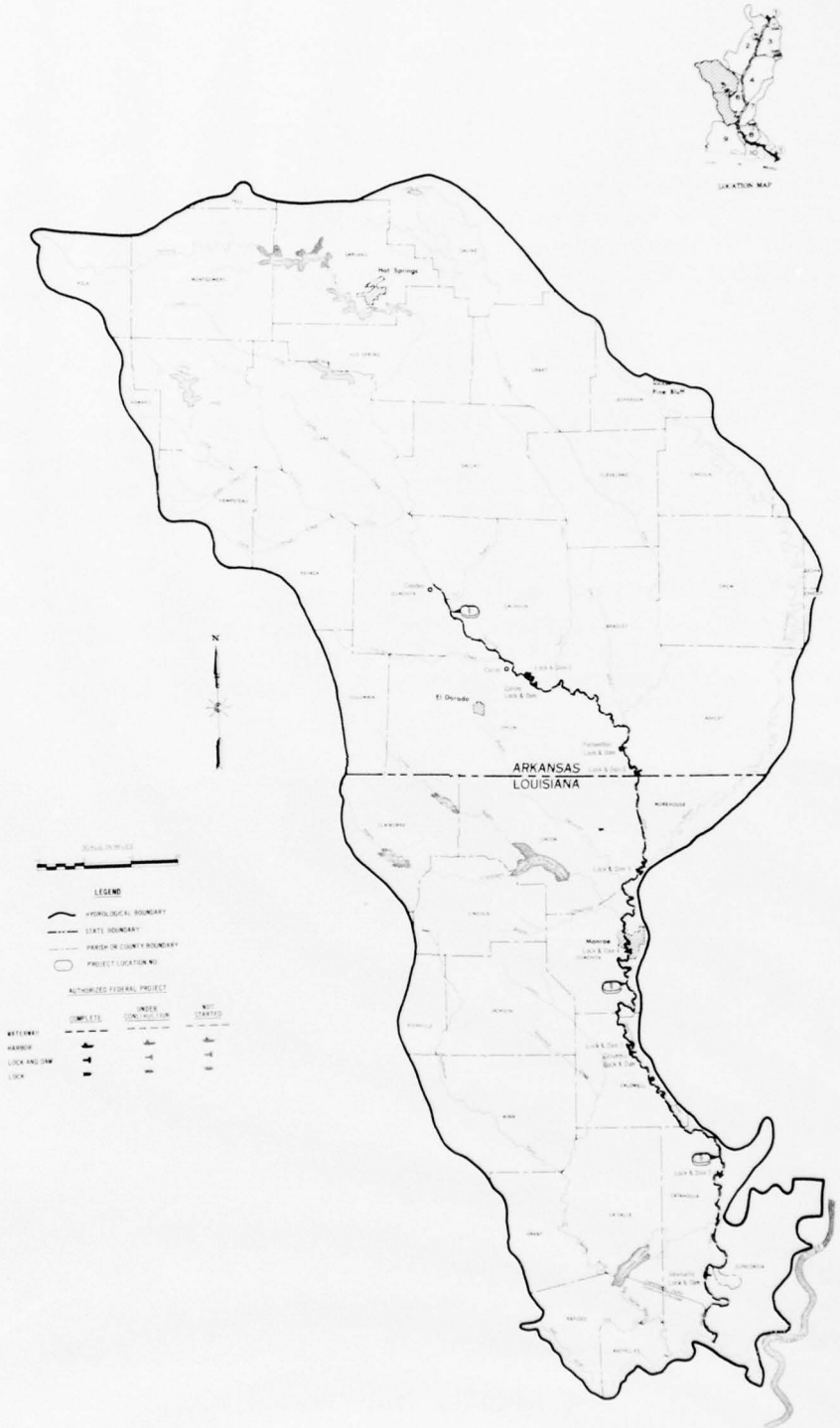
Table 23 - List of Terminals, Docks, Mooring Locations, and Warehouses in WRPA 5

AHP Mile	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
MISSISSIPPI RIVER						
363R	Vidalia, La.	McGehee Lumber Co.	Lumber yard	None	Derrick barge	No RR connections
		US Army Engr Dist, Vicksburg	Revetment casting and loading	None	None	No RR connections

Mileage Above Mouth: Black River	Location	Owner or Operator	Type of Service	Shelter or Warehousing	Cargo Handling Equipment	Remarks
OUACHITA & BLACK RIVER						
351R	Camden, Ark.	Camden Port Authority	Freight loading and unloading	Warehouse	Derrick	St.L SWN RR. Mooring dolphins & dock
349R	Camden, Ark.	International Paper Co.	Private dock	None	None	No RR connections. Floating barge & ramp
307R	Calion, Ark.	Calion Lbr. Co.	Saw mill	Mill	Crane	MP RR. Dock
304R	Champagnolle, Ark.	Lion Oil Co.	Oil & chemical dock	Tanks	Pipeline	No RR connections. Mooring dolphins
283L-R	Moro Bay, Ark.	Humble Oil Co.	Loading ramps & slips	None	None	No RR connections. Pile dolphins
208L	Sterlington, La.	Commercial Solvents Corp.	Chemical dock	Storage tanks	Pipeline	MP RR. Mooring dolphins & dock
182L	Monroe, La.	Howard Griffin	Marina	Dock & water, gas, etc.	None	No RR connections. Covered storage
180R	Monroe, La.	Thermo Products Company	Private dock	Warehouse	Gantry	No RR connections. Slip and dock
167R	Rilla, La.	Moore Terminal & Barge Co.	Loading & unloading petroleum products	Storage tanks	Pumps & pipeline	No RR connections. Mooring dolphins
133L	Riverton, La.	Caldwell Parish	Dock & grain elevator	Storage tanks	Pipeline	No RR connections. Mooring dolphins and dock
126L	Columbia, La.	Georgia Pacific	Freight loading and unloading	Tanks	Pipeline	No RR connections. Mooring dolphins and dock
125R	Columbia, La.	Newton & Jacobs	Oil dock	Storage tanks	8" pipeline	No RR connections. Mooring dolphins
57R	Jonesville, La.	Falco, Inc. Shreveport, La.	Oil dock	Storage tanks	Pipeline	No RR connections. Mooring dolphins
		Tri River Elevator Co.	Grain loading facility	Grain storage tank	Conveyor	No RR connections. Mooring dolphins
47L Black R.	8 miles below Jonesville, La.	Cross Grain Co.	Grain loading facility	Grain storage	Conveyor	No RR connections. Mooring dolphins
8R Black R.	Acme, La.	Morrison-Quirk Corp.	Grain loading facility	Grain storage tanks	Conveyor	No RR connections. Mooring dolphins

PROJECT MAP INDEX
Navigation and Harbors-WRPA 5

Map Location No.	Name of Project	Agency	Year Completed	Project Uses	Description
1.	Ouachita & Black Rivers, Ark. & La.	C of E, VXD	Under constr.	N, R, & F&A	Presently, 6-1/2 ft. chan. fm mouth to Camden, Ark., with 6 55 ft. x 268 ft. locks. New system under constr., 4 84 ft.x600 ft. locks with 9 ft. nav. chan. up to Camden, Ark. Fed. cost $129,000,000 1970 traffic, 80,687,939 tn.-mi.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

NAVIGATION

WRPA 5

FIGURE 26

RECREATION
AND
FISH AND WILDLIFE

General

Land and water resources as well as human population density are about average for the Lower Mississippi Region study area. WRPA 5 is the largest of the WRPA's in the Lower Mississippi Region; the 821,878 area inhabitants have a relatively uniform distribution throughout the area.

Recreation

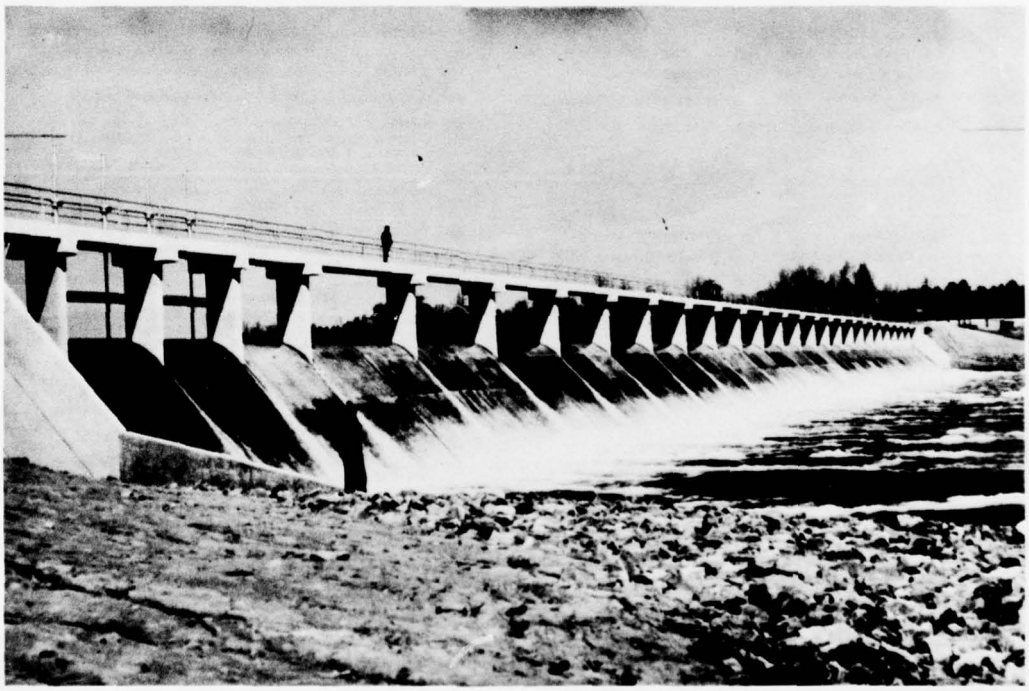
WRPA 5 has 407,375 acres of land available for outdoor recreation, including 364,950 acres federally owned, 17,673 acres State owned, 3,300 acres of county and quasipublic lands, and 3,941 acres municipal, local government and school board lands. Additionally, there are 17,511 acres in private ownerships.

WRPA 5 has 174,783 acres of slack water and about 1,931 miles of stream suitable for recreation. Developed recreation facilities include 1,504 acres for camping, 823 acres for picnicking, 1,935 acres for playing outdoor sports and games, 319 acres for swimming, and 212 acres for boat ramps.

Lake Ouachita State Park.

Fish and Wildlife

WRPA 5 water-related fish and wildlife resources include 76,000 acres of lakes between two and 40 acres in size, 175,000 acres of lakes over 40 acres in size, 1,931 miles of fishable streams, 10,228,000 acres of forest land, and 791,000 acres of wetland. Ponds under two acres in size are abundant but as yet have not been inventoried. Included in the lake acreage figures are numerous reservoirs and Mississippi River ox-bow lakes. WRPA 5 water-related fish and wildlife facilities include State ownership of 13 lakes and one fish hatchery. Federally owned facilities include one existing and two proposed wildlife refuges, two national forests, and one park. About 50 percent of the national park acreage is outside the hydrologic boundaries of WRPA 5. Numerous private fishing and hunting clubs exist but have not been inventoried. All areas are capable of supplying wildlife-oriented recreation. Fish and wildlife-oriented recreation consists of nature study and photography, with most emphasis on bird watching. Such use is nonconsumptive within certain limits.



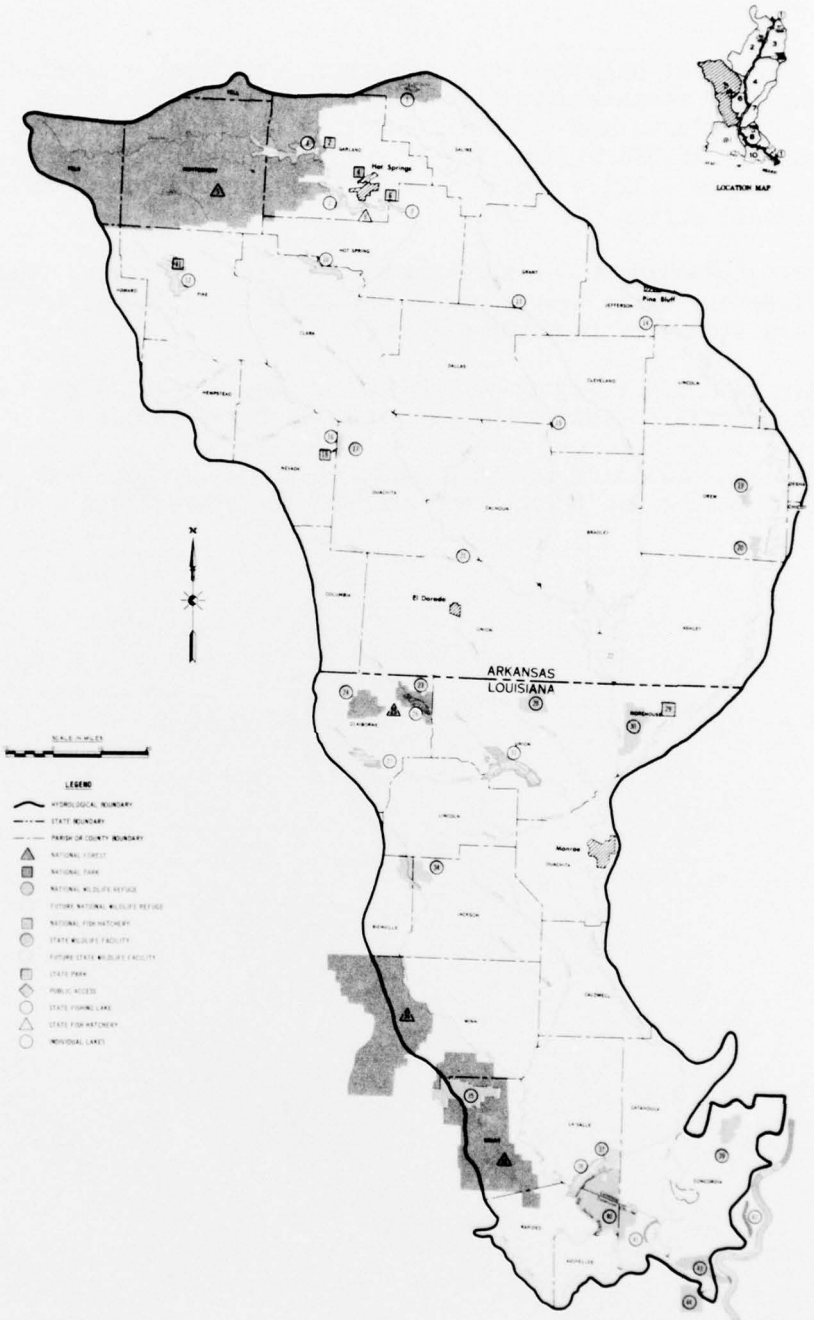
Lake D'Arbonne Spillway, Union Parish, Louisiana.

PROJECT MAP INDEX

Recreation, Fish, and Wildlife Facilities - AREA 5

Map Location No.	Name of Project	Agency	Project Use	Description 1/
33.	Bayou D'Arborne Lake	Local Comm.	R, F&W	High F&W rating. 15,241 ac. Excellent fishing. Some waterfowl use.
21.	Calion Lake, Public Fishing Lake	Ark. Game & Fish Comm.	R, F&W	High F&W rating. 500-ac. public-owned & managed fishing lake. Intensive mgmt. & use.
23.	Caney Wildlife Mgmt. Area, Corney Division	La. Wild Life & Fisheries Comm.	F&W	Moderate F&W rating. Approx. 11,000 ac. No waterfowl hunting. Fishing.
24.	Caney Wildlife Mgmt. Area, Middle Fork Division	La. Wild Life & Fisheries Comm.	F&W	Moderate F&W rating. Approx. 11,000 ac. No waterfowl hunting. Fishing.
38.	Catahoula Lake		R, F&W	High F&W rating. 26,880 ac. Extremely high waterfowl use, of natl. importance. Good fishing.
35.	Catahoula Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 36,117 ac. Extremely high use of waterfowl & fish resources. Nationally important.
37.	Catahoula Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	High F&W rating. 5,308 ac. Valuable waterfowl refuge. Fair fishing. High WOR use.
29.	Chemin a Haut State Park	La. State Park & Rec. Comm.	R, F&W*	306 ac. High WOR use. Rec. facs. include camping (cabins, tent-trailer), picnicking, boating, & swimming.
30.	Concordia Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 8,525 ac. Waterfowl hunting & fishing.
26.	Corney Lake	Local Comm.	R, F&W	Moderate F&W rating. 1,920 ac. No waterfowl use. Fair fishing. Lake has weed problem.
13.	Cox Creek Public Fishing Lake	Ark. Game & Fish Comm.	F&W	High F&W rating. 306 ac. public owned & managed fishing lake. Intensive mgmt. & use.
20.	Cut Off Creek Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 8,612 ac. Good waterfowl use and fishing.
11.	Daisy State Park	Ark. Parks, Rec. & Travel Comm.	R, F&W	370 ac. No hunting. Available fishing.
32.	D'Arbonne Proposed Natl. Wildlife Refuge	U. S. Fish & Wildlife Svc.	F&W	Future high F&W rated. National wildlife refuge.
10.	DeGray Lake	Corps of Engineers	R, F&W	High F&W rating. 13,400 ac. Reservoir. High fishing & WOR use. Rec. facs. incl. camping (285 units), picnicking (205 units), 18 boating ramps, 3 picnic shelters, & 1 swimming beach.
22.	Felsenthal Natl. Wildlife Refuge (Proposed)	U. S. Fish & Wildlife Svc.	F&W	Future high rated F&W area. Waterfowl refuge primarily.
30.	Georgia Pacific Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	Moderate F&W rating. 41,980 ac. No waterfowl hunting or fishing.
42.	Glasscock Lake		R, F&W	High F&W rating. 1,773 ac. Miss.R. oxbow lake. Fish.& waterfowl use.
44.	Grassy Lake Public Shooting Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 11,800 ac. Waterfowl hunting & fishing.
4.	Hot Springs National Park	National Park Service	R, F&W*	3,500 ac. No waterfowl or fishing, WOR use only. 8 hot spring bathhouses.
34.	Jackson-Bienville Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	Low F&W rating. 31,000 ac. No fishing or waterfowl use.
25.	Kisatchie Natl. Forest, Caney Div.	U. S. Forest Service	R, F&W	Moderate F&W rating. Insignificant waterfowl use. Fair fishing. 2 recreation areas developed for camping (54 units), picnicking (75 units), swimming, boating, & fishing.
36.	Kisatchie National Forest, Catahoula & Winn Division	U. S. Forest Service	F&W	Moderate F&W rating. Significant waterfowl use. Fair fishing. 2 recreation areas developed for camping (22 units), picnicking (17 units), boating, & fishing.
9.	Lake Catherine	Ark. Power & Light Co.	R, F&W	High F&W rating. 3,000 ac. Reservoir. High fishing & WOR use.
6.	Lake Catherine State Park	Ark. Parks, Rec. & Travel Comm.	R, F&W*	2,048 ac. WOR use. Rec. facs. incl. camping (cabins, tent-trailer), picnicking, swimming, boating, & nature trails.
27.	Lake Claiborne	Local Comm.	R, F&W	High F&W rating. 6,400 ac. Heavy fishing use. Excellent water quality. Fair WOR use. Minimal waterfowl use.
12.	Lake Greeson	Corps of Engineers	R, F&W	High F&W rating. 7,260 ac. Reservoir. Maj. fish. area. No waterfowl use. High WOR use. Rec. facs. incl. camping (243 units), picnicking (299 units), 18 boat ramps, 39 comfort stas. & 4 swimming beaches.
7.	Lake Hamilton	Ark. Power & Light Co.	R, F&W	High F&W rating. 7,200 ac. Reservoir. Maj. fish.area. No waterfowl use. High WOR use.
8.	Lake Hamilton State Hatchery	Ark. Game & Fish Comm.	F&W	High F&W rating. State fish hatchery.
3.	Lake Ouachita	Corps of Engineers	R, F&W	High F&W rating. 40,060 ac. High fishing & WOR use. No waterfowl use. Rec. facs. incl. camping (301 units), picnicking (197 units), 19 boat ramps, & 1 swimming beach.
2.	Lake Ouachita State Park	Ark. Parks, Rec. & Travel Comm.	R, F&W*	570 ac. Rec. facs. incl. camping (cabins, tent-trailer), picnicking, swimming, boating, & nature trails.
14.	Lake Pine Bluff	Ark. Game & Fish Comm.	R, F&W	High F&W rating. 500-ac. public owned & managed fish. lake. Intensive mgmt. & use.
1.	Lake Winona	Local Comm.	R, F&W	High F&W rating. 5,520 ac. Fishing. Underutilized.
41.	Larto Lake		R, F&W	High F&W rating. 2,176 ac. Fishing, waterfowl use. Maj. Red R. oxbow.
5.	Ouachita National Forest	U. S. Forest Service	R, F&W	High F&W rating. 392,300 ac. Excellent fishing. Some waterfowl. 13 recreation areas developed for camping (182 units), picnicking (70 units), swimming, boating, & fishing.
43.	Red River Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 16,977 ac. Good waterfowl hunting & fishing.
40.	Saline Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	High F&W rating. 60,275 ac. Good waterfowl hunting & fishing.
19.	Seven Devils Swamp Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	High F&W rating. 3,050 ac. Waterfowl hunting, fishing.
15.	Tri-County Public Owned Fishing Lake	Ark. Game & Fish Comm.	R, F&W	High F&W rating. 280 ac. public owned & managed fishing lake. Intensive mgmt. & use.
28.	Union Wildlife Mgmt. Area	La. Wild Life & Fisheries Comm.	F&W	Moderate F&W rating. 11,510 ac. No waterfowl use or fishing.
16.	White Oak Lake	Ark. Game & Fish Comm.	R, F&W	High F&W rating. 2,600 ac. public owned & managed fishing lake. Intensive mgmt. & use.
18.	White Oak State Park	Ark. Parks, Rec. & Travel Comm.	R, F&W*	272 ac. WOR use. Rec. facs.-camping, picnicking, boating & nature trls.
17.	White Oak Lake Wildlife Mgmt. Area	Ark. Game & Fish Comm.	F&W	Moderate F&W rating. 2,969 ac. Very limited waterfowl hunting.

1/ WOR = Wildlife oriented recreation
F&W = Fish and wildlife
F&W* = Supplies only nonconsumptive fish and wildlife oriented recreation



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

RECREATION AND FISH AND WILDLIFE

WRPA 5

FIGURE 27

POWER

At the end of calendar year 1970 there were four hydroelectric plants and four steam-electric generating plants in the area. The hydroelectric plants had installed capacity of 165.8 megawatts, and generated 331,246,000 kilowatt-hours during the year. Steam plant capacity totaled 1,315.4 megawatts with a net generation of 5,128,999,000 kilowatt-hours during the year.

Three steam plants use once-through cooling, the other relies on cooling towers. Three plants use river water for cooling, the other plant draws its water from the city supply.

There is a minor amount of industrial generation. A good network of interconnected systems transmission lines cover the area.

Additional capacity is being added at two existing steam plants in addition to one new steam plant and one new hydroelectric plant.

PROJECT MAP INDEX
Power Plants - WRPA 5

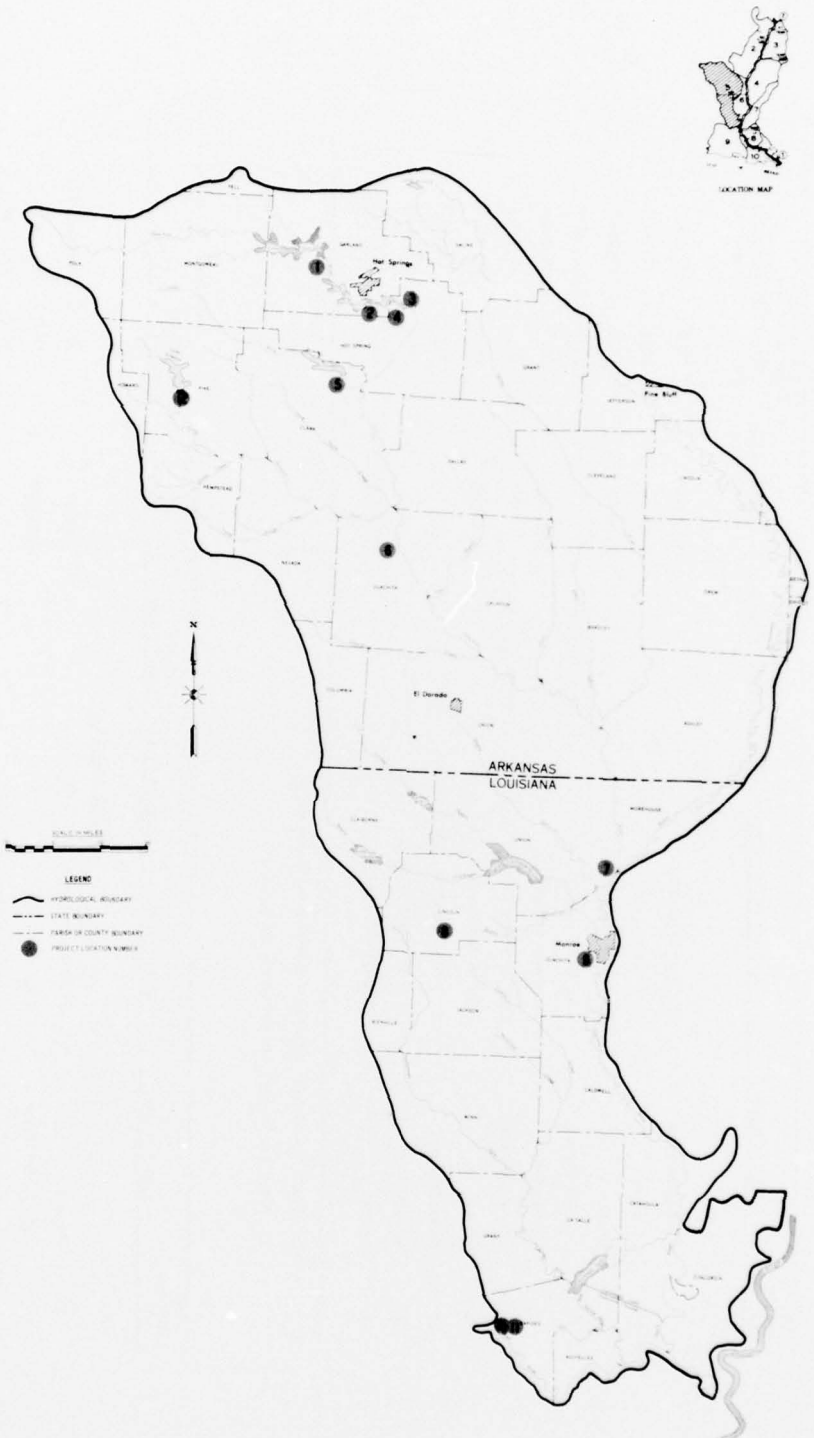
Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (31 Dec 70) (MW)	Annual 1970 Production (1000kwh)	Remarks
			Existing					
1.	Blakely Mountain	US Corps of Engrs	H		Ouachita	75.0	167,258.0	
2.	Carpenter	Ark. Power & Light Co.	H		Ouachita	56.0	93,841.0	
3.	Remmel	Ark. Power & Light Co.	H		Ouachita	9.3	39,196.0	
4.	Lake Catherine	Ark. Power & Light Co.	S	Lake Catherine		756.5	3,315,792.0	
7.	Sterlington	La. Power & Light Co.	S		Ouachita	351.5	1,198,806.0	
8.	McDonald Street	City of Ruston, La.	S	Ruston City Water		41.4 1/	91,643.0	
9.	Monroe	City of Monroe, La.	S		Ouachita	166.0 2/	522,758.0	
10.	Alexandria No. 1	City of Alexandria, La.	S	Wells		21.5	1,441.2	
11.	Alexandria No. 2	City of Alexandria, La.	S	Wells		97.5	292,767.2	
12.	Narrows	US Corps of Engrs	H		Little Missouri	25.5	30,951.0	

1/ Plant has 14.5-MW internal combustion auxiliary unit.

2/ Plant has 10.0-MW gas turbine auxiliary unit.

Map Location No.	Name of Plant	Owner of Plant	Type of Plant	Type of Water Supply	River	Installed Capacity (MW)	Date
			Planned Additions				
5.	De Gray	US Corps of Engrs	H		Caddo	68.0 1/	January 1972
6.	John L. McClellan	Ark. Elec. Coop.	S		Ouachita	133.0	May 1972
7.	Sterlington	La. Power & Light Co.	GT			130.6	April 1973
7.	Sterlington	La. Power & Light Co.	S		Ouachita	100.0	May 1974
8.	McDonald Street	City of Ruston, La.	S	Ruston City Water		41.5	April 1974

1/ 40.0 MW conventional, 28.0 MW pumped-storage.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

POWER

WRPA 5

FIGURE 28

WATER SUPPLY
AND
SEWAGE TREATMENT

General

Water Resources Planning Area 5 covers all or part of 40 counties in Arkansas and Louisiana. Because data herein is available only on a county-wide basis, hydrologic boundaries have been adjusted to conform to county lines. Twenty-eight counties fall within these boundaries and are considered in municipal, industrial, and agricultural water use and sewage treatment data collection. These counties have been further subdivided into eight subareas.

In 1970, within WRPA 5, 634.1 MGD was required to meet the municipal, industrial, and agricultural water withdrawal requirements. Of this, 64.1 percent was supplied by groundwater sources. Groundwater withdrawals accounted for 69 percent of the municipal water used, 51.7 percent of the industrial water used, and 67 percent of the agricultural water used.

Sewage treatment was provided in 24 percent of the communities and serviced 70 percent of the population which utilized the area's municipal water distribution systems in 1970. The remaining 30 percent of the municipally serviced population utilized septic tanks or their sewage was disposed untreated.

1970 Municipal Water Supply

In 1970, municipal water systems within the WRPA serviced 164 communities, which had a combined population of 455,003 people, and varied in size from 42 people at Bois D'Arc, Ark., to almost 60,000 people in Pine Bluff, Ark. The average daily municipal water withdrawal within the WRPA was 54.3 MGD. During July, the peak municipal water use month in 1970, the average daily use was 77.7 MGD. This water was supplied 69.1 percent from groundwater sources. The average daily withdrawals resulted in a 119 GPCD use in areas serviced by central water systems. This compares with a national average of 166 GPCD.

1970 Industrial Water Supply

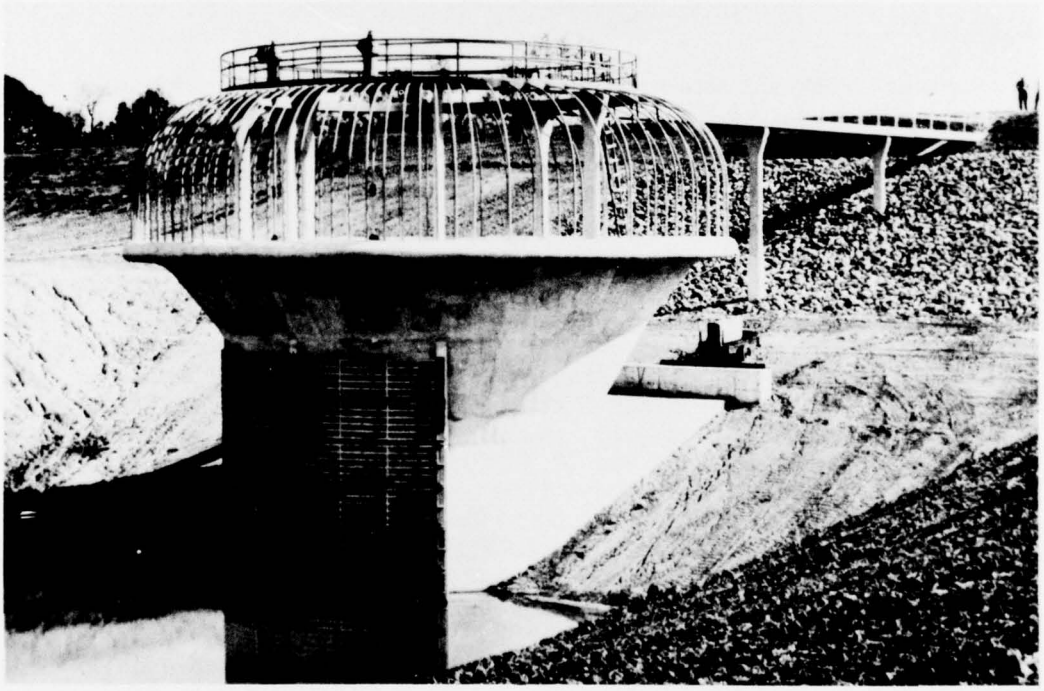
Industrial activity within WRPA 5 during 1970 required a daily average water withdrawal of 206.7 MGD. Groundwater supplied 57.7 percent of this withdrawal and surface sources supplied 42.3 percent.

1970 Agricultural Water Supply

In addition to the municipal and industrial water withdrawals, agricultural withdrawals required 365.7 MGD for use in the irrigation of 212,587 acres and 7.4 MGD for use in the raising of livestock and poultry in 1970. Of the water used, 67 and 33 percent were supplied from groundwater and surface sources, respectively.

1970 Sewage Treatment Facilities

Primary and secondary treatment was provided in 38 of the communities that utilized a municipal water distribution system in 1970. These treatment facilities provided service for 314,416 people. There was, however, one community with a population over 1,000 that did not provide any centralized sewage treatment.



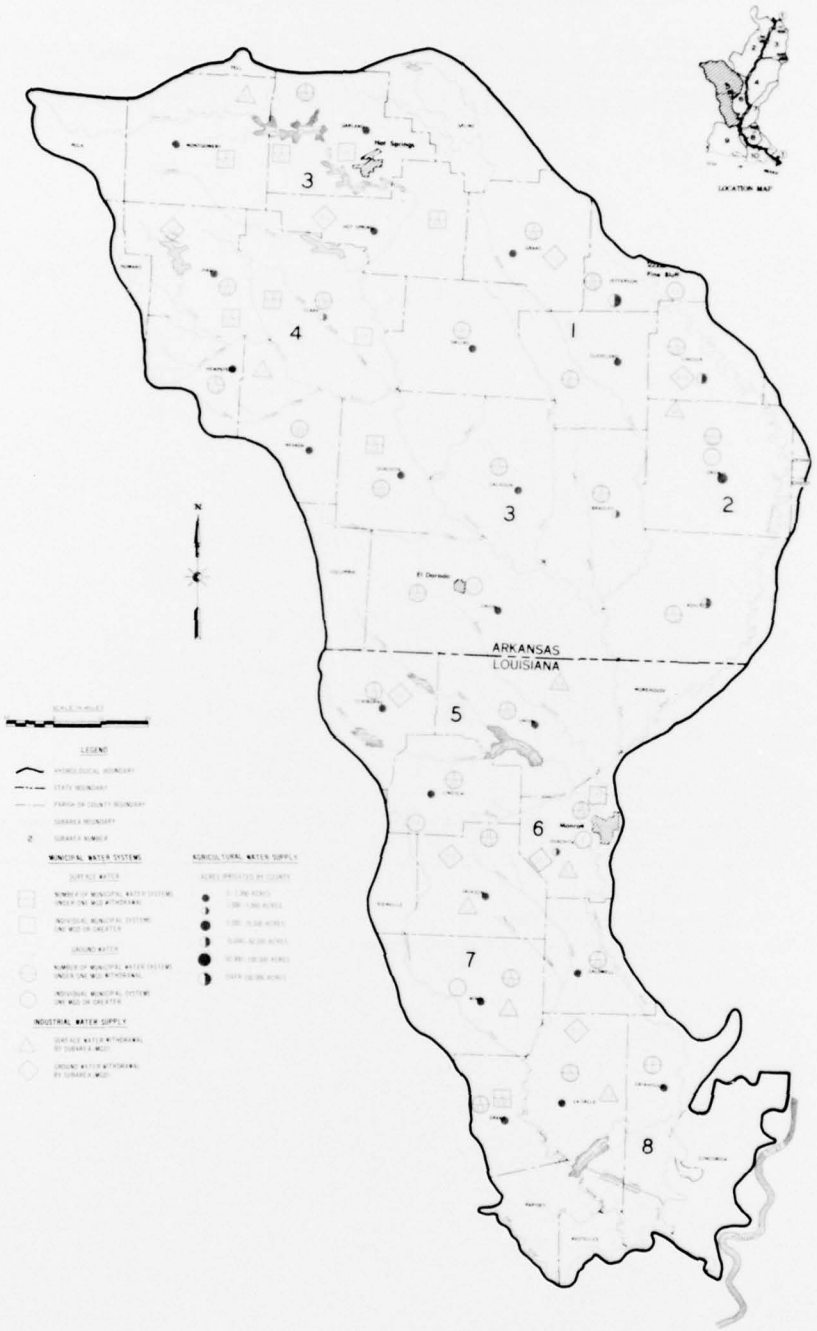
Lake Claiborne water supply project
Claiborne Parish, Louisiana.

PROJECT MAP INDEX
Municipal, Industrial, and Agricultural Water Supply and Sewage Treatment Facilities - WRPA 5

Subarea / County	Municipal Water Use					Industrial Water Use			Agricultural Water Use			Sewage Treatment Facilities					
												Secondary Treatment		Primary Treatment		No Treatment 2/	
	Population	No. systems	Withdrawal (MGD) Ground	Surface	Total	Withdrawal (MGD) Ground	Surface	Total	Withdrawal (MGD) Ground	Surface	Total	Number Plants	Population Serviced	Number Plants	Population Serviced	Number Communities	Population
5-1						0.5	0.0	0.5	51.4	25.8	77.2						
Grant	3,782	4	.8		.8							1	2,480				
Cleveland	1,463	2	.1		.1							1	1,214				
5-2						65.0	40.0	105.0	172.0	84.9	256.9						
Jefferson	4,465	11	7.9		7.9							2	58,426				
Lincoln	7,049	3	.4		.4							2	3,715				
Drew	68,627	6	2.1		2.1							1	5,085				
Ashley	18,267	9	1.5		1.5							2	7,323	1	3,102		
5-3						23.1	22.7	45.8	10.9	5.0	15.9						
Montgomery	1,179	2		.1	.1												
Garland	43,683	4		5.2	5.2							1	35,631				
Hot Spring	10,200	2		.8	.8							1	8,739				
Dallas	6,416	3	.7		.7							1	4,837				
Ouachita	20,285	6	.6	1.4	2.0							3	17,603				
Calhoun	2,396	4	.2		.2							1	1,252				
Bradley	7,065	3	.7		.7							1	6,433				
Union	35,858	9	4.4		4.4							2	27,341				
5-4						1.3	2.1	3.4	6.9	3.7	10.6						
Pike	3,331	4	.6	.2	.8							2	2,562				
Clark	15,450	3		1.4	1.4									2	11,916		
Hempstead	10,184	4	1.1		1.1							1	8,810				
Nevada	4,474	3	.4		.4									1	3,921		
5-5						3.3	.4	3.7	4.9	2.5	7.4						
Claiborne	10,500	3	1.4		1.4							2	7,538				
Union	7,430	6	.6		.6							2	5,210				
Lincoln	20,929	9	3.5		3.5							3	22,868				
5-6						10.7	20.6	31.3	.5	.2	.7						
Ouachita	106,072	26	4.8	7.7	12.5							2	57,492			1	14,868
5-7						15.2	1.2	16.4	1.0	.4	1.4						
Jackson	11,498	16	1.1		1.1							1	5,072				
Caldwell	4,410	3	.4		.4												
Winn	10,925	6	1.2		1.2							1	7,142				
Grant	5,375	5	.3	.02	.32												
5-8						.2	.4	.6	2.4	.6	3.0						
LaSalle	9,565	5	1.7		1.7							2	3,776				
Catahoula	4,125	3	1.0		1.0												
Total	455,003	164	37.5	16.82	54.32	119.3	87.4	206.7	250.0	123.1	373.1	34	295,477	4	18,939	1	14,868

1/ All figures are daily averages.

2/ Only denotes communities of 1,000 or greater population.



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

MUNICIPAL, INDUSTRIAL, AND AGRICULTURAL WATER SUPPLY

WRPA 5

FIGURE 29

ARCHEOLOGY AND HISTORY

The most important thing about WRPA 5, from the archeological standpoint, is how little is known and how great is the potential. The differing environments - the flat bottomlands, the surrounding hills, and the Ouachita Mountains - means that there will be evidence in the sites for significant adaptations of cultural groups to varied local environmental conditions.

Archeological sites identified in this WRPA total 935: 9 historic, 311 Mississippian, 280 woodland, 173 archaic, 5 paleo, 157 unknown. Figure 30 shows the number of sites occupied during each period by county. Since some of the sites have been occupied during more than one period, the number of sites shown on the figure do not agree with those above.

Historically, Arkansas and northern Louisiana may not show as many significant sites as some other areas, but, similar to the other areas in the southern end of the region, early day explorers traversed the area extensively, as is evidenced by the marked historic roads and trails. The States of Arkansas and Louisiana have made an effort to locate these old routes, and in many instances, have marked them on the ground or mapped them.

Physiographically, only a small portion of this WRPA is in the alluvial plain, the main portion of the area varying from rolling hills to the highlands and high ridges of the Ouachita Mountains. This is probably one of the most scenic WRPA's in this region.

PROJECT INDEX
Historic Sites - WRPA-5

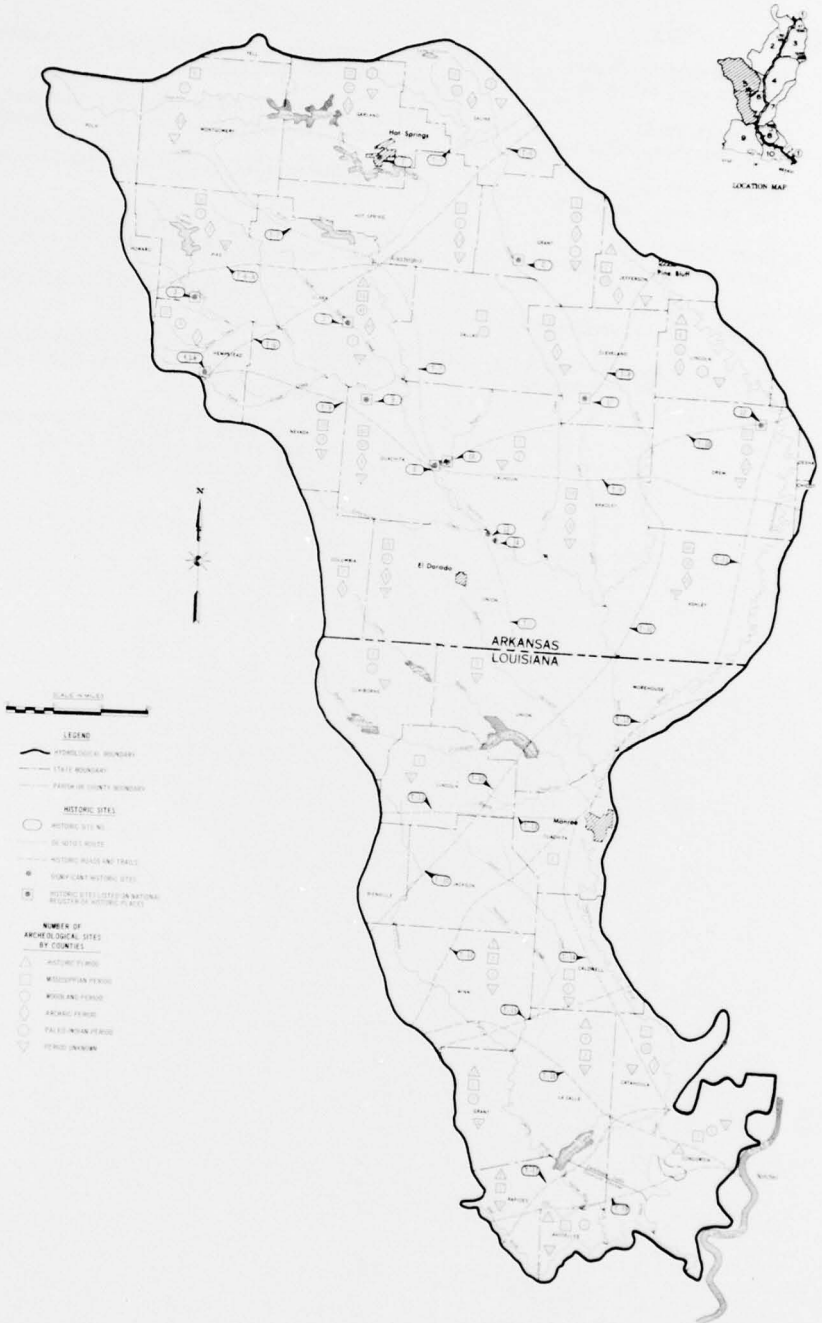
Map No.	Name		Description
T-11	Arkansas Post Road Three Counties, Arkansas		Also known as the "Grand Maris" or "Louisiana Trace."
T-19	Bienville and d'Iberville Trail Four Parishes, Louisiana		Early trails developed by the two French explorers.
T-8	Camden-Pine Bluff Road Three Counties, Arkansas		Also known as the "Civil War Road."
14	Champagnolle Landing Union County, Arkansas		Old river port and first Seat of Justice for Arkansas.
T-10	Chihuahua Trail Five Counties, Arkansas Four Parishes, Louisiana		A portion of the old Napoleon Road from Tennessee to Mexico.
4	Confederate State Capitol (The Hemstead County Courthouse) Hemstead County, Arkansas	NR	Located on Main Street in Washington. State Capitol from 1863-65.
3	Crater of Diamonds State Park Pike County, Arkansas	NR	Only diamond mines found in the United States.
13	De Soto Wintering Site Union County, Arkansas		De Soto's winter camp 1541-42.
T-7	De Soto's Route Ten Counties, Arkansas		Historic route of De Soto through Arkansas during 1541-42.
T-16	El Camino Real Four Parishes, Louisiana		Portion of 1700 Old Spanish Road from Pensacola, Florida, to Mexico City.
T-14	Fort Monroe to Natchez Road Four Parishes, Louisiana		Main traveled route from Fort Monroe to Natchez.
T-9	Fort Towson Road Seven Counties, Arkansas		First east-west road in the South. Also known as "Military Road," Chicot Trace," "Washington Road," and "Mill Road."
1	Hot Springs National Park Hot Springs County, Arkansas	NP	Springs used for centuries by man to ease pain and supposedly cure ills.
2	Jenkins Ferry Battleground State Park Grant County, Arkansas	NR	Site of Civil War skirmish in July 1864.
9	McCollum-Chidester House Ouachita County, Arkansas	NR	Early stagecoach inn and military headquarters for both sides during Civil War.
7	Magnolia Manor Clark County, Arkansas	NR	Excellently preserved two-story white framed Greek Revival home built in 1854. Located 0.6 miles southwest of intersection of I-30 and Arkansas 51.
11	Marks Mill Battlefield Park Cleveland County, Arkansas	NR	Site of Confederate capture of Union supply train during spring of 1864.
8	Poison Springs State Park Ouachita County, Arkansas	NR	Civil War battle site. Now a State park.
T-17	Rapides to Natchez Road Three Parishes, Louisiana		Early travel route.
T-12	Route Des Ouachitas Five Parishes, Louisiana		Early trail from Natchitoches into Arkansas. Also known as "The Road to the Ouachitas."
5	Royston, Grandison D., House Hemstead County, Arkansas	NR	Located on Alexander Street in Washington.
T-15	St. Denis and LeSeur's Route Three Parishes, Louisiana		Route from Texas to Vicksburg.

(NR--This site is on the National Register of Historic Places)
(NP--National Park)

PROJECT INDEX
Historic Sites - WRPA-5
(Continued)

Map No.	Name		Description
12	Selma Methodist Church Drew County, Arkansas	NR	Well-preserved small rural church in continuous use since 1874 in Selma.
T-6	Southwest Trail Five Counties, Arkansas		First trail in Arkansas regularly traveled by white man from St. Louis into the southwest area.
T-13	Stage Coach Route Two Parishes, Louisiana		Early route between Fort Monroe and Shreveport.
10	Tates Barn Ouachita County, Arkansas	NR	Located at 902 Tate Street, Camden. Built by the first settlers in the county in early 1900's.
T-6-A	Texas Route Three Counties, Arkansas		A branch of the Southwest Trail from Arkadelphia to Texas.
6	Washington Historic District Hemstead County, Arkansas	NR	Washington. Boundaries correspond to 1824 plat. Intact example of early Arkansas City. Site of State Capitol, 1863-65.

(NR--This site is on the National Register of Historic Places)
(NP--National Park)



LOWER MISSISSIPPI REGION
COMPREHENSIVE STUDY

HISTORIC AND ARCHEOLOGICAL SITES

WRPA 5

FIGURE 30

WATER RESOURCES PLANNING AREAS