REVISION OF MASTER PLAN FOR RESOURCE MANAGEMENT

POOLS 11-22
9-FOOT CHANNEL NAVIGATION PROJECT

CHAPTER XI
THE MISSISSIPPI RIVER
POOL 20

U. S. ARMY ENGINEER DISTRICT, ROCK ISLAND
CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

MAY 1972

NCDPD-ER (13 July 72) 2nd Ind
SUBJECT: Revision of Master Plan for Resource Management, Upper Mississippi River, Pools 11-22, Nine-Foot Channel Navigation Project

DA, North Central Division, Corps of Engineers, 536 South Clark Street, Chicago, Illinois 60605 30 October 1972

TO: District Engineer, Rock Island

For information and appropriate action.

FOR THE DIVISION ENGINEER:

Walter E. McDonald

WALTER E. MC DONALD
Assistant Chief, Planning Division

DEPARTMENT OF THE ARMY
NORTH CENTRAL DIVISION, CORPS OF ENGINEERS
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605

NCDPD-ER 13 July 1972

SUBJECT: Revision of Master Plan for Resource Management, Upper Mississippi River, Pools 11-22, Nine-Foot Channel Navigation Project

HQDA (DAEN-CWP-V)
WASH DC 20314

1. Chapters XI and XII of the subject master plan (Pools 20 and 21) are forwarded, recommending approval, subject to the following comments.

2. Reference Pages II-2, Paragraphs 4, and Plates II-2.1, Chapters XI and XII. The figures for high and low water elevations of record shown on Plates II-2.1 should be updated to agree with data presented in paragraphs 4.

3. Reference Page V-1, Paragraph 3, and Plate V-1.1, Chapter XII (Pool 21). Section V should explain the factors which will lead to the sharp increase in visitation in 1980.

4. The land use zoning and forestry management objectives indicated on the plastic overlays with the base maps are important features of this master plan. These overlays provide guides for achieving rational long range resource management on project lands and waters. Preparation of these land use zoning-forestry management overlays involved detailed analysis of resources and extensive coordination efforts which warrant special mention in the narrative portion of the plan. As indicated in Chapter I, General Information, the last chapter of the master plan, Chapter XIV, will contain a summary of the complete master plan. Chapter XIV will contain a section to emphasize the fact that the most significant long range value of this master plan can be realized through appropriate implementation of the land use zoning and forestry management features of the plan.

5. The chapters of the master plan covering the individual pools do not present sufficient data on needed recreational facility expansion. Chapter XIV will, therefore, provide a consolidated detailed analysis of all works specifically recommended in Pools 11 thru 22, to include the following:

a. Existing Facilities Operated by the Corps.

(1) Provide site plans indicating expansion needed to meet increased demand, or modifications needed to improve site design or user control.

(2) Provide detailed cost estimates including costs of site preparation, landscaping and signs.

b. Dredging.

(1) Identify by pool and river mile all dredging proposed in support of recreational boating.

(2) Provide detailed information on length, width and depth of channel that should be provided and explain if dredged material can be used beneficially.

(3) Provide cost estimates for each site.

c. New Sites.

This master plan contains specific recommendations for development of new sites even though at this time no local agencies have indicated an intent to cost share. For these new sites, provide detailed cost estimates including special items of cost associated with development such as bridges, railroad crossings, ramps over levees and fencing.

d. Programming.

Establish priorites for recommended improvement of existing facilities. Indicate which improvements will be programmed for development under current policy prior to 30 June 1976 (See Appendix I of ER 1120-2-404.

NCDPD-ER 13 July 1972

SUBJECT: Revision of Master Plan for Resource Management, Upper Mississippi River, Pools 11-22, Nine-Foot Channel Navigation Project

6. Items discussed or proposed in this master plan do not in any way conflict with the current concept of a National Recreation Area for the Upper Mississippi River. In fact, this master plan and the related resource maps could very well serve as the framework for a more elaborate development and management plan should the National Recreation Area become a reality.

FOR THE DIVISION ENGINEER:

2 Incl (trip)
as fwd sep

Walter J. Slazak

WALTER J. SLAZAK
Colonel, Corps of Engineers
Deputy Division Engineer

DAEN-CWP-V (13 July 72) 1st Ind
SUBJECT: Revision of Master Plan for Resource Management, Upper Mississippi River, Pools 11-22, Nine-Foot Channel Navigation Project

DA, Office of the Chief of Engineers, Washington, DC 20314 4 Oct 72

TO: Division Engineer, North Central

Chapters XI and XII (Pools 20 and 21) of the subject Master Plan are approved subject to the comments expressed by NCDPD-ER in the basic letter and the following.

Subsequent input of material in Chapter XIV, as discussed in the basic letter, should designate the land uses as defined in ER 1130-2-400, ER 1120-2-400 and ER 1165-2-400 and delete on the plates and in the narrative the term priority of uses. In addition a separate summary section should be prepared on the plans and programs for historical and cultural preservation, restoration and administration pursuant to paragraph 4 of ER 1105-2-11.

FOR THE CHIEF OF ENGINEERS:

Norman E. Jansson
for IRWIN REISLER
Chief, Planning Division
Directorate of Civil Works

wd all incl

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING
ROCK ISLAND, ILLINOIS 61201

IN REPLY REFER TO

NCRED-PB

11 May 1972

SUBJECT: Revision of Master Plan for Resource Management, Upper Mississippi River, Pools 11-22, Nine-Foot Channel Navigation Project

Division Engineer, North Central

1. Chapter XI, Pool 20, of the subject master plan is submitted in accordance with Engineer Manual 1130-2-302.

2. This chapter of the master plan contains specific information concerning the administration and development of the resources within the pool.

3. It is recommended that chapter XI of the master plan for resource management of the Mississippi River 9-foot channel navigation pools be approved.

2 Incls (6 cys)
1. Narrative, Pool 20
2. Maps, Pool 20

F. W. ASHTON
Acting District Engineer

cc: Dist File w/o incls
Engrg Div w/o incls
Environ. Res. Sect. w/o incls

REVISION OF MASTER PLAN
FOR
RESOURCE MANAGEMENT

POOLS 11-22
NINE-FOOT CHANNEL NAVIGATION PROJECT

CHAPTER XI
THE MISSISSIPPI RIVER, POOL 20

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REVISION OF MASTER PLAN
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THE MISSISSIPPI RIVER, POOL 20

SECTION I

INTRODUCTION

As noted in chapter I, a Master Plan is developed to provide a sound instrument of guidance for the administration and operation of land and water resource projects; to assure sound resource management; and to coordinate activities with interested Federal, State, and local agencies. Pool 20, one of the series of navigation pools on the Upper Mississippi River, and within the limits of the Rock Island District, is treated under such master planning requirements. Plate I-1.1 locates the pool with reference to others of the navigational system in the Rock Island District, U. S. Army Corps of Engineers.

CORPS OF ENGINEERS

U.S. ARMY

MISSISSIPPI RIVER
9-FT. CHANNEL PROJECT
ROCK ISLAND DISTRICT

IN 1 SHEET

SHEET NO. 1

10 5 0 10 20

SCALE IN MILES

CORPS OF ENGINEERS, U.S. ARMY
ROCK ISLAND, ILLINOIS

ROCK ISLAND DISTRICT
JANUARY 1959

PLATE I-1.1

SECTION II

DESCRIPTION OF PROJECT

1. General. Pool 20, regulated by Dam No. 20, begins a short distance upstream of Canton, Missouri, at river mile 343.2 and extends to Keokuk, Iowa, river mile 364.2, a distance of 21.0 river miles measured along an established sailing line. Three states - Iowa and Missouri on the western shore and Illinois along the eastern bank - border the pool stretch. Counties involved include portions of Lee in Iowa, Clark and Lewis in Missouri, and Hancock and Adams in Illinois.

2. Topography and geology. Except for some highlands in the upper reaches, the pool is characterized by adjacent broad and flat flood plains protected by levees throughout most of the area. The rich and fertile interior lands, protected by the levees, are intensively cultivated for an agricultural economy. One major tributary - the Des Moines River - joins the Mississippi at the southern edge of the city of Keokuk, Iowa, and also marks the boundary between the States of Iowa and Missouri in this region. Lake Red Rock, 143 miles upstream on the Des Moines River, and which became operable in January 1969, has greatly reduced the incidence of flooding in the lower Des Moines River Valley and on the Mississippi River below the mouth of the Des Moines River.

Only three minor creeks and one minor river - the Fox - are other contributing streams in pool waters. These streams have rapid response to heavy rainfall and have some effect on short-range pool levels. Interior drainage of areas landward of the levee system has little effect on pool levels. The sediment load carried by the contributing streams during periods of storm runoff may create problems of a resource management nature.

Islands, within the pool limits, while generally sizeable, are not as numerous as those existing in most upstream pools. Island vegetation tends to be dense although bare and extensive sand bar areas are plentiful. No island property within the pool is owned by the Federal Government.

The broad flood plain just downstream from the Des Moines River, overlies the course of the preglacial Mississippi River. Upstream from the Des Moines River, the old channel lay to the west of the present channel between Montrose and Keokuk and is now filled with glacial deposits.

The preglacial channel downstream from the Des Moines River was partially filled by a glacial outwash; the present channel lies more than 100 feet above the former.

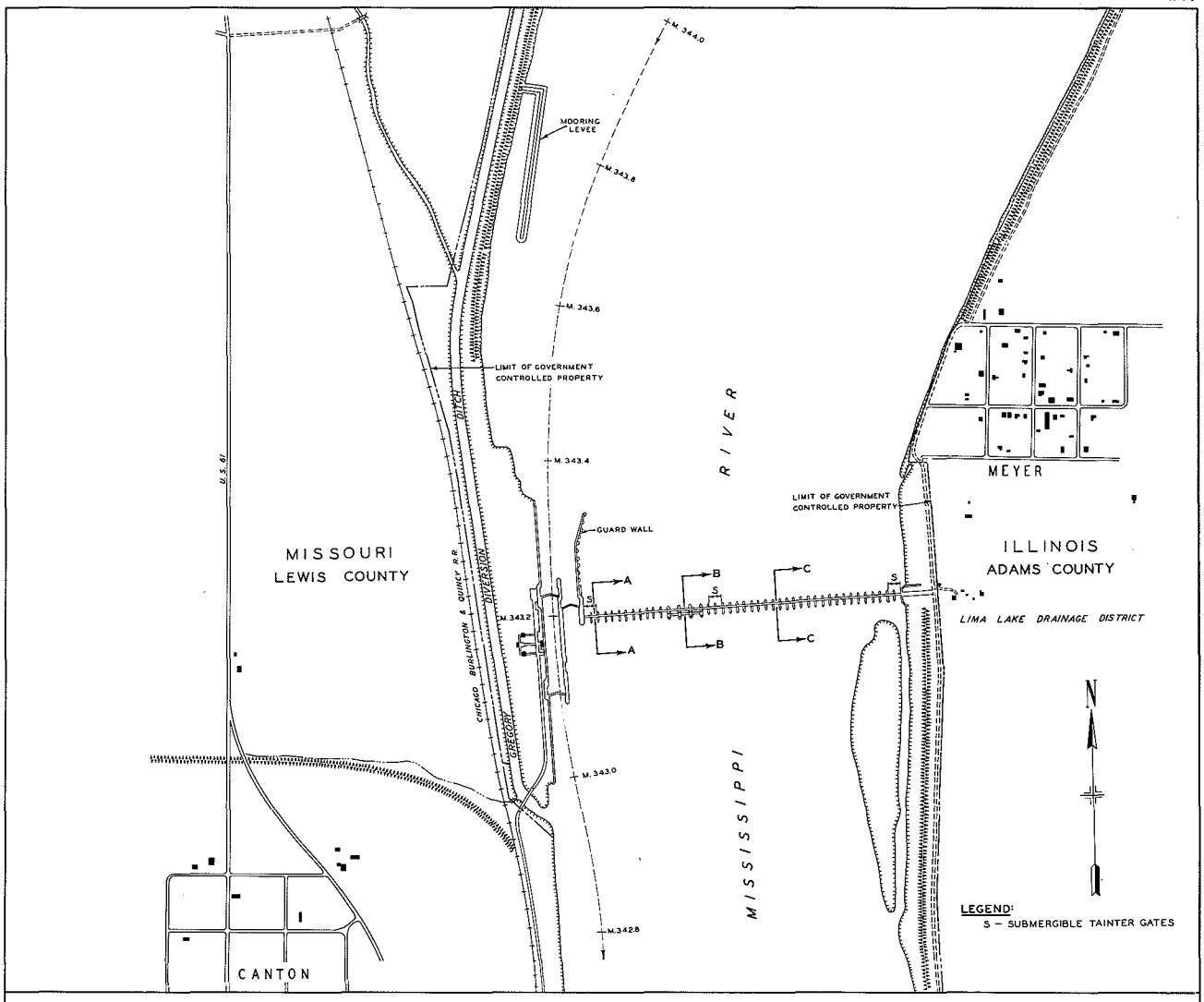
Loess, eroded from the highlands and combined with decayed vegetable matter, has been deposited on the flood plain over centuries of recurrent high water stages to create a deep and fertile soil. Bedrock beneath the deeper part of the preglacial channel is the Hannibal Shale. Above this and exposed in the valley walls is the limestone.

3. Lock and Dam No. 20. The structure, located at river mile 343.2, is the tenth such installation within the Rock Island District in terms of a downstream progression from the northern District limits on the river. The 110-foot by 600-foot lock and the completed upper section of a proposed future auxiliary lock lie adjacent to the Missouri shore. The operable position of the dam consists of 3 roller gates and 40 tainter gates which are adjusted and positioned to maintain the upstream pool within the authorized elevation under low and medium low flow conditions. Druing higher flows the gates are removed from the water. A short 150-foot earth fill section completes the dam and ties to a levee along the Illinois shore.

A plan and location of Lock and Dam No. 20 is shown on plate II-2.1, and on Chart No. 61 of the Upper Mississippi River navigation charts, which is a part of this master plan submission.

4. Pool 20. Beginning in a northerly direction, the pool bears gradually to the northeast to reach Lock and Dam No. 19 at Keokuk, Iowa, a distance of 21.0 river miles. The drainage area, at the dam is 134,300 square miles. The pool varies in width from 1,200 to 5,500 feet at the authorized elevation (flat pool) of 480.0 feet above mean sea level (1912 adj.). Since the dam became operable, the low water of record, at the dam, occurred on 14 December 1936 at elevation 462.3 or 17.7 feet below the authorized flat pool level. Record high water at the dam was established on 1 May 1965 at elevation 490.71 or 10.71 feet above the authorized flat pool elevation.

Maintenance dredging, all in the lower three-fourths of the pool, has amounted to 3,402,155 cubic yards of material since the dam became operable. Dredging operations have differed from those necessary in upstream pools where activity has been concentrated mainly in the upper regions. The upper quarter of Pool 20 benefits from the scouring action resulting from operation of the power dam at Keokuk, Iowa, while the influence of the Des Moines River is apparent in the remainder of the downstream stretch.



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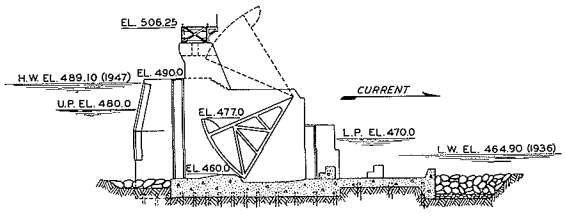
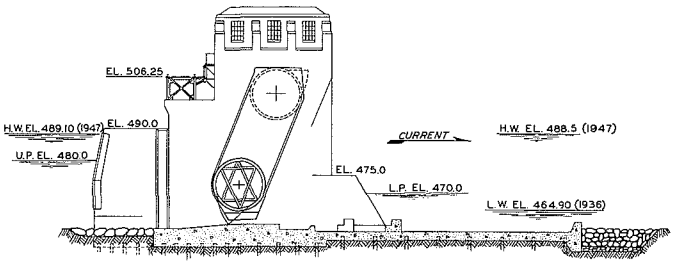
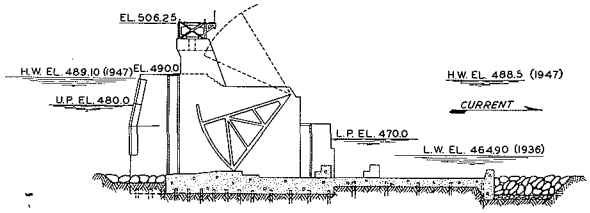
SCALE IN FEET



SECTION A-A



SECTION B-B



SECTION C-C

10 0 20 40 60
SCALE IN FEET

NOTE:
AVAILABLE DIMENSIONS OF LOCKS:
MAIN LOCK 600' X 110'
AUXILIARY LOCK 360' X 110' (FUTURE)
CONTROLLING DEPTH 12' AT NORMAL POOL
NORMAL LIFT 10 FEET.

REFERENCES:
1. ELEVATIONS BASED ON MEAN SEA LEVEL DATUM (1912 ADJUSTMENT).
2. RIVER MILEAGE ORIGINATES AT MOUTH OF OHIO RIVER.

MISSISSIPPI RIVER
RIVER AND HARBOR PROJECT
LOCK & DAM NO. 20
NEAR CANTON, MISSOURI

SCALE AS SHOWN
ROCK ISLAND DISTRICT
30 JUNE 1953

SECTION III

POOL RESOURCES

1. General. The existing physical features and resources of the pool are herein examined on both a qualitative and quantitative basis. Present and proposed resource management, usage, and recommendations for development are predicated on such factors.

As noted in Chapter I, paragraph 7b, page II-5, acreages have been calculated from master plan maps for general land use planning and are not to be considered accurate for legal purposes. Significant variance may exist between the acreages as given and the official records maintained by the Real Estate Division of the Rock Island District office.

2. Water. The general characteristics of both a river and a shallow lake are present in the 7,542 acres of average water surface within the pool area. A flat pool, although authorized and established, cannot be maintained with any degree of accuracy because of the fluctuating discharge emanating from the Keokuk power dam as a result of varying power demands. Approximately 14%, or 1,056 surface water acres are considered as channel waters, have a minimum depth of 9 feet, and a minimum width of 400 feet. The remaining 86%, or 6,486 surface acres, are considered as off-channel waters, vary in depth, and may present navigational hazards to small craft.

Agricultural pollutants represented by fertilizers, insecticides, and feedlots may enter Mississippi River waters by way of the Des Moines River and the three contributing creeks as well as shore runoff in the upper area. The remainder of flood plain agricultural lands, however, are separated from the river by a levee system and pollutants can be discharged only at interior drainage outlet points.

3. Land. In Pool 20, as in previous Pool 19, the Federal Government owns very little fee shore land and no island property. Only shore tracts immediately associated with the lock and dam structure have been acquired along with a narrow 4½-mile strip of Missouri shore extending upstream of the lock installation. Land acquired in fee, necessary for project construction, amounted to 236 acres of which 178 acres remain above the normal flat pool elevation.

Normal shoreline, mainland and islands, totals about 93 miles within the pool limits. Approximately 5¼ miles

of mainland shoreline is owned and controlled by the Federal Government and administered by the Corps of Engineers. Forty-one miles of mainland and 46 miles of island shoreline are under the jurisdiction of other than Federal agencies. Thirty-five islands of variable size with a combined area of 1,943 acres lie within the pool.

4. Vegetation. Vegetative cover on the 178 acres of Federally owned land is generally classed as open since a levee occupies a large part of the property. Cover on 45 acres, or 25% of the land area, is classified as medium to dense; 6 acres, or 4%, as sparse; and 127 acres, or 71% as open. Cottonwood, American elm, and maple are the predominant tree species, but are not of sufficient number to be considered in a forestry management program.

5. Wildlife. Favorable habitat for wildlife is present mainly on pool islands which are generally well vegetated. Shoreline cover, in many areas, tends to be thin and does not extend inland for any appreciable distance because of agricultural pursuits on the landward side of the levee bordering the pool. While habitat may be considered as average, small animal populations are less than those to be found in the areas of most other pools. No wildlife sanctuaries have been established by the States or Federal Government within the Pool 20 area.

a. Birds. Pool waters and adjacent agricultural lands are attractive to the 19 species of ducks and 4 species of geese that follow the "Mississippi Flyway" during the spring and fall migratory periods. Flocks of ducks numbering upwards of an estimated 5,000 birds have been observed on the water immediately upstream of Dam No. 20 during the fall migration. Upstream slough areas offer shelter and still water while adjacent farmlands serve as feeding grounds for some species.

The wood duck is a summer resident of the pool area. Mallard, blue-wing teal, and hooded merganser may also nest on occasion. Other aquatic birds frequenting the pool are the coot, grebe, American egret, bittern, and several species of gulls. Numerous species of songbirds are summer residents or transients. The presence of owls and hawks is fairly common in the area. The bald eagle is a frequent visitor to the pool area.

b. Animals. Small animal populations include raccoon, skunk, weasel, opossum, mink, muskrat, beaver, fox, squirrel, rabbit, and woodchuck. Badger and otter are a rarity and a coyote may occasionally be reported.

Muskrat are generally abundant, but will vary in numbers from year to year depending on water conditions and elevations. Squirrel and raccoon, too, are usually abundant, but are subject to changing habitat conditions resulting from fire, flood, and available food supply. Except for rabbit, other small animal populations are considered as stable, but relatively low in numbers.

The white-tailed deer, also known as the Virginia deer, is the only large game animal inhabiting the region. The deer population, although small in numbers, has extended distribution, ranging mainly in the timbered bottomlands of the pool and its tributaries.

Several varieties of harmless watersnakes are to be found in pool and tributary waters, especially in backwater and slough areas. Poisonous snakes, which may be found on land areas, are the massasauga, timber, and canebrake rattlesnake, and the copperhead. Although fairly common in the days of the early settlers, these poisonous reptiles are now seldom seen.

6. Fish. Sport and commercial species of fish taken from pool waters include walleye, northern, sauger, carp, bullhead, bluegill, crappie, bass, freshwater drum, channel catfish, and buffalo. No creel census is available as to man-hours of effort and the species mostly taken in the sport fishery recreational category, but all species except carp and buffalo are generally popular with fishermen. Sport fishing accounted for a catch of only 15,000 pounds during 1970 which reflects the rather low population concentration in the pool area as well as lack of recreational sites. The commercial catch, consisting primarily of carp, buffalo, freshwater drum, and channel catfish, amounted to 151,350 pounds during 1970, a fairly respectable take when considering the general lack of access to pool waters.

7. Recreation. Non-Federal recreational facilities in Pool 20 are few in number being located only along the riverfront of population centers. The levee system, along each river bank throughout most of the pool, does not permit ready access to water areas.

Only one area of Federal land exists within the pool limits and extends upstream of Dam No. 20 along the Missouri shore. At the upper limits of this tract the Corps of Engineers has developed a small public use area with basic facilities and a small-boat launching ramp. Only limited camping space is available. Another minor public use facility consisting of picnic tables only is located adjacent

to Lock No. 20. Additional recreational developments within the pool will necessarily be the responsibility of non-Federal entities unless the Government acquires additional fee land.

8. Historical and archaeological. Keokuk, Iowa, bears the name of the famous Sauk and Fox indian chief - the bitter rival of Black Hawk - who replaced the war chief as tribal leader by order of the U. S. Government following Black Hawk's abortive attempt to drive out the whites in the War of 1832. Ordered out of the State of Illinois by President Jackson because of the help the Indians had given the British in the War of 1812, Chief Keokuk led his people into the Iowa Territory and established a new village at the confluence of the Des Moines and Mississippi Rivers. In 1833 he sold the eastern portion of the Iowa Territory to the Federal Government for $900,000 and later sold his own reserve of 400 square miles in the southeastern corner of the future State. In 1837 he sold another 1,250,000 acres of land and in 1842 he sold the remainder of what was to become the State of Iowa, for $800,000.

Keokuk was described as being more magnificant than any other Indian chief as well as a brilliant orator. After selling all tribal lands comprising the future State of Iowa, Keokuk moved his people to Kansas where he died in 1847. Although death was likely the result of disease, some believed he was poisoned by one of Black Hawk's sons. The remains were reinterred in the city which now bears his name in 1883.

Five hospitals were established in the city of Keokuk in 1861 to care for the ill and wounded brought up the river from southern battlefields during the Civil War years. Iowa's only National Cemetary is located in the city.

The Des Moines River was first explored in 1841 by famed John C. Fremont who was later to become a U. S. army general. In 1849 General Samuel R. Curtis directed one of the first factual surveys on the stream. Private interests later initiated a program to build a series of locks and dams in the river to serve the purpose of commercial navigation upstream to the city of Des Moines. The project was eventually abandoned.

The prehistoric Mississippi River followed the lower portion of the present Des Moines River valley before resuming its generally southerly course. Opposite this ancient bend and below the mouth of the present Des Moines River, Fort Johnson was established in 1812 on the high

shore of the future State of Illinois (1818). Major Zachary Taylor, later to become president of the United States, founded Fort Edwards a short distance upstream on an even more commanding height in 1814. Named for Governor Ninan Edwards, the last territorial and first Governor of Illinois, the fort was abandoned in 1824 as a military post. However, its buildings remained standing and were used by white families fearing Indian attacks during the Black Hawk War of 1832. The town of Warsaw was established on the site of Fort Johnson in 1834 and now includes the historic site of Fort Edwards within its city limits.

A settlement known as Tully was once located on the Missouri shore upstream of present Lock and Dam No. 20. Completely obliterated in the flood of 1851, the town was never rebuilt although lots are still being sold.

Peoples of prehistoric periods as well as the Indians of historic times necessarily chose village sites near the banks of rivers and large streams. Gravel beds and rock outcroppings provided material for arrow and spear heads. Fish, wildfowl, and animals were present as a food source, and water itself was a necessity of life. Burial mounds likely exist on high ground on both sides of the Mississippi as well as the Des Moines River since the remains of several cultures of aboriginal people have been studied from St. Paul, Minnesota, to Baton Rouge, Louisiana, and in the Ohio River Valley.

SECTION IV

FACTORS AFFECTING RESOURCE USE

1. General. Pool 20 is another link in the chain of navigation pools created by the 9-foot channel project on the Upper Mississippi River. Except for one rural industry, pool waters serve for transit of commerce to population centers within and beyond pool limits. Plate IV-2.1 graphically traces commercial activities at Lock No. 20 over a period of nearly two decades of navigation traffic. Comparitively few water-oriented recreational facilities are presently available to the public.

2. Zone of influence. The primary zone of influence is considered as an area two counties in width (approximately 50 miles), extending inland on both sides of the river, and following the length of the Rock Island District. The approximate total 1960 population of the entire area is given in Chapter I, Section VII, paragraph 3a. An attempt to estimate population by pools is considered as impractical since a given pool may span portions of several counties and the limits of the larger cities, in most instances, extend along the shores of both an upper and lower pool.

Four concentrations of population exist along the pool with one - Keokuk, Iowa, lying adjacent to both pools 19 and 20, as does also Hamilton, Illinois, but to a lesser extent. Residents and visitors to both cities have the recreational facilities of two pools at their disposal. The 1960 census counted 16,316 persons in Keokuk, Iowa; 2,516 in Hamilton, Illinois; 1,938 in Warsaw, Illinois; and 452 in Alexandria, Missouri.

3. Economic conditions. Except for industrial developments located in Keokuk, Iowa, Warsaw, Illinois, Alexandria, Missouri, and at river mile 353.0, Missouri, the economy the pool area is entirely agricultural. An extensive levee system protects low lying farmlands, adjacent to the river, through most of the pool stretch. No State or county parks exist on or near pool shores, but visitors are attracted to Keokuk, Iowa, and Warsaw, Illinois, because of sites of historical significance.

Although the Federal Government owns very little land within the pool, a 2-acre tract has been reserved at river mile 343.4, Illinois, for industrial use and is presently occupied under lease. No other Federal lands are classified under an industrial availability.

4. Accessibility. Railroad passenger service, available to and from eastern points at Keokuk, Iowa, and Warsaw, Illinois, has been discontinued. Although a railroad borders the pool along the Missouri shore, no scheduled passenger service is offered. Scheduled bus service is operated, however. A municipal airport serves Keokuk, Iowa, with commercial uncontrolled-traffic facilities. Warsaw, Illinois, maintains a landing field for small-craft.

Road access to pool waters is mostly restricted to areas of urban establishment. Only two other points of access exist in the entire pool stretch. One road leads to a rural industrial operation and another road provides access to the only Corps of Engineers recreational development established on Federal property other than that associated with Dam No. 20.

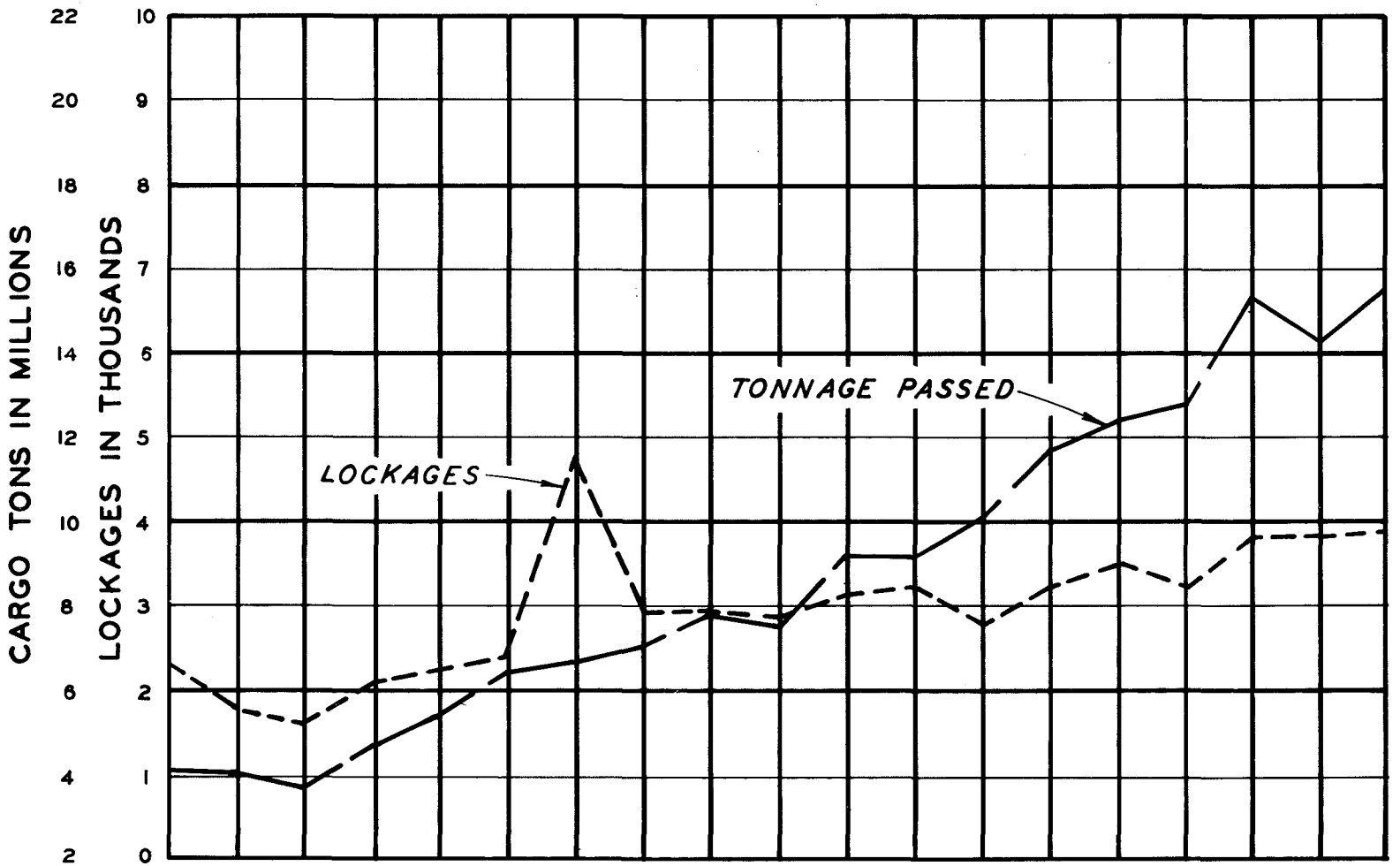
The Great River Road is planned to eventually follow both shores of the river, as closely as possible, from the Canadian border to the Gulf of Mexico to create a route of outstanding scenic attraction. Primary responsibility for construction or relocation of roads to realize this goal rests with the States and counties with some cooperation from the Federal Government in the form of technical assistance. The presently established route does not afford a view of the river within the pool limits except for a short distance upstream of Warsaw, Illinois. The full scenic concept of the road will likely not be realized in pool 20 unless, at some future time, the levee system paralleling most of the pool stretch is widened and the Great River Road relocated on the crown.

No scheduled sightseeing boats presently operate from the communities located on pool shores. One combination highway and railroad draw span bridge crosses the river immediately downstream of the Lock and Dam at Keokuk, Iowa, river mile 363.9.

5. Existing recreational facilities.

a. Of the 25 recreational areas established and maintained by the Corps of Engineers within the Rock Island District, plate IV-2.2, two are located on the Missouri shore of Pool 20.

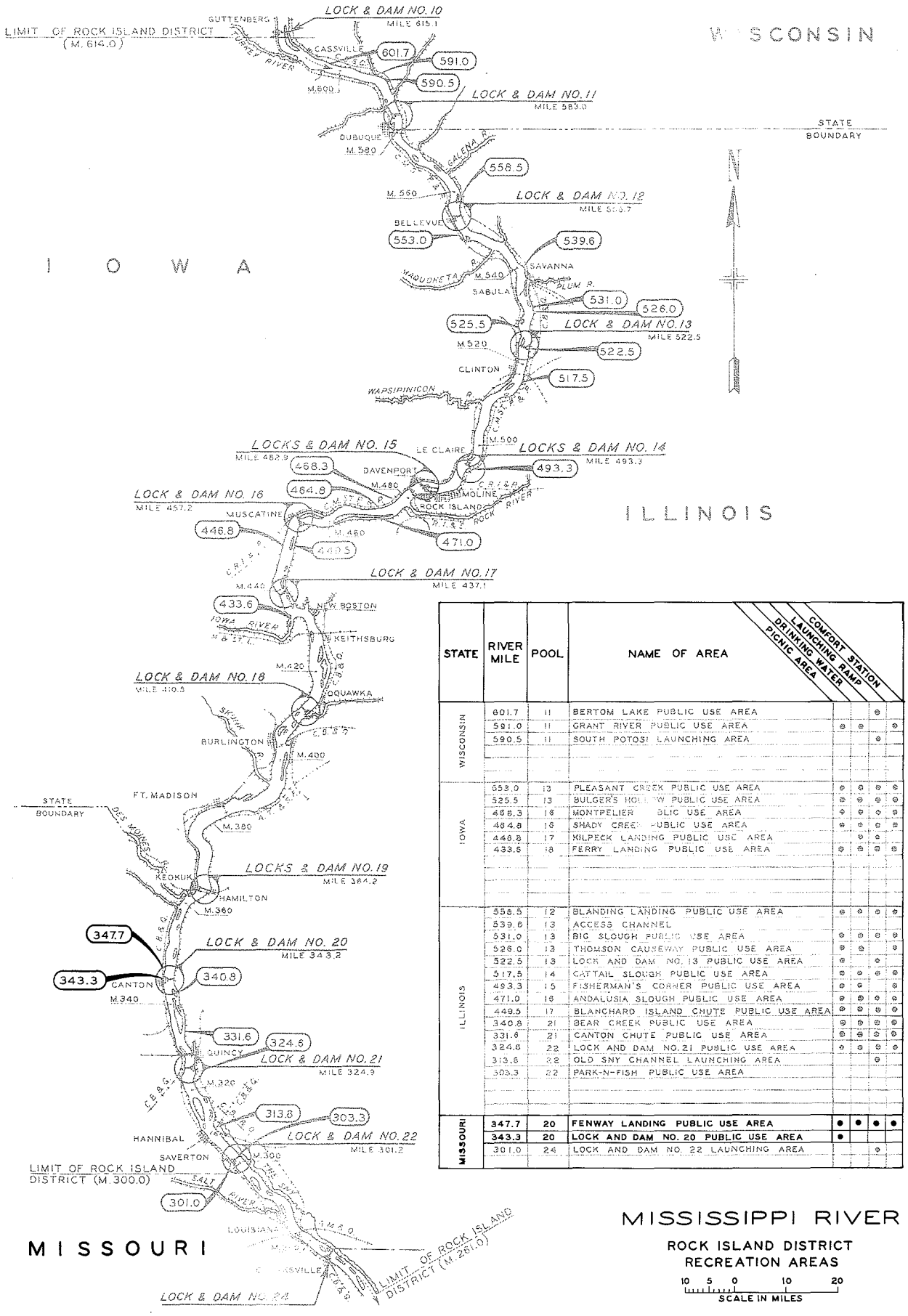
(1) Fenway Landing Public Use Area. Located at river mile 347.7, plate IV-2.3, the 1½-acre site lies approximately 4 miles upstream of Canton, Missouri. Facilities include a potable water supply, 11 picnic tables, 5 fireplaces, 6 trash receptacles, 2 pit-type sanitation units, passenger



LOCK NO. 20

CORPS OF ENGINEERS U.S. ARMY

PLATE IV-2.1



STATE	RIVER MILE	POOL	NAME OF AREA	COMFORT STATION	LAUNCHING RAMP	DRINKING WATER	PICNIC AREA
WISCONSIN	601.7	11	BERTOM LAKE PUBLIC USE AREA			⊕	
	591.0	11	GRANT RIVER PUBLIC USE AREA	⊕	⊕		⊕
	590.5	11	SOUTH POTOSI LAUNCHING AREA			⊕	
IOWA	553.0	13	PLEASANT CREEK PUBLIC USE AREA	⊕	⊕	⊕	⊕
	525.5	13	BULGER'S HOLLOW PUBLIC USE AREA	⊕	⊕	⊕	⊕
	466.3	18	MONTPELIER PUBLIC USE AREA	⊕	⊕	⊕	⊕
	464.8	18	SHADY CREEK PUBLIC USE AREA	⊕	⊕	⊕	⊕
	446.8	17	KILPECK LANDING PUBLIC USE AREA		⊕	⊕	
	433.6	18	FERRY LANDING PUBLIC USE AREA	⊕	⊕	⊕	⊕
ILLINOIS	556.5	12	BLANDING LANDING PUBLIC USE AREA	⊕	⊕	⊕	⊕
	539.6	13	ACCESS CHANNEL				
	531.0	13	BIG SLOUGH PUBLIC USE AREA	⊕	⊕	⊕	⊕
	526.0	13	THOMSON CAUSEWAY PUBLIC USE AREA	⊕	⊕		⊕
	522.5	13	LOCK AND DAM NO. 13 PUBLIC USE AREA	⊕		⊕	
	517.5	14	CATTAIL SLOUGH PUBLIC USE AREA	⊕	⊕	⊕	⊕
	493.3	15	FISHERMAN'S CORNER PUBLIC USE AREA	⊕	⊕		⊕
	471.0	18	ANDALUSIA SLOUGH PUBLIC USE AREA	⊕	⊕	⊕	⊕
	449.5	17	BLANCHARD ISLAND CHUTE PUBLIC USE AREA	⊕	⊕	⊕	⊕
	340.8	21	BEAR CREEK PUBLIC USE AREA	⊕	⊕	⊕	⊕
	331.6	21	CANTON CHUTE PUBLIC USE AREA	⊕	⊕	⊕	⊕
	324.6	22	LOCK AND DAM NO. 21 PUBLIC USE AREA	⊕	⊕	⊕	⊕
	313.8	22	OLD SNY CHANNEL LAUNCHING AREA			⊕	
	303.3	22	PARK-N-FISH PUBLIC USE AREA				
MISSOURI	347.7	20	FENWAY LANDING PUBLIC USE AREA	●	●	●	●
	343.3	20	LOCK AND DAM NO. 20 PUBLIC USE AREA	●			
	301.0	24	LOCK AND DAM NO. 22 LAUNCHING AREA			⊕	

MISSISSIPPI RIVER

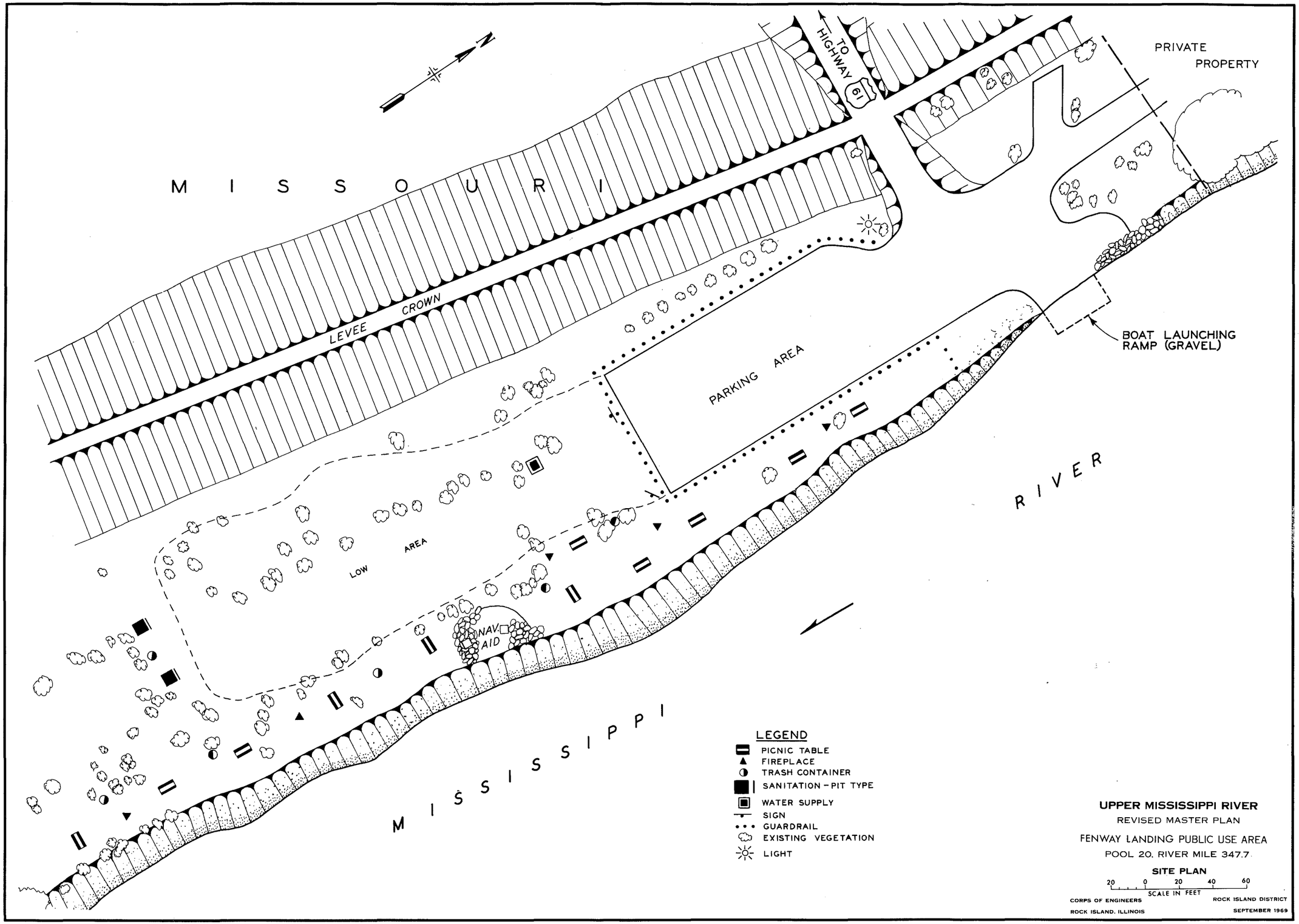
ROCK ISLAND DISTRICT RECREATION AREAS

10 5 0 10 20
SCALE IN MILES

CORPS OF ENGINEERS, U.S. ARMY
ROCK ISLAND, ILLINOIS

ROCK ISLAND DISTRICT
FEBRUARY 1968

PLATE IV - 2.2



UPPER MISSISSIPPI RIVER

REVISED MASTER PLAN

FENWAY LANDING PUBLIC USE AREA

POOL 20, RIVER MILE 347.7

SITE PLAN

20 0 20 40 60

SCALE IN FEET

CORPS OF ENGINEERS ROCK ISLAND DISTRICT

ROCK ISLAND, ILLINOIS SEPTEMBER 1969

PLATE IV - 2.3

car parking, a graveled boat ramp and maneuvering area, and parking for approximately 6 car-boat trailer units. Although not intended or designed for camping, some such use is made of the very limited space available. Access is by a continuation of a county road ramped over the levee to the parking and maneuvering areas - no circulation roads are present.

(2) Lock and Dam No. 20 Public Use Area. An area of less than an acre, plate IV-4.1, is positioned along the landwall immediately upstream of the lock chamber. A graveled parking area will accommodate 34 cars and is primarily for spectators viewing the river and the water traffic. Five picnic tables and 5 trash containers are the only facilities provided. No open fires are permitted because of the proximity of barges and towboats approaching the lock.

b. All other existing recreational developments within the pool area are located on non-Federal property. The developments are located at Montebello State Park, river mile 364.0, Illinois; a steamboat museum, river mile 363.7, Keokuk, Iowa; a municipal boat ramp, river mile 363.5, Iowa; a boat dock, river mile 363.5, Iowa; a boat club, river mile 363.0, Iowa; a historical site, river mile 360.1, Illinois; a municipal ramp, river mile 359.7, Illinois; a marina, river mile 359.1, Illinois; and a boat dock, river mile 358.9, Missouri.

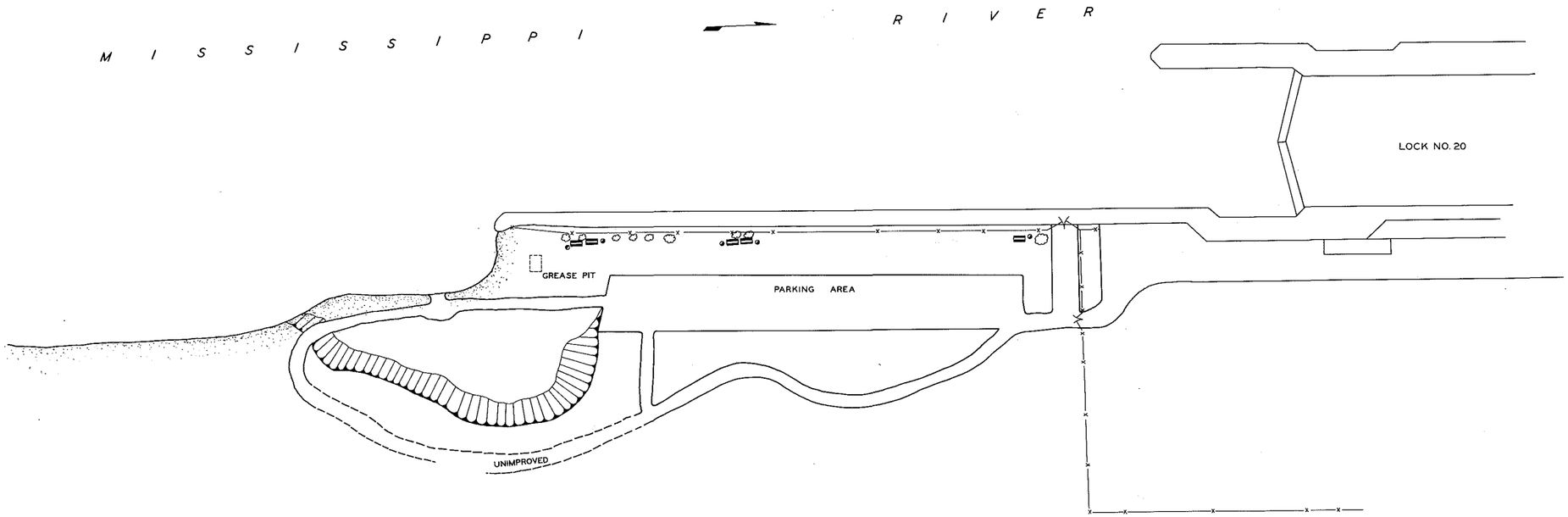
6. Water quality. The waters of this pool are generally considered satisfactory for all forms of water-oriented recreation. Volumes of flow from the Des Moines River, main stream flows, distance and time all tend to improve the quality of water over the upstream pool. The suspended silt and agricultural pollutants pose the greatest threat to future water quality.

7. Climatic conditions. The pool area experiences a mean annual temperature of 51°F. with a summer average of 74°F. and an average of 27°F. during the winter months. Extremes during the 1959-1969 period have been 103°F. and -14°F. Extreme temperatures of record are 111°F. and -27°F. Freezing temperatures have occurred as early as 6 October and as late as 20 April.

The crop growing season spans a period of approximately 183 days. Precipitation averages 35 inches annually. Prevailing summer winds are from the south and southwest and shift to the northwest in winter.

River navigation is normally halted by ice formation in late December and resumes by late February or early March.

Activities have been possible throughout the winter period in some years and increasingly powerful towboats are tending to extend the generally accepted navigation season. Studies are presently being conducted by the Corps of Engineers on the feasibility of year-round navigation.



LEGEND
- PICNIC TABLE
- TRASH CONTAINER
- EXISTING VEGETATION

UPPER MISSISSIPPI RIVER

REVISED MASTER PLAN

LOCK AND DAM NO. 20 PUBLIC USE AREA

POOL 20, RIVER MILE 343.3

SITE PLAN

40 0 40 80 120
SCALE IN FEET

CORPS OF ENGINEERS
ROCK ISLAND, ILLINOIS

ROCK ISLAND DISTRICT
SEPTEMBER 1969

PLATE IV - 4.1

SECTION V

CURRENT AND ANTICIPATED RECREATIONAL USE

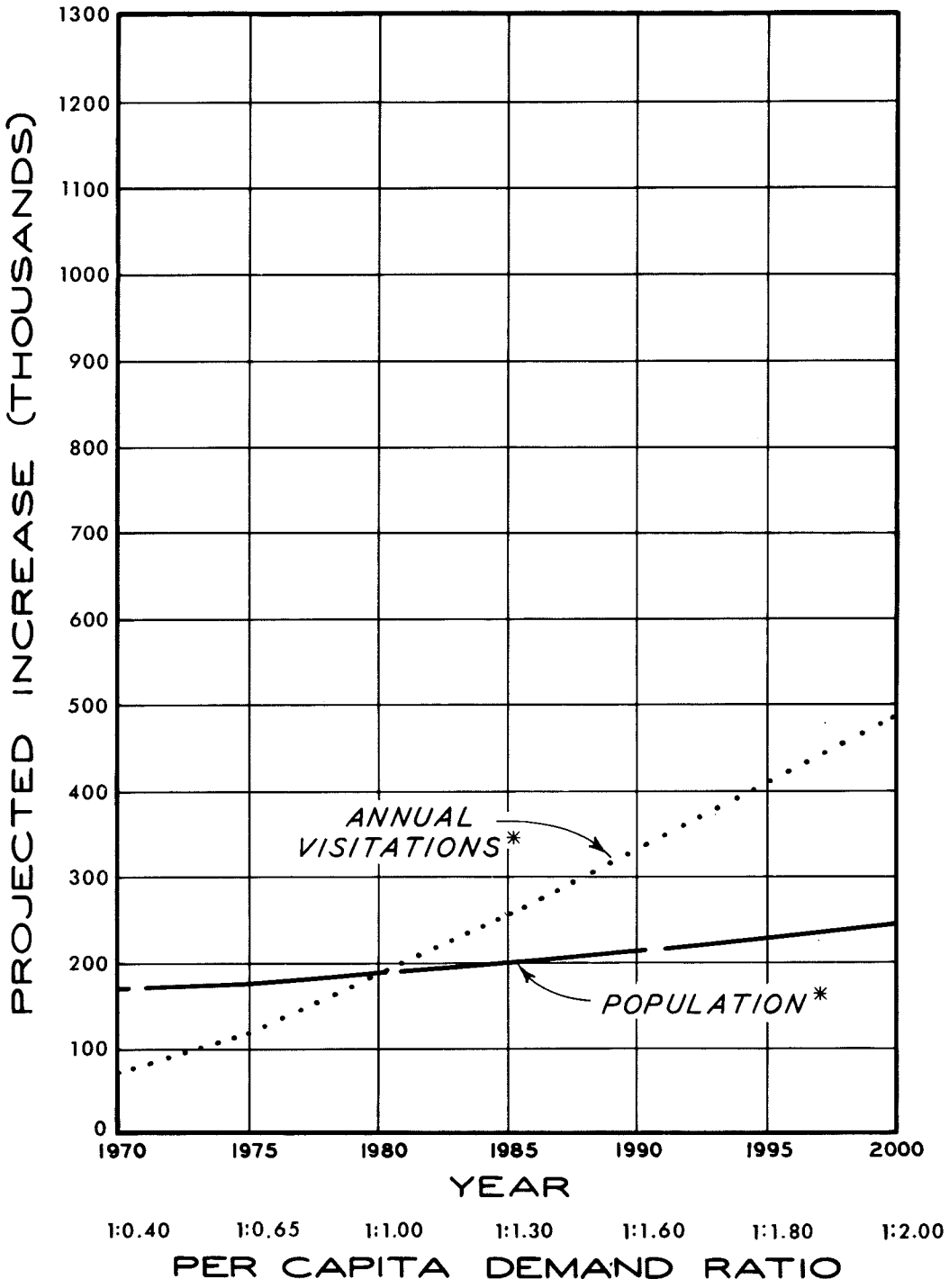
Pool 20 ranks twelfth among the pools in the limits of the Rock Island District. The annual recreational visits reached a figure of 101,920 in 1970. Recreational attendance ranged from a low of 1,850 visits in January to a high of 15,875 in July. Peak-day visitation was estimated to be 4,875.

The low visitation was actuated by the fact Pool 20 is primarily an agriculturally oriented area, with a low population density.

Plate V-1.1 presents the anticipated population increase and corresponding recreational demand within the primary zone of influence. The per capita demand ratio is calculated on the 1970 population, and visitations reported in the past. A relatively constant increase is projected from 1970 to the year 2000 with the per capita demand ratio reaching 1:100 about the year 1980.

Plate V-1.2 tabulates pool recreational facilities presently developed or proposed by both Federal and non-Federal agencies or individuals. Non-Federal installations are limited to those immediately adjacent to the river and may or may not be located on lands leased from the Federal Government. Proposed non-Federal developments are those known to be scheduled for completion in the near future.

Total requirements for future demand is predicated on anticipated population and public recreation participation. Projected facility developments, to serve an increasing population and demand, are calculated from criteria established in ER 1130-2-312. On this assumption adequate facilities are neither existing nor presently proposed.



* PRIMARY ZONE - AREA TWO COUNTIES IN WIDTH (APPROX. 50 MILES) EXTENDING INLAND ON EACH SIDE OF POOL.

POOL 20
MISSISSIPPI RIVER
PROJECTED POPULATION & VISITATIONS

POOL 20

1969 EXISTING AND PROPOSED FACILITY DATA

	EXISTING FEDERAL FACILITIES	EXISTING NON-FEDERAL FACILITIES	TOTAL EXISTING FACILITIES	RECOMMENDED FEDERAL FACILITIES	PROPOSED NON-FEDERAL FACILITIES	TOTAL PROJECTED FACILITIES	*TOTAL REQUIREMENTS FOR ANTICIPATED DEMAND			
							1970	1980	1990	2000
DAY-USE										
PARKING (UNITS)	42	10	52	0	0		18	46	84	120
PICNIC TABLES	16	5	21	0	0		18	46	84	120
FIREPLACES	5	0	5	0	0		9	23	42	60
POTABLE WATER	1	1	2	0	0		1	2	3	4
SHELTERS	0	0	0	0	0		5	13	25	35
BOAT LAUNCHING										
PARKING (UNITS)	6	90	96	0	0		10	40	80	120
RAMPS	1	3	4	0	0		1	4	8	12
CONCESSIONS, FUEL, ETC.	0	3	3	0	0		—	—	—	—
SANITATION										
PIT TOILETS	2	2	4	0	0		2	2	2	4
FLUSH TOILETS	0	4	4	0	0		NONE PROPOSED			
TRAILER STATIONS	0	0	0	0	0		UNDETERMINED			
CAMPING										
PARKING SPURS (GRAVEL)	0	5	5	0	0		9	24	45	64
PICNIC TABLES	0	0	0	0	0		9	24	45	64
FIREPLACES	0	0	0	0	0		9	24	45	64

* BASED ON ER 1130-2-312 CRITERIA:
- 1 PICNIC TABLE PER 4000 ANNUAL VISITORS
- 1 PARKING SPACE PER TABLE
- 1 FIREPLACE PER 2 DAY-USE PICNIC TABLES
- 1 FIREPLACE PER CAMP SPUR
- 1 SHELTER PER 225 WEEK-END DAY VISITORS
- 1 LAUNCHING RAMP PER 40,000 ANNUAL VISITORS
- 10 CAR-TRAILER PARKING SPACES PER RAMP
- 2 PIT TOILETS PER 3000 WEEK-END DAY VISITORS
- 1 CAMP SPUR PER 7500 ANNUAL VISITORS

NOTES:

1. Less than 170 acres of Federal land exists within the pool limits. Primitive camping is permitted.
2. No supervised river swimming areas are in operation.
3. Road access to the river exists at 2 rural locations within the 47 miles of mainland shoreline.

CORPS OF ENGINEERS

U.S. ARMY

PLATE V-1.2

SECTION VI

POOL RESOURCE MANAGEMENT

1. General. The stated purpose of a master plan requires the examination and analysis of the various physical features of the pool as well as plans for utilization and development of the scenic, biologic, and recreational potential. Orderly and controlled resource protection and development is the basic purpose of a management program. In Pool 20, however, only limited application of such policies can be made because of the minor land acreages controlled by the Federal Government.

2. Land use zoning. Section VI, Chapter I, describes and outlines the zoning classifications established to meet the criteria of a master plan development. In Pool 20 only narrow strips of mainland property on each side of the river, above the lock and dam structure, are owned and controlled by the Federal Government. No islands are a part of government property.

All 178 acres of Federal land remaining above flat pool elevation are administered by the Corps of Engineers. There have been no outgrants made for fish and wildlife management. A recreation-developed classification has been assigned to 176 acres and the remaining 2 acres are occupied under a industrial lease.

3. Water zoning. Detailed water zoning is not considered in the concept of this master plan. Of the total 7,542 surface acres of water contained within the limits of the pool, 1,056 surface acres are considered as channel waters and are maintained at a minimum depth of 9 feet to serve craft of considerable draft such as towboats and barges. Submerged wing dams and stump fields in the off-channel areas, as indicated on the navigation charts, will generally not present operating hazards to pleasure boats in the lower half of the pool. In the upper reaches, however, such obstructions may lie at a more shallow depth with relation to the pool surface elevation and present a potential danger.

No purpose would be served in attempting to locate and publish water depths in the off-channel areas in the upper pool region. Changing currents and shifting sandbars would soon render much of such information obsolete and ineffective.

Definitive and explicit water zoning may become a necessity in the future, at least in certain areas, as populations increase and water-oriented recreational activities expand.

4. Timber management. A timber management program is not needed for such a limited amount of government-owned timber in Pool 20. All of the 178 acres are zoned recreation-developed.

5. Wildlife management. Prior to the 9-foot channel project, ownership of certain Mississippi River lands was vested in the Department of the Interior, Bureau of Sport Fisheries and Wildlife. Within the present limits of pool 20, however, no such ownership now exists. Lands currently under the administration of the Corps of Engineers are not sufficient to warrant a management program.

6. Shoreline ownership. The pool contains a total of 93 miles of shoreline at the established flat pool elevation. Island shoreline is represented by 46 miles of shore, none of which is owned by the Federal Government. Mainland shoreline totals 47 miles of which 5¼ miles are owned by the Federal Government and administered by the Corps of Engineers.

7. Additional recreational developments.

a. Corps of Engineers. Huff Island, in the vicinity of river mile 348.0 and adjacent to the Fenway Landing Public Use Area established by the Corps of Engineers, should be considered for future acquisition. The island is largely a sandbar area and attracts many primitive camping enthusiasts who use the boat launching ramp at the Fenway development. The limited Federal land presently available for public recreation makes such acquisition highly desirable to partially satisfy increasing demand.

Limited downstream expansion of the Fenway Landing Public Use Area is possible, but additions would be removed from the only parking area. No dredging has been performed in the area for over 30 years, however, spoil disposal, if available from future dredging operations, could be used to advantage to greatly enhance and improve the development.

b. Bureau of Sport Fisheries and Wildlife. No lands are owned or controlled by the Department of the Interior within the pool limits or administered by the Bureau.

c. States.

(1) Iowa. All of this section of pool shores is taken by the city of Keokuk. No area exists for a State development.

(2) Missouri. No suitable Federal lands exist on which the State could request an outgrant for recreational development. No present plans are being formulated for installations on non-Federal property.

(3) Illinois. The only Federal lands within the pool are associated with the Dam No. 20 structure. The State is not planning recreational developments on non-Federal lands in the region.

d. Counties.

(1) Lee (Iowa). The city of Keokuk occupies all of this section of the county. No lands are available for recreational development.

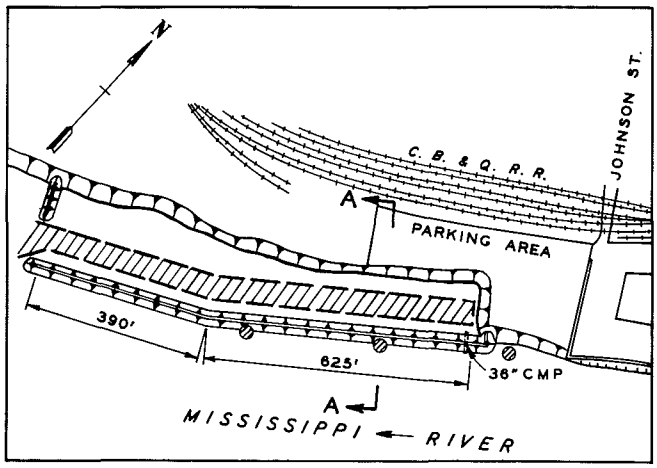
(2) Hancock and Adams (Illinois). While State law permits the establishment of county conservation boards, no such organizations have been organized in either county. No Federal lands, however, exist in Hancock County and only minor tracts associated with Dam No. 20 in Adams County.

(3) Clark and Lewis (Missouri). No county conservation boards are organized in the State.

e. Municipal. No Federal land exists within the limits of or immediately adjacent to the four communities along pool shores, except for property associated with the lock structure at Keokuk, Iowa.

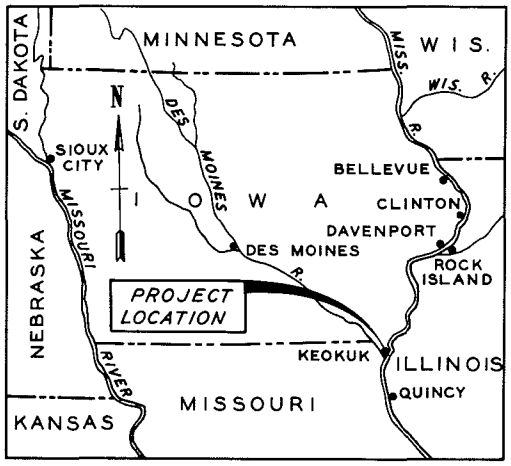
Plate VI-3.1 locates the small boat harbor authorized at Keokuk, Iowa, by the River and Harbor Act of 1962. Planning funds, however, have not been made available.

Plate VI-3.2 locates the small boat harbor authorized at Warsaw, Illinois, by the River and Harbor Act of 1962. Construction was completed in October 1966.



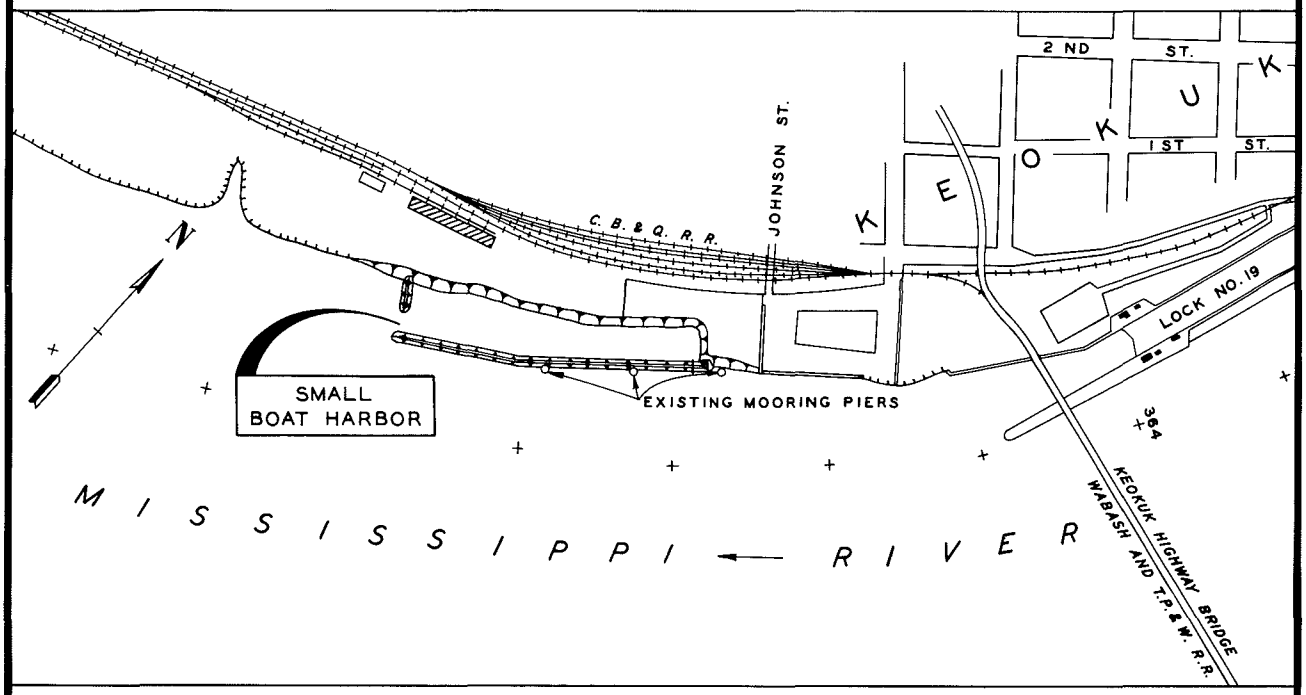
PLAN

100 0 100 300
SCALE IN FEET



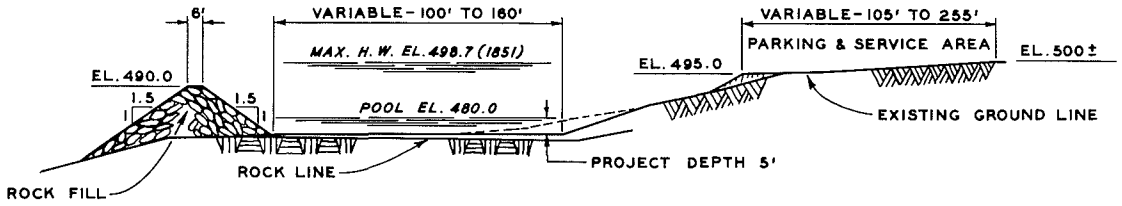
VICINITY MAP

25 0 50 100
SCALE IN MILES



LOCATION MAP

100 0 500 1000
SCALE IN FEET



SECTION A-A

10 0 50 100
SCALE IN FEET

LEGEND

DREDGING

MILEAGE ORIGINATES AT MOUTH OF OHIO RIVER

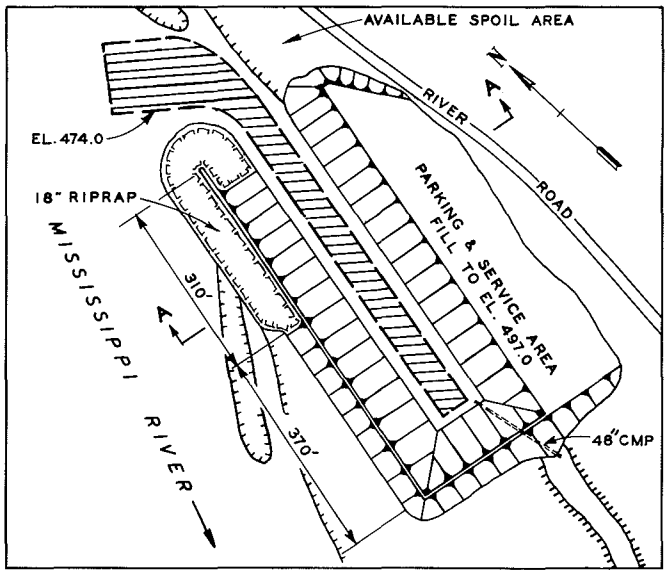
ELEVATIONS BASED ON MEAN SEA LEVEL DATUM (1912 ADJUSTMENT)

MISSISSIPPI RIVER
RIVER AND HARBOR PROJECT
KEOKUK, IOWA
SMALL BOAT HARBOR

SCALES AS SHOWN

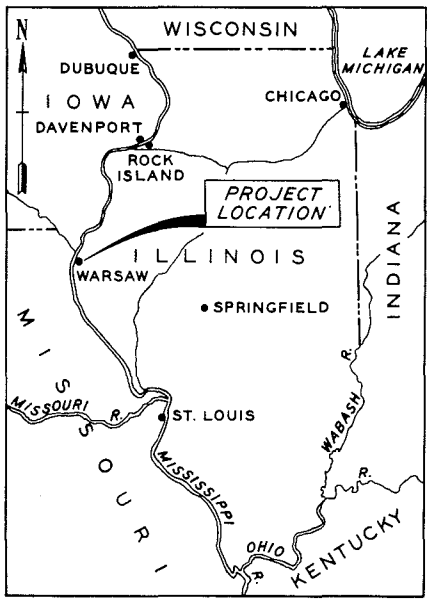
ROCK ISLAND DISTRICT

30 JUNE 1963



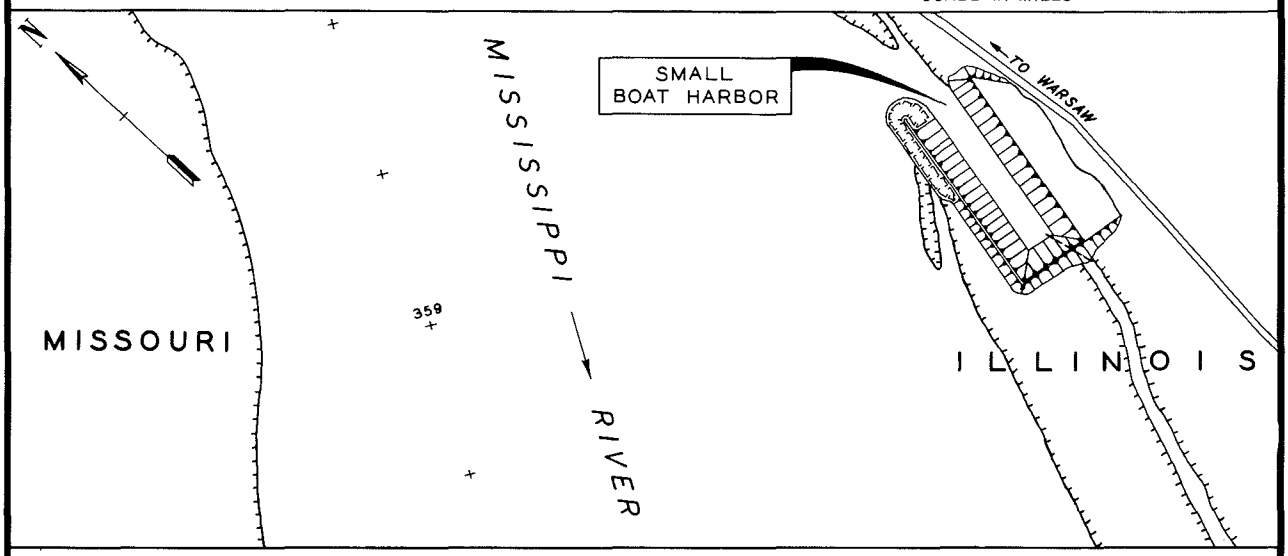
PLAN

100 0 100 200
SCALE IN FEET



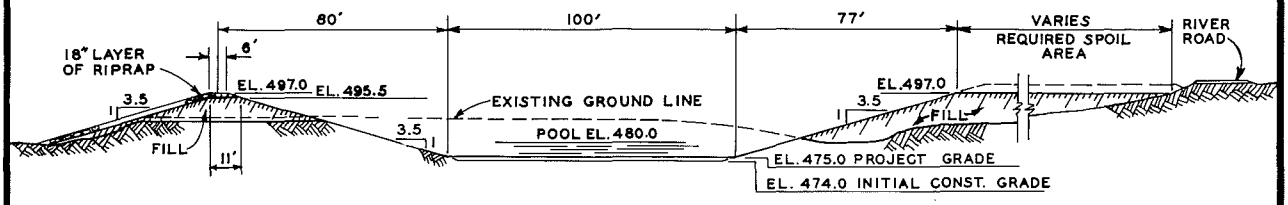
VICINITY MAP

25 0 25 50 75
SCALE IN MILES



LOCATION MAP

100 0 400 800
SCALE IN FEET



SECTION A-A

10 0 50 100
SCALE IN FEET

LEGEND

DREDGING

MILEAGE ORIGINATES AT MOUTH OF OHIO RIVER

ELEVATIONS BASED ON MEAN SEA LEVEL DATUM (1912 ADJUSTMENT)

MISSISSIPPI RIVER
RIVER AND HARBOR PROJECT
WARSAW, ILLINOIS
SMALL BOAT HARBOR

SCALES AS SHOWN

ROCK ISLAND DISTRICT

30 JUNE 1966

SECTION VII

OPERATION AND MAINTENANCE

1. Pool Manager-Ranger. The need for and suggested duties of the specialized position of pool manager-ranger are outlined and explained in Chapter I, Section IX, Project Administration. Pool 20 has no need for such services because of the small amount of Federal land existing within the pool limits. However, such lands as do exist are located immediately upstream of the lock and dam, and could readily be supervised by a manager-ranger assigned to downstream Pool 21.

2. Recreation facilities maintenance. Existing Federal recreation areas may be improved, expanded, and maintained with funds requested and allocated under applicable laws and regulations. The Corps of Engineers employs a field crew of 6 persons to accomplish such work on the 25 recreation areas existing within the Rock Island District, including Fenway Landing Public Use Area and the Lock and Dam No. 20 Public Use Area.

Improvement and maintenance of recreational facilities, established by the Corps of Engineers, is the responsibility of the Operations Division of the District Office which supervises and directs the efforts of field personnel assigned to such work. Activity on recreational sites continues throughout the year with additional temporary and seasonal employees added to the field crew when required. The supervisor of the group also acts as the contracting officer in the selection of individuals who accept seasonal appointments for trash and garbage removal, grass cutting, etc., on the various public use areas.

SECTION VIII

SUMMARY AND RECOMMENDATIONS

1. General summary. Recreational potential is limited throughout most of the pool by the levee system which generally follows close to pool shores and by the lack of access roads leading to areas near the river. Although Federally-owned lands are not extensive, suitable areas for development do exist, but are isolated insofar as road access is concerned. Industry has not begun to locate on the 41 miles of pool shores under non-Federal ownership, but future developments might adversely affect the ecology of the region unless zoned by the counties or States.

2. Recommendations.

a. Duties of a pool manager-ranger, if accepted in downstream Pool 21, should be expanded to include supervision of Federal lands in Pool 20. A periodic inspection and patrol of the Fenway Landing Public Use Area is desirable, and other Federal lands could be protected against unauthorized use. Possible vandalism might be minimized and closer public relations established.

b. Huff Island, in the vicinity of river mile 348.0 and offshore of Fenway Landing Public Use Area, is recommended for acquisition by the Federal Government. The island is largely a sandbar and is used by fishermen and primitive camping practioners who launch from the Fenway Landing ramp on the mainland.

c. The Federal Government should encourage the States and counties, located along pool shores, to develop zoning standards for the protection of water quality, existing scenic resource, and general regional ecology.

d. Approval is recommended for the land use zoning established for Federal property indicated on the transparent overlays accompanying certain base charts of the Master Plan for the pool. Private-use cottage sites on Federal lands, within the Rock Island District, will be phased out within a prescribed period. No such sites, however, are located on Federal property within Pool 20.

3. Suggested future recreational facilities.

a. The crown of the levee, extending between the Fenway Landing Public Use Area and Lock No. 20 along the Missouri

shore, is suitable for the location of a roadway. Establishment of such a road would provide more than 4 miles of scenic driving and ramps to lower levels would open several choice riverfront areas to recreational development.

b. A sealed bulletin-board type of display at Fenway Landing Public Use Area could contain posted information as to nearest phone service, emergency medical attention, hunting and fishing regulations and laws, vandalism warning, an appeal to reduce litter, etc. Samples of the flora and fauna of the region could be features as an educational service.

SECTION IX

REVIEW OF PLAN

1. Real Estate Division.

Pursuant to paragraph 5b of ER 405-2-835, the Master Plan was submitted for review and the Real Estate Division concurs that the material was prepared in accordance with sound real estate management and utilization practices.

H. E. KENDALL
Chief, Real Estate Division

2. Operations Division.

Sections of this Master Plan, which have a direct or indirect bearing upon the operation and maintenance of the Mississippi River, have been coordinated with the Operations Division.

ROBERT E. CLEVENSTINE
Chief, Operations Division