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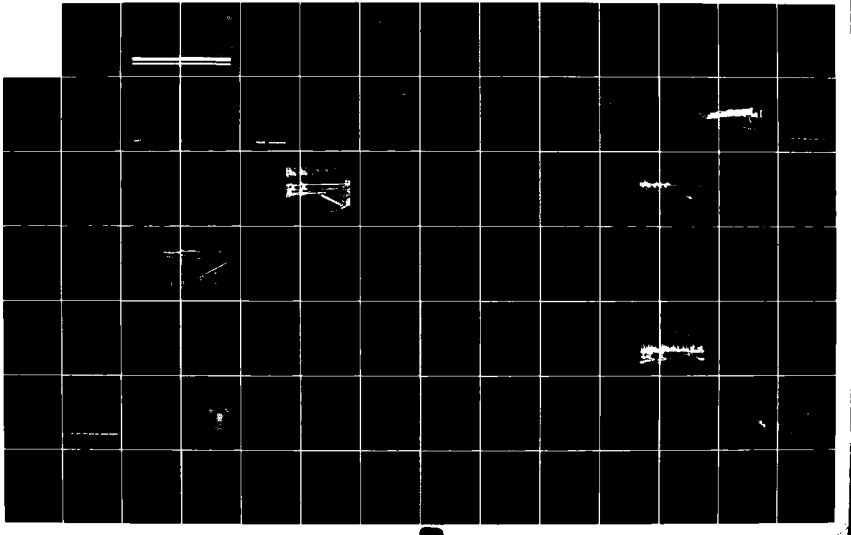

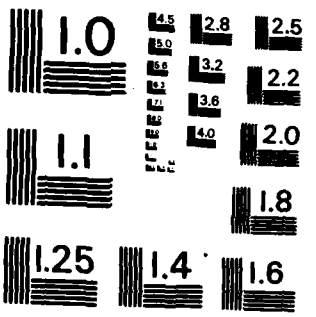

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UPPER MISSISSIPPI RIVER
LAND USE ALLOCATION PLAN

MENT AND RESOURCE MANAGEMENT PART I & PART II

SEPTEMBER 1983

US Army Corps of Engineers
St. Paul District

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St. Paul District, COE
Public Use Planning (PD-ES)
1135 U. S. P. O. & Customs House
St. Paul, Mn. 55101

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RECREATION
INLAND WATERWAYS
WILDLIFE

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The primary objective of this master plan for the Upper Mississippi River, is to provide a clear, practical, and balanced plan that will guide future Federal land use decisions and public use development actions. The intent is to provide balanced distribution of the resources for wildlife production and management, to satisfy public recreational demands, and to insure continued river navigation. The plan was cooperatively prepared by the Corps and the U.S. Fish and Wildlife Serice, Region 3.

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ACKNOWLEDGEMENTS

FISH AND WILDLIFE SERVICE
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
1135 U. S. POST OFFICE & CUSTOM HOUSE
ST. PAUL, MINNESOTA 55101

Dear Reader:

We are proud to present to you the land use allocation plan for Federal land along the Mississippi River between Guttenberg, Iowa, and Minneapolis, Minnesota.

The primary objective of this plan is to balance and enhance public recreational use and fish and wildlife management while maintaining the river navigation system. We are confident that this land use allocation plan fully accomplishes this objective.

Much of the Federal land along the river is cooperatively managed by the Corps of Engineers and the U.S. Fish and Wildlife Service. Therefore, our agencies have worked together very closely in the preparation of this land use plan. The result is a solid land use framework upon which both agencies will prepare detailed development and management plans.

Implementation of this allocation plan and the associated development and management plans that will stem from it will significantly improve management of Federal lands. Because of the national significance of the Upper Mississippi River, such improved management is clearly in the best public interest.

Sincerely,

Harvey K. Nelson
Regional Director, Region 3
U.S. Fish and Wildife Service

Edward G. Rapp
Colonel, Corps of Engineers
District Engineer, St. Paul District

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St. Paul District

ACKNOWLEDGEMENTS

This document was prepared by the Public Use Planning Section of the St. Paul District, Corps of Engineers, and is the result of a team effort involving the cooperation and close coordination of many disciplines and agencies. Special thanks go to those staff who actively participated from the following offices and/or agencies.

St. Paul District, Corps of Engineers

Public Use Planning Section
Natural Resources Management Section
Office of Counsel
Environmental Resources Branch
Reports and Communications Branch
La Crescent Field Office (Resource Management)

Region 3, U.S. Fish and Wildlife Service

Upper Mississippi National Wildlife and Fish Refuge Office Headquarters
Area Office - Mississippi River
North Central Region Office

State Agencies

Wisconsin Department of Natural Resources
Minnesota Department of Natural Resources
Iowa Conservation Commission

Regional Advising Agency

Minnesota-Wisconsin Boundary Area Commission

Local Governmental Agencies

Sincere thanks also go to the many members of the general public who participated in the preparation of this document by attending the public workshops and meetings and by providing comments and other valuable contributions.

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PREFACE, STUDY OBJECTIVES AND SCOPE

PREFACE

The St. Paul District, Corps of Engineers, developed the original Corps master plan for the Upper Mississippi River system over a decade ago. Since then, there have been many changes in public recreational perceptions and demands, in natural and man-made resources along the river, and in Federal roles in the project area (the Mississippi River from Minneapolis to Guttenberg, Iowa).

These changes have resulted in the need to update the original master plan and to make it a meaningful guide for future Federal management of the Upper Mississippi River. Towards that end, the St. Paul District has prepared this land use allocation plan as the first step in updating the master plan for the river. This plan has been prepared with significant cooperation and assistance from the Region 3 office of the U.S. Fish and Wildlife Service. Together, these Federal agencies manage approximately 130,000 acres of land along the Upper Mississippi River between Minneapolis, Minnesota, and Guttenberg, Iowa.

Because the Corps land use allocation plan (LUAP) has been cooperatively prepared and because it allocates both Corps and Fish and Wildlife Service lands, it has the combined support of both managing agencies. We believe that the land use allocations and related Corps and FWS joint policies in the LUAP provide a framework that will meet current and future public use demand for Federal lands while it maintains inherent resource quality for fish and wildlife management and enhancement.

The St. Paul District has prepared this master plan in separate parts. (This volume contains parts I and II, as described below.) This approach has allowed planning efforts to continue despite the St. Paul District's manpower limitations and funding fluctuations. This approach also allows implementation of parts as they are completed.

The master plan is divided into three major parts plus several separate supplements:

- Part I (project description, review, and analysis) presents relevant project and resource inventory data. This part provides information on base conditions needed for part II (land use allocation plan) and part III (plan of development).

- Part II (land use allocation plan) docu
the preparation and coordination
determining the best use of Federal lands
also presents the policy of the mana
Federal agencies on private use of the pu
lands that they administer.

- Part III (plan of development) will foc
recommendations for future site-spec
actions and on detailed recreation-ori
studies recommended by the GREAT I study
an example, it will present plans on
Blackhawk Park should be developed. Par
will be published later.

- A operational management plan (OMP) wi
prepared in the near future. This porti
the master plan will be an appendix deta
the Corps of Engineers natural reso
management and park management (incl
shoreline management).

- A special publication called "Pu
Involvement in the Land Use Allocation Pla
the Upper Mississippi River" is being prep
This document will be available in early
It will provide details of the comprehe
public involvement program employed to o
public comments and other contributions t
LUAP.

When complete, the master plan will be a
coordinated plan for management and developme
existing and potential Corps recreation-re
resources, facilities, and activities in the
area.

STUDY OBJECTIVES AND SCOPE

The general objectives, scope, and format of
document follow the Corps-wide guideline
Engineering Regulations (see section 2.00 of
report for more details). Therefore, this master
does not attempt to resolve many broad-based and
term problems associated with the Upper Missis
River. Examples of such problems include incre
sedimentation, water quality issues, balancing g
of commercial navigation, recommended develop
that are not on Federal lands, optimization of
levels, and many others. Issues associated with

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II (land use allocation plan) documents eparation and coordination for ning the best use of Federal lands. It esents the policy of the managing agencies on private use of the public nat they administer.

III (plan of development) will focus on endations for future site-specific ; and on detailed recreation-oriented ; recommended by the GREAT I study. As mple, it will present plans on how awk Park should be developed. Part III published later.

rational management plan (OMP) will be ed in the near future. This portion of ster plan will be an appendix detailing rps of Engineers natural resource ment and park management (including ne management).

pecial publication called "Public ement in the Land Use Allocation Plan for per Mississippi River" is being prepared. ocument will be available in early 1984. l provide details of the comprehensive involvement program employed to obtain comments and other contributions to the

e, the master plan will be a fully lan for management and development of d potential Corps recreation-related acilities, and activities in the study

problems are, however, identified in this plan as needed. These problems may be addressed in separate future studies by the Corps and other appropriate agencies.

The primary objective of this master plan is to publish a clear, practical, and balanced plan that will guide future Federal land use decisions and public use development actions. The intent of the master plan is to provide balanced distribution of the Federal lands needed to preserve the natural riverine resources for wildlife production and management, to satisfy public recreational demands, and to insure continued river navigation.

New research and primary data collection were generally not required for the land use allocation plan because of the many recent, pertinent studies of the study area. These sources contain diverse and extensive inventory information upon which a land use allocation plan can be developed. Updating of previous study data critical to meaningful completion of the LUAP was necessary (e.g., updating real estate maps and refinement of the U.S. Geological Survey base maps).

However, new research and primary data collection are necessary for part III of the master plan. New work is especially needed for many of the GREAT I-related studies (e.g., recreation use monitoring and lock waiting area studies).

CTIVES AND SCOPE

objectives, scope, and format of this llow the Corps-wide guidelines in Regulations (see section 2.00 of this re details). Therefore, this master plan mpt to resolve many broad-based and long- associated with the Upper Mississippi les of such problems include increasing , water quality issues, balancing growth l navigation, recommended developments on Federal lands, optimization of pool any others. Issues associated with such

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Pool 9	Mile 671.0-674.7
Pool 9	Mile 667.3-671.2
Pool 9	Mile 663.7-667.5
Pool 9	Mile 659.8-663.9
Pool 9	Mile 657.7-660.0
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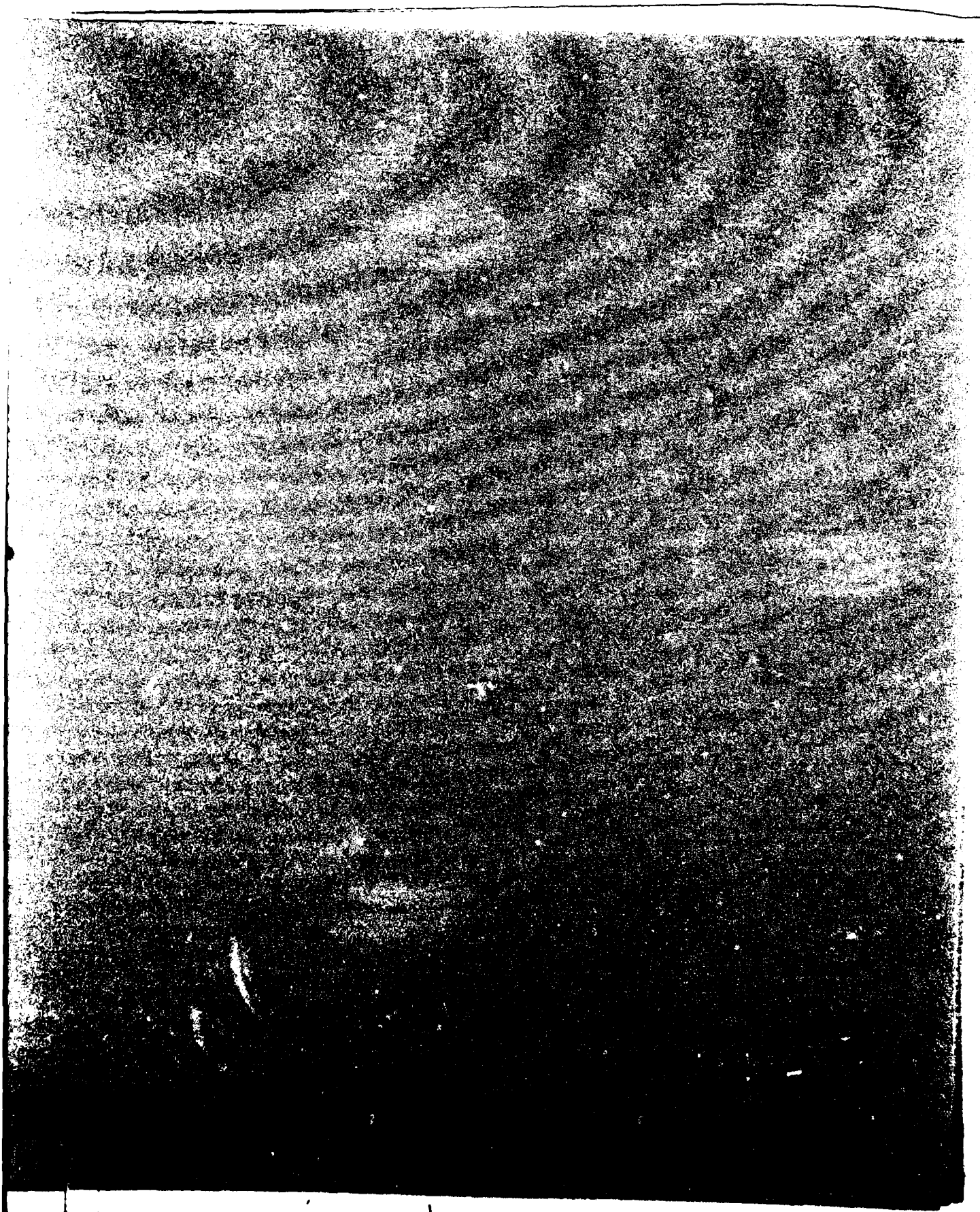
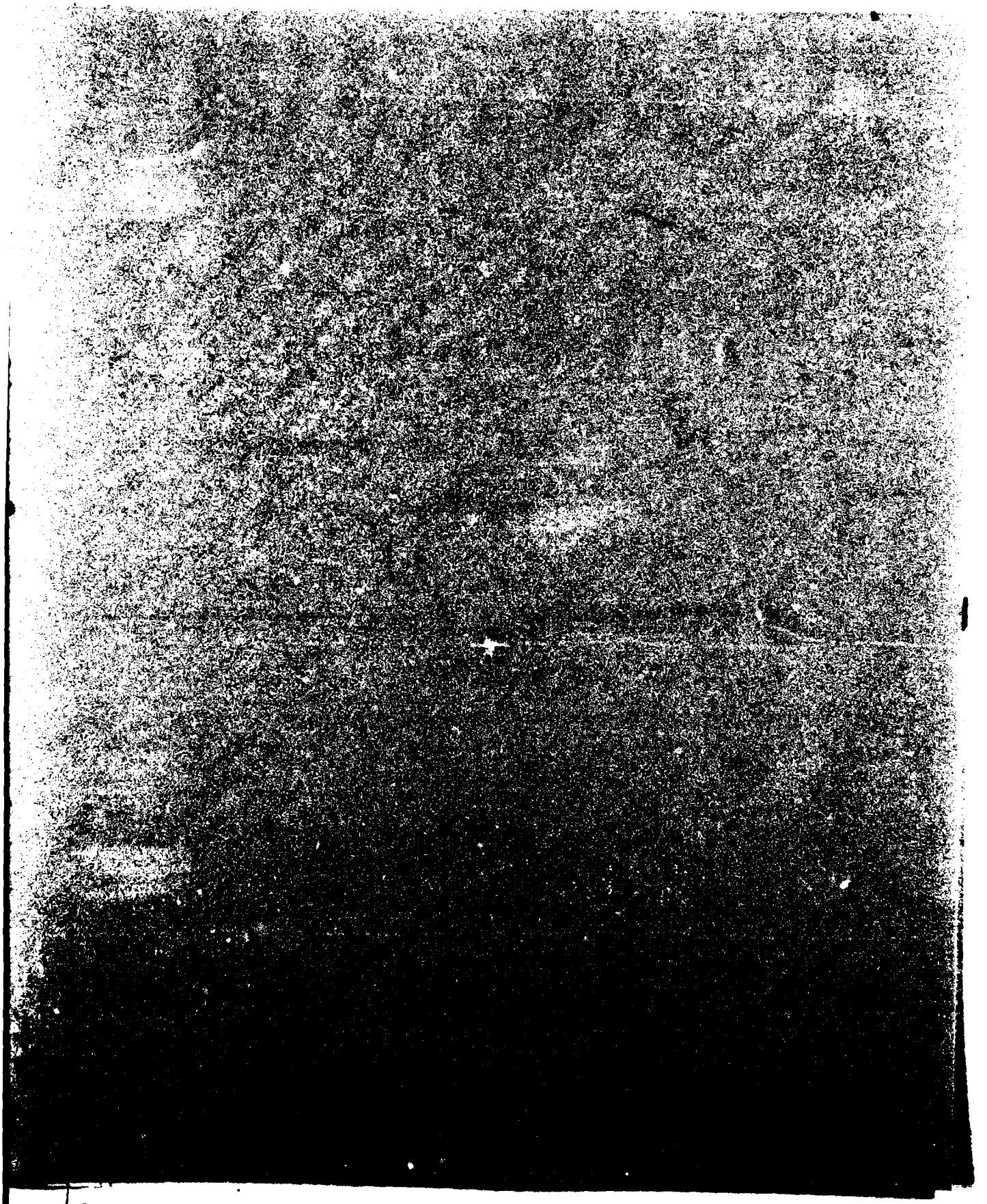
Pool 10	Mile 620.3-624.7
Pool 10	Mile 616.8-620.5
Lock and Dam 10	Mile 613.0-617.0





1. PROJECT INFORMATION

GENERAL

1.01 The 9-foot navigation channel[1] within the St. Paul District, Corps of Engineers, is an existing operational project consisting of 13 locks and dams, supplemented by maintenance dredging, that facilitates navigation on the upper reaches of the Mississippi River system. In addition to the Upper Mississippi itself, this project includes portions of the Minnesota, St. Croix, and Black Rivers (see figure 1-1). Each lock and dam complex creates a flat water pool that is regulated to maintain water levels required to accommodate navigation. The St. Paul District also dredges within these pools, as necessary, to maintain the 9-foot deep navigation channel, as required by law.

1.02 Each pool area contains varied natural and recreation resources, often with high scenic, educational, scientific, wildlife, and cultural values. Protection and proper use of these resources are major concerns of the Corps of Engineers.

PROJECT LOCATION

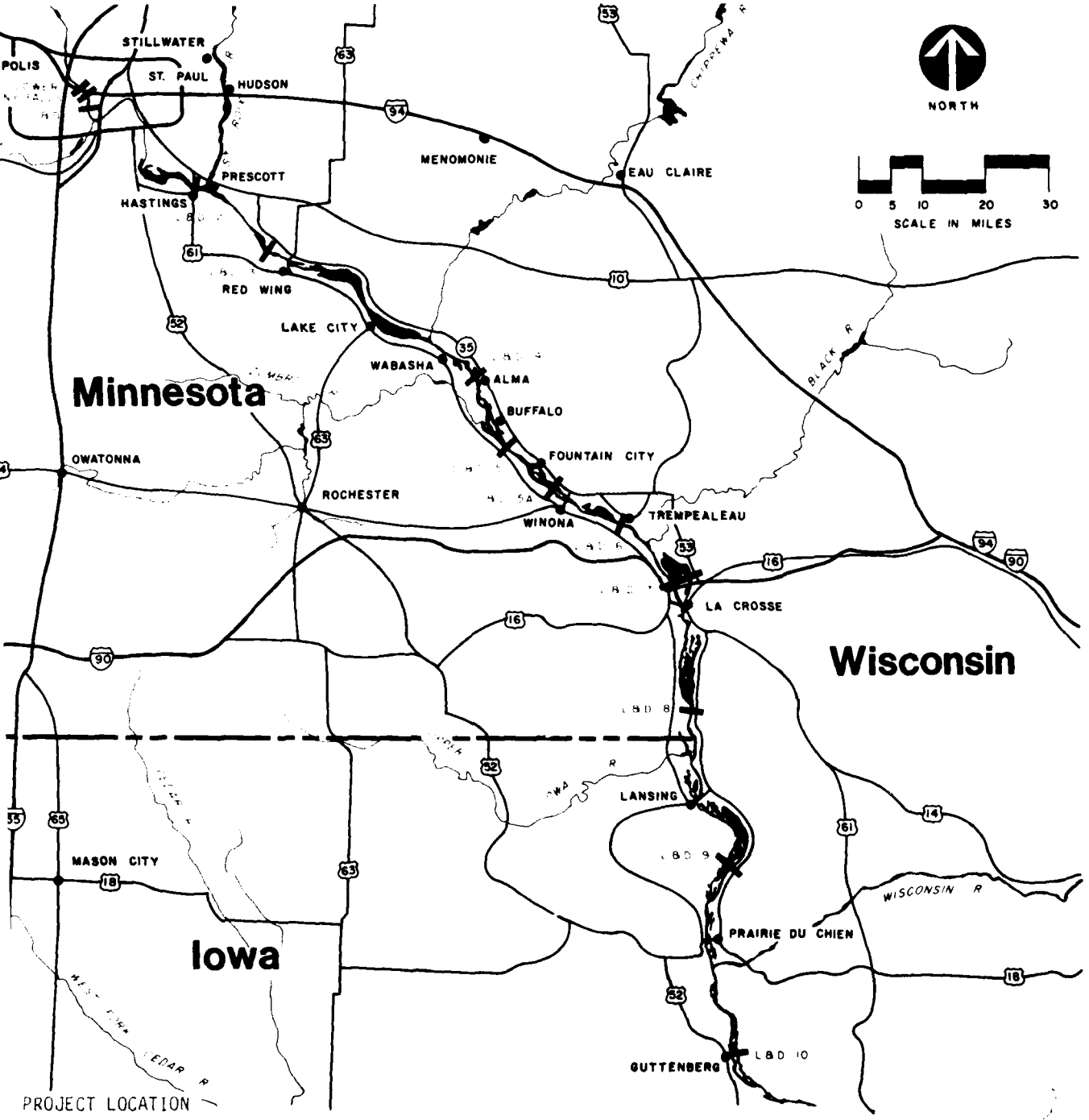
Nine-Foot Channel Project

1.03 The St. Paul District maintains a 9-foot navigation channel in the Upper Mississippi River from the head of navigation at Minneapolis, Minnesota (river mile 857.6),[2] to just below lock and dam 10 at Guttenberg, Iowa (mile 614.0), for a total distance of 243.6 river miles. The project also includes maintenance of a 9-foot channel on 14.7 miles of the Minnesota River, 24.5 miles of the St. Croix River, and 1.4 miles of the Black River. All 13 of the locks and dams (Upper St. Anthony Falls lock and dam through lock and dam 10), however, are on the Mississippi River proper.

FIGURE 1-1. PROJECT LOCATION

(1) See the glossary for technical and other terms not in common use or used in a specific, limited sense in this report.

(2) All Upper Mississippi River miles cited in this report refer to miles above the mouth of the Ohio River. River miles for the Minnesota, St. Croix, and Black Rivers refer to the miles above the confluence of that particular river with the Mississippi. Thus, the confluence of the Minnesota and Mississippi is at mile 0 of the Minnesota but mile 844.0 of the Upper Mississippi.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Wisconsin
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IOWA R
MASON CITY
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GUTTENBERG
L&D 8
L&D 9
L&D 10
WEST FORK CEDAR R
PROJECT LOCATION

1. PROJECT INFORMATION

Master Plan Study Area

1.04 The portion of the Mississippi River covered in this plan begins above Minneapolis, Minnesota (mile 870.0), and ends just below Guttenberg, Iowa (mile 614.0). From mile 870.0, the river flows generally southeast to the mouth of the St. Croix (mile 811.3). From that point, the Mississippi continues southeast, forming the Minnesota-Wisconsin boundary between miles 811.3 and 673.8 and the Wisconsin-Iowa boundary between miles 673.8 and 614.0. The portion of the Minnesota River studied lies between mile 30 above the mouth of the Minnesota, near Shakopee, Minnesota, and the Minnesota's confluence with the Mississippi at mile 844.0 in pool 2. The section of the St. Croix River studied runs from mile 33.0 above the mouth of the St. Croix, about 10 miles above Stillwater, Minnesota, to the confluence with the Mississippi at mile 811.3, at Prescott, Wisconsin, in pool 3. The section of the Black River studied runs from mile 5 above the mouth of the Black, at Onalaska, Wisconsin, to its confluence with the Mississippi River at mile 698.2, at La Crosse, Wisconsin, in pool 8.

PROJECT AUTHORIZATION

1.05 As early as 1824, the Federal Government recognized navigational problems on the Mississippi River. At that time, Congress authorized the Corps of Engineers to remove snags, shoals, and sandbars; to excavate rock in several reaches of rapids; and to close meandering sloughs and backwaters to confine flows to the main channel and thus to assure more adequate depths for navigation during low-water periods.

1.06 The first comprehensive modification of the river for navigation was authorized by the River and Harbor Act of June 18, 1878: a 4-1/2-foot channel from the mouth of the Missouri River to St. Paul, Minnesota. The Corps maintained this channel by constructing dams at the Mississippi River headwaters (impounding water to supplement low flows), bank revetments, wing dams, closing dams, and longitudinal (riverbank) dikes. In 1890, the 4-1/2-foot channel was extended to Minneapolis, requiring removal of boulders and dredging of sandbars.

1.07 The River and Harbor Act of March
authorized a 6-foot channel. The additional
obtained primarily by constructing more wing
rock and brush structures extending out fr
into the river to constrict low-water flows).
the shore opposite the wing dams was protecte
erosion by rock riprap. Construction of lock
1 in 1917 and of lock and dam 2 in 1930
improved the 6-foot channel.

1.08 The River and Harbor Act of July 3
authorized a 9-foot channel navigation proje
Upper Mississippi. This act approved constr
a system of locks and dams plus supplementa
between Minneapolis and the mouth of the
River. The 9-foot channel from pool 1 thr
and dam 10 was operational in 1938. In 1937,
authorized a 4.6-mile extension of the proje
upstream end in Minneapolis, past the Fal
Anthony. The Lower St. Anthony Falls lock
complex was completed in 1959, and the
Anthony Falls lock and dam was completed in

PROJECT PURPOSES

1.09 The 9-foot channel project was o
constructed for a single purpose - to
sufficient water depth for river traffic
flows in the river. However, in additio
original navigation purpose, the project has
the desirability of the Upper Mississippi Ri
broad spectrum of outdoor recreation by prov
stable water levels where formerly t
fluctuated substantially with every chang
Throughout the year, the locks and dams now
series of slack-water pools that annuall
thousands of persons who fish, swim, boat,
picnic. The number of small pleasure cra
river increases every summer, and each fall
hunters in the marshes. Wildlife also bene
the project because the backwater areas crea
dams provide good habitat for feeding, spaw
nesting.

1.10 A common misconception is that the Mi
River lock and dam system was constructed
floods, but their function for flood contr

Harbor Act of March 2, 1907,
annel. The additional depth was
constructing more wing dams (low
ures extending out from shore
trict low-water flows). Usually
wing dams was protected against
. Construction of locks and dam
ck and dam 2 in 1930 further
annel.

Harbor Act of July 3, 1930,
annel navigation project on the
is act approved construction of
dams plus supplemental dredging
and the mouth of the Missouri
annel from pool 1 through lock
ional in 1938. In 1937, Congress
extension of the project at the
eapolis, past the Falls of St.
t. Anthony Falls lock and dam
ed in 1959, and the Upper St.
dam was completed in 1963.

annel project was originally
single purpose - to provide
h for river traffic during low
However, in addition to this
irpose, the project has improved
e Upper Mississippi River for a
loor recreation by providing more
s where formerly the river
ally with every change in flow.
he locks and dams now provide a
r pools that annually attract
who fish, swim, boat, hunt, or
of small pleasure craft on the
summer, and each fall finds more
s. Wildlife also benefits from
e backwater areas created by the
itat for feeding, spawning, and

eption is that the Mississippi
stem was constructed to control
ction for flood control is very

limited. Figure 1-2 illustrates the pool stair-step effect that the dams created on the Upper Mississippi. Note that flooding still occurs (shown by the "High Water" line) even with the dams in place.

1.11 Before the Corps of Engineers constructed the 9-foot channel navigation project, the river would occasionally have so little water that navigation was nearly impossible, backwater areas would dry up, and mud flats would extend out from the riverbanks. This situation is represented in figure 1-2 by the line labeled "Low Water Before Lock Construction." Since the locks and dams were built, the water level has been relatively stable, as shown by the lines indicating "Low Water After Lock Construction."

1.12 Although navigation was the initial purpose of the 9-foot channel project, Congress has since authorized the development of recreational facilities and required the consideration of fish and wildlife conservation at water resources projects. The Flood Control Act of 1944, as amended, authorized the Corps of Engineers to construct recreational developments at water resources projects. In 1958, the Fish and Wildlife Coordination Act required that fish and wildlife conservation receive consideration equal to that of other project purposes and be coordinated with other features of water resource development. In accordance with these laws, development and management of project lands along the Upper Mississippi River are now major goals of the 9-foot channel project. The intent of the Corps is to encourage maximum sustained use and public enjoyment while protecting the available natural resources.

1.13 The creation of the lock and dam/river pool system also offers opportunities for the implementation of electric generating/hydropower projects at the dams. Studies to evaluate the feasibility of specific hydropower sites are underway by the Corps and the Federal Energy Regulatory Commission (FERC). Generally, the Corps will support development of such projects at its locks and dams on the Upper Mississippi River as long as the projects would not compromise the integrity of the navigation system or of the congressionally-mandated fish and wildlife and recreation purposes of the project.

1. PROJECT INFORMATION

PREVIOUS REPORTS

1.14 The reports listed below include pertinent studies by the Corps of Engineers and interagency studies to which the Corps made significant contributions. This list is selective, rather than comprehensive, because so many studies of the Mississippi River have been conducted. More information on the relationship of this report to other studies (of the Corps and other agencies) is found in part I, sections 2.192 to 2.204 and 3.120 to 3.211.

1.15 Although some of these documents are no longer available for public distribution because their supply is limited, they are available for inspection in the St. Paul District office and in many public and institutional libraries within the study area.

- Great River Environmental Action Team (GREAT) I. Study of the Upper Mississippi River: Guttenberg, Iowa to the Head of Navigation at Minneapolis, Minnesota. 9 Volumes. 1980.

- GREAT River Study, Recreation Work Group. Recreation Demand Analysis: Public Use Projections. Prepared for the Outdoor Recreation Work Group of the Great River Environmental Action Team by the St. Paul District, Corps of Engineers. 1976.

- North Star Research Institute. Final Report: Environmental Impact Assessment Study of the Northern Section of the Upper Mississippi River. Prepared under contract for the St. Paul District, Corps of Engineers. 14 Volumes. 1973.

- U.S. Army Corps of Engineers, St. Paul District. Final Environmental Impact Statement: Operation and Maintenance, 9-Foot Navigation Channel, Upper Mississippi River, Head of Navigation to Guttenberg, Iowa. 2 Volumes. 1974.

- U.S. Army Corps of Engineers, St. Paul District. Implementation for GREAT I Study: Nine Foot Channel Project, Upper Mississippi River (Head of Navigation to Guttenberg, Iowa). 1981.

- U.S. Army Corps of Engineers, St. Paul District. Master Recreation Plan. Mississippi River 9-Foot Channel Navigation Pools, St. Anthony Falls Pools and Pools 1-10. 1965-1973 (individual pool volumes - parts I-XII - are listed below:

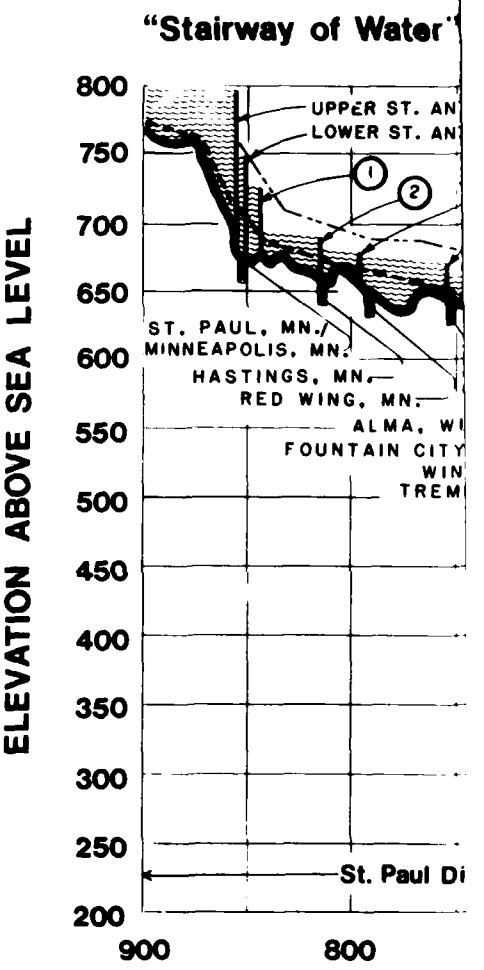

FIGURE 1-2. THE LOCKS AND DAMS PR
FOR A VARIETY OF RECR

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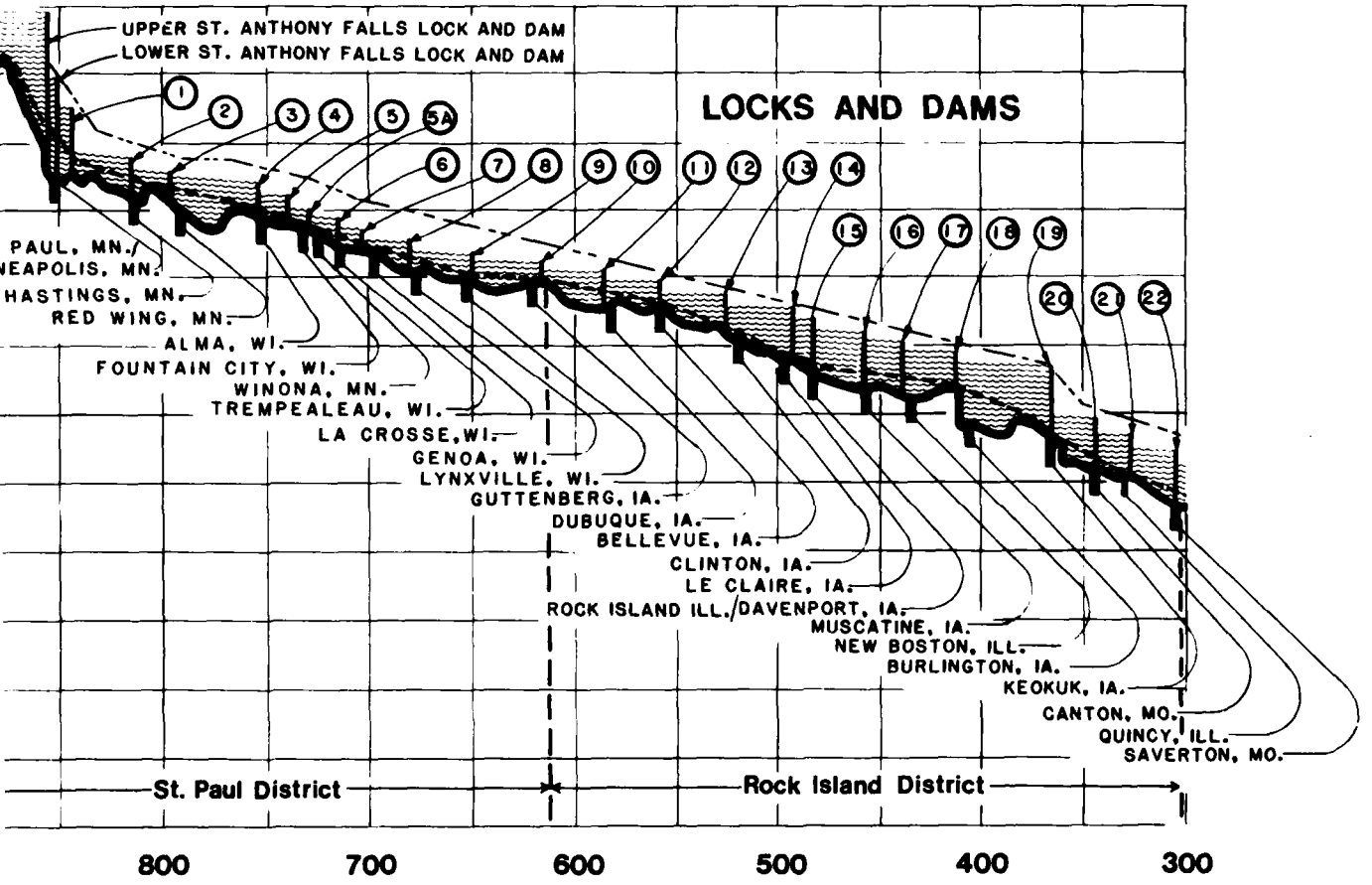


APPROXIMATE MILES ABOVE MOUTH OF OHIO RIVER

H WATER

W WATER AFTER LOCK CONSTRUCTION

W WATER BEFORE LOCK CONSTRUCTION

ROXIMATE RIVER BED

THE LOCKS AND DAMS PROVIDE A SERIES OF SLACK-WATER POOLS THAT ANNUALLY ATTRACT THOUSANDS OF PEOPLE FOR A VARIETY OF RECREATION ACTIVITIES.

1. PROJECT INFORMATION

Part I - General Information. 1965.

Part II - St. Anthony Falls Pools and Pool 1. 1972.

Part III - Pool 2. 1973.

Part IV - Pool 3. 1967.

Part V - Pool 4. 1968.

Part VI - Pool 5. 1968.

Part VII - Pool 5A. 1969.

Part VIII - Pool 6. 1969.

Part IX - Pool 7. 1965.

Part X - Pool 8. 1967.

Part XI - Pool 9. 1968.

Part XII - Pool 10. 1968.

- U.S. Army Corps of Engineers, St. Paul District. Reconnaissance Report for Hydropower: Upper and Lower St. Anthony Falls, Locks and Dams 1, 2, 5, 7, and 8. 1981.

- U.S. Army Corps of Engineers, St. Paul, Rock Island, and St. Louis Districts. Recreational Craft Locks Study, Stage II Planning Report, Upper Mississippi River Basin: Minnesota, Wisconsin, Iowa, Illinois, Missouri. 1977.

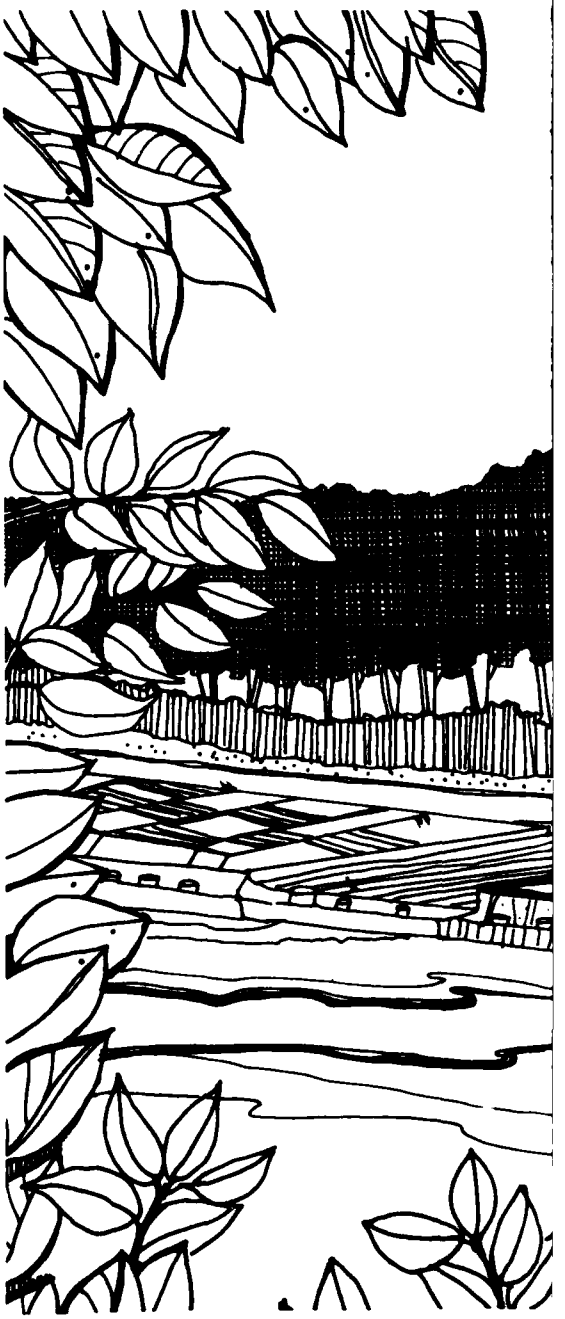
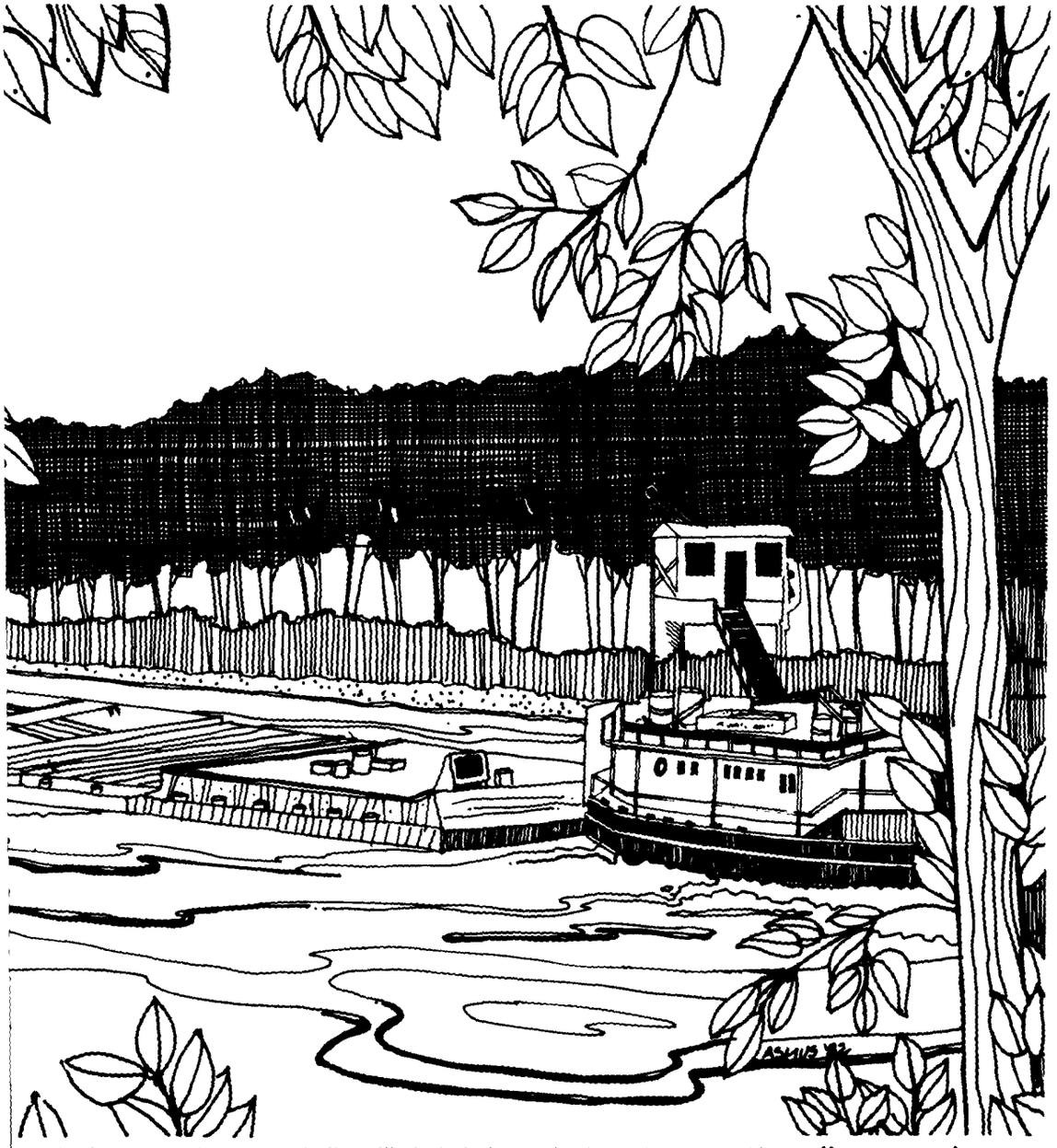


FIGURE 1-3. A vital link in our national transportation
porting bulk commodities for over 150 years. Early
way to modern barges and giant tows as advancing technolo



r national transportation system, the Upper Mississippi river navigation project has provide an efficient means of trans- over 150 years. Early types of water craft were crude but efficient. Canoes, keelboats, and paddlewheelers gave tows as advancing technology created more sophisticated and larger vessels.

2. BACKGROUND INFORMATION

OVERVIEW OF PROJECT AREA

2.01 The Mississippi River headwaters are in northcentral Minnesota, a relatively flat area where streams meander through shallow valleys. This part of the Mississippi is too shallow for commercial navigation. But where the Mississippi reaches Minneapolis in central Minnesota, it flows in a narrow valley with steep bluffs on either side. Corps of Engineers locks and dams in this valley allow river traffic to reach this area. Minneapolis, then, is the head of navigation on the Mississippi. This area marks the beginning of the master plan project area.

2.02 The gradient of the riverbed where the Mississippi flows into Minneapolis is the steepest of the entire river. Consequently, the locks in this area have the greatest lifts (difference in water level between upstream and downstream sides of the lock) of all the locks in the Mississippi River navigation system. In fact, the three uppermost locks (Upper and Lower St. Anthony Falls and lock and dam 1) have a greater combined lift than the combined lift of the 10 remaining downstream locks in the St. Paul District.

2.03 The Minneapolis-St. Paul metropolitan area is the most highly urbanized area on the Upper Mississippi River. This metropolitan area has a considerable impact on all facets of the river system. Access to the river is often difficult because of the bluffs and because much of the river's edge is industrialized and privately owned. As a result of the extensive development, the quality of the water is generally below the water quality of the river as a whole. Water quality further deteriorates in this area below the Mississippi's confluence with the Minnesota River - a river that carries a large sediment and nutrient load from the farmlands to the west.

2.04 The Minnesota River enters the Mississippi between Minneapolis and St. Paul. Thirty-three miles downstream from the mouth of the Minnesota River, the St. Croix River joins the Mississippi in pool 3. Unlike the Minnesota River, the St. Croix is a relatively clean river that drains Minnesota and Wisconsin from the north. Consequently, the water quality of the Mississippi improves below the mouth of the St. Croix.

2.05 The Minnesota and St. Croix Rivers are important to the Mississippi River navigation system because they are tributaries that the Corps maintains (in part) for commercial river traf
are no Federal lands along the
fact, there are very few Federal
lock and dam 2 (near Hastings).
area does not figure significant
of Federal land use as described

2.06 Downstream of St. Paul, the
into a wide floodplain, developing
of lakes and sloughs. The Missi
widen until it reaches Lake Pep
natural river-lake approximately 2
4. This lake ends at the delta fo
River (a contributor of large vol
ment visible for many miles downs

2.07 Below the Chippewa River, th
forms a main channel with a
extensive backwaters. The climate
River Valley downstream from p
because the floodplain is only a
sea level and because it is flat
rise as high as 650 feet above
Winters are less severe in the
Winona, Minnesota, for example,
Rochester, Minnesota, area only ab
west.

2.08 Further downstream, in pool
contains many ponds and lakes suc
Waters of the Black River flow in
portion of Lake Onalaska passes t
and spillway. This water enters t
downstream near La Crosse, Wiscons

2.09 From pool 7 to the southernm
St. Paul District at Guttenberg, Io
through a valley 2 to 3 miles wid
bluffs, crags, and pinnacles.
narrow and sometimes discontinuous
bases of the bluffs where these te
places for people to settle and f

2.10 Below Prairie du Chien, Wisc
River flows into the Mississippi R
lock and dam 10. Lock and dam
Iowa, marks the end of the St. Pa
of the Upper Mississippi River.

2.11 In each of the 13 pools in th
distinct zones occur. The upper
in essentially the normal river

commercial river traffic. However, there deral lands along these tributaries. In e are very few Federal lands upstream from lam 2 (near Hastings). Consequently, this not figure significantly in the allocation land use as described in this study.

stream of St. Paul, the Mississippi spreads e floodplain, developing an extensive system and sloughs. The Mississippi continues to il it reaches Lake Pepin, a 22-mile-long ver-lake approximately 2 miles wide, in pool ke ends at the delta formed by the Chippewa ntributor of large volumes of coarse sedi-le for many miles downstream of its mouth).

the Chippewa River, the Mississippi again ain channel with a wide floodplain of backwaters. The climate of the Mississippi ley downstream from pool 4 is moderated e floodplain is only about 550 feet above and because it is flanked by bluffs that igh as 650 feet above the valley floor. re less severe in the river community of nnesota, for example, than they are in the Minnesota, area only about 45 miles to the

er downstream, in pool 7, the floodplain any ponds and lakes such as Lake Onalaska. he Black River flow into Lake Onalaska. A Lake Onalaska passes through Onalaska Dam y. This water enters the Mississippi River near La Crosse, Wisconsin.

pool 7 to the southernmost boundary of the strict at Guttenberg, Iowa, the river flows alley 2 to 3 miles wide between weathered ags, and pinnacles. Terraces, usually sometimes discontinuous, can be seen at the e bluffs where these terraces have provided people to settle and for towns to develop.

Prairie du Chien, Wisconsin, the Wisconsin into the Mississippi River, 16 miles above am 10. Lock and dam 10, at Guttenberg, s the end of the St. Paul District portion r Mississippi River.

h of the 13 pools in the study area, three nes occur. The upper end of each pool is ally the normal river condition, where impoundment did not raise the water levels to any extent. In this portion of the pools, marsh development is limited, and the old condition of deep sloughs and wooded islands is found. In the middle of each pool, impoundment backed up water over islands and old hay meadows, spreading the river out over large areas of comparatively shallow water. The best marsh development occurred in the middle portion of the pools. Immediately above each dam, the water was impounded to a depth that precluded marsh development. At present, these areas are essentially deep, open water.

2.12 These lake-type pools caused a change from predominantly fast-water species such as smallmouth bass to fishes whose environment is pond-like, such as the largemouth bass, bluegills, crappies, carp, buffalo, and northern pike. The dams also slowed the current and increased silt deposition. The sediment sometimes covers the sand and gravel bars necessary for the feeding and breeding of such fish as smallmouth bass and walleyes. There has been a corresponding increase of fish that are tolerant of mud bottoms.

2.13 Since many of the characteristic birds of the river valley are migratory, the study area is of national and international significance. In addition, the Mississippi River and its tributary valleys are a natural route over which the non-migratory or semi-migratory species may expand their ranges. The river valley forms a wildlife corridor between the Gulf of Mexico and the Great Lakes Region. The mammalian species are generally representative of eastern (Alleghenian) types, with some influence of southern (Carolinian) and northern (Canadian) species.

2.14 Plant species in the river valley also enjoy conditions that are not generally associated with the geographic location of the river. Overlapping of eastern and western species and subspecies of plants as well as animals occurs in the river valley. Several high "sand prairie" areas are also scattered along the length of the Upper Mississippi National Wildlife and Fish Refuge, offering habitat conditions normally found much farther west. In the pioneer sites (disturbed sites without previous growth where species of plants are beginning to grow) along sandbars, mud flats, and other open places of recent soil disturbances, the usual forest is dominated by black willow and cottonwood. On open sites near the upland edge of the wet ground, river birch and swamp

2. BACKGROUND INFORMATION

oak are the usual dominants. As both of these woodland types mature, these areas are invaded by silver maple and American elm.

SUMMARY POOL DESCRIPTIONS

2.15 The following paragraphs briefly describe each pool within the study area.

St. Anthony Falls Pools and Pool 1

TABLE 2-1 - PRINCIPAL FEATURES OF ST. ANTHONY FALLS (SAF) POOLS AND POOL 1

St. Anthony Falls	Upper	Lower
Length of pool	10.9 river miles	.4 miles
River mile limits	853.8-864.7	853.4-853.8
Average pool elevation	798.3 feet(1)	750.0 feet
Pool surface area	974 acres	51 acres
Shoreline miles (meandering outer perimeter)	25.0 miles	1.5 miles
Land owned by Corps (Upper and Lower SAF combined)	13 acres: 10 acres above normal flat pool	

Pool 1	
Length of pool	5.7 river miles
River mile limits	847.7-853.4
Average pool elevation	725.1 feet
Pool surface area	546 acres
Shoreline miles	11.6 miles
Corps-owned land	33 acres: 6 acres above normal flat pool

(1) Pool elevations are given in feet above mean sea level.

2.16 **Description** - The Upper and Lower St. Anthony Falls locks and dams at river miles 853.8 and 853.4, respectively, are in the main channel at Minneapolis. Both locks are along the west (right descending) riverbank. The falls consist of a hard layer of limestone over a bed of soft sandstone. In prehistoric times, the falls were near the Minnesota River, about 8 miles downstream from site. As the protective limestone l through the years, the falls gradually

2.17 Locks and dam 1 is at river mile the Twin Cities of St. Paul and Minneap locks are along the Minneapolis side descending bank). Pool 1 is confine channel cutting through limestone bluffs. These bluffs rise almost heights approaching 150 feet. They ar deciduous trees and rock outcroppings the Washington Avenue bridge, the bl decrease in height.

2.18 **Recreation Facilities** - The three have the following recreational facil accesses with 3 launching lanes and 125 spaces, 97 picnic units, 5 miles of hik 5 miles of bicycling trails. Major North Mississippi River Regional Park Anthony Park (mile 857.5), Mississip (mile 853.5), East River Flats (mil portions of Minnehaha Park (miles Developable land adjacent to these p mainly for industrial and commercial us are characterized by bluffs.

2.19 Intermittent water pollution, h traffic, the narrow channel, the s between the locks, plus the lack facilities discourage many recreationa might otherwise use the river. Genera lands here are limited and are unsuit based public recreation because topography and lack of flat beach a river.

2.20 **Transportation, Accessibility, a Uses** - Much industry is located al from upper pool 1 to the upstream limi navigation channel (mile 857.6). Eight navigation facilities for shipment and commodities are located in the three p the St. Anthony Falls pools and nine St. Anthony Falls pools are the orig point for a substantial amount of the g the St. Paul District. State, county, closely parallel the river on both sid pools. Many roads enter the pool area 12 highway bridges cross the river bet dam 1 and the upper limits of the 9-f channel.

es downstream from their present
ective limestone layer broke off
the falls gradually receded.

1 is at river mile 847.7, between
St. Paul and Minneapolis. The two
e Minneapolis side (west or right
Pool 1 is confined to a narrow
hrough limestone and sandstone
uffs rise almost vertically to
150 feet. They are covered with
d rock outcroppings. Upstream of
enue bridge, the bluffs begin to

cilities - The three pools combined
recreational facilities: 2 boat
nching lanes and 125 nearby parking
nits, 5 miles of hiking trails, and
ing trails. Major parks include
iver Regional Park (mile 858), St.
e 857.5), Mississippi River Park
t River Flats (mile 852.5), and
haha Park (miles 847 and 848).
djacent to these pools is zoned
al and commercial use. Other areas
y bluffs.

water pollution, heavy commercial
ow channel, the short distance
, plus the lack of access and
ge many recreational boaters who
e the river. Generally, riverbank
ited and are unsuitable for land-
reation because of the steep
k of flat beach areas near the

n, Accessibility, and Commercial
stry is located along the banks
o the upstream limit of the 9-foot
(mile 857.6). Eighteen commercial
es for shipment and/or receipt of
cated in the three pools: nine in
lls pools and nine in pool 1. The
pools are the origin or terminal
cial amount of the goods shipped in
ct. State, county, and local roads
e river on both sides of all three
enter the pool area laterally, and
cross the river between locks and
limits of the 9-foot navigation

2.21 Along the Upper St. Anthony Falls pool and south of I-694, the Great River Road is Marshall Street. The river's edge here is wooded, with occasional clearings that provide views of the river. The Great River Road then passes south through a mixed industrial and residential area where the view of the river is obstructed until the Broadway Bridge crossing. Expansive views to downtown Minneapolis are visible from the bridge. The Great River Road alignment parallels the river along West River Road North, with land adjacent to the river being park-like. Below Plymouth Avenue, the Great River Road passes through a warehouse district with many loading docks. Along First Street North, the road is partially surfaced with cobblestones. Crossing Third Avenue, the new alignment of West River Road will closely parallel the river. At Fourth Street South, the Great River Road alignment follows the existing West River Parkway. This corridor has been retained as parkland and is one of the more scenic portions of the metro segment of the Great River Road. As the Great River Road approaches Minnehaha Park, locks and dam 1 becomes visible. Minnehaha Park offers extensive day-use park facilities and river views and trails. The river valley widens as the road nears the confluence of the Mississippi and Minnesota Rivers.

2.22 Access, however, is generally limited by steep bluffs along the river. Most of the land is privately owned or industrialized, although the cities of St. Paul and Minneapolis own tracts of land along the river below the University of Minnesota.

2.23 Cultural Areas - Cultural resources within these three pool areas are primarily limited to historic resources. These resources are structures such as buildings and bridges. Few known prehistoric archeological sites remain within the Twin Cities metropolitan area. Many cultural resources along the bluffs have probably been impacted or destroyed by commercial, residential, and industrial development. Most known historic sites that have survived are on top of the bluffs, well removed from the effects of water levees or of human activities in and along the river.

2.24 In these three pools, many of the properties on the National Register of Historic Places are associated with the early industrial developments along the river. The Cappelen Memorial Bridge, the Pillsbury "A" Mill, the St. Anthony Falls Historic District, and the Minnehaha State Park Historic District are on the National Register of Historic

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Places. The Minnesota Historical Society also owns several noteworthy structures in this area: the Edwin H. Hewitt House (mile 851), the Bennet/McBride House (mile 854), and the Grain Belt Brewery (miles 854-858).

2.25 **Natural Resources** - Lack of shallow water habitat, the relatively small size of the pools, industrial development along the riverbanks, and periods of poor water quality also limit fish and wildlife populations. Some good habitat for small furbearers and birds still exists on the bluffs along pool 1. Hunting of game is prohibited. In the St. Anthony Falls area, soils along the riverbanks are generally sands. On top of the bluffs, soils are generally classified as sandy clays. These soils are characteristically well drained on hills but have a high water table in lower areas. The percolation rate is generally less than 10 minutes per inch. These soils tend to be acid and low in nitrate and potassium. The bedrock in the area is a layer of limestone over sandstone. Vegetation consists of mixed prairie types associated with deciduous and coniferous forests.

Pool 2 (Including the Minnesota River)

TABLE 2-2 - PRINCIPAL FEATURES OF POOL 2

Length of pool	Mississippi River	32.5 river miles
	Minnesota River	25.0 river miles
River mile limits	Mississippi River	815.2-847.7
	Minnesota River	0.0- 25.0
Average pool elevation		687.2 feet
Pool surface area		9,652 acres (Mississippi River segment)
Shoreline miles (meandering outer perimeter)		110 miles (Mississippi River segment)
Corps-owned land		1,219 acres: 255 acres above normal flat pool

2.27 **Description** - Lock and dam 2 is at river mile 815.2 near Hastings. Pool 2 is entirely in Minnesota.

FIGURE 2-1. The need to carry larger projects. Federal efforts to improve was authorized. Uncontrolled free-f environment provides hundreds of tho

The need to carry larger cargos in and out of the region prompted the Federal Government to become more actively involved in navigation ederal efforts to improve the river for navigation began in 1824. In the late 1920's and early 1930's, the present 9-foot navigation channel ed. Uncontrolled free-flowing rivers gave way to locks and dams that created slack-water pools and controlled channels. The resulting provides hundreds of thousands of acres of fish and wildlife habitat plus a multitude of recreational opportunities.

2. BACKGROUND INFORMATION

From below locks and dam 1 to St. Paul Park (mile 829), extensive residential, institutional, and commercial developments occupy the tops of the bluffs and the floodplain. Downstream to lock and dam 2, only occasional residential or industrial sites occur.

2.28 Land use in the Fort Snelling area is best characterized as urban/natural. Near the St. Paul central business district it can be described as urban/industrial. The viewing angle at both sites is from above. River awareness at Fort Snelling is high, but in the St. Paul central business district, awareness of the river is low. Pool 2 includes the 25 navigable river miles of the Minnesota River, but the Corps maintains only the lower 14.7 miles for the 9-foot navigation channel.

2.29 Upstream from lock and dam 2, pool 2 spreads over the floodplain, and the deeper navigable channel meanders through the valley. Near mile 825, the pool becomes confined to the old river channel. Except for several backwater areas and connected lakes, the pool remains within the confined and progressively narrowing channel up to lock and dam 1.

2.30 Extensive residential, institutional, and commercial developments occupy the blufftop and floodplain from locks and dam 1 to St. Paul Park, Minnesota (RM 829). Urban development below locks and dam 1 to Lilydale, Minnesota, is partially screened by vegetation and high bluffs. Downstream from St. Paul Park, only occasional residential or industrial sites interrupt the floodplain and bluff-slope woodlands.

2.31 **Recreation Facilities** - In pool 2, development of camping, swimming, and waterskiing has been hampered by water pollution, lack of access and facilities, heavy commercial river traffic, and bank development. Pool 2 (excluding the Minnesota River) has 11 boat accesses with a total of 14 launching lanes and 970 adjacent parking spaces. It also has 497 marina slips, 40 rental boats, and 392 picnicking units. The navigable section of the Minnesota River has 2 accesses, 2 launching lanes, 125 adjacent parking spaces, 60 camping units, and 300 picnicking units, plus 23 miles of hiking and 3.5 miles of cross-country ski trails. The pool has 6 dredged material disposal islands used as undeveloped recreation areas. Most of the open-water recreational boating occurs in the extreme upper portion and the lower portion of pool 2. However, because of the poor water quality in this pool, water-contact sports should be a
Hidden Falls/Crosby Farm Regional Park, S
County Park, and Fort Snelling State Park
2.

2.32 **Transportation, Accessibility, and Uses** - There are 29 commercial navigation
for the shipment and/or receipt of goods
The Minnesota River has another 9. Both s
Mississippi River segment are paralleled
State, and county highways. Many highways
enter the pool area laterally, particular
Twin Cities metropolitan area. Access
because of the abundance of privately-owne
the lack of publicly-owned lands adjace
river. A paved highway parallels the rig
the Minnesota River, and several main trun
approach the pool from the Twin Cities area

2.33 In this pool, the Great River Road c
Mendota Bridge, offering views of the con
the Mississippi and Minnesota Rivers.
Highway 13, the road follows the gently cu
bluffs to Lilydale, and it crosses the river
35 bridge onto Shepard Road, going toward d
Paul. Shepard Road characterizes the river
qualities of St. Paul. Industry - with its
storage areas of grain, coal, and oil -
along much of this part of the road. Bar
here presents a strong image of river ac
spur at Chestnut Street diverges the Great
up through St. Paul's famous Hill distric
terminus at the State Capitol Building.
road begins again on Warner Road, linking wi
61, near Indian Mounds Park and leaving
moving as the road moves to the south.
maintains a parkway character with occasiona
the river. The Great River Road cr
Mississippi again at the I-494 bridge.
with Highways 52/56 and 55 and goes on to
The character along this route g
residential/commercial on an industrial f
rural agricultural setting near Hastings.
the river on Highway 10, the road proceed
Douglas where both the St. Croix and Missi
visible. This point is also where the G
Road enters Wisconsin from Minnesota.

2.34 **Cultural Areas** - Within pool 2, 4
sites have been reported. Seven of these

sports should be avoided. The
m Regional Park, Spring Lake
elling State Park are in pool

ccessibility, and Commercial
mercial navigation facilities
r receipt of goods in pool 2.
another 9. Both sides of the
nt are paralleled by Federal,
ays. Many highways and roads
erally, particularly near the
an area. Access is limited
e of privately-owned land and
wned lands adjacent to the
parallels the right bank of
d several main trunk highways
he Twin Cities area.

Great River Road crosses the
ng views of the confluence of
nnesota Rivers. Exiting on
llows the gently curving river
it crosses the river at the I-
oad, going toward downtown St.
cterizes the river-oriented
ndustry - with its associated
coal, and oil - is evident
of the road. Barge traffic
image of river activity. A
diverges the Great River Road
mous Hill district with its
apitol Building. The river
er Road, linking with Highway
Park and leaving St. Paul
s to the south. Highway 61
cter with occasional views of
: River Road crosses the
e I-494 bridge. It connects
55 and goes on to Hastings.
this route goes from
on an industrial fringe to a
ng near Hastings. Crossing
the road proceeds to Point
t. Croix and Mississippi are
also where the Great River
n Minnesota.

within pool 2, 49 historic
Seven of these properties

are on the National Register of Historic Places. Most are associated with the early industrial developments along the river. Fort Snelling, at the confluence of the Minnesota and Mississippi Rivers, provides an outstanding example of the early military presence in the area. This fort has been restored by the Minnesota Historical Society and is open to the public.

2.35 Across the river from Fort Snelling is the widely known Sibley House and Museum, in the town of Mendota, Minnesota. Near the intersection of Warner Road and Highway 61 is Indian Mounds Park. As the name implies, this is an ancient burial place of Indians who inhabited this area before white settlers moved in. Below this park, now obscured from view, is the mysterious Carver's Cave. Eyewitness accounts in the late nineteenth century tell of fantastic Indian heiroglyphs in a mammoth cave with an underground lake. Unfortunately, railroad construction has hidden entry to the cave.

2.36 Over 30 archeological sites are within pool 2, primarily outside the metropolitan area. One site, the Schilling Site, occupied between 1000 BC and AD 1700, is on the National Register of Historic Places.

2.37 A cultural resources study completed for the U.S. Fish and Wildlife Service from the mouth of the Minnesota River to Carver, Minnesota, recorded 107 prehistoric and historic sites.

2.38 **Natural Resources** - Fish habitat is limited yet generally good upstream of downtown St. Paul. Fish habitat is poor in the Minnesota River and in the downstream portion of pool 2, however, because of periodically poor water quality. Fishing is good in the tail waters of locks and dam 1 and at the outfall of Black Dog Lake (which Northern States Power Company uses as a cooling pool for a generating plant). Wildlife habitat is good in the areas of Crosby Lake, Pig's Eye Lake, and Grey Cloud Island, and on the Minnesota River in the Minnesota Valley Wildlife Refuge and at Black Dog Lake. Pig's Eye Lake is in pool 2, just downstream from St. Paul. This lake has a unique heron-egret rookery at its border. This rookery contains many black-crowned and great blue herons and common egrets. Hunting is prohibited in the majority of the pool 2 and Minnesota River study area.

2. BACKGROUND INFORMATION

Pool 3 (Including the St. Croix River)

TABLE 2-3 - PRINCIPAL FEATURES OF POOL 3

Length of pool	Mississippi River	18.3 river miles
	St. Croix River	24.5 river miles
River mile limits	Mississippi River	796.9-815.2
	St. Croix River	0.0- 24.5
Average pool elevation		675.0 feet
Pool surface area		17,950 acres
Shoreline miles (meandering outer perimeter)		37.1 miles (Mississippi River segment)
Corps-owned land		5,605 acres:
		2,400 acres above normal flat pool
		4,123 acres managed for fish and wildlife by State of Minnesota

2.39 **Description** - Lock and dam 3 is located at river mile 796.9 on the Minnesota side of the main channel. The lower 24.5 miles of the St. Croix River are also included in this pool. Within the St. Croix River Valley, the pool is confined within the original banks of Lake St. Croix , with very little lowland or floodplain area. In the Mississippi River Valley below the mouth of Lake St. Croix, the pool widens and spreads over low, flat bottom lands in a generally wide floodplain. Pool 3 is one of the least stable pools in the St. Paul District because it is subject to the effects of increased discharges from the Mississippi, Minnesota, and St. Croix Rivers, which all have large drainage areas.

2.40 The coliform bacterial count in this segment of the river remains relatively high. The Minnesota Board of Public Health still classifies the pool 3 stretch as an area where "whole body contact constitutes a distinct health hazard." The water quality of the St. Croix is better than that of either the Mississippi or the Minnesota Rivers. The Minnesota is especially bad, with tur Pike Island 10 times greater tha Mississippi above the confluence. Ef Minneapolis/St. Paul Sanitary Dis wastewater treatment plant is also a

2.41 **Recreation Facilities** - Excludi pool 3 has 8 boat accesses with launching lanes and 129 parking sp these accesses are in Minnesota. Th 669 marina slips, 525 in Minnesota units; and no camping units. Pool material disposal islands used recreation areas. The Corps maintains area at Sturgeon Lake. Most open-wa boating takes place near the mouth River, near Hastings and Diamond Bl the third-highest level of boat use am the study area. The only major par Lake Rebecca Municipal Park (compl 1982). This stretch of the Missis exception of the St. Croix, is not sui contact sports because of poor wate portion of the St. Croix in the 9- project has been designated a National River.

2.42 **Transportation, Accessibility, Uses** - Only one commercial navigatio the Mississippi River portion of th two are on the navigable portion o River. Pool 3 is neither the origin for large amounts of river cargo. M pass through this section of the r other pools. Although good highwa area, actual access to the river by is lacking. In the Mississippi River trunk or secondary feeder highways either side of the pool. The only crossing the Mississippi is in Hast bridge crosses the St. Croix be Minnesota, and Prescott, Wisconsin confluence with the Mississippi). bridges cross the St. Croix upstream.

2.43 **Cultural Areas** - Seventy-four hi are known in pool 3. All but two s Minnesota, with the majority of th Twelve properties and two historic the National Register of Historic Hastings. Most of the single propert homes such as the Ignatius Eckert an Houses, but the Dakota County Cou

especially bad, with turbidity levels at
l 10 times greater than those of the
above the confluence. Effluent from the
/St. Paul Sanitary District Pig's Eye
reatment plant is also a problem.

tion Facilities - Excluding the St. Croix,
8 boat accesses with a total of 10
anes and 129 parking spaces. Seven of
ses are in Minnesota. The pool also has
slips, 525 in Minnesota; 36 picnicking
10 camping units. Pool 3 has 11 dredged
isposal islands used as undeveloped
reas. The Corps maintains a public access
geon Lake. Most open-water recreational
es place near the mouth of the St. Croix
Hastings and Diamond Bluff. Pool 3 has
ghest level of boat use among the pools in
rea. The only major park in the area is
a Municipal Park (completed in summer
s stretch of the Mississippi, with the
the St. Croix, is not suitable for water-
rts because of poor water quality. The
the St. Croix in the 9-foot navigation
been designated a National Wild and Scenic

ortation, Accessibility, and Commerical
one commercial navigation facility is in
ippi River portion of this pool and only
the navigable portion of the St. Croix
l 3 is neither the origin nor destination
nounts of river cargo. Most tows simply
h this section of the river en route to
. Although good highways lead into the
l access to the river by well-paved roads
In the Mississippi River segment, no main
ondary feeder highways closely parallel
of the pool. The only highway bridge
e Mississippi is in Hastings, although a
sses the St. Croix between Hastings,
and Prescott, Wisconsin (at that river's
with the Mississippi). Several other
s the St. Croix upstream.

l Areas - Seventy-four historic structures
n pool 3. All but two structures are in
with the majority of these in Hastings.
erties and two historic districts are on
l Register of Historic Places, all in
ost of the single properties are historic
is the Ignatius Eckert and the Bryon Hower
the Dakota County Courthouse and the
Hastings Foundry are also listed. The two historic districts are the East Second and West Second Commercial Districts in downtown Hastings.

2.44 Sixteen prehistoric sites are located on the Minnesota shoreline of pool 3, and 14 sites are on the Wisconsin side. Only one archeological site, the Bartron Site in Goodhue County, Minnesota, is on the National Register of Historic Places.

2.45 No comprehensive study has been conducted along the Lower St. Croix to determine the number of known sites. National Register sites along the St. Croix River are historic sites in Hudson, Wisconsin, and in Stillwater and Marine-on-the-St. Croix, Minnesota.

2.46 Pool 3 has a small but important commercial fishery in North and Sturgeon Lakes. Sport fishing is also good through much of the pool although it is not as popular as in other areas because of occasionally poor water quality. Hunting is a popular sport, and native game birds and locally nesting waterfowl are in good supply. Gores Wildlife Area, which is managed by the Minnesota DNR, is made up of several thousand acres, much of it designated as a wildlife sanctuary.

2.47 Two privately-owned natural areas in Pierce County of county-wide significance include Diamond Bluff Cottonwoods and Pierce County Islands.

Pool 4

TABLE 2-4 - PRINCIPAL FEATURES OF POOL 4

Length of pool	44.2 river miles
River mile limits	752.7 - 796.9
Average pool elevation	667.0 feet
Pool surface area	35,198 acres
Shoreline miles (meandering outer perimeter)	155 miles
Corps-owned land	2,900 acres:
	390 acres above normal flat pool
	2,811 acres managed by FWS

2.48 **Description** - Lock and dam 4 is at river mile 752.5 near Alma, Wisconsin. Pool 4 is the longest pool, with the longest shoreline and largest water

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area of all the pools in the study area. Extending upstream from lock and dam 4, the main channel meanders through the floodplain towards the right side of the valley, until it reaches high ground at Wabasha, Minnesota. It then essentially parallels the high-ground area to the lower end of Lake Pepin. The Chippewa River is the only major tributary. Smaller tributaries include the Vermillion and Cannon Rivers in Minnesota and the Buffalo River in Wisconsin. Lake Pepin forms about half of the 44-mile-long pool.

2.49 **Recreation Facilities** - There are 35 boat accesses with a total of 4 launching lanes (32 in Minnesota, 16 in Wisconsin) and 1,530 parking spaces. Pool 4 also has 1,332 marina slips (1,210 in Minnesota, 122 in Wisconsin), 356 camping units, and 328 picnicking units, plus 17 dredged material disposal islands used as undeveloped recreation areas. The dredged material islands/beaches/camps below the Chippewa River are the third-most heavily-used area within the GREAT I region. Only pools 9 and 10 have more island/beach/camp recreation. Frontenac State Park, Minnesota, is in the area, as are several municipal parks and private recreational developments. Lake Pepin is well known for its sailboating and waterskiing.

2.50 **Transportation, Accessibility, and Commercial Uses** - Pools 4 and 9 are the two major sources of commercial fish in the Upper Mississippi River. During the 1960's, these two pools ranked either first or second as the pool that provided the greatest commercial fish catch in terms of weight. Five commercial navigation facilities are in pool 4. An analysis of industrial and commercial facilities adjacent to the pool suggests the major commodities originating or terminating in the pool are grain, vegetable oils, and coal. Primary highways closely parallel both sides of the pool. Primary and secondary highways and networks of county and township roads provide lateral access. The highway bridge at Red Wing provides a crossing.

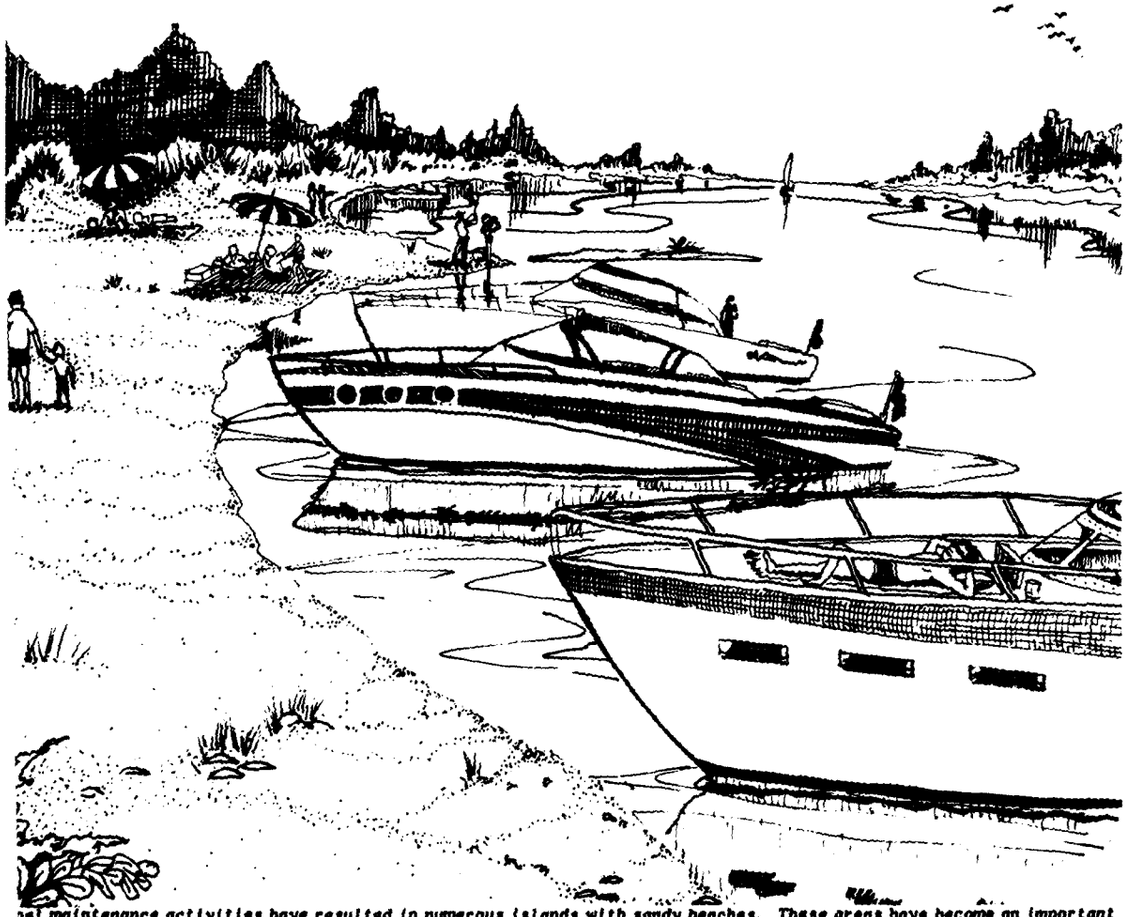
2.51 The following utility, transportation, and commercial industrial activities or easements are on Federal lands in pool 4:

City of Alma - sewer line easement

Northern States Power - two powerline/access road easements

Buffalo Electric Cooperative - electric power transmission line easements

FIGURE 2-2. Over the years, channel maintenance activit resource for water-oriented recreation activities. Many Ongoing and future management actions must recognize the beach sites.



nel maintenance activities have resulted in numerous islands with sandy beaches. These areas have become an important nation activities. Many islands are heavily used during the summer months for primitive camping and day-use activities. ions must recognize the need to preserve these opportunities and must develop methods and arrangements for maintaining these

2. BACKGROUND INFORMATION

Burlington Northern Railroad - railroad operation and maintenance

Wisconsin Highway Commission - Wabasha-Nelson bridge/highway construction and scenic easement

2.52 Cultural Areas - Within pool 4 are 130 known archeological sites, including 3 on the National Register of Historic Places. These archeological sites are fairly evenly divided among the various counties in Wisconsin and Minnesota. Within Minnesota, the majority of the known archeological sites in pool 4 are in the vicinity of Red Wing in Goodhue County. In Wisconsin, the greatest number of known sites are in Buffalo County, followed by Pierce and Pepin Counties, each with the same number of sites.

2.53 Only one known historic structure is on the Wisconsin side of pool 4. Many historic properties are in Minnesota, however. Most of these 289 properties are in the towns of Red Wing and Wabasha and were located as a result of the Minnesota Historical Society Historic Site Inventory. These structures are houses, commercial and industrial buildings, and public buildings. Twenty-eight structures are on the National Register of Historic Places. Three historic districts are also on the National Register: the Frontenac Historic District, the West Red Wing Residential District, and the Wabasha Commercial District.

2.54 Natural Resources - Pool 4 has a diversity of valuable fish and wildlife habitats. Fishing, trapping, and hunting are considered excellent in pool 4. This pool is also one of the major sources of commercial fish in the Upper Mississippi River.

2.55 During the winter, the riparian areas just downstream of Lake Pepin are heavily used for roosting by bald eagles and other raptors (eagles, hawks, owls). The Nelson-Trevino Bottoms is one of two areas on the river where the massasauga (swamp rattlesnake) is known to exist. The Nelson-Trevino Bottoms is also the site with the greatest potential for expansion of bald eagle nesting on the northern end of the Upper Mississippi National Wildlife and Fish Refuge. The 3,740-acre Nelson-Trevino Research Natural Area was established in 1972. Its two closed areas provide sanctuary to waterfowl during the waterfowl hunting season. The backwaters are good spawning, nesting, and rearing areas. The Big Lake, Peterson Lake areas provide hig wildlife habitat. Large numbers use the Big Lake area in the ear migration period. The Reick's heavily by migrating tundra swans.

2.56 In Pierce County, Wisco Conservancy owns a natural area o called the Rush River Bottoms. Th has designated the Tiffany Bo Scientific Area and the Nelson-T State Natural Area. The Chippewa R 760-764) is a National Natural Lan

Pool 5

TABLE 2-5 - PRINCIPAL FEATUR

Length of pool	14.6 r
River mile limits	738.1 -
Average pool elevation	660.0 f
Pool surface area	10,836 a
Shoreline miles (meandering outer perimeter)	50 m
Corps-owned land	7,565 a
	900 a
	n
	7,192 a

2.57 Description - Lock and da miles above the mouth of the O Minnesota side of the main channe areas through pool 5 show signs o action. The lowland and floodpla consist of alluvial fill deposit terraces by glacial stream outwash miles above lock and dam 5, poo channel are confined within a rela between the Minnesota high ground a sections of the earth dike that fu the lock and movable dam section. main channel follows the Minnesc about mile 742.5. Then the main through the floodplain until it rea ground near the downstream city Wisconsin. From that point, t parallels this high ground to loc

ng areas. The Big Lake, Robinson Lake, and Lake areas provide high quality fish and habitat. Large numbers of American wigeon ig Lake area in the early part of the fall period. The Reick's Lake area is used migrating tundra swans.

Pierce County, Wisconsin, The Nature y owns a natural area of State significance Rush River Bottoms. The State of Wisconsin gnated the Tiffany Bottoms as a State c Area and the Nelson-Trevino Bottoms as a ral Area. The Chippewa River Bottoms (miles s a National Natural Landmark.

LE 2-5 - PRINCIPAL FEATURES OF POOL 5

pool	14.6 river miles
limits	738.1 - 752.7
ol elevation	660.0 feet
ce area	10,836 acres
miles	50 miles
ng outer r)	
d land	7,565 acres:
	900 acres above normal flat pool
	7,192 acres managed by FWS

scription - Lock and dam 5 is 738.1 river ve the mouth of the Ohio River on the side of the main channel. The high bluff ough pool 5 show signs of previous glacial he lowland and floodplain areas basically f alluvial fill deposited in the form of by glacial stream outwash. For about 2-1/2 ve lock and dam 5, pool 5 and the main e confined within a relatively narrow area e Minnesota high ground and two longitudinal of the earth dike that funnel the flow into and movable dam section. Thereafter, the nel follows the Minnesota high ground to e 742.5. Then the main channel meanders e floodplain until it reaches Wisconsin high ar the downstream city limits of Alma, n. From that point, the main channel this high ground to lock and dam 4. Two small tributaries - the Zumbro River and the White Water River - flow into the pool from the Minnesota side.

2.58 Recreation Facilities - Pool 5 has 9 boat accesses with a total of 13 launching lanes (7 in Wisconsin, 6 in Minnesota) and 222 parking spaces. It also provides 12 marina slips, 16 rental boats, 115 camping units, and 43 picnicking units. Most of the recreational boating activity is in the upper third of the pool. The Weaver Bottoms is a heavily-used hunting area. Pool 5 has 8 dredged material disposal islands used as undeveloped recreation areas. The two major parks are John Latsch State Park in Minnesota and Buena Vista State Park in Wisconsin.

2.59 Transportation, Accessibility, and Commercial Uses - Primary highways either closely parallel the shorelines along both sides of the pool or follow nearby areas within the valley in the same general north-to-south direction. There are no highway bridges between Minnesota and Wisconsin in pool 5. Railroads closely parallel the primary highways on both sides of this pool. Neither airline service nor small airports are available in the immediate area. The only commercial dock in pool 5 handles coal for an electric utility company, Dairyland Power Cooperative.

2.60 The following utility, transportation, and commercial/industrial activities or easements are on Federal lands in pool 5:

Minnesota Department of Highways - Highway 61 construction/maintenance easement

Dairyland Power - 2 electric transmission lines

Wisconsin State Highway Commission - wayside park

Commercial fishermen - dock, holding box, and other commercial fishing facilities - Weaver Landing

2.61 Cultural Areas - Only 22 archeological sites are known in this pool; 19 of these are in Wabasha County, Minnesota. No archeological sites within pool 5 have been placed on the National Register of Historic Places.

2.62 Of the historic sites within pool 5, most are in Wisconsin. Twenty-four historic properties are located here, with most in the communities of Alma, Buffalo, and Cochrane in Buffalo County, Wisconsin.

2. BACKGROUND INFORMATION

Three properties are on the National Register of Historic Places. A multiple-resource district for Alma, which includes some archeological sites, is also on the National Register. Only one historic site within pool 5 has been recorded for Minnesota.

2.63 Natural Resources - Pool 5 provides excellent fish and wildlife habitat. Waterfowl hunting and trapping are considered good. Much of the pool is within the Winona District of the Upper Mississippi National Wildlife and Fish Refuge.

2.64 The Finger Lakes area immediately below lock and dam 4 provides some unique habitat qualities in this reach of the river. The main channel border area below the dam is used by bald eagles as a winter roosting area. The backwaters of the Weaver Bottoms and Belvidere Slough provide excellent spawning, nesting, and rearing areas, although sedimentation plus wind and current action are causing a decline in the fish and wildlife habitat value of these areas. The Weaver Bottoms "closed area" receives significant use from migrating canvasbacks. Both the Weaver Bottoms and Belvidere Slough areas are important for migrating tundra swans. GREAT I recommended a major rehabilitation project for the Weaver Bottoms to preserve and enhance its value. Areas such as Island 42 provide habitat for significant wood duck production. Mozeman's Slough is one of the most heavily fished areas in pool 5, especially for ice fishing. The sand prairie and marsh areas north of the Weaver Bottoms provide habitat for rare species of turtles and many waterfowl.

2.65 The State-managed McCarthy Lake Wildlife Area and a privately-funded peregrine falcon release project are also in this pool.

Pool 5A

TABLE 2-6 - PRINCIPAL FEATURES OF POOL 5A

Length of pool	9.6 river miles
River mile limits	728.5 - 738.1
Average pool elevation	651.0 feet
Pool surface area	6,140 acres
Shoreline miles (meandering outer perimeter)	35 miles
Corps-owned land	3,915 acres:
	570 acres above normal flat pool
	3,309 acres managed by FWS

2.66 Description - Lock and dam 5A is above Winona, Minnesota, at mile 728.5 lowest lift (5.5 feet) of the 13 dams area, except for pool 1 and Lower St. A Of the pools below locks and dam 1, p shortest, and it has the smallest water shoreline accessible by land. There are rivers in pool 5A.

2.67 In other respects, this pool has features of a wide floodplain extendi valley between high bluffs with the meandering through the alluvial fill a level terraces and lowlands formed by gl The main channel upstream of lock and d the Wisconsin side up to Fountain City (this point, the channel cuts diagonal floodplain to Minnesota and lock and 738.1).

2.68 Recreation Facilities - This poo accesses with 16 launching lanes and spaces. It also has 80 marina slips, 38 163 camping units, and 96 picnicking u has 10 dredged material disposal is undeveloped recreation areas. Merrick Wisconsin is the only major park. Lo river miles 735 and 736, this park serv access to the river from Wisconsin. narrow park extending northward from Fou with some additional area in the r Merrick State Park is a very popu picnicking, swimming, boating, and fish

2.69 Transportation, Accessibility, ar Uses - No commercial navigation fa available in this pool. However, from commercial lockages through lock 5A i 1,657 to 2,127. Commercial docking, boa related services are available at vari the pool area. Boat and motor sales ar available in the nearby city of Winon Primary highways closely parallel both river. Primary and secondary highways p township roads provide lateral access, b cross the river in pool 5A. The neare airport is in Winona, Minnesota.

2.70 The following utility, transpor commercial/industrial activities or eas Federal lands in pool 5A:

ion - Lock and dam 5A is 3 river miles Minnesota, at mile 728.5. It has the 5 feet) of the 13 dams in the study r pool 1 and Lower St. Anthony Falls. low locks and dam 1, pool 5A is the has the smallest water area and least ible by land. There are no tributary 5A.

respects, this pool has the typical ide floodplain extending across the high bluffs with the main channel ugh the alluvial fill and the multi- nd lowlands formed by glacial outwash. upstream of lock and dam 5A follows de up to Fountain City (mile 733). At channel cuts diagonally across the Minnesota and lock and dam 5 (mile

n Facilities - This pool has 11 boat 16 launching lanes and 430 parking has 80 marina slips, 38 rental boats, ts, and 96 picnicking units. Pool 5A material disposal islands used as eation areas. Merrick State Park in e only major park. Located between and 736, this park serves as a major iver from Wisconsin. It is a long, nding northward from Fountain City Bay itional area in the river bottoms. Park is a very popular camping, mming, boating, and fishing attraction.

tion, Accessibility, and Commercial
mercial navigation facilities are s pool. However, from 1960 to 1972, tages through lock 5A increased from Commercial docking, boat rental, and s are available at various points in Boat and motor sales and service are e nearby city of Winona, Minnesota. s closely parallel both sides of the nd secondary highways plus county and rovide lateral access, but no highways in pool 5A. The nearest commercial nona, Minnesota.

ing utility, transportation, and trial activities or easements are on pool 5A:

Northwestern Bell - underground telephone cable easement construction and maintenance

Northern States Power - construction, operation, and maintenance of electric power transmission line

Wisconsin State Highway Commission - construction, use and maintenance of public highways

2.71 **Cultural Areas** - Known cultural resources within pool 5A are few. No historic properties are recorded for Minnesota. Only 8 archeological sites have been recorded in the Minnesota portion of this pool. Most of these sites are burial mounds located outside of the floodplain. Within this area, 11 archeological sites are known in Buffalo County. Twenty-two known historic sites are in the Wisconsin part of this pool. All of these are known from inventory work conducted by the Wisconsin State Historical Society. The Fugina House in Fountain City, Wisconsin, is on the National Register of Historic Places.

2.72 **Natural Resources** - Fish and wildlife habitat are generally very good in pool 5A. There is substantial commercial fishing. The low level of water pollution in this pool is not harmful to fish and wildlife. Much of the pool lies within the Winona District of the Upper Mississippi National Wildlife and Fish Refuge.

2.73 The Fountain City Bay area and the extensive backwater between Fountain City, Wisconsin, and Minnesota City, Minnesota, provide excellent hunting, fishing, and trapping. A large heron and egret rookery exists in the Fountain City vicinity. Much of the rich and diverse Fountain City Bay area is within the Whitman Wildlife Area (managed by the Wisconsin Department of Natural Resources). The Fish and Wildlife Service recommends that the Federal land within the overall boundaries of the Whitman Wildlife Area be transferred to the State of Wisconsin. The Thorp Wildlife Management Area is managed by the Minnesota Department of Natural Resources. One closed area provides waterfowl sanctuary during the hunting season.

2.74 Whitman Bottoms Floodplain Forest in Buffalo County is a 170-acre scientific area controlled by the Wisconsin Department of Natural Resources, Bureau of Wildlife Management. The Wisconsin Department of Natural Resources has designated Kammeroski Rookery at mile 734 as a State Natural Area.

2. BACKGROUND INFORMATION

Pool 6

TABLE 2-7 - PRINCIPAL FEATURES OF POOL 6

Length of pool	14.2 river miles
River mile limits	714.3 - 728.5
Average pool elevation	645.5 feet
Pool surface area	8,870 acres
Shoreline miles (meandering outer perimeter)	55 miles
Corps-owned land	337 acres above normal flat pool 223 acres managed by FWS

2.75 Description - Lock and dam 6 is at river mile 714.3 near Trempealeau, Wisconsin. A railroad right-of-way embankment (owned and operated by the Burlington Northern Railroad) longitudinally divides the pool into two relatively large, equal portions from river miles 717 to 725. The main channel portion lies on the south side of the railroad embankment. This portion of the pool has all the features that are typical of deep-water channel sections of the Upper Mississippi. The north portion, previously known as the Delta Fish and Fur Farm, is now part of the Trempeleau National Fish and Wildlife Refuge. Management of this refuge is intended to enhance the propagation of fish and wildlife for private sport fishing and hunting by permit only. The FWS controls the refuge independently of the main channel levels maintained by the Corps.

2.76 Recreation Facilities - Pool 6 has 11 boat accesses with 16 launching lanes and 570 parking spaces. There are also 547 marina slips, 243 camping units, and 191 picnicking units. Eight dredged material disposal islands in pool 6 are used as undeveloped recreation areas.

2.77 The two major parks adjacent to the pool are Perrot State Park in Wisconsin and Latsch Prairie Island Park in Minnesota. Perrot State Park overlooks pool 6 from the high bluff area between the village of Trempealeau, Wisconsin (mile 715), and Trempealeau Bay (mile 717). The park is over 1,000 acres, provides general day-use recreational facilities scattered along its scenic and natural areas, and includes about 40 campsites. A boat-launching area is at the upstream end of the park on Trempealeau Bay. The entire pool is heavily used by recreationists.

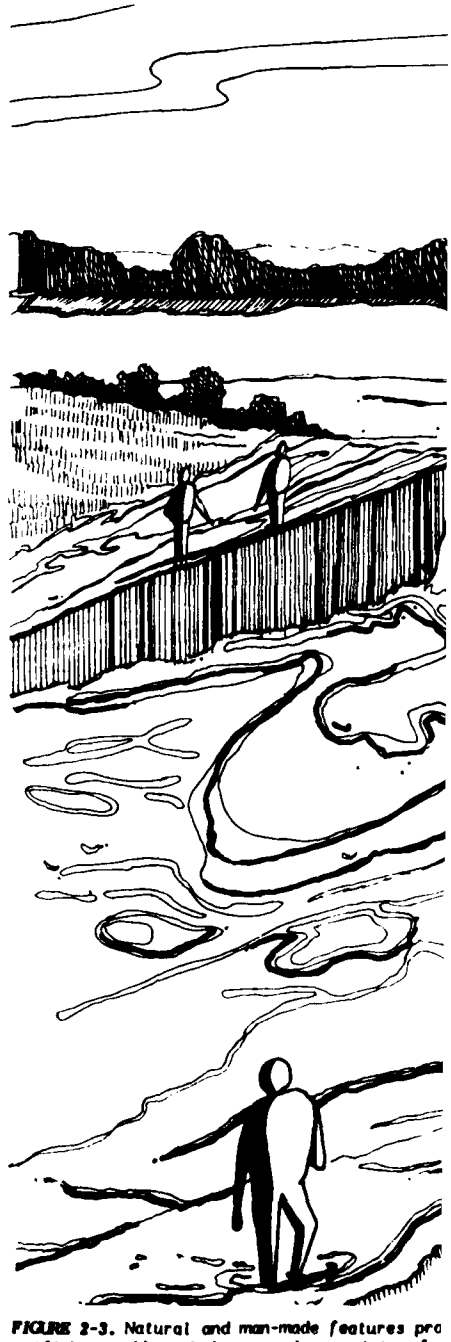
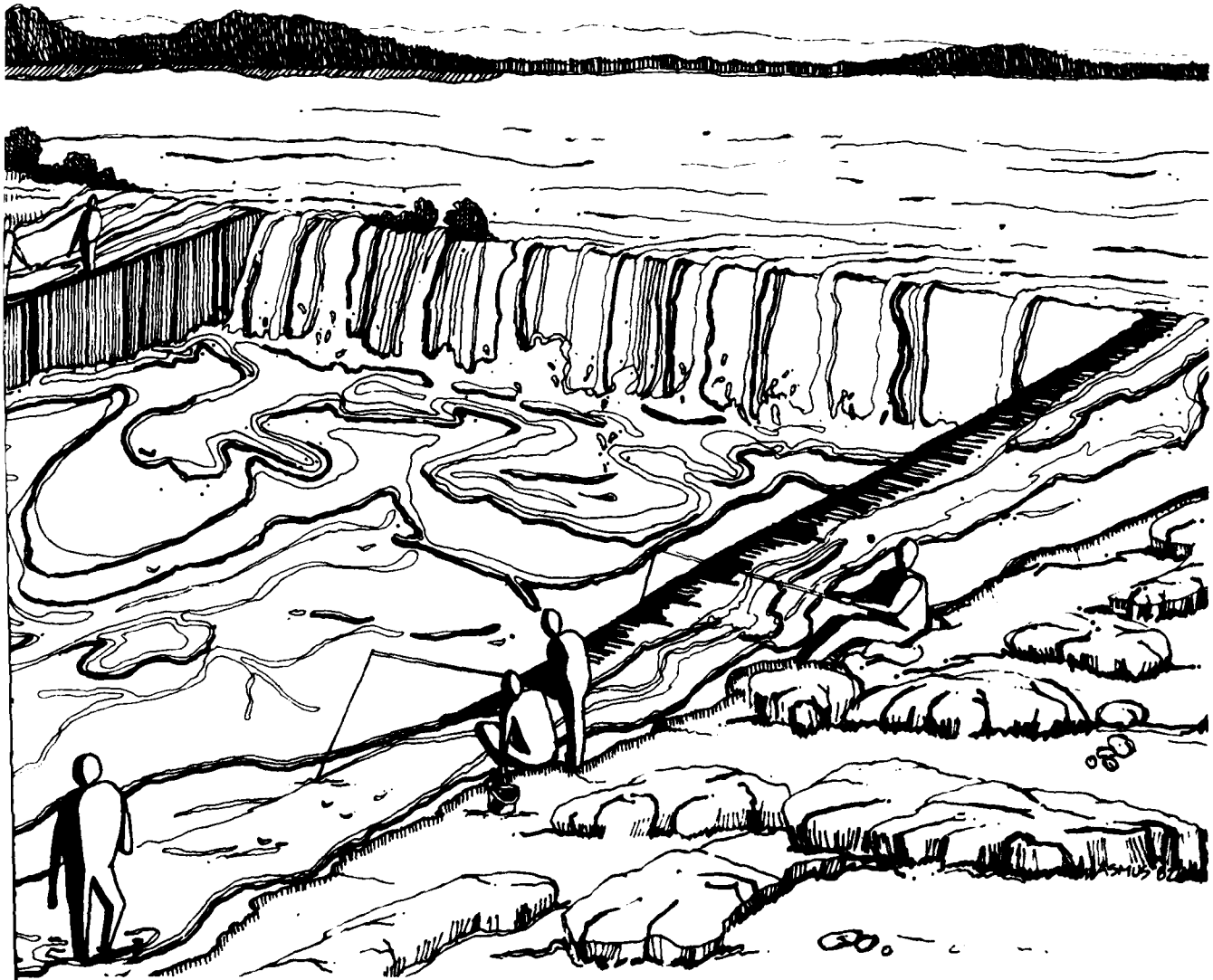


FIGURE 2-3. Natural and man-made features pro
catfish, smallmouth bass, and a variety of
River.



and man-made features provide many sport-fishing opportunities on the river. Popular species include walleye, northern pike, white bass, bass, and a variety of pan fish. Conservative estimates indicate that several million people annually fish on the Upper Mississippi

2. BACKGROUND INFORMATION

2.78 Most of the recreational boating centers around Winona or immediately downstream. Pleasure craft passing through lock and dam 6 have increased from 3,700 in 1960 to about 5,800 in 1972. This number is continuing to increase.

2.79 **Transportation, Accessibility, and Commercial Uses** - Pool 6 has 10 commercial navigation facilities. Eight of these facilities are in Winona, Minnesota. Two of these docks serve grain companies, three serve oil companies, two handle coal, and one handles miscellaneous products. Primary highways and railroads closely parallel both sides of the pool. Highways and other roads provide lateral access. The only highway crossing between Minnesota and Wisconsin is at Winona, Minnesota. Winona also has a commercial airport.

2.80 The following utility, transportation, and commercial/industrial activities or easements are on Federal lands in pool 6:

City of Winona - barge-fleeting area

Trempealeau Electric Cooperative - electric transmission line

Northern States Power - powerline easement

Dredging Operator - permit for operations base

Village of Trempealeau - sewer line easement

2.81 **Cultural Areas** - Pool 6 has 39 known archeological sites. None of these sites are on the National Register of Historic Places. Only 5 of the 39 sites are in Minnesota, all in Winona County. In Wisconsin, most of the known archeological sites are in Trempealeau County, with only 7 in Buffalo County.

2.82 The historic sites of this pool include bridges, houses, industrial buildings, and public buildings. In all, 130 historic structures in the area have been recorded. The majority of these are in Winona, Minnesota. Sixteen of the properties in Winona are on the National Register. Only 16 historic structures are within Trempealeau County, Wisconsin.

2.83 **Natural Resources** - Pool 6 has some good fish and wildlife habitat, but habitat acreage is limited. A significant heron rookery is locatec property in the Winona area. The Straig Blacksmith Slough areas provide fishing trapping. Some areas are popular with l but hunting is generally quite limited.

2.84 The Trempealeau National Wildlife adjacent to the pool 6 planning area. provides excellent habitat for water furbearers, eagles, deer, and other wi Fish and Wildlife Service recently cc master plan for the Trempealeau Refuge. DNR has classified Trempealeau Mc Mertes Slough as State Natural Areas.

Pool 7

TABLE 2-8 - PRINCIPAL FEATURES OF I

Length of pool	11.8 river m
River mile limits	702.5 - 714.3
Average pool elevation	639.0 feet
Pool surface area	13,440 acres
Shoreline miles (meandering outer perimeter)	37.1 miles
Corps-owned land	7,066 acres:
	1,250 acres al normal
	6,880 acres ma

2.85 **Description** - Lock and dam 7 is at about 4.6 river miles above La Crosse, W the Minnesota side or right bank of the Between the bluffs, the lowland and floc average over 5 miles wide and consist terraces deposited by glacial stream ou major features of pool 7 include Lak several large island complexes, and the tributary. The extreme lower end of the Wisconsin side is highly suitable for w The land is relatively level and less b interspersed water areas. The shoreline not wooded except for fringe cover considered desirable for extensive la recreation. The upper pool is more extens and more aesthetically attractive than the

2.86 **Recreation Facilities** - Pool 7

n rookery is located on private
inona area. The Straight Slough and
areas provide fishing and muskrat
eas are popular with local hunters,
erally quite limited.

eau National Wildlife Refuge lies
ool 6 planning area. This refuge
it habitat for waterfowl, fish,
s, deer, and other wildlife. The
e Service recently completed its
Trempealeau Refuge. The Wisconsin
ied Trempealeau Mountain and
tate Natural Areas.

PRINCIPAL FEATURES OF POOL 7

	11.8 river miles
	702.5 - 714.3
ion	639.0 feet
	13,440 acres
	37.1 miles
	7,066 acres:
	1,250 acres above normal flat pool
	6,880 acres managed by FWS

- Lock and dam 7 is at mile 702.5,
es above La Crosse, Wisconsin, on
or right bank of the main channel.
the lowland and floodplain areas
es wide and consist of alluvial
by glacial stream outwash. The
pool 7 include Lake Onalaska,
d complexes, and the Black River
reme lower end of the pool on the
ighly suitable for water access.
ely level and less broken-up by
reas. The shoreline is generally
for fringe cover and is not
le for extensive land-related
r pool is more extensively wooded
ly attractive than the lower pool.

cilities - Pool 7 has 11 boat accesses with 15 launching lanes and 235 adjacent parking spaces. A total of 46 marina slips, 112 camping units (Wisconsin), 213 picnic units (28 in Minnesota and 185 in Wisconsin), and 4 miles of hiking trails (Wisconsin) are also located here. Pool 7 has 12 dredged material disposal islands used as undeveloped recreation areas. O.L. Kipp State Park in Minnesota and Louis Nelson Park in Wisconsin are the two major parks.

2.87 Transportation, Accessibility, and Commercial Uses - There are no commercial navigation facilities in this pool. Pool 7 acts as a water link between terminals in other pools. From 1960 to 1972, commercial lockages through lock 7 increased from 1,324 to 2,429. The commercial fishing catch, although still substantial, has declined significantly. Most points along the outer limits of pool 7 are accessible by both railroad and highway. The lower end of the pool on the Wisconsin side (by La Crosse) is especially suitable for access. La Crosse is a focal point for highways servicing both Wisconsin and Minnesota. The crossing nearest to lock and dam 7 is the Interstate Highway 90 bridge.

2.88 The following utility, transportation, and commercial/industrial activities or easements are on Federal lands in pool 7:

City of La Crosse - easement for municipal airport facilities

Dairyland Power - electric transmission lines

State of Wisconsin Highway Commission - construction and maintenanceof highways

2.89 Cultural Areas - Pool 7 includes 41 archeological sites and 28 historic properties. One-fourth of the known archeological sites are within Winona County, Minnesota. The majority of the Wisconsin sites are in La Crosse County, which has twice the number known in Trempealeau County. The Midway Village Site, a burial and habitation site dating between AD 200 and AD 1630, is on the National Register of Historic Places.

2.90 Only 28 historic sites are known within pool 7, most in Trempealeau County, Wisconsin. Five are in Winona County, Minnesota, and three are in La Crosse County, Wisconsin.

2. BACKGROUND INFORMATION

2.91 Natural Resources - Pool 7 provides some extremely valuable fish and wildlife habitat. The deltas of Tank Creek, Shingle Creek, and the Black River provide excellent hunting, fishing, and trapping as well as good wood duck production. The Black River Bottoms area holds good potential for bald eagle nesting, and the massasauga (swamp rattlesnake) is known to exist there. Lake Onalaska contains outstanding beds of wild celery and provides migration habitat for large concentrations of migrating canvasbacks as well as for other ducks, Canada geese, and tundra swans. Lake Onalaska also supports a very diverse fishery and is a very popular sport fishing area. Most of Lake Onalaska is closed to hunting and trapping during the duck season.

2.92 Sedimentation in Lake Onalaska and in other backwaters is a major concern in pool 7. The Fish and Wildlife Service has been conducting extensive studies of the area and of its importance to both waterfowl and fish. The FWS will develop a fish management plan for Lake Onalaska.

2.93 The Wisconsin DNR has classified Black River Bottoms, Lake Onalaska, Sunset Point, Upland Plover Nesting Site, and Tank Creek as Natural Areas.

Pool 8

TABLE 2-9 - PRINCIPAL FEATURES OF POOL 8

Length of pool	23.3 river miles
River mile limits	679.2 - 702.5
Average pool elevation	631.0 feet
Pool surface area	20,810 acres
Shoreline miles (meandering outer perimeter)	85 miles
Corps-owned land	10,179 acres:
	2,100 acres above normal flat pool
	9,193 acres managed by FWS

2.94 Description - Lock and dam 8 is at river mile 679.2 on the Wisconsin side or left bank of the main channel. The lower pool area has one of the broader expanses in the study area of water surface that is relatively unbroken by interspersed areas of protruding land. The floodplain and lowlands basically consist of alluvial fill deposited in terraces by glacial stream outwash situated about halfway down the poc largest developed recreation areas The Root River from Minnesota and th from Wisconsin both flow directly i cities of La Crosse, Wisconsin, (popu and Onalaska, Wisconsin (populatio Crescent, Minnesota (population 3,1 upper end of the pool. The populat mile radius is estimated at about 10(

2.95 Recreation Facilities - Poo accesses with 34 launching lanes an parking spaces. It also has 909 m camping units, 383 picnicking unit beach areas (3 in Wisconsin, 1 in Mi miles of hiking trails (16 in W Minnesota). Pool 8 has 16 dredged i islands used as underdeveloped recre area near Brownsville is one of the undeveloped shoreline areas in the main channel north of Genoa to Brow of La Crosse is heavily used for p waterskiing.

2.96 Transportation, Accessibility Uses - Three commercial navigatio located in pool 8, with five more f Black River. (The Black River has t entering pool 7 and one that is These facilities include four that petroleum to NSP, Socony Mobil, Texas La Crosse Coal company. Another trar Cargill . From 1960 to 1972, com through lock 8 increased from 1,670 is paralleled by primary and second connect with highways leading late pool area. A highway bridge crosses La Crosse and La Crescent, and Inte crosses just downstream of lock and

2.97 The following utility, tra commercial/industrial activities or Federal lands in pool 7:

Lee Association - radio transmis

Village of Stoddard - dump site, se

Northern Natural Gas Company - pipe

Dairyland Power - construction, maintenance of electric power transm

' glacial stream outwash. Goose Island, ıout halfway down the pool, is one of the eloped recreation areas in the District. ver from Minnesota and the La Crosse River ısin both flow directly into pool 8. The a Crosse, Wisconsin, (population of 51,153) :a, Wisconsin (population 4,909), and La Minnesota (population 3,142) are near the f the pool. The population within a 50- is estimated at about 100,000.

eation Facilities - Pool 8 has 21 boat th 34 launching lanes and 975 associated aces. It also has 909 marina slips, 530 its, 383 picnicking units, 4 road access (3 in Wisconsin, 1 in Minnesota), and 17 ıiking trails (16 in Wisconsin, 1 in Pool 8 has 16 dredged material disposal l as underdeveloped recreation areas. The rownsville is one of the most heavily used l shoreline areas in the study area. The l north of Genoa to Brownsville and north se is heavily used for powerboating and

ortation, Accessibility, and Commercial ee commercial navigation facilities are pool 8, with five more facilities on the . (The Black River has two channels, one ool 7 and one that is part of pool 8.) lities include four that supply coal and o NSP, Socony Mobil, Texas Oil Company, and oal company. Another trans-ships grain for From 1960 to 1972, commercial lockages 8 increased from 1,670 to 2,135. Pool 8 ed by primary and secondary highways that h highways leading laterally toward the A highway bridge crosses the river between nd La Crescent, and Interstate Highway 90 downstream of lock and dam 7.

ollowing utility, transportation, and industrial activities or easements are on ds in pool 7:

ation - radio transmission towers

Stoddard - dump site, sewer line

tural Gas Company - pipeline and stations

Power - construction, operation, and of electric power transmission line

Minnesota Department of Highways - construction and maintenance of Highways 26, 61, 14, and I-90

Northern States Power - electric transmission line

Wisconsin Highway Commission - construction and maintenance of Highways 35 and I-90

Harbor Services, Inc. - barge-fleeting area

City of La Crosse - Pammel Creek flood control project

2.98 **Cultural Areas** - Very few of the known cultural resources within pool 8 are in Minnesota. Only 7 archeological sites and 4 historic properties are recorded in Houston County along the river.

2.99 Forty-three archeological sites are known in La Crosse County, Wisconsin. Two of these, the Overhead Site and the Valley View Site, are on the National Register of Historic Places. Both sites were investigated recently by the Anthropology Department of the University of Wisconsin, La Crosse. Twelve known archeological sites are in Vernon County, Wisconsin. One site, at Goose Island, is on the National Register. All but 10 of the 442 Wisconsin historic sites in this pool are in La Crosse County. Five properties are on the National Register of Historic Places, and 33 structures have been determined eligible for the National Register.

2.100 **Natural Resources** - Pool 8 provides good fish and wildlife habitat. The pool is also of major importance for commercial fishing. Hunting, fishing, and trapping are considered excellent throughout the extensive backwaters in the Blue Lake, Target Lake, and Upper Goose Island areas. A significant heron rookery is in the Root River delta. Crosby Slough provides excellent waterfowl hunting.

2.101 Diving duck use, especially by canvasbacks, was traditionally quite high in pool 8. However, an 83-percent decline in wild celery between 1975 and 1980 led to a 90-percent decline in canvasback use. The Fish and Wildlife Service is presently investigating this decline and is searching for possible causes and potential means of restoration. One large source of silt and a possible contributing factor to resource loss is the Root River. Despite its problems, pool 8 still has significant wood duck production, and the

2. BACKGROUND INFORMATION

large closed area in the lower pool provides migration habitat for diving ducks, tundra swans, Canada geese, and other waterfowl.

2.102 Wisconsin has designated Turtle Nesting Site (mile 685) as a Natural Area. Four natural areas of county significance in La Crosse County include West Channel Woods, Goose Island, Interstate Bridge Woods, and Smith Slough Flood Plain Forest. Vernon County sites include Lower Goose Island, Crosby Slough, and Cook Creek Marsh.

Pool 9

TABLE 2-10 - PRINCIPAL FEATURES OF POOL 9

Length of pool	31.3 river miles
River mile limits	647.9 - 679.2
Average pool elevation	620.0 feet
Pool surface area	29,125 acres
Shoreline miles (meandering outer perimeter)	90 miles
Corps-owned land	8,950 acres:
	2,000 acres above normal flat pool
	8,190 acres managed by FWS

2.103 **Description** - Lock and dam 9 is at Lynxville, Wisconsin, 647.9 river miles above the mouth of the Ohio River. The total water area of the pool plus all Federal above-water lands within acquisition limits give pool 9 the largest federally-managed area of any pool in the study area. The Bad Axe River from Wisconsin and the Upper Iowa River from Iowa are small tributaries that flow into the Mississippi River in pool 9. The main river channel parallels the high Wisconsin shoreline from lock and dam 9 upstream to the village of Lynxville. Above that point, the main channel angles sharply across the valley to the Iowa shoreline, which it then parallels to the town of Lansing. The river again angles across the valley to the village of De Soto, Wisconsin, and continues upstream at or near Wisconsin high ground until it reaches lock and dam 8 at Genoa, Wisconsin.

2.104 **Recreation Facilities** - Pool 9 has 16 boat accesses with 21 launching lanes (2 in Minnesota, 13 in Wisconsin, 6 in Iowa) and 408 adjacent parking spaces. It also has 216 marina slips (70 in Wisconsin, 146 in Iowa), 180 camping unit picnicking units, and 2 miles of hiking trails Hunting, fishing, boating, waterskiing, and are concentrated in the upper two-thirds of This pool is one of the most heavily fished p the study area. Pool 9 has 11 dredged m disposal islands used as undeveloped recreatio The only major park in the area is Blackhaw which is managed by the Corps.

2.105 **Transportation/Accessibility, and Com Uses** - There are two commercial navigation fac in pool 9. Primary highways closely parallel t along the Wisconsin side and along the upper the Iowa and Minnesota side. Secondary h provide adequate access along the lower half pool in Iowa. One highway bridge exists at L The railroad tracks and steep adjacent bluff access to the water.

2.106 Pool 9 and pool 4 share the distinction the most important pools for commercial fishin northern section of the Upper Mississippi Rive ranks first in commercial value in pool 9. catfish catch is also significant. The average (1953-1964) catch for all commercial in pool 9 was 1,333,856 pounds. Only pool 4 e this figure during that period. The average harvest of furbearers is also a significant com activity, with muskrats the prime species ha

2.107 The nearest commercial airline ser available at La Crosse, Wisconsin. However, th small airports at several smaller towns for private planes.

2.108 The following utility, transportati commercial/industrial activities or easements Federal lands in pool 9:

Wisconsin State Highway Commission - construct maintenance of Highways 35 and 82

Dairyland Power - 161KV power transmissio barge-fleeting area

Northern States Power - electric power trans line

Minnesota Highway Commission - construct maintenance of Highway 26

Town of New Albin - diversion ditch

owa), 180 camping units, 149
2 miles of hiking trails (Iowa).
ting, waterskiing, and camping
he upper two-thirds of pool 9.
e most heavily fished pools in
l 9 has 11 dredged material
as undeveloped recreation areas.
in the area is Blackhawk Park,
e Corps.

/Accessibility, and Commercial
commercial navigation facilities
hways closely parallel the pool
ide and along the upper half on
ota side. Secondary highways
ess along the lower half of the
hway bridge exists at Lansing.
nd steep adjacent bluffs limit

4 share the distinction of being
ls for commercial fishing in the
e Upper Mississippi River. Carp
rcial value in pool 9. Annual
so significant. The 12-year
ch for all commercial species
6 pounds. Only pool 4 exceeded
at period. The average annual
is also a significant commercial
ts the prime species harvested.

ommercial airline service is
, Wisconsin. However, there are
veral smaller towns for use of

utility, transportation, and
activities or easements are on
9:

y Commission - construction and
s 35 and 82

1KV power transmission line,

- electric power transmission

ommission - construction and
26

version ditch

Vernon County - construction and maintenance of access road

Iowa State Conservation Commission - construction and maintenance of New Albin access road

Commercial Fishermen - permit for operation base

2.109 **Cultural Areas** - The cultural resources of pool 9 are primarily archeological resources. Eighty-eight sites are within the pool: 33 in Wisconsin, 51 in Iowa, and 4 in Minnesota. At one time there were an estimated 30,000 Indian burial mounds in Iowa. Most of these mounds are on prominent ridges or bluffs along the rivers and larger streams. The mounds occur in clusters or groups. A single site sometimes contains more than 100 mounds. Mounds are in three forms: conical (round), linear (long), and effigy. The effigy mounds are large, elaborately-shaped animal forms that may measure as much as 100 feet across. Effigies in this region usually resemble birds and bears.

2.110 One historic site is known in Houston County, Minnesota; two are known in Allamakee County, Iowa; and 11 are known in Vernon and Crawford Counties, Wisconsin. The two properties in Lansing, Iowa, are on the National Register.

2.111 **Natural Resources** - The relatively high water quality in pool 9 contributes to the good fish and wildlife habitat, although sedimentation is causing a decline in fish habitat. Pool 9 and pool 4 are the most important pools in the northern section of the Upper Mississippi River for commercial fishing. There is also a significant amount of mussel fishing, largely because of the Japanese demand for freshwater clamshells.

2.112 Capoli Slough, Reno Bottoms, Winneshiek Slough, Big Lake, and Minnesota Slough provide a diversity of habitats. These areas offer excellent waterfowl hunting and furbearer trapping. The latter three areas plus the main channel border north of Lansing also provide excellent sport fishing. The closed area in the lower portion of pool 9 receives very high diving duck use. Together with Lake Onalaska, this closed area provides the major food resource for migrating canvasbacks. The Big Lake and Reno Bottoms areas provide migration habitat for large numbers of American wigeon, mallards, gadwalls, and other dabblers.

2. BACKGROUND INFORMATION

2.113 The 1980-acre Reno Bottoms Research Natural Area was established in 1972. In addition to wood duck production and significant heron rookery areas, the Reno Bottoms area provides the most significant bald eagle production on the Upper Mississippi River.

2.114 Natural areas of county significance include Waiter Lake Flood Plain Forest (Vernon County), Winneshiek Slough, Forester's Tern Colony, and Chain and Ambrough Sloughs (Crawford County).

Pool 10

TABLE 2-11 - PRINCIPAL FEATURES OF POOL 10

Length of pool	32.8 river miles
River mile limits	615.1 - 647.9
Average pool elevation	611.0 feet
Pool surface area	17,070 acres
Shoreline miles (meandering outer perimeter)	110 miles
Corps-owned land	3,794 acres:
	480 acres above normal flat pool
	3,634 acres managed by FWS

2.115 **Description** - Lock and dam 10 is at river mile 615.1, adjacent to downtown Guttenberg, Iowa. Prairie du Chien, Wisconsin, with a population of 5,540, is the largest city on the pool. Guttenberg, Iowa, with a population of 2,177, is the largest Iowa city on the pool. Total population in the zone is estimated at 90,000, with 30,000 in Wisconsin and 60,000 in Iowa. Pool 10 is the second longest pool with the second longest shoreline in the St. Paul District. However, it has less water area than some other, shorter pools because the valley and flood plain area between the bluffs become increasingly narrow at the lower end of the pool. The Wisconsin River, at mile 631, enters pool 10, as does the Yellow River at mile 642, a smaller tributary from Iowa.

2.116 **Recreation Facilities** - Pool 10 has 33 boat accesses with 47 launching lanes and 1,700 nearby parking spaces. It also has 785 marina slips, 130 rental boats, 141 camping units, and 212 picnicking units. Trails include 73 miles for hiking, 28 miles for cross-country skiing and 17 miles for horseback riding. Records of pleasure boat traffic through lock and dams 9 and 10 show a small increase over the last decade. Pool 10 has 15 dredged ma islands used as undeveloped recreat parks and forests include the Natio Effigy Mound National Monument at Pike's Peak State Park and Yellow Ri and Wisconsin's Wyalusing State Park

2.117 **Transportation Accessibility, Uses** - Primary highways closely pa along both sides through most of the the Wisconsin River, but below that inland for a considerable distance be the area immediately bordering the bridge at Prairie du Chien provides a Iowa and Wisconsin. Five commercial needs of pool 10. Three docks are o side of the river. These serve Prai handle coal, salt, fertilizer, steel, attractive grain-shipping docks serve Commercial lockages through pool 1(gradually over the last decade. Cor although substantial in pool 10, is or the volume of pool 9. Commercially a boat rental, and related services a various points in the pool area. Boat service are also available at lar generally in the large municipalities.

2.118 The following utility, trans commercial/industrial activities or Federal lands in pool 10:

Wayalusing Township - public road ease

Interstate Power Company - powerline maintenance

Crawford County Electric Company - t (Ambro Slough area)

Wisconsin Highway Commission - reloca and 60 - construction and maintenance

2.119 **Cultural Areas** - Of all the p Paul District, pool 10 has the grea diversity of known cultural resources.

2.120 Two hundred seventy-two archeol districts are known within the poo twenty of these are in Iowa. Effigy Monument in Allamakee and Clayton Cou on the National Register of Historic P by the National Park Service, the mo

10 has 15 dredged material disposal
s undeveloped recreation areas. Major
sts include the National Park Service
ational Monument at mile 627, Iowa's
e Park and Yellow River State Forest,
Wyalusing State Park at mile 629.

ation Accessibility, and Commercial
highways closely parallel the pool
s through most of the area upstream of
River, but below that point, they loop
siderable distance before returning to
iately bordering the pool. A highway
ie du Chien provides a crossing between
sin. Five commercial docks serve the
10. Three docks are on the Wisconsin
er. These serve Prairie du Chien and
lt, fertilizer, steel, and grain. Two
n-shipping docks serve McGregor, Iowa.
kages through pool 10 have increased
the last decade. Commercial fishing,
ntial in pool 10, is only 30 percent of
ool 9. Commercially available docking,
id related services are available at
in the pool area. Boat and motor sales
so available at larger facilities,
e large municipalities.

owing utility, transportation, and
strial activities or easements are on
pool 10:

hip - public road easement

Company - powerline construction and

Electric Company - transmission line
ea)

y Commission - relocation of Routes 18
ction and maintenance

Areas - Of all the pools in the St.
pool 10 has the greatest number and
wn cultural resources.

d seventy-two archeological sites and
nown within the pool. One hundred
are in Iowa. Effigy Mounds National
amakee and Clayton Counties, Iowa, is
Register of Historic Places. Operated
Park Service, the monument annually
draws large numbers of people who view the burial mounds along the bluffs of the river. This site (located below the monument) is also on the National Register. Pool 10 also contains several of the larger early-day outposts and settlements. Principal existing cities on pool 10 that have developed from this early era are Prairie du Chien, Wisconsin, and Guttenberg Iowa. . These early towns were significant centers for the fur trade, steamships, and railroads.

2.121 In Crawford and Grant Counties, Wisconsin, an additional 152 archeological sites along the river have been recorded. One site, the Pedretti III site, is on the National Register; and two districts, the St. Feriole Island Historic and Archeological District and the Marais Lake Archeological District have been determined eligible for the National Register.

2.122 The majority of the 243 historic properties in this portion of the study area are in Guttenberg, Iowa. Two properties are on the National Register. Four historic properties have been recorded in Grant County, and 14 have been recorded in Crawford County, Wisconsin. Many historic structures in Prairie du Chien are within the St. Feriole Island Historic and Archeological District. The State Historical Society of Wisconsin maintains and operates Villa Louis, the American Fur Company Warehouse, the Brisbois House, and the Rollette House. The Villa Louis is open to the public. The Dousman House Hotel, on St. Feriole Island, is also on the National Register. Many of these structures are also National Historic Landmarks. Three historic properties located on mainland Prairie du Chien are also on the National Register. One of these is Second Fort Crawford, which was constructed in 1829.

2.123 **Natural Resources** - The relatively low level of water pollution in pool 10 contributes to good fish and wildlife habitat, although fluctuating water levels cause significant problems. Fishing, hunting, and trapping are considered excellent throughout the extensive backwaters. Mussel fishing is also increasing in this pool.

2.124 Harper's Slough, Gernet Lake, the Johnson Slough area, the Wyalusing Slough area, Gremore Lake, Ambro Lake, the Bagley Bottoms, and the Ferry Slough area are used extensively for camping and boating. Production of great blue heron and wood duck is significant. Bald eagles roost in good numbers along open-water stretches during the winter. Populations of the endangered Higgins' eye mussel are known in the

2. BACKGROUND INFORMATION

East Channel at Prairie du Chien, Wisconsin, and at McMillan Island above Guttenberg, Iowa. A small closed area above lock and dam 10 provides sanctuary for waterfowl during the hunting season.

2.125 Natural areas of county significance include McGregor and Gernett Lakes. The Wisconsin Department of Natural Resources has three natural areas - Lowland Woods (mile 621), Cliffs Woods (mile 618), and Eagle Valley (mile 614).

CORPS-OWNED RECREATION AREAS

Corps-Operated Recreation Sites

2.126 The St. Paul District of the Corps of Engineers maintains and operates five recreational areas along the Mississippi River. A brief summary of each of these recreation sites follows.

2.127 **Sturgeon Lake Access** - This site covers 2 acres at Sturgeon Lake on the right descending bank of the river adjacent to mile 798.5 in pool 3. Present facilities include a two-lane boat-launching ramp and a parking lot with 8 car spaces plus 15 car-and-trailer spaces. No sanitary facilities are available at this site.

2.128 **Millstone Landing** - This site covers 15 acres in the right descending bank backwaters adjacent to mile 677 in pool 9. Facilities include two picnic tables, a vault toilet, a one-lane launching ramp and a 22-space car-and-trailer parking lot.

2.129 **Bad Axe Landing** - This 5-acre site is on the left descending bank of the river at mile 675 in pool 9. A one-lane boat-launching ramp and a 20-space car-and-trailer parking lot are provided for users. Additional facilities include two picnic sites and a vault toilet.

2.130 **Blackhawk Recreation Area** - This 225-acre Corps-managed area on the left descending bank of the river between miles 670 and 671 is the largest public use facility in pool 9. Facilities include 146 campsites and 69 picnic sites. Electrical hookup is available for campers. Potable water and vault toilets are provided. Additional facilities include two one-lane boat-launching ramps and three parking lots with a total of 60 car spaces plus 20 car-and-trailer spaces. Among current development plans is a shoreline protection project to control an erosion problem.

TABLE 2-12 - SUMMARIZED PROJECT DATA

Item	Pool USAF	LSAF	1	
Adjacent States	MN only	MN only	MN only	
River Mile Limits	853.8-864.7	853.4-853.8	847.7-853.4	8 8
Length of Pool (river miles)	10.9	.4	5.7	
Average Pool Elevation (feet above mean sea level)	798.3	750.0	725.1	6
Shoreline Miles	25.0	1.5	11.6	
Major Highway Access	I-35W (MN)	I-35W (MN)	I-35W I-94 (MN)	U U
Land (acres) owned by Corps.[c]	Combined = 13		33	
Pool Surface Area (acres)	974	51	546	
Land (acres) Managed by Dept. of Interior[d]	0	0	0	

a Includes 25.0 river miles on Minnesot
b Includes 24.5 river miles on St. Croi
c Source: Natural Resource Management
d GREAT I Recreation Study, Volume 6, 1 Department of Interior.
e Leased to Minnesota State Wildlife Se

ZED PROJECT DATA

SUMMARIZED PROJECT DATA

LSAF	1	2	3	4	5	5A	6	7	8	9	10
MN only	MN only	MN only	WI, MN	WI, MN	WI, MN	WI, MN	WI, MN	WI, MN	WI, MN	WI,IA, MN	WI, IA
- 853.4-853.8	847.7-853.4	815.2-847.7	796.9-815.2	752.7-796.9	738.1-752.7	728.5-738.1	714.3-728.5	702.5-714.3	679.2-702.5	647.9-679.2	615.1-647.9
.4	5.7	57.5[a]	42.8[b]	44.2	14.6	9.6	14.2	11.8	23.3	31.3	32.8
750.0	725.1	687.2	675.0	667.0	660.0	651.0	645.5	639.0	631.0	620.0	611.0
1.5	11.6	110	37.1	155	50	35	55	37.1	85	90	110
I-35W (MN)	I-35W I-94 (MN)	U.S.10 U.S.61 (MN)	U.S.61 (MN) I-94 (MN-WI)	U.S.61 (MN) WI 35 (WI)	U.S.61 (MN) WI 35 (WI)	U.S.61 (MN) WI 35 (WI)	U.S.61 (MN) WI 54 (WI)	U.S.61 (MN) U.S.55 (WI) I-90 (MN-WI)	U.S.26 (MN) WI-35 (WI)	U.S.26 (IA) WI 35 (WI)	U.S.52 (IA) U.S.18 (WI)
ed = 13	33	1,219	5,605	2,900	7,565	3,915	337	7,066	10,179	8,950	3,794
51	546	9,652	17,950	35,198	10,836	6,140	8,870	13,440	20,810	29,125	17,070
0	0	0	4,123[e]	2,811	7,192	3,309	223	6,880	9,193	8,190	3,634

r miles on Minnesota River.
r miles on St. Croix River.
esource Management Section, Corps of Engineers.
Study, Volume 6, 1980, does not include refuge lands owned in fee title bythe
ior.
State Wildlife Service.

2. BACKGROUND INFORMATION

2.131 **Jay's Lake Access** - This area is a 20-acre Corps-managed recreation site in the backwaters of the left descending bank adjacent to mile 622 in pool 10. Public use facilities include a one-lane boat-launching ramp and parking spaces for 30 cars and trailers. Four picnic sites and vault toilets are also available.

Recreation Sites Leased from the Corps

2.132 A number of sites along the Mississippi River owned in fee title by the Corps are leased to other agencies and operated as recreation areas. The most significant leased areas are summarized below.

2.133 **Riecks Lake Park** - This Corps-owned site in pool 4 is leased and managed by the city of Alma, Wisconsin. The 13-acre site is in the backwaters of the left descending bank of the river adjacent to mile 755. The park provides 30 picnic sites, 21 camping sites, electrical hookup, on-site water supply, and vault toilets. A one-lane boat-launching ramp and two parking lots with a total of 15 car spaces plus 15 car-and-trailer spaces complete the available facilities.

2.134 **Alma Nelson Park** - This 1-acre site in pool 4 along Wisconsin State Highway 35 and adjacent to Riecks Lake Park is leased to the Wisconsin Highway Commission for use as a wayside highway park. Three picnic sites and parking for 10 cars are provided.

2.135 **Spring Lake Park** - This narrow, 22-acre shoreline property in pool 5 is leased to the city of Buffalo, Wisconsin. The leased site stretches from about mile 746 north of Buffalo to Spring Lake adjacent to mile 742. Public use facilities provided are two ramps with three launching lanes and two parking lots with a total of 20 car spaces plus 20 car-and-trailer spaces.

2.136 **Lizzy Pond Way** - This 1-acre site in pool 5 on Lizzy Paul's Pond is adjacent to Wisconsin State Highway 35 behind the left descending bank of the river near mile 748. The Wisconsin Highway Commission leases the site for use as a wayside park. Four picnic sites and parking spaces for 10 cars are provided.

2.137 **Onalaska Landing** - This narrow, 95-acre shoreline property along the northeast shore of Lake Onalaska in pool 7 is leased to Onalaska Township. Five acres are developed for public use with a two-lane boat-launching ramp and parking 10 car-and-trailer spaces.

2.138 **Nelson Park** - The Nelson Park two areas on French Island in pool Crosse County, Wisconsin: a 4-ac northernmost tip of the island and a the dike intersects the western Facilities include two ramps with fou accompanied by three parking lots w car spaces plus 90 car-and-trai ballfield, 52 picnic sites, and two provided. Proposed developments incl ments, picnic shelters, and additiona

2.139 **Goose Island Park** - This 645 backwaters of the left descending r to miles 691-693 in pool 8 is leas County, Wisconsin. A concessionair with the county operates a snack, t shop; rents canoes and boats; and campground. Over 10 miles of road p and about the 230 developed acr Public use facilities include 500 shelter houses, 18 toilets, a beac campsites, electrical hookups, and a Four boat ramps and five parking lots 80 car spaces plus 65 car-and-trailer the list of available facilities. developments include expansion of ca improved sanitary facilities, road w launching ramp and parking lot.

2.140 **Wildcat Park** - This 105-acre descending riverbank adjacent to mi just south of Brownsville, is le County, Minnesota. Land access is Highway 26. The 50 developed acr feature 47 picnic sites, 29 camp toilets, a swimming area, and a pota Completing the public use facilitie launch ramp and three parking lots w car spaces plus 30 car-and-trailer sp future improvements include an expan new toilet facilities, a small-bo parking lot, a tennis court, and a court.

2.141 **Stoddard Park** - This 34-acre adjacent to mile 685 on the left de the Mississippi in pool 8. The sit city of Stoddard, Wisconsin, provic boat-launching ramps, two parking lot

-launching ramp and parking for 5 cars plus d-trailer spaces.

lson Park - The Nelson Park lease consists of s on French Island in pool 7 leased to La ounty, Wisconsin: a 4-acre site at the ost tip of the island and a 3-acre site where intersects the western island shore. s include two ramps with four launching lanes ied by three parking lots with a total of 40 es plus 90 car-and-trailer spaces. A 52 picnic sites, and two vault toilets are Proposed developments include ramp improve- cnic shelters, and additional fences.

ose Island Park - This 645-acre park in the s of the left descending riverbank adjacent 691-693 in pool 8 is leased to La Crosse isconsin. A concessionaire under contract county operates a snack, bait, and tackle ts canoes and boats; and administers the d. Over 10 miles of road provide access to t the 230 developed acres of the park. e facilities include 500 picnic sites, 5 ouses, 18 toilets, a beach area, over 400 electrical hookups, and a concession stand. ramps and five parking lots with a total of aces plus 65 car-and-trailer spaces complete of available facilities. Proposed future nts include expansion of camping facilities, sanitary facilities, road work, and a boat- ramp and parking lot.

dcat Park - This 105-acre site on the right g riverbank adjacent to mile 688 in pool 8, h of Brownsville, is leased to Houston innesota. Land access is from Minnesota 26. The 50 developed acres of the park 7 picnic sites, 29 campsites, 6 vault swimming area, and a potable water supply. g the public use facilities are a two-lane p and three parking lots with a total of 50 plus 30 car-and-trailer spaces. Proposed rovements include an expanded water system, t facilities, a small-boat harbor with ot, a tennis court, and a sand volleyball

ddard Park - This 34-acre recreation site is o mile 685 on the left descending bank of ssippi in pool 8. The site, leased to the oddard, Wisconsin, provides two one-lane ning ramps, two parking lots with a total of 30 car spaces plus 10 car-and-trailer spaces, five campsites, and a vault toilet.

2.142 Frenchtown Park - This 11-acre site leased to Clayton County, Iowa, is on the right descending bank of the river on Frenchtown Lake, north of Guttenberg, Iowa in pool 10. The park features five picnic sites, two vault toilets, and potable water on site. Boat and vehicle facilities include a one-lane launching ramp and a parking lot with 10 car spaces plus 10 car-and-trailer spaces.

2.143 Bussey Lake Park - This 6 acre-site at Bussey Lake is on the right descending bank adjacent to mile 617 in pool 10. The site, leased to the Iowa Conservation Commission, provides a two-lane boat-launching ramp, vault toilet, and parking lot with 20 car spaces plus 50 car-and-trailer spaces.

2.144 River of Lakes Marina Concession - This area is 1 mile south of Bagley, Wisconsin, on the left bank of the river near mile 622.5 in pool 10. This facility includes a 120-unit campground with electric hook-ups, a one-lane boat launch, playground, and concession.

2.145 Guttenberg Park - The city of Guttenberg, Iowa, leases 4 acres of Corps land along the levee in pool 10 adjacent to the city and above lock and dam 10. Facilities provided for public use include sanitary facilities with flush toilets, drinking water, 29 picnic sites, and two parking lots with 100 car spaces plus 100 car-and-trailer spaces.

LAWS APPLICABLE TO RESOURCE DEVELOPMENT AND MANAGEMENT

2.146 This section discusses the Federal statutes, other applicable laws, executive orders, interagency agreements, and regulations that affect development and management of the Upper Mississippi River system. These laws and other guidance have been considered during development of this study.

Federal Statutes with Major Impacts

2.147 Public Law 68-268, June 7, 1924 - The Upper Mississippi River Wild Life and Fish Refuge Act (43 Statute 650) authorized a refuge between Rock Island, Illinois, and Wabasha, Minnesota. (Originally administered by the U.S. Department of Agriculture, this refuge is now under the jurisdiction of the U.S. Department of the Interior, Fish and Wildlife Service.) The Upper Mississippi National Wildlife and Fish Refuge is designated a refuge and breeding place

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for migratory birds. As prescribed by the Secretary of the Interior through regulations, this area also serves as a refuge and as a breeding and conservation area for other wild birds, game animals, furbearing animals, wildflowers, aquatic plants, fish, and other aquatic animal life.

2.148 Public Law 78-534, December 22, 1944 - Section 4 of the Flood Control Act of 1944 (58 Statute 887), as amended, authorizes the Chief of Engineers to construct, operate, and maintain public park and recreational facilities at water resource projects. It also requires that the water areas of all such projects be open to public use for boating, fishing, and other recreation and that ready access to and exits from such areas be maintained for general public use when in the public interest.

2.149 Public Law 79-732, August 14, 1946 - Section 3 of the Fish and Wildlife Coordination Act of 1946 (60 Statute 1080) provides for use of water resource projects for the conservation, maintenance, and management of wildlife resources and wildlife habitat, to be administered by State agencies or the Secretary of the Interior. In accordance with this act, General Plans for the Use of Lands and Waters of the Navigation Channel Project for Wildlife Conservation and Management were formulated and approved by the Secretary of the Army, the Secretary of the Interior, and the heads of pertinent State agencies.

2.150 Public Law 85-624, August 12, 1958 - The Fish and Wildlife Coordination Act of 1958 (72 Statute 563) requires that fish and wildlife conservation receive equal consideration with other project purposes and that they be coordinated with other features of water resource development programs. All planning and project development must be coordinated with the Fish and Wildlife Service.

2.151 Public Law 86-523, June 27, 1960 - The Reservoir Salvage Act of 1960 (74 Statute 220), as amended by Public Law 93-291 (88 Statute 174), specifically provides for preservation of historical and archeological data that might otherwise be irreparably lost or destroyed as a direct result of any Federal construction project or any federally-licensed project, activity, or program. For Federal construction projects, up to 1 percent of the authorized appropriation for the project may be expended for survey and mitigation work. For emergency programs, no recovery or mitigation work is required if such work would impede the emergency action.

2.152 Public Law 86-645, July 14, 1960 - of the River and Harbor Act of 1960 (74 as amended, provides authority for develop and construct small navigati including small-boat harbors for recreat Although Section 107 authorizes the Corp construct such projects, only general facilities can be provided as a Fede Terminal facilities and interior dredg responsibilities.

2.153 Public Law 87-714, September 28, fuge Recreation Act (76 Statute 653), authorizes the Secretary of the Interior refuges, hatcheries, and other conservat recreational use, when such uses do not i the primary purposes of these areas authorizes construction and mai recreational facilities and the acquis for incidental fish and wildlife-oriented development or for protection of natur It also authorizes charging fees for pub

2.154 Public Law 88-578, September 3, 196 and Water Conservation (LAWCON) Fund Ac Statute 897), as amended, established a public agencies meet outdoor recreatio needs. The act authorized acquisition federally-administered recreation areas grants for State recreation planning and local land acquisition and developme State, county, and city parks alon Mississippi River have been developed money.

2.155 Public Law 89-72, July 9, 1965 - Water Project Recreation Act of 1965 (79 as amended, established recreation at F resources projects as a full project pu act requires consideration of recreation and of fish and wildlife enhancement in p resources projects. Section 2(a) sp benefits for recreation must be incl economic analyses of proposed projects federal public agency agrees to acm facility at its expense and to pay separable first cost. Section 3(b) aut acquisition to preserve the recreation p project for a 10-year period, when no l can be found. Section 9 limits the maxim for recreation and fish and wildlife enha percent of the total project cost. The requires beneficiaries to bear part of

45, July 14, 1960 - Section 107
bor Act of 1960 (74 Statute 484),
es authority for the Corps to
uct small navigation projects,
harbors for recreational boaters.
authorizes the Corps to plan and
ects, only general navigational
provided as a Federal project.
and interior dredging are local

-714, September 28, 1962 - The Re-
(76 Statute 653), as amended,
ary of the Interior to administer
and other conservation areas for
en such uses do not interfere with
es of these areas. This act
ruction and maintenance of
ties and the acquisition of land
nd wildlife-oriented recreational
protection of natural resources.
harging fees for public use.

578, September 3, 1964 - The Land
ion (LAWCON) Fund Act of 1965 (78
nded, established a fund to help
t outdoor recreation demands and
horized acquisition of lands for
ed recreation areas plus matching
reation planning and for State and
tion and development. Various
d city parks along the Upper
have been developed with LAWCON

-72, July 9, 1965 - The Federal
tion Act of 1965 (79 Statute 213),
shed recreation at Federal water
as a full project purpose. This
ration of recreation opportunities
life enhancement in planning water
. Section 2(a) specifies that
ation must be included in the
f proposed projects when a non-
ncy agrees to administer the
xpense and to pay half of the
t. Section 3(b) authorizes land
rve the recreation potential of a
r period, when no local sponsor
n 9 limits the maximum allocation
sh and wildlife enhancement to 50
l project cost. The act further
ies to bear part of the costs of
installing and managing recreation developments at Federal water resource projects.

2.156 Public Law 89-80, 22 July 1965 - The Water Resources Planning Act (79 Statute 244) provided for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of the Water Resources Council and river basin commissions, and by providing financial assistance to the States that will increase State participation in such planning.

2.157 Public Law 89-665, October 15, 1966 - The National Historic Preservation Act of 1966 (80 Statute 915), as amended by Public Law 96-515 (94 Statute 2987), established national policy for historic preservation, authorized the Secretary of the Interior to expand and maintain a National Register of Historic Places, and created the Advisory Council on Historic Preservation. Section 101 of Public Law 89-665 authorized the Secretary of the Interior to grant funds to individual States for comprehensive statewide historic surveys. These surveys were to inventory historic, architectural, and archeological resources within the States. Many of the counties along the Mississippi River in Iowa, Minnesota, and Wisconsin have been surveyed by the State Historic Preservation Offices in the last decade. Section 106 specifies that Federal agencies, before approval of any expenditure or before issuance of any license, must consider the effect of the action on any property included in or eligible for the National Register of Historic Places and must afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on this action. Section 110 requires each Federal agency to establish a program to locate, inventory, and nominate all properties under the agency's ownership or control that appear to qualify for inclusion on the National Register.

2.158 Public Law 89-669, October 15, 1966 - The National Wildlife Refuge System Administration Act of 1966 (80 Statute 927), as amended, defines the National Wildlife Refuge System as including wildlife refuges, areas for the protection and conservation of fish and wildlife species that are threatened with extinction, wildlife ranges, game ranges, wildlife management areas, and waterfowl production areas. The Secretary of the Interior is authorized to permit any use of an area, provided that such use is compatible with the major purposes for which such area was established. Any payments for rights-of-way through

2. BACKGROUND INFORMATION

such areas go into the Migratory Bird Conservation Fund for the acquisition of additional lands. By regulation, up to 40 percent of an area acquired for a migratory bird sanctuary may be opened to migratory bird hunting unless the Secretary of the Interior finds that hunting any species of migratory game bird in more than 40 percent of such an area would be beneficial to the species. This act requires an Act of Congress for the divestiture of lands in the system, except (1) that lands acquired through the Migratory Bird Conservation Fund may be divested upon approval of the Migratory Bird Conservation Commission, and (2) that any lands can be removed from the system by lands exchange, or if brought into the system by a cooperative agreement, then these lands can be removed according to the terms of the agreement.

2.159 Public Law 91-190, January 1, 1970 - The National Environmental Policy Act (NEPA) of 1969 (83 Statute 852) declared a national environmental policy for protection and enhancement of the environment and established a Council on Environmental Quality (CEQ). NEPA set forth the requirement for an environmental impact statement on any major Federal action significantly affecting the quality of the human environment.

2.160 Public Law 96-95, October 31, 1979 - The Archaeological Resources Protection Act of 1979 (93 Statute 721) provides for excavation and removal of archeological resources on public or Indian lands, by qualified individuals with a permit from the Federal land manager. The act establishes criminal and civil penalties for persons engaged in illegal excavation, removal, or damage to archeological resources or in the sale, purchase, exchange, or transportation of illegally-removed resources. This act authorizes rewards for information that leads to conviction. It authorizes the forfeiture of archeological resources, equipment, and vehicles involved in a violation. It authorizes the Federal land manager to withhold disclosure of the location and nature of archeological resources. The act also provides for cooperation with private individuals having collections obtained before passage of this act.

2.161 Public Law 97-140, December 29, 1981 - Section 6 of this act allows lawful private uses and structures (such as boathouses, docks, and houseboats) to remain at Corps of Engineers water resource projects until December 31, 1989, if the structure or property is maintained in usable condition and if the use or structure does not present a threat property.

Other Federal Statutes

2.162 Public Law 59-206, June 8 Antiquities Act of 1906 (34 Statute 2 Federal offense to appropriate, excava destroy any historic ruin or monument lo owned or controlled by the Federal Gover permission from the Secretary of the Dep jurisdiction over those lands.

2.163 The River and Harbor Act of 1930, The River and Harbor Act of 1930 (46 authorized the 9-foot navigation ch achieved by constructing a system of l supplemented by dredging. This act a the Secretary of the Army to acquire l foot channel project.

2.164 Public Law 74-942, August 2 Historic Sites Act of 1935 (49 Statute 6 national policy to preserve cultural national significance for public use, certain powers to the Secretary of Int regard.

2.165 Public Law 80-697, June 19, 1948 of the Anti-Drawdown Law of 1948 (62 directs the Corps of Engineers to give ation and recognition to the needs wildlife and their habitat dependent u of the Upper Mississippi River by maintaining pool levels as though na carried on throughout the year, to the possible.

2.166 Public Law 83-780, September 3, 209 of the Flood Control Act of 1954 (68 amends the Flood Control Act of 1944 a the Secretary of the Army to grant lic and occupation of land and water ar jurisdiction of the Department of the and recreation purposes.

2.167 Public Law 86-717, September 6, (74 Statute 817) requires that projects and maintained to encourage adequate fo Forest management programs must be ad increase the value of project lands for

not present a threat to life and

tutes

Law 59-206, June 8, 1906 - The
t of 1906 (34 Statute 225) makes it a
to appropriate, excavate, injure, or
oric ruin or monument located on lands
lled by the Federal Government, without
the Secretary of the Department having
er those lands.

and Harbor Act of 1930, July 3, 1930 -
Harbor Act of 1930 (46 Statute 847)
9-foot navigation channel, to be
structing a system of locks and dams,
y dredging. This act also authorized
f the Army to acquire land for the 9-
oject.

Law 74-942, August 21, 1935 - The
ct of 1935 (49 Statute 666) declares a
y to preserve cultural properties of
icance for public use, and it grants
to the Secretary of Interior in this

w 80-697, June 19, 1948 - Section 5(a)
wdown Law of 1948 (62 Statute 497)
s of Engineers to give full consider-
gnition to the needs of fish and
eir habitat dependent upon the waters
ississippi River by operating and
l levels as though navigation were
ghout the year, to the maximum extent

w 83-780, September 3, 1954 - Section
Control Act of 1954 (68 Statute 1256)
d Control Act of 1944 and authorizes
f the Army to grant licenses for use
of land and water areas under the
the Department of the Army for park
urposes.

w 86-717, September 6, 1960 - This law
requires that projects be developed
o encourage adequate forest resources.
nt programs must be administered to
ue of project lands for recreation and
wildlife and to promote natural ecological conditions by following accepted conservation practices.

2.168 House Committee on Public Works Resolution, December 11, 1969 - This resolution provides the Corps with the authority to study possible modifications to existing projects to promote their continued and successful operation.

2.169 Public Law 93-205, December 28, 1973 - The Endangered Species Act of 1973 (87 Statute 884), as amended, states the policy of Congress that all Federal departments and agencies must seek to conserve endangered and threatened species. Section 7 requires each Federal agency to consult with the Secretary of the Interior to insure that authorized actions neither jeopardize the continued existence of any endangered or threatened species nor result in adverse modification of critical habitat. Unless previously completed and included in the project environmental impact statement, a biological assessment must identify any endangered species that, in the opinion of the Fish and Wildlife Service, may be affected by the project. This requirement applies to all civil works studies, projects, or programs and includes the operation and maintenance of completed projects.

2.170 Public Law 94-587, October 22, 1976 - The Water Resources Development Act of 1976, Section 117, authorized funds to initiate the interagency Great River Environmental Action Team (GREAT) study:

> "The Secretary of the Army, acting through the Chief of Engineers, is authorized to investigate and study, in cooperation with interested States and Federal agencies, through the Upper Mississippi River Basin Commission the development of a river system management plan in the format of the 'Great River Study' for the Mississippi River from the mouth of the Ohio River to the head of navigation at Minneapolis, incorporating total river resource requirements, including, but not limited to navigation, the effects of increased barge traffic, fish and wildlife, recreation, watershed management, and water quality at an estimated cost of $9,100,000."

2.171 Public Law 95-217, December 27, 1977 - The Federal Water Pollution Control Act of 1977, also called the Clean Water Act of 1977 (91 Statute 1566), amends earlier acts to establish a more effective program of water pollution control by extending Federal authority

2. BACKGROUND INFORMATION

and increasing construction grant authority. Section 404(b) of the act requires an evaluation of dredged material disposal activities to insure compliance with the guidelines developed by the Administrator of the Environmental Protection Agency (EPA) and the Secretary of the Army. Section 404(t) authorizes any State to regulate, in accordance with its laws, the discharge of dredged material, in any portion of the navigable waters within the jurisdiction of the State, that results from maintenance dredging involving Corps of Engineers navigation projects.

2.172 Present State policies on dredged material disposal will serve as interim standards until the Corps and EPA develop applicable national standards. The States would then decide whether to adopt these national standards.

2.173 Section 30.12 of the Wisconsin Statutestotally prohibits open-water disposal of dredged material, including beach nourishment. All disposal in Wisconsin must be above the normal high-water mark. In addition, Section 147.025 of the Wisconsin Statutes requires a discharge permit for any discharge of dredged materials into State waters. To facilitate the implementation of recommendations of the interagency Great River Environmental Action Team (GREAT), the State of Wisconsin exempted the GREAT dredged material placement sites from State statutes. A memorandum of understanding between the Corps of Engineers and the Wisconsin Department of Natural Resources regulates use of the GREAT placement sites in accordance with this exemption.

2.174 At present, no Minnesota regulation specifically governs dredged material disposal; however, disposal below the ordinary high-water mark in State waters is not allowed without a permit. Minnesota also requires that any effluent generated from dredging operations must meet the standards and regulations described in Minnesota Statutes, Chapters 115 and 116, as amended. Effluents generated from disposal and dredging operations must be monitored for their impacts on water quality.

2.175 Iowa Statutes do not allow beach nourishment or open-water disposal without a State discharge permit. Although Iowa does not require a permit for discharge of effluent from a diked disposal facility, impacts of the effluent can be regulated by State water quality standards.

2.176 Public Law 95-502, October 21, 19
Waterway Authorization Act (92 Statute
a schedule for taxing fuel used i
transportation on inland waterways. Se
204 of this act established an Inland
Fund (in which fuel tax receipts are t
and specify its use. Money in this fu
for future construction and rehab
facilitate navigation. Section 101 s
the Upper Mississippi River Basin Comm
prepare a comprehensive master plan
Mississippi River system. No replacem
tion, or rehabilitation that expanded t
capacity of locks and dams or channe
undertaken by the Secretary of the Army
approved the UMRBC master plan, ex
construction of a single 1200-foot long
and dam 26 and for necessary o
maintenance.

Executive Orders

2.177 Executive Order 11593, May 13
executive order requires the location,
nomination to the National Register of
of all sites, buildings, districts, and
a Federal agency's jurisdiction or cont
must be exercised in the interim to as
federally-owned properties that migh
nomination are not inadvertently trans
demolished, or substantially altered. P
may be affected by Federal action or as
be appropriately recorded prior to init
Federal undertaking. These requireme
incorporated into the amendments of
Historic Preservation Act of 1966.

2.178 Executive Order 11988, May 24, 19
cutive order places new emphasis on
aspects of floodplain management. It re
agencies to recognize the significa
floodplains and to consider the public
would be realized from restoring an
floodplains. This executive order requ
of Engineers to provide leadership and
to avoid development in the base floodp
is the only practical alternative, t
hazards and risk associated with floods
the impact of floods on human safety and
to restore and preserve the natural a
values of the base floodplain.

5-502, October 21, 1978 - The Inland tion Act (92 Statute 1693) provides taxing fuel used in commercial inland waterways. Sections 203 and tablished an Inland Waterways Trust l tax receipts are to be deposited) e. Money in this fund is reserved truction and rehabilitation to tion. Section 101 stipulated that ppi River Basin Commission (UMRBC) ensive master plan for the Upper system. No replacement, construction that expanded the navigational and dams or channels was to be Secretary of the Army until Congress BC master plan, except for the single 1200-foot long lock at locks for necessary operation and

Order 11593, May 13, 1971 - This quires the location, inventory, and National Register of Historic Places dings, districts, and objects under jurisdiction or control. Caution in the interim to assure that any roperties that might qualify for inadvertently transferred, sold, stantially altered. Properties that Federal action or assistance shall ecorded prior to initiation of the ng. These requirements have been the amendments of the National on Act of 1966.

der 11988, May 24, 1977 - This exes new emphasis on environmental in management. It requires Federal nize the significant values of consider the public benefits that l from restoring and preserving executive order requires the Corps vide leadership and to take action t in the base floodplain unless it ical alternative, to reduce the sociated with floods, to minimize s on human safety and welfare, and serve the natural and beneficial floodplain.

Interagency Agreements

2.179 **General Plans, March 9 - November 2, 1953, revised March 8, 1961** - General plans for the use of project lands for wildlife conservation and management were drawn up in accordance with the Fish and Wildlife Coordination Act of 1946 (Public Law 9-732). Through this agreement, the Secretary of the Army made certain project lands available to the Secretary of the Interior for wildlife conservation and management. The Secretary of the Interior may, in turn, make these lands available to the respective State conservation agencies for administration.

2.180 **Cooperative Agreement, 14 February 1963** - Through the cooperative agreement between the Department of the Army and the Department of the Interior, Bureau of Sport Fisheries and Wildlife (now the Fish and Wildlife Service), certain Corps lands and waters in the 9-foot channel navigation project were made available to the Department of the Interior for conservation and wildlife management. The Department of the Army, however, retains the right to develop public use facilities, provide for timber management, and to issue leases, licenses, and easements for public use, and special use licenses for non-exclusive private uses. Under this agreement, every proposal to develop a public use area must be coordinated with the Fish and Wildlife Service, and the Corps must consider any adverse effect that a proposed development may have on the wildlife management program. The agreement stipulates that the FWS must submit an annual management program to the District Engineer.

2.181 **Memorandum of Agreement, April 18, 1973** - A memorandum of agreement between the Corps of Engineers and the U.S. Coast Guard clarifies areas of jurisdiction and responsibilities under Federal statutes to regulate certain activities in navigable waters of the United States. The agreement covers alteration of bridges; construction, operation, and maintenance of bridges and causeways; closure of waterways and restriction of passage under bridges; and design of flood flows. This agreement also requires mutual coordination and consultation on projects and activities in or affecting navigable waters.

2. BACKGROUND INFORMATION

2.182 **Memorandum of Understanding, October 17, 1980** - A memorandum of understanding documents the joint decision by the U.S. Fish and Wildlife Service, Region 3, and the Corps of Engineers, North Central Division, to place a moratorium on granting special use permits and licenses for new private recreational structures or associated actions on lands within the Upper Mississippi National Wildlife and Fish Refuge. The moratorium is an interim measure to be concluded with a joint plan for realizing the maximum practical public use potential of the refuge while protecting environmental quality and fish and management potential of refuge lands and waters.

Corps of Engineers Regulations

2.183 **Engineer Regulation 1165-2-400, August 3, 1970** - This regulation (Water Resource Policy and Authorities: Recreational Planning, Development, and Management Policies) defines objectives and policies governing planning, development, and management of outdoor recreational resources, plus enhancement of fish and wildlife at Corps water resource projects.

2.184 **Engineer Regulation 1120-2-401, August 14, 1970**- This regulation (Investigation, Planning and Development of Water Resources: Preservation and Enhancement of Fish and Wildlife Resources) prescribes policies and procedures for considering the preservation and enhancement of fish and wildlife resources in the planning and development of Corps water resource projects.

2.185 **Engineer Regulation 1120-2-404, August 14, 1970**- This regulation (Investigation, Planning and Development of Water Resources: Federal Participation in Recreational Development) provides guidance on Federal participation and non-Federal cooperation in the development of outdoor recreation and fish and wildlife enhancement at Corps water resource projects, plus guidance on the need and timing of assurances of non-Federal cooperation in such features.

2.186 **Engineer Regulation 1130-2-400, May 28, 1971** - This regulation (Project Operations: Recreation-Resource Management of Civil Works Water Resource Projects) provides policy and procedural guidance for administration and management of Corps civil works projects. It deals primarily with the administration of project lands and waters to assure a uniformly high quality of recreational services and environmental enhancement and preservation in the operation, maintenance, and administration of all projects.

2.187 **Engineering Regulation 11 1974, Appendix E** - The North statement on managing recreati identifies specific management private use on Corps-administe the North Central District. appendix E, paragraph 3(e), District Engineer has the res the compatibility of existing with project purposes.

2.188 **Engineer Regulation 112 1976** - This regulation (Invest Development of Water Resources Planning) prescribes polici procedures to insure that prot of recreation resources are give other objectives in the planni Corps water resource projects.

2.189 **Engineer Regulation 1105** - This regulation (Planning: E Chapter 3: Historic Preservat for consideration of historic works planning studies. It inc of historic preservation p statutes, executive orders, and agencies applicable to Corps of studies and preconstruction pla This regulation does not apply operation of Federal water deve Corps is preparing regulation activities.

2.190 **33 CFR Part 325, Append** This draft appendix (Procedures Cultural Resources) establishe with the National Historic Pres It implements regulations pertaining to cultural resource by work or structures authorize Army permits. These procedure properties that are listed on for the National Register of would be affected by the permitt

ering Regulation 1130-2-406, December 13, dix E - The North Central Division policy n managing recreational use (January, 1981) pecific management procedures to deal with on Corps-administered lands and waters in Central District. NCD supplement 1 to , paragraph 3(e), indicates that each gineer has the responsibility to evaluate bility of existing private recreation use t purposes.

eer Regulation 1120-2-400, February 12, regulation (Investigation, Planning and of Water Resources: Recreation Resources rescribes policies, guidelines, and to insure that protection and enhancement n resources are given equal treatment with tives in the planning and development of resource projects.

neer Regulation 1105-2-50, January 29, 1982 ation (Planning: Environmental Resources, Historic Preservation) provides guidance ration of historic preservation in civil ing studies. It incorporates requirements c preservation policies embodied in ecutive orders, and rules of other Federal licable to Corps of Engineers feasibility preconstruction planning and engineering. ion does not apply to the construction and Federal water development projects. The eparing regulations that apply to these

t Part 325, Appendix C, April 3, 1980 - ppendix (Procedures for the Protection of ources) establishes procedures to comply ional Historic Preservation Act of 1966. nts regulations and executive orders cultural resources that may be affected tructures authorized by Department of the . These procedures apply only to those at are listed on or determined eligible onal Register of Historic Places that cted by the permitted activity.

2.191 Engineer Regulation 1105-2-167, April 12, 1978 - This regulation (Planning Resource Use: Establishment of Objectives) provides policy and guidance on establishing resource use objectives for all Corps water resource projects.

RELATIONSHIP OF THE MASTER PLAN WITH OTHER STUDIES

2.192 Several other studies address components of this master plan. Among these are the Upper Mississippi National Wildlife and Fish Refuge master plan, the Twin Cities and main stem level B studies of the Upper Mississippi River Basin Commission, Minnesota-Wisconsin Boundary Area Commission studies, the Metropolitan River Corridors Study, and the GREAT I reports. Corps of Engineers studies include the Recreational Craft Locks Study and the environmental impact statement for the operation and maintenance of the 9-foot channel. Also, Public Law 95-502 (which authorized construction at locks and dam 26) required the Upper Mississippi River Basin Commission to prepare a master plan for management of the Upper Mississippi River system. Coordination of the St. Paul District master plan and these other studies has avoided duplication of efforts. Information from these other studies has been used for this report. Brief summaries of some of the other studies follow.

Upper Mississippi National Wildlife and Fish Refuge Master Plan

2.193 Approximately 95 percent of the Corps lands covered by this land use allocation plan have been managed by the U.S. Fish and Wildlife Service (FWS) for the conservation and maintenance of wildlife resources under a cooperative agreement with the Corps. To prevent disruptive jurisdictional disputes, these two agencies have worked together very closely on this land use allocation plan. The FWS and the Corps consider this plan an agreement on the best management of the Corps lands within the Upper Mississippi National Wildlife and Fish Refuge.

2.194 The Fish and Wildlife Service is writing a long-term management plan that will detail how the FWS intends to manage the Upper Mississippi National Wildlife and Fish Refuge to carry out the purposes of the allocations within the refuge. The final refuge and Corps master plans will set forth the duties, authorities, and relationships of the two agencies.

2. BACKGROUND INFORMATION

Level B Studies

2.195 Level B studies are cooperative efforts between various agencies that result in policy documents. Such studies provide information to decision-makers at all levels of government and to the general public on recommendations for various critical water and related land resource problems, opportunities, and needs. Level B studies focus on problems, needs, and issues requiring solutions within 15 to 25 years. These studies deal with the problems of flooding and interior drainage, recreational boating safety, the relationship between navigation and the environment, water quality, and land use management planning. Level B studies done by the Upper Mississippi River Basin Commission include the Main Stem Level B Study and Minneapolis-St. Paul Water and Land Future Perspectives and Plans.

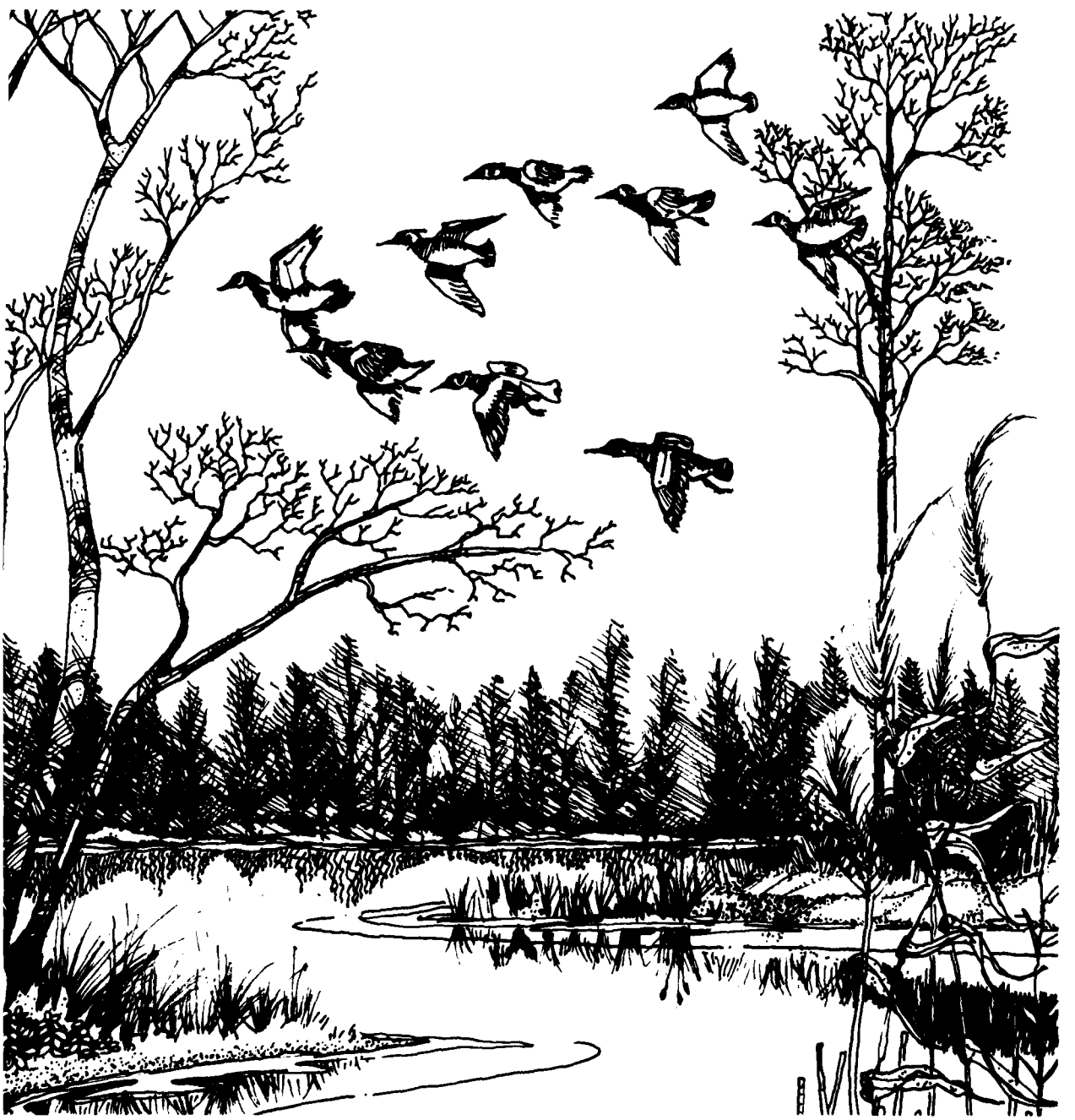
Upper Mississippi River Basin Commission (UMRBC) Comprehensive Master Plan

2.196 Through Public Law 95-502, Congress charged the UMRBC with developing a master plan for the Upper Mississippi River system. This plan is intended to guide management and development decisions, especially those concerning management of the navigation system (Upper Mississippi, Illinois, and Kaskaskia Rivers). The plan also addresses environmental quality and resource management policies and programs. The final plan was submitted to Congress on January 1, 1982. The successor to the UMRBC, the Upper Mississippi River Basin Association (UMRBA), which consists of State members and Federal observers, is primarily concerned with passage of legislation that would implement the UMRBC master plan recommendations.

Minnesota-Wisconsin Boundary Area Commission (MWBAC)

2.197 The MWBAC serves as a primary consultant and coordinator for the two State governments on matters concerning the Upper Mississippi and St. Croix River systems along the interstate border. The MWBAC uses aerial photography to monitor recreational use of the Lower St. Croix River. Other MWBAC studies include the Prescott Study, which examined traffic patterns at the confluence of the St. Croix and Mississippi Rivers, and the 1981 Riparian Landowners Recreation Studies.

FIGURE 2-5. The Mississippi River, the largest environm Diverse habitat has made the corridor one of the greates to recognize the importance of this ecological resource



i River, the largest environmental corridor in North America, has international significance as a major migration route for birds. ie corridor one of the greatest ecological communities on the North American Continent. Future management activities must continue e of this ecological resource and work toward its preservation and enhancement.

2. BACKGROUND INFORMATION

Metropolitan River Corridors Studies

2.198 In 1980, the National Park Service (NPS) completed the Reconnaissance Survey: Twin Cities Metropolitan River Corridors. This study describes the river corridor resource, and it discusses trends and potential threats to this river resource as well as efforts taken to protect the resource. While the study makes no recommendations, the information it provides helps to determine whether the river corridor resource is of sufficient national significance to warrant a study of alternatives.

2.199 Title IX of Public Law 96-607 (December 28, 1980) established a committee (the Three River Corridors Study Committee) to study recreational use along the river corridors (Upper Mississippi, Minnesota, and Lower St. Croix) and to recommend policies that should be adopted to optimize the recreational, fish and wildlife, historic, and scenic values of the area. In accordance with Public Law 96-607, the committee will review studies, plans, programs, and policies of the Upper Mississippi River Basin Commission plus other governmental plans that affect recreational use of the river corridors.

2.200 The Corps participated in the Reconnaissance Survey, is represented on the Three River Corridors Study Committee, and will continue to review the metropolitan river corridors studies. However, because the NPS and the Three River Corridors Study Committee are examining recreation on the Twin Cities segments of the river corridors, the Corps sees little need to further study this portion of the study area and will rely on the studies of other agencies.

Great River Environmental Action Team (GREAT) I Reports

2.201 The Great River Environmental Action Team I recently completed the final GREAT I report. This report focuses on development of a river system management plan that reviews all major river resource requirements in the St. Paul District portion of the Upper Mississippi. Major components of the GREAT I study that have assisted in the preparation of this master plan include the channel maintenance plan, the recreation appendix, the fish and wildlife appendix, and the associated environmental impact statement.

2.202 The end result of the GREAT I s recommendations advocating needed actions, further studies, or policy recommended 39 action items, 26 poli and 47 further study items. recommendations concern recreational, and cultural resources. Such recomme implemented wholly or in part, throu this master plan.

Recreation Craft Locks Study — Corps of

2.203 This study investigated the prot by recreational boaters in the 9-fo study centered on the feasibility, a economic justification of provid passage for recreational craft at lock

Environmental Impact Statement-Operatio 9-foot Navigation Channel — COE

2.204 This report discusses the maintenance functions necessary to channel depths for commercial nav Mississippi River from the head of Minneapolis, Minnesota, to Guttent discusses the environmental setting o terms of its physical, biological, a aspects; and the environmental impacts It also discusses alternatives operations and maintenance program channel navigation project.

OPERATION AND MAINTENANCE PRO

2.205 A major Corps of Engineers prog the operation and maintenance activit provide a 9-foot deep channel depth navigation on the Upper Mississippi head of navigation at Minneapolis, Guttenberg, Iowa, a distance of 24 This program also includes maintena deep channel on 14.7 miles of the M 24.5 miles of the St. Croix River, a the Black River. St. Paul District the operation and maintenance of 13 plus the channel dredging and disp material necessary to maintain a 9 navigation on these sections of the ri

ult of the GREAT I study was a set of advocating needed, implementable studies, or policy changes. GREAT I ction items, 26 policy funding items, r study items. Many of these concern recreational, environmental, ources. Such recommendations will be ly or in part, through completion of .

ocks Study — Corps of Engineers

investigated the problems encountered boaters in the 9-foot channel. The n the feasibility, advisability, and ification of providing independent eational craft at locks and dams.

act Statement-Operation and Maintenance Channel — COE

ort discusses the operation and ctions necessary to provide 9-foot for commercial navigation on the er from the head of navigation at nnesota, to Guttenberg, Iowa. It vironmental setting of the project in sical, biological, and socioeconomic environmental impacts of the project. ses alternatives to the existing maintenance program for the 9-foot n project.

MAINTENANCE PROGRAMS

ps of Engineers program consists of l maintenance activities necessary to deep channel depth for commercial e Upper Mississippi River from the ion at Minneapolis, Minnesota, to a, a distance of 243.6 river miles. o includes maintenance of a 9-foot 14.7 miles of the Minnesota River, e St. Croix River, and 1.4 miles of St. Paul District actions include d maintenance of 13 locks and dams dredging and disposal of dredged ry to maintain a 9-foot depth for se sections of the river system.

2.206 Related Corps activities include snagging and clearing, erosion control and bank protection, small river and harbor improvements, and small flood control projects.

2.207 Public Law 96-515 authorized a St. Paul District cultural resources program to inventory and nominate properties under District ownership or control that appear to qualify for the National Register of Historic Places. This program is funded out of the District's annual operation and maintenance budget, as priorities dictate. An initial step, a literature search and records review of all known historic, architectural, and archeological properties, has been completed. Future studies include survey and assessment of newly recorded sites. The long-range program objective is development of a management plan to protect and preserve significant cultural resources that are on Corps of Engineers property or that are affected by Corps projects.

GENERAL REGULATORY PROGRAMS

2.208 Section 10 of the River and Harbor Act of 1899 (30 Statute 1151) requires a permit from the Corps of Engineers for placement of structures or work in navigable waters, for the discharge of dredged or fill material into navigable waters, or for the transportation of dredged material for the purpose of dumping into ocean waters. Construction of piers, wharfs, docks, and similar structures, and activities such as channel excavation, placement of riprap, groins, and mooring devices also require permits.

2.209 As a result of the 1972 amendments to Section 404 of the Federal Water Pollution Control Act (Clean Water Act), the regulatory authority of the Corps expanded to include responsibility for regulating the discharge of dredged or fill material in the waters of the United States. The purpose of the program is to insure that the chemical/biological integrity of the waters of the United States is protected from the irresponsible and unregulated discharge of dredged or fill material that could permanently destroy or alter the character of valuable resources.

2.210 The Corps evaluates each permit application to determine the benefits that reasonably may be expected from the proposal, as well as the reasonably foreseeable detriments. Permits also are coordinated with other governmental agencies, such as the Environmental

Protection Agency and the U.S. Fish and Wildlife Service. All factors relevant to the proposal are considered. These include conservation, economics, aesthetics, historic and archeological values, general environmental concerns, navigation, land use classifications, fish and wildlife, recreation, flood damage prevention, water supply, water quality, and, in general, the needs and welfare of the people. The Corps issues permits only if it determines that the project is in the overall public interest.

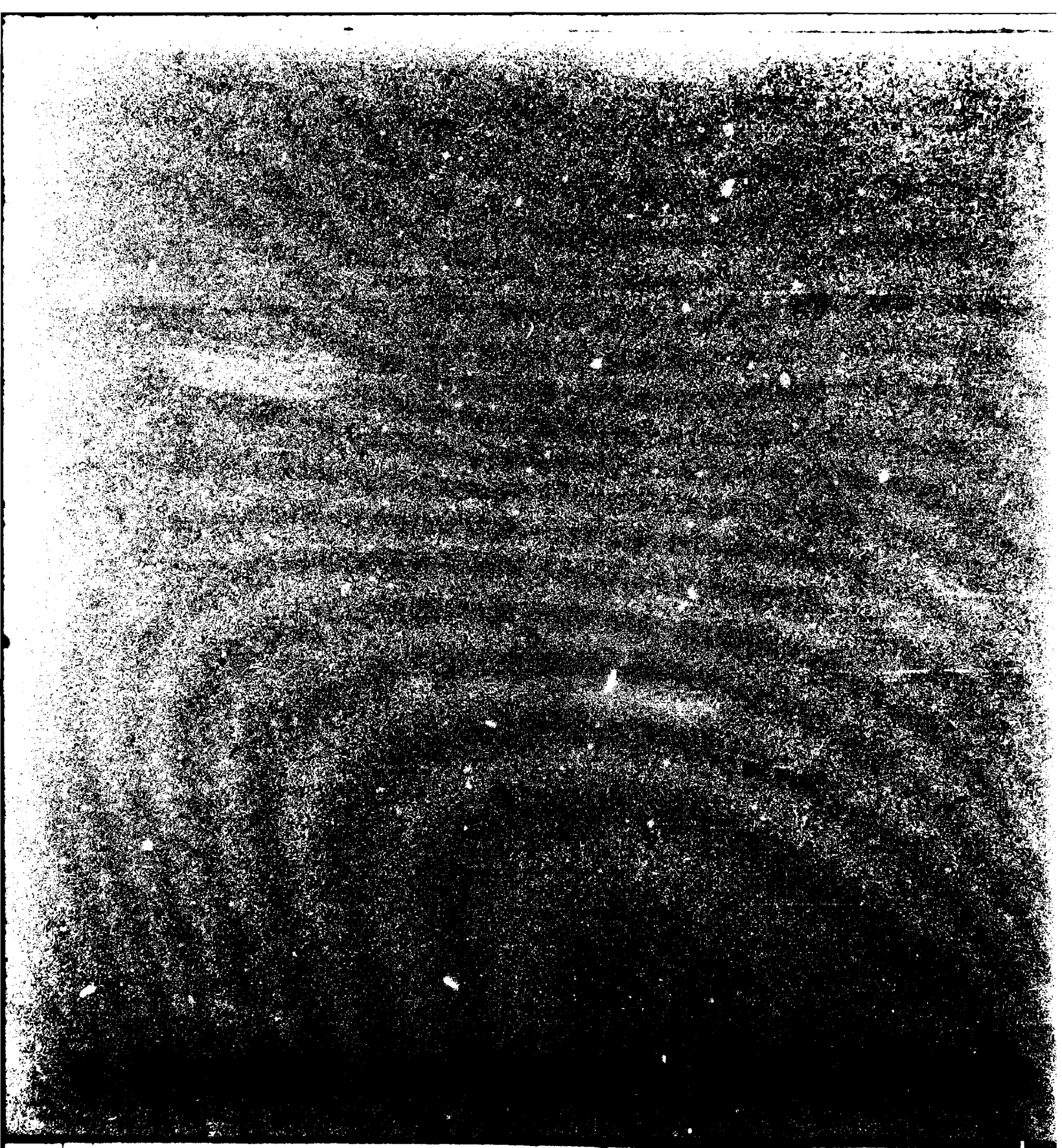
2.211 The St. Paul District exercises regulatory authority over Upper Mississippi River system waters within Minnesota and Wisconsin. Although the portions of pools 9 and 10 in Iowa are part of the St. Paul District, the Rock Island District handles all Corps of Engineers permits in the State of Iowa.

NATURAL RESOURCE MANAGEMENT PROGRAMS

2.212 The St. Paul District, Corps of Engineers, is responsible for management of all Upper Mississippi River system Corps recreation areas and other project lands within its District boundaries, except for areas of joint responsibility such as leased sites or refuge lands.

2.213 Management of Corps lands includes functions such as fire protection, safety, security, public protection, shoreline management, and real estate licensing. Five recreation areas on the Mississippi River or its backwaters are maintained and operated by the District (Sturgeon Lake Access, Blackhawk Park, Millstone Landing, Jay's Lake Landing, and Bad Axe Landing). In addition, the District provides observation platforms and other visitor facilities at most of its lock and dam sites.

2.214 Under a February 1966 cooperative agreement between the Departments of the Army and the Interior, most of the Corps-administered lands within the St. Paul District have been made available to the U.S. Fish and Wildlife Service for the conservation, maintenance, and management of wildlife resources. For purposes of management under this agreement, these lands are part of the Upper Mississippi National Wildlife and Fish Refuge. These refuge lands are below the mouth of Chippewa River, in pools 4 through 10. (Other lands in the Rock Island District of the Corps, in pools 11 through 14, are also part of this refuge.)



3. FACTORS INFLUENCING DEVELOPMENT

3.01 The following section describes a number of variables that influence the development and management of Upper Mississippi River resources. A review of these variables provides a general understanding of resource potentials and limitations that project planners evaluated for this study. As an extension of the background information in section 2.00, this section further identifies the complexity and diversity of resource conditions of the Upper Mississippi River and the challenge involved in developing objective management decisions.

RESOURCE USE OBJECTIVES

3.02 The following objectives/goals, which are listed in no order of significance, have guided the St. Paul District in formulating management alternatives and land use allocations. These objectives will also provide direction for long-range development plans (to be included in part III of this master plan).

- To maintain and enhance public recreational opportunities for all publics on an equal basis in accordance with recreation needs.
- To adjust management activity to respect resource capabilities in relation to multiple resource demands (including recreation, fish and wildlife, and navigation interests).
- To minimize user conflicts and to optimize public safety and access.
- To maximize Corps management actions for the greatest public benefit (such benefits may be categorized as economic, social, and/or environmental).
- To consider the implications of Corps planning and management activities on the Upper Mississippi National Wildlife and Fish Refuge. The objective of such consideration is to conserve and enhance river-related natural resources.

CLIMATE

3.03 The Upper Mississippi River Valley is an area of great temperature extremes. The lowest temperatures generally occur in January and February; the highest temperatures, in July and August. Summer highs can reach 100°F, with winter lows do
temperature variation and seaso
distinctly different recreational
a variety of recreational opportu
upon yearly temperature fluctua
season activities can extend fr
October, with the rest of the
winter-oriented recreational activ
shows average high and low temper
seasons, and associated recreationa

GEOLOGY AND TOPOGRAPHY

3.04 The geologic characterist
Mississippi River have been determ
processes that began over 400 mil
that time, material was deposited
vast inland sea that covered the ar
were subsequently transformed into
of dolomite, shale, and sandstone
several hundred million years,
throughout central North America r
elevation, thus exposing the sec
erosion. As the land rose, th
Mississippi River and its tributarie
the soft sedimentary rock to form t
today's complex drainage system. T
this very efficient drainage sys
reason that relatively few natural
the great number in adjacent ar
Upper Mississippi below the head
Minneapolis.

3.05 Approximately one million ye
of at least four periods of conti
began. Apparently, the last thre
touched the major portion of the st
the bluffs and valleys surrounding
sippi River below Fort Snelling hav
scoured and rounded by glacial ice
are no significant upland deposit
(sand, gravel, rocks), the area
tacular vistas, very different
glaciated regions.

3.06 The Wisconsin glaciation i
(20,000 to 10,000 years ago) an
glacial influence on the formati
Upper Mississippi River basin. Du
period, drainage of glacial melt w
and east was blocked, resulting in

with winter lows down to -30° F. This ariation and seasonal change create ferent recreational seasons which offer ecreational opportunities. Depending emperature fluctuations, the summer ties can extend from early May into n the rest of the year dominated by d recreational activities. Figure 3-1 high and low temperatures, recreation ssociated recreational activities.

) TOPOGRAPHY

ologic characteristics of the Upper ver have been determined by events and t began over 400 million years ago. At terial was deposited at the bottom of a a that covered the area. These deposits tly transformed into alternating layers shale, and sandstone. During the past ed million years, the earth's crust tral North America rose to its present us exposing the sedimentary rock to the land rose, the pre-Pleistocene ver and its tributaries cut down through entary rock to form the basic pattern of drainage system. The development of icient drainage system is the major latively few natural lakes (compared to ber in adjacent areas) are near the ippi below the head of navigation in

ately one million years ago, the first ur periods of continental glaciation ntly, the last three glaciers scarcely jor portion of the study area. Because valleys surrounding the Upper Missis- ow Fort Snelling have not been recently unded by glacial ice and because there tant upland deposits of glacial drift rocks), the area offers many spec- , very different from the nearby ns.

onsin glaciation is the most recent 000 years ago) and most important nce on the formation of the present ppi River basin. During much of this e of glacial melt waters to the north ocked, resulting in tremendous flows through the Mississippi River drainage system. These flows generally carried very small sediment loads compared to the size of the discharge, giving the water great capacity to erode. The Minnesota and Mississippi River Valleys, for example, were deepened and widened by glacial River Warren far beyond the apparent needs of their present discharges. As the glaciers retreated, drainage to the north and east reestablished. Then, as the volume and velocity of the melt water declined, river valleys were partially

Temperature & Associated Recreational Activities

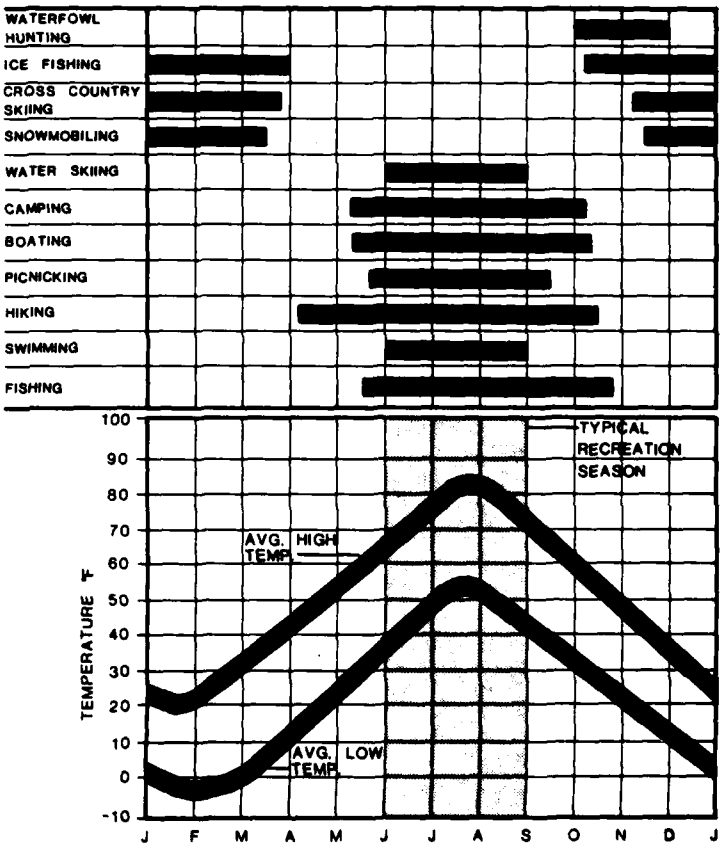


FIGURE 3-1. EXTREME TEMPERATURE VARIATION CREATES OPPORTUNITIES FOR A VARIETY OF RECREATION ACTIVITIES.

3. FACTORS INFLUENCING DEVELOPMENT

refilled by glacial outwash sediments consisting largely of sand and sandy gravel. Subsequent river action incised and greatly modified such outwashes, leaving a terraced valley with a gently meandering river and many side-channel formations. The reduced flow has also indirectly created lakes on the river system behind alluvial fans formed from material deposited in or along the Mississippi channel by tributary streams of great sediment-carrying capacity (Lake Pepin).

3.07 The natural geologic character of the study area makes it very attractive for recreation. The relative lack of large, natural, non-river lakes in the immediate vicinity leaves the river as one of the few navigable waters in the area. Consequently, the river attracts many boaters and fishermen. Additional attractions are the rugged and aesthetically pleasing bluffs and rock outcroppings along the river. These formations are in sharp contrast to the gently rolling glaciated topography of the surrounding regions. Lake Pepin and Lake St. Croix are two major naturally occurring areas on the river with large expanses of lake-like conditions.

3.08 Man-made structures built during the past 100 years, however, have greatly modified natural geologic conditions. The series of locks and dams created lakes, backwater areas, and wetlands in the pre-1930 floodplain along nearly the entire length of the study area. The wing dams constructed in the late 1800's and early 1900's, now covered by water, create both good fishing habitat and navigation hazards. Since the time that these areas were inundated, they have been subject to varying rates of sedimentation, caused and/or aggravated by disposal of material dredged for channel maintenance and by increased erosion in the upstream drainage area. If present sedimentation rates continue, much of the river valley eventually will lose most of its capacity to support fish and wildlife resources.

BIOLOGICAL RESOURCES

3.09 The Upper Mississippi River Valley supports one of the most diverse ecological communities in North America, in terms of abundance and variety of habitat and species. The unusual plant an results from both geographical locat graphical variety. Because the vall transition region between the eastern and the prairie, species from both o (major ecological community types Southern species also intrude up the advantage of the climatic moderation. relief from the floodplain to adjacent a diversity of local habitats.

3.10 Before construction of the lock the river bottoms were primarily woode some hay meadows and small farmin sloughs were common, but hundreds of were also scattered through the woode plants, dominated by river bulrushes, the lakeshores and cuts leading off th marshes often dried up completely. F was a major activity, with crews rescui in bottom-land lakes and ponds af receded. The locks and dams converte acres of forest and meadow to aqu Species adapted to aquatic and wet flourished while forest and brus diminished. Through ecological suc brushlands, meadows, and marginal agr eventually returned to forest.

Vegetation

3.11 Most project lands within the f permanent normal pool levels are cove lowland hardwood species in varying densities. Willow, cottonwood, map birch, and box elder are the preval species. Elm is a declining species, h of Dutch elm disease. Dominant overst the wet forest type are silver maple, cottonwood, American elm, and river bir prevalence. The most common understo wood nettle, poison ivy, wild grape, Dominant overstory species in better-d are American elm, silver maple, green and black ash, in order of commonne common understory species are woodbine touch-me-not, jack-in-the-pulpit, and v of the temperate conditions in the b

usual plant and animal life
ographical location and topo-
ecause the valley lies in the
een the eastern decidous forest
ies from both of these biomes
ommunity types) are present.
intrude up the valley, taking
natic moderation. Topographical
lain to adjacent bluffs provides
abitats.

ion of the lock and dam system,
primarily wooded islands, with
d small farming areas. Deep
but hundreds of lakes and ponds
hrough the wooded areas. Marsh
iver bulrushes, were limited to
s leading off the sloughs. The
completely. Fish rescue work
with crews rescuing fish trapped
s and ponds after the river
nd dams converted thousands of
meadow to aquatic habitats.
quatic and wetland habitats
orest and brushland species
ecological succession, many
and marginal agricultural lands
forest.

nds within the floodplain above
levels are covered with many
cies in varying mixtures and
ottonwood, maple, elm, ash,
are the prevalent overstory
ining species, however, because
Dominant overstory species in
e silver maple, black willow,
m, and river birch, in order of
common understory species are
vy, wild grape, and woodbine.
ies in better-drained forests
er maple, green ash, basswood,
er of commonness. The most
es are woodbine, wood nettle,
ne-pulpit, and violet. Because
itions in the bottom land, a

number of trees in the river valley extend well north of their normal ranges. Major species in this group are Kentucky coffeetree, honey locust, smooth buckeye, river birch, and sycamore. Climbing vines (lianas) are extremely important plants in these stands. Poison ivy, woodbine, and wild grape are the most common climbing vines, forming as much as 25 percent of the canopy.

3.12 The aquatic vegetation of the area is mostly associated with backwaters and can be grouped into two habitat types: deep and shallow marshes, and wood and shrub swamps. Major species include willow, bulrush, reed grass, water lily, arrowhead, duckweed, and coontail. A minor vegetation species, wild celery, is of great importance as food to the canvasback, redhead, and other diving ducks. Increased turbidity is causing wild celery to diminish.

3.13 Generally, minimally-vegetated areas and those disturbed by human intervention are suitable for high-density recreational activity or development. Developed parks and dredged material disposal sites on Corps land have this high-development potential.

3.14 Vegetation areas with moderate capacity to accommodate development or recreation activity are generally areas that readily adjust to passive or low-intensity recreation without major vegetative disruption. Mature lowland forests above the ordinary high-water level with adequate drainage are examples of sites with a moderate development capacity.

3.15 Vegetation with a low capacity for recreational development and activities is found in areas where any significant activity might irreversibly damage that vegetation. Lowland forest with poor drainage capabilities and aquatic vegetation associated with backwater areas are examples of such low-capability class vegetation. Uncommon or significant plant communities such as remnant native prairie would also be classified as low-capability areas.

3. FACTORS INFLUENCING DEVELOPMENT

3.16 Detailed information on vegetation in the study area is provided in a report entitled Vegetation, Land and Water Surface Changes in the Upper Navigable Portion of the Mississippi River Basin Over the Period 1939-1973, by Kurt N. Olson and Merle P. Meyer, University of Minnesota, 1976.

Fish and Wildlife Resources

3.17 Fish - Approximately 123 species of fish live in the Upper Mississippi River. The lock and dam system created lake-type pools, with a current slower than that of the pre-impoundment river. Consequently, fast-water species decreased (such as the smallmouth bass) while species that prefer a pond-like environment increased (such as the largemouth bass, bluegills, crappies, carp, buffalo, and walleye). By slowing the current, the dams also increased silt deposition, thus reducing available habitat for species that require gravel beds to spawn and increasing habitat for species that tolerate mud bottoms.

3.18 Sedimentation has also filled some backwater sloughs to the point where fish may suffer winterkill because of oxygen depletion or freeze-out. Nevertheless, the river supports a very productive fishery, particularly below pool 3. In pools 4 through 6, the river has a conservatively estimated carrying capacity of at least 300 pounds of fish per acre.

3.19 Backwater sloughs, main channel border areas (especially the wing dams), and tailwater areas are the most important aquatic habitats for the production of aquatic invertebrates. Benthic organisms, particularly aquatic insects and freshwater mussels, are very abundant in the river system. Such animals are important forage items for many terrestrial and aquatic species.

3.20 Wildlife - The Upper Mississippi River corridor has one of the most diverse ecological communities, in terms of wildlife species abundance and variety, on the entire North American continent. The following wildlife species descriptions represent the extremely rich and diverse wildlife community of the Upper Mississippi River. This community has great inherent stability because of its present diversity.

3.21 Mammalian habitat in the r
primarily of extensive marshla
water areas, deciduous river b
sedge meadows, sand prairies, an
steep slopes covered with a
hardwoods. Fifty-two species of
the area. Aquatic mammals s
beaver, and upland mammals such
and squirrels are common. Th
sumptive (such as hunting) a
recreational values (such as na
wildlife observation).

3.22 The Upper Mississippi Ri
deciduous forests of the east,
the oak-hickory forests of
coniferous forests of the north.
large number of diverse habi
corresponding bird species. The
is indicated by the number
Nearly 300 species are known t
about 100 species nest here.
birds, and non-game birds of the
public benefits including hun
nature photography, scavenging,
rodent pests, and general ae
Since many birds using the rive
tory, the area has both nation
significance.

3.23 Endangered and Threatene
area falls within the rang
threatened and endangered spec
the peregrine falcon, and the
mussel. The Higgins' eye i
locations (primarily pools 9 and
River) in the river's side chan
border. The peregrine falcon is
area but has been seen during
Canada to the Gulf Coast. The
common in the area. It winters,
young in the study area.

3.24 In addition to the federal
States of Iowa, Minnesota, and W
other plant and animal specie
threatened, or endangered. Not
on Federal lands, but these spe
scientific and aesthetic value f
national standpoints. A conce
made to preserve these species a

habitat in the river corridor consists tensive marshlands and adjacent open ciduous river bottom forests, moist sand prairies, and limestone bluffs and overed with a mixture of cedar and y-two species of mammals are known in iatic mammals such as muskrats and and mammals such as white-tailed deer are common. They provide both con- as hunting) and non-consumptive ilues (such as nature photography and ition).

Mississippi River is a blend of the ts of the east, the western prairies, ry forests of the south, and the sts of the north. The area provides a of diverse habitats, each with its ird species. The variety of bird life by the number of species observed. cies are known to frequent the area; ies nest here. The waterfowl, game game birds of the area provide various s including hunting, bird watching, hy, scavenging, control of insect and and general aesthetic enhancement. s using the river corridor are migra- has both national and international

d and Threatened Species - The study thin the range of three Federal endangered species: the bald eagle, falcon, and the Higgins' eye pearly Higgins' eye is found in various rily pools 9 and 10 and the St. Croix ver's side channels and main channel egrine falcon is a rare visitor to the een seen during its migration from ulf Coast. The bald eagle is quite ea. It winters, nests, and rears its dy area.

to the federally-listed species, the Minnesota, and Wisconsin list over 150 animal species as rare, uncommon, ndangered. Not all of them are found , but these species have significant esthetic value from local, State, and oints. A concentrated effort must be these species and their habitats.

3.25 Refuges - Two extensive National Wildlife Refuges are in this portion of the Upper Mississippi. The Upper Mississippi National Wildlife and Fish Refuge, authorized in 1924, extends from Wabasha, Minnesota, mile 760, to Rock Island, Illinois, mile 490. The Trempealeau National Wildlife Refuge, established in 1936, was expanded to a total of 5,617 acres in 1979. This refuge lies within the Upper Mississippi River Valley in the extreme southern end of Buffalo and Trempealeau Counties bordering Perrot State Park in pool 6. The State of Minnesota leases 4,123 acres of land in pool 3 from the Corps for fish and wildlife management. This area is known as the Gores Wildlife Refuge. Other, smaller wildlife areas also exist along the river system.

3.26 Sources of Additional Information - Additional information on the terrestrial and aquatic life of the Mississippi River can be found in the following reports: the Environmental Impact Statement for the Operation and Maintenance of the 9-Foot Navigation Channel for the Upper Mississippi River, St. Paul District, 1974; A Compendium of Fishery Information on the Upper Mississippi River, the Upper Mississippi River Conservation Committee, 1979; the Fish and Wildlife Work Group Appendix to the GREAT I Study of the Upper Mississippi River, 1980; the Summary Report of the Fish and Wildlife Habitat Changes Resulting from the Construction of a Nine-Foot Channel in the Upper Mississippi River, 1978; the Upper Mississippi River Main Stem Level B Study by the Upper Mississippi River Basin Commission, 1981; and the Master Plan for the Upper Mississippi River, St. Paul District, 1965-1973. These reports provide more detailed information on species presence and abundance; on fish, wildlife, and vegetation changes over time; and on the importance and recreational value of these resources.

WATER QUALITY

3.27 The Upper Mississippi River has variable water quality. Municipal and industrial use of the river has caused pollution problems and deterioration of water quality in the St. Paul-Minneapolis area. In general, water quality improves at the confluence of the Mississippi and St. Croix Rivers (mile 811) as well as further downstream, below Lake Pepin (at about mile 787).

3. FACTORS INFLUENCING DEVELOPMENT

3.28 Minnesota River water quality is generally lower than that in the Mississippi because of riverbank erosion and land practices. These practices have resulted in high levels of turbidity and fecal coliforms. As a result, the Minnesota River is considered unsuitable for swimming. However, typical recreation uses of the river include pleasure boating and limited sport fishing.

3.29 Water quality of the Mississippi decreases at the confluence of the Mississippi and Minnesota Rivers because of the Minnesota's higher turbidity and coliform levels. Turbidity and suspended solids found in this segment of the river typically do not affect common non-contact recreational uses of the river such as recreational boating. However, high fecal coliform levels continue to make the river unsuitable for water-contact recreational uses such as swimming.

3.30 Water quality of the Mississippi River from pool 3 to upper pool 4 (downstream of Hastings, Minnesota, to the inlet of Lake Pepin) is relatively good for recreational uses such as boating and sightseeing. This stretch of the river is considered a recovery zone where water quality improves with increasing distance from the metropolitan area, particularly downstream of the confluence with the St. Croix River, which has higher water quality than the Mississippi itself. Water quality parameters generally meet standards for fisheries and recreation, with the exceptions of fecal coliform bacteria suspended solids, and PCB's.

3.31 The Lower St. Croix River includes a large river lake, Lake St. Croix (mouth to river mile 24.5). which has high water quality. The relatively undeveloped nature of the 7,650-square-mile St. Croix River drainage is an important factor in this lake's excellent water quality.

3.32 The water quality of the Mississippi River from pool 4 to pool 10 is relatively good for most recreational uses. Water quality in Lake Pepin is of sufficiently high quality that it does not limit swimming activity.

3.33 Major tributaries in this portion of the Upper Mississippi system, such as the Black River in pool 7 and the Root and La Crosse Rivers in pool 8, are similar in water quality to the Mississippi. The tributaries, particularly the Root and La Crosse, are usually low in turbidity but, during high may contribute large quantities of silt a the Mississippi.

3.34 For more detailed water quality in please contact the following agencies:

- Minnesota Pollution Control Agency
- Wisconsin Department of Natural Resour
- Iowa Conservation Commission
- U.S. Environmental Protection Agency
- U.S. Geological Survey

POPULATION

3.35 Current and future populations within area are critical factors influencing Federa

TABLE 3-

County	Pool(s)	1970 Census	C
Hennepin, MN	SAF, 1, MN R.	960.1	
Ramsey, MN	1, 2	476.3	
Dakota, MN	2, 3, MN R.	139.8	
Scott, MN	MN R.	32.4	
Washington, MN	2, 3, LSCR	83.0	
Pierce, WI	3, 4, LSCR	26.7	
St. Croix, WI	LSCR	34.4	
Goodhue, MN	3, 4	34.8	
Pepin, WI	4	7.3	
Wabasha, MN	4, 5	19.3	
Buffalo, WI	4, 5, 5A, 6	13.7	
Winona, MN	5, 5A, 6, 7	44.4	
Trempealeau, WI	6, 7	23.3	
La Crosse, WI	7, 8	80.5	
Houston, MN	8, 9	17.6	
Vernon, WI	8, 9	24.6	
Crawford, WI	9, 10	15.3	
Allamakee, IA	9, 10	15.0	
Clayton, IA	10, 11	20.6	
Grant, WI	10, 11	48.4	
Total		2,117.5	2

(1) Preliminary census data.
(2) Percent of total population in study are
(3) State Demographer data from Minnesota, W

lity but, during high discharge, quantities of silt and clay to

led water quality information, llowing agencies:

tion Control Agency

tment of Natural Resources

on Commission

tal Protection Agency

Survey

ture populations within the study tors influencing Federal develop-

ment of the Mississippi River system. Planners and managers used the population data summarized in this section to evaluate alternative actions.

3.36 The study area comprises twenty counties along the river in three States. These counties have a total population exceeding 2.2 million (based on preliminary 1980 census data). The total area population is expected to increase by about 25 percent between 1980 and 2000. Table 3-1 lists this population by county and pool and details these expected changes.

3.37 Populations of municipalities by pool are in table 3-2.

3.38 The effects of this distribution and concentration on resource management are discussed in the System-wide Analysis section of this report.

TABLE 3-1 - POPULATION BY COUNTY (BY THOUSAND)

Pool(s)	1970 Census	1980 Census (1)	% of Total (2)	%change 1970-1980	1990 (3) projected	% change 1980-1990	2000 (3) projected	% change 1980-2000
, 1, MN R.	960.1	939.5	42.45	- 2.1	909.8	- 3.2	880.0	- 4.3
2	476.3	457.4	20.67	- 4.0	449.4	- 1.8	442.0	- 3.4
3, MN R.	139.8	194.3	8.78	+39.0	243.3	+25.2	293.3	+50.9
4.	32.4	43.6	1.97	+34.4	51.6	+18.3	58.7	+34.6
5, LSCR	83.0	113.7	5.14	+37.0	138.6	+21.9	163.5	+43.8
5, LSCR	26.7	31.2	1.41	+17.1	35.5	+13.8	40.4	+29.5
5	34.4	43.2	1.95	+25.8	58.4	+35.2	73.8	+70.8
5	34.8	37.7	1.75	+11.3	43.2	+14.6	48.6	+28.9
	7.3	7.5	0.34	+ 2.2	7.8	+ 4.0	8.2	+ 9.0
5	19.3	19.3	0.87	0	19.7	+ 2.1	20.1	+ 4.1
5, 5A, 6	13.7	14.1	0.64	+ 2.6	15.4	+ 9.2	16.1	+14.2
5A, 6, 7	44.4	46.2	2.09	+ 4.1	46.2	0	46.2	0
7	23.3	25.9	1.17	+11.0	28.1	+ 8.5	30.4	+17.4
8	80.5	89.6	4.05	+11.4	101.2	+12.9	111.0	+23.9
9	17.6	19.5	0.88	+10.8	19.7	+ 1.0	19.9	+ 2.0
1	24.6	25.3	1.15	+ 3.2	28.0	+10.7	26.1	+ 3.2
10	15.3	16.4	0.74	+ 7.7	17.6	+ 7.3	18.3	+11.6
10	15.0	15.1	0.68	+ 0.7	16.7	+10.6	17.5	+15.9
11	20.6	21.1	0.95	+ 2.4	23.2	+10.0	24.4	+15.6
11	48.4	51.4	2.32	+ 6.2	56.8	+10.5	60.4	+17.5
	2,117.5	2,213.0	100.00	+ 4.5	2,328.2	+ 5.2	2,398.9	+ 8.4

data.
opulation in study area in 1980.
data from Minnesota, Wisconsin, and Iowa.

3. FACTORS INFLUENCING DEVELOPMENT

TABLE 3-2. POPULATION OF MUNICIPALITIES IN STUDY AREA

Pool/ Municipality	1980 Population(1)	Percent of population in pool	Percent of population in system
Pool 1 & SAF	370,091	100.00	35.84
Minneapolis, MN	370,091	100.00	
Pool 2	339,446	100.00	32.87
St. Paul, MN	268,248	79.03	
Mendota, MN	219	0.06	
Lilydale, MN	419	0.12	
Newport, MN	3,309	0.97	
Inver Grove Heights, MN	17,154	5.05	
St. Paul Park, MN	4,876	1.44	
Cottage Grove, MN	18,925	5.78	
Rosemount, MN	5,080	1.49	
South St. Paul, MN	21,216	6.25	
Pool 3	15,494	100.00	1.50
Hastings, MN	12,830	82.81	
Prescott, WI	2,664	17.19	
Pool 4	22,270	100.00	2.16
Red Wing, MN	13,721	61.61	
Bay City, WI	542	2.43	
Maiden Rock, WI	174	0.78	
Stockholm, WI	104	0.47	
Lake City, MN	4,518	20.29	
Pepin, WI	892	4.01	
Wabasha, MN	2,319	10.41	
Pool 5	1,917	100.00	0.19
Alma, WI	876	45.70	
Buffalo, WI	909	47.42	
Minneiska, MN	132	6.88	
Pool 5A	1,238	100.00	0.12
Fountain City, WI	973	78.59	
Minnesota City, MN	265	21.41	
Pool 6	25,011	100.00	2.42
Winona, MN	25,011	100.00	
Pool 7	10,021	100.00	0.97
Trempealeau, WI	954	9.52	
Dakota, MN	351	3.50	
Onalaska, WI	8,716	86.98	

(1) Preliminary 1980 census data.

TABLE 3-2. POPULATION OF MUN IN STUDY AREA (C

Pool/ Municipality	1980 Population(1)	Per in
Pool 8	53,223	10
LaCrescent, MN	3,648	
La Crosse, WI	48,193	9
Brownsville, MN	418	
Stoddard, WI	691	
Genoa, WI	273	
Pool 9	2,491	10
New Albin, IA	608	2
DeSoto, WI	318	1
Lansing, IA	1,177	4
Ferryville, WI	214	
Lynxville, WI	174	
Pool 10	10,356	10
Harpers Ferry, IA	257	
Prairie du Chien, WI	5,837	5
Marquette, IA	522	
McGregor, IA	938	
Clayton, IA	67	
Bagley, WI	319	
Guttenberg, IA	2,416	2
Minnesota River	149,291	10
Mendota Heights, MN	7,288	
Eagan, Mn	20,720	1
Burnsville, MN	35,681	2
Bloomington, MN	81,640	5
Savage, MN	3,962	
Lower St. Croix R.	31,651	10
Afton, MN	2,539	
St. Mary's Point, MN	347	
Lake St. Croix Beach, MN	1,177	
Lakeland Shores, MN	171	
Lakeland, MN	1,814	
Hudson, WI	5,427	1
North Hudson, WI	2,215	
Bayport, MN	2,942	
Stillwater, MN	12,255	3
Oak Park Heights, MN	2,764	

Total population in system - 1,032,50

(1) Preliminary 1980 census data.

ABLE 3-2. POPULATION OF MUNICIPALITIES IN STUDY AREA (CONT.)

lity	1980 Population(1)	Percent of population in pool	in system
	53,223	100.00	5.15
ıt, MN	3,648	6.85	
e, WI	48,193	90.55	
lle, MN	418	0.79	
, WI	691	1.30	
	273	0.51	
	2,491	100.00	0.24
ı, IA	608	24.40	
WI	318	12.77	
IA	1,177	47.25	
le, WI	214	8.59	
e, WI	174	6.99	
	10,356	100.00	1.00
Ferry, IA	257	2.48	
du Chien, WI	5,837	56.36	
e, IA	522	5.04	
IA	938	9.06	
IA	67	0.65	
WI	319	3.08	
g, IA	2,416	23.33	
River	149,291	100.00	14.46
Heights, MN	7,288	4.88	
	20,720	13.88	
e, MN	35,681	23.90	
on, MN	81,640	54.69	
MN	3,962	2.65	
Croix R.	31,651	100.00	3.07
	2,539	8.02	
s Point, MN	347	1.10	
Croix MN	1,177	3.72	
Shores, MN	171	0.54	
MN	1,814	5.72	
WI	5,427	17.15	
son, WI	2,215	7.00	
MN	2,942	9.30	
r, MN	12,255	38.72	
Heights, MN	2,764	8.73	

ulation in system - 1,032,500

minary 1980 census data.

CULTURAL RESOURCES

3.39 The rich historical heritage fostered by the Mississippi River provides great potentials for public interpretation and enjoyment and for educational and scientific values. However, the many important cultural sites on Federal lands can also limit certain types of activities and/or facility developments. Therefore, the identification of cultural resources becomes an important influencing factor for all planning, development, and management actions.

3.40 According to recent studies conducted by the St. Paul District, approximately 2,200 known cultural properties are located along the Mississippi River from St. Anthony Falls to lock and dam 10. One-third of these are archeological sites and the remaining two-thirds are historic. These sites include only those listed in the literature and records of the various agencies, museums, and libraries that maintain such information.

3.41 Few intensive studies have been undertaken along the river, and, of these, most have been conducted within the last decade. Therefore, many areas along the river may have archeological and historic properties that have not yet been recorded. With intensive study, the number of known properties would probably increase dramatically.

3.42 The majority of the known historic sites along the Mississippi River are the buildings and structures in the river towns.

3.43 Identification of many of these structures has been the direct result of standing structure surveys undertaken by the State Historic Preservation Offices in Iowa, Minnesota, and Wisconsin. Historic structures form the bulk of those properties on the National Register of Historic Places.

3.44 Archeological resources that have been recorded within the past decade tend to be distributed in undeveloped areas that lie between communities. Archeological sites were once found throughout the river valley, but modern development tends to obscure or destroy these sites. Because the locations of many historic towns correspond closely to areas that were also inhabited prehistorically, a large number of undocumented sites or site remnants may exist. Many prehistoric sites were inundated in the 1930's as a result of the construction of the locks and dams.

3. FACTORS INFLUENCING DEVELOPMENT

3.45 Impacts upon these resources come from a variety of sources. Water fluctuation at the locks and dams and wave action resulting from commercial transportation wash many archeological sites into the river. People seeking recreation can further this erosion by adding to wave action and by beaching their craft on sites. Untrained amateurs, not recognizing the destructiveness of their actions, dig for artifacts. Some of these impacts are major and some seem insignificant; however, each destroys a portion of the data base and increases the difficulty of interpreting the archeological record.

3.46 The sites that form the cultural resource base of the study area are significant in resource use development because the Corps is responsible for the protection, preservation, and enhancement of cultural resources that are on its fee title land or that may be affected by its actions. Prior to construction of any new facilities on Corps fee title lands, cultural resource investigations will be conducted to locate and assess the significance of any cultural resources. These investigations are important because most sites leave no surface indication that can be detected easily after hundreds or thousands of years. A recent site-specific investigation of a proposed recreation area on Goose Island, Wisconsin, in pool 8, for example, was instrumental in determining the extent and future direction of development plans for the area.

OUTDOOR RECREATION TRENDS

3.47 The lack of reliable, useful data about public use and its effects on river resources is one of the greatest obstacles to both short- and long-term resource planning for the Upper Mississippi region. Because various government agencies exercise jurisdiction along the river, no comprehensive, continuing resource use monitoring program has been developed. A need for such a coordinated program has been identified, however, in several comprehensive river planning studies.

3.48 Lacking reliable historical data, projections of future public demands are questionable at best. When combined with the difficulties of obtaining an accurate list of the existing supply of recreation resources along the Upper Mississippi, the problems involved in preparing comprehensive recreation trend data multiply.

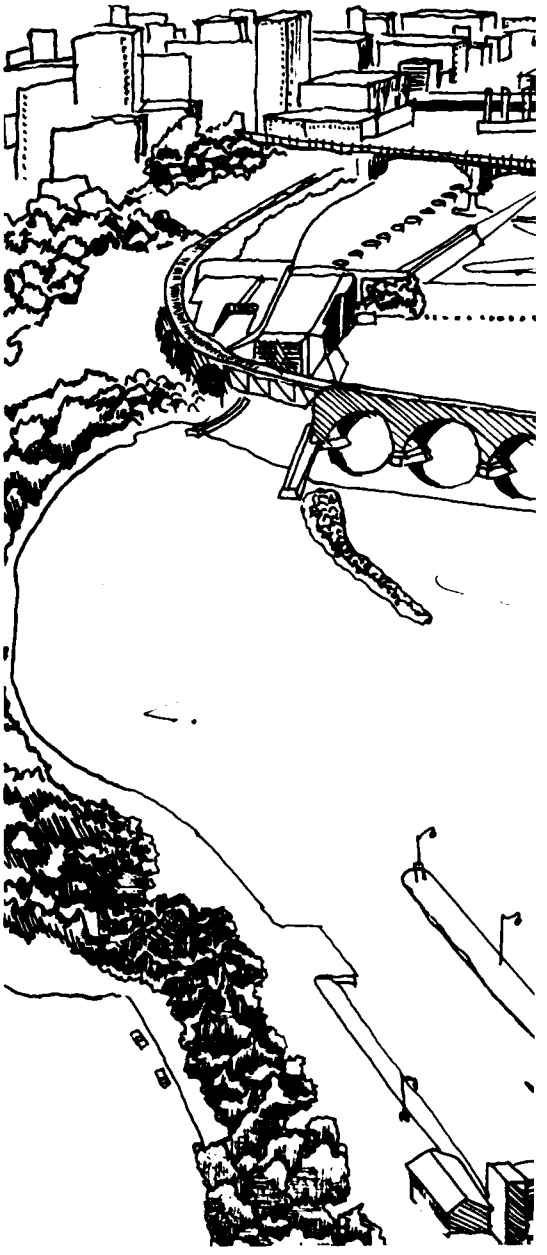
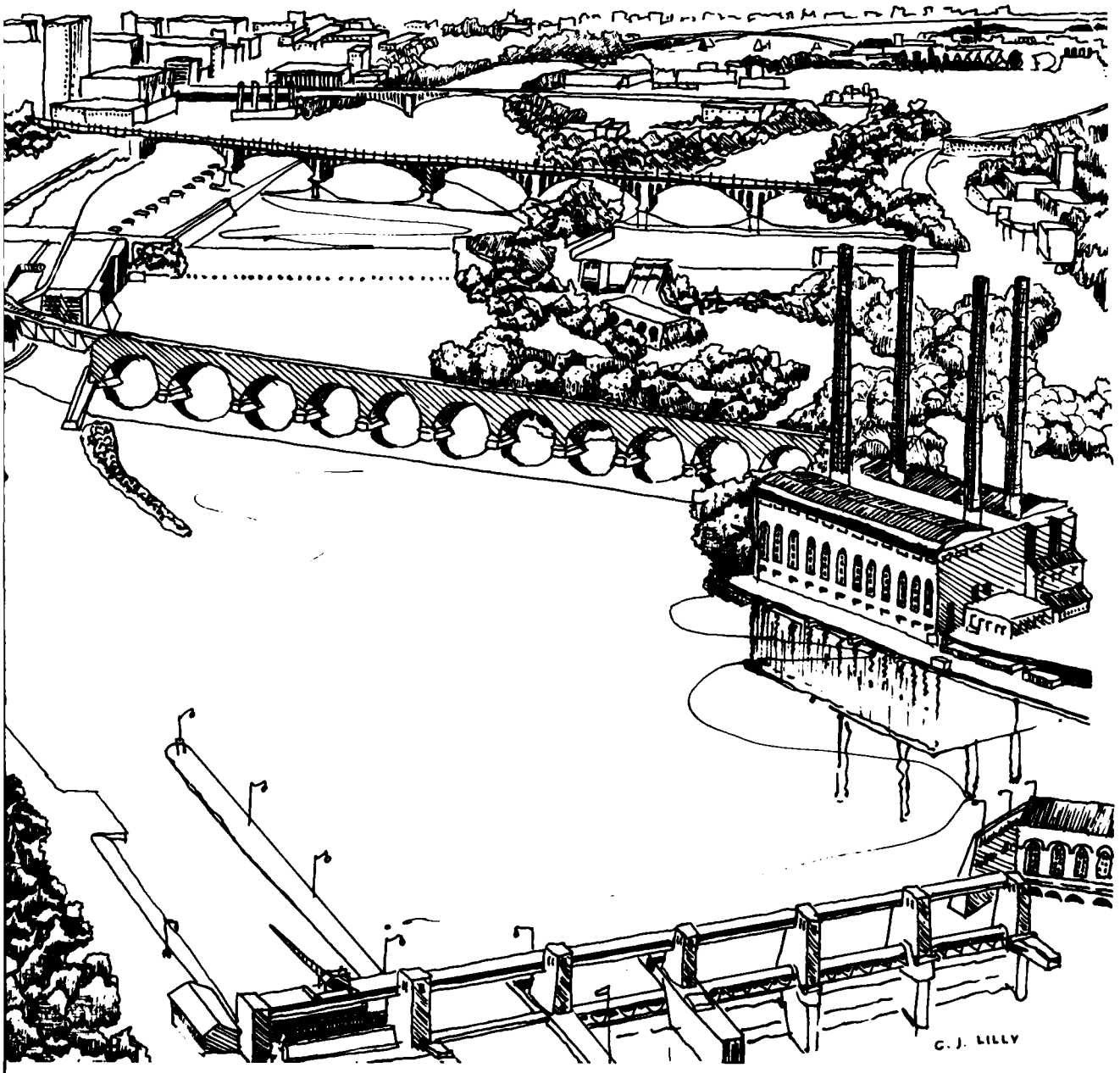


FIGURE 3-2. The upper reaches of the Mississippi Rive prehistoric times and have given rise to many signific and structures that are significant to American pre-hi are many cultural resources along the river, the effec District (listed on the National Register of Historic Pl the river.



reaches of the Mississippi River have served as an important artery for travel, commerce, communication, and settlement since have given rise to many significant cultural resources along the shoreline. Cultural resources are those sites, buildings, objects, e significant to American pre-history and history in the areas of architecture, archaeology, engineering, and culture. Because there ources along the river, the effects of management activities on these resources must be considered. The St. Anthony Falls Historic National Register of Historic Places) is one of many areas along the river that must be considered when developing plans and uses for

3. FACTORS INFLUENCING DEVELOPMENT

3.49 Various user profiles suggest that the river services a wide variety of recreationists - from hunters and trappers to waterskiers and hikers. Because Federal land ownership is generally limited to river bottom and shoreline border areas, mos studies have not examined fully the many land-based, water-influenced land recreation uses such as hiking, cross-country skiing, nature photography, and bicycling.

3.50 In short, each of the studies analyzed in this section provides a limited view of some user groups. Such studies are restricted to a specific time and depict only a part of the overall, still-incomplete picture of public use on the Upper Mississippi River system. These studies provide the best available data, however.

Public-Use Visitation

3.51 **Historical Trends** - Table 3-3 shows the annual visitation recorded by the St. Paul District for the St. Anthony Falls pools through pool 10. Road counters, recreational lockage data, fish and wildlife bag checks, and camping and resort receipts were used as gross indicators for estimating visitation from 1965 to 1971. In 1971, the Recreation Resource Monitoring System (RRMS) was initiated. The RRMS is a system designed to collect and analyze annual information on recreational facilities and recreation resource management for each Corps project with an annual visitation of 5,000 recreation days or more. The RRMS is the only Corps-administered recreational use inventory for the Upper Mississippi River. Because the RRMS has undergone several revisions since 1971, comparing annual visitation from year to year is misleading. The RRMS data do, however, indicate a trend towards increased recreational use in the study area, which is recognized as an accurate trend.

3.52 Visitation figures for specific recreation sites will be covered in detail in part III (plan of development) of this master plan (to be published later).

Special User Studies

3.53 Recent studies of recreational use on the Upper Mississippi generally focus on specific user groups or use in specific areas. Brief summaries of several major studies follow.

TABLE 3-3 - ANNUAL PUBLIC USE VISITA
IN RECREATION DAYS, POOLS
SAF-10, 1965-1980

Year	Recreation d
1965	1,710,000
1966	1,930,000
1967	2,030,000
1968	2,060,000
1969	2,110,000
1970	2,100,000
1971	2,130,000
1972	3,630,000
1973	3,493,200
1974	3,976,200
1975	4,081,700
1976	4,267,300
1977	4,103,000
1978	5,746,900
1979	7,907,100
1980	9,083,900
1981	8,474,000
1982	8,726,100

3.54 **MRI** - Midwest Research Institute (M a study for the Corps in 1977 entitled and Forecasts of Recreation Use and Lockages on the UMR." According to nearly half of the recreational craft us are runabouts, followed by cruisers and Fishing boats account for little recrea through the locks. The survey also weekend trips are shorter and use fewe weekday trips and that these generally the afternoon. Weekday recreational lock over the entire day and involves craft on that use many locks. Runabouts seem greatest pressure on the locks duri afternoons on weekends, with weekend percent above weekday use. Lock use houseboats, and fishing boats is more shows no weekend peaking. Swimming popular activity, then picnicking, cam skiing, and fishing. Most people surveye so on the dredged material disposal i their boats. Over two-thirds of th traveled less than 50 miles to their starting point on the river.

3.55 **GREAT I** - The Dredged Material Recreation User Survey was conducted for

3 - ANNUAL PUBLIC USE VISITATION,
IN RECREATION DAYS, POOLS
SAF-10, 1965-1980

Recreation days
1,710,000
1,930,000
2,030,000
2,060,000
2,110,000
2,100,000
2,130,000
3,630,000
3,493,200
3,976,200
4,081,700
4,267,300
4,103,000
5,746,900
7,907,100
9,083,900
8,474,000
8,726,100

dwest Research Institute (MRI) conducted
e Corps in 1977 entitled "Methodology
of Recreation Use and Small Craft
he UMR." According to this survey,
the recreational craft using the locks
, followed by cruisers and houseboats.
account for little recreation traffic
locks. The survey also showed that
are shorter and use fewer locks than
and that these generally occur during
Weekday recreational lockage is spread
e day and involves craft on longer trips
locks. Runabouts seem to exert the
sure on the locks during the mid-
weekends, with weekend use about 10
weekday use. Lock use by cruisers,
nd fishing boats is more balanced and
end peaking. Swimming was the most
ity, then picnicking, camping, water-
shing. Most people surveyed who camp do
dged material disposal islands or on
Over two-thirds of those surveyed
than 50 miles to their launching or
on the river.

- The Dredged Material Disposal Site
r Survey was conducted for GREAT in the summer of 1977. Based on this survey, a dredged material disposal island user profile was drawn and compared with data obtained from a similar study of Lower St. Croix River users.

3.56 The survey shows that the composite user of Upper Mississippi dredged material disposal islands travels 50 miles or less to be on the river with five other people. This group uses one powerboat 16 to 25 feet long. Typically, the island user owns the boat and does not rent marina space. Trips on the Upper Mississippi itself are generally overnight, last 3 days or more, and cost less than $30. Islands are used more often than the shore for camping, or the user camps on the boat. Launching sites on the Upper Mississippi are chosen because they offer easy access or are close to home, to a favorite island, or to a favorite section of the river. A grocery store and/or restaurant and boat pumpout near the launch are desirable. Most island users stay within one pool and do not use the locks.

3.57 While the typical island user enjoys dredged material disposal islands and wishes to see more of them, he is not sure what sites actually are dredged material disposal islands (see the glossary). Users prefer islands that combine sand and trees, with a sand beach the most important criterion for selecting an island. The recreation experience generally sought is relaxation in natural areas requiring few outdoor skills, with no supervision or control of activities. Boating, camping, and fishing are the primary recreational activities. Typically, users prefer to be alone or with their own groups. However, each user is considered compatible with like users (e.g., runabout users are compatible with other runabout users), and with houseboats and canoes. Also, the composite user does not feel that barge tows reduce enjoyment of the river, although he thinks that recreation use of the river is as important as commercial use. About half of those surveyed on the Upper Mississippi proper perceived no crowding; another quarter mentioned feeling slightly crowded. Overall, users seem very satisfied with their river experiences.

3.58 The typical Lower St. Croix user surveyed seems as satisfied with his visit as is the Upper Mississippi user. This satisfaction level is not lowered by an increased perception of crowding. The typical Lower St. Croix user attempts to avoid crowds by picking a trip time when the fewest people are on the

river. He does not mind encountering other people while traveling along the river as much as when he is on shore, and he does not mind encountering a group of quiet people anywhere. Like the Upper Mississippi user, the Lower St. Croix River user prefers natural areas that require few outdoor skills and that have no controls on activities. The typical Lower St. Croix user, however, is receptive to restricting watercraft types and to limiting some areas of the river to specific uses, although he does not agree with limiting peak-use areas. In contrast to the Upper Mississippi, the St. Croix is predominantly a day-use area.

3.59 MWBAC Prescott Study - The Prescott Study was conducted in 1979 by the Minnesota-Wisconsin Boundary Area Commission (MWBAC). The purpose of the study was to determine the contribution of watercraft use levels on the Lower St. Croix made by craft originating in the Hastings-Prescott area of the Upper Mississippi. Study data showed that most of the recreation traffic coming down the Mississippi from the direction of lock and dam 2 as well as most of the recreation traffic coming up the Mississippi from the direction of lock and dam 3 has the Lower St. Croix River as its recreation destination. Watercraft with pool 4 as a recreation destination come mainly from the Lower St. Croix. Relatively little traffic that passes the confluence of the two rivers appears to have pool 2 as a recreation destination.

3.60 Like the MRI and dredged material disposal island surveys, this study indicated that the most common type of craft was the runabout. In the Prescott survey, fishing boats were dominant before 9:00 a.m., with runabouts (usually launched) dominant from 10:00 a.m. until dusk. Cruisers and houseboats (marina-based craft) account for nearly half of the traffic after 8:00 p.m. Launched boats are more likely to use the Lower St. Croix and to spend part of the day beached than are marina-based boats.

3.61 UMRCC Studies: Pools 5 and 9 - The Upper Mississippi River Conservation Committee (UMRCC) surveyed recreational use of pool 5 in 1978 and pool 9 in 1974-1975. In pool 5, sport fishing was the most popular activity, followed by pleasure boating and waterfowl hunting. Most recreationists surveyed were from Minnesota or Wisconsin, and more than half traveled less than 50 miles to the pool. Sport fishing was also the most popular activity in pool 9, followed by sightseeing, boating, and camping. Mos in the pool 9 survey were from Iowa or Wi traveled less than 50 miles to use the p

Demand - Supply - Needs Analysis

3.62 Demand, supply, and need are recrea terms. In short, demand is an estim possible participation; supply is a facilities and areas available; and nee the supply falls short of meeting the de glossary for more detailed definitions).

3.63 An analysis of demand, supply, ar important factor in resource manageme (e.g., future expansion of a certa recreation facility can only be justifi for more of these facilities).

3.64 The following paragraphs briefly su recognized sources of demand, supply, ar for different areas of concern associated foot navigation channel project.

3.65 Systemwide Demand-Supply-Needs Anal Update - The GREAT I Recreation Work Grou demand-supply-needs analysis based on 197 and projected activity occasions through by pool.

3.66 These demand estimates were base Corps of Engineers annual RRMS visitatio accuracy of these estimates is questionat are still the best available. O interpreting the results of this type of the relative weighting of activity needs areas along the river. Information on hiking, and hunting was based on State Outdoor Recreation Plan (SCORP) data, demands for these activities are expressed regional demand rather than pool-spec Further information on the methodology us this data and its limitations is avail GREAT I Report, Volume 6, Recreational Appendix.

3.67 Corps Update - The St. Paul Distric the GREAT needs analysis using a rev inventory and new 1980 population censu information from field personnel familiar

ing, and camping. Most respondents ey were from Iowa or Wisconsin; half n 50 miles to use the pool.

eeds Analysis

ply, and need are recreation planning ; demand is an estimate of total pation; supply is a count of the reas available; and need is how far short of meeting the demand (see the detailed definitions).

of demand, supply, and need is an in resource management decisions xpansion of a certain type of ity can only be justified by a need facilities).

ng paragraphs briefly summarize many s of demand, supply, and needs data as of concern associated with the 9- hannel project.

Demand-Supply-Needs Analysis: GREAT I

T I Recreation Work Group conducted a ds analysis based on 1977 supply data ivity occasions through the year 2025

nd estimates were based in part on s annual RRMS visitation data. The estimates is questionable, but they best available. Of value in results of this type of analysis is nting of activity needs for different river. Information on snowmobiling, ng was based on State Comprehensive on Plan (SCORP) data, and project activities are expressed in terms of rather than pool-specific demand. on on the methodology used to develop s limitations is available in the Volume 6, Recreational Work Group

e - The St. Paul District has revised analysis using a revised supply w 1980 population census data plus field personnel familiar with the 9-foot channel project and with recent changes in recreational use. This revision involved the same approach as the GREAT needs analysis. The revised needs analysis permits comparison from 1975 through 1981.

3.68 The following sections and table 3-4 show summary results by pool.

3.69 Pool 1 has a high need for hiking trails and a low need for boater parking spaces and launch lanes. The supply of picnic and camping facilities and swimming beach area should remain adequate through 2005.

3.70 Pool 2 has a need for snowmobiling trails and a high need for camping facilities and hiking trails. The need for snowmobile trails require further evaluation before any actions are taken to facilitate trail development. The need for launch lanes and parking spaces for boating is low. No need for additional picnic facilities or beach area is expected.

3.71 Pool 3 has the highest need in the system for picnic facilities, boater parking spaces, launch lanes, swimming beach area, camping facilities, and hiking trails. However, because the upper pool 3 and St. Croix River areas already receive heavy water-related recreational use, a site that would encourage additional users must be chosen carefully. The need for snowmobile trails also appears to be high, but again, this need requires further evaluation.

3.72 Pool 4 has a high need for boater parking spaces and launch lanes. This pool has a moderate need for swimming beach area and for hiking and snowmobile trails. The supply of camping facilities should remain adequate until 1995, when a low need will develop. No additional picnic facilities should be needed through 2005.

3.73 Pool 5 has a high need for picnic facilities and a low need for swimming beach area and hiking trails. This pool has the lowest need in the system for boater parking spaces, launch lanes, and snowmobile trails. The camping facility supply is expected to be adequate through 2005.

3.74 No need for additional picnic and camping facilities is expected in pool 5A through 2005. A moderate need exists in this pool for boater parking spaces, launch lanes, swimming beach area, and hiking trails. The need for snowmobile trails is low.

3. FACTORS INFLUENCING DEVELOPMENT

TABLE 3-4 - RELATIVE NEEDS FOR RECREATION FACILITIES, BY POOL, ACCORDING TO THE CORPS STUDY

	Facility						
Pool	Picnic Units	Boating parking	Launch lanes	Swim beach	Camp units	Hiking trails	Snow trails
1 and SAF	1	4	4	1	1	6	6
2	-	4	4	-	6	6	7
3	7	7	7	7	7	7	6
4	1	6	6	5	2	5	5
5	6	3	3	2	1	4	3
5A	1	5	5	5	1	5	4
6	1	5	5	5	2	5	5
7	6	5	5	5	6	5	4
8	1	6	6	6	2	5	5
9	1	5	5	5	5	4	5
10	1	5	5	6	1	3	5

Relative needs scale:
- = not applicable or data not available.
1 = adequate through 2005
2 = adequate through 1995
3 = has the lowest need.
4 = has a low need.
5 = has a moderate need.
6 = has a high need.
7 = has the highest need.

3.75 Pool 6 has a moderate need for boater parking spaces, launch lanes, swimming beach area, and hiking and snowmobile trails. The supply of camping facilities should remain adequate until 1995, when a low need will develop. The supply of picnic facilities should suffice through 2005.

3.76 Pool 7 has a high need for picnic and camping facilities. The need for boater parking spaces, launch lanes, swimming beach area, and hiking trails is moderate. Pool 7 also has a low need for snowmobile trails.

3.77 Pool 8 has a high need for boater parking spaces, launch lanes, and swimming beach area. The pool exhibits a moderate need for hiking and snowmobile trails. A need for additional camping facilities is not expected until 1995, when a low need will occur. There is no expected need for picnic facilities through 2005.

3.78 Pool 9 has a moderate need for boater parking spaces, launch lanes, swimming beach areas, camping facilities, and snowmobile trails. A low need for hiking trails exists in this pool. The supply of picnic facilities should remain s
2005.

3.79 A high need for swimming be
pool 10. The need for boater parki
lanes, and snowmobile trails is m
for hiking trails is the lowest in
10 should have sufficient pic
facilities through 2005.

3.80 Statewide/Regional Demand-Supp
The State Comprehensive Outdoor
(SCORP's) represent a continuous pl
outdoor recreational lands and faci
SCORP's summarize State human and
analyze recreational supply, dem
statewide and regional bases; pres
tions; and offer recommendation
State's recreational objectives.
policy document that acts as a manag
by all levels of government. Since
and provision of recreational opport
cooperation and coordination of a
and private groups involved in provi
necessary to meet the objectives
Corps Engineering Regulation on Fed
in recreational development (ER 1
that "Planning for the recreationa
will be accomplished . . . in c
comprehensive Federal and State pla

TABLE 3-5 - DEMAND, SUPPLY, N
1975 AND 1990, REGION 1,

Year	Activity	Peak day demand	Supply
1975	Picnicking	5,194	5,707
1990	(units)	6,642	
1975	Boating	17,188	65,467
1990	(acres)	30,000	
1975	Camping	2,571	4,955
1990	(units)	4,079	
1975	Beach	5,122	22,600
1990	Swimming(3)	8,054	

(1) From 1978 Iowa SCORP.
(2) Assume constant at 1975 level.
(3) Beach unit (100 square feet).

:ilities should remain sufficient through

gh need for swimming beach area exists in he need for boater parking spaces, launch snowmobile trails is moderate. The need trails is the lowest in the system. Pool have sufficient picnic and camping through 2005.

ıide/Regional Demand-Supply-Needs Analyses - Comprehensive Outdoor Recreation Plans epresent a continuous planning process for creational lands and facilities. Generally, mmarize State human and natural resources; ecreational supply, demand, and needs on and regional bases; present demand projec- d offer recommendations to achieve the ecreational objectives. The SCORP is a ument that acts as a management tool for use els of government. Since the responsibility ion of recreational opportunities is shared, on and coordination of all public agencies e groups involved in providing recreation is to meet the objectives of the SCORP. The neering Regulation on Federal participation tional development (ER 1120-2-404) states ning for the recreational development . . . ccomplished . . . in coordination with ive Federal and State plans."

E 3-5 - DEMAND, SUPPLY, NEED ANALYSIS, 1975 AND 1990, REGION 1, IOWA (1)

ivity	Peak day demand	Supply (2)	Excess supply(+) or demand(-)
icking	5,194	5,707	+ 513
its)	6,642		- 935
ing	17,188	65,467	+48,279
res)	30,000		+35,467
ing	2,571	4,955	+ 2,384
its)	4,079		+ 876
h	5,122	22,600	+17,478
ming(3)	8,054		+14,546

978 Iowa SCORP.
constant at 1975 level.
unit (100 square feet).

3.81 The 1978 Iowa SCORP divides that State into seven planning regions. The part of Iowa that is in the master plan study area (Allamakee and Clayton Counties) lies in Region 1. In addition to Allamakee and Clayton Counties, Region 1 includes 13 other counties. Outdoor recreation planning efforts must consider that the demand, supply, and needs analysis in the SCORP is regional (13 counties) and may not reflect actual local conditions (Allamakee and Clayton). Table 3-5 shows the supply, demand, and needs analysis for picnicking, boating, camping, and beach swimming. As this table shows, supply presently exceeds demand for these activities. Supply is expected to exceed demand through 1990 for boating, camping, and swimming. By 1990, however, a slight deficiency of picnic facilities is projected.

3.82 The master plan study area includes portions of two Minnesota development regions: Regions 10 and 11.

3.83 Region 10 covers Goodhue, Wabasha, Winona, and Houston Counties, plus seven other counties outside the study area. The 1979 Minnesota SCORP performed a demand and needs analysis. Table 3-6 shows the analysis for those activities which occur on the Upper Mississippi River system or adjacent lands. The SCORP recommends that increased hunting opportunities should be a primary objective of public agencies providing winter recreation and that the object of summer recreation planning should be more bicycling facilities. Other activities that show a high need for more facilities in this region are camping, hiking, and fishing.

3.84 Bicycling, snowmobiling, hiking, and skiing trails should be developed. Hunting, camping, fishing, and swimming opportunities should be increased. More access sites are needed.

3.85 Region 11, the Twin Cities metropolitan region, includes Hennepin, Ramsey, Washington, Dakota, and Scott Counties, which are adjacent to the Mississippi River, plus two other counties off the river. Table 3-7 shows the SCORP demand and needs analysis for certain activities in this region. The primary focus of public agencies involved in winter recreation should be providing cross-country ski trails. For agencies providing summer recreation, the main focus should be on bicycling trails. Additionally, Region 11 has a high need for more camping, fishing, and swimming opportunities.

3. FACTORS INFLUENCING DEVELOPMENT

3.86 Campground development is sparse in this region. Trails for skiing, bicycling, hiking, and snowmobiles are needed.

3.87 The 1979 Wisconsin SCORP divides the State into 15 planning regions, four containing portions of the master plan's study area: Regions 3, 4, 12, and 13.

3.88 Table 3-8 shows the SCORP's demand, supply, and need analysis for Region 3, which consists of Grant County plus three other counties not in the study area. The SCORP recommends an emphasis on the primary environmental corridors in the region: the Upper Mississippi and Wisconsin Rivers. It also recommends protecting the scenic amenities of the Mississippi, utilizing the river's recreation potential, and fully developing the Great River Road. The SCORP further proposed that Grant County and the Wisconsin Department of Natural Resources (DNR) establish a linear park along the bluffs of the Mississippi, featuring a hiking and nature study trail. The highest needs in Region 3 are more hiking and snowmobiling trails and hunting opportunities, with moderate needs for more primitive camping, canoeing, and fishing opportunities.

3.89 Region 4 consists of La Crosse, Vernon, and Crawford Counties plus one other county. Table 3-9 shows the demand, supply, and need analysis for this region. SCORP recommendations for Region 4 include developing hiking and bicycle trail facilities along the river. Particular emphasis should be given to the proposal to develop a bicycling facility between the city of La Crosse and Goose Island. A high need for more primitive campsites and fishing opportunities was also shown, as was a moderate need for more boat accesses, snowmobile trails, and canoeing and hunting opportunities.

3.90 Region 12 includes Buffalo and Trempealeau Counties plus one other county. Table 3-10 shows the demand, supply, and need analysis for this region. The SCORP recommends hiking and bicycle trail development along the river. Consideration of a regional park on Lake Pepin is also given high priority. Additionally, the region has a high need for canoeing opportunities, and a moderate need for primitive campsites and snowmobile trails.

3.91 Region 13 includes St. Croix, Pierce, and Pepin Counties in addition to two other counties. Table 3-11 shows the demand, supply, and needs analysis for

TABLE 3-6 - DEMAND AND NEEDS ANALYSIS, 1
REGION 10, MINNESOTA (1)

Activity	Year	Number of activity occasions	% of Region request recreation c
Winter camping	1978	7,165	
	1990	5,836	
Cross-country skiing	1978	175,451	
	1990	178,701	
Snowmobiling	1978	1,135,806	
	1990	1,203,203	
Winter fishing	1978	172,210	
	1990	182,594	
Trapping	1978	66,317	
	1990	63,795	
Recreational biking	1978	5,106,773	2
	1990	5,289,960	
Nature study	1978	156,011	
	1990	176,572	
Camping	1978	359,761	1
	1990	402,485	(Supply: 105
Canoeing	1978	111,416	
	1990	101,899	
Summer fishing	1978	679,262	1
	1990	742,482	
Hiking	1978	203,286	1
	1990	245,518	
Swimming	1978	2,054,016	
	1990	2,105,989	(Supply: 32 45
Driving for pleasure	1978	975,503	
	1990	1,073,065	
Picnicking	1978	752,405	
	1990	838,823	(Supply:
Boating	1978	433,240	
	1990	453,781	(Supply:
Hunting	-	-	

(1) From 1979 Minnesota SCORP.

ND NEEDS ANALYSIS, 1978 AND 1990
10, MINNESOTA (1)

ber of ivity asions	% of Region 10 population requesting more recreation opportunities
7,165 5,836	-
75,451 78,701	8.1
35,806 03,203	8.7
72,210 82,594	-
66,317 63,795	-
06,773 89,960	22.0
56,011 76,572	-
59,761 02,485	15.0 (Supply: 105 campgrounds)
11,416 01,899	3.5
79,262 42,482	12.2
03,286 45,518	11.0
54,016 05,989	7.5 (Supply: 32 beaches and 45 pools)
75,503 73,065	-
52,405 38,823	5.8 (Supply: 227 parks)
33,240 53,781	7.5 (Supply: 103 accesses)
-	9.9

ta SCORP.

TABLE 3-7 - DEMAND AND NEEDS ANALYSIS, 1978 AND 1990
REGION 11, MINNESOTA (1)

Activity	Year	Number of activity occasions	% of Region 11 population requesting more recreation opportunities
Winter camping	1978 1990	26,851 30,485	-
Cross-country skiing	1978 1990	2,415,352 2,752,792	11.9
Snow-mobiling	1978 1990	2,299,074 2,464,659	6.3
Winter fishing	1978 1990	1,057,137 1,174,066	0.7
Trapping	1978 1990	61,599 52,314	0.2
Recreational biking	1978 1990	23,259,872 24,103,610	21.9
Nature study	1978 1990	820,983 958,381	0.1
Camping	1978 1990	371,209 415,369	16.0 (Supply: 78 campgrounds)
Canoeing	1978 1990	1,609,063 1,725,279	2.4
Summer fishing	1978 1990	2,004,513 2,915,021	11.4
Hiking	1978 1990	1,698,008 1,965,962	8.2
Swimming	1978 1990	10,295,066 11,196,472	10.3 (Supply: 131 beaches, 54 pools)
Driving for pleasure	1978 1990	2,540,402 2,866,956	-
Picnicking	1978 1990	2,917,732 3,378,575	5.3 (Supply: 1,125 parks)
Boating	1978 1990	3,389,063 3,736,007	5.3 (Supply: 233 accesses)
Hunting	-	-	8.5

(1) From 1979 Minnesota SCORP.

3. FACTORS INFLUENCING DEVELOPMENT

Region 13. Region 13 should also give consideration of a regional park on Lake Pepin a high priority. This region has a high need for hiking and bicycle facilities and for canoeing opportunities, plus a moderate need for primitive campsites, snowmobile trails, and hunting opportunities.

TABLE 3-8 - DEM

Activity	Year	
Swimming	1975	34,20(
	1995	40,70(
Developed camping	1975	
	1995	
Primitive camping	1975	
	1995	
Picnicking	1975	
	1995	
Motor boating	1975	7,100 oc
	1995	8,500 oc
Canoeing	1975	4,000 oc
	1995	4,700 oc
Fishing	1975	11
	1995	14
Hiking trails	1975	2
	1995	2
Bicycling trails	1975	
	1995	
Snowmobiling trails	1975	3
	1995	4
Hunting	1975	412,10(
	1995	479,10(

TABLE 3-9 - DEM

Activity	Year	
Swimming	1975	10,60(
	1995	12,30(
Developed camping	1975	1
	1995	2
Primitive camping	1975	
	1995	
Picnicking	1975	2
	1995	3
Motor boating	1975	7,100 oc
	1995	8,300 oc
Canoeing	1975	1,400 oc
	1995	1,600 oc
Fishing	1975	9
	1995	10
Hiking trails	1975	
	1995	
Bicycling trails	1975	1
	1995	2
Snowmobiling trails	1975	2
	1995	3
Hunting	1975	362,300
	1995	410,000

(1) From 1977 Wisconsin SCORP.

TABLE 3-8 - DEMAND, SUPPLY, NEED ANALYSIS, 1975 AND 1995, REGION 3, WISCONSIN (1)

Year	Demand	Supply (2)	Need
1975	34,200 activity occasions	50,332 activity occasions	--
1995	40,700 activity occasions	(39,690 beach; 10,642 pool)	--
1975	5,200 sites	3,698 sites	1,502 sites
1995	6,175 sites		2,477 sites
1975	155 sites	68 sites	87 sites
1995	188 sites		120 sites
1975	5,367 tables	4,311 tables	1,056 tables
1995	6,300 tables		1,989 tables
1975	7,100 occasions; 109 accesses	34,689 acres surface water	35 access sites
1995	8,500 occasions; 125 accesses	74 developed accesses	51 access sites
1975	4,000 occasions; 22 accesses	13 access sites	9 access sites
1995	4,700 occasions		
1975	11,800 occasions	2,966 miles streams and 9,480	
1995	14,000 occasions	acres lakes suitable for fishing	
1975	221.9 miles	23.0 miles	198.9 miles
1995	259.1 miles		236.1 miles
1975	33.2 miles	27.0 miles	6.2 miles
1995	64.3 miles		37.3 miles
1975	396.2 miles	122.8 miles	273.4 miles
1995	458.3 miles		355.5 miles
1975	412,100 annual occasions	50,272 acres open to hunting	
1995	479,100 annual occasions		

TABLE 3-9 - DEMAND, SUPPLY, NEED ANALYSIS, 1975 AND 1995, REGION 4, WISCONSIN (1)

Year	Demand	Supply (2)	Need
1975	10,600 activity occasions	16,500 activity occasions	--
1995	12,300 activity occasions	(8,875 beach; 7,625 pool)	--
1975	1,900 sites	1,892 sites	8 sites
1995	2,225 sites		333 sites
1975	158 sites	25 sites	133 sites
1995	183 sites		158 sites
1975	2,600 tables	1,989 tables	611 tables
1995	3,000 tables		1,011 tables
1975	7,100 occasions; 104 accesses	63,545 acres surface water	46 access sites
1995	8,300 occasions; 122 accesses	58 developed accesses	64 access sites
1975	1,400 occasions; 13 accesses	5 access sites	8 access sites
1995	1,600 occasions		
1975	9,300 occasions	1,355 miles streams and 4,390	
1995	10,800 occasions	acres lakes suitable for fishing	
1975	52.9 miles	28.0 miles	24.9 miles
1995	65.3 miles		37.3 miles
1975	109.6 miles	35.0 miles	74.6 miles
1995	215.2 miles		180.2 miles
1975	294.4 miles	95.5 miles	198.9 miles
1995	337.8 miles		242.3 miles
1975	362,300 annual occasions	81,912 acres open to hunting	
1995	410,000 annual occasions		

977 Wisconsin SCORP. (2) Assume constant at 1975 level.

3. FACTORS INFLUENCING DEVELOPMENT

TABLE 3-10 - DEMAND

Activity	Year	D
Swimming	1975	6,900 act
	1995	8,000 act
Developed camping	1975	900
	1995	1,050
Primitive camping	1975	25
	1995	40
Picnicking	1975	1,017
	1995	1,150
Motor boating	1975	3,100 occasi
	1995	3,500 occasi
Canoeing	1975	400 occasi
	1995	400 occasi
Fishing	1975	2,800
	1995	3,200
Hiking trails	1975	84.8
	1995	97.2
Bicycling trails	1975	28.8
	1995	53.7
Snowmobiling trails	1975	246.5
	1995	271.4
Hunting	1975	121,100 ann
	1995	134,700 ann

TABLE 3-11 - DEMAND

Activity	Year	D
Swimming	1975	38,300 act
	1995	48,200 act
Developed camping	1975	2,475
	1995	3,150
Primitive camping	1975	173
	1995	220
Picnicking	1975	4,067
	1995	5,400
Motor boating	1975	17,900 occasi
	1995	22,600 occasi
Canoeing	1975	5,600 occasi
	1995	7,000 occasi
Fishing	1975	26,600
	1995	33,200
Hiking trails	1975	123.7
	1995	160.9
Bicycling trails	1975	107.2
	1995	231.5
Snowmobiling trails	1975	1,071.8
	1995	1,450.9
Hunting	1975	433,500 ann
	1995	603,800 ann

(1) From 1977 Wisconsin SCORP.

TABLE 3-10 - DEMAND, SUPPLY, NEED ANALYSIS, 1975 AND 1995, REGION 12, WISCONSIN (1)

Demand	Supply (2)	Need
6,900 activity occasions	21,695 activity occasions	--
8,000 activity occasions	(17,713 beach; 3,982 pool)	--
900 sites	1,019 sites	--
1,050 sites		31 sites
25 sites	13 sites	12 sites
40 sites		27 sites
1,017 tables	947 tables	70 tables
1,150 tables		203 tables
3,100 occasions; 46 accesses	26,674 acres surface water	14 access sites
3,500 occasions; 51 accesses	32 developed accesses	19 access sites
400 occasions; 12 accesses	2 access sites	10 access sites
400 occasions; 12 accesses		10 access sites
2,800 occasions	1,427 miles streams and 3,723	
3,200 occasions	acres lakes suitable for fishing	
84.8 miles	47.5 miles	37.3 miles
97.2 miles		49.7 miles
28.8 miles	4.0 miles	24.8 miles
53.7 miles		49.7 miles
246.5 miles	109.8 miles	136.7 miles
271.4 miles		161.6 miles
121,100 annual occasions	207,956 acres open to hunting	
134,700 annual occasions		

TABLE 3-11 - DEMAND, SUPPLY, NEED ANALYSIS, 1975 AND 1995, REGION 13, WISCONSIN (1)

Demand	Supply (2)	Need
38,300 activity occasions	41,378 activity occasions	--
48,200 activity occasions	(37,341 beach; 4,037 pool)	6,822 occasions
2,475 sites	2,934 sites	--
3,150 sites		216 sites
173 sites	99 sites	74 sites
220 sites		121 sites
4,067 tables	2,721 tables	1,346 tables
5,400 tables		2,676 tables
17,900 occasions; 263 accesses	64,909 acres surface water	86 access sites
22,600 occasions; 332 accesses	177 developed accesses	155 access sites
5,600 occasions; 26 accesses	7 access sites	19 access sites
7,000 occasions		
26,600 occasions	1,655 miles streams and 48,252	
33,200 occasions	acres lakes suitable for fishing	
123.7 miles	18.0 miles	105.7 miles
160.9 miles		142.9 miles
107.2 miles	14.0 miles	93.2 miles
231.5 miles		217.5 miles
1,071.8 miles	407.0 miles	664.8 miles
1,450.9 miles		1,043.9 miles
433,500 annual occasions	77,550 acres open to hunting	
603,800 annual occasions		

n SCORP. (2) Assume constant at 1975 level.

3. FACTORS INFLUENCING DEVELOPMENT

AESTHETIC RESOURCES

3.92 The Upper Mississippi River is a nationally-significant resource. Natural features, historical and archeological sites, and wildlife habitat together with recreational use and commercial interests form a complex and visually-sensitive environment. Consequently, any action that may affect visual quality must be evaluated carefully. A systematic evaluation process is needed to analyze development and managemen Mississippi.

Landscape Zones

3.93 As part of this mast developed to analyze the visu area.(1) This analysis iden

DOMINANT LANDSCAPE ZONE CHARACTERISTICS

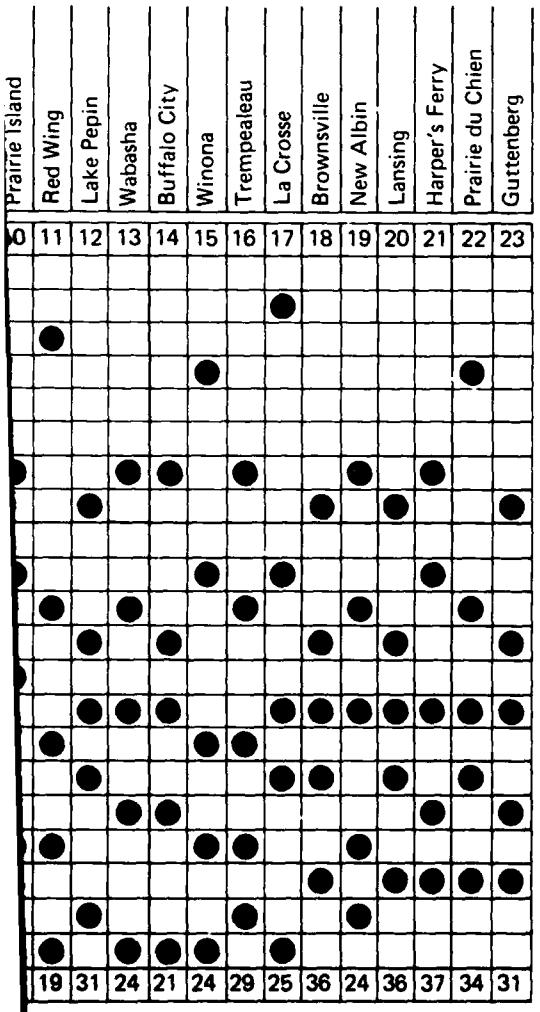
			Zone Location	Mpls. - CBD	Mpls. - Lower Gorge	Fort Snelling	St. Paul - CBD	South St. Paul	Grey Cloud Is.	Spring Lake	Hastings	Prescott	Prairie Island	Red Wing	Lake Pepin	Wabasha	Buffalo City	Winona
			Zone Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
LAND USE	1	Urban/Industrial		●			●	●										
	2	Urban/Residential			●						●							
	3	Urban/Agricultural												●				
	5	Urban/Natural				●												●
	6	Agricultural/Industrial							●									
	8	Agricultural								●								
	9	Agricultural/Natural											●			●	●	
	10	Natural										●			●			
RIVER ZONES	10	Channel		●	●		●	●			●							
	7	Island/River				●			●				●					●
	4	Marsh/River										●		●		●		
	1	Open Water								●					●		●	
VIEWING ANGLE	1	Above		●	●	●	●			●	●	●	●					
	5	Mid-level						●							●	●	●	
	10	Low							●					●				●
RIVER AWARENESS	10	High		●	●	●					●				●			
	5	Moderate														●	●	
	1	Low					●	●	●	●		●	●	●				●
LANDFORM CONTAINMENT	10	High			●	●	●				●							
	5	Moderate		●				●							●			
	1	Low							●	●		●	●	●		●	●	●
			Total Score	27	33	33	23	22	25	12	33	17	19	19	31	24	21	24

TABLE 3-12. PROCESS DIAGRAM

eded to analyze the effects of potential and management actions on the Upper

BS

t of this master plan, a process was analyze the visual character of the study is analysis identified 23 dominant land-



scape zones which have been designated by geographic area. Table 3-12 defines the general characteristics of these zones and ranks them in five categories. Zone numbers and the corresponding geographic location or city are across the top of the table. The five categories and the ranking scales for each category are along the left side. (See below for further explanation of these categories.) The total number values for all five categories determine the overall rank for each of the 23 zones. The maximum possible score is 50, the minimum 5.

3.94 The existing landscape character was determined by using five categories to describe the dominant impressions within the study area:

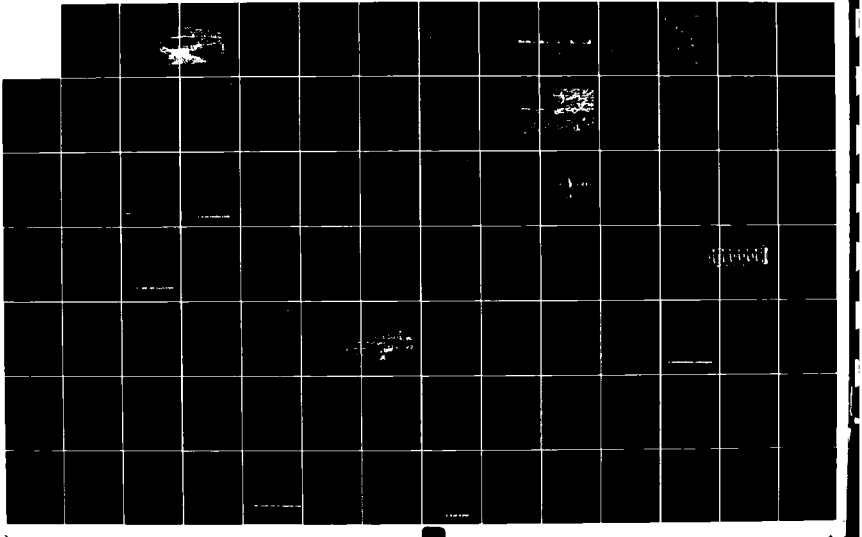
- Dominant land use, e.g., urban, natural, agricultural.
- River zones or water characteristics - how observers perceive the types of water environments in each pool, i.e., open water, marsh/river, and island/river.
- Predominant viewing angle - where the majority of observers would see the river valley, i.e., above, mid-level, or low. An above viewing angle is from the upper portion of the bluff edge. A low viewing angle is considered to be near the river's water level.
- River awareness - whether observers can perceive the river or the river valley.
- Landform containment - whether a feeling of visual or physical containment pervades the landscape. The perception of containment is generally produced by the presence of bluffs along the river valley.

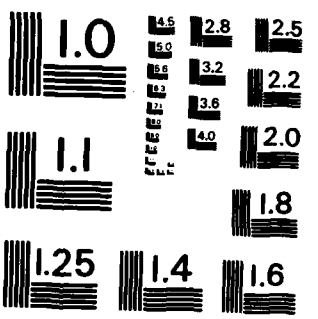
3.95 As the dominant impressions change, zone boundaries can be drawn and different category rankings can be assigned. More than one definition for each category may be possible. Each category is meant to represent one of the dominant impressions of a zone; however, it does not represent potential

(1) This study was conducted under contract for the Corps of Engineers by InterDesign, Inc. The study report, Visual Resource Evaluation Methodology for the Mississippi River, March 1982, is on file in the St. Paul District office.

AD A136 602 UPPER MISSISSIPPI RIVER LAND USE ALLOCATION PLAN MASTER PLAN FOR PUBLIC U..(U) CORPS OF ENGINEERS ST PAUL MN ST PAUL DISTRICT SEP 83 2/4

UNCLASSIFIED F/G 5/4 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963 - A

impressions. If potential impressions were considered, zones would be virtually impossible to establish.

3.96 For this study area, it was assumed that the more natural a zone, the higher the score for that particular zone in the land use category. The reasoning behind this assumption is that a natural area is highly sensitive to modification, and in this study area a natural area is generally considered of greater value or interest. Conversely, an urban/industrial area could readily accept further cultural modifications with little or no additional negative visual impacts.

3.97 A channelized river corridor with dramatic bluffs on both sides is considered to have the highest visual quality. Such corridors are generally narrow, and modifications could be visible on either side. Open water zones are wide expanses where modifications would generally occur in the background and not be readily perceived.

3.98 A low viewing angle assumes an intimacy with a scene in a riverine environment. Because close visual contact with a scene exposes modifications to a high degree, areas with low viewing angles are sensitive to development.

3.99 River awareness is similar to river zones. It is assumed that, if river awareness is high, the observation location is close to the riverbank and in the river valley. The focus of the view from such a vantage point is the river. Modifications to this scene would generally distract from visual quality.

3.100 Landform containment is also associated with river zones and viewing angle. In a channelized river corridor observed from a low viewing angle, landform containment is high and receives the highest score.

3.101 The total score for a zone represents its relative aesthetic importance. In this evaluation, high scores represent visually-sensitive areas.

3.102 This systematic process for evaluating visual resources on the Mississippi River is a very useful tool that Corps planners employ to identify visual impacts associated with dredged material disposal actions. This process also provides a framework that the Corps uses to prepare beautification plans that help offset project-related visual impacts. A visual resource evaluation process will also be used for site-specific planning in the plan of development (part III) for this master plan.

FIGURE 3-3. The primary method employed to keep which can move as much as 20,000 cubic yards o vary based on water level. Because 1982 has h channel, compared to an annual average of 400,0 created from dredged material may be used by swi

keep the navigation channel open is hydraulic dredging. The St. Paul District uses the Dredge WILLIAM A. THOMPSON, rds of material daily and place it up to 7,000 feet away from the point of dredging. Yearly dredging quantities has had higher than normal water levels, approximately 750,000 cubic yards of material will be removed from the 400,000. Dredging has beneficial as well as adverse effects on river resources. For example, islands and beaches by swimmers and boaters; and, in some cases, these areas provide habitat for wildlife.

3. FACTORS INFLUENCING DEVELOPMENT

Scenic Vistas

3.103 During field investigations, significant scenic vistas were noted. These scenic vistas should be considered for potential sightseeing observation locations. Table 3-13 lists the vistas by zone and the general location of the vista.

TABLE 3-13 - SCENIC VISTAS

Zone	Location
2	Locks and Dam 1
4	Bridge on State Highway 56
5	U.S. Highway 10
7	Spring Lake Park
8	Point Douglas Drive
10	Goodhue County Road E
12	Lake Pepin
13	Buena Vista State Park
13	U.S. Highway 61
15	John Latsch State Park
15	Lake Park
16	Perrot State Park
17	Lock and Dam 7
17	Minnesota State Highway 26
18	Wisconsin State Highway 35
18	Minnesota State Highway 26
19	Mount Hosmer, Lansing, Iowa
20	Clayton, Iowa, Light House
22	Pike's Peak State Park
22	McGregor Heights Park
23	Indian Burial Mounds Park
23	Guttenberg, Iowa
23	U.S. Highway 52

ACCESSIBILITY

3.104 Along both sides of the Upper Mississippi in the St. Paul District, good primary highways permit access to the outer limits of the project area. In Minnesota, the main highway along the Mississippi River is U.S. Highway 61; in Wisconsin, it is State Trunk Highway 35. In Iowa, secondary roads border the river. Many highways approach the river laterally, including Interstate Highways 94, 494, and 90, and U.S. Highways 10, 63, 53, and 18 (see figure 1-1).

3.105 Although the highway system facilitates access to the area near the river, access to the resource itself is more difficult. Along most of the river, railroad tracks run between roads, thereby limiting acce ing access include private l in pool 2 and high bluffs pools and in pools 1, 8, 9, of well-paved roads provid river is often limited.

3.106 The Great River Road scenic recreational and hi Mississippi River. This d will run from Lake Itasca t only this route will be elig River Road funds. The roa sides of the river althoug also be designated on the op

REAL ESTATE

3.107 Through implementat project in the St. Paul Dis fee title to approximatel project purposes. Essenti Engineers fee title proper the lower-lying bottom lands ly 48,850 acres is under Federal or State agencies. title lands, 15,448 acres flowage easement. Althoug rights of use to flowage ea cannot be designated for an

3.108 Part of this master p fying Federal land owners reflect river conditions as

PRIVATE/INDUSTRIAL DEVE

3.109 A wide variety of com ciated with the Upper Miss tributaries within the St. and management strategies diversity and distribution potential expansions. This District policy on appli allocation plan to future private commercial developm

3.110 To solicit informati mercial interests, a cons District conducted a mail s February 1981. A questi

between the river and the nearby
ng access. Other factors limit-
ivate lands adjacent to the river
bluffs in the St. Anthony Falls
, 8, 9, and 10. Also, the number
providing direct access to the
ed.

r Road is intended to provide a
and historic roadway along the
This designated national route
tasca to the Gulf of Mexico, and
be eligible for the Federal Great
he road will alternate between
lthough State scenic routes may
the opposite side of the river.

mentation of the 9-foot channel
aul District, the Corps acquired
imately 51,500 acres of land for
ssentially all of this Corps of
property in the pool areas is in
m lands. A total of approximate-
under permit or lease to other
encies. In addition to the fee
acres of land are held under
lthough the Corps holds certain
wage easement lands, these lands
for any public use.

aster plan study involves identi-
ownership on base maps, which
ons as of 1976.

DEVELOPMENT

of commercial interests are asso-
r Mississippi and its navigable
he St. Paul District. Planning
tegies must be sensitive to the
ution of existing businesses and
This section discusses St. Paul
application of the land use
uture uses of Federal land for
velopment.

rmation from river-related com-
a consultant for the St. Paul
ail survey from December 1980 to
estionnaire, two follow-up

postcard reminders, and a telephone follow-up resulted in a 79.4-percent response rate (290 completed questionnaires).

3.111 The purpose of this survey was twofold. It provided information about the District's master plan efforts, and it also solicited responses on a variety of issues pertinent to recreation resource planning and management.

3.112 This survey indicated interest in Corps recreation master planning efforts. Most companies expressed an interest in participating in the master plan study. Such interest is significant because the cooperation of commercial and other special interests adds to the comprehensiveness of the master plan.

3. FACTORS INFLUENCING DEVELOPMENT

COMPUTER RESOURCE SUITABILITY MODEL

3.113 As part of this study, the St. Paul District used the computerized data files of Minnesota's Land Management Information Center (LMIC) to develop resource suitability models for various recreational activities. Models describing resource requirements of four major activities were developed for each pool. Specific models included camping, swimming, picnicking, and boat access. In addition, composite suitability models combining all activities were developed for each pool. The U.S. Fish and Wildlife Service extensively used the same computer base information, known as the Geo-Information System (GIS), to provide inputs for this study. These suitability analyses were of value in determining the most appropriate land use allocation for an area. The plan of development (part III) will use this suitability data extensively to identify possible specific development sites. The Fish and Wildlife Service will also use the GIS program to complete their refuge master plan.

3.114 The effectiveness of a computer-based geo-information systems as a planning tool has been demonstrated in a number of past efforts. A particular advantage of these systems is the ability to quickly assemble, review, and match various resource characteristics for broad geographic areas. Figure 3-4 presents a sample composite model.

3.115 A report describing the modeling process and illustrating the specific models developed for each pool is being prepared by the St. Paul District. This report will be summarized in part III of this master plan.

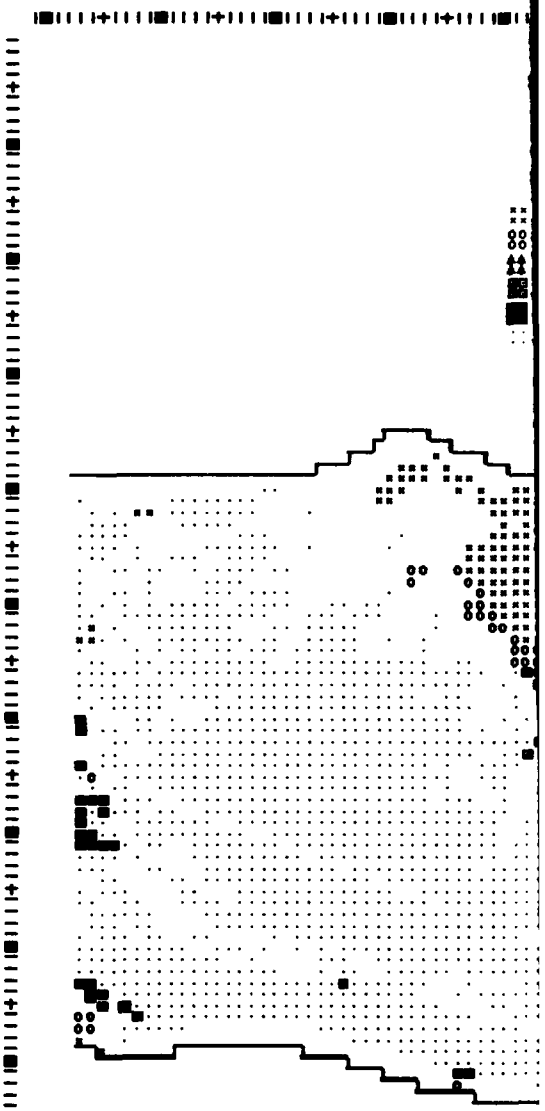
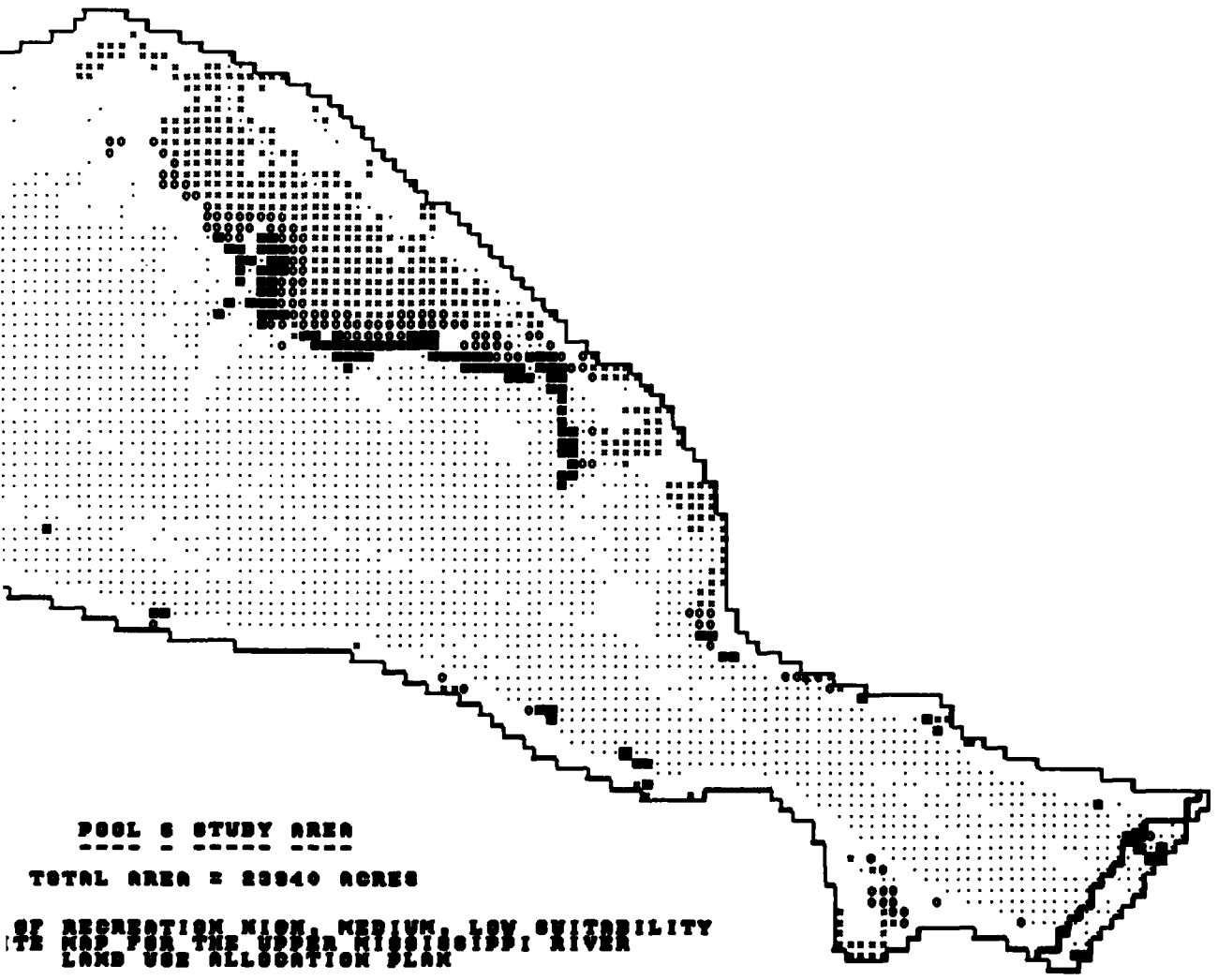


FIGURE 3-4. EXAMPLE COMPUTER RESOU

SYMBOL	COUNT	PERCENT	ACRES	LEGEND
0	3794	39.6	9485.0	UNSUITABLE
1	749	7.8	1872.5	ONE LOW SUITABILITY
5	266	2.8	665.0	ONE MEDIUM SUITABILITY PLUS
6	1	0.0	2.5	TWO MEDIUM SUITABILITIES PLUS
9	342	3.6	855.0	ONE HIGH SUITABILITY PLUS
10	39	0.4	97.5	TWO HIGH SUITABILITIES PLUS
20	4385	45.8	10962.5	WATER



POOL 6 STUDY AREA

TOTAL AREA = 23940 ACRES

OF RECREATION HIGH, MEDIUM, LOW SUITABILITY
TE MAP FOR THE UPPER MISSISSIPPI RIVER
LAND USE ALLOCATION PLAN

.E COMPUTER RESOURCE SUITABILITY MODEL

3. FACTORS INFLUENCING DEVELOPMENT

SYSTEM-WIDE ANALYSIS

3.116 Traditionally, river planners have tended to view the navigation pools on the Upper Mississippi as separate entities with little impact on each other. Yet, recreational facilities in one pool can have tremendous impact on recreational use in another. For example, the siting of a large marina could affect shoreline use many miles up or down the river from the facility. Or, user pressure from the St. Croix River has obvious impacts on recreational craft lockages at locks and dams 2 and 3.

3.117 Because of its linear nature, the river system serves as a natural transportation corridor for recreationists, both along and on the water. Locations of population centers, major highways, bridge crossings, navigational locks, and shoreline river access points significantly influence the density and distribution of public uses on the river. In an attempt to further examine how these and other variables influence general user patterns, a set of system-wide data was prepared and evaluated. This systemic perspective provided a useful tool for the preparation of the land use allocation plan.

3.118 The following variables, considered important influences on user patterns on the Upper Mississippi River, were evaluated.

- Population concentrations. (Public pressure is greatest at the upper end of the system, centering on the Twin Cities area. Before the 1980's, many Twin Citians looked to northern Minnesota and Wisconsin for water recreation. With climbing energy costs, however, boating pressure on the upper navigation pools has increased noticeably in the last several years.)
- River crossings.
- State and county park and recreation areas and their visitation.
- Recreation navigation access areas, including ramps, marinas, boat clubs, and high-density private docking areas.
- High-density water surface use areas.
- Existing and proposed barge fleeting sites.
- Projected recreation demand-supply-needs. (An update was provided to the GREAT I analysis.)

FIGURE 3-5. Pools formed by construction of the many Lake Pepin, provide excellent water for sailing. Cu same areas may already experience overcrowding during

d by construction of the many locks and dams provide varied recreation opportunities. Several large open expanses of water, such as ellent water for sailing. Current trends indicate that demands for water-based opportunities will continue to increase. In fact, experience overcrowding during peak-use periods. Active management is needed to alleviate this problem.

3. FACTORS INFLUENCING DEVELOPMENT

3.119 Figure 3-6 summarizes key system-wide variables. The following information is displayed in that figure:

- Bridges - Several bridges span the Mississippi River in the Twin Cities between miles 857.6 and 832.6. Other bridges are located at Hastings (mile 814), Red Wing (mile 790.6), Wabasha (mile 760.2), Winona (mile 725.9), North La Crosse (mile 701.8), La Crosse (mile 697.5), Lansing (mile 663.4), and Prairie du Chien (mile 634.6).
- Major Public Use Areas - All river miles given are close approximations. Both Federal and State field resource managers provided data. For simplicity, public use areas are divided into two distinct groups: fishing and boating with the symbol , and camping shorelines with the symbol .

Fishing and Boating:

A. Upstream and off main channel from Red Wing, mile 797.0 to mile 807.0 (10 river miles).

B. 1. Up and downstream of Wabasha, mile 757.0 to mile 762.0 (5 river miles).
   2. Lake Pepin and Read's Landing, mile 763.0 to mile 785.0 (22 river miles).

C. 1. Downstream of Zumbro River, mile 743.0 to mile 750.0 (7 river miles).
   2. Downstream of lock and dam 5, mile 733.0 to mile 738.2 (5.2 river miles).

D. Minnesota Slough downstream of lock and dam 8 off the main channel, mile 672.0 to mile 677.0 (5 river miles).

Camping Shorelines:

A. 1. Downstream of lock and dam 6, mile 711.0 to mile 713.0 (2 river miles).
   2. Downstream of lock and dam 7, mile 695.0 to mile 701.5 (6.5 river miles).

B. 1. Goose Island downstream of La Crosse, near mile 691.0.
   2. Downstream of lock and dam 8, mile 674.0 to mile 678.0 (4 river miles).

C. 1. Jackson Island, mile 641.5 to mile 646.5 (5 river miles).
   2. Upstream of lock and dam 10 at Guttenberg, mile 616.0 to mile 626.0 (10 river miles).

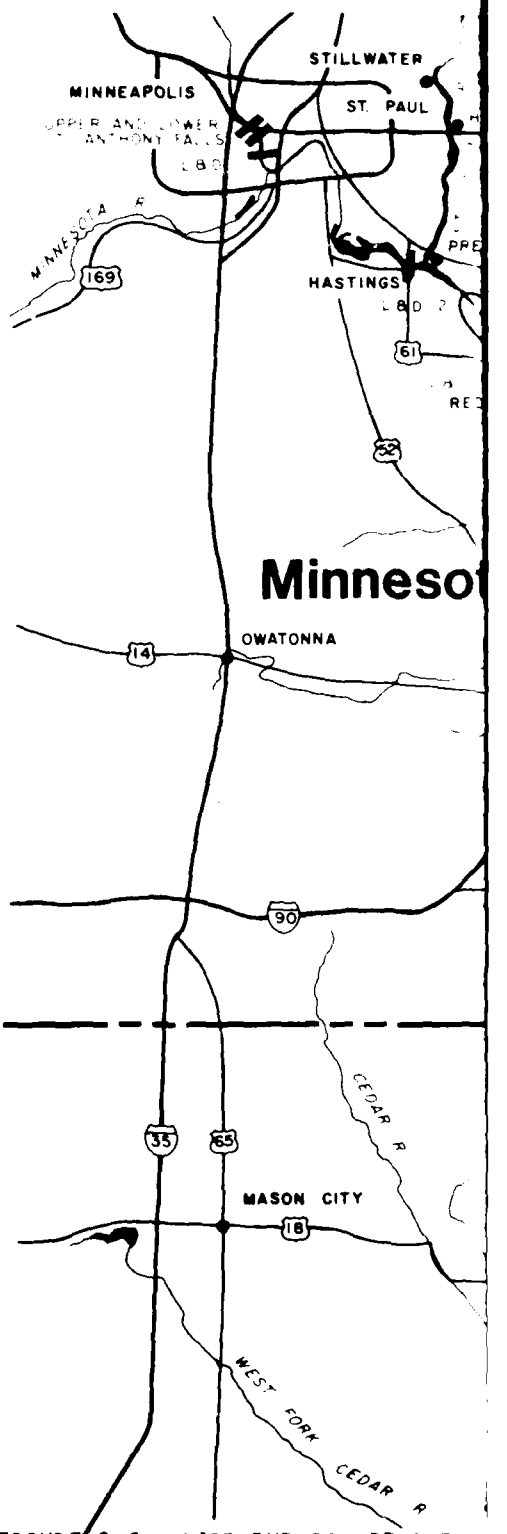
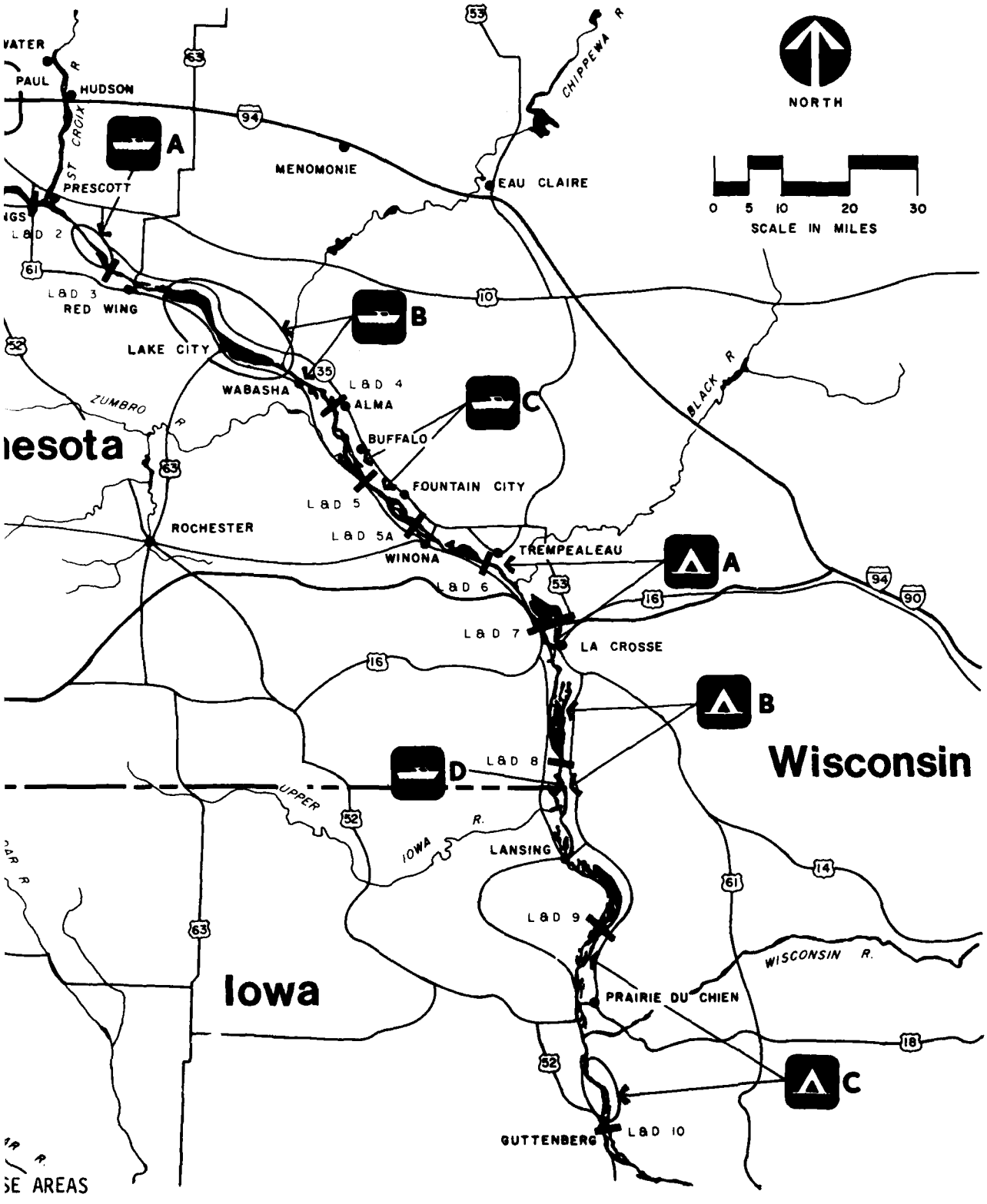


FIGURE 3-6. MAJOR PUBLIC USE AREAS


NORTH
0 5 10 20 30
SCALE IN MILES
A
B
C
D
A
B
C
PRESCOTT
HUDSON
PAUL
MENOMONIE
EAU CLAIRE
CHIPPEWA R
ST CROIX
L&D 2
L&D 3
RED WING
LAKE CITY
WABASHA
L&D 4
ALMA
BUFFALO
FOUNTAIN CITY
L&D 5
L&D 5A
ROCHESTER
WINONA
TREMPEALEAU
L&D 6
L&D 7
LA CROSSE
L&D 8
LANSING
L&D 9
PRAIRIE DU CHIEN
L&D 10
GUTTENBERG
BLACK R
ZUMBRO R
UPPER
IOWA R.
WISCONSIN R.
Wisconsin
Iowa
SE AREAS

3. FACTORS INFLUENCING DEVELOPMENT

PROGRAMS OF OTHER AGENCIES

3.120 St. Paul District planners carefully considered programs and policies of other government agencies in the development of this land use allocation plan and in the development of site-specific plans. In particular, the District has worked very closely with the U.S. Fish and Wildlife Service because the Corps and FWS share management jurisdiction over the Upper Mississippi.

3.121 This section presents information on the following agency and interagency programs that have potential to the Mississippi River and to associated planning: U.S. Fish and Wildlife Service (FWS); National Park Service; U.S. Department of Transportation; Upper Mississippi River Basin Commission; Great River Environmental Action Team; Minnesota-Wisconsin Boundary Area Commission; Upper Mississippi River Conservation Committee; Metropolitan River Corridors Study Committee; the States of Iowa, Minnesota, and Wisconsin; regional planning commissions; and county and local agencies.

3.122 The Conclusions and Recommendations section of this document provides information about how the St. Paul District and the Region 3 office of the FWS propose to manage Federal lands in the short-term future in relation to the allocations made as part of this study.

U.S. Fish and Wildlife Service

3.123 **Upper Mississippi National Wildlife and Fish Refuge** - The Upper Mississippi National Wildlife and Fish Refuge was established by Congress in 1924. It stretches 284 miles through the river corridor from Wabasha, Minnesota, to Rock Island, Illinois. Managed by the U.S. Fish and Wildlife Service (FWS), the refuge comprises five districts, with a central headquarters at Winona, Minnesota.

3.124 This refuge consists of approximately 195,000 acres of wooded islands and riverbanks, sandbars, and open-water marshes. It is maintained to provide resting and feeding habitat for migratory waterfowl species, wintering habitat for eagles and other raptors, year-round habitat for fish and furbearers, and summer habitat for colonial water birds. Actual physical management of the refuge has been limited because of its massive size and the general lack of means to make alterations, within the refuge are legall waters of the United States. emphasis has therefore been o and on setting regulations fo furbearers. This land use provide the land use framewor Wildlife Service master planni

3.125 **Trempealeau National Wi** leau National Wildlife Refuge facility surrounded by the Upp Wildlife Refuge on the Wisco between Winona and Trempealeau 1934 as a migratory bird refu acres were acquired at that ti acres, part of the Delta Fish acquired until March 9, 1979. refuge master plan provides th long-range plan for management

3.126 **Chronology of Project De with U.S. Fish and Wildlife S** sissippi River National Wildl established by the Upper Miss and Fish Refuge Act (June authorized land acquisition al fish and wildlife conservation

3.127 The River and Harbor authorized the Department of t for the 9-foot navigation ch sition for the refuge was the Engineers was granted permis land for the navigation projec

3.128 Management of much of t navigation project was tranf Sport Fisheries and Wildlife (1940's. Flowage easements, ho the Corps.

3.129 Section 3 of the Fish a Act of August 14, 1946 (Publi for use of water resource pr maintenance, and management o habitat, to be administered the Secretary of the Interior. in 1953 and signed by the Sec

erations, and because all waters are legally defined as navigable d States. Most refuge management ore been on controlling land uses lations for taking waterfowl and land use allocation plan will e framework for detailed Fish and ster planning.

ational Wildlife Refuge - Trempea- fe Refuge is an independent refuge by the Upper Mississippi National the Wisconsin side of the river Trempealeau. It was authorized in bird refuge. However, only 700 at that time. The remaining 5,700 elta Fish and Fur Farm, were not 9, 1979. The recently completed rovides the FWS with a meaningful management of this refuge.

Project Development - Relationship Wildlife Service - The Upper Mis- nal Wildlife and Fish Refuge was pper Mississippi River Wild Life ct (June 7, 1924). This act isition along the Mississippi for servation and management.

d Harbor Acts of 1930 and 1935 ment of the Army to acquire land gation channel project. Acqui- e was then halted. The Corps of ed permission to overflow refuge on project in the early 1930's.

much of the land acquired for the was tranferred to the Bureau of Wildlife (now the FWS) during the ments, however, were reserved by

he Fish and Wildlife Coordination 46 (Public Law 79-732) provided ource projects for conservation, gement of wildlife resources and istered by State agencies or by nterior. General Plans drawn up the Secretary of the Army, the Secretary of the Interior, and the heads of the respective State conservation agencies terminated previous permits and agreements and called for revocation of pertinent executive orders and public land orders. Navigation project lands were made available by the Secretary of the Army to the Secretary of the Interior for wildlife conservation and management by the Cooperative Agreement between the Corps of Engineers and the Bureau of Sport Fisheries and Wildlife in 1954.

3.130 The Fish and Wildlife Coordination Act of 1958 (Public Law 85-624) amended the earlier act; and, in 1963, the Cooperative Agreement was revised. Under this agreement, 41,442 acres of Corps-administered land in pools 4 through 10 (approximately 95 percent of Corps-administered land in those pools) was made available to the Bureau of Sport Fisheries and Wildlife. For purposes of management under the agreement, these lands were included in the Upper Mississippi National Wildlife and Fish Refuge. The Fish and Wildlife Service also owns 75,550 acres in fee title in pools 4 through 10. Plans for management of the lands as a Federal refuge were coordinated with and approved by the States of Minnesota, Wisconsin, and Iowa.

3.131 Additionally, 4,123 acres in pool 3 (approximately 74 percent of Corps-administered land in that pool) have been leased to the Minnesota Department of Natural Resources for wildlife management, maintenance, and conservation. Remaining Corps lands not included in the General Plan are almost entirely lands where locks, dams, and related structures are located. (Source for acreage figures: 1979 Recreation Resource Management System (RRMS)).

National Park Service

3.132 The National Park Service (NPS) is charged with preserving and protecting the Nation's cultural and natural heritage for present and future use and enjoyment. To achieve this goal, NPS uses five major classifications of cultural and natural resource management units: national parks, monuments, historical sites, recreation areas, and wild and scenic rivers. In the study area are a national monument, a national scenic river, and numerous national historical sites.

3. FACTORS INFLUENCING DEVELOPMENT

3.133 The Wild and Scenic Rivers Act of 1968 (Public Law 90-542) established a Wild and Scenic Rivers system. This act also states that rivers designated as components of the system shall be classified and administered as wild, scenic, or recreational.

3.134 In 1972, Public Law 92-560 amended this act by designating the 52-mile-long Lower St. Croix River as a component of the national system. The NPS administers the Lower St. Croix between Taylors Falls and Stillwater; the States of Wisconsin and Minnesota administer the portion between Stillwater and Prescott. The upper 10.3 miles of the river (between Taylors Falls and the Chisago-Washington County line) is classified as a scenic river; the remainder of the Lower St. Croix is classified as a recreational river.

3.135 The Lower Wisconsin River (another tributary) and parts of the Upper Mississippi between Lake Itasca and Anoka (north of the study area) have been studied for inclusion as a scenic river in the National Wild and Scenic Rivers System.

3.136 In April 1981, the NPS completed its Development Concept Plan for the Lower St. Croix National Scenic Riverway. Proposed developments include visitor information exhibits, an interpretive trail, and canoe accesses and trail. A major goal of NPS administration of the Lower St. Croix National Scenic Riverway is balancing the demand for recreational use against the objective of preserving the natural values of the area.

3.137 Effigy Mounds National Monument was established in 1949 near McGregor, Iowa. Much of the park's 1,244 acres contain prehistoric Indian mounds. Although only minimal facilities are provided for water-associated activities, the park attracts many people to the area. A southern extension of Effigy Mounds Monument at Sny McGill Creek is undeveloped but offers river access through Sny McGill Landing (operated by the Iowa Conservation Commission).

U.S. Department of Transportation

3.138 **Great River Road** - The Great River Road (GRR) was originally conceived in 1938 as a parkway along the Mississippi from the source near Lake Itasca to the Gulf of Mexico. It is the third major recreational and scenic highway in the country, following development of the Natchez Trace Parkway in the South and the Blue Ridge Parkway in the East. The GRR is intended to provide a scenic, recreati historic roadway along the Mississippi. I to providing recreational opportunities traveler, the GRR is intended to conserve natural amenities such as woodlands, rive and scenic vistas.

3.139 The federally-designated Great River alternates from one side of the river to crossing at existing bridge locations. In area, the GRR extends from the head of nav Minneapolis to Hastings, Minnesota, where the river to Prescott, Wisconsin. From Pre designated route parallels the Mississipp the Wisconsin side until it crosses the rive Lansing, Iowa, and continues south through G where the master plan study area ends.

3.140 The GRR program is administered by th State Departments of Transportation. Fu development of projects adjacent to the d route is on a Federal-State cost-shared ba Federal Highway Administration (FHWA) pa percent of total development costs, with the 25 percent the responsibility of local Funds are offered only to the 10 States Mississippi River. Appropriations come fro trust and general funds.

3.141 On March 11, 1981, FHWA announced funding had been rescinded by presidential However, projects that received Federal app funding and that had funds obligated affected. This deferral lasted through fi 1981 when the President decided to fund th through future fiscal years.

3.142 **U.S. Coast Guard** - The Ports and Safety Act of 1972 (Public Law 92-340) auth Coast Guard (U.S. Department of Transport prevent damage to vessels, bridges, a structures on navigable waters and adjacent to protect navigable waters against environm resulting from vessel or structure dam Secretary of Transportation is authorized t vessel traffic in hazardous areas or during of adverse weather or vessel congestion. N vessel traffic control include vessel size ments, speed limits, and operating condit Secretary of Transportation may also prescrib safety equipment, investigate any incident damage to vessels or structures on navigab

de a scenic, recreational, and
ong the Mississippi. In addition
eational opportunities for the
is intended to conserve existing
such as woodlands, river valleys,

-designated Great River Road route
he side of the river to the other,
g bridge locations. In the study
ds from the head of navigation in
ings, Minnesota, where it crosses
tt, Wisconsin. From Prescott, the
arallels the Mississippi River on
ntil it crosses the river again at
ontinues south through Guttenberg,
an study area ends.

am is administered by the various
of Transportation. Funding for
jects adjacent to the designated
al-State cost-shared basis. The
ministration (FHWA) pays for 75
elopment costs, with the remaining
sponsibility of local agencies.
only to the 10 States along the
Appropriations come from highway
unds.

1981, FHWA announced that GRR
cinded by presidential deferral.
hat received Federal approval for
had funds obligated were not
erral lasted through fiscal year
dent decided to fund the program
l years.

Guard - The Ports and Waterways
(Public Law 92-340) authorizes the
epartment of Transportation) to
vessels, bridges, and other
ble waters and adjacent lands, and
waters against environmental harm
ssel or structure damage. The
rtation is authorized to control
zardous areas or during conditions
or vessel congestion. Methods of
rol include vessel size require-
, and operating conditions. The
rtation may also prescribe minimum
vestigate any incident involving
r structures on navigable waters,

and issue rules, regulations, and standards necessary to implement this law.

3.143 Installation and maintenance of primary navigation aids are also Coast Guard responsibilities. The Corps District Engineer is authorized to confer with the Coast Guard District Commander about establishment or alteration of permanent navigation aids. The Corps is only responsible for navigation aids required temporarily because of construction and zoning ordinances, such as buoys to mark dredging equipment.

3.144 The Coast Guard Auxiliary, a civilian volunteer organization established by Congress to promote recreational boating safety, attempts to meet its objective through boater education and safety patrols. Boater education includes safety courses for the public and examination of recreational boats, upon request of the owners or operators, for safety equipment required by Federal and State law. Auxiliary members also help Coast Guard rescue and assistance missions. A radio facility staffed by Auxiliary members opened recently near Prescott, Wisconsin, for this purpose.

Upper Mississippi River Basin Commission (1)

3.145 Twin Cities Level B Study - The Twin Cities Level B Study, covering the Minneapolis-St. Paul seven-county metropolitan area, was completed in 1978. This study identified various recreation-related issues on the Upper Mississippi, Lower St. Croix, and Minnesota Rivers: water quality in pool 2, commercial navigation, wetland preservation and management, and recreational water surface use management. Several planning recommendations were made, generally oriented toward achievement of environmental quality goals:

- To achieve a 1983 goal of fishable and swimmable water quality in pool 2 through pollution abatement planning procedures and implementation of water treatment technologies consistent with the Federal Water Pollution Control Act Amendments (Public Law 92-500).
- To establish a coordinated, well planned program to insure that future barge-fleeting areas and

(1) The UMRBC was discontinued by a Presidential Executive Order on December 31, 1982.

terminal facilities develop in a balanced fashion with minimum impact on the environment. Since barge traffic is expected to increase, safe mooring facilities for recreational craft at the locks and dams were recommended.

- To establish a regional program of wetlands management to increase hunting, trapping, and nature study opportunities.

- To develop and implement a management plan and associated boat launch strategies for the area rivers.

3.146 **UMR Main Stem Level B Study** - The draft report completed in 1980 includes issues such as recreational boating safety and land use management planning. Near-term recommendations on boating safety were that Congress should enact a 5-year minimum extension of Federal legislation to fund longer-range planning for State programs and that the concerned States should increase funding for boating safety and security programs with revenue techniques such as licensing fees, launch fees, and unrefunded State marine fuel tax. The mid-term recommendation was that appropriate State agencies should consider designating certain portions of the river for limited recreation boating.

3.147 Near-term recommendations regarding land use management planning were that the Fish and Wildlife Service should designate the river basin as a high priority area in its wetlands inventory program and that appropriate Federal and State agencies should cooperate in additional inventories of critical areas. The UMRBC should coordinate these inventories through the establishment of a Water and Related Land Resource Task Force. The mid-term recommendation was that this task force consider establishment of a riverine zone management program to address long-term land management needs.

Great River Environmental Action Team

3.148 **GREAT I Study** - In 1974, under the leadership of the Corps of Engineers and the U.S. Fish and Wildlife Service (the two principal river management agencies), an interagency team (authorized by Section 117 of the Water Resources Act of 1976) was organized to identify and assess problems associated with multi-purpose use of the river and to develop recommendations for improved river management. The Upper Mississippi River was divided into three stud study group called a Great River I Team (GREAT). The first study co covering the river system from th in Minneapolis-St. Paul, Minnes Iowa (the St. Paul District, C portion of the navigable river).

3.149 GREAT I comprised the follo Department of the Interior - Service, U.S. Department of Defe Engineers, U.S. Department of Conservation Service, U.S. Transportation - Coast Guard, Protection Agency, State of Iowa Commission, State of Minnesota - D Resources, State of Wisconsin - D Resources, Minnesota-Wiscons Commission (nonvoting member), Upp Conservation Committee - (nonvoti general public.

3.150 From 1974 through 1980, GRE extensive program of research an jects, addressing total river reso

3.151 The GREAT I study was comp 1980. The St. Paul District has r recommendations. Using those reco nated for Corps implementation, developed an implementation repor recommendations for implementing outlines three possible courses of

- A Basic Program, which ou recommendations that can be the District's ongoing pro tional authority or fundi implementation.

- A First Priority Program, wh GREAT I recommendations t believes are most importan they would be implemented, and funding were provided.

- An Early Implementation of G outlines how all of the GREA could be implemented, if su and funds were available.

3.152 The District Engineer has re Priority Program to higher auth

into three study areas, each with a
a Great River Environmental Action
first study completed was GREAT I,
system from the head of navigation
t. Paul, Minnesota, to Guttenberg,
ul District, Corps of Engineers,
vigable river).

rised the following members: U.S.
he Interior - Fish and Wildlife
rtment of Defense - Army Corps of
Department of Agriculture - Soil
Service, U.S. Department of
Coast Guard, U.S. Environmental
State of Iowa - Iowa Conservation
of Minnesota - Department of Natural
f Wisconsin - Department of Natural
esota-Wisconsin Boundary Area
ing member), Upper Mississippi River
ittee - (nonvoting member), and the

rough 1980, GREAT I carried out an
of research and pilot action pro-
total river resource requirements.

study was completed in September
District has reviewed the GREAT I
sing those recommendations desig-
implementation, the District has
mentation report detailing its own
implementing GREAT I. The report
ible courses of action:

ram, which outlines the GREAT I
ns that can be implemented under
's ongoing programs, if no addi-
rity or funding is provided for
n.

ity Program, which identifies those
mmendations that the District
most important and indicates how
implemented, if the authorities
ere provided.

ementation of GREAT Program, which
ll of the GREAT I recommendations
emented, if sufficient authorities
available.

Engineer has recommended the First
o higher authorities within the

Corps. In the area of recreation, the following are the major points of the First Priority Program:

- Recreation enhancement will be accomplished whenever possible during ongoing channel maintenance operations.
- GREAT I recommendations pertaining to a specific recreation problem will be addressed in part III of this master plan.

Minnesota-Wisconsin Boundary Area Commission

3.153 The Minnesota-Wisconsin Boundary Area Commission (MWBAC) was created through an interstate compact in 1965 to facilitate communication between Minnesota and Wisconsin regarding the use of the resources of the Upper Mississippi and the Lower St. Croix Rivers.

3.154 The MWBAC assists the two States in cooperative efforts by conducting studies and making recommendations on plans, policies, development proposals, public management, uniform laws, conservation efforts, and use of river corridor waters and lands. It helps the States and their local subdivisions to coordinate programs, plans, and projects with one another, and it assists their participation in the many Federal programs on the St. Croix and Mississippi Rivers. Under a special Federal-State cooperative agreement, the MWBAC also serves as the coordinator for the St. Croix National Riverway.

Upper Mississippi River Conservation Committee

3.155 The Upper Mississippi River Conservation Committee (UMRCC) was organized in 1943 by the States of Minnesota, Wisconsin, Illinois, Iowa, and Missouri, with the encouragement of the Bureau of Sport Fisheries (now the U.S. Fish and Wildlife Service) and the Corps of Engineers. The UMRCC was formed to facilitate cooperation between the States for studies of the river's natural resources, to exchange information about the river and its problems at regular meetings, and to promote cooperation in resource management of interstate waters, including development of more uniform laws and regulations affecting use of the river's natural resources. The committee works closely with the U.S. Fish and Wildlife Service, the Corps of Engineers, and the U.S. Public Health Service.

3. FACTORS INFLUENCING DEVELOPMENT

3.156 The emphasis of the UMRCC is on fisheries, wildlife, and recreation, although the committee also has water quality and law enforcement sections. UMRCC studies include recreational use surveys for pools 5 and 9, and sport fishery surveys done at 5-year intervals between the 1962-1963 and 1972-1973 seasons. The committee also has written a guide for an Upper Mississippi River system monitoring plan to document ecological impacts from navigational capacity expansion and from operation and maintenance of the existing navigational system. A reference library is maintained by the UMRCC at Rock Island, Illinois.

3.157 A recent UMRCC publication of interest to this master plan study includes a paper entitled "Outdoor Recreation: Big Business on the Upper Mississippi River System." This paper reviews available estimates of the value of river resources for recreation uses. The paper concludes with several points, including: "People spend large sums of money to recreate on the UMRS. The exact amount is unknown, but it seems inevitable that the total annual recreation expenditure is in the hundreds of millions of dollars. . . . the total figure could be over a billion dollars a year." Part III of this master plan will address the need for improved methods of measuring recreation use. Such improved measurement is needed to support future recreation valuation efforts.

Metropolitan River Corridors Study Committee

3.158 The National Park Service completed the Twin Cities Metropolitan River Corridors Reconnaissance Survey in December 1980. This survey describes the river resource and discusses trends and potential threats to it as well as efforts taken to protect the resource. The primary intent of this reconnaissance study was to determine the potential for implementation of Federal programs to enhance recreation opportunities on the Upper Mississippi, St. Croix, and Minnesota Rivers. It also reviews options for resource protection. While the survey makes no recommendations, the information it provides will help determine whether the river resource is of sufficient national significance to warrant a study of alternatives.

3.159 Title IX of Public Law 96-607 (December 28, 1980) established an independent study committee (the Three River Corridors Study Committee) to work with a regional agency (the Metropolitan Council) in studying preservation, enhancement, prote
designated recreation areas along t
This committee also recommends t
and actions for optimizing the rec
wildlife, historical, natural, scie
cultural values of the area wit
restricting economic uses of these

State of Iowa

3.160 Iowa Floodplain Management
Natural Resources Council (INRC)
enforces regulations for orderly de
use of the floodplain of any river
that State. The INRC is direc
encroachment limits, protection me
protection levels appropriate
characteristics and to the use of t
INRC may cooperate with and assist
in establishing such regulations.
help establish a development constra
land use allocations and site-specif

3.161 Chapter 455.A, Code of Iowa,
to regulate floodplain development.
issued if the work meets certain c
can require removal of unpermi
construction if notification is m
after completion of the work. Deve
obstruct flow is not allowed in flo

3.162 Counties and municipalities ha
to zone with respect to flood
floodplain ordinances or regulations
approval before adoption.

3.163 Yellow River State Forest -
administered by the Iowa Conserv
(ICC), Yellow River State Forest lie
County in northeast Iowa along the
Recreational facilities there inc
horse and foot trails, and primiti
Additionally, the forest offers
trout fishing, hunting, and sightse

3.164 The forest is managed und
concept that encompasses timber, wi
watershed management, and agricultu
recreation management aims to enc
recreational opportunities such a
picnicking, camping, hiking, dr

ancement, protection, and use of on areas along the river corridors. so recommends to Congress policies timizing the recreational, fish and al, natural, scientific, scenic, and f the area without unreasonably ic uses of these resources.

lain Management Program - The Iowa Council (INRC) establishes and s for orderly development and wise ain of any river or stream within INRC is directed to establish s, protection methods, and minimum s appropriate to the flooding to the use of the floodplain. The with and assist local governments n regulations. These regulations velopment constraints framework for s and site-specific development.

, Code of Iowa, requires the INRC ain development. An INRC permit is meets certain criteria. The INRC val of unpermitted floodplain tification is made within a year the work. Development that would t allowed in floodways.

unicipalities have been authorized pect to flood hazards. Local s or regulations must receive INRC ption.

State Forest - A 6,292-acre forest e Iowa Conservation Commission State Forest lies within Allamakee Iowa along the Upper Mississippi. ities there include picnic areas, ls, and primitive camping sites. forest offers opportunities for ng, and sightseeing.

s managed under a multiple-use sses timber, wildlife, recreation, t, and agricultural products. The ent aims to encourage compatible tunities such as hunting, fishing, g, hiking, driving, horseback riding, snowmobiling, bicycling, and nature study. The wildlife management aims to improve wildlife habitat through forest management and food plots.

3.165 Iowa Scenic River Program - Iowa's Scenic Rivers Act of 1970 gives the Iowa Conservation Commission (ICC) authority to designate, as part of a scenic rivers system, rivers and adjacent land areas with outstanding water conservation, scenic, fish, wildlife, historical, or recreational values.

3.166 To assist in scenic rivers management, counties and cities must zone lands adjacent to the river or establish other controls. The Upper Iowa River, which flows into the Mississippi, is presently the only designated scenic river.

3.167 Iowa Protected Water Areas Program - In 1981, the ICC met the provision in the Iowa Scenic Rivers Act for a statewide scenic rivers plan by issuing the Iowa Protected Water Areas General Plan. The phrase "Protected Water Areas" replaced "Scenic Rivers" since this plan protects lakeshores and marshes as well as rivers and streams. The Protected Water Areas Plan provides the State legislature, the ICC, and other interested agencies with the necessary guidelines to protect the natural and cultural resources within the State's scenic lakeshores, river corridors, and marshes. Fee title land acquisition, conservation easements, leases, State preserves dedication, and tax incentives, in addition to local zoning ordinances, are recommended methods of protecting designated areas.

3.168 The goal of the Protected Water Areas Program is a system for designating portions of selected lakes, rivers, streams, and marshes for preservation, protection, and enhancement of outstanding natural and cultural resources of water and associated land areas.

3.169 Iowa State Preserves Program - The Iowa Preserves Act created a State Preserves System and a State Preserves Advisory Board. A State preserve is an area of land or water designated for maintenance in a condition as close as possible to its natural condition. However, the character of the area need not be completely primeval at the time of dedication. Areas with unusual floral, faunal, geological, archeological, visual, or historic features of scientific or educational value are also eligible for

State preserve designation. The advisory board was established to recommend appropriate State-owned lands for dedication as preserves. A preserve is formally dedicated after final approval by the Governor. The State Preserves Act effectively prohibits environmental alterations in designated areas. State preserve designation presently provides the greatest protection for such significant land areas. Within the study area, the Fish Farm Mound, near New Albin, is included in the Iowa State Preserves System.

3.170 Iowa State Parks and Recreation Areas System - The Iowa Conservation Commission administers the State parks and recreation areas in Iowa. Within the study area, two parks are included in the system: Pikes Peak and McGregor Heights. Both parks are in Clayton County.

State of Minnesota

3.171 Minnesota Shoreland Program - The Shoreland Management Act of 1969 established a program to guide shoreland development in order to preserve and enhance the quality of surface waters, to preserve the economic and natural environmental values of shorelands, and to provide for the wise use of water and related land resources. Shoreland is defined as "land within 1,000 feet from the ordinary high watermark of a lake, pond, or flowage; and land within 300 feet of a river or stream or the landward side of a floodplain delineated by ordinance on such a river or stream, whichever is greater." Regulations developed under this program specify building setback requirements, minimum lot sizes per structure, building elevation above high water, designation of types of land uses, and sewage system design criteria. All counties and municipalities must adopt shoreland management ordinances approved by the DNR. A knowledge of these guidelines and the plans developed under this program is valuable for a systems approach to shoreline management.

3.172 Minnesota's Floodplain Program - Authorized by the Flood Plain Management Act, this program was established to reduce flood damage and flood-related loss of life. The act requires emphasis on nonstructural measures such as zoning, flood proofing, and flood warning. Local governments must establish floodplain ordinances within specific time limits after adequate technical data are available. The Minnesota Department of Natural Resources (DNR) is responsible for ensuring local co
act. If a local governmental unit
the time limit, the Commissioner o
may adopt an ordinance for that u
DNR published "Statewide Standard
Managment of Flood Plain Areas of
Reg. NR85 et seq.). These gui
standards for local ordinances.

3.173 State law generally allows f
ment that would cause an increase o
flood stage. However, the Commis
Resources may be more or less restr
this limit, depending on project
stances. As with the shoreland pr
management activity in the floodpla
use management.

**3.174 Richard J. Dorer Memorial Ha
est** - This forest lies in southeas
the Upper Mississippi River withi
Wabasha, Dodge, Olmsted, Winona, Fi
Counties. It extends from about 20
St. Paul-Minneapolis metropolitan
border. The Minnesota DNR Divi
currently administers about 38,00
acres in the forest. Federal owne
Minnesota is 45,000 to 50,000 acr
Upper Mississippi National Wildli
and in Corps of Engineers navigati
90 percent of the land in the Memor
is privately owned.

3.175 The Richard J. Dorer Memori
Forest includes most of the State's
lation plus significant numbers of
grouse, and other game species. T
of designated trout streams, seven
designated canoe and boating routes
life management areas within the f
in this forest have been nominate
the Scientific and Natural Areas
recreational resources include tr
municipal campgrounds, and the
National Wildlife and Fish Refuge.

3.176 Minnesota State Park Syste
isters State parks and waysides.
tunities provided by State parks
trail use, nature interpretation,
and sightseeing. Four State par
wayside are in the study area.

nsuring local compliance with the overnmental unit fails to act within e Commissioner of Natural Resources nance for that unit. In 1970, the tewide Standards and Criteria for d Plain Areas of Minnesota" (Minn. .). These guidelines describe l ordinances.

nerally allows floodplain encroach- use an increase of up to 0.5 foot of ever, the Commissioner of Natural ore or less restrictive in enforcing ding on project-specific circum- the shoreland program, the primary y in the floodplain program is land

Dorer Memorial Hardwood State For- lies in southeast Minnesota along ippi River within Dakota, Goodhue, msted, Winona, Fillmore, and Houston ds from about 20 miles south of the lis metropolitan area to the Iowa nesota DNR Division of Forestry ters about 38,000 of the 2,000,000 st. Federal ownership in southeast 00 to 50,000 acres, mostly in the National Wildlife and Fish Refuge gineers navigation projects. Over land in the Memorial Hardwood Forest .

J. Dorer Memorial Hardwood State st of the State's wild turkey popu- icant numbers of white-tailed deer, game species. There are 297 miles t streams, seven State parks, three nd boating routes, and seven wild- eas within the forest. Fifty sites e been nominated for inclusion in d Natural Areas Program. Other urces include trails, private and ounds, and the Upper Mississippi and Fish Refuge.

State Park System - The DNR admin- and waysides. Recreation oppor- by State parks include camping, interpretation, fishing, swimming, Four State parks plus one State study area.

3.177 Minnesota Canoe and Boating Route Program - Minnesota Statute 85.32 authorized the Commissioner of Natural Resources to mark canoe and boating routes and to provide recreational facilities on certain rivers, including the Minnesota, Root, Zumbro, Cannon, and Mississippi. River management activities for the Canoe and Boating Route Program focus on recreational development and land acquisition.

3.178 During 1980 and 1981, the State studied Upper Mississippi backwater areas from Anoka to the Iowa border, for possible designation into the Canoe and Boating Route Program. The study completed the canoe route map of the river and identified new canoe routes in the backwater areas. These maps include campsites, rest areas, and access sites.

3.179 Minnesota Wild and Scenic Rivers Program - Minnesota's Wild and Scenic River Act, passed in 1973, directs the DNR to protect and maintain the natural characteristics of rivers or river reaches possessing outstanding scenic, scientific, historical, or recreational value. This act is not meant to restore river areas to wilderness, but is meant to protect exceptional rivers from degradation caused by uncontrolled development and recreation overuse. Management activities in the Wild and Scenic Rivers Program include land use management, water surface use management, recreational development, and land acquisition. All land use management practices must be compatible with Shoreland and Floodplain Program regulations.

3.180 Although no river reaches in the study area are designated as wild or scenic, the Cannon and Root Rivers, which flow into the Upper Mississippi, were studied for designation.

3.181 Minnesota Scientific and Natural Areas Program - Part of Minnesota's outdoor recreation system, the Scientific and Natural Areas Program aims to preserve and perpetuate the ecological diversity of the State's natural heritage, including landforms, fossil remains, plant and animal communities, rare and endangered species, or other biotic features and geological formations, for scientific study and public education as components of a healthy environment.

3.182 The following criteria are necessary for an area to be included in the Scientific and Natural Areas Program:

- Areas shall feature elements of natural diversity of exceptional scientific and educational value.

- Areas shall be large enough to preserve their inherent natural values and permit effective research or educational functions.

3.183 **Minnesota Critical Areas Act** - The Critical Areas Act of 1973 was passed to help identify areas possessing important historical, cultural, aesthetic, or natural values. The State helps local governments prepare plans and regulations for wise use of such areas. A local government or a regional development commission may recommend an area for critical area designation to the Minnesota Environmental Quality Board, which makes recommendations to the Governor regarding designation. The Governor may issue an executive order designating all or part of the recommended area as critical. The order must include specific standards and guidelines for use in preparing and adopting plans and regulations, and it must indicate what development shall be permitted pending adoption of plans and regulations.

3.184 The Upper Mississippi River in the Twin Cities metropolitan area from the Anoka-Sherburne County border to the Dakota-Goodhue County border is a designated critical area. The purposes of critical area designation in this segment of the river are:

- To protect and preserve a unique and valuable State and regional resource for the benefit of the health, safety, and welfare of the citizens for the region, State, and Nation.

- To prevent and mitigate irreversible damage to this regional, State, and national resource.

- To preserve and enhance its natural, aesthetic, cultural, and historical value for the public use.

- To protect and preserve the river as an essential element in the national, State, and regional transportation, sewer and water, and recreational systems.

- To protect and preserve the biological and ecological functions of the corridor.

- To seek input from users, local residents, and

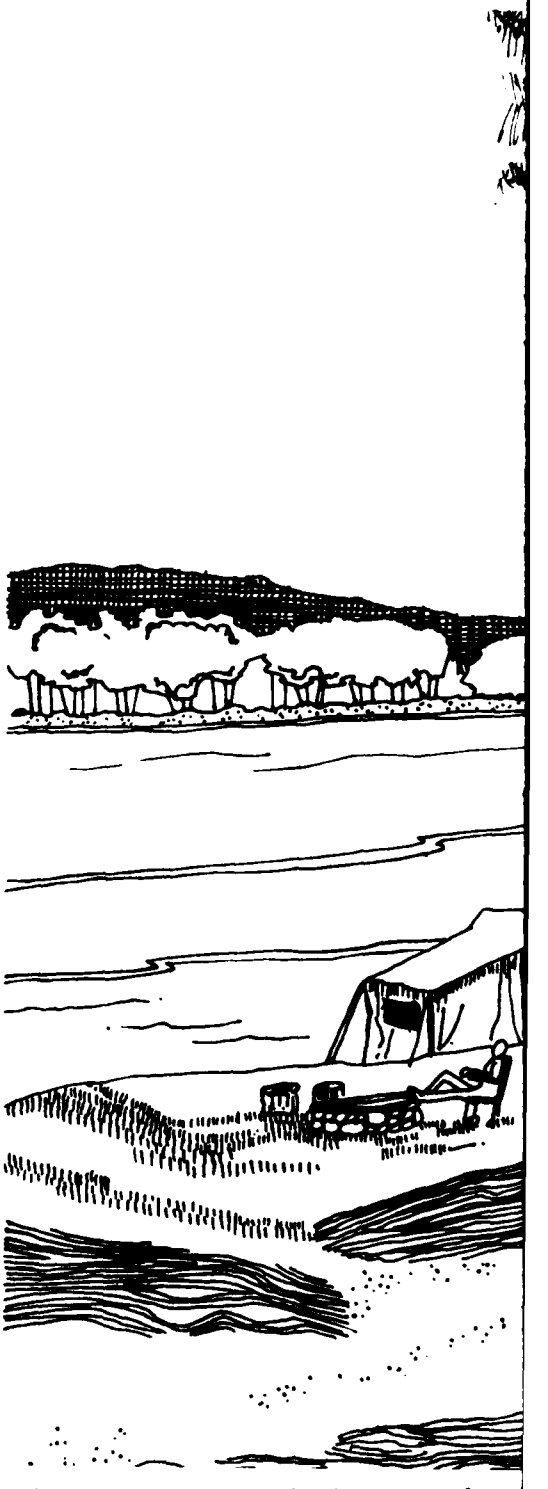


FIGURE 3-7. The St. Paul District, Corps of Eng from small access points to large-scale inten recreation days.

Paul District, Corps of Engineers, operates and maintains a number of public recreation areas along the river. These developments range points to large-scale intensive park developments. In recent years, total annual recreation use on the river has exceeded 5 million

special interest groups in decisions regarding the most suitable use(s).

- To require users engaged in scientific study to make information obtained on scientific and natural areas available to the DNR, and to encourage users to make their studies available to the scientific community.

3.185 Three Minnesota scientific and natural areas are in the study area. Table 3-14 lists these areas, their locations, and significance.

TABLE 3-14 - MINNESOTA SCIENTIFIC AND NATURAL AREAS

Location	Site	Size	Features
Dakota Co. mile 813.5	Hastings Scientific and Natural Area	25 acres	Good example of Big Woods forest type; marsh land; a series of spring-fed ponds.
Goodhue Co. mile 784	Wacouta Scientific and Natural Area	49 acres	Peregrine falcon habitat; haven for concentrations of migrating birds; geological formations; undisturbed plant community.
Wabasha Co. mile 749.5	Kellogg River Sand Dunes Scientific and Natural Area	182 acres	Sand dunes; dry prairie on dunes habitat for three rare species: Blanding's turtle (nesting colony), yellow-fruited sedge, and Ottoe skipper butterfly.

State of Wisconsin

3.186 **Wisconsin Shoreland Management Program** - The Wisconsin Water Resources Act of 1965 established a joint State-local program for managing Wisconsin's water and related land resources. This act also created the State's Shoreland and Flood Plain Zoning Acts. The Shoreland Zoning Act required counties to adopt subdivision and zoning regulations for all unincorporated areas by January 1, 1968. Department of Natural Resources (DNR) is adopt shoreland ordinances for those co to adopt acceptable ordinances.

3.187 This act also requires the DNR standards and criteria for navigable wa regulations and their administration:

> "Such standards and criteria s particular attention to the safe and conditions for the enjoyment o recreation; the demands of water boating and water sports; the capa the water resource; requirements ne assure proper operation of sep disposal fields near navigable building setbacks from the water; pr of shore growth and cover; conserv for low lying lands; shoreland l residential and commercial deve suggested regulations and suggestion effective administration and enfor such regulations."

3.188 **Wisconsin Floodplain Management** Flood Plain Zoning Act requires counties villages in the State to adopt rea effective floodplain zoning ordinances f plains where serious flood damage may o may assist local governments in the adoption, and administration of the flo ordinances. If the local government fai DNR can formulate an ordinance and enforcement. This act provides a unif preparation and implementation of sou regulations to protect life, health, and to minimize economic losses.

3.189 DNR standards for such ordinances floodplain development that would re stage increases greater than 0.1 foot, u action is taken. Further action may arrangements with affected landowners ordinances in affected communities.

3.190 **Wisconsin State Park System** - Th ters the Wisconsin State park system. qualify as a State park because of its plants and wildlife, or its historical, or geological interest. The purpose of

eas by January 1, 1968. The Wisconsin Natural Resources (DNR) is authorized to nd ordinances for those counties failing ptable ordinances.

ct also requires the DNR to establish criteria for navigable water protection nd their administration:

standards and criteria shall give attention to the safe and healthful ns for the enjoyment of aquatic on; the demands of water traffic, nd water sports; the capability of resource; requirements necessary to roper operation of septic tank fields near navigable waters; setbacks from the water; preservation growth and cover; conservancy uses lying lands; shoreland layout for ial and commercial development; regulations and suggestions for the e administration and enforcement of ilations."

sin Floodplain Management Program - The oning Act requires counties, cities, and the State to adopt reasonable and odplain zoning ordinances for all flood- serious flood damage may occur. The DNR ocal governments in the development, administration of the floodplain zoning If the local government fails to act, the mulate an ordinance and require its This act provides a uniform basis for and implementation of sound floodplain o protect life, health, and property, and conomic losses.

andards for such ordinances prohibit any evelopment that would result in flood es greater than 0.1 foot, unless further ken. Further action may include legal with affected landowners and amended affected communities.

sin State Park System - The DNR adminis- consin State park system. An area may State park because of its scenery, its ldlif, or its historical, archeological, interest. The purpose of the State park system is to provide areas for public recreation and for public education and nature study.

3.191 Wisconsin Wild Resources Program - A 1973 DNR resolution established the Wild Resources System. The Wisconsin Natural Resources Board periodically evaluates DNR lands for designation into this system. The DNR also cooperates with other public agencies and interested private landowners to determine how other lands might become a part of this system or complement it. Additionally, the Wild Resources Advisory Council was formed to advise the DNR and Natural Resources Board on the identification and preservation of those areas that may qualify.

3.192 The Wild Resources System has eight categories: wilderness areas; wild areas; public use natural areas; scientific areas; Federal wild, scenic, and recreational rivers; Wisconsin wild rivers; wild lakes; and wilderness lakes.

3.193 Wisconsin Scientific and Natural Areas Program - Scientific and natural areas are areas of land or water with native biotic communities, unique natural features, or significant geological or archeological sites. Generally, natural areas have largely escaped disturbance since settlement or exhibit little recent disturbance so that recovery has occurred and presettlement conditions are approached. Scientific areas are selected from the best natural areas and set aside specifically for scientific research, teaching natural history and conservation, nature appreciation, and preservation of natural values for future generations.

3.194 Scientific areas are designated by the Scientific Areas Preservation Council, which advises the DNR and other public agencies. Natural areas are identified through inventory or, in some cases, through recommendations. These areas are then evaluated by the Scientific Areas staff and may receive preliminary council approval. For tracts in public ownership, the council negotiates dedications through management agreements. For privately-owned areas, the council encourages acquisition by either public agencies or private conservation groups. Designation is accomplished when the council adds the dedicated tract to the State list of scientific areas. Ten Wisconsin scientific areas are in the study area.

3.195 The goal of the scientific areas program is

protection of sufficient scientific areas and other natural areas in each region of the State to preserve examples of all types of biotic communities and unique natural features native to the region. The objective of scientific area management is to preserve the area in a natural condition, with the least possible human disturbance.

Regional Planning Commissions

3.196 Iowa - Local governments in northeast Iowa have joined together in the Upper Explorerland Regional Planning Commission. Allamakee and Clayton Counties are members of this planning commission. This advisory commission prepares comprehensive studies and plans for the development of the area. Such plans may be adopted wholly or in part by member cities and counties.

3.197 Minnesota - Minnesota's regional development commissions facilitate intergovernmental cooperation and coordination of State, Federal, and local comprehensive and development planning. Development Region 10 includes Goodhue, Wabasha, Winona, and Houston Counties. The Region 10 Development Commision, which has recently been discontinued, has conducted regional land use studies and regional transportation plans that included river transportation. The commission was also active in trail development planning in the Richard J. Dorer Memorial Hardwood Forest.

3.198 To coordinate planning and development within the Twin Cities metropolitan area, the Metropolitan Council was created. A primary function of the council is to develop a long-range system policy plan for recreational open space. The council also makes grants to municipalities, park districts, and counties for recreational open space acquisition and development. The Metropolitan Parks and Open Space Commission, which advises the council, works to increase State and Federal funding for local parks and the regional recreational open space program. The council's goal is to help provide a range of recreational opportunities through the establishment and maintenance of a balanced system of local parks and regional recreational open space.

3.199 Wisconsin - Wisconsin's regional planning commissions are voluntary associations of counties that advise local governments. Regional planning commissions prepare master plans for the physical development of their respective r governments may adopt all or any part other planning commission programs.

3.200 The commission affecting the la the study area is the Mississippi Planning Commission (MRRPC). The Pierce, Pepin, Buffalo, Trempeale Vernon, Monroe, and Crawford Counties. Engineers locks and dams are in this r

3.201 The MRRPC's comprehensive pla adopted in 1972. To implement this conducts a variety of local assistance programs include preparation of base maps, and zoning maps; advocacy of i interests; helping communities prepar necessary to obtain State and Feder development aids; and other services the MRRPC has helped prepare land us plans, and development policies for eac counties. Although most MRRPC activit at local governments, the MRRPC also river projects, including review actions. The MRRPC also helps local g Federal and State requirements regard activities. The La Crosse Area Plan (LAPC) coordinates planning activities The LAPC is the Commission's policy a planning activities in the La Crosse u

3.202 Grant County is a member of th Wisconsin Regional Planning Commissio planning commission published a re recreation and open space program region's Comprehensive Planning Pr activities of the commission include outdoor recreation plans, land use historical site inventories; and provi to local governments on financial ai park and recreation improvement.

3.203 The St. Croix County/Community tion Plan and a land use study for S were developed by the West Central Wi Planning Commission.

County and Local Agencies

3.204 County and municipality outdoor and zoning ordinances also influe

r respective regions. Local all or any part of the plans and sion programs.

affecting the largest portion of e Mississippi River Regional (MRRPC). The MRRPC includes alo, Trempealeau, La Crosse, awford Counties. Eight Corps of ms are in this region.

mprehensive plan document was implement this plan, the MRRPC local assistance programs. Such aration of base maps, land use ; advocacy of its communities' mmunities prepare the paperwork State and Federal planning and other services. In addition, prepare land use plans, policy policies for each of its member t MRRPC activities are directed the MRRPC also reviews Corps uding review of recommended so helps local governments meet irements regarding its planning rosse Area Planning Committee ning activities with the MRRPC. sion's policy advisory body on the La Crosse urban area.

a member of the Southwestern ning Commission. In 1980, this ublished a regional outdoor space program as part of the e Planning Program. Other ission include preparing county lans, land use surveys, and ries; and providing information n financial aid available for rovement.

ty/Community Outdoor Recrea- se study for St. Croix County est Central Wisconsin Regional

ality outdoor recreation plans also influence recreation development and management along the Upper Mississippi. A county or city recreation plan guides development of specific recreational programs and long-range objectives. Additionally, it addresses recreation-related issues and establishes policies. Through examination of the issues and demand-supply-need analysis, such plans make recommendations to achieve the recreation objectives of the county or city. Table 3-15 shows counties and cities in the study area known to have outdoor recreation plans.

TABLE 3-15 - COUNTIES AND CITIES IN THE STUDY AREA WITH OUTDOOR RECREATION PLANS

Counties	Cities
Minnesota	Minnesota
Dakota	Bloomington
Houston	Savage (Comprehensive Plan)
Ramsey	Stillwater
	Lakeland
Wisconsin	St. Paul
	South St. Paul
St. Croix	Cottage Grove
Pierce	Newport (Comprehensive Plan)
Pepin	Eagan
Buffalo	Hastings
Trempealeau	Red Wing
La Crosse	Lake City
Vernon	Winona
Crawford	
Grant	Wisconsin
	North Hudson
	La Crosse
	Stoddard

3.205 Although land use controls are a State responsibility, the States in the study area have delegated implementation and enforcement of such controls to local governments. The enabling legislation established guidelines, rules, and regulations that local land use control ordinances must meet. The States retain authority to act where local units fail to adopt or enforce the State-approved ordinances.

3.206 Generally, floodplain districts are formed by counties or municipalities that control the land inundated by the regional flood (a flood with a

1-percent chance of occurring any given year). A floodplain district includes the floodway and the flood fringe. The floodway includes the river channel and parts of the adjoining floodplain required to carry and discharge the regional flood. The flood fringe consists of floodplain areas outside the floodway still subject to the regional flood.

3.207 Open space uses that have low flood damage potential and that do not obstruct flood flows are permitted within the floodway. Acceptable recreational uses include golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, boat-launching ramps, swimming areas, parks, wildlife and nature preserves, game farms, fish hatcheries, shooting preserves, target ranges, trap and skeet ranges, hunting and fishing areas, recreational trails, marinas, and boat rentals. Structures related to permitted open space uses are allowed under the following restrictions:

- The structures are not designed for human habitation.
- The structures have low flood damage potential.
- The structures are built and placed on the site so that they offer minimum obstruction to the flow of floodwaters. Whenever possible, a structure should be built with the longitudinal axis parallel to the direction of flow of floodwaters and placed on approximately the same flood flow lines as those of adjoining structures.
- The structures are flood-proofed.
- The structures have all service facilities, such as electrical and heating equipment, at or above the flood protection elevation for that particular area.

3.208 Virtually all uses permitted by existing zoning ordinances are allowed in the flood fringe as long as structures are elevated on fill or are flood-proofed to 3 feet above the regional flood elevation.

3.209 Detailed information on local floodplain and shoreline development programs in Iowa, Minnesota, and Wisconsin is in the discussion of the individual State programs. In Iowa, local governments may adopt floodplain development ordinances. Iowa Natural Resources Council (INRC) perm construction in floodplain a State-approved local ordinan counties and municipalities adopt and enforce floodplain If the local government does DNR may adopt an ordinance unincorporated shorelands, a adopt appropriate ordinances. trators issue land use permit governments must adopt flo management ordinances in standards. If local governm programs, the Wisconsin DNR m ordinances.

3.210 Both Minnesota and W governments to protect the Lo Statutes, Chapte .04.25, auth of Natural Resources to provid for management and developmen National Scenic Riverway. Ch law authorizes the DNR to standards for local zoning o the banks, bluffs, and bluf Croix. Such standards incl residential, commercial, and as prohibition of issuance of such uses are inconsistent National Scenic Riverway. The establishment of acreage, requirements. Counties and mu the guidelines must adopt zon with the standards and guide may not be modified without D

3.211 Counties and cities in t ordinances are listed in table

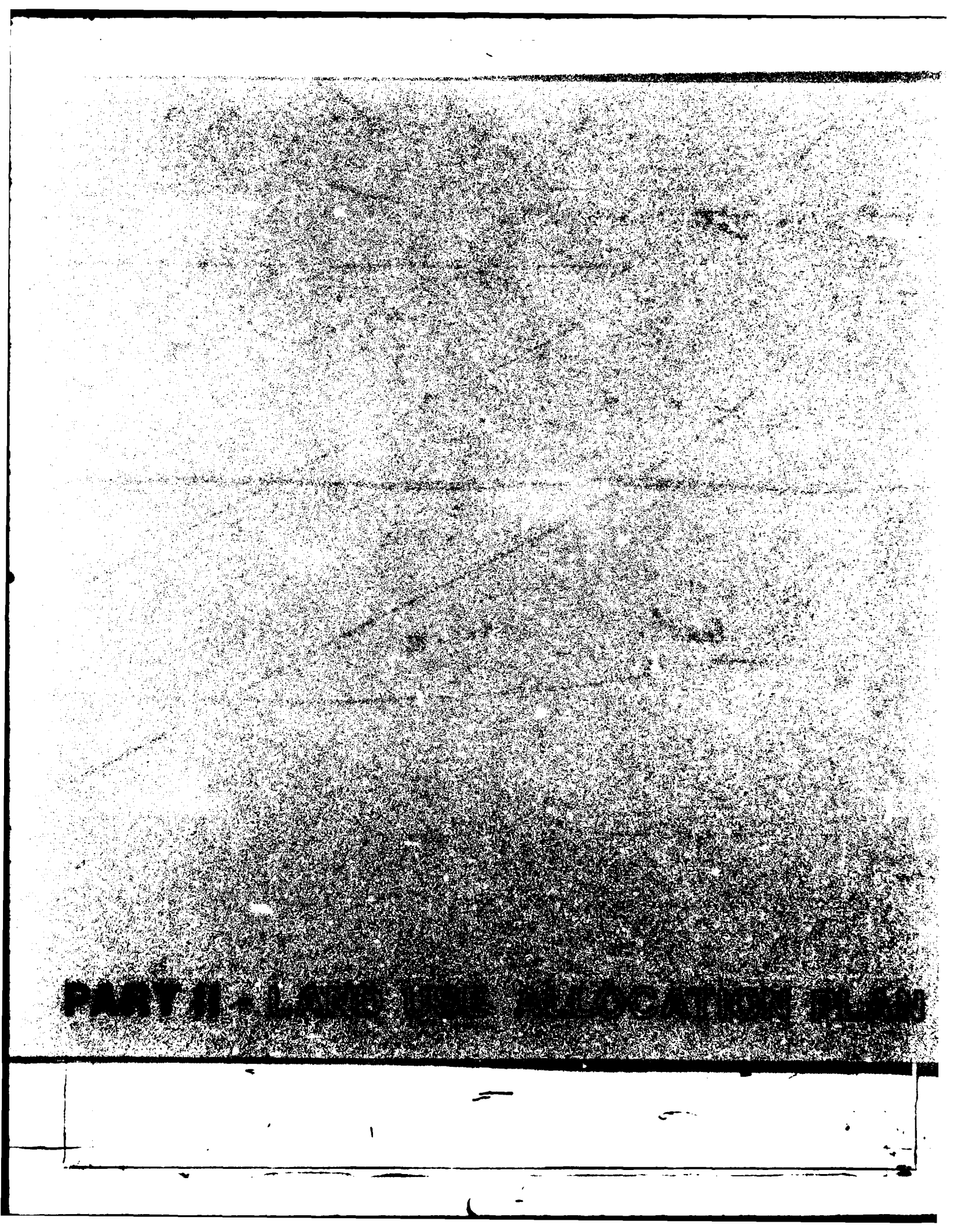
(INRC) permits are not necessary for floodplain areas that comply with a ocal ordinance. Minnesota requires nicipalities with adequate data to e floodplain management ordinances. ernment does not act, the Minnesota an ordinance. Counties must zone shorelands, and municipalities must ordinances. Local zoning adminis- nd use permits. In Wisconsin, local t adopt floodplain and shoreland inances in accordance with State ocal governments do not adopt such sconsin DNR may formulate and enforce

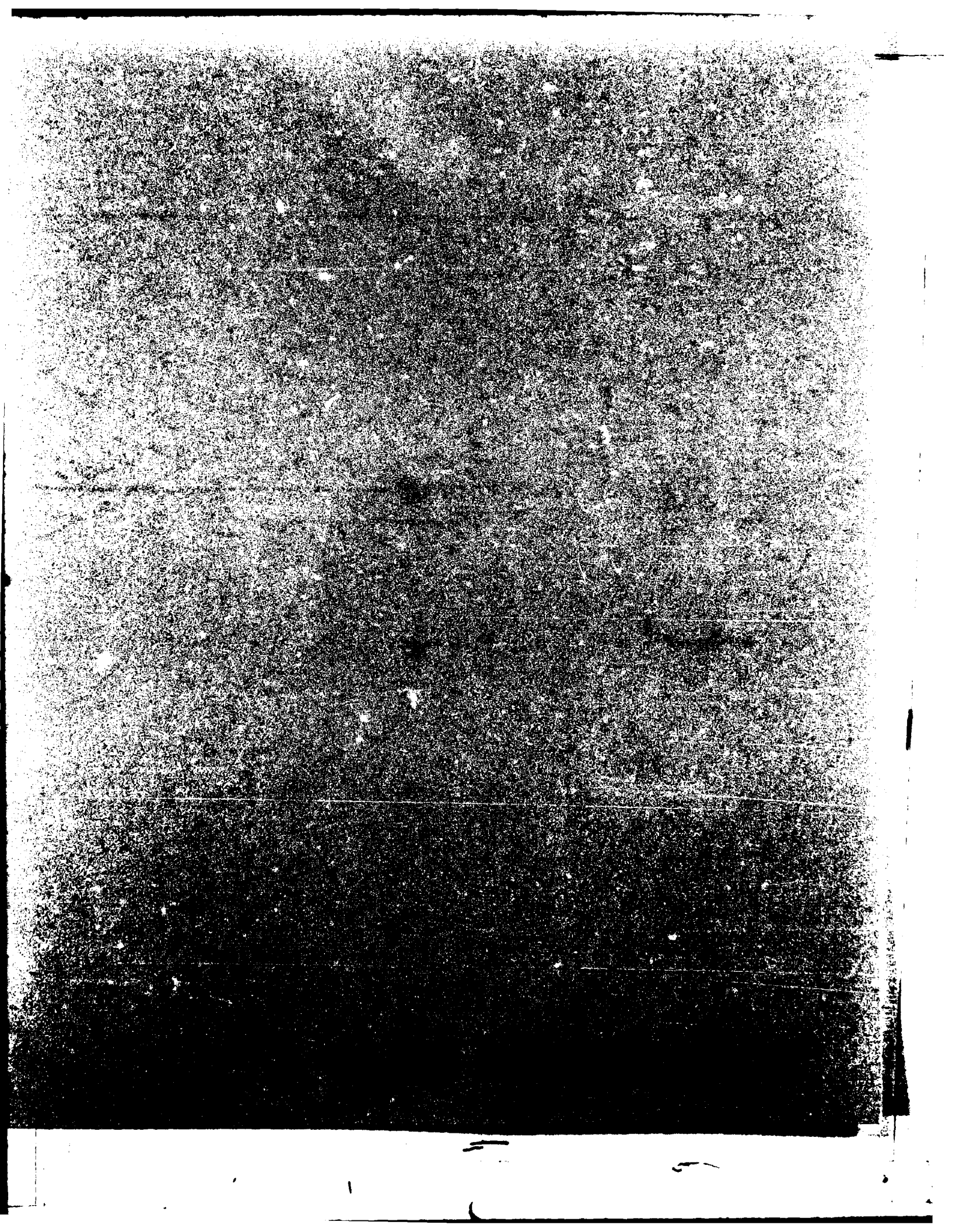
esota and Wisconsin require local otect the Lower St. Croix. Minnesota 104.25, authorizes the Commissioner ces to provide standards and criteria nd development of the Lower St. Croix Riverway. Chapter 30.27 of Wisconsin the DNR to adopt guidelines and cal zoning ordinances that apply to fs, and blufftops of the Lower St. ndards include prohibition of new ercial, and industrial uses, as well issuance of building permits where consistent with the purpose of the iverway. The standards also include f acreage, frontage, and setback unties and municipalities affected by st adopt zoning ordinances complying ds and guidelines. Such ordinances ed without DNR approval.

d cities in the study are with zoning sted in table 3-16.

TABLE 3-16 - COUNTIES AND CITIES IN THE STUDY AREA WITH ZONING ORDINANCES

	Cities		
Counties	Minnesota	Wisconsin	Iowa
Washington	Stillwater	North Hudson	Harpers Ferry
Scott	Bayport	Hudson	McGregor
Dakota	Lakeland	Prescott	Guttenberg
Chisago	Afton	Bay City	
Goodhue	Savage	Maiden Rock	
Wabasha	Bloomington	Stockholm	
Winona	Burnsville	Pepin	
Houston	Minneapolis	Alma	
	St. Paul	Buffalo	
Wisconsin	Mendota	Fountain City	
	Eagan	Trempealeau	
St. Croix	Lilydale	La Crosse	
Pierce	South St.	Stoddard	
Pepin	Paul	Genoa	
Buffalo	Newport	DeSoto	
Trempealeau	Inver Grove	Ferryville	
La Crosse	Heights	Lynxville	
Vernon	St. Paul	Prairie du	
Crawford	Park	Chien	
Grant	Rosemount	Bagley	
Polk	Cottage	St. Croix Falls	
	Grove	Osceola	
Iowa	Hastings		
	Red Wing		
Allamakee	Lake City		
Clayton	Wabasha		
	Winona		
	La Crescent		
	Lake St. Croix Beach		
	St. Mary's Point		
	Oak Park Heights		
	Marine on the St. Croix		





4. PLAN FORMULATION

LAND ALLOCATION OBJECTIVES AND THE PLANNING PROCESS

Introduction

"All Civil Works water resource project land will be allocated to provide for sound development and resource management practices consistent with authorized project purposes and the intent of the provisions of the National Environmental Policy Act of 1969, Public Law 91-190. Land allocation is highly selective based on its highest and best use."

4.01 The preceding statement is taken from Engineer Regulation (ER) 1120-2-400 (Investigations, Planning and Development of Water Resources: Recreation Resource Planning), the primary source of land use allocation guidance for the Corps of Engineers.

Determining the "Highest and Best Use"

4.02 The following section describes the management factors that greatly influence the St. Paul District's ability to manage the Upper Mississippi River for this "best use." The next section provides an overview of the planning process, including a brief description of the data base used for making allocation decisions. These data were combined with information obtained through extensive coordination efforts with other agencies and from a series of public workshops and formal meetings. This information is intended to provide a better understanding of the process used to develop this plan.

4.03 The determination of "highest and best use" of Federal lands managed by the St. Paul District along the 9-foot navigation channel is the primary objective of this land use allocation plan. The following major factors influenced this determination of "best use" for these Federal lands:

- Federal laws and regulations that place priority on navigation, above other project public uses.
- The great size and scope of the study area, and its multiple uses.
- Past and present Federal land management practices and arrangements with other government agencies and the using publics.
- Limited Federal manpower, support planning and managem
- Limitations of Corps of Engir authorities for public recre services.
- Limitations imposed by limit data.
- The need for resolution of conflicts with the U.S. Service (FWS) in reviewing a use activities on Cooperativ
- The need for identification objectives for current an material disposal areas to guidance to the St. Paul Di Branch and the GREAT I impl team.
- The need for clear plan facilitate a follow-up sh management plan to be incl operational management plan.
- The need for ongoing Corp Upper Mississippi River reso channel maintenance act management decisions invo licenses and regulatory perm

The Planning Process — An Overview

4.04 **Data Base** - To gain a compreh river resources, Corps planners ex and, in some cases, updated backgr baseline analysis. The followi essential direction for the l decisions:

- Review of existing Federal ments.

  This review included a use licenses, real estate l land use commitments.

- Recreation demand-supply-nee

  The GREAT I recreation

deral manpower, time, and money to
nning and management.

of Corps of Engineers implementation
for public recreation and associated

imposed by limited resource and user

r resolution of resource management
with the U.S. Fish and Wildlife
S) in reviewing and approving public
ies on Cooperative Agreement lands.

r identification of land management
for current and proposed dredged
isposal areas to provide operational
the St. Paul District Maintenance
the GREAT I implementation planning

for clear planning criteria to
a follow-up shoreline (lakeshore)
plan to be included as part of the
management plan.

or ongoing Corps involvement with
ssippi River resources centering on
aintenance activities and land
decisions involving real estate
d regulatory permits.

s — An Overview

To gain a comprehensive knowledge of
orps planners extensively reviewed
, updated background material for a
s. The following items provided
tion for the land use allocation

xisting Federal land use arrange-

iew included all existing special
s, real estate leases, and similar
mitments.

emand-supply-needs analysis.

T I recreation demand methodology

was modified slightly, and 1980 census data were incorporated to generate new recreational demand estimates and related resource requirements.

Many coordination meetings and mailings to Federal, State, county, and local agencies were used to update the GREAT I recreation facility inventory.

The recreation resource needs estimates were determined by subtracting existing inventories from estimated resource requirements, based on the new recreation demand figures.

- Computerized Geographic Information System (GIS) analysis.

The GIS data base, prepared for the FWS and GREAT I, was used to generate recreation activity area models and fish/wildlife suitability models. These models helped identify and evaluate degrees of suitability of Federal lands for such activities as camping, beach use, picnicking, boat launching, and trail use. They also identified fish and wildlife values.

- Field analysis of current recreation use patterns.

Field personnel from the Corps, the FWS, and the States of Iowa, Wisconsin, and Minnesota helped identify areas along the river that they felt should be recognized within this study. These areas included existing recreation use sites, important fish and wildlife habitat areas, and proposed commercial navigation structures, etc.

- Resource inventory.

Stereo aerial photography of the river and adjacent shorelines was used to check for vegetation or land use changes identified in the 1973 river vegetation analysis conducted by Dr. Myers of the University of Minnesota.

4.05 These data, when combined with information from such previous river studies as GREAT I and the Upper Mississippi River Basin Commission master plan, provided an incomplete but extensive resource base.

4. PLAN FORMULATION

4.06 A final step in the data base process was summarizing this information on resource maps. Several map scales were necessary to display the data. A set of new real estate maps that showed boundaries of Corps and FWS lands was developed as part of this data collection.

4.07 Team Approach - After the data base was developed, the next step was to form an interdisciplinary team of Corps resource specialists and planners. This step was accomplished early in fiscal year 1980. At that time, efforts were begun to conduct archeological and historical investigations, an inventory of private commercial enterprises along the river, a social institutional analysis, a summary review of environmental studies, a visual impact methodology study, and other related studies. These studies provided the planning team landscape architects, biologists, sociologists, archeologists, resource managers, outdoor recreation planners, and other team members with much of the information that was summarized and evaluated during a series of District team meetings. These meetings were used to prepare an initial set of land use allocation definitions and a rough land use allocation plan.

4.08 Changes to Planning Schedule - Changes in the availability of human and financial resources required several revisions in the planning schedule after the master plan update was initiated in 1980. The loss of supporting staff forced an unexpected shift in the project: the master plan was divided into three parts. Parts I and II (this report) provide the background data used for the master plan and the land-use allocation process. Part III (plan for development) will include site designs for Corps-managed or leased recreation sites as well as discussions and recommendations for a variety of river-related public use issues. Part III is scheduled for completion by 1985.

AGENCY COORDINATION EFFORTS

4.09 Throughout this study, the St. Paul District has worked closely with the U.S. Fish and Wildlife Service (FWS). This coordination has resulted in a greater appreciation of each agency's role in managing the resources under its jurisdiction and the realization that the two agencies can work cooperatively to improve management programs. This coordination made possible the development of a land use allocation plan jointly prepared and supported by both agencies.

4.10 Following preparation of the firs house draft land use allocation maps, District and the FWS met to identify and management conflicts. Intensive st discussion, negotiation, and compromise r modified version of the land use allo Most land use conflicts were resolved meetings, with the exception of ident appropriate categories for strips of Fede currently support extensive private structures. Initially, it was not allocate appropriate management catego areas because existing Corps policy on pr not sufficiently detailed. Followir coordination within the St. Paul D restatement of policy was provided and allocations were completed.

4.11 The States of Iowa, Minnesota, a have vested interests in the managemen the Corps and the FWS (General Plan coordination requirements). Conseque involvement was sought at each major land use allocation process. Each State on the study process, and site-specific was obtained from various field offices. coordination meetings were held in J present the preliminary land use alloca each State. Formal review of the dra requested, and comments received were during preparation of the final dra allocation plan.

4.12 The Corps and the FWS jointly pr revised land use allocation maps to th Minnesota, Wisconsin, and Iowa through natural resource management agency. The reviewed the maps and provided comment the State meetings, a series of public w held in communities along the river c August. (See the following Public Involve section for further details).

4.13 The Minnesota-Wisconsin Boundary Are has also been given opportunities to contr study and has been briefed on its scope The commissioners have been briefed at k the formulation of the land use allocatio

4.14 After collecting and reviewing the c various State and local agencies and public, the Corps met with the FWS to det modifications were needed in the dra allocation plan.

tion of the first set of in-
location maps, the St. Paul
to identify and resolve land
. Intensive staff review,
and compromise resulted in a
e land use allocation maps.
were resolved during these
eption of identification of
)r strips of Federal land that
tensive private recreation
, it was not possible to
anagement categories to these
irps policy on private use was
ailed. Following extensive
the St. Paul District, a
as provided and the land use
ed.

a, Minnesota, and Wisconsin
in the management actions of
S (General Plan Agreement
nts). Consequently, State
at each major step of this
cess. Each State was briefed
nd site-specific information
us field offices. Additional
were held in July 1982 to
land use allocation plan to
view of the draft plan was
s received were considered
f the final draft land use

e FWS jointly presented the
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ng Public Involvement Program
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onsin Boundary Area Commission
rtunities to contribute to the
fed on its scope and status.
been briefed at key points in
and use allocation plan.

d reviewing the comments from
l agencies and the general
th the FWS to determine where
eded in the draft land use

4.15 Minor modifications to the preliminary land use allocation maps presented to the public in August 1982 were made after a ground-truthing exercise conducted by Corps and FWS staff. Using recently obtained aerial photography and on-site visits, the field staff recommended minor changes. At a follow-up FWS/Corps coordination meeting, recommended changes were discussed, negotiated, and approved.

4.16 The recommended changes were incorporated and the draft report was printed. Problems associated with the quality of work produced by the contract printer delayed report distribution from late fall to winter 1983.

4.17 Approximately 4 weeks after distribution of the printed draft report to public agencies and to public libraries in river communities, the Corps and the FWS scheduled a series of formal public meetings in January 1983. The Corps and the FWS obtained many public comments and statements during and after these meetings. Further discussion of the comments and the changes made in the draft plan in response to these comments is in the following section (Public Involvement Program).

4.18 One major revision in the draft report involves the land use allocations for FWS-managed lands. The draft plates showed these allocations by symbols. The revised plates now show both Corps and FWS allocations with a single color code, but with screened half-tones to distinguish the FWS-managed lands. Other changes are also noted in the following report section.

PUBLIC INVOLVEMENT PROGRAM

General Public Involvement Activities

4.19 The Corps has made continual efforts to incorporate public opinion throughout this master planning process. The Corps hired a consultant to help design and implement the master plan public involvement program. This program has included joint Corps/FWS public presentations, workshops, and meetings.

4.20 The first series of four public involvement meetings took place in November 1980, in St. Paul and Wabasha, Minnesota, and in La Crosse and Prairie du Chien, Wisconsin. These workshops informed the general public about the scope of the master plan

study. Public comments about the key issues that the plan should address were also recorded at these meetings. Early in 1981, meeting participants received a mailed summary of identified and ranked issues.

4.21 The FWS and the Corps jointly sponsored a series of open-house meetings in summer 1981. Three informal meetings in Hastings and Winona, Minnesota, and Lansing, Iowa, were augmented by a formal public meeting in La Crosse, Wisconsin. The basic purpose of these meetings was to inform the public of the progress on the master plan. At the request of a Congressman, the La Crosse meeting was added to deal with public issues specific to the Lake Onalaska area. At each meeting, the public was given opportunities to identify concerns and issues related to the planning objectives.

August 1982 Workshops

4.22 The FWS and Corps jointly sponsored an additional series of public workshops during August 1982 in Red Wing and Winona, Minnesota; Onalaska, La Crosse, and Prairie du Chien, Wisconsin; and Lansing, Iowa. The Corps informed the public of its intent to separate the master plan into several parts.

4.23 The workshops were publicized by announcements in local newspapers and radio stations. Also, approximately a month before the meetings, a special newsletter that summarized planning efforts was distributed to about 4,000 addresses. Although public attendance at the workshops was less than expected for locations along the upper reaches of the river (Red Wing and Winona, Minnesota; La Crosse, Wisconsin), the more southern locations had larger turnouts. Approximately 350 people attended the six workshops.

4.24 At these workshops, the public focused on the preliminary draft set of land use allocation maps and on the private special use issue. Both agencies realized that a further policy interpretation of their current positions on private use of Federal lands was necessary to complete the land use allocation study. Such a position was not formulated before these meetings. Lacking this position, the Corps and FWS informed the public of their intent to formulate a joint position on private use, and these two agencies presented various policy options that were being considered. The public had the opportunity to express their comments and concerns about these matters.

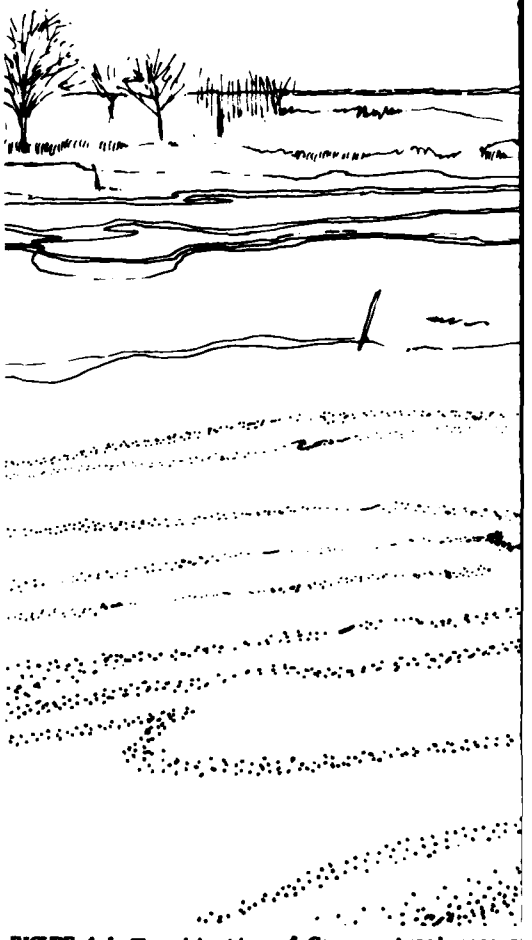


FIGURE 4-1. The objective of Corps natural resour base without harm to the ecology. The carrying functional values. The Mississippi River projec sound resource management.

of Corps natural resource management activities is the continued enjoyment and maximum sustained public use of the natural resource e ecology. The carrying capacity of the land is determined on a site-by-site basis, using biological, aesthetic, historical, and Mississippi River project area contains a vast mix of various land types. Ongoing management efforts continue to be directed toward t.

4. PLAN FORMULATION

4.25 The workshops included brief presentations on the master plan study by FWS and Corps representatives. After these presentations, the public separated into small groups where discussion facilitators and recorders obtained public input. Following the workshops, public comments obtained at the meetings or through the mail were compiled according to meeting location. Both agencies reviewed these comments and grouped the comments into several categories which are further discussed below.

4.26 At a special joint meeting, both agencies further reviewed public comments that might be incorporated into the revised draft land use allocation maps. Review of the public comments recorded at the workshops and those mailed in later indicated that most of the public concern focused on the related problems of soil erosion and resulting river sedimentation, backwater filling, and increasing rates of vegetation growth.

4.27 Other central issues identified at most of the workshops include (not listed by priority):

- Bank erosion and backwater sedimentation problems perceived to be associated with barge traffic.
- Negative impacts of pool-level fluctuations.
- The need to improve water quality.
- More public education and information about issues such as boat safety, litter, and river recreation resource locations.
- The decrease in available sand beaches and sandbars for recreation uses.
- A need for greater management authority to deal with enforcement of regulations.
- Protection and enhancement of fish and wildlife resources.

4.28 Several local issues also surfaced in various communities. For example, concerns about future water quality, sedimentation, aquatic vegetation, and recreational use of Lake Onalaska were discussed at length during the Onalaska and La Crosse, Wisconsin, workshops. Barge-fleeting impacts and regulatory controls were sensitive issues for those attending the meeting at Lansing, Iowa.

4.29 Most of the public comments terms of subject matter and identi unrelated to the current FWS and Corp studies. Various comments supported private-use questions.

4.30 All public comments identifying site-specific recommendations that allocations were studied carefully, changes were made in the draft land maps.

January 1983 Formal Public Meetings

4.31 The draft land use allocation pla November 1982, following the changes to public comments from the August The draft report was then sent to pub to community and institutional librar available to the public.

4.32 Public notices were distributed three formal public meetings schedule week of January 1983, that were held i sota; La Crosse, Wisconsin; and Lansin each of these meetings, there were houses facilitated through the Minne Boundary Area Commission. These pro an opportunity to ask agency plan informally prior to the meeting. The well attended. A meeting record wa meeting. Copies of the transcript about 15 public libraries along th interested parties who requested them. of the public, the District Enginee normal 30-day open public comment peri meetings to 60 days, until March 15, 1

4.33 The majority of public comm meetings, as well as most of the contr to be generated by special interest groups objected to the Corps and F private/special-use licensing of Feder of the existing permit holders wh

e public comments were diverse in matter and identified many issues urrent FWS and Corps master planning comments supported both sides of the ons.

mments identifying area-specific or ommendations that affect land use studied carefully, and appropriate in the draft land use allocation

Public Meetings

d use allocation plan was printed in owing the changes made in response s from the August 1982 workshops. as then sent to public agencies and nstitutional libraries where it was ublic.

es were distributed for a series of c meetings scheduled for the second 83, that were held in Winona, Minne- isconsin; and Lansing, Iowa. Before etings, there were informal open d through the Minnesota-Wisconsin nission. These provided the public o ask agency planners questions o the meeting. These meetings were meeting record was made for each of the transcripts were sent to libraries along the river and to who requested them. At the request ie District Engineer extended the public comment period following the s, until March 15, 1983.

y of public comments at these as most of the controversy, appeared y special interest groups. These to the Corps and FWS position on licensing of Federal lands. Many permit holders who attended the meeting felt that discontinuing the transferability of special-use licenses in January 1990 would negatively affect the value of their properties. There is evidence that some opposition groups even helped create public confusion about the management actions proposed by the Corps and the FWS. Both agencies were accused of wanting to close the river off to public use. A series of widely distributed media announcements and newsletters was necessary to correct the misinformation that was causing public confusion. These newsletters and news releases explained the management goals of both agencies (that the real intent of the plan is to enhance public use and wildlife production, and that the plan would not restrict public use or access).

4.34 By the end of the public comment period on March 15, 1983, many constructive comments and recommendations had been received from various government agencies, river interest groups, and involved citizens.

4.35 Many commenters indicated a desire to see what changes were made to the LUAP as a result of comments. All individuals, groups, and agencies who provided statements at public meetings or who made written comments during the open comment period received individual letters of response from the St. Paul District Engineer, Colonel Edward G. Rapp. These letters explained how the commenter's specific comments would be incorporated into the revised LUAP. In addition, a newsletter was jointly prepared by the Corps and FWS. This newsletter was widely distributed to provide the public with an update on LUAP progress plus a summary of responses to the comments received from individuals (included in this report as figure 4-2). These summary comments are included in this report to give the reader a sense of the public concerns expressed at the public meetings or during the open comment period that followed the public meetings.

4.36 Formal comments were also received from all three State conservation or natural resource departments, the Lake Onalaska Protection and Rehabilitation District, and the Minnesota-Wisconsin Boundary Area Commission. Individual letters responding to their comments were prepared and mailed in July 1983.

4.37 These letters and the associated St. Paul District responses, along with additional public involvement materials, have been compiled in a supplementary document (to be published separately) entitled Public Involvement and Agency Coordination in the Land Use Allocation for the Upper Mississippi River. This document on public involvement will be a complete compilation of correspondence that shows the process of public involvement and coordination related to the LUAP between the Corps and other agencies. This document will also contain all the public announcements (such as public notices, newsletters, and news releases). It will also contain all comments from agencies plus the Corps responses to their comments. The document will be available to the public at little or no cost and will be sent to local libraries after it is completed.

Comment Topic (Reference*)	Resulting Change or Reason for No Change
I. Private Use Licensing Policy A. Keep policy same as before the plan (5.03-5.09) (4.27-4.30)	Both the Corps and FWS have determined that the approximately 23 shoreline miles of Federal lands currently used to support individual private recreation structures should be returned over time to public use. Special private use of Federal land is becoming increasingly less appropriate and is not in the best public interest. Because Federal land resources continue to receive greater pressure for public use, all available Federal land along the river will be needed to help meet future public use demands. Community docks are encouraged as an alternative means to meet boat-mooring needs.
B. Make policy stronger by cutting off all permits within 10 years (5.03-5.09)	The Corps and the FWS continue to support the grandfathering policy in order to maintain their commitment to existing license holders. Existing license holders have invested in the purchase, construction, or improvement of private recreation structures on the basis that the Government would honor its present policy of renewals. The public demand for use of Federal shorelines is also not expected to peak in 10 years but will continue to grow slowly as the population expands and private shoreline development increases.
C. The Corps should allow land exchanges - similar to FWS (4.27)	Lands were acquired by the Corps on the Upper Mississippi River system for construction and operation of the 9-foot navigation channel. The Corps, therefore, has less flexibility to exchange lands than the FWS.
D. Increase 15-percent limit for maximum annual repairs (4.27, 5.03-5.09)	Consideration has been given to the possibility of increasing the maximum allowable percentage of fair market value that can be spent each year to maintain or repair licensed private structures. Such a change can be authorized only through approval of higher authorities. Tentative approval to increase the maximum limit from 15 percent has been received. The new limit is 25 percent of the fair market value. Since the grandfathering policy is not scheduled to take effect until 1990, dock owners will have the opportunity to convert to floating docks, which would be less susceptible to damage.

FIGURE 4-2.

Summary Topic (Reference)	Resulting Change or Reason for No Change
[illegible]	[illegible]
[illegible]	[illegible]
Natural Resource Restoration Issues: GMP should include plans to improve water quality and sedimentation problems [illegible]	These issues are [illegible] however, the GMP [illegible] such problems. The Corps, through the [illegible] program, will provide [illegible] and sedimentation problems. [illegible] Mississippi and Illinois River [illegible] will address many of these [illegible] problems.
Address improved pool regulation [illegible] recommendation [illegible]	Another river resource-related problem most cited in public comments is the negative impact of river [illegible]. Some water level fluctuation is necessary [illegible] operating pools for navigation, the primary project purpose. The Corps of Engineers [illegible] manuals govern the regulation of each pool [illegible] are periodically reviewed and updated. [illegible] of this matter will be considered during those reviews.
Designating [illegible] allocations to support public uses [illegible] more low-density recreation [illegible] recommendation [illegible]	Additional lands are included in the low density recreation allocation. The revised GMP also shows [illegible] of FWS [illegible] that [illegible] public [illegible] recreational use levels. Traditionally, [illegible] percent of [illegible] lands of the Upper Mississippi River have been [illegible] for the various forms of public recreation. [illegible] wildlife management lands which are also used for [illegible] forms of public recreation.
[illegible]	The wildlife management allocation definition has been changed to read as follows: • *Wildlife Management* - These lands are allocated for fish and wildlife and they provide opportunities for wildlife-oriented recreation. Hunting, fishing, trapping, bird watching, and photography are examples of such recreation. These lands will also be available for other traditional, dispersed forms of public recreation such as primitive camping, boating, water skiing, sailing, canoeing, swimming, cross country skiing and hiking. The primary management emphasis for such lands is protection and enhancement of wildlife habitat values, but this emphasis also allows traditional forms of public recreation at use levels that have proven

FIGURE 4-2. Continued on next page

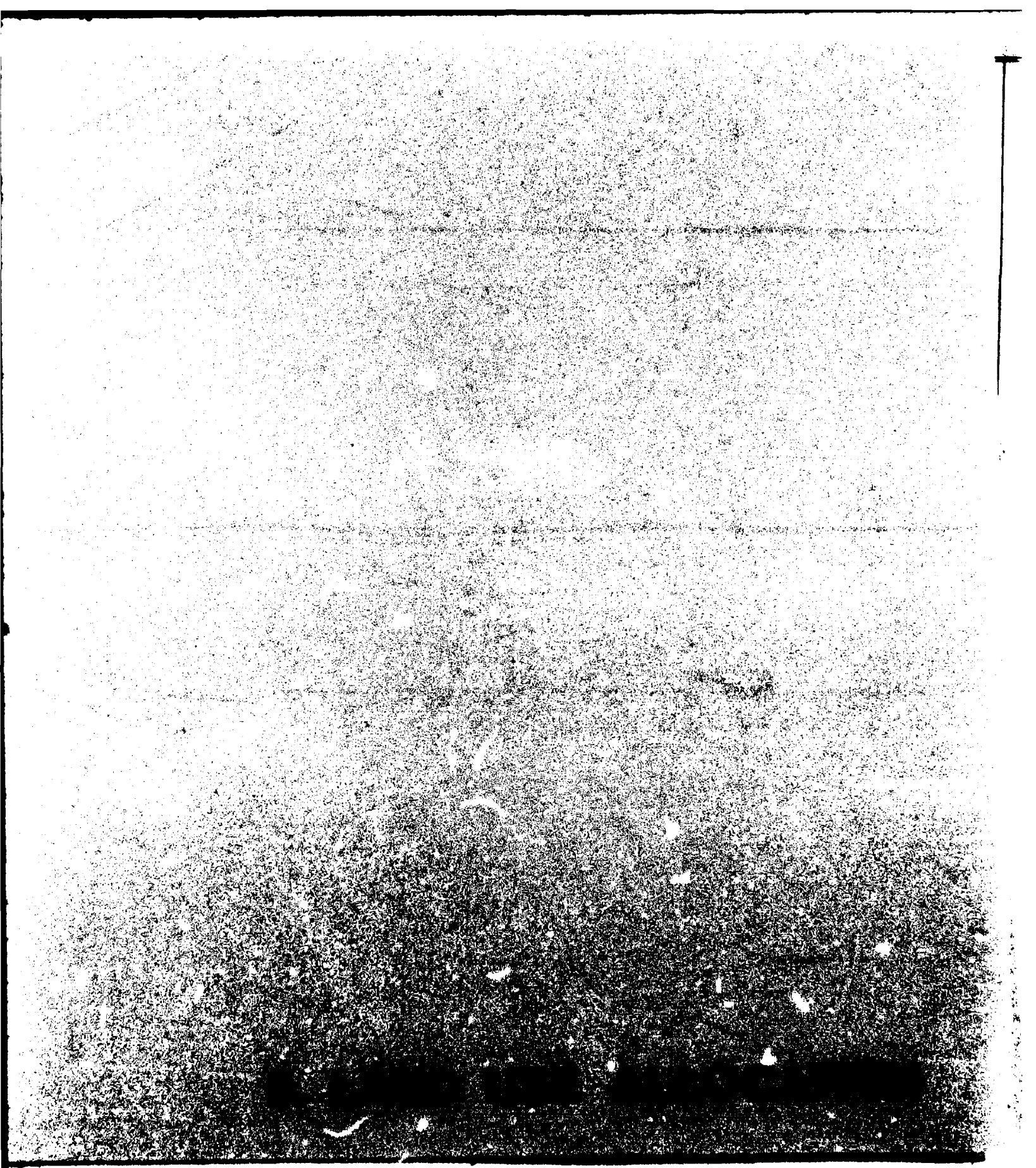
4. PLAN FORMULATION

Comment Topic (Reference*)	Resulting Change or Reason for No Change
	compatible with wildlife. Designated portions of such lands have been reserved as waterfowl sanctuaries ("closed areas") during migration periods, thereby limiting hunting and trapping. Limited developments such as boat landings, access roads, trails, and parking areas are facilities that may be compatible with this allocation.
B. Use time of year land allocation zoning (5.10-5.12)	The Corps has carefully examined the possibility of using time management restrictions or land allocation zoning on Corps lands. This technique would be of value only if restrictions were placed on recreation use and access. Additional public use restrictions on Corps lands would not be consistent with the objective of the LUAP to allow year-round traditional recreation use on practically all Federal lands along the Upper Mississippi.
C. Strengthen language in wildlife management definition to protect integrity of wildlife values (4.27-4.30, 5.10)	The FWS has determined that existing public recreation use levels do not threaten present wildlife habitat values. If refuge lands come under enough pressure from increased public use and become unable to provide for wildlife needs, the Corps and the FWS will work with the public to make resource management adjustments necessary to protect the wildlife habitats. If future restrictions on use are necessary, river users will have adequate opportunities to contribute their ideas before any change in management is implemented.
D. LUAP should include restrictions on commercial navigation (1.05, 4.27)	The Corps has no authority to restrict barge traffic. Factors that place growth limitations on the barge industry are the physical constraints of the lock structures, the economic realities of the cost of fuel, the need to use more efficient power systems, and the competition of alternative forms of transportation.
E. LUAP should identify existing and future locations for industrial and commercial uses (3.113, 4.27-4.30)	The LUAP is not the appropriate vehicle to deal with this issue. Studies such as the interagency GREAT I study and the Upper Mississippi River Basin Commission master plan are intended to serve that broader planning function. The LUAP focuses on Federal land uses for public recreation and for fish and wildlife. The revised LUAP includes the following guidance regarding future commercial or industrial uses: The land use allocation plan does not identify Federal lands that may be needed for future uses which are not part of the Corps or FWS missions. Examples of such uses are utility lines, pipelines, roads, power plants, industrial sites, river terminals, and barge-fleeting areas. However, it may be necessary to accommodate such uses on Federal lands. Federal lands may be made available if there is a documented "public" need, if there is no reasonable alternative on non-Federal land, and if the intent of this allocation plan is considered. Requests for commercial or industrial uses will be considered on an individual basis, using laws, regulations, established policies (see pp. 13-18), and the LUAP to determine the compatibility of a proposed use. Sensitive or valuable resource areas

FIGURE 4-2.

Comment Topic (Reference*)	Resulting Change or Reason for No Change
	will be protected and avoided in the siting process. Unavoidable losses of recreational opportunities and of fish and wildlife habitat that would result from future commercial development of Federal lands would be calculated for replacement and, when applicable, treated as a cost of the project to the developer. The above guidance would also apply to requests for renewal of existing permits or leases. The Corps will continue leasing Government land through use of a bidding process when conditions so warrant. All permits must be consistent with State and local laws, rules, and ordinances on shoreline and floodplain management.
IV. Planning and Public Involvement Planning Issues (4.08, 4.16, 4.27)	The Corps and the FWS have held three series of public workshops (1980-1982) in addition to the formal public meetings in January 1983. Coordination meetings were held with State and regional planning agencies, and a number of presentations were made to special interest groups. Several newsletters and a number of news releases kept the public informed.
A. Want additional public meetings to review and comment on plan (4.16-4.30)	The workshops, newsletters, news releases, public meetings, and other parts of the public involvement program conducted by both Federal agencies provided interested parties with ample opportunity to learn about and comment on the draft LUAP. Corps public involvement policy requires collection of data from the public and appropriate government agencies. This policy also requires that the public/interagency review comments on a draft plan be evaluated and incorporated as appropriate. These requirements have been more than adequately accomplished.
B. Combine the Corps and FWS master plans (Preface, 4.27, Recommendations)	The revised LUAP shows allocations on Fish and Wildlife Service lands more clearly than did the draft LUAP. Both the St. Paul and Rock Island Corps Districts and the FWS are working together so that the revised LUAP is consistent with future master plan studies of both agencies. The FWS refuge master plan will balance habitat management and recreation for wildlife management-allocated lands while the Corps will focus its remaining master plan studies upon site plans for intensive recreation sites and upon various recreation aspects associated with GREAT I implementation. (Corps and FWS policies require that separate agency master plans be submitted, consistent with agency planning guidelines.)
C. Add nature interpretation and education programs (Preface, 4.27, Recommendations)	The scope of the LUAP is limited to determination of appropriate public uses of Federal lands, primarily for fish and wildlife and for recreation. Part III of the Corps master plan (plan of development) will address the need for a coordinated program of interpretive services and activities at appropriate Corps facilities. This will include an examination of visitor interpretive facilities at all Corps locks and dams. (New interpretive structures have recently been designed for construction at lock and dam 1.)

* These numbers refer to those sections in the draft LUAP that have been changed in response to public comments.



5. LAND USE ALLOCATION

POLICY CONSIDERATIONS

Introduction

5.01 This section provides an overview of the major factors involved in the formulation of the land use allocations shown on the plates in section 9. Definitions of each land use allocation plus supporting information clarify the management objectives associated with each allocation. The last part of this section describes the allocations in each pool.

5.02 This land use allocation plan had to be developed within the scope of existing policy and in consonance with stated national policy directives. The following statements provide general guidance for the plan of development and future management arrangements.

- Corps of Engineers management activities will be directed towards fostering a balance between the economic, environmental, and recreational demands on the Upper Mississippi River within constraints of the two primary Federal purposes of the river (navigation and fish and wildlife) and recognizing the multi-use, multi-purpose character of the resource.

- Allocation of public lands for private recreational use will be consistent with the intent of current Federal resource management policies and stated policies to take effect in the planning horizon. Generally, use of Federal lands should foster public (community) use rather than private, special use.

- Major portions of land parcels purchased by the Federal Government along the river are submerged (below normal pool levels) as a result of construction and operation of the navigation project. To the degree possible, these submerged lands will be treated in a manner consistent with adjacent land use allocation designations in terms of permit applications for non-federal uses. For example, a permit for a barge-fleeting area may be viewed differently if the proposed location were adjacent to lands allocated for project operations than it would be if the location were adjacent to lands allocated for wildlife management.

- The plan of development (to
part III of the master plan) w
transfer of management responsi
wildlife lands within the boun
wildlife area or State Park to
policy would allow more effecti
management units for the State.

- Commercial activities will
considered appropriate on Fede
the jurisdiction of this land
plan. However, instances may
only valid alternative for th
activity is on Federal lands.
will be evaluated on a case-by-c
established permit and lease mec

- The Corps and FWS recogni
jointly planned and fully-coord
Federal lands covered under t
agreement. This plan will lay t
further joint action.

- Management programs establishe
District for lands and wa
jurisdiction will be consi
following established environm
for the Corps of Engineers:

  To preserve unique and impo
  aesthetic, and cultural
  national heritage.

  To conserve and use wis
  resources of our Nation f
  present and future generat

  To enhance, maintain,
  natural and man-made envir
  its productivity, variet
  beauty, and other measures

  To create new opportunities
  people to use and enjoy th

5.03 Both the Corps and the FW
important management issue that wil
by this master plan: the need
definition of the Upper Mississippi
and Fish Refuge. The FWS wishes
management authority over all Fede

an of development (to be published as of the master plan) will consider the of management responsibility of Federal lands within the boundaries of a State area or State Park to the State. This ould allow more effective and efficient nt units for the State.

cial activities will generally not be ed appropriate on Federal land within sdiction of this land use allocation owever, instances may arise where the id alternative for this justifiable is on Federal lands. Such instances evaluated on a case-by-case basis through hed permit and lease mechanisms.

orps and FWS recognize the need for planned and fully-coordinated actions on lands covered under the General Plan t. This plan will lay the groundwork for joint action.

ment programs established by the St. Paul t for lands and waters under its ction will be consistent with the g established environmental objectives Corps of Engineers:

preserve unique and important ecological, thetic, and cultural aspects of our ional heritage.

conserve and use wisely the natural ources of our Nation for the benefit of sent and future generations.

enhance, maintain, and restore the ural and man-made environment in terms of productivity, variety, spaciousness, uty, and other measures of quality.

create new opportunities for the American ple to use and enjoy their environment.

he Corps and the FWS recognize ar agement issue that will not be resolved ter plan: the need for a clearer the Upper Mississippi National Wildlife uge. The FWS wishes to increase its uthority over all Federal lands in the refuge. This question of authority involves national policy and is of regional concern to the North Central Division and Rock Island District as well as to the St. Paul District of the Corps. Both agencies will address this issue after they complete their resource master plans. In the interim, the coordinated land use allocations shown in this report will guide both agencies in their river resource management decisions. (See the recommendations section for further information.)

AREAS OF PUBLIC CONTROVERSY

Private Use of Federal Lands

5.04 In consonance with stated national policies, the St. Paul District of the Corps and the North Central Region of the U.S. Fish and Wildlife Service have determined that the continued, unlimited granting of private rights to public lands (for cottages, boathouses, private docks, and similar structures or uses) is no longer in the public interest. The strategy of these two agencies for implementing this position varies to some degree because of the differing Federal purpose of each agency: fish and wildlife (FWS), and navigation (Corps).

5.05 The Chief of Engineers has recognized that leasing of Federal lands in the floodplain for private recreational cottages contradicts general zoning principles since private development of this nature creates a hazard to human life and does not provide maximum overall use of Government land for public purposes. In response to this policy of the Chief of Engineers, no new cottage site leases will be granted and existing cottage site leases will be phased out by December 31, 1989. Implementation of this policy will affect 32 cottage sites currently on Corps lands in the study area.

5.06 Both the Corps and the FWS have a consistent grandfathering policy. This policy honors existing licenses, "grandfathering" them so that the license holders may keep them as long as the holders or their spouses live and as long as the licenses meet Federal restrictions. This policy will gradually eliminate existing private-use licenses without imposing hardship on current license holders. The public comments on this issue have helped clarify the

5. LAND USE ALLOCATION

language of the public-use policy. The Corps and FWS have identified one exception to the principle that private special use of Federal lands is not in the best public interest. Specifically, exceptions to this principle can be granted on a limited, case-by-case basis when the primary purpose of the Federal project is enhanced. The licensing of private activities on Federal lands may have merit and may be allowed if the applicant can clearly activities have a public benefit tha public cost. An example is the ripra eroding shorelines.

5.07 Table 5-1 shows how the Corps and for purposes of this plan, to adminis use policy.

TABLE 5-1 - CORPS-FWS ADMINISTRATION OF PRIVATE-USE POLICY IN THE ST. PAUL DISTRICT

	Now-1985	1985-1989
NEW STRUCTURES (Private)		
Inside Limited Development Areas	No (1)	No
Outside Limited Development Areas	No	No
NEW COMMUNITY DOCKS		
Inside Limited Development Areas	No	Yes
Outside Limited Development Areas	No	No
EXISTING COTTAGES UNDER LEASE	Yes (5)	Yes (5)
EXISTING STRUCTURES UNDER LICENSE		
Relicense to Existing Owner		
Inside or Outside Limited Development Areas	Yes	Yes
Relicense to New Owner		
Inside or Outside Limited Development Areas	Yes	Yes
Maintenance of Private-Use Existing Structure		
Inside or Outside Limited Development Areas	Yes	Yes
Replace or Reconstruct Existing Structure		
Inside or Outside Limited Development Areas	Yes	Yes
Expand or Relocate Private Structures		
Inside or Outside Limited Development Areas	No	No
EXISTING COMMUNITY DOCKS		
Inside Limited Development Areas	Yes	Yes
Outside Limited Development Areas	Yes	Yes

(1) No new permits according to Memorandum of Understanding.
(2) Begin grandfathering in January 1990, in accordance with Public Law 97-140.
(3) Community docks outside limited development areas may remain as long as they pass annual safety inspections.

(4) Limited to 25 percent of fair market value.
(5) No approval will be granted for reconstruction of severely damaged structures.

ant can clearly show that these
lic benefit that outweighs the
le is the riprapping of certain

ow the Corps and the FWS intend,
lan, to administer the private

AUL DISTRICT

085-1989	Jan 1, 1990
.....	No
.....	No
es.....	Yes
.....	No
es (5)	No
es	Yes(2)
es	No
es	Yes(4)
es	No
.....	No
es	Yes
es	Yes(3)

5.08 In the next phase of master planning, the St. Paul District will prepare an operational management plan (OMP) to further address the private recreation use issues. Specifically. limited development areas will be identified.

5.09 Table 5-1 indicates whether private recreation structures are permissible under stated conditions. Even though structures may be permitted under these management rules, they are subject to various Federal, State, and local permit requirements, and to lease or license conditions. The only new structures within the St. Paul District that may be allowed in limited development areas are community docks. Further information on community docks will also be in part III of this master plan. Table 5-1 also shows that holders of existing licenses for private structures will not be able to transfer their special-use licenses after December 31, 1989. Licensed private recreational structures or uses on Corps-administered land allowed after 1990 may be "grandfathered," to the license holder of record, subject to the following conditions:

- A use or structure can remain until replacement is required; or
- A use or structure can remain until the death of the permittee; or
- A use or structure can remain until the sale or other type of transfer of legal ownership or cessation of use of the facility.
- Cottage site leases will not be extended beyond December 31, 1989, in keeping with Federal floodplain management policies.

5.10 The District will treat any unauthorized use or structure as a trespass or an encroachment on public property. Such structures will be removed. Limited development areas generally will not be located on land that the land use allocation plan designates as intensive-use recreation areas, wildlife management areas, or natural areas. Low-density recreation lands will be primarily considered in designating limited development areas.

5. LAND USE ALLOCATION

5.11 Three existing public recreation leases allow local governments to issue permits for private recreation structures on Corps lands:

- Buffalo City - pool 5 (expires 1987).
- Brice Prairie Township (Lake Onalaska) - pool 7 (expires 1990).
- Guttenberg - pool 10 (expires 1997).

When these leases expire, these private structure areas will return to Corps control and the Corps private-use policy will apply.

Management of Private Use

5.12 General - The following paragraphs describe the Corps of Engineers authority and regulations for management of private use.

5.13 Authority:

- Title 16, United States Code, Section 460d - The Flood Control Act of 1944, now Title 16, United States Code, Section 460d, authorized the Chief of Engineers to construct, maintain, and operate public park and recreation facilities at Corps of Engineers water resource development projects. This law also authorizes the Chief of Engineers to lease project lands upon such terms for such purposes as he deems reasonable in the public interest. At a leased project, the water areas must be open to public use, and ready access to and exit from the water area along the shore must be maintained.

- Regulation - The Chief of Engineers exercised the authority granted him; and, in 1974, he published a regulation (ER 1130-2-406) that outlined his policy for management of the shoreline or lakeshore at Corps of Engineers civil works projects. That regulation is in Title 36, Code of Federal Regulations, section 327.30. The Chief of Engineers management policy states the following:

"It is the objective of th
private exclusive use of pub
degree necessary to gain maxi
general public. (ER 1130-2-4
and Title 36, Code of Fed
section 327.30(d)(1)).

It is the policy of the Chief
private exclusive use will n
new lakes or on lakes where
ties or uses exist as of
regulation. Such use will be
honor any past commitments wh
(ER 1130-2-406, paragraph 4
Code of Federal Regulations,
(2))."

5.14 The Chief of Engineers manageme
implemented by the Corps of Engine
Division, as provided in North
Supplement 1 to ER 1130-2-406. App
1, of the supplement states the foll

"It is the policy of the U.
Engineers that lands and
administers shall be managed
benefits to the overall ge
corollary of this policy is th
tional use may be permitted on
administered properties w
compatible with authorized p
Project purposes include, bu
to, navigation, flood damage p
recreation and fish and wildli

5.15 Past Commitments - Grandfatheri

- Regulation - Engineering Regu
2-406, paragraph 4b and Title 3
Regulations, Section 327.30(d
the policy of the Chief of Engi
past commitments regarding priv
uses on public lands.

- Grandfathering - As provided
discussed above, the grandfat
intended to consider the prior
implicit in the issuance of
residual value of a permitted
The grandfathering policy wi

objective of the Corps to manage
clusive use of public property to the
ssary to gain maximum benefits to the
blic. (ER 1130-2-406, paragraph 4a,
36, Code of Federal Regulations,
7.30(d)(1)).

olicy of the Chief of Engineers that
clusive use will not be permitted on
or on lakes where no private facili-
ses exist as of the date of this
Such use will be permitted only to
ast commitments which have been made.
-406, paragraph 4b, and, Title 36,
deral Regulations, section 327.30(d)

Engineers management policy has been
he Corps of Engineers, North Central
rovided in North Central Division
ER 1130-2-406. Appendix E, paragraph
ent states the following:

policy of the U.S. Army Corps of
that lands and waters which it
shall be managed so as to maximize
o the overall general public. A
f this policy is that private recrea-
may be permitted only on those Corps
red properties where such use is
with authorized project purposes.
rposes include, but are not limited
ion, flood damage prevention, public
and fish and wildlife management."

ents - Grandfathering:

- Engineering Regulation (ER) 1130-
raph 4b and Title 36, Code of Federal
, Section 327.30(d)(2), states that
f the Chief of Engineers is to honor
nents regarding private facilities or
ic lands.

ring - As provided in the regulations
bove, the grandfathering policy is
consider the prior Corps commitment
the issuance of permits and the
ue of a permitted structure or use.
thering policy will help protect permittees from inappropriate expenditures on their structures or uses. The process and policy provides for adequate warning so that no permittee should be surprised as to the implementation date.

5.16 Implementation Strategy

- Regulation - North Central Division (NCD) policy (NCD Supplement 1 to ER 1130-2-206, paragraph 3.e, October 12, 1982) states that "at projects where lawful permitted private recreational use exists, the District Engineer, or his authorized representative, will evaluate the compatibility of the permitted private recreational use with project purposes. Where such use is compatible with project purposes, the District Engineer may designate areas of Corps administered land for limited development."

LAND USE ALLOCATION DEFINITIONS

5.17 The land use allocation categories described below are based on criteria in Engineering Regulation (ER) 1120-2-400 and are modified to meet unique riverine conditions. Emergency operation requirements for navigation take priority over any of these five categories:

- Project Operations - These lands are required for siting or storing facilities, structures, or equipment necessary for authorized project purposes. This category includes lock and dam facilities, areas restricted for safety, major dredged material disposal sites, and Corps maintenance facilities. Recreational uses of such lands may be considered appropriate on a case-by-case basis.

- Recreation/Intensive-Use - These lands are allocated for use as developed public areas for intensive recreational activities, including areas for concessions and quasi-public development. An intensive recreation area is generally defined as a relatively small, distinctly defined area where concentrated public use for the more traditional recreation predominates, such as campgrounds, picnic areas, and

swimming areas. These areas generally require extensive facility development and maintenance.

• Recreation/Low-Density - These lands are allocated for nonintensive, low-density recreation use. Low-density or dispersed recreation occurs generally throughout a large area and is not confined to a specific place. This type of recreation includes scattered, individual outdoor recreation activities. Low-density recreation areas normally are not identified with developed facilities or with areas of intense group concentration. Typical activities on such lands include hiking, backpacking, hunting, fishing, primitive camping, horseback riding, and cross-country skiing. This allocation includes all recreation sites on Corps lands identified by GREAT I as recreation enhancement sites.

• Natural Areas - These lands are allocated to preserve scientific, ecological, historical, archeological, or aesthetic values and to protect threatened and endangered species. Public uses that do not adversely affect the protected resource may be allowed on a case-by-case basis.

• Wildlife Management - These lands are allocated for fish and wildlife and provide opportunities for wildlife/wildlands-related recreation. Hunting, fishing, trapping, bird watching, and photography are examples of such recreation. The lands will also be available for other traditional dispersed forms of public recreation such as primitive camping, boating, water skiing, sailing, canoeing, swimming, cross-country skiing, and hiking. The primary management emphasis is protection and enhancement of wildlife habitat values, recognizing traditional forms of public recreation at use levels that have proven compatible with wildlife. Designated portions of such lands are reserved as waterfowl sanctuaries ("closed areas") during migration periods. Such closed areas limit hunting and trapping. Limited development such as boat landings, access roads, trails, and parking areas are facilities that may be compatible with this allocation.

5.18 Recreation/low-density lan wildlife management lands primarily density of recreation use considered example, on low-density recreation lan habitat values of a site may be maintain recreation use levels. On ment lands, habitat values would tak recreation use levels.

5.19 This priority means that, if re under enough pressure from increased are unable to provide for wildlife n and the U.S. Fish and Wildlife Service the public to make resource managem necessary to protect the integrity of If future restrictions on use are n users would have adequate opportunitie their ideas before any change in implemented.

5.20 After site-specific planning a coordination between the Corps, FWS, dredged material could be placed on for recreation/intensive-use, recreati or wildlife management if it would s objectives in addition to project ope it is consistent with applicable State

5.21 The St. Paul District historica tracts of submerged land for such acti fleeting areas. In the future, the examine the appropriateness of prop light of allocations made on adjacent

LAND USE ALLOCATION

Introduction

5.22 Although the land use allocation planning document were prepared u Engineers planning guidelines, allocati Wildlife Service fee title lands ar Corps map plates. It was necessary t tions on the land of both agencies beca Corps fee title land is managed by Wildlife Service along with FWS fee cohesive management unit: the Upp National Wildlife and Fish Refuge.

-density lands differ from
ds primarily in terms of the
e considered acceptable. For
recreation lands, the wildlife
site may be compromised to
e levels. On wildlife manage
ues would take priority over

ns that, if refuge lands come
rom increased public use and
or wildlife needs, the Corps
dlife Service would work with
urce management adjustments
e integrity of wildlife lands.
on use are necessary, river
e opportunities to contribute
y change in management is

fic planning and appropriate
e Corps, FWS, and the States,
be placed on lands allocated
-use, recreation/low-density,
if it would serve management
o project operations, and if
plicable State laws.

ict historically has leased
for such activities as barge-
e future, the District will
eness of proposed leases in
de on adjacent dry land.

use allocations shown in this
prepared under Corps of
lines, allocations on Fish and
itle lands are shown on the
is necessary to show alloca-
agencies because most of the
is managed by the Fish and
with FWS fee title land as a
it: the Upper Mississippi
Fish Refuge. Since Corps-

administered fee title lands are so closely related to the Fish and Wildlife Service fee title lands, it would have been impractical and much less useful to allocate only the Corps portion of these lands.

5.23 The confusion and misconceptions resulting from the draft map plates (which showed Fish and Wildlife Service land uses through symbols) supports this view. The complete allocations delineated in the final map plates of this report show Corps and Fish and Wildlife Service ownership, consistent allocations between lands, and refuge boundaries.

5.24 These allocations illustrate how the lands of these two agencies combine to form the Upper Mississippi National Wildlife and Fish Refuge. For example, the plates clearly illustrate that not all project operation areas or recreation allocations are on Corps land and that not all wildlife management or natural areas are on Fish and Wildlife Service land.

5.25 In the development of land use allocations, certain systemwide guidelines were established that predetermined allocations for a very few areas, although most Federal land areas were considered individually during the allocation process. These general allocation guidelines included the following:

- All Corps-managed recreation areas were allocated at least in part as recreation/intensive-use because they were originally constructed as developed recreation areas.

- All GREAT I-recommended primitive camp/beach areas on Federal land were allocated as recreation/low-density.

- Existing sand beaches with significant historic recreational use or beaches in areas with projected demand were allocated as recreation/low-density.

- Existing dredged material containment areas and Corps facilities at the locks and dams (including levee areas) were allocated as project operations.

5. LAND USE ALLOCATION

- Archaeological sites listed on the National Register of Historic Places and significant areas of native prairie would be allocated as natural areas.

- Access points with limited, existing developments that primarily provide for hunting and fishing-related boat launches would be allocated as wildlife management.

- Access points with good access to the main channel that primarily serve recreational boat launching would be allocated as recreation/low-density.

5.26 Some allocation principles were developed and applied case by case. For example, on some island areas, beach sites were allocated as recreation/low-density although the rest of the island was allocated as wildlife management. This allocation method addressed both the recreational use of the beach site and the natural resource value of the island in question. The wildlife management allocation does not limit recreation use of the island to the recreation/low-density area, although only the recreation/low-density beach area would be managed and possibly maintained for recreation.

5.27 In some cases, allocations reflected both interim and ultimate uses. For example, where leases that are scheduled to expire soon would change the ultimate highest and best use of a tract of land, an allocation that reflects this ultimate use was chosen. The allocations do not reflect only existing or interim uses, and the plates should not be perceived as traditional land use maps that only reflect existing uses. The plan is a management tool and is not intended to represent only existing conditions.

5.28 The following paragraphs summarize land use allocations of Corps and Fish and Wildlife Service lands from the St. Anthony Falls pools in Minneapolis, Minnesota, to lock and dam 10 in Guttenberg, Iowa. Specific allocations of various Federal land areas are discussed.

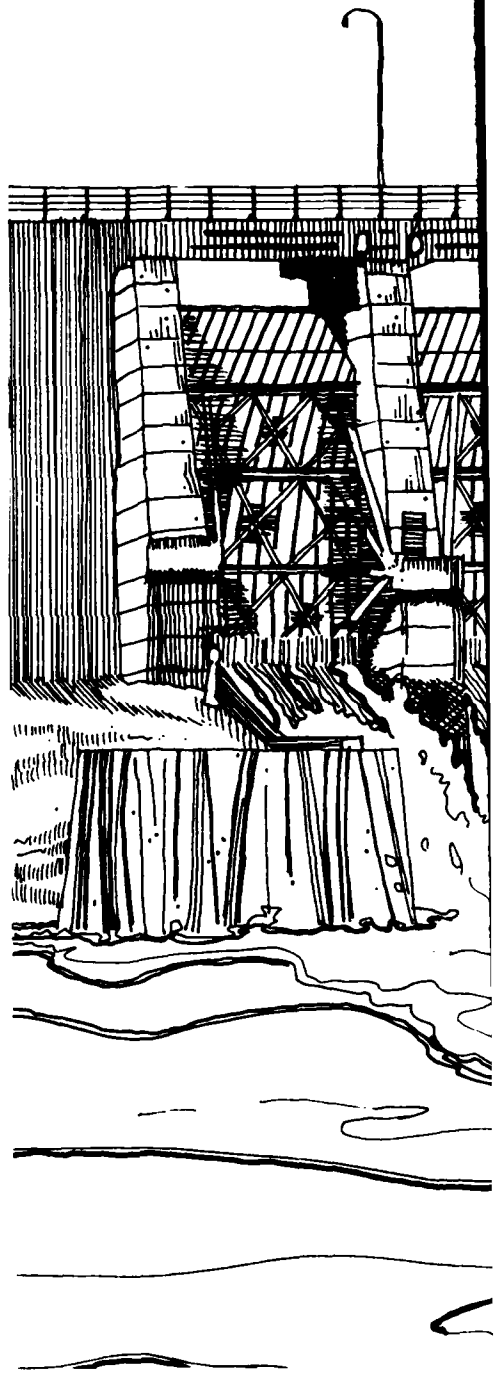
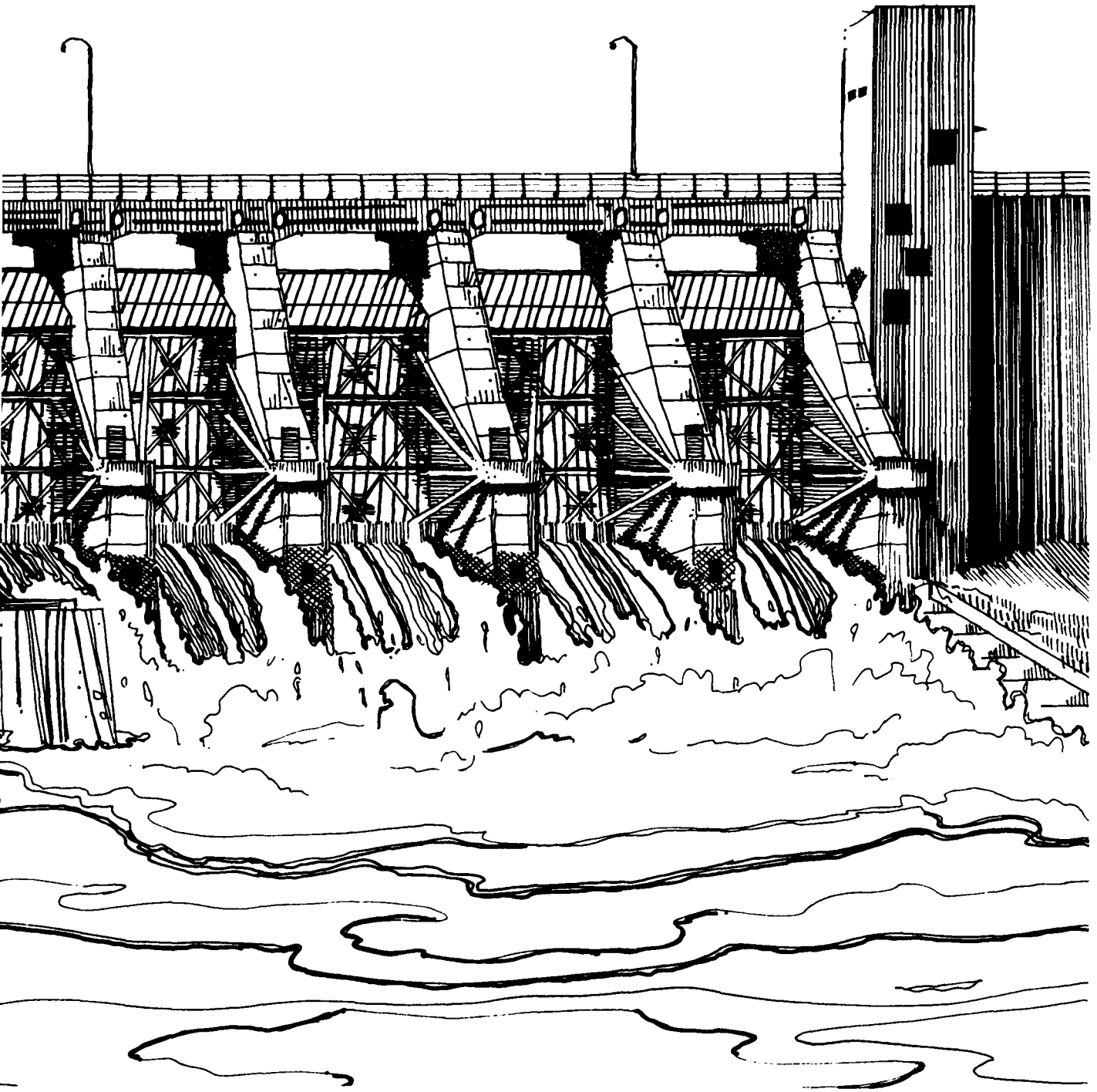


FIGURE 5-2.The pool system created by construc conflict with one another and result in mult agencies and involved individuals a critical system.



em created by construction of the many dams on the river serve other valid purposes. In many instances, these other purposes seem to her and result in multiple demands on similar resources. These multiple demands make the working relationships between managing ndividuals a critical concern. How they work together in the future will significantly influence the overall character of the river

5. LAND USE ALLOCATION

LAND USE ALLOCATION BY POOL

Upper and Lower St. Anthony Falls and Pool 1 (Plates 1 - 3)

5.29 Audited accounts of Federal lands in these pools show that the Corps of Engineers has acquired and presently administers approximately 45 acres of federally-owned land and water areas: 12 acres in the St. Anthony Falls area and 33 acres in pool 1. Only about 16 acres of land near pool 1, 4 acres of land adjacent to Lower St. Anthony Falls pool, and 2 acres at Upper St. Anthony Falls pool are above the water surface. These lands are used primarily for lock and dam facilities such as the control structures, parking areas, and access roads. About 1.6 acres of the project lands in Lower St. Anthony Falls pool are leased to the Shiely Sand and Gravel Company for a storage yard and concrete plant. Most of these areas have been allocated as project operations. The shoreline area upstream of the Ford Plant Bridge and the islands immediately below lock and dam 1 have been allocated as recreation/low-density.

5.30 Proposed use of Corps land at St. Anthony Falls for the city of Minneapolis West River Parkway project is compatible with the project operations allocation as long as the parking, access, and operational concerns of the Corps are adequately resolved.

Pool 2 (Plates 3 - 9)

5.31 Audited accounts of Federal lands show that the Corps of Engineers has acquired and presently administers approximately 1,220 acres of Federally-owned land and water in the lock and dam 2 area. Because of the manner of acquisition (which generally provided for overlap of property into the adjacent pool at the structure sites), only a small portion of the total area actually lies within pool 2 above lock and dam 2, with the rest below the lock and dam complex. Only about 55 acres of this land are above the water surface in pool 2, mostly in the chain of small islands immediately upstream from the lock and dam on the right side of the main channel. These islands have been allocated as recreation/low-density but they have limited recreation potential until the water quality in pool 2 improves.

Pool 3 (Plates 9 - 14)

5.32 The Corps of Engineers holds title in pool 3. Of this total, managed as part of the Gores Wildli under a license agreement wit Department of Natural Resources.

5.33 Although this pool is within ar the Twin Cities, limited road ac intermittently poor water quali recreation facility development significantly limited user interest the Mississippi. In contrast, pressure on the St. Croix, which quality plus better access and fac documented. User trends over the indicate that pool 3 is receiving in however, with users coming primar Cities. Most of the open-water rec in pool 3 occurs near the mouth River, near Hastings and Diamond B the third highest open-water boat us Survey, 1976).

5.34 Eleven dredged material islan were identified during the GREAT I September 5, 1976. Two of these are use (miles 807.5R and 799.4R). recommended primitive recreation si at miles 807.5R, 805.5R, 802.3R, and sites have been allocated as recre This allocation is consistent w recommendations.

5.35 Two recreation sites are on Fed 3: Lake Rebecca Park (leased to the Minnesota) and Sturgeon Lake Access Allocations at Lake Rebecca Park between recreation/intensive-use, density, and wildlife management. delineate distinct use areas development plan for the park (Cor 1978). The Corps Sturgeon Lake Acc for recreation/intensive-use, as operated access areas. This and operated sites in other pools are m for intensive recreation.

5.36 Portions of Prescott Island ar the Minnesota Department of Natur wildlife management and have be

ers holds 5,610 acres in fee
iis total, 4,122 acres are
ires Wildlife Management Area
ment with the Minnesota
ources.

s within an hour's drive from
ed road access to the pool,
ter quality, and limited
velopment have in the past
r interest in this portion of
contrast, the intense use
ix, which has higher water
ess and facilities, is well
is over the last few years
eceiving increasing pressure,
ing primarily from the Twin
n-water recreational boating
the mouth of the St. Croix
i Diamond Bluff. Pool 3 has
ater boat use (GREAT I Aerial

erial islands/beaches/camps
the GREAT I Aerial Survey on
of these areas receive "heavy"
d 799.4R). Four GREAT I-
ecreation sites are in pool 3
802.3R, and 799.4R. All four
ed as recreation/low-density.
nsistent with the GREAT I

s are on Federal lands in pool
eased to the city of Hastings,
Lake Access (Corps-operated).
oecca Park divide the area
ensive-use, recreation/low-
anagement. The allocations
se areas outlined in the
ne park (Corps of Engineers,
eon Lake Access was allocated
ve-use, as were most Corps-
This and similar Corps-
pools are managed primarily

tt Island are under lease to
nt of Natural Resources for
nd have been allocated as

wildlife management lands. The remaining island area was allocated as recreation/low-density.

5.37 The only project operations allocation in the pool is the Corps lock and dam site. Most of the remaining Federal land in pool 3 is managed as part of the Gores Wildlife Management Area under a license agreement with the Minnesota Department of Natural Resources. Within this area is the DNR's North Lake Access. The Gores Wildlife Management Area is allocated as wildlife management, with the exception of the recreation/low-density areas associated with the GREAT I-recommended recreation sites discussed earlier.

Pool 4 (Plates 14 - 27)

5.38 The Corps of Engineers has acquired in fee title about 2,900 acres of land and water. The U.S. Fish and Wildlife Service administers 6,035 acres that it holds in fee title. Of the 2,900 acres of Corps-owned land and water, about 2,898 acres have been made available to the Fish and Wildlife Service as part of the Upper Mississippi National Wildlife and Fish Refuge for management in conjunction with FWS-owned lands. About 2 acres of Corps land at lock and dam 4 have been retained for Corps use and are outside the Upper Mississippi National Wildlife and Fish Refuge.

5.39 In pool 4, Federal lands extend from lock and dam 4 upstream to the Chippewa River. No federally-owned lands are located on Lake Pepin, which lies between the Chippewa River and lock and dam 3. Just below lock and dam 3, about 138 acres on the Minnesota side of the old channel were acquired by the Corps in connection with work on the lower approach channel to lock 3. Although these 138 acres are actually in pool 4, Federal audit records relate the land to pool 3 and the lock and dam 3 project. Therefore, these 138 acres are not included in the 2,900 acres of Corps lands acquired as pool 4 lands.

5.40 About 6,600 acres of federally-owned lands in pool 4 are above the normal flat pool elevation of 667.0. The Fish and Wildlife Service has jurisdiction over 4,840 acres, all in the refuge area downstream from the Chippewa River. The Corps of Engineers has jurisdiction over 1,760 acres, with about 1,605 acres downstream from the Chippewa River and about 155 acres immediately downstream of lock and dam 3. These 155 acres represent an increase over the originally

acquired 138 acres. The additional 17 acres resulted from accretion and from the deposition of dredged material.

5.41 Most of the open water recreational boating in pool 4 occurs on Lake Pepin. However, the dredged material beach areas below the Chippewa River are the third-most heavily-used areas within the study area (GREAT I Aerial Survey, 1976). Only pools 9 and 10 have more island/beach camp recreation.

5.42 Although 12 sites on Federal land along the main channel have been allocated as recreation/low-density, few Federal land areas are accessible by wheeled vehicles or have characteristics suitable for development of recreation facilities. Six GREAT I-recommended primitive camp areas are in pool 4. Three of these channel-side sites are on Federal land (miles 759.5L, 756.2R, and 753.3R). All three of these sites have been allocated as recreation/low-density areas.

5.43 *Indian Slough Landing, on the Wisconsin Highway* 25 causeway adjacent to the main channel, was allocated as recreation/low-density. This site on Corps land is operated and maintained by the FWS and Buffalo County, Wisconsin. The ramp provides access to the main channel and is used for recreation-related launches and hunting/fishing-related launches. Pontoon Slough and Beef Slough Landings are also on the Highway 24 causeway but serve primarily the backwater area with hunting and fishing launches. The latter two landings have been allocated for wildlife management and are managed and operated by the FWS and Buffalo County. Peterson Lake Landing (FWS) near RM 754 on the Minnesota side was also allocated as wildlife management because it serves primarily hunting/fishing-oriented launches and has limited facilities.

5.44 Federal lands that comprise the Nelson Trevino Research Natural Area (extending from the Chippewa River to the State Highway 25 causeway) were allocated as a natural area with the exception of the Reads Landing project operations area and an adjacent recreation/low-density beach area. The Nelson Trevino Research Natural Area is part of the Upper Mississippi National Wildlife and Fish Refuge.

5.45 Two Corps land areas in pool 4 are leased for public recreational purposes: Riecks Lake Park and a highway wayside park. Riecks Lak site, adjacent to Buffalo Slough, of Alma, Wisconsin. Developed p were allocated as recreation/i undeveloped shoreline below t allocated as wildlife management. Highway Commission has a license acre site as a wayside park in the Lake Park. This wayside park is recreation/intensive-use.

5.46 Remaining Federal lands in po as wildlife management and are mai Upper Mississippi National Wildlif

Pool 5 (Plates 27 - 31)

5.47 The Corps of Engineers has ac administers about 7,550 acres of and it holds special rights on a acres administered by the Fish ar Of the 7,550 acres of Corps-adm water area, the Fish and Wildli most as part of the Upper Mi Wildlife and Fish Refuge in conjunc lands. About 2 acres of Corps lan have been retained for exclusive pool 5 Federal lands owned in fee acres are above the normal flat 660.0.

5.48 Data from the GREAT I Aerial 1976) indicated an open-water b approximately one boat per 130 w with an additional 35 boats pu This is a very low density for re Most of the recreational boating upper third of the pool. The Wea heavily used for hunting. island/beach areas at river experience moderate recreational

5.49 Three sites (miles 749.7L, were recommended by GREAT I as areas. In addition, the GREA reported beached boats at eight boats were observed on only three I sites have been allocated as rec consistent with the GREAT I maintain these sites as recreatio

park. Riecks Lake Park is a 12-acre
o Buffalo Slough, leased to the city
sin. Developed portions of the site
as recreation/intensive-use while
ioreline below the boat ramp was
dlife management. The Wisconsin State
sion has a license to operate a 1.40-
ayside park in the vicinity of Riecks
s wayside park is also allocated as
sive-use.

ederal lands in pool 4 were allocated
gement and are managed as part of the
i National Wildlife and Fish Refuge.

31)

Engineers has acquired and presently
t 7,550 acres of land and water area,
cial rights on an additional 1,350
ed by the Fish and Wildlife Service.
es of Corps-administered land and
Fish and Wildlife Service manages
f the Upper Mississippi National
Refuge in conjunction with FWS-owned
cres of Corps lands at lock and dam 5
ed for exclusive Corps use. Of the
nds owned in fee title, about 5,150
the normal flat pool elevation of

e GREAT I Aerial Survey (September 5,
an open-water boat-use density of
e boat per 130 water acres in pool 5
al 35 boats pulled onto sandbars.
w density for recreational boating.
ational boating activity is in the
e pool. The Weaver Bottoms Area is
or hunting. Dredged material
eas at river miles 749 and 745
e recreational use.

(miles 749.7L, 743.6R, and 741.6R)
by GREAT I as primitive camp/beach
tion, the GREAT I Aerial Survey
boats at eight sites. Five or more
ed on only three sites. These GREAT
allocated as recreation/low-density,
the GREAT I recommendations to
es as recreation beaches.

5.50 Seven other existing beach areas have been allocated as recreation/low-density. Although recreation use of some of these areas is presently low, their highest and best use is for recreational purposes. Past dredging practices have created an abundance of sandy beach areas in mid-pool, adjacent to Weaver Bottoms.

5.51 Lower Spring Lake Landing has been allocated as recreation/low-density because it has more developed site facilities than access points allocated as wildlife management. The Buffalo City Landing and Belvidere Landing are in shoreline areas allocated as recreation/low-density.

5.52 Half Moon Landing, Pritchard Landing, Weaver Landing, and Upper Spring Lake Landing are in areas allocated as wildlife management and serve hunting and fishing launches. Consequently, these areas are allocated as wildlife management.

5.53 The existing dredged material disposal sites, West Newton Site 5.18 (mile 745.9R) and the Lost Island Site (mile 745L), have both been allocated as project operations, as have the lock and dam and the lower pool levee.

5.54 Most of the shoreline area leased to Buffalo City, Wisconsin, for public park and recreation purposes is allocated as recreaton/low-density. When the lease expires in 1987, private-use structures along this shoreline will return to Corps control and will be subject to the special-use license grandfathering policy outlined in this plan.

5.55 The West Newton Chute shoreline (mile 749R) is allocated as recreation/low-density. Its location (adjacent to the side channel with access to the main channel) provides potential for future recreational development. Special-use licenses along this shoreline are subject to the grandfathering policy outlined elsewhere in this plan.

5.56 Three Corps-owned sites on the Minnesota side adjacent to John Latch State Park are allocated as recreation/low-density. Future consideration will be given to transfer of management responsibility of these tracts to the State.

5. LAND USE ALLOCATION

5.57 Remaining Federal lands in pool 5 are allocated for wildlife management. These areas are managed as part of the Upper Mississippi National Wildlife and Fish Refuge.

Pool 5A (Plates 31 - 33)

5.58 The Corps of Engineers has acquired about 3,900 acres of Federally-owned land and water area, and it holds special rights on an additional 1,200 acres administered by the Fish and Wildlife Service. Of the 3,900 acres of Corps-administered land and water, the Fish and Wildlife Service manages about 3,870 acres as part of the Upper Mississippi National Wildlife and Fish Refuge in conjunction with FWS-owned lands. About 30 acres of Corps lands at lock and dam 5A and at the Corps of Engineers Fountain City Service Base have been retained for exclusive Corps use. Of the Federal lands owned in fee in pool 5A, about 3,000 acres are above the normal flat pool elevation of 651.0 msl. Of this total, 2,700 acres are under jurisdiction of the Corps of Engineers, and 1,300 are under jurisdiction of the FWS.

5.59 No GREAT I-recommended sites for primitive camp/beaches are in pool 5A, although recreational boating activity occurs in the middle pool area at sand beaches created by historic dredged material disposal. The GREAT I Aerial Survey on September 5, 1976, revealed 10 beaching sites used by recreational boats in pool 5A. The heaviest concentration of boats occurred at mile 730.0L and between miles 735 and 734. These sites accounted for nearly 80 percent of the beached boats observed in pool 5A. The most popular site, a past dredged material disposal area between mile 735 and 734, is State of Wisconsin land. The site at mile 730L at GREAT I disposal site 5A.08 was allocated as project operations, with beach areas at the site allocated as recreation/low-density. Two additional sites on Federal land at mile 734R and L were allocated as recreation/low-density to support the mid-pool recreational use occurring there.

5.60 Other Federal lands allocated for recreation include the 11-acre Minnesota City Boat Club (intensive-use) area, a 1.3-acre Wisconsin Highway Department wayside park and an area used as part of the Winona Prairie Island Park, all leased from the Corps.

5.61 Areas of Federal land allc operations include the Corps Foun Base, the lock and dam 5 facil structure along the lower pool area disposal site 5A.08 at mile 730.5.

5.62 Two areas adjacent to the lo Winona, Minnesota are allocated because of the presence of native pr are important to local educational natural area allocation will not ad of the boat ramps at Upper and Lowe

5.63 The remaining Federal lands allocated as wildlife management an Mississippi National Wildlife and Minnesota City Boat Club lease, t Park tract, the Fountain City Servic pool levee, and the lock and dam 5 only Federal land areas outside of t

Pool 6 (Plates 33 - 38)

5.64 The Corps of Engineers has ac acres of Federally-owned land and wa area. About 1,470 acres are owned an the U.S. Fish and Wildlife Servic Wildlife Service manages most of Corps property as part of the Up National Wildlife and Fish Refuge in FWS-owned lands. The only Federal the refuge are about 2 acres of Cor and dam 6, a portion of the Port Aut barge-fleeting lease site, the Corps of Winona's Prairie Island Park, and a dredging company for a harbor and

5.65 Of the Federal lands owned i about 1,640 acres are above the elevation of 645.5. Of this total administered by the Corps of Engi acres are administered by the FWS. FWS manages the 5,617-acre Tremp Wildlife Refuge, which is physicall pool 6 by the Burlington Northern Ra

5.66 The entire pool is used heavily boating, although most of the be limited to the mid-pool area. Eig

land allocated as project
Corps Fountain City Service
im 5 facilities, the levee
r pool area, and the historic
ile 730.5.

; to the lower pool levee at
allocated as natural areas
of native prairie species that
educational institutions. The
will not adversely affect use
er and Lower McNally Landing.

deral lands in pool 5A are
nagement and are in the Upper
ldlife and Fish Refuge. The
ub lease, the Prairie Island
City Service Base, the lower
and dam 5 facilities are the
outside of the refuge.

eers has acquired about 330
land and water in the pool 6
are owned and administered by
ife Service. The Fish and
s most of the 330 acres of
of the Upper Mississippi
h Refuge in conjunction with
ly Federal lands outside of
cres of Corps lands at lock
he Port Authority of Winona
the Corps tract in the city
Park, and an area leased to
harbor and storage site.

ds owned in fee in pool 6,
bove the normal flat pool
this total, 300 acres are
ps of Engineers, and 1,340
the FWS. In addition, the
acre Trempealeau National
physically separated from
Northern Railroad tracks.

ed heavily for recreational
of the beaching sites are
area. Eight boat beaching

sites were identified in the GREAT I Aerial Survey (September 5, 1976). The majority of sites and beached boats were observed between miles 720 and 724. Most of this historic recreational use occurs on non-federal land.

5.67 Five Federal land areas in pool 6 are allocated as recreation/low-density. A beach area immediately below lock and dam 5A has been allocated as recreation/low-density because of its potential as a recreational lockage waiting area. "Mosquito Island," a heavily used sandy beach site at mile 722, is allocated as recreation/low-density. An island beach area above lock and dam 6 has been allocated as recreation/low-density, as has the mainshore area above the lock, at Trempealeau, which is the site of proposed marina development. Most of an 11-acre site above the lock and dam on the Minnesota side (currently leased to a dredging company for equipment storage and harbor use) has been allocated as recreation/low-density because of the site's accessibility. An area of the site not affected by the dredging company operation has been allocated for wildlife management. A small tract of Corps land leased by the city of Winona as part of that city's Prairie island Park is allocated as recreation/intensive-use.

5.68 Project operation allocations include the lock and dam facilities plus an area at Yeomans Pond (mile 727) leased to the Port Authority of Winona for barge fleeting. The remaining Federal land in pool 6 is allocated as wildlife management. The bulk of this land is owned by the FWS, which administers it as part of the Trempealeau National Wildlife Refuge. Other wildlife management lands in the pool are part of the Upper Mississippi River National Wildlife and Fish Refuge.

Pool 7 (Plates 38 - 42)

5.69 Approximately 14,300 acres are held in fee by the Federal Government in pool 7. Of this total, 7,000 acres are under the jurisdiction of the Corps, and 7,300 acres are under the jurisdiction of the FWS. All Corps lands except the project operations site at Trempealeau, Wisconsin, and the Nelson Park recreation site are part of the Upper Mississippi National Wildlife and Fish Refuge. Of the Federal lands owned in fee, about 7,100 acres are above the normal flat pool elevation of 639.0.

5. LAND USE ALLOCATION

5.70 Pool 7 ranks fourth in recreational use among the 13 in the study area (according to the 1976 GREAT I Aerial Survey use counts). Recreational users come primarily from the La Crosse, Wisconsin, area even though that city's river frontage is in pool 8.

5.71 The GREAT I Aerial Survey reported eight beaching sites being used by four or more boats in pool 7. In pool 7, 70 boats were observed on beach sites adjacent to the main channel. The heaviest concentrations of boats were at miles 705.0L, 706.5L, and 709.0L. Because of their heavy use concentrations, seven sites, including miles 705.0L and 709.0L, were recommended by GREAT I for maintenance or development as primitive camp/beach sites. The other five GREAT I recreation sites are at miles 713.8R, 713.0L, 711.7R (lower Richmond Island), 706.5R (Dakota Island), and 703L (lower Dresbach Island). All seven of these sites are on Federal land, and all have been allocated as recreation/low-density. In addition, three other channel-side sites were allocated as recreation/low-density: the shoreline between miles 712L and 713L, the shoreline across the channel from Dakota Island, and a portion of upper Dresbach Island.

5.72 Allocating two shoreline areas at Dresbach Island as recreation/low-density while allocating most of the island as wildlife management addresses both the recreation demand in this area and the natural resource value assigned the island by Minnesota DNR and FWS personnel. A similar approach was used in allocating other recreation beach areas on islands with high resource value for wildlife (for example, Richmond Island in this same pool).

5.73 Nelson Park and the Wisconsin Sailing Club site at the upper end of French Island (both leased from the Corps for recreational purposes) are the only areas in pool 7 allocated as recreation/intensive-use. A number of access points and commercial sites leased from the Corps were allocated as recreation/low-density, including the launch area below lock and dam 6, Upper Brice Prairie Landing, Red Sails Resort, Lake Onalaska/Schafer's Landing, Fisherman's Road Landing, and the Upper and Lower Dike 7 Landing. Three upper pool backwater landings (Long Lake, Round Lake, and Lone Tree Landings) are allocated as wildlife management because they have limited facilities and serve primarily fish and wildlife-oriented boaters.

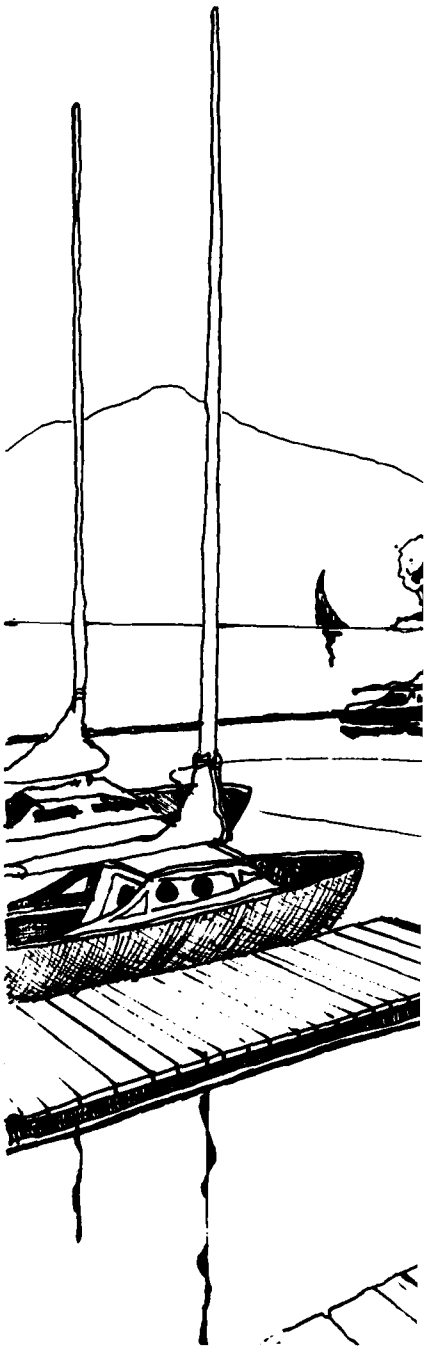
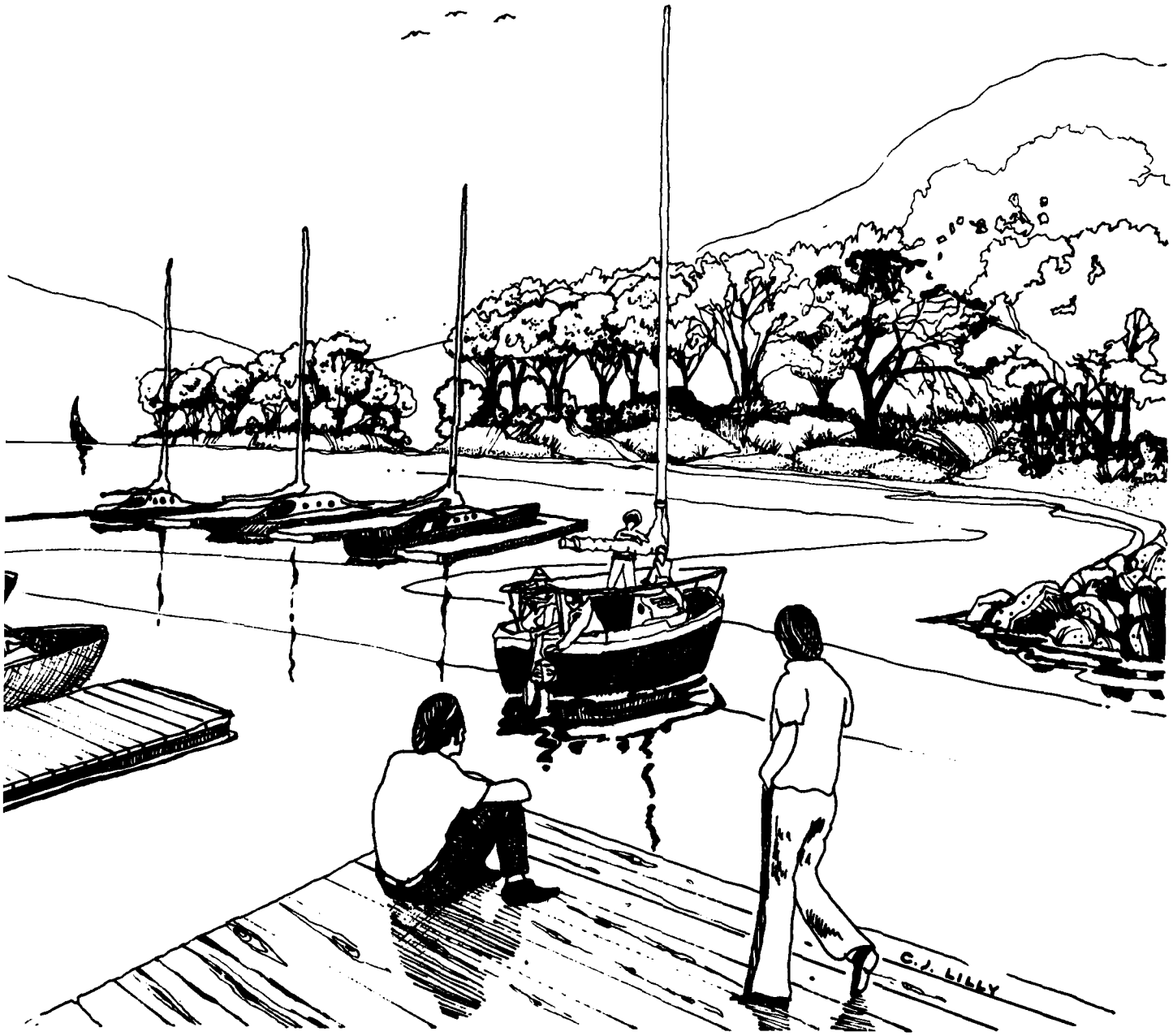


FIGURE 5-3. River navigation is not re Future trends indicate that recreation river. Many harbors provide excellent Wisconsin; and Lansing, Iowa.



gation is not restricted to commercial traffic. During the summer months, large numbers of recreational boats travel on the river. that recreational boating will continue to grow. To accommodate these craft, many small-boat harbors have been constructed along the provide excellent "bases" for recreational craft, including the harbors at St. Paul, Hastings, Wabasha, and Winona, Minnesota; Bay City, g, Iowa.

5. LAND USE ALLOCATION

5.74 Project operation allocations include the lock and dam 7 dike, the Onalaska spillway, and the long-term dredged material disposal site 5A.32 adjacent to lock and dam 6 at Trempealeau. The remaining Federal land in pool 7 is primarily suited as refuge and is allocated as wildlife management. These and other areas are managed as part of the Fish and Wildlife Service Upper Mississippi National Wildlife and Fish Refuge.

5.75 The Lake Onalaska shoreline on the Wisconsin side (under lease to Brice Prairie Township for recreational purposes) is allocated as wildlife management. When the current lease expires in 1990, the permits for private structures along this shoreline will return to Corps control and will be subject to the private structure grandfathering policy described earlier. The unique wildlife values at Lake Onalaska are not duplicated elsewhere in the Upper Mississippi National Wildlife and Fish Refuge. Corps and FWS planners and resource managers determined that the highest and best allocation and future use for this shoreline is wildlife management. The wildlife management allocation allows management continuity for long-term wildlife protection and production.

Pool 8 (Plates 42 - 48)

5.76 Approximately 24,090 acres of combined land and water area are held in fee by the Federal Government in pool 8. Of this total, 9,500 acres are under the jurisdiction of the Corps,and 14,590 acres are under the jurisdiction of the FWS. About 10,390 acres of the Federal lands owned in fee in pool 8 are above the normal flat pool elevation of 631.0. Of this total, 3,950 acres are under the jurisdiction of the Corps and 6,340 acres are under the jurisdiction of the FWS.

5.77 Only the Corps lock and dam facilities and the recreation lease areas at Goose Island and Wildcat Park are not included in the boundaries of the Upper Mississippi National Wildlife and Fish Refuge. Heavy recreation use of main channel islands occurs in the mid-pool area adjacent to Lawrence Lake and Wildcat Park. Below Brownsville, Minnesota, and Wildcat Park is a broad expanse of relatively open water with numerous stump fields, shallow water, and few islands or shorelines suitable for beaching. These conditions limit recreational use of the lower pool area.

5.78 In pool 8, the GREAT I Aeria
beaching sites with four or more
survey also reported 578 private
pool. The GREAT I main report r
miles 702.3L and 686-689LR to
primitive camp/beach sites. These
as recreation/low-density. Six ad
the mid-pool main channel
recreation/low-density, including
694.6R, 692.5L, 691.5L, 690.7R,
689.5L. The FWS I-90 Landing i
allocated as recreation/low-den
proximity to the main channe
recreational launchings. Three Co
public park purposes (Goose Island
and Stoddard Park) were
recreation/intensive-use.

5.79 Large areas of sandy soil abo
make the Goose Island area the la
land in the study area suite
development. Goose Island Park (
by La Crosse County) is operated
park with regional use. The d
north of the La Crosse-Vernon Cou
as recreation/intensive-use. The
of the county line (recently add
boat access improvements and tr
allocated as recreation/low-
exception of three natural areas
site listed on the National Re
Places at the county line ramp has
natural area. The county line r
and intensive recreational us
preservation of this archeolog
restricted. Two sites in the 7
lease are managed by the FWS as
areas. These sites have been a
areas. These two prairie area
Mississippi National Wildlife an
the remainder of the 717-acre
outside the refuge boundary. O
Island outside of the recreat
allocated as recreation/low-de
management. These areas are
boundaries.

5.80 Houston County's Wildcat Pa
is on Corps and FWS lands. The
with its boat ramp, concession,
allocated as recreation/intensiv

: GREAT I Aerial Survey recorded 12
:h four or more boats present. The
ed 578 private boats moored in the
main report recommended areas at
686-689LR to be maintained as
ch sites. These sites are allocated
lensity. Six additional areas along
:in channel are allocated as
sity, including beach areas at miles
91.5L, 690.7R, 690.5R, and 689.0-
I-90 Landing in the upper pool is
eation/low-density because of its
e main channel and its use for
nings. Three Corps areas leased for
es (Goose Island Park, Wildcat Park,
Park) were allocated as
ve-use.

f sandy soil above normal pool level
and area the largest tract of Corps
dy area suited for recreational
e Island Park (leased from the Corps
:y) is operated as a 717-acre county
al use. The developed lease area
osse-Vernon County line is allocated
nsive-use. The 72-acre area south
e (recently added to the lease for
vements and trail development) is
creation/low-density, with the
e natural areas. An archeological
he National Register of Historic
ty line ramp has been allocated as a
e county line ramp has been closed,
creational use that threatened
this archeological site has been
sites in the 72-acre lower island
by the FWS as native prairie grass
es have been allocated as natural
o prairie areas are in the Upper
al Wildlife and Fish Refuge while
the 717-acre recreation lease is
je boundary. Other areas at Goose
f the recreation lease area are
reation/low-density and wildlife
se areas are within the refuge

ty's Wildcat Park below Brownsville
WS lands. The developed park area
, concession, and camping area was
ation/intensive-use. Undeveloped
park area was allocated as wildlife management. The 12.9-acre park leased to the village of Stoddard, Wisconsin, has been allocated as recreation/intensive-use and recreation/low-density. There are several existing cottage leases along this shoreline area which expire in 1988. These cottage sites have been allocated as recreation/intensive-use because of the area's recreational development potential. Part III of the Corps master plan (plan of development) will address the future use and possible development of this area.

5.81 The Lawrence Lake Marina, owned by the FWS and operated by private concerns, has been allocated as recreation/low-density. Gary Candahl Park, owned by the FWS and leased to Houston County, Minnesota, has also been allocated as recreation/low-density. This park is operated as a campground and access site under a commercial sub-lease from Houston County.

Pool 9 (Plates 48 - 57)

5.82 The Corps of Engineers has acquired about 8,710 acres of federally-owned land and water areas in pool 9, and it holds special rights on an additional 25,050 acres that the FWS administers in pool 9. All of the 8,710 acres of Corps-administered land except the Corps recreation areas at Blackhawk Park, Millstone Landing, and Bad Axe Landing, and the lock and dam site have been made available to the FWS for inclusion in the Upper Mississippi National Wildlife and Fish Refuge and for management in conjunction with FWS-owned lands. About 8 acres of Corps lands at lock and dam 9 have been retained for exclusive Corps use. Of the Federal lands owned in fee in pool 9, about 18,790 acres are above the normal flat pool elevation of 620.0. Of this total, 6,620 acres are under jurisdicton of the Corps of Engineers, and 12,170 acres are under jurisdiction of the FWS.

5.83 Pool 9 experiences moderate- to high-density boating in the Lansing Bend area (miles 664-666) and relatively low-density use elsewhere in the pool (GREAT I Aerial Survey, 1976). The Lansing Bend area experiences a great deal of congestion because of the availability of sand beach and camping areas and because of its proximity to the town of Lansing, Iowa, and accompanying services. Houseboat rentals available at McGregor, Iowa (which are restricted to pools 9 and 10), account for some of the high houseboat use in pool 9. Fishing, hunting, and

5. LAND USE ALLOCATION

canoeing will continue to be low density because there are more water surface acres accessible for these activities.

5.84 Development, redevelopment, or expansion of sand beach and camping areas elsewhere in the pool - away from the Lansing Bend - should provide additional recreation use and should reduce the congestion near Lansing. Four GREAT I-recommended primitive camp/beach sites are in pool 9: at miles 664.0R, 664.5L, 665-665.5R, and 678.9R. The recommended action for all these sites is to maintain them as beach areas by placing small quantities of dredged material at each site. These four sites are all on Federal land and have been allocated as recreation/low-density. An additional 10 beach sites adjacent to the main channel are allocated as recreation/low-density. The Corps-operated access sites at Bad Axe Landing and Millstone Landing were allocated as recreation/intensive-use.

5.85 The Corps-operated Blackhawk Park, the only major park in this pool, is allocated as recreation/intensive-use. Part III of this master plan (plan for development) will address reorganization of activity areas and improved circulation at the park.

5.86 Winneshiek Landing on Fish and Wildlife Service land is maintained by FWS and the Wisconsin Department of Transportation. It is allocated as recreation/low-density because of proposed site redevelopment by the maintaining agencies. Visger Landing, New Albin Landing, Big Slough Landing, and Cold Springs Landing (all on Federal land) are allocated as wildlife management because they serve primarily wildlife-oriented hunting and fishing boat launches.

5.87 Areas of Federal land allocated as project operations include a disposal site at Lansing Bend (mile 664.3R), a shoreline protection area south of Lansing (mile 662) and the lock and dam 9 structures and associated levee. A small tract of land below Lynxville, Wisconsin is leased by the Crawford County, Wisconsin, Highway Department for highway equipment storage. This small tract also has been allocated as project operations.

5.88 The Federal lands that make up the Fish and Wildlife Service Reno Bottoms Research Natural Area in the Upper Mississippi National Wildlife and Fish Refuge have been allocated under the natu category. Remaining Federal holdings in po allocated as wildlife management and are inc the Upper Mississippi National Wildlife Refuge, as are other Federal lands in the po the exception of those noted earlier.

Pool 10 (Plates 57 - 66)

5.89 The Corps of Engineers has acquired abo acres of land and water areas, and holds rights on an additional 5,340 acres adminis the FWS in pool 10. Of the 3,720 acres of administered land and water area, most are ma the FWS in conjunction with FWS-owned lands as the Upper Mississippi National Wildlife a Refuge.

5.90 Of the Federal lands owned in fee title 10, about 11,100 acres are above the normal f elevation of 611.0. Of this total, 2,260 ac under the jurisdiction of the Corps, and 8,84 are under the jurisdiction of the FWS. A rel small portion of the total above-water Feder consists of high, firm ground suitable for deve and use for land-based recreational activitie relatively low pollution level of the pool encourages water-contact sports.

5.91 Pool 10 experiences moderate- to high- boating activity immediately south of lock an in the Gordons Bay Islands-Jackson Island-Du Creek area and near the upstream end of Wy Slough (across from the Wyalusing Public A these areas all have sand beaches/islands available. The Gordons Bay Islands-Jackson Is Charme Creek area is used heavily by housebo runabouts. Many of the houseboats are renta from McGregor, which are restricted to pools 9 Because Gordons Bay and Du Charme Creek Isla low-lying and sometimes submerged, they are not for recreation during the season. In ad approximately 760 boats are privately moored pool (GREAT I Aerial Survey, 1976). There ar concentrations of private boats and marina between lock and dam 10 and Clayton, Iowa, and the U.S. Highway 18 bridge (Marquette-Prairie D bridge/causeway) and lock and dam 9.

5.92 The GREAT I Aerial Survey also recorded 10 that 15 beaching sites are used by b

been allocated under the natural area
emaining Federal holdings in pool 9 are
wildlife management and are included in
ississippi National Wildlife and Fish
re other Federal lands in the pool, with
of those noted earlier.

s 57 - 66)

ps of Engineers has acquired about 3,720
nd and water areas, and holds special
additional 5,340 acres administered by
pool 10. Of the 3,720 acres of Corps-
land and water area, most are managed by
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ississippi National Wildlife and Fish

Federal lands owned in fee title in pool
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and dam 10 and Clayton, Iowa, and between
way 18 bridge (Marquette-Prairie Du Chien
way) and lock and dam 9.

AT I Aerial Survey also recorded in pool
beaching sites are used by boating

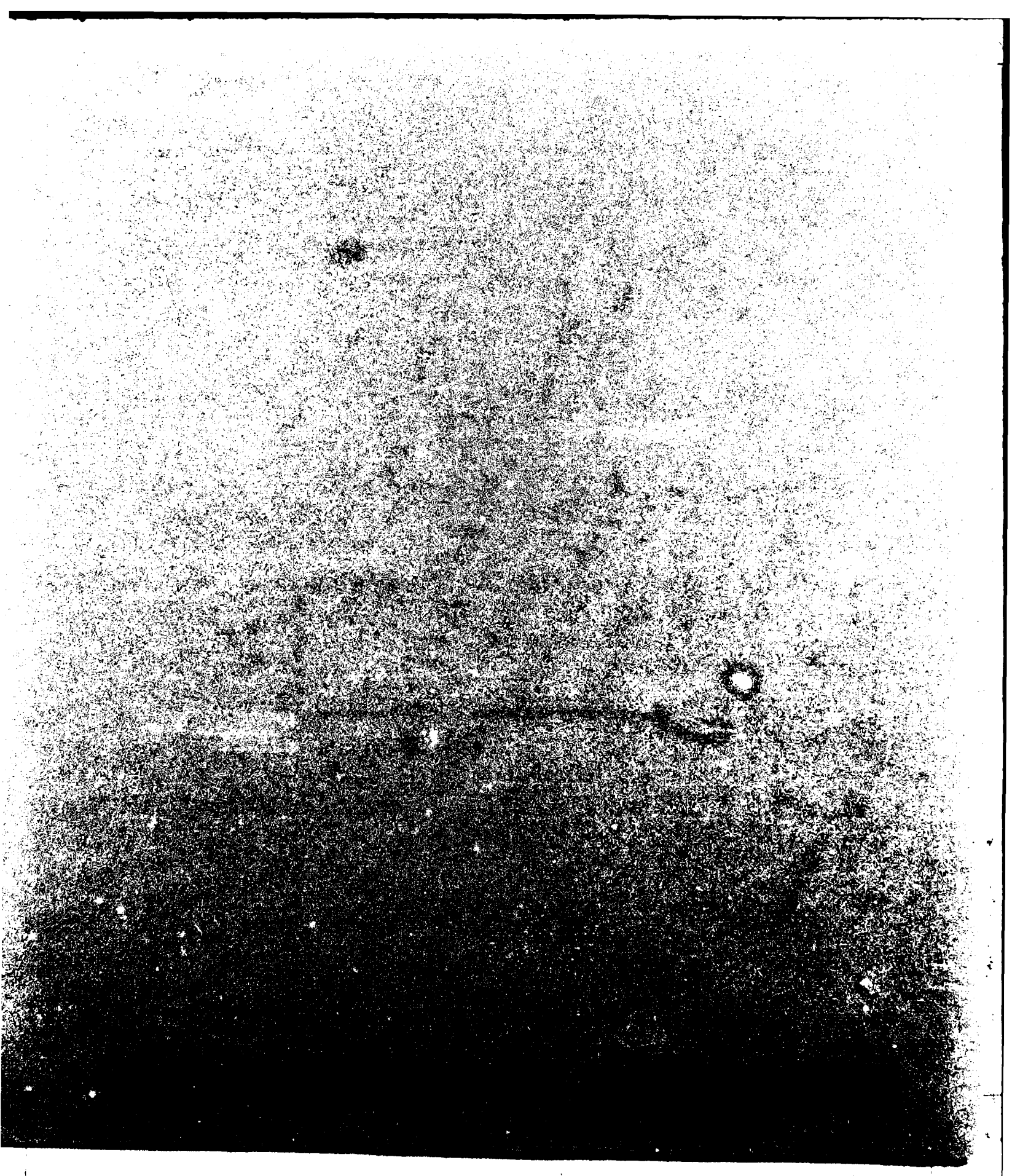
recreationalists. The GREAT I main report (1980) recommended redeveloping the site at mile 622.8L. This site is on Hovie Island, which is allocated as recreation/low-density. An additional 13 beach sites adjacent to the main channel are allocated as recreation/low-density.

5.93 The shoreline area at Willys Landing, which is presently used by individuals with special-use licenses, is allocated as recreation/low-density. This area will be evaluated in part III of the master plan as a future public recreation site and possible access point.

5.94 Developed recreation areas at Jays Lake Landing, Frenchtown Park, Bussey Lake Park, and Guttenberg are allocated as recreation/intensive-use. The River of Lakes Campground, north of Jays Lake Landing, is a commercial recreation area operated under a lease agreement. It is also allocated as recreation/intensive-use.

5.95 The lock and dam 10 facility and levee have been allocated as project operations. The remaining Corps and FWS lands in pool 10 are allocated as wildlife management, and they are part of the Upper Mississippi National Wildlife and Fish Refuge. Ambro Landing, Glen Lake Landing, Bagley Bottoms Landing, and Plondtke's Slough Landing are all allocated as wildlife management because they serve primarily hunting and fishing boat launches. There are presently no plans to expand recreation use or to accommodate additional recreation use at these sites.

5.96 Several tracts of land in pool 11 below lock and dam 10 are in the St. Paul District and have been allocated for wildlife management and recreation/low-density. Remaining lands in pool 11 are in the Rock Island District and will be addressed by that district.



6. ENVIRONMENTAL ASSESSMENT

NEED FOR PROPOSED ACTION

6.01 In compliance with the requirements and intent of the National Environmental Policy Act of 1969 and applicable Corps of Engineers regulations, the St. Paul District prepared an environmental assessment for the proposed land use allocation plan. This assessment provides details of existing land allocations plus biological and socio-economic impacts of the proposed land allocations. Because the District Engineer determined that the proposed action would not have a significant impact upon the quality of the human environment, the St. Paul District prepared a Finding of No Significant Impact (FONSI) stating that an environmental impact statement is not required for this plan.

6.02 The FONSI and the assessment have been reviewed by the Regional Offices of the U.S. Environmental Protection Agency in Chicago, Illinois, and Kansas City, Missouri.

6.03 The following section comprises the environmental assessment for this land use plan.

6.04 As part of the 9-foot navigation channel project, the St. Paul District, Corps of Engineers, owns approximately 51,500(1) acres of land and water areas along the Upper Mississippi River system.

6.05 The St. Paul District is updating its master plan for public use development and resource management for these project lands. Because of funding and personnel limits, this master plan is being updated in three parts. Part I is a project description, review, and analysis. Part II is a land use allocation plan (LUAP) for project lands. These two parts are being released simultaneously. The LUAP has been developed in close coordination with the other major Federal landowning agency on the river, the U.S. Fish and Wildlife Service (FWS). The FWS is also developing its own master plan for the Upper Mississippi National Wildlife and Fish Refuge.

(1) No precise figure is available for Corps-owned "land" acres. The figures used in this environmental assessment are derived from measurements of the land areas shown on the land use allocation plan plates.

6.06 The next phase of the master plan (part be specific development plans and recommenda project management. The primary purpose of is to guide management decisions concerning m and development of Corps land during and a later phase.

PROPOSED ACTION

Land Use Allocation Plan

6.07 The proposed action is a land use alloca (LUAP) for Corps-owned project lands along Mississippi River in the St. Paul Distri assessment incorporates the LUAP document by as a source of information about the plan planning process and as a source of informat the resources of the Upper Mississippi River.

Land Use Allocation Categories

6.08 The LUAP contains a detailed discussi planning process plus maps showing the prop use allocations. Table 6-1 shows the proposed for the various land use categori LUAP. Table 6-2 shows the data by percentag per pool.

TABLE 6-1
ACRES(1) UNDER PROPOSED LAND USE DESIGNATIONS

Pool	Project Operations	Recreation: Intensive-Use	Recreation: Low-Density	Natural Area	Wildli Manage
SAF	10	0	0	0	0
1	5	0	0	0	0
Minnesota River	0	0	0	0	0
2(2)	20	20	125	0	55
St. Croix River	0	0	0	0	0
3	25	15	145	0	960
4	15	10	60	360	610
5	125	0	150	0	1,565
5A	85	55	20	25	1,325
6	45	5	40	30	380
7	25	10	75	0	1,415
8	65	525	210	25	2,515
9	0	175	215	45	12,335
10	5	30	105	0	1,970
Totals	425	845	1,145	485	25,130

(1) Land acres measured from LUAP plates. All figures are round nearest 5 acres.

(2) Lake Rebecca is included in the pool 2 figures.

of the master plan (part III) will
ment plans and recommendations for
The primary purpose of the LUAP
ent decisions concerning management
Corps land during and after this

lan

ction is a land use allocation plan
ned project lands along the Upper
in the St. Paul District. This
ates the LUAP document by reference
formation about the plan and the
d as a source of information about
e Upper Mississippi River.

ategories

ains a detailed discussion of the
us maps showing the proposed land
Table 6-1 shows the acreages
arious land use categories in the
ows the data by percentage of area

TABLE 6-1
RES(1) UNDER PROPOSED
AND USE DESIGNATIONS

		Recreation			
Intensive-Use	Low-Density	Natural Area	Wildlife Management	Totals
0	0	0	0	10
0	0	0	0	5
0	0	0	0	0
20	125	0	55	3,145
0	0	0	0	0
15	145	0	960	3,145
10	60	360	610	1,055
0	150	0	1,565	1,840
55	20	25	1,325	1,510
5	40	30	380	500
10	75	0	1,415	1,525
525	210	25	2,515	3,340
175	215	45	12,335	12,770
30	105	0	1,970	2,110
845	1,145	485	25,130	28,030

LUAP plates. All figures are rounded to the

in the pool 2 figures.

TABLE 6-2
PERCENTAGE OF AREA UNDER
PROPOSED LAND USE DESIGNATIONS

		Recreation			
Pool	Project Operations	Intensive-Use	Low-Density	Natural Area	Wildlife Management	Totals
SAF	100.0	0	0	0	0	100.0
1	100.0	0	0	0	0	100.0
Minnesota River	0	0	0	0	0	0
2	9.1	9.1	56.8	0	25.0	100.0
St. Croix River	0	0	0	0	0	0
3	0.8	0.5	4.6	0	94.1	100.0
4	1.4	1.0	5.7	34.1	57.8	100.0
5	6.8	0	8.1	0	85.1	100.0
5A	5.6	3.7	1.3	1.7	87.7	100.0
6	9.0	1.0	8.0	6.0	76.0	100.0
7	1.6	0.7	4.9	0	92.8	100.0
8	1.9	15.7	6.3	0.8	75.3	100.0
9	0	1.4	1.7	0.3	96.6	100.0
10	0.2	1.4	5.0	0	93.4	100.0
Totals	1.5	3.0	4.1	1.7	89.7	100.0

TABLE 6-3
SUMMARY OF PROPOSED
LAND USE CHANGES(1)
(APPROXIMATE ACRES)

Existing Use(2) / Proposed Designation(2)	WM / NA	WM / RIU	WM / RLD	RLD / WM
Pool				
SAF	0	0	0	0
1	0	0	0	0
Minnesota River	0	0	0	0
2	0	0	0	0
St. Croix River	0	0	0	0
3	0	0	85	10
4	360	0	35	10
5	0	0	10	35
5A	25	0	0	25
6	30	0	10	0
7	0	0	15	5
8	25	180	265	5
9	45	0	10	0
10	0	0	45	15
Total	485	180	475	105

(1) Because of the difficulty in measuring acreages in locations where the Corps owns a narrow strip of shoreline, this table does not reflect changes in such areas.

(2) Key to abbreviations: WM - Wildlife management
RIU - Recreation/intensive-use
NA - Natural area
RLD - Recreation/low-density

6.09 Table 6-3 summarizes essentially how the proposed land use allocation plan differs from existing land use on Corps lands in the various pools.

6. ENVIRONMENTAL ASSESSMENT

6.10 Existing land uses were determined from an interpretation of 1973 aerial photography and existing knowledge about uses on the river. For example, open sandy islands along the river channel were considered recreation/low-density areas because these islands are heavily used by recreationists; most wetland and forest areas were considered wildlife management lands; and existing recreational facilities were considered recreation/intensive-use areas.

6.11 The LUAP employs five land use categories:

- Project Operations (PO)
- Recreation/Intensive-Use (RIU)
- Recreation/Low-Density (RLD)
- Natural Areas (NA)
- Wildlife Management (WM)

6.12 Project Operations - These lands are required for siting or storing facilities, structures, or equipment necessary for authorized project purposes. This category includes lock and dam facilities, areas restricted for safety, major dredged material disposal sites, and Corps maintenance facilities. Recreational uses of such lands may be considered appropriate on a case-by-case basis.

6.13 The only areas designated project operations in the LUAP are sites of existing facilities or GREAT I-designated dredged material disposal sites. No new lands are designated project operations.

6.14 Recreation/Intensive-Use - These lands are allocated for use as developed public areas for intensive recreational activities, including areas for concessions and quasi-public development. An intensive-use recreation area is generally defined as an area where relatively traditional recreation predominates, such as a campground, picnic area, or swimming area. Such areas generally require extensive facility development and maintenance.

6.15 For the most part, the only areas designated recreation/intensive-use (RIU) in the LUAP are those with existing recreational facilities. The only exception is at Goose Island in pool 8, where undeveloped lands are designated RIU.

6.16 Recreation/Low-Density - These lands are allocated for non-intensive, low-density recreation use. Low-density or dispersed recreation (RLD) occurs generally throughout a large area and is not confined to a specific place. Such recreation includes scattered, individual outdoor recreation ac RLD areas normally are not identified with facilities or with areas of intens concentration. Typical activities on su include hiking, backpacking, hunting, p camping, horseback riding, and cross-country

6.17 The primary areas that the LUAP desig RLD are islands and riparian areas along channel and buffer zones around RIU areas.

6.18 The primary purpose of designating R along the main channel of the river is to boat-beaching, primitive camping, and picnick for river recreationists. At selected sites of these locations, dredged material may be the future to maintain open, sandy condition by river recreationists.

6.19 In the RLD buffer zone around RIU ar only foreseeable development would be the cr trails compatible with intensive recreation u

6.20 Natural Areas - These lands are allo preserve scientific, ecological, hist archaeological, or aesthetic values and to threatened and endangered species. Public do not adversely affect the protected resourc allowed on a case-by-case basis.

6.21 The LUAP designates two areas as natur Part III of the master plan will present plans to protect and manage these areas.

6.22 Wildlife Management - These lands are for fish and wildlife and provide opportuni wildlife/wildlands-related recreation. fishing, trapping, bird watching, photogra canoeing are examples of such recreation dispersed forms of recreation such as p camping, boating, swimming, cross-county sk hiking are also permitted. However, wildlif and population needs take precedence over p levels. Designated portions of such l reserved as waterfowl sanctuaries ("close during migration periods, limiting certain us

6.23 Ninety percent of the Corps-owne designated in the LUAP are wildlife managem Such areas are generally large tracts of f wetlands interspersed with similiar holding FWS. Most of these Corps WM lands are manag FWS as part of the Upper Mississippi National

l outdoor recreation activities.
are not identified with developed
ith areas of intense group
ical activities on such lands
ackpacking, hunting, primitive
iding, and cross-country skiing.

reas that the LUAP designates as
riparian areas along the main
nes around RIU areas.

urpose of designating RLD areas
nnel of the river is to provide
ive camping, and picnicking areas
ists. At selected sites in some
dredged material may be used in
in open, sandy conditions desired
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ffer zone around RIU areas, the
lopment would be the creation of
th intensive recreation use.

- These lands are allocated to
ic, ecological, historical,
aesthetic values and to protect
ngered species. Public uses that
ct the protected resources may be
-case basis.

ates two areas as natural areas.
ter plan will present specific
manage these areas.

ment - These lands are allocated
e and provide opportunities for
-related recreation. Hunting,
ird watching, photography, and
es of such recreation. Other
recreation such as primitive
imming, cross-county skiing, and
tted. However, wildlife habitat
take precedence over public use
portions of such lands are
l sanctuaries ("closed areas")
ods, limiting certain uses.

t of the Corps-owned lands
P are wildlife management (WM).
ally large tracts of forest and
with similiar holdings of the
orps WM lands are managed by the
er Mississippi National Wildlife
and Fish Refuge, and they are likely to continue under such management. Lands designated WM but currently not in the refuge may be included in the refuge, subject to further planning and coordination between the Corps and FWS.

ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

Fish and Wildlife Resources

6.24 The proposed land use allocation plan is expected to have a positive impact upon the fish and wildlife resources of the Upper Mississippi River. Most of the effects of the LUAP should be relatively localized, centering on areas of proposed land use changes. In addition, the effects generally should be gradual changes caused by natural vegetative succession and by diminishing private use of public lands.

6.25 From a system-wide perspective, the cumulative effects, although beneficial, are not expected to be significant. Land use changes proposed by the LUAP affect only about 3.5 percent of the Corps-owned lands along the river (about 0.3 percent of the total land area in the Upper Mississippi floodplain in pools 1-10). Most of the impact of land use changes should be a gradual shift of recreational uses towards less sensitive areas and away from more valuable fish and wildlife habitats. No large-scale habitat alterations are expected from any of the proposed land use changes.

6.26 Two types of land use changes proposed in the LUAP would cumulatively account for most of the impacts on fish and wildlife resources: (1) the designation of main channel islands and riparian sites as low-density recreation lands and (2) the designation of shoreline areas with current private-use development as wildlife management lands.

6.27 Low-density recreation activities such as boat beaching and primitive camping are very popular along the main channel of the river. Such activities occur primarily on open or semi-open sandy areas created by past dredged material deposition. The impacts of these recreation activities themselves are generally minor, localized disturbances such as vegetation cutting, noise, and littering. Adverse efforts on wildlife result from habitat degradation and reductions in habitat use because of human activity.

6.28 The LUAP proposes designating certain island and riparian sites along the main channel as low-density recreation areas to meet recreational demand for boat-beaching/primitive camping sites. Such areas were selected because they could accommodate low-density recreation with a minimum of adverse effects on other environmental values. Because these sites would eventually be managed to keep them in the semi-open condition preferred by recreationists, wildlife habitat values on these sites will remain relatively low.

6.29 The remaining riparian areas, including many old dredged material deposits, are designated wildlife management. These areas would generally be left as they area. The old dredged material deposit sites designated as wildlife management areas would be allowed to revegetate naturally. As these areas revegetate, their value as fish and wildlife habitat would generally improve.

6.30 In a number of backwater areas along the river (e.g., Robinson Lake, Peterson Lake, Spring Lake, Lake Onalaska, and the Raft Channel area), the Corps owns narrow strips of shoreline containing a considerable number of private-use structures such as boat docks and floating boathouses.

6.31 The private-use structures along these shoreline strips would eventually be removed under the grandfathering policy (see section 5.00 of the LUAP). The rate of removal of private structures would vary from site to site, primarily depending on the age of the owner and/or the state of disrepair of the structures. Within the next 30 years, a majority of the structures are likely to be removed as the owners die or the structures deteriorate. Also, if the adjacent property were sold, the structures would have to be removed because the permits would not be transferable.

6.32 Although removal of these structures would not be caused by the LUAP designation, such removal should have beneficial effects on fish and wildlife resources. Shoreline areas currently disturbed by human activity would tend to revegetate once the human use is reduced, improving habitat conditions for riparian wildlife.

6.33 The shoreline strips on all backwater lake-type areas are designated wildlife management. This designation should maintain these areas in a more natural state for wildlife habitat purposes as the private-use structures gradually are removed

6.34 Overall, boater use of the backwater expected to stabilize or decrease becau designation of the shoreline as wildlife m coupled with the eventual removal of the p structures. This situation should benefi wildlife resources directly by reducing the boat disturbances on waterfowl (a problem note for the canvasback duck on Lake Onal other aquatic wildlife. Indirectly, there benefits from a reduction or elimination of for controlling aquatic vegetation or for d facilitate boater access to these areas.

6.35 In summary, the primary effects of th Upper Mississippi River fish and wildlife would be to direct future recreational development toward areas where the recreati be accommodated with less impact on the reso general trend would be to reduce recreatio these backwater areas where the habitat v more sensitive.

Recreation Impacts

6.36 No immediate, short-term recreation related impacts appear to be associated with Long-term impacts are difficult to ascertai LUAP should lead to improved Federal mana existing and future recreation resources on Mississippi River.

6.37 Allocation of Federal lands for ei density or intensive-use recreation wou greater focus of available manpower an resources on those areas. In the l implementing the LUAP guidelines would i greater balance of diverse recreational opp as they are needed. Without the LUAP as a tool, this balance of resource needs, possibly recognized, would not have systematically researched and organized.

6.38 The LUAP should also improve ma coordination between the Corps and the manpower and time previously devoted to management disputes should be available t new, more productive techniques for improvement and resource use. Elimi intensively-used recreation resources (su Island in pool 8) from the Upper Mississipp

ructures gradually are removed.

boater use of the backwater areas is stabilize or decrease because of the the shoreline as wildlife management the eventual removal of the private-use This situation should benefit fish and rces directly by reducing the effects of ces on waterfowl (a problem of special canvasback duck on Lake Onalaska) and wildlife. Indirectly, there should be a reduction or elimination of pressures g aquatic vegetation or for dredging to ter access to these areas.

ry, the primary effects of the LUAP on ippi River fish and wildlife resources direct future recreational use and ward areas where the recreation use can d with less impact on the resource. The would be to reduce recreational use of er areas where the habitat values are .

cts

mediate, short-term recreation resource- s appear to be associated with the LUAP. acts are difficult to ascertain, but the ead to improved Federal management of uture recreation resources on the Upper ver.

on of Federal lands for either low- tensive-use recreation would mean a s of available manpower and funding n those areas. In the long run, the LUAP guidelines would identify a e of diverse recreational opportunities eeded. Without the LUAP as a planning lance of resource needs, although cognized, would not have been so researched and organized.

AP should also improve management between the Corps and the FWS. The time previously devoted to settling sputes should be available to develop roductive techniques for habitat and resource use. Elimination of sed recreation resources (such as Goose 8) from the Upper Mississippi National Wildlife and Fish Refuge should provide greater flexibility in planning for and implementation of new recreation resources.

6.39 As a result of work on the LUAP, District recreation planners have become more aware of the need to develop site plans for recreation beaching sites at dredged material disposal areas along the river. In conjunction with the interagency Great River Environmental Action Team (GREAT) studies, the LUAP identifies Federal low-density recreation lands that should be studied carefully for possible use as disposal-recreation enhancement areas.

Social Impacts

6.40 The primary source of social impacts related to the land use allocation plan would be the changes in recreational use of Federal lands. These impacts fall into three general categories: public access, social patterns, and market value. The impacts would be significant to the individuals experiencing them. To some these impacts would seem inequitable, but to others merely would seem to correct a presently inequitable situation that allows public property to be pre-empted for private use.

6.41 Public Access - There would be no change in accessibility for present private-use permit holders, for either shore-to-river access or river-to-shore access, unless the permitted structures require improvements or repairs. Because the grandfathering provisions would not allow modifications costing more than 25 percent of a structure's value, some structures may become unusable. Access for future owners of properties adjacent to Federal lands would be less convenient (possibly considerably so) than for the present, permit-holding owners. However, this lower accessibililty is anticipated to be reflected in lower purchase prices of these adjacent properties.

6.42 Those who do not own property adjacent to Federal lands would experience no change in accessibility of the river from the land. Accessibility of public shore from the river would be somewhat improved because boaters would be more likely to perceive shore as public when it no longer contains obviously private structures or recreational uses that tend to make the land appear private.

6.43 Market Value - Knowledgeable realtors and appraisors consider permits for private use to be a very significant factor in the market values of

riverfront properties. Restrictions on permits and attendant publicity have already slowed past property sales in some areas. Properties presently benefitting from the increased market value caused by a permit range from recreational cabins to single-family homes valued at over $100,000 and even more expensive condominiums. An estimated 350 to 500 properties would no longer have permits routinely transferred at the time of sale, and these properties would probably experience lowered market values. Although this change would be primarily an impact of the Federal policy on private use and not of the LUAP designation, designating many of the shoreline areas as wildlife management instead of low-density recreation may also affect property values.

6.44 Social Patterns - In addition to the consequences for individual property owners, changes in market value of these properties may make local tax revenues fluctuate. These fluctuations may change taxation patterns or affect the services that local governments provide.

6.45 Ownership of shorefront property often reflects social status, as well as recreational preferences. The prestige of shorefront property in some areas has been heightened by past Federal policies that permitted special private use of public land. A change in these policies would affect such social status.

6.46 Perceptions of private property rights and of the rights/obligations of the Federal Government to regulate public lands would continue to be sources of controversy.

Cultural Resources

6.47 Literature Search and Records Review - The St. Paul District is completing an archeological and historical literature search for the main stem of the Mississippi River from the Upper St. Anthony Falls pool in Minneapolis, Minnesota, to lock and dam 10 at Guttenberg, Iowa. This literature search has compiled more than 1,000 historically and architecturally significant structures plus more than 1,400 prehistoric archeological components. These components span the period from 11,500 B.C. up to the recent past. Historic site types range from early French fur posts to bridges crossing
Prehistoric sites include the villages, cam
burial mounds on the floodplains, terraces,
of the river.

6.48 This literature search covers only
sites along the river. Historic and arc
surveys have been completed for many of
towns such as Wabasha and Red Wing, Minnes
Crosse and Alma, Wisconsin; however, littl
archeological survey work has been done
the greater resource base. The Univ
Wisconsin-La Crosse has been focusing its
the prehistory of the La Crosse area,
University of Wisconsin-Madison has a
project underway in the Prairie du Chien r

6.49 The key areas where the LUAP proposes
land use were checked against the known cu
along the river. Except for two areas (G
in pool 8 and Abel Island in pool 10), n
known in these areas.

6.50 General Cultural Resource Impacts - F
part, the changes proposed in the LU
converting the zoning from fish and
management areas to low-density or int
recreation areas. Recreation areas, espec
of intensive use, can have a very adverse
archeological resources. Activities such
camping, picnicking, hunting, fishing, b
horseback riding can have an adverse
archeological sites that are at the ground
that are eroding out of the riverbar
activity, especially in areas of loose,
can quickly destroy the context of an arc
site. Loss of the data base can also be
campers and picnickers who collect
prehistoric artifacts or who use metal d
locate and remove historic artifacts. In
recreation designation usually assumes
areas will be developed for use. Constr
toilets, camp pads, roads, and boat landin
an adverse impact upon cultural resources.

6.51 Some changes proposed in the LUAP hav
to convert recreation areas to fish an
management use. While this change is
compatible with the preservation of arc
resources, these conversions involve lon
30,000 feet), narrow (from inches to a
feet) riparian strips of property. Since
archeological sites can be quite large com

sts to bridges crossing the river. es include the villages, campsites, and n the floodplains, terraces, and bluffs

erature search covers only the known e river. Historic and architectural been completed for many of the river abasha and Red Wing, Minnesota, and La , Wisconsin; however, little intensive survey work has been done to identify resource base. The University of osse has been focusing its efforts on of the La Crosse area, while the Wisconsin-Madison has a multi-year y in the Prairie du Chien region.

eas where the LUAP proposes changes in hecked against the known cultural sites . Except for two areas (Goose Island Abel Island in pool 10), no sites are areas.

tural Resource Impacts - For the most nges proposed in the LUAP involve e zoning from fish and wildlife as to low-density or intensive-use s. Recreation areas, especially areas e, can have a very adverse impact upon resources. Activities such as hiking, king, hunting, fishing, boating, and ng can have an adverse effect on tes that are at the ground surface or ing out of the riverbank. Human ially in areas of loose, sandy soil, troy the context of an archeological the data base can also be hastened by icnickers who collect or dig for ifacts or who use metal detectors to ve historic artifacts. Intensive-use ignation usually assumes that these eveloped for use. Construction for ds, roads, and boat landings also has t upon cultural resources.

s proposed in the LUAP have been made reation areas to fish and wildlife . While this change is much more h the preservation of archeological e conversions involve long (7,200 to arrow (from inches to a few hundred trips of property. Since the size of tes can be quite large compared to the width of the riparian strips, and since most of the strips are already quite developed, the beneficial effect of this zoning change on the preservation of archeological sites is much less significant than it would be if larger tracts of land were being converted.

6.52 Impacts from wildlife management range from beneficial impacts to adverse impacts that are less severe than those of recreational uses. Impacts from activities compatible with wildlife management (such as hunting, fishing, bird watching, and canoeing) can create some of the same results as impacts on archeological resources as other forms of recreation. However, these impacts are less severe because the intensity of use from these activities is far less. These activities tend to be more dispersed and occur less frequently at any one location. Areas designated as wildlife habitat or waterfowl sanctuaries provide a beneficial effect upon archeological resources because these areas restrict activity or access.

6.53 All areas of development for recreation use will be inventoried and assessed for significant resources prior to construction. All low-density recreation areas and intensive-use areas whether developed or not should also be inventoried for cultural resources. These inventory efforts on Federal lands are part of the St. Paul District's responsibilities under Executive Order 11593 and the 1980 amendments to the National Historic Preservation Act of 1966 (Public Law 89-665).

6.54 In accordance with Section 106 of the National Historic Preservation Act, the National Register of Historical Places has been consulted. As of November 16, 1982, only one site listed on the National Register would be impacted by changes suggested in the LUAP.

6.55 Archeological Resources on Goose Island - The Goose Island Archeological Site (Ve 502) and other sites on Goose Island in pool 8 are discussed below.

6.56 Goose Island Archeological Site (Ve 502) - This site was discovered in 1979 by Stefanija Harris of the U.S. Fish and Wildlife Service during a survey for a boat access area. Philip Salkin tested this site in 1979 and determined that there were three components at the site: a recent historic component, a prehistoric Oneota component, and a Middle Woodland to Late Woodland component. This site was placed on the National Register of Historic Places in July 1980.

6.57 Goose Island II Site (Ve 508) - This site is south of the Goose Island Landing site. It was originally located by Harris in 1979, and further work was done at this site in 1981 by James Gallagher of the University of Wisconsin-La Crosse. This site consists of a buried Woodland component, as indicated by ceramic material recovered from the site.

6.58 Hunter's Point Site (Ve 526) - This site was located during Gallagher's 1981 survey. Gallagher describes the site as a buried artifact scatter consisting of lithic debitage and ceramic material. The site dates to the Woodland Period.

6.59 House Site (Ve 527) - This site is a historic site consisting of a foundation and historic debris from the house. Its location is given on early maps (ca. 1894). The site is considered one of the earliest Euro-American occupations on Goose Island. Gallagher located this site during his 1981 survey of portions of southern Goose Island.

6.60 Wigwam Site Ve 528) - The nature of this site is similar to that of Ve 526. The buried Woodland artifact scatter was discovered by Gallagher in 1981.

6.61 Old Field Site (Ve 529) - This site was reported by a local collector and has not been field-verified. It is reported to be a surface scatter of Woodland Period materials.

6.62 Perry Green Site (LC-55) - This site was reported by one of Gallagher's students. Gallagher's report of the 1979 field season of the La Crosse area archeological survey describes this site. The site is described as a historic Winnebago site, probably dating to 1810-1830, based upon a trade pipe that was collected from the surface of the site.

ALTERNATIVES

6.63 Each parcel of Corps-owned property in the project area was examined to determine its most appropriate land use designation. Theoretically, each parcel could have been designated as any of the five land use categories during the initial classification.

6.64 The lands designated project operations are the sites of existing project facilities such as locks and dams or major dredged material disposal sites. Since such facilities are essentially permanen could not be designated for other uses. already in such use were designa operations (PO).

6.65 Areas with existing recreational f designated recreation/intensive-u recreation/low-density (RLD), depend nature of the facilities. Since many c are leased or have permanent faciliti inappropriate to designate them for any the estimated effective lifetime (approximately 15 years).

6.66 What remained for the majority (approximately 98 percent) was the a designating these lands as RLD or wildl (WM) (except for special areas that wa area (NA) designation or considerati area). In most cases, topographic c conditions dictated that the only feasib was wildlife management. These sites w the large wetland and forest areas channel of the river that are inaccessil

6.67 Table 6-4 lists the areas wh options are available and where the de have the most potential impact in term existing uses of the river resources. F to 6.93 and tables 6-5 to 6-26 discuss the impacts of the proposed and designations at these sites.

Pool 3

6.68 Prescott Island - The LUA approximately 10 acres of an 80-acre (Prescott Island) at river mile 811 as r density. An alternative would be to d entire island as wildlife managemen outlines the impacts of the proposed a designations.

Upper Pool 4

6.69 Lock and Dam 3 Peninsula - The LUA acres of a 35-acre wooded peninsula imm lock and dam (L/D) 3 as recreation/lo alternative would be to designate thi wildlife management. Table 6-6 outlin of the proposed and alternative designa

ies are essentially permanent, these areas
: designated for other uses. No lands not
) such use were designated project
PO).

with existing recreational facilities were
recreation/intensive-use (RIU) or
low-density (RLD), depending upon the
ıe facilities. Since many of these areas
or have permanent facilities, it seemed
e to designate them for any other use for
ıted effective lifetime of the plan
ly 15 years).

remained for the majority of the lands
ely 98 percent) was the alternative of
these lands as RLD or wildlife management
t for special areas that warrant natural
lesignation or consideration as an RIU
most cases, topographic or locational
lictated that the only feasible designation
e management. These sites were primarily
wetland and forest areas off the main
the river that are inaccessible from land.

le 6-4 lists the areas where feasible
available and where the decisions could
st potential impact in terms of altering
es of the river resources. Paragraphs 6.68
tables 6-5 to 6-26 discuss and summarize
ts of the proposed and alternative
; at these sites.

TABLE 6-4
FEASIBLE ALTERNATIVES
LAND USE ALLOCATION PLAN

Pool	Area	LUAP Designation	Possible Alternative Designation
3	Prescott Island	RLD/WM	WM
Upper 4	L/D 3 Peninsula	RLD/WM	WM
Lower 4	Robinson Lake Shoreline	WM	RLD
Lower 4	Peterson Lake Shoreline	WM	RLD
5	Buffalo City Shoreline	RLD	WM
5	Spring Lake Shoreline	WM	RLD
5A	Mid-Pool 5A Shoreline	WM	RLD
6	L/D 6 Dike Island	RLD	WM
6	Trempealeau Wetland	RLD	WM
7	Mid-Pool 7 Shoreline	WM	WM/RLD
7	Dresbach Island	RLD	WM
7	Brice Prairie Shoreline	WM	RLD
7	French Island Shoreline	WM	RLD
8	Goose Island	RIU/RLD	RIU/RLD/WM
8	Brownsville Bay Shoreline	WM	RLD
8	Wildcat Creek Shoreline	WM	RLD
8	Shellhorn Shoreline	WM	RLD
9	Mid-Pool 9 Shoreline	WM	RLD
9	Lansing Shoreline	WM	RLD
10	Willies Landing Shoreline	RLD	WM
10	Jays Lake Landing Shoreline	RLD	WM
10	Hovie Island	RLD	WM
10	Abel Island Shoreline	RLD	WM

(1) Key to abbreviations: WM - Wildlife management
RIU - Recreation/intensive-use
RLD - Recreation/low-density

scott Island - The LUAP designates
ely 10 acres of an 80-acre wooded island
land) at river mile 811 as recreation/low-
n alternative would be to designate this
and as wildlife management. Table 6-5
e impacts of the proposed and alternative
.

TABLE 6-5 - PRESCOTT ISLAND DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Future recreational development would likely be limited to the use of dredged material to form and slope a boat-beaching and primitive camping area.	Prescott Island would essentially be allowed to remain in its wooded state.
Potential alteration of 5-10 acres of floodplain forest habitat.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.
Potential loss of aquatic riprap habitat.	
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	

nd Dam 3 Peninsula - The LUAP designates 5
35-acre wooded peninsula immediately below
m (L/D) 3 as recreation/low-density. An
e would be to designate this peninsula as
nagement. Table 6-6 outlines the impacts
osed and alternative designations.

6. ENVIRONMENTAL ASSESSMENT

TABLE 6-6 - L/D 3 PENINSULA DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
The most likely development would be a recreation craft lockage waiting area.	The area would be left in its current natural state.
Potential disturbance of 1-5 acres of floodplain forest habitat.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	

Lower Pool 4

6.70 Robinson Lake Shoreline - The LUAP designates the approximately 6,000 feet of Corps-owned shoreline on Robinson Lake as wildlife management. An alternative would be to designate these areas as recreation/low-density. Table 6-7 outlines the impacts of the proposed and alternative designations.

TABLE 6-7 - ROBINSON LAKE SHORELINE DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Private-use structures (approximately 31) would be removed under grandfathering procedures. Future public uses would tend toward primitive, wildlife-oriented public uses.	Private-use structures (approximately 31) would be removed under the grandfathering procedures.
There may be an eventual reduction in boat traffic disturbance impacts on waterfowl, fish, and other aquatic life.	Boat traffic disturbance impacts may be reduced.
Shoreline disturbances would likely be reduced, allowing revegetation.	Shoreline vegetation disturbances from recreational activities may occur.
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

6.71 Peterson Lake Shoreline - The LUAP proposes that the approximately 3,600 feet of Corps-owned shoreline on Peterson Lake be designated as wildlife management. The alternative would be to designate this shoreline as recreation/low-density. Table 6-8 outlines the impacts and alternative designations.

TABLE 6-8 - PETERSON LAKE SHORELINE DESIGNATION IM

Impact of Proposed Designation	Impact of Alternative Designa
Private-use structures (approximately 30) would be removed under grandfathering procedures. Future public uses would emphasize wildlife values.	Private-use structu (approximately 30) removed under the g procedures. Future use would be enhanc beaching, biking, a camping areas.
There may be an eventual reduction in boat traffic disturbance impacts on waterfowl, fish, and other aquatic life.	Boat traffic distur would likely contin present levels.
Shoreline disturbances would likely be reduced, allowing revegetation.	Shoreline vegetatio would result from r activities.
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.	No cultural resourc known at this site. general description impacts, see paragr

Pool 5

6.72 Buffalo City (Belvidere Slough) designates approximately 18,800 feet of C shoreline at Buffalo City on Belvidere recreation/low-density. An alternative designate this shoreline as wildlife m Table 6-9 outlines the impacts of the pr alternative designations.

TABLE 6-9 - BUFFALO CITY SHORELINE DESIGNATION IMPA

Impact of Proposed Designation	Impact of Alternative Designa
Licensed/permitted private use would be removed under the grandfathering procedures. Greater pressure on existing boat accesses would occur.	Private-use structu be removed under th grandfathering proc Greater pressure on boat accessess woul
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	Unrecorded cultural would remain relati undisturbed. For a description of wild impacts, see paragr

6.73 Spring Lake Shoreline - The LUAP pro the 8,500 feet of Corps-owned shoreline a Lake be designated as wildlife manage alternative would be to designate this sh recreation/low-density. Table 6-10 ou impacts of the proposed and alternative de

PETERSON LAKE SHORELINE DESIGNATION IMPACTS

	Impact of Alternative Designation
, (approximately ınder grand- Future public ıildlife values.	Private-use structures (approximately 30) would be removed under the grandfathering procedures. Future recreational use would be enhanced by boat-beaching, biking, and primitive camping areas.
ıal reduction ·bance impacts ıd other aquatic	Boat traffic disturbance impacts would likely continue near the present levels.
; would likely be :getation.	
:sources ly :neral 'e management 1 6.52.	Shoreline vegetation disturbances would result from recreational activities.
	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.57.

City (Belvidere Slough) - The LUAP
ximately 18,800 feet of Corps-owned
uffalo City on Belvidere Slough as
-density. An alternative would be to
shoreline as wildlife management.
nes the impacts of the proposed and
ignations.

- BUFFALO CITY SHORELINE DESIGNATION IMPACTS

	Impact of Alternative Designation
vate use	Private-use structures would be removed under the grandfathering procedures. Greater pressure on existing boat accessess would occur.
cedures. Greater oat accesses	
are or a recreation 6.51.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.

e Shoreline - The LUAP proposes that
of Corps-owned shoreline along Spring
ated as wildlife management. An
ld be to designate this shoreline as
·density. Table 6-10 outlines the
roposed and alternative designations.

TABLE 6-10 - SPRING LAKE SHORELINE DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Private-use structures would be removed under the grand-fathering procedures.	Private-use structures would be removed under the grand-fathering procedures.
There may be an eventual reduction in boat traffic disturbance impacts on waterfowl, fish, and other aquatic life.	Boat traffic disturbance impacts may eventually be reduced.
Shoreline disturbances would likely be reduced, allowing revegetation.	Shoreline vegetation disturbances may result from recreational activities.
Future public use would involve more wildlife-oriented activities.	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52	

Pool 5A

6.74 Mid-Pool 5A - The LUAP designates some mid-pool riparian islands with old dredged material deposits (mile 733-736) as wildlife management. An alternative would be to designate certain areas on these islands as recreation/low-density. Table 6-11 outlines the impacts of the proposed and alternative designations.

TABLE 6-11 - MID-POOL 5A SHORELINE DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
These islands would be left to revegetate naturally, generally increasing their wildlife habitat value.	The designated areas would likely be maintained in an open, sandy condition, probably through use of dredged material, to benefit recreational uses such as boat beaching and primitive camping.
Existing recreational activities such as boat beaching and camping would be allowed to continue as long as wildlife values are not threatened.	Wildlife habitat values would remain low because of habitat disturbance and human activity.
	No cultural resources are known on these islands. Any unrecorded sites on these islands would be buried beneath dredged material.

Pool 6

6.75 L/D Dike Island - The LUAP designates part of a 15-acre wooded and meadow island above the lock and dam 6 dike as recreation/low-density. An alternative would be to designate this entire island as wildlife management. Table 6-12 outlines the impacts of the proposed and alternative designations.

6. ENVIRONMENTAL ASSESSMENT

TABLE 6-12 - L/D 6 DIKE ISLAND DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Recreational development on the island would likely be a lockage waiting area for recreational craft. Boat beaching and primitive camping activities would likely continue.	The island would be left in its natural state.
Minor alteration of wooded and meadow habitat (less than 5 acres).	No change in existing recreation uses would be expected.
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.

6.76 Trempealeau Wetland - The LUAP designates a 15-acre wetland area behind the upper guidewall at lock and dam 6 as recreation/low-density. An alternative would be to designate this area as wetland wildlife management. Table 6-13 outlines the impacts of the proposed and alternative designations.

TABLE 6-13 - TREMPEALEAU WETLAND DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
This wetland is being considered for recreational development by local unit(s) of government. Development would require approval by Federal and State agencies.	The wetland would likely remain in its current state.
Recreational development would likely be limited to boat mooring and other related resource development. Wildlife and fishery habitat values of the area would likely be severely reduced.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	

Pool 7

6.77 Mid-Pool 7 Shoreline - The LUAP proposes designating the mid-pool Wisconsin shoreline of the main channel at miles 705-710 as wildlife management. An alternative would be to designate certain areas along this shoreline as recreation/low-density. Table 6-14 outlines the impacts of the proposed and alternative designations.

TABLE 6-14 - MID-POOL 7 SHORELINE DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designatio
The area would be left in its natural state. Any old dredged material deposits would revegetate naturally, generally improving their wildlife habitat value.	Designated areas would maintained in an open, condition for recreati activities such as boa and primitive camping.
Existing boat beaching and primitive camping uses could continue as long as wildlife values were not threatened.	Wildlife habitat value areas would remain low habitat disturbances a activity.
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52	Potential adverse impa dam and aquatic riprap
	No cultural resources known at this site. F general description of impacts, see paragraph

6.78 Dresbach Island - The LUAP designates s strip areas of revegetating dredged mate wooded habitat on the upper and lower ends of Island as recreation/low-density. An alt would be to designate these areas as management. Table 6-15 outlines the impac proposed and alternative designations.

TABLE 6-15 - DRESBACH ISLAND DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designatio
Future recreational development that occurred would take the form of additional boat beaching and primitive camping area, plus a recreational craft lockage waiting area.	The areas would be lef are. The revegetating material would likely a grass and forb stage and small tre: stage o 15 years, changing its habitat values.
Developed areas would have low wildlife habitat values because of habitat alteration and human activity. Human activity may also adversely affect adjacent undeveloped portions of the island.	Unrecorded cultural re would remain relativel turbed. For a general of wildlife management see paragraph 6.52.
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	

6.79 Brice Prairie Shoreline and French Is LUAP designates approximately 20,500 feet owned shoreline on Lake Onalaska at Brice Pr French Island as wildlife management. An al would be to designate these areas as recrea density. Table 6-16 outlines the impact proposed and alternative designations.

BLE 6-14 - MID-POOL 7 SHORELINE DESIGNATION IMPACTS

ation	Impact of Alternative Designation
be left in its Any old dredged lts would irally, generally wildlife habitat	Designated areas would likely be maintained in an open, sandy condition for recreational activities such as boat beaching and primitive camping.
eaching and ing uses could ig as wildlife threatened.	Wildlife habitat values on these areas would remain low because of habitat disturbances and human activity.
ural resources latively or a general wildlife acts, see 52	Potential adverse impacts on wing dam and aquatic riprap habitat. No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

ch Island - The LUAP designates shoreline s of revegetating dredged material and tat on the upper and lower ends of Dresbach recreation/low-density. An alternative to designate these areas as wildlife . Table 6-15 outlines the impacts of the d alternative designations.

TABLE 6-15 - DRESBACH ISLAND DESIGNATION IMPACTS

ation	Impact of Alternative Designation
onal development that take the form of beaching and primitive lus a recreational aiting area.	The areas would be left as they are. The revegetating dredged material would likely change from a grass and forb stage to a shrub and small tree stage over the next 15 years, changing its wildlife habitat values.
would have low t values because of ion and human n activity may affect adjacent tions of the island.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.
ources are ite. For a tion of recreation ragraph 6.51.	

Prairie Shoreline and French Island - The ates approximately 20,500 feet of Corps-line on Lake Onalaska at Brice Prairie and nd as wildlife management. An alternative designate these areas as recreation/low-able 6-16 outlines the impacts of the d alternative designations.

TABLE 6-16 - BRICE PRAIRIE AND FRENCH ISLAND SHORELINE DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Private-use structures (approximately 124) would be removed under the grandfathering procedures. There may be an eventual reduction in boat traffic disturbance impacts on waterfowl, fish, and other aquatic life. Of special concern at Lake Onalaska is the need to reduce adverse disturbance impacts on canvasback ducks. Shoreline disturbances would likely be reduced, allowing revegetation. *Unrecorded cultural resources would* remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52	Private-use structures approximately 124) would be removed under the grandfathering procedures. Boat traffic disturbance impacts would likely continue at current levels. Shoreline vegetation disturbances caused by recreational activities would likely continue. No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

Pool 8

6.80 Goose Island - The LUAP designates additional areas at Goose Island as recreation/intensive-use and recreation/low-density. An alternative would be to reduce the area committed to recreation and to increase the area designated as wildlife management. Table 6-17 outlines the impacts of the proposed and alternative designations, except for the cultural resource impacts, which are outlined in paragraphs 6.81 through 6.84.

TABLE 6-17 - GOOSE ISLAND DESIGNATION IMPACTS

Impacts of Proposed Designation	Impact of Alternative Designation
Additional areas designated RIU would be subject to future development pressures, most likely for additional campground area, picnic area, and boat access. Wildlife values would be degraded as additional area is developed. Additional areas designated RLD would likely be developed for hiking and cross-county skiing trails. Impacts on wildlife are likely to be relatively minor.	Areas available for future recreational development would be reduced. Potential impacts on wildlife habitat would be lessened.

6.81 As the result of a previous lease review, coordination has been initiated with the Wisconsin State Historic Preservation Office concerning the impacts of recreational use on the Goose Island Archeological Site (Ve 502) and on the other sites at the southern end of Goose Island.

6. ENVIRONMENTAL ASSESSMENT

6.82 La Crosse County plans to develop an existing boat landing at the south end of Goose Island. Sites Ve 526 and Ve 527 are in the vicinity of the access road and ramp. Development at this location would minimize or avoid impact on these sites. Site Ve 527, the House Site, would be avoided by diverting the road around the site. Impact at Site 526, the Hunter's Point Site, would be minimized by limiting major development, such as the parking lot, to the eastern part of the southern tip of Goose Island where test units did not contain cultural material. The development plan and the county construction plan would be reviewed by the Wisconsin State Historic Preservation Office before implementation.

6.83 Once the Hunter's Point Landing is developed, the County Line boat ramp that is now adversely affecting the Goose Island Archeological Site (Ve 502), a National Register property, would be closed to vehicular traffic. This closing would remove the major activities that cause the adverse impacts now affecting this site: boat launching and vehicle parking in undesignated areas.

6.84 All Corps of Engineers property on Goose Island zoned as intensive-use or low-density recreation will be surveyed for cultural resources and all sites that have not been tested will be assessed for their National Register potential. If a number of the sites located on Goose Island appear to qualify for the National Register, the island's archeological resources may be submitted as a National Register District. At that time, the interpretive potential of these resources would also be considered.

6.85 Brownsville Bay Shoreline - The LUAP designates the approximately 2,500 feet of Corps-owned shoreline at Brownsville Bay (mile 690) as wildlife management. An alternative would be to designate this area of shoreline as recreation/low-density. Table 6-18 outlines the impacts of the proposed and alternative designations.

6.86 Wildcat Creek Shoreline - The LUAP designates approximately 12,000 feet of Corps-owned shoreline below Wildcat Creek (mile 688) as wildlife management. An alternative would be to designate this shoreline as recreation/low-density. Table 6-19 outlines the impacts of the proposed and alternative designations.

TABLE 6-18 - BROWNSVILLE BAY SHORELINE DESI

Impact of Proposed Designation	Impact of Alternativ
Private-use structures (approximately 27) would be removed under the grandfathering procedure.	Private-us mately 27) under the
There may be an eventual reduction in boat traffic disturbance impacts on waterfowl, fish, and other aquatic life.	Boat traff may be rec
Shoreline disturbances would likely be reduced, allowing revegetation.	Shoreline caused by are likely
Recreational uses in the future would be more low density, wildlife oriented.	No cultura known at t general de impacts, s
Unrecorded cultural resources would remain relatively undisturbed. For a general descr'ption of wildlife management impacts, see paragraph 6.52.	

TABLE 6-19 - WILDCAT CREEK SHORELINE DESI(

Impact of Proposed Designation	Impact of Alternativ
Private-use structures (approximately 31) would be removed under the grandfathering procedures.	Private-us mately 31) removed ur procedures
There may be an eventual reduction in boat traffic disturbance impacts on waterfowl, fish, and other aquatic life.	Boat traff may be rec
Shoreline disturbances would likely be reduced, allowing revegetation.	Shoreline caused by may occur.
Future public use of the shoreline would be directed towards more low-density wildlife-oriented uses.	No cultura know.. at t general de impacts, s
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.	

TABLE 6-20 - SHELLHORN SHORELINE DESIGNATI

Impact of Proposed Designation	Impact of Alternativ
Private-use structures (approximately 24) would be removed under the grandfathering procedures.	Licensed/p structures removed ur procedures
There should be an eventual reduction in boat traffic disturbance impacts on waterfowl, fish, and other aquatic life.	Boat traff may be rec
Shoreline disturbances would likely be reduced, allowing revegetation.	Shoreline caused by may contir
Future public use of the shoreline would be directed towards more low-density wildlife-oriented uses.	No cultura known at t general de impacts, s
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.	

ILLE BAY SHORELINE DESIGNATION IMPACTS

	Impact of Alternative Designation
mately	Private-use structures (approximately 27) would be removed under the grandfathering procedures.
ion acts quatic	Boat traffic disturbance impacts may be reduced.
kely be	Shoreline vegetation disturbances caused by recreational activities are likely to occur.
	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

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T CREEK SHORELINE DESIGNATION IMPACTS

	Impact of Alternative Designation
mately	Private-use structures (approximately 31) would be removed under the grandfathering procedures.
ion acts quatic	Boat traffic disturbance impacts may be reduced.
kely be	Shoreline vegetation disturbances caused by recreational activities may occur.
ne low-	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

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e
h 6.52.

RN SHORELINE DESIGNATION IMPACTS

	Impact of Alternative Designation
ately	Licensed/permitted private-use structures would be removed under the grandfathering procedures.
ction cts quatic	Boat traffic disturbance impacts may be reduced.
ely be	Shoreline vegetation disturbances caused by recreational activities may continue.
ne ow-	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

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h 6.52.

6.87 Shellhorn Shoreline - The LUAP designates approximately 14,000 feet of Corps-owned shoreline in the Shellhorn area (mile 683) as wildlife management. An alternative would be to designate this shoreline as recreation/low-density. Table 6-20 outlines the impacts of the proposed and alternative designations.

Pool 9

6.88 Mid-Pool 9 Shoreline - The LUAP designates much of the shoreline in mid-pool (miles 665.5-670) as wildlife management. An alternative would be to designate certain sites along this shoreline as recreation/low-density. Table 6-21 outlines the impacts of the proposed and alternative designations.

6.89 Lansing Shoreline - The LUAP designates approximately 3,000 feet of Corps-owned shoreline at Lansing as wildlife management. An alternative would be to designate this area as recreation/low-density. Table 6-22 outlines the impacts of the proposed and alternative designations.

Pool 10

6.90 Hovie Island - The LUAP designates Hovie Island at mile 622.5 as recreation/low-density. An alternative would be to designate the island as a wildlife management area. Table 6-23 outlines the impacts of the proposed and alternative designations.

6.91 Jays Lake Landing Shoreline - The LUAP designates approximately 3,000 feet of Corps-owned shoreline at Jays Lake Landing (mile 622) as recreation/low-density. An alternative would be to designate this shoreline as wildlife management. Table 6-24 outlines the impacts of the proposed and alternative

6.92 Willies Landing Shoreline - The LUAP designates approximately 2,000 feet of Corps-owned shoreline at Willies Landing (mile 621) as recreational low-density. An alternative would be to designate this area as wildlife management. Table 6-25 outlines the impacts of the proposed and alternative designations.

6.93 Abel Island Shoreline - The LUAP designates approximately 6,500 feet of Corps-owned shoreline on Abel Island (miles 617-619) as recreation/low-density. An alternative would be to designate this shoreline area as wildlife management. Table 6-26 outlines the impacts of the proposed and alternative designations.

6. ENVIRONMENTAL ASSESSMENT

TABLE 6-21 - MID-POOL 9 DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Shoreline areas would be left in their natural state. Existing low-density recreation uses would be allowed to continue unless wildlife habitat values were threatened.	Areas designated RLD would likely be developed for low-density recreational activities such as boat beaching and primitive camping.
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52	Potential alternation of small areas of floodplain forest habitat.
	Potential impacts on wing dam habitat.
	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

TABLE 6-22 - LANSING SHORELINE DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Private-use structures (approximately 19) would be removed under the grandfathering procedures.	Private-use structures (approximately 19) would be removed under the grandfathering procedures.
Shoreline disturbances should be reduced, allowing some revegetation. Boat traffic impacts on aquatic life may be reduced.	Boat traffic impacts on aquatic life likely to remain the same.
Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife impacts, see paragraph 6.52.	Shoreline disturbances from recreational activity are likely to continue.
	No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.

TABLE 6-23 - HOVIE ISLAND DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Some portions of the island would likely be developed for low-density recreational uses such as boat beaching and primitive camping.	The island would be left in its natural state to meet the public needs for wildlife-oriented activities.
Potential alteration of small areas of floodplain forest habitat.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife management impacts, see paragraph 6.52.
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	

TABLE 6-24 - JAYS LAKE LANDING SHORELINE DESIGNATION IMPA

Impact of Proposed Designation	Impact of Alternative Designati
Private-use structures (approximately 32) eventually would be removed under the grandfathering policy.	Private-use structures (approximately 32) wou ually be removed under grandfathering procedu
Boat traffic impacts on aquatic life likely to remain at about current levels.	Shoreline disturbances reduced, allowing some
Shoreline disturbances from recreational activity likely to remain the same.	Boat traffic impacts o life may be reduced.
No cultural resources are known at this site. For a general description of recreation impacts, see paragragh 6.51.	Unrecorded cultural re would remain relativel For a general descript wildlife impacts, see 6.52.

TABLE 6-25 - WILLIES LANDING SHORELINE DESIGNATION IMPAC

Impact of Proposed Designation	Impact of Alternative Designatio
Private-use structures (approximately 42) would be removed under the grandfathering procedures.	Private-use structures (approximately 42 woul be removed under the grandfathering procedu
Shoreline disturbances from recreational activity likely to remain the same.	Shoreline disturbances reduced, allowing some
No cultural resources are known at this site. For a general description of recreation impacts, see paragraph 6.51.	Boat traffic impacts o life may be reduced.
	Unrecorded cultural re remain relatively undi a general description impacts, see paragraph

TABLE 6-26 - ABEL ISLAND SHORELINE DESIGNATION IMPACTS

Impact of Proposed Designation	Impact of Alternative Designation
Licensed/permitted private-use structures would be removed under the grandfathering procedures.	Private-use structures (approximately 29) wou be removed under the gr fathering procedures.
Boat traffic impacts on aquatic life likely to remain the same.	Boat traffic impacts on life may be reduced.
Three groups of burial mounds were recorded on Abel Island; however, these have since been destroyed. Associated habitation sites may still exist on the island. See paragraph 6.51 for a general description of recreation impacts.	For a general descripti life management impacts paragraph 6.52.

6-24 - JAYS LAKE LANDING SHORELINE DESIGNATION IMPACTS

ation	Impact of Alternative Designation
uctures (approxi- tually would be he grandfathering	Private-use structures (approximately 32) would event-ually be removed under the grandfathering procedures.
pacts on aquatic life in at about current levels.	Shoreline disturbances should be reduced, allowing some revegetation.
rbances from recreational y to remain the same.	Boat traffic impacts on aquatic life may be reduced.
sources are site. For a ption of recreation aragragh 6.51.	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife impacts, see paragraph 6.52.

LE 6-25 - WILLIES LANDING SHORELINE DESIGNATION IMPACTS

gnation	Impact of Alternative Designation
tructures (approxi- uld be the grandfathering	Private-use structures (approximately 42 would be removed under the grandfathering procedures.
turbances from recreational ly to remain the same.	Shoreline disturbances should be reduced, allowing some revegetation.
esources are site. For a iption of recreation paragraph 6.51.	Boat traffic impacts on aquatic life may be reduced.
	Unrecorded cultural resources would remain relatively undisturbed. For a general description of wildlife impacts, see paragraph 6.52.

TABLE 6-26 - ABEL ISLAND SHORELINE DESIGNATION IMPACTS

gnation	Impact of Alternative Designation
itted private-use uld be removed ndfathering	Private-use structures (approximately 29) would be removed under the grand-fathering procedures.
impacts on aquatic life ain the same.	Boat traffic impacts on aquatic life may be reduced.
of burial mounds were bel Island; however, nce been destroyed. bitation sites may n the island. See .51 for a general f recreation impacts.	For a general description of wild-life management impacts, see paragraph 6.52.

COORDINATION

6.94 The proposed land use allocation plan has been extensively coordinated with the U.S. Fish and Wildlife Service (especially with the Upper Mississippi River Wild Life and Fish Refuge), which shares management of this portion of the river with the Corps of Engineers.

6.95 The LUAP also has been coordinated with the Wisconsin Department of Natural Resources, Minnesota Department of Natural Resources, Iowa Conservation Commission, and the Minnesota-Wisconsin Boundary Area Commission.

6.96 This environmental assessment and the draft LUAP have been submitted to the State Archeologists and State Historic Preservation Officers in Wisconsin, Iowa, and Minnesota. Copies have also been provided to the National Park Service and the Advisory Council on Historic Preservation.

6.97 Public workshops were held in St. Paul and Wabasha, Minnesota, and in La Crosse and Prairie du Chien, Wisconsin in November 1980. Additional workshops were held during August 1982 in Red Wing and Winona, Minnesota, in Onalaska, La Crosse, and Prairie du Chien, Wisconsin, and in Lansing, Iowa.

6.98 Public meetings were held in Winona, La Crosse, and Lansing to review the draft LUAP.

COMPLIANCE WITH ENVIRONMENTAL PROTECTION STATUTES

6.99 This section discusses how the proposed action complies with various environmental protection statutes and future compliance actions that may be required.

National Environmental Policy Act (NEPA) of 1969

6.100 This assessment and the associated finding of no significant impact (FONSI) fulfill the requirements of NEPA. Full compliance with NEPA will be attained when the District Engineer signs the FONSI.

Archeological and Historic Preservation Act

6.101 The proposed action is in full compliance with this statute.

6. ENVIRONMENTAL ASSESSMENT

Fish and Wildlife Coordination Act

6.102 The proposed action has been thoroughly coordinated with the U.S. Fish and Wildlife Service, especially with the Upper Mississippi National Wildlife and Fish Refuge. The proposed action is a result of coordinated effort between the St. Paul District and the U.S. Fish and Wildlife Service to develop compatible plans for management of Federal lands on the Upper Mississippi River.

Endangered Species Act of 1973

6.103 The proposed LUAP has been coordinated with the U.S. Fish and Wildlife Service to determine project impacts on endangered and threatened species. The Fish and Wildlife Service has determined that the proposed plan would have no impact upon protected species or their habitats.

Clean Water Act of 1971

6.104 Because the proposed land allocation plan proposes no specific discharge of dredged or fill material into waters of the United States, this statute does not apply to the proposed action (the LUAP). Future, specific proposed recreational developments resulting from the land use allocation plan may entail such discharges, however. These discharges would be evaluated in compliance with Section 404(b)(1) guidelines (40 CFR 230).

National Historic Preservation Act of 1966, Amended by Public Law 96-515

6.105 The proposed action is in full compliance with this statute.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST
CHICAGO, ILLINOIS 60604

02 AUG 1983

Colonel Edward G. Rapp
District Engineer
St. Paul District, Corps of Engineers
1135 U.S. Post Office and Custom House
St. Paul, Minnesota 55101

Dear Colonel Rapp:

The U.S. Environmental Protection Agency, in acc
sponsibilities under Section 309 of the Clean Air Act,
environmental assessment and finding of no significant
Upper Mississippi River Land Use Allocation Plan for
on the Mississippi River in Minnesota, Wisconsin and I

Based on our review of these documents, we concu
that this action will not affect human health nor sign
environment.

Sincerely yours,

James P. Hooper

for/ Barbara Taylor Backley, Chief
Environmental Review Branch
Planning and Management Division

FIGURE 6-1. LETTER OF CONCURRENCE FRO

UNITED STATES
NMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF

Engineers
ustom House

309-FN-F69004-00

Protection Agency, in accordance with its re-
309 of the Clean Air Act, has reviewed the
finding of no significant impact for the proposed
Use Allocation Plan for public use development
Minnesota, Wisconsin and Iowa.

these documents, we concur with your conclusions
fect human health nor significantly degrade the

f
sion

F CONCURRENCE FROM EPA.

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
1135 U. S. POST OFFICE & CUSTOM HOUSE
ST. PAUL, MINNESOTA 55101

REPLY TO ATTENTION OF:

Environmental Resources Branch
Planning Division

FINDING OF NO SIGNIFICANT IMPACT

In compliance with the National Environmental Policy Act of 1969, the St. Paul District, Corps of Engineers, has assessed the environmental impacts of the following project:

UPPER MISSISSIPPI RIVER LAND USE ALLOCATION PLAN
MASTER PLAN FOR PUBLIC USE DEVELOPMENT
IOWA, MINNESOTA, AND WISCONSIN

This land use plan is intended to provide practical, balanced guidance to future Federal land use management decisions for the Upper Mississippi River. The plan allocates Corps-owned lands along the river within the St. Paul District to one of the five land use categories described in section 2.00 of the environmental assessment.

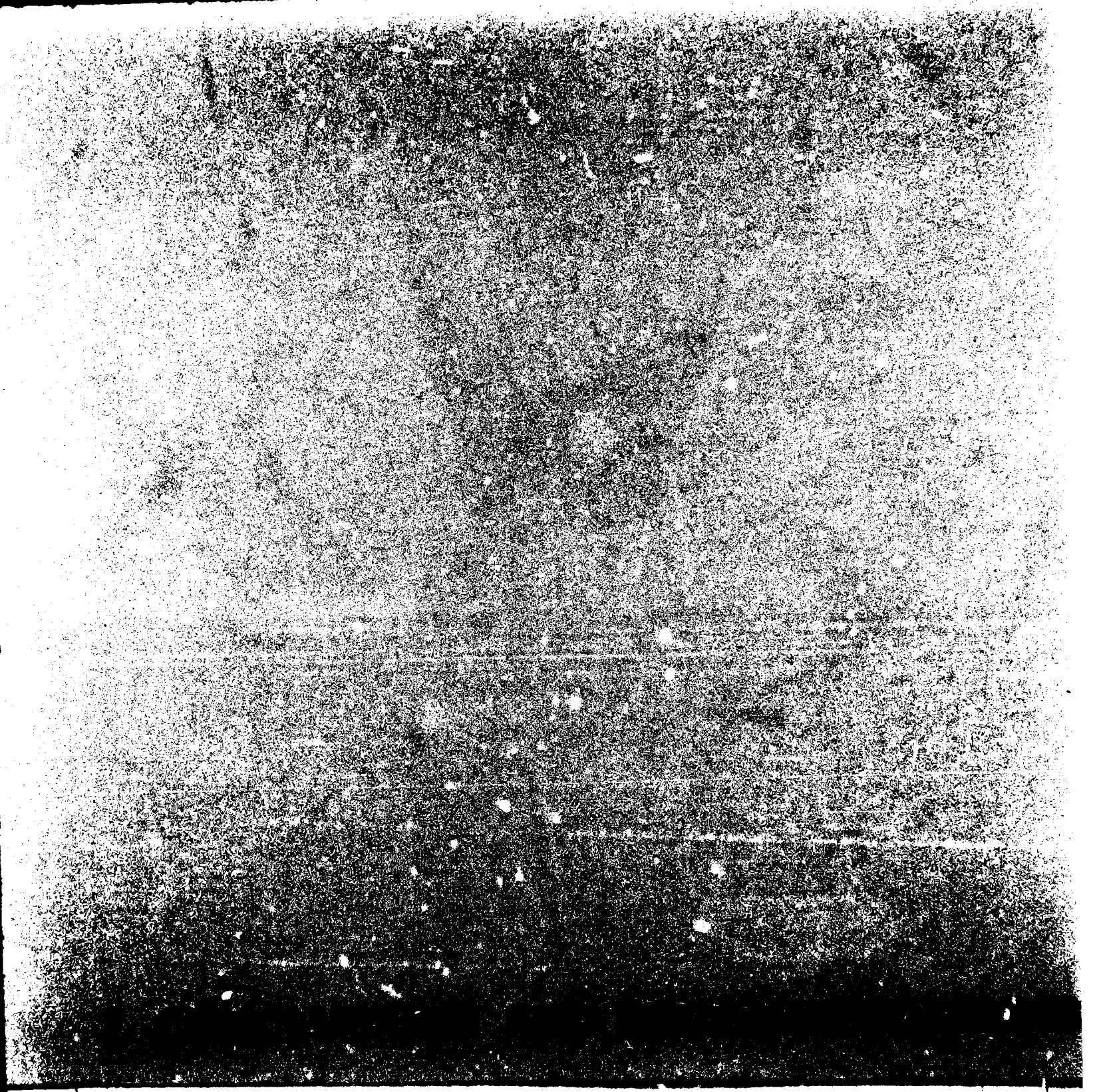
This finding of no significant impact considers the following project impacts: moderate benefits to fish and wildlife through the gradual shifting of recreational pressures to areas with less sensitive habitat, moderate benefits to recreation through identification of the most appropriate and useful areas for recreation development, minor site-specific adverse impacts on fish and wildlife from recreation development, moderate adverse social impact from a gradual alteration of traditional private-use patterns on public lands, and continued coordination with Federal and State agencies and with the public (see the assessment for more information.)

The environmental review indicates that the proposed action does not constitute a major Federal action with a significant impact on the quality of the human environment. Therefore, an environment impact statement will not be prepared.

11 Aug 83
Date

Archer M Doering, LTC, CE, DDE
for Edward G. Rapp
Colonel, Corps of Engineers
District Engineer

FIGURE 6-2. FINDING OF NO SIGNIFICANT IMPACT.



7. CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

7.01 With the continuing cooperation of
and Wildlife Service, the St. Paul Distri
Engineers, has collected and evaluat
available data from a wide range of perti
This inventory data, plus the contribu
interested public, concerned organiz
governmental agencies, has led to th
allocation plan for Federal lands alon
Mississippi River in the St. Paul Distric

7.02 This land use allocation plan ide
highest and best use of Federal lands an
framework for future management actio
detailed planning studies. The allocati
this plan are a balanced approach for mee
and future public use demands on Federal
maintaining inherent values for fish a
management and for continued river naviga

7.03 The cooperative planning process
Corps and the FWS to prepare thi
significantly improved the working com
between these managing agencies. T
interagency cooperation, when combined wi
allocation plan, will result in improved m
public lands along the Upper Mississippi

RECOMMENDATIONS

7.04 The following recommendations relate
use allocation plan should be implemented:

1. This plan will serve as the
preparation of detailed, site-specif
planning and management actions such as
this master plan, the Corps operational
plan, and the Fish and Wildlife Service
plan.

2. Over time, Federal policies an
change, as will the river and its u
significant changes occur, land use all
management policies will need to be
optimize benefits to the public.
supplements to this allocation plan will
in the future to keep this land use all
current and effective.

IONS

S

continuing cooperation of the U.S. Fish Service, the St. Paul District, Corps of as collected and evaluated the best from a wide range of pertinent sources. y data, plus the contributions of the ublic, concerned organizations, and agencies, has led to this land use an for Federal lands along the Upper iver in the St. Paul District.

d use allocation plan identifies the est use of Federal lands and provides a r future management actions and more ning studies. The allocations shown in a balanced approach for meeting current blic use demands on Federal lands while inherent values for fish and wildlife for continued river navigation.

erative planning process used by the he FWS to prepare this plan has improved the working communications se managing agencies. This Federal operation, when combined with the actual n, will result in improved management of long the Upper Mississippi River.

ATIONS

wing recommendations related to the land plan should be implemented:

plan will serve as the basis for f detailed, site-specific Federal management actions such as part III of lan, the Corps operational management Fish and Wildlife Service refuge master

time, Federal policies and laws will ill the river and its users. When hanges occur, land use allocations and olicies will need to be adjusted to nefits to the public. Therefore, this allocation plan will be developed to keep this land use allocation plan ffective.

3. Management relationships between the St. Paul District and the U.S. Fish and Wildlife Service will be further articulated to maximize management efficiency and effectiveness. This updating and streamlining of Federal management roles will recognize the following:

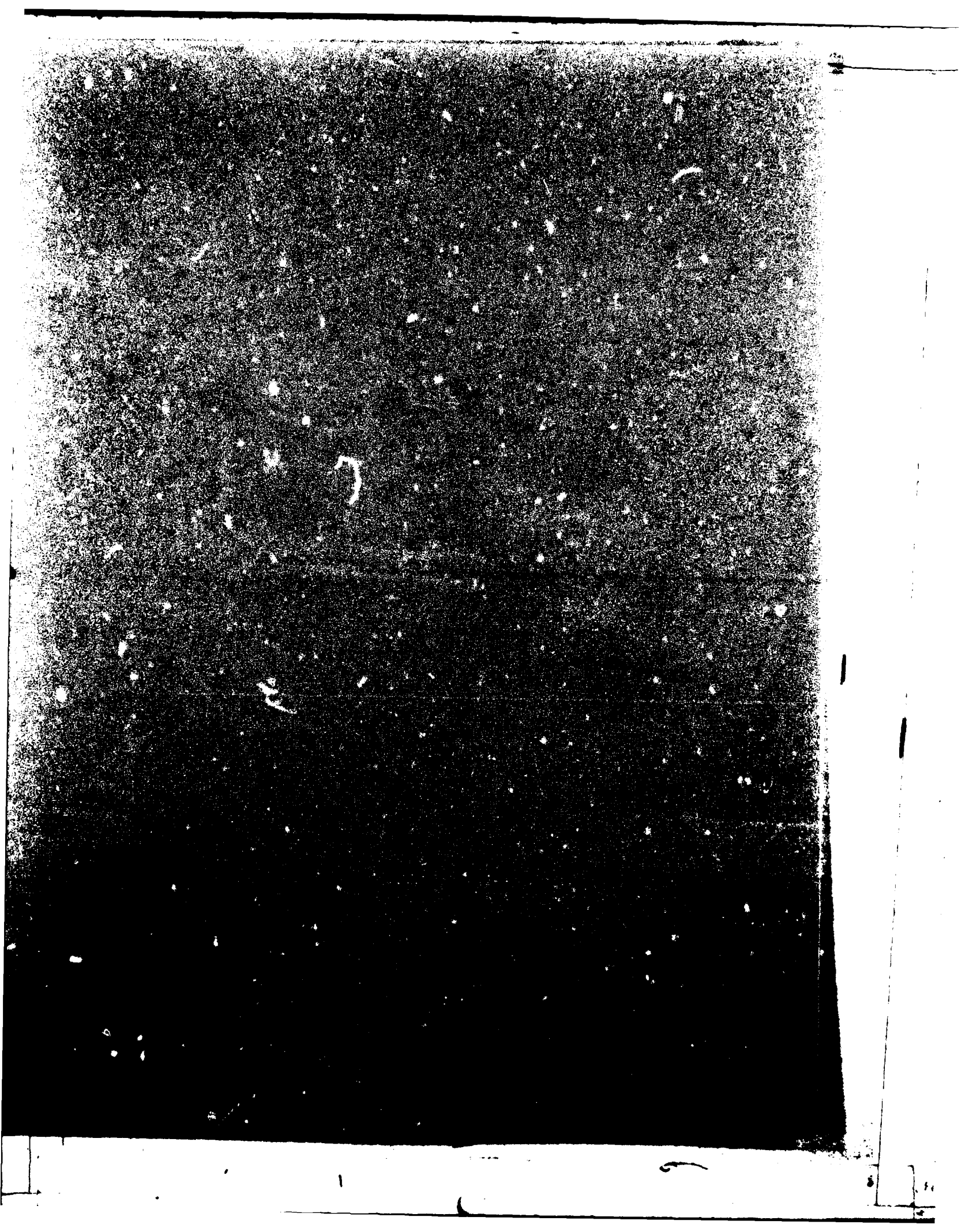
a. Proposed changes of the land use allocations will be reviewed by both Federal agencies. Each proposal will be considered on an individual basis.

b. The Corps and the FWS will coordinate closely in making management decisions about wildlife management lands under the guiding principles identified in the 1963 Cooperative Agreement. However, the Corps will not prepare detailed management plans for lands that are allocated for wildlife management in the Upper Mississippi National Wildlife and Fish Refuge. The Fish and Wildlife Service will prepare management plans for these lands.

c. Lands allocated in this plan for low-density recreation will be managed actively by the Corps and the FWS to serve the intended public recreation uses (as defined earlier in the land use allocation definitions).

d. The land use allocations will be used by resource managers to determine future dredged material placement sites. As a general rule, the Corps will not place material, except under emergency conditions, on lands allocated for other than project operations or low-density recreation. Placement of sand on land allocated as low-density recreation area should not diminish that site's suitability for recreation. An exception to this rule is placement of material on wildlife management lands when such action is requested by the Fish and Wildlife Service. Part III of the Corps master plan will address site-specific recreation enhancement in general.

4. The Corps will review and, as appropriate, incorporate public comments received during this study when it updates the pool regulation manuals. (Pool regulation manuals are periodically updated by the Corps on a pool-by-pool basis.)



8. PLAN PLATES

INTRODUCTION TO MAP PLATES

8.01 Sixty-six map plates following this summary delineate the 9-foot navigation channel project area from the Upper St. Anthony Falls pool in Minneapolis, Minnesota, to lock and dam 10 in Guttenberg, Iowa. These plates are all identified by river pool and river mile. The map plates have been developed from U.S. Geological Survey topographic maps, with the land-water interface (boundary) revised according to 1977 aerial photographs. The plates are at a scale of 1 inch equals 2,000 feet (approximately 2-1/2 inches equals 1 mile).

8.02 Figure 8-1 (index to map plates) precedes the maps and provides a geographic reference for specific plate locations.

8.03 The maps show Corps and Fish and Wildlife Service ownership as accurately as possible at the scale used. The map plates are not intended to serve as real estate documents, although the best available real estate information was used to prepare them.

8.04 The maps use different colors for each land use allocation category. Allocations on Fish and Wildlife Service lands use half-tone screened versions of the same colors that illustrate allocations on Corps land.

8.05 The maps show proposed refuge boundaries to delineate how most lands of the two agencies are in the Upper Mississippi National Wildlife and Fish Refuge.

8.06 The maps also show parks, access points, and commercial recreation sites on Federal land.

8. PLAN PLATES

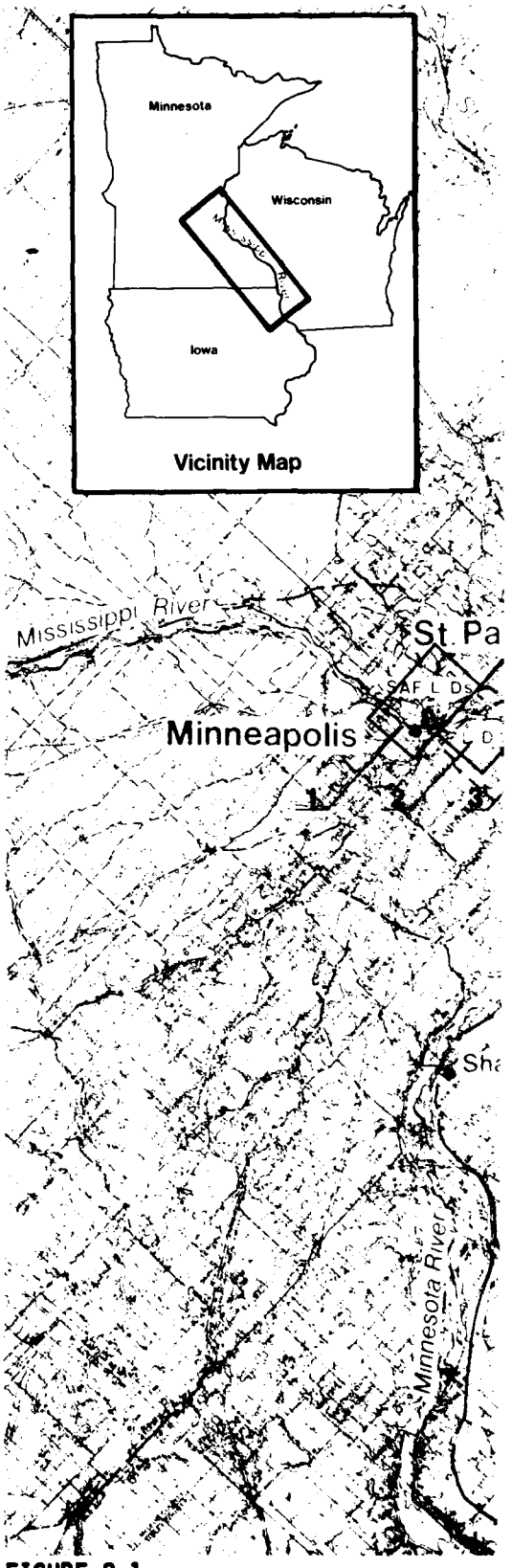
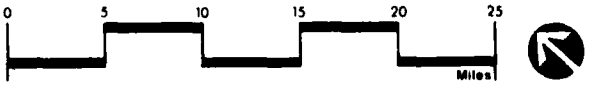
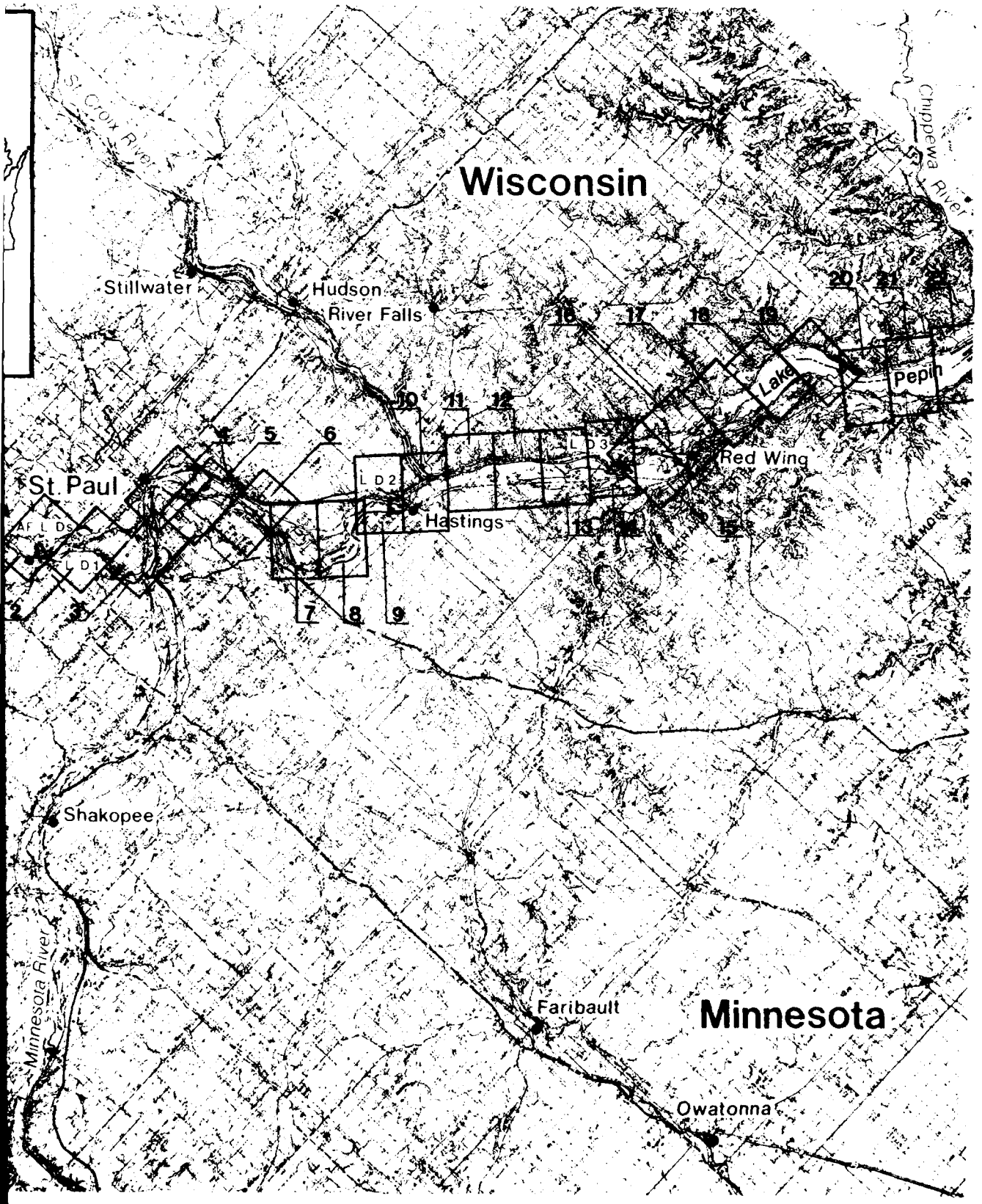


FIGURE 8-1.

Index to Plates




Wisconsin
Minnesota
St. Croix River
Chippewa River
Stillwater
Hudson
River Falls
Lake
Pepin
Red Wing
St. Paul
Hastings
Shakopee
Faribault
Owatonna
Minnesota River
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L D2
L D3
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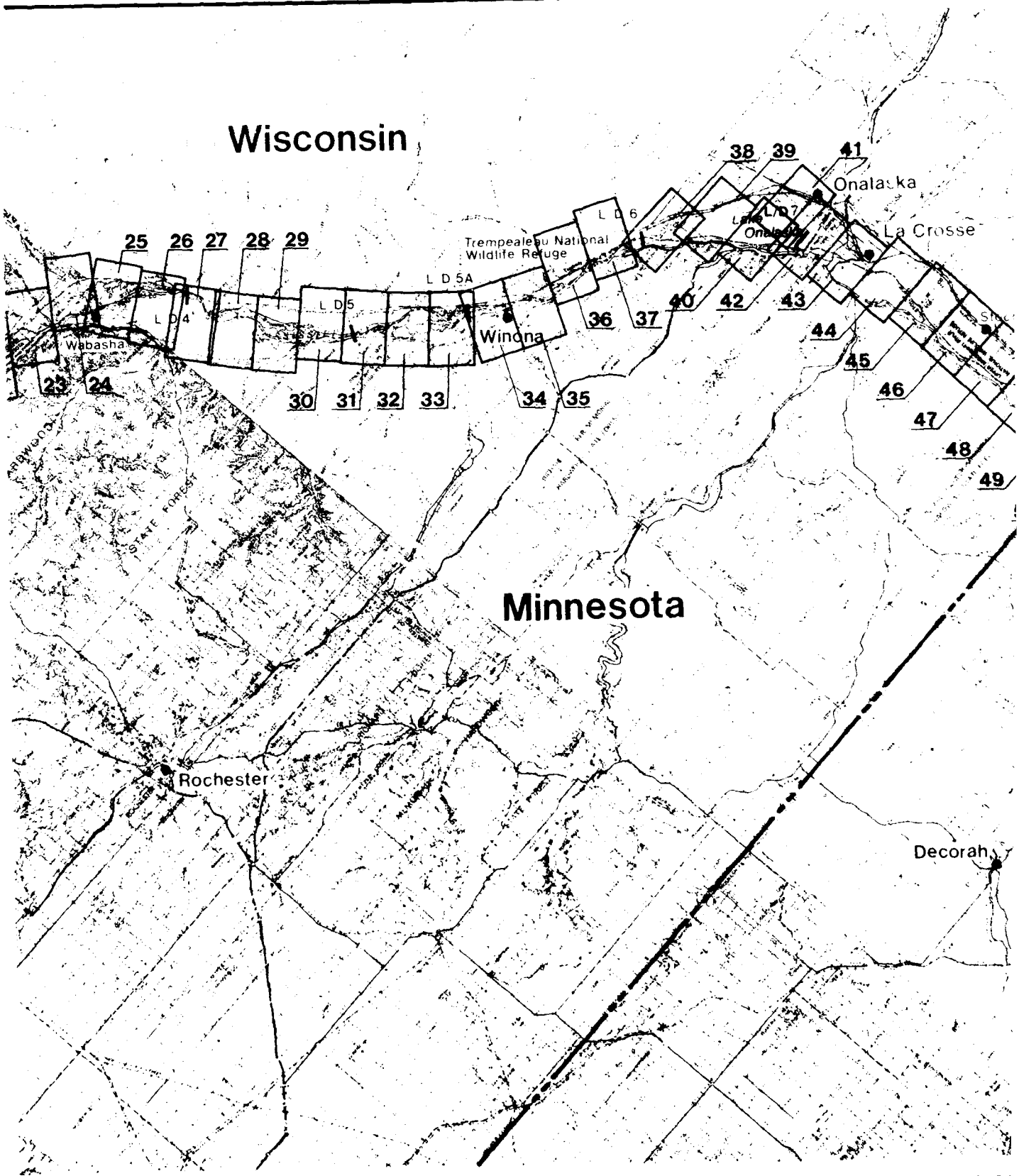
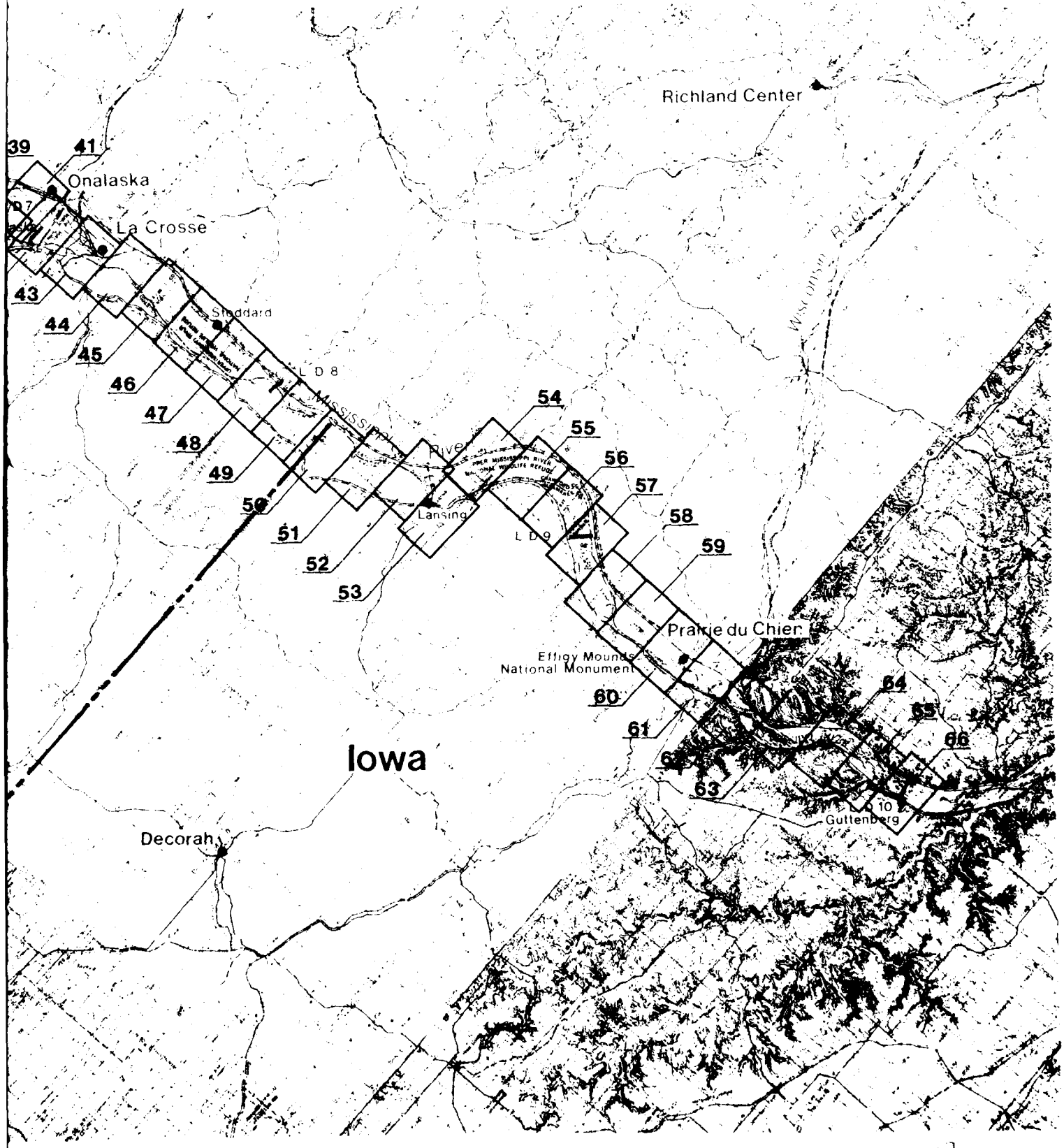
8. PLAN PLATES




Richland Center
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La Crosse
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Stoddard
L D 8
Lansing
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Prairie du Chien
Effigy Mounds
National Monument
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Guttenberg
Iowa
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AD A136 602 UPPER MISSISSIPPI RIVER LAND USE ALLOCATION PLAN MASTER PLAN FOR PUBLIC U..(U) CORPS OF ENGINEERS ST PAUL MN ST PAUL DISTRICT SEP 83 3/4

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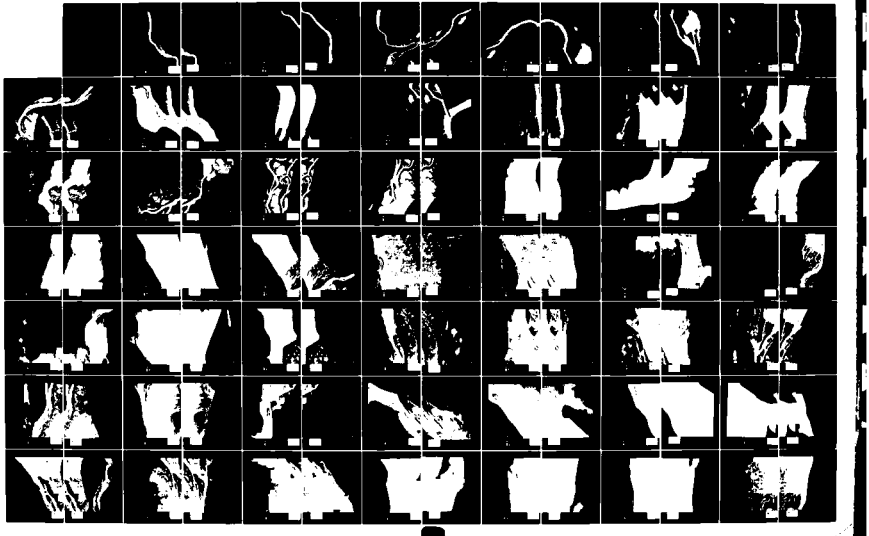

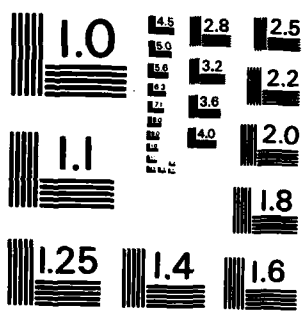

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A


Fairview Park
Bottineau Field
Jackson Square
Northeast Athletic Field
Logan Park
Beltrami Park
Dickman Park
Burlington Northern Sta
Post Office
Library
Shopping Center
Courthouse
Armory
County Hospital
St Barnabas Hospital
Metropolitan State Jr College
Dunwoody Institute
Chute Square
HENNEPIN
WASHINGTON
BURLINGTON
NORTHERN
SPRING ST
CONDUIT
LOWRY
BROADWAY
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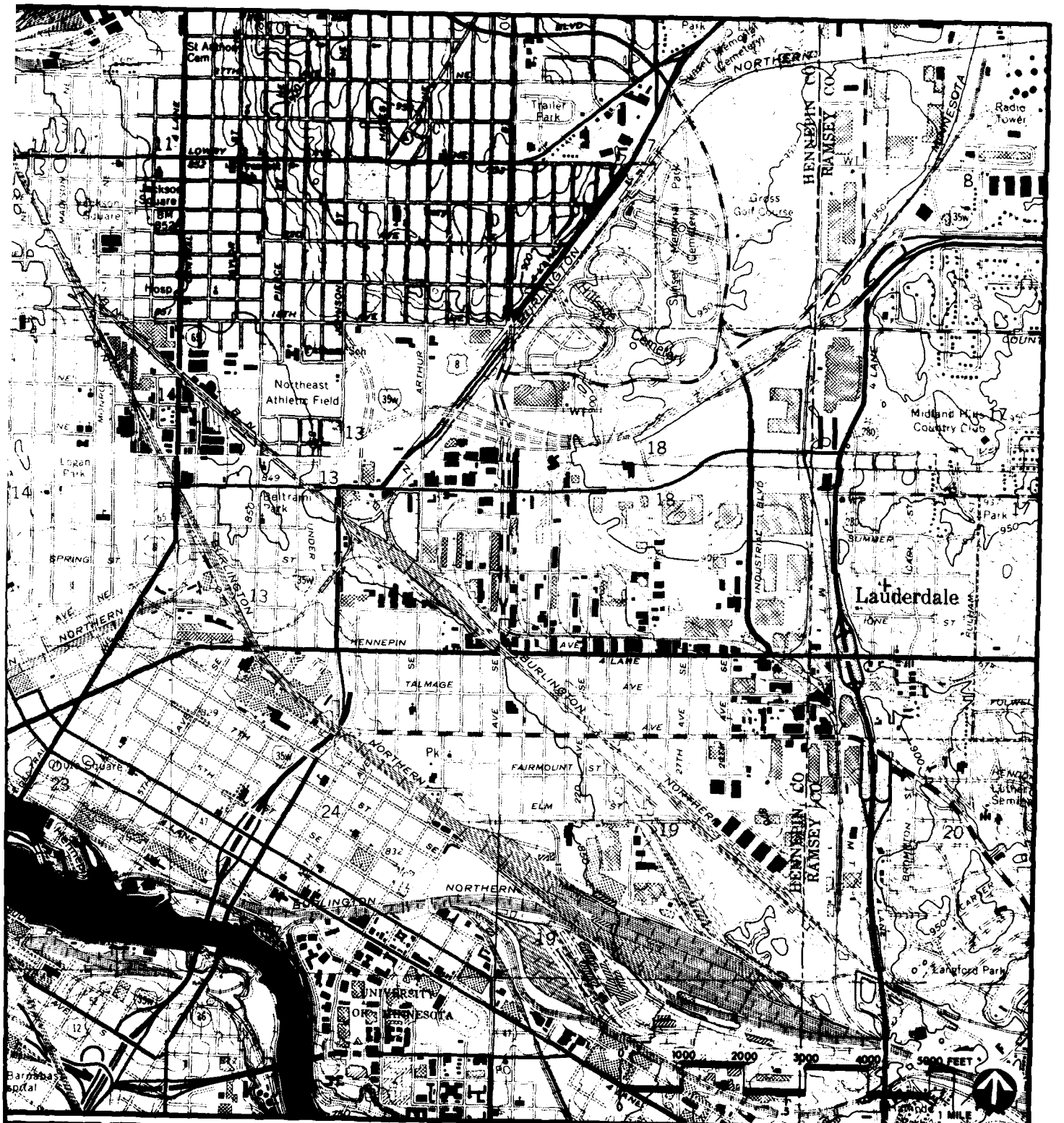
PROPOSED LOCATION



Boundary
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US Army Corps of Engineers

Drawn by: BV/RS

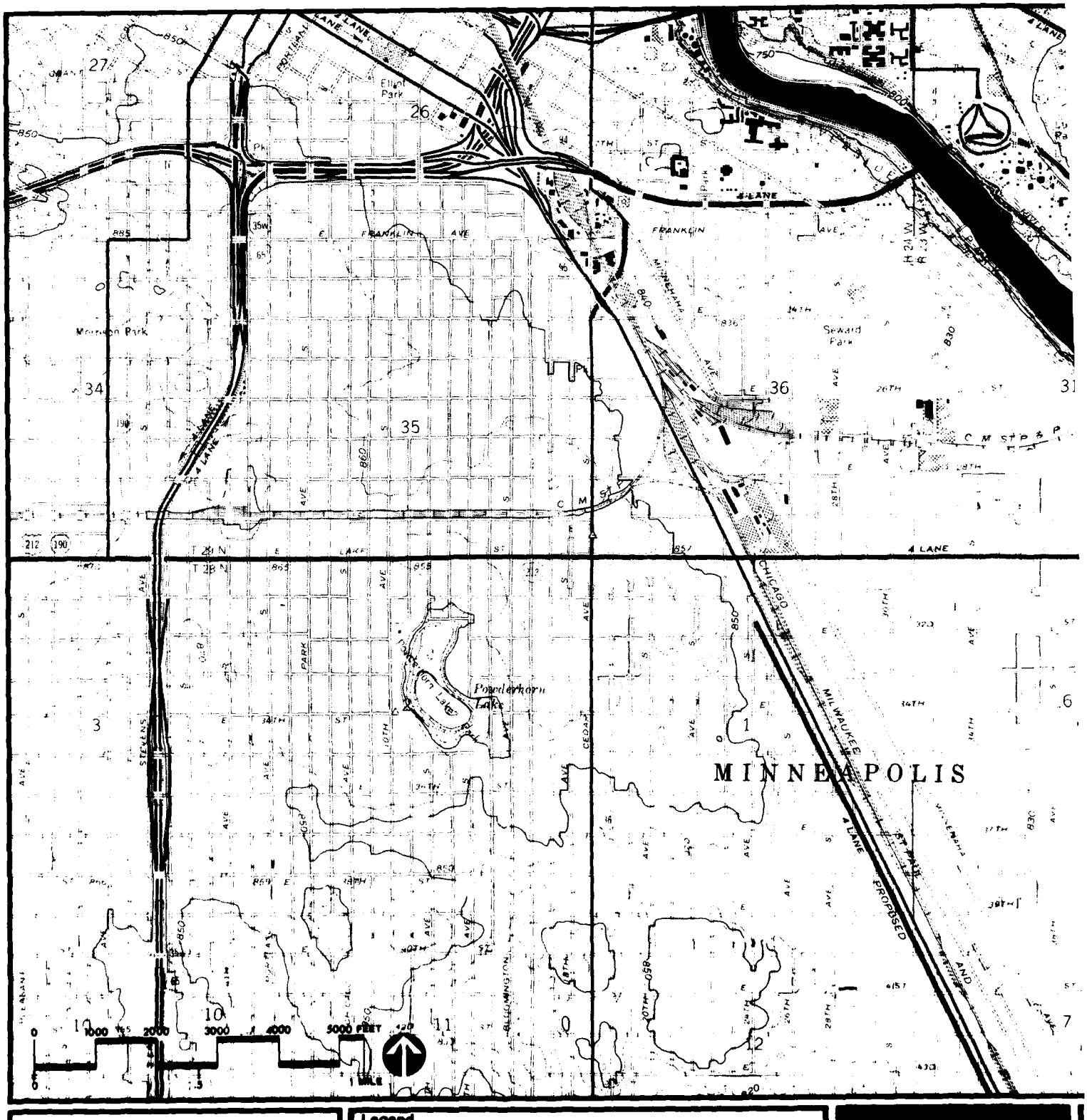
Checked by: Russell K Snyder

Submitted by:

Approved by: Charles E. Wakeman

Land Use Allocation

USAF Mile 852.5-857.0 Plate 1 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

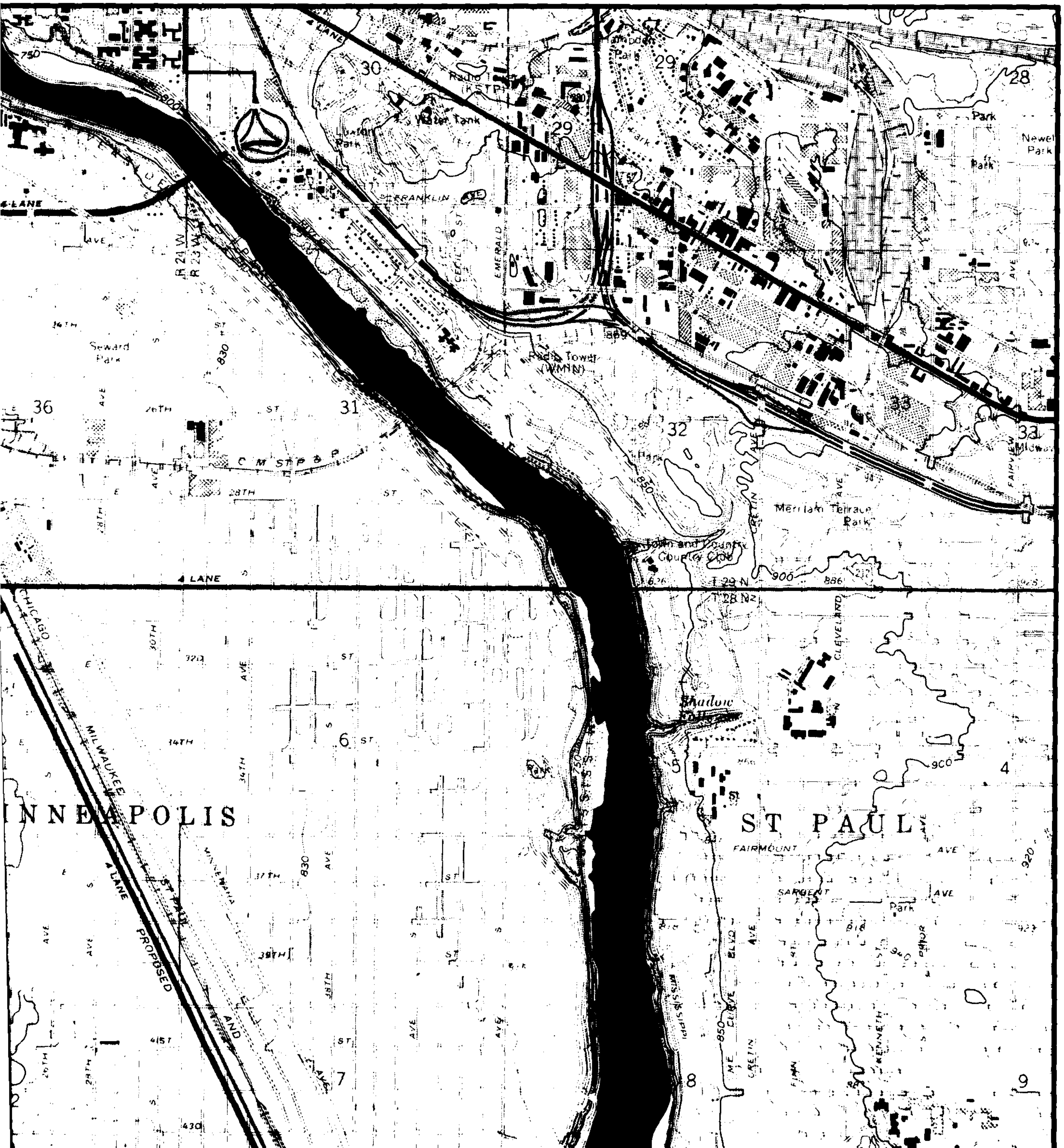
CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories



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US Army Corps of Engineers

Drawn by: B.V./R.S.

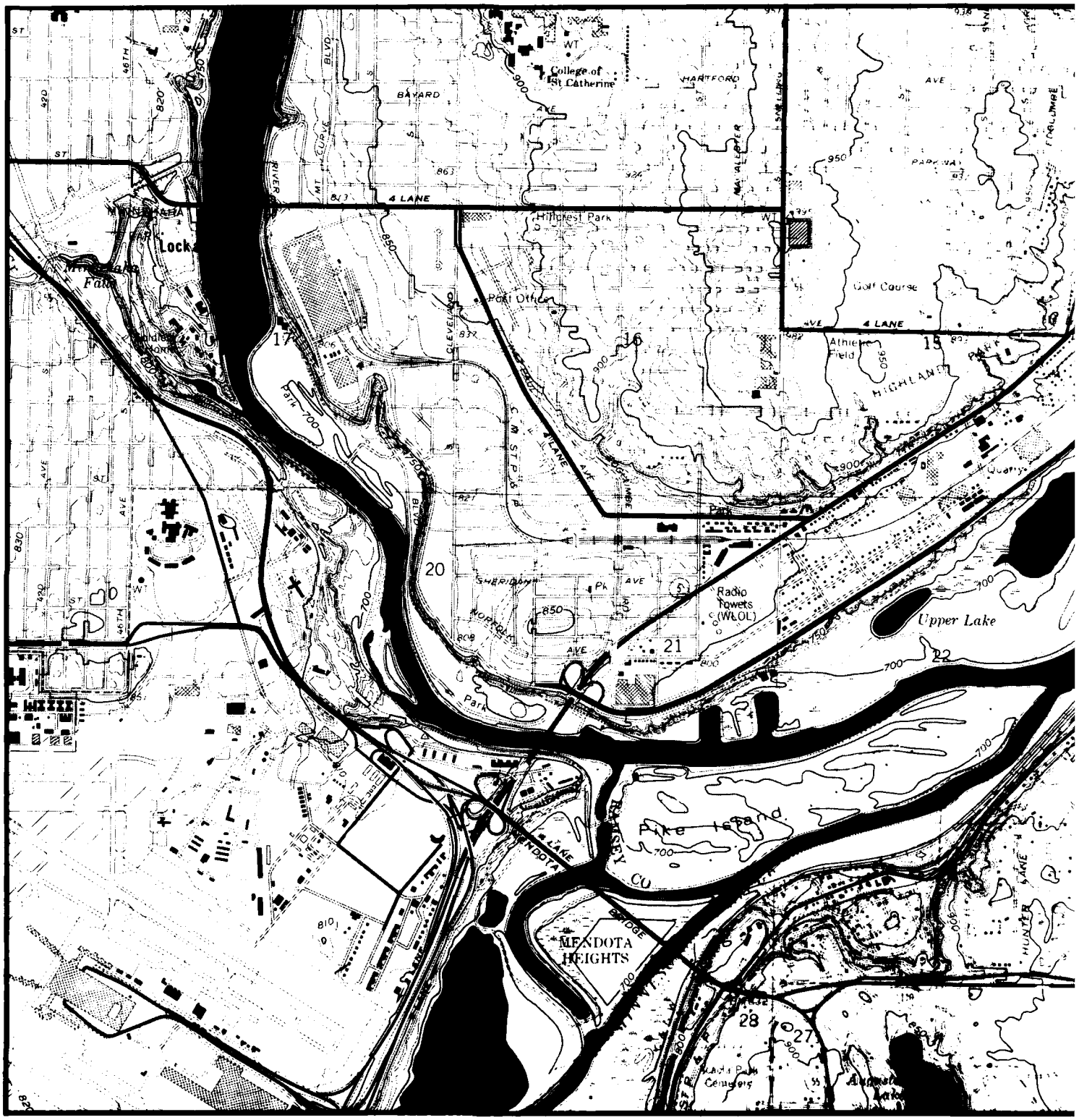
Checked by: Russel K Snyder

Submitted by: [signature]

Approved by: Charles E. Wakeman

Land Use Allocation

Pool 1 Mile 848.4-852.5 Plate 2 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

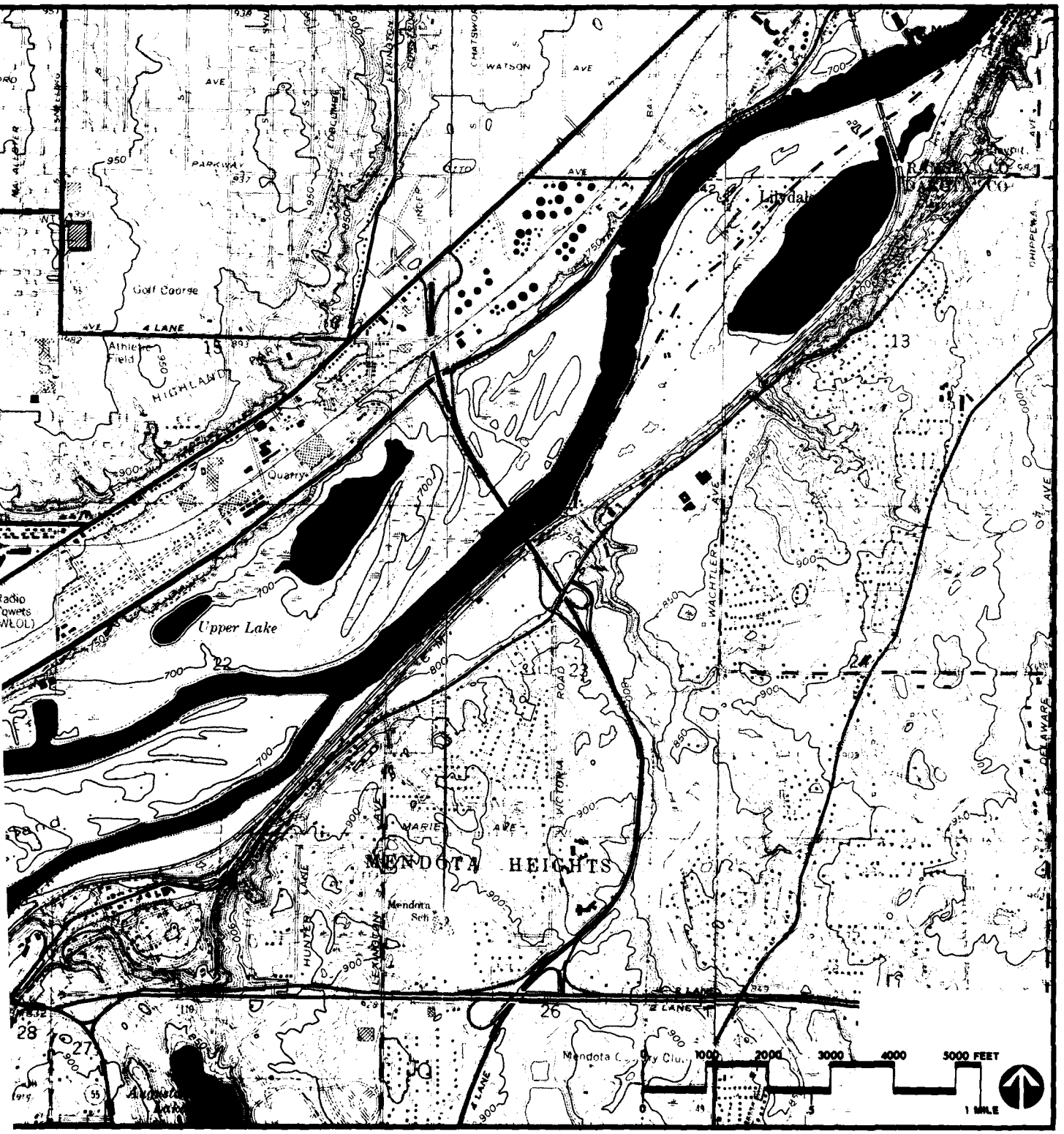
CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories



Boundary
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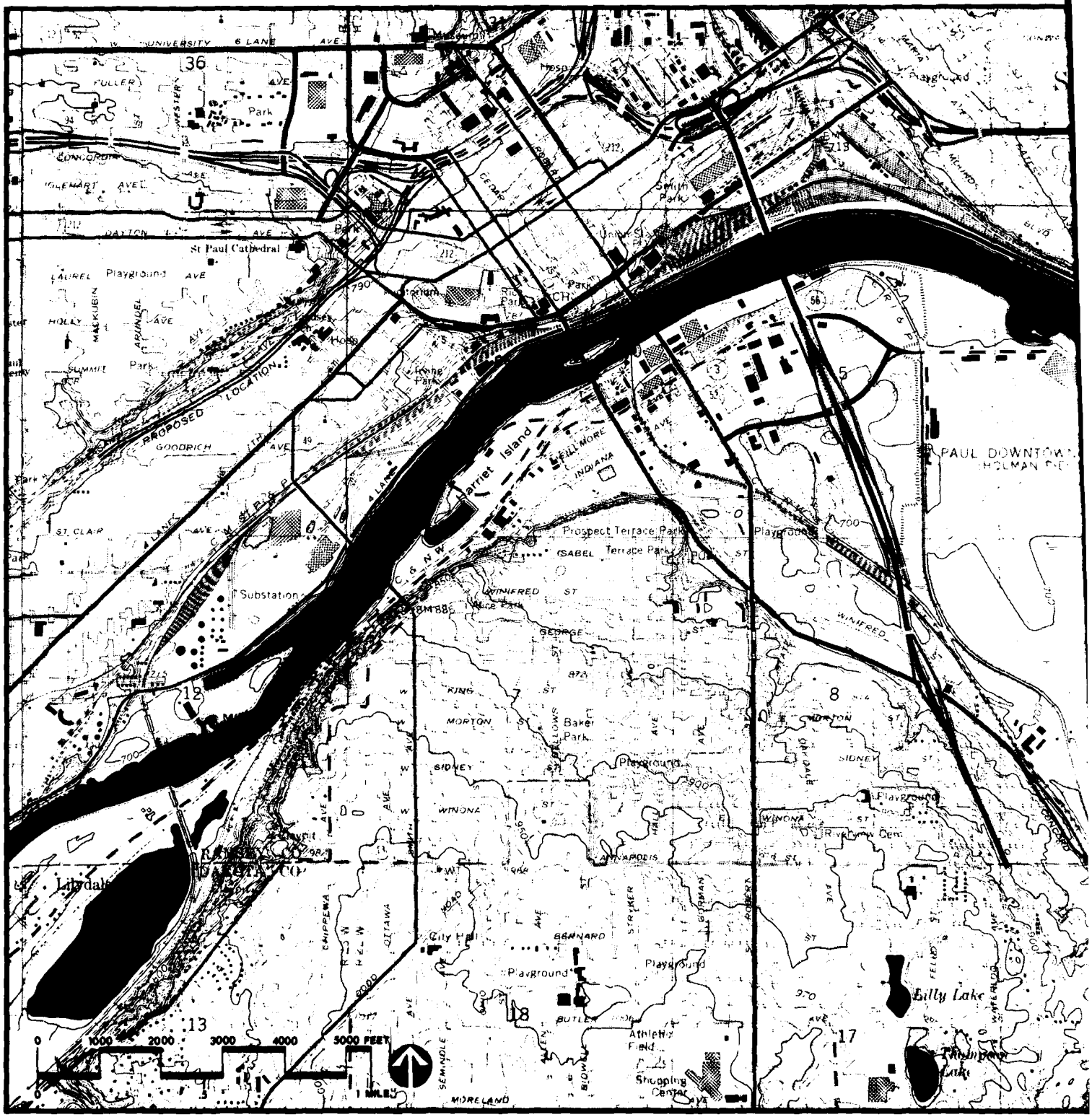
U.S. Army Corps of Engineers

Drawn by: BV/RS
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E. Wakeman

Land Use Allocation

L & D 1 Mile 841.0-848.4 Plate 3 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

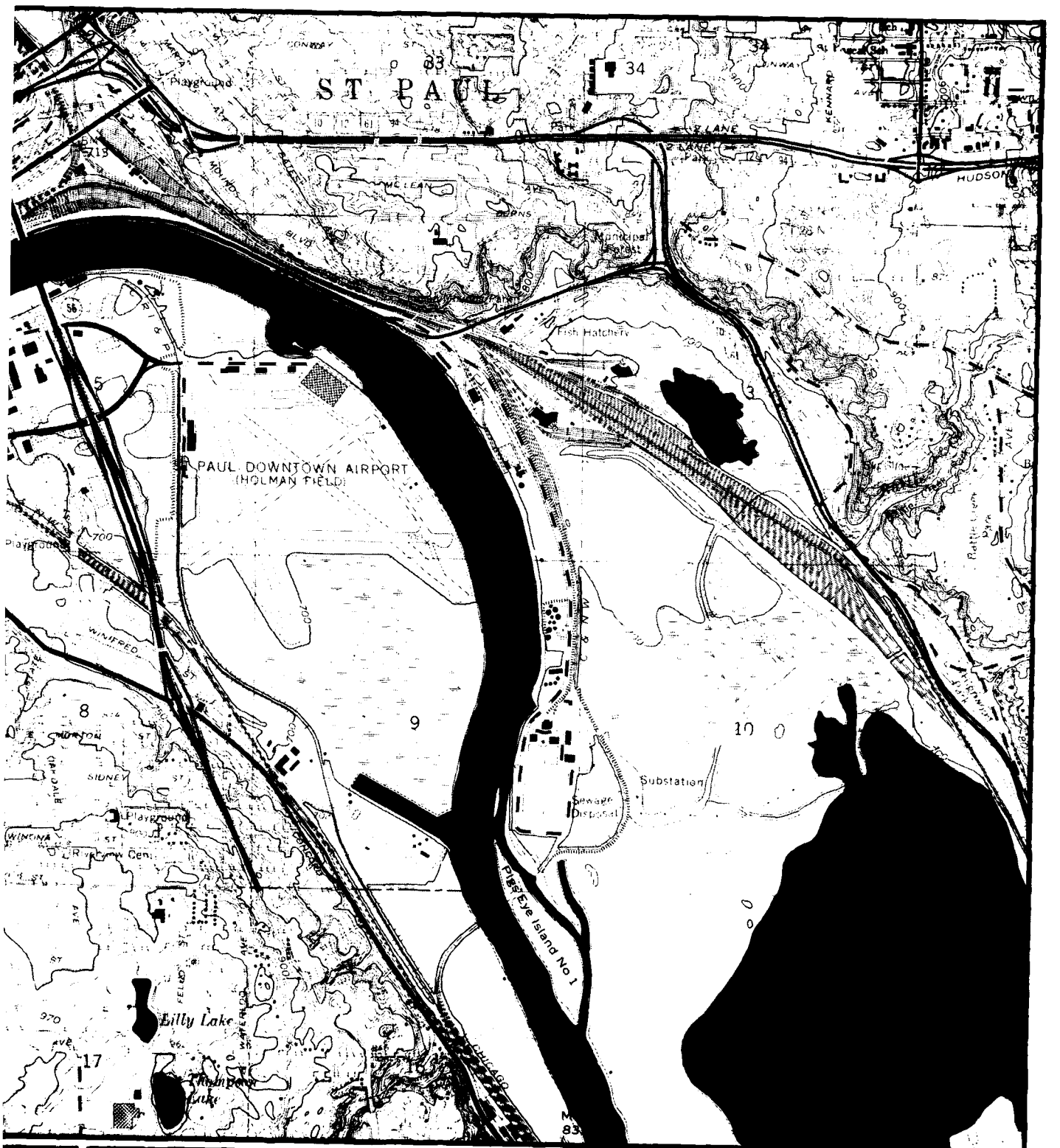
State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



US Army Corps of Engineers

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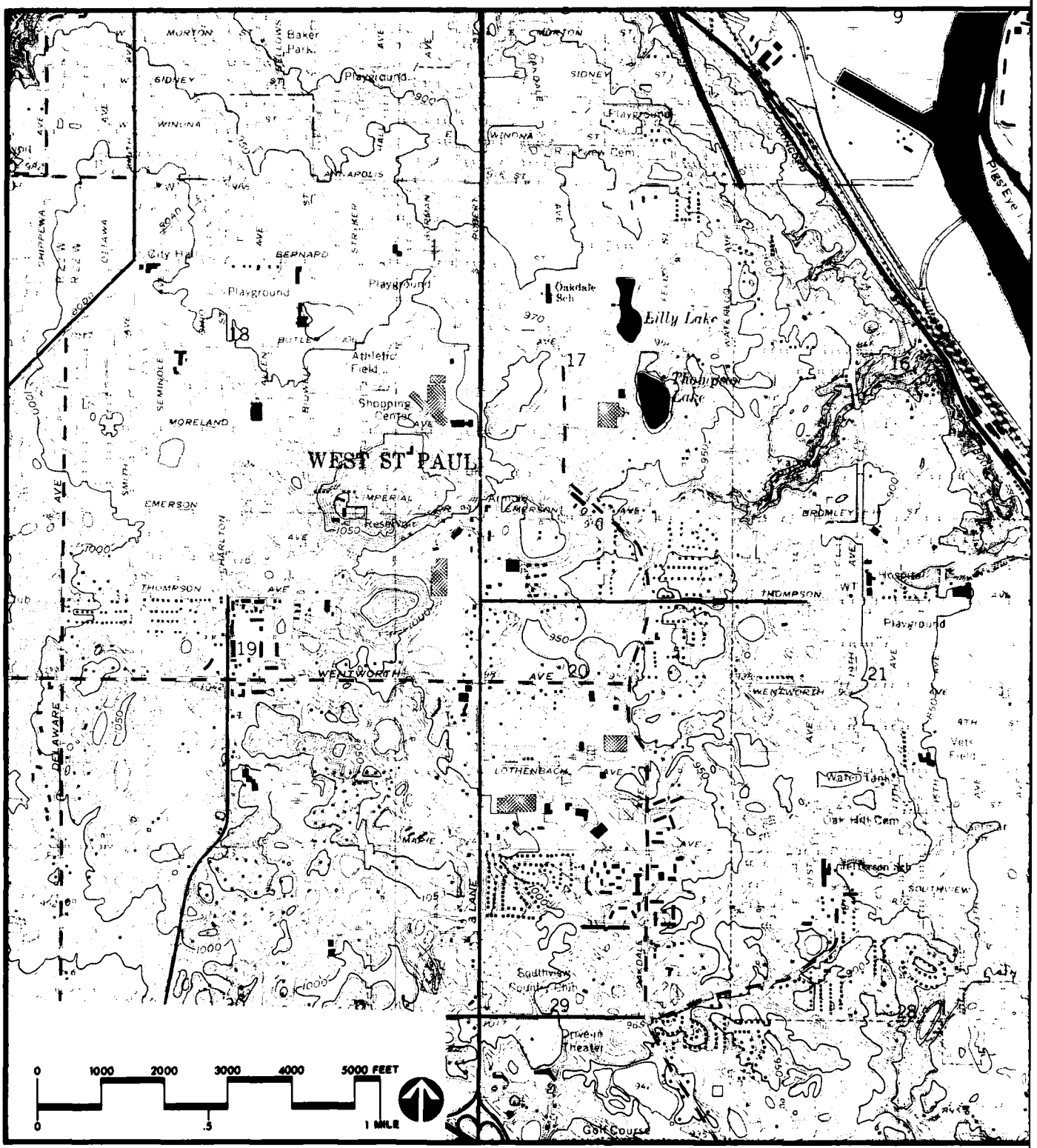
Checked by: Russell K Snyder

Submitted by: [signature]

Approved by: Charles E. Watkins

Land Use Allocation

Pool 2 **Mile 835.0-842.0** **Plate 4 of 66**



Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

Boundary
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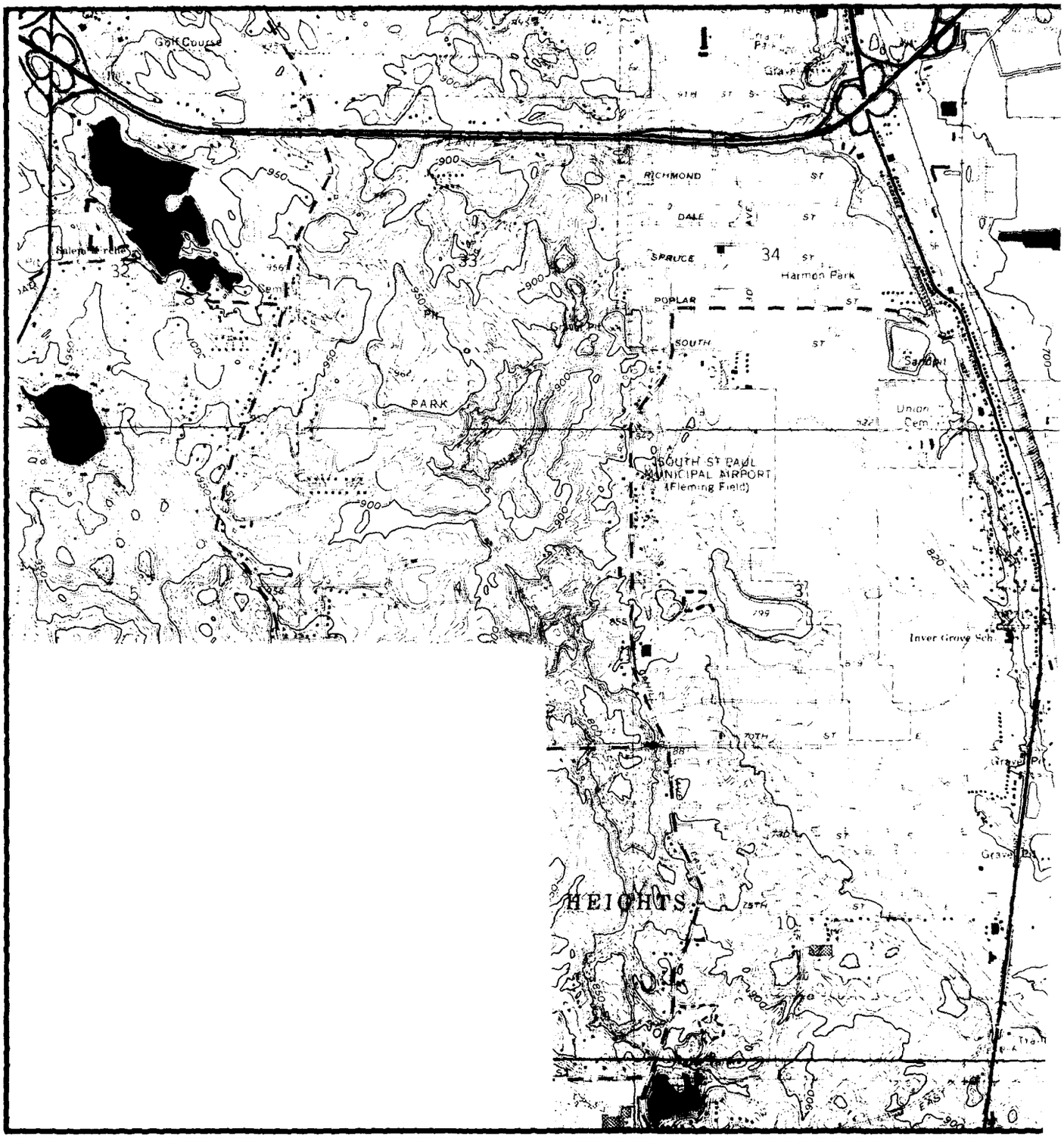
US Army Corps of Engineers

Drawn by: B.V./RS.
Checked by: Russell K. Snyder
Submitted:
Approved by: Charles E. Workman

Land Use Allocation

Pool 2 Mile 832.1-836.0 Plate 5 of 66



Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
■	■	Project Operations
□	□	Recreation / Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

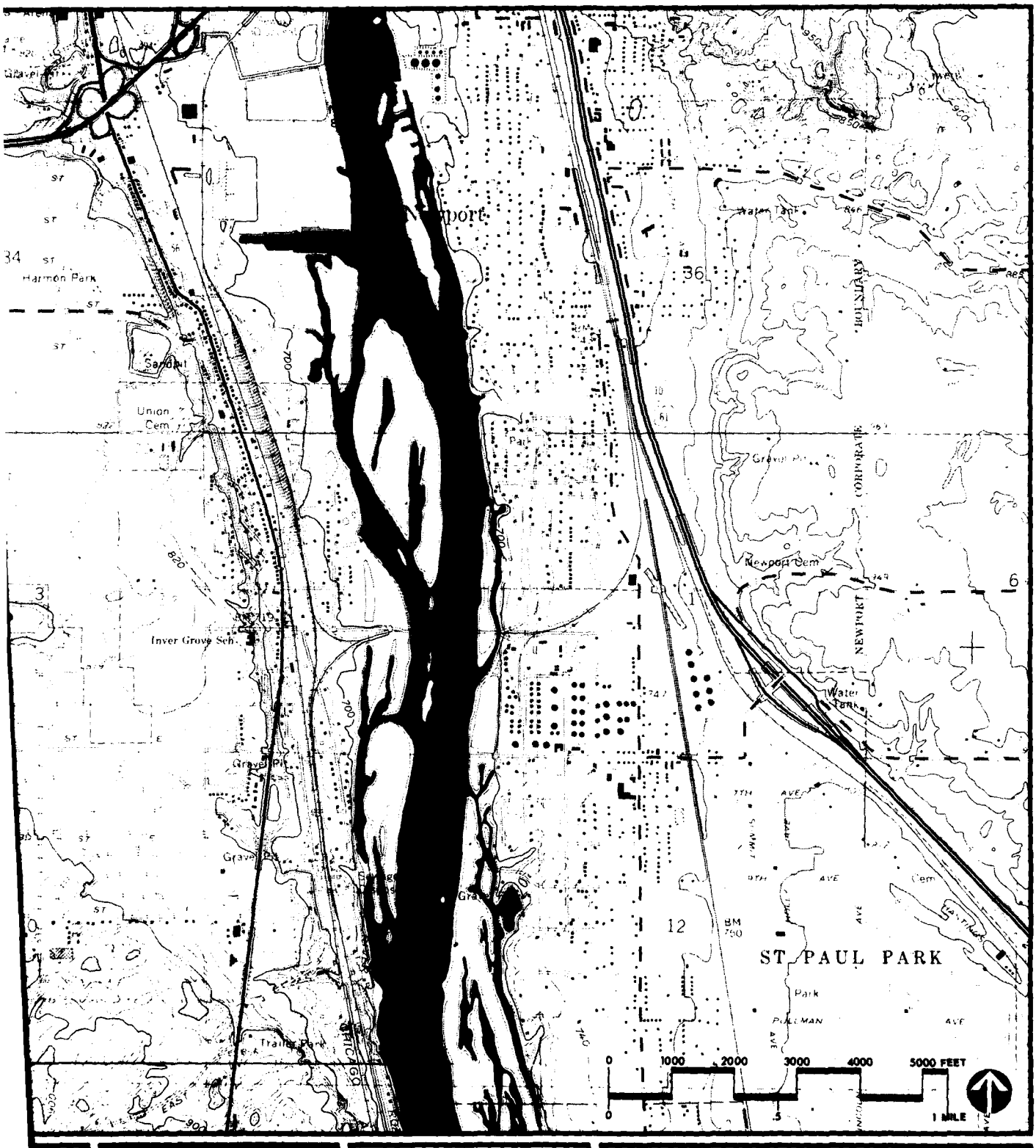
State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



US Army Corps of Engineers

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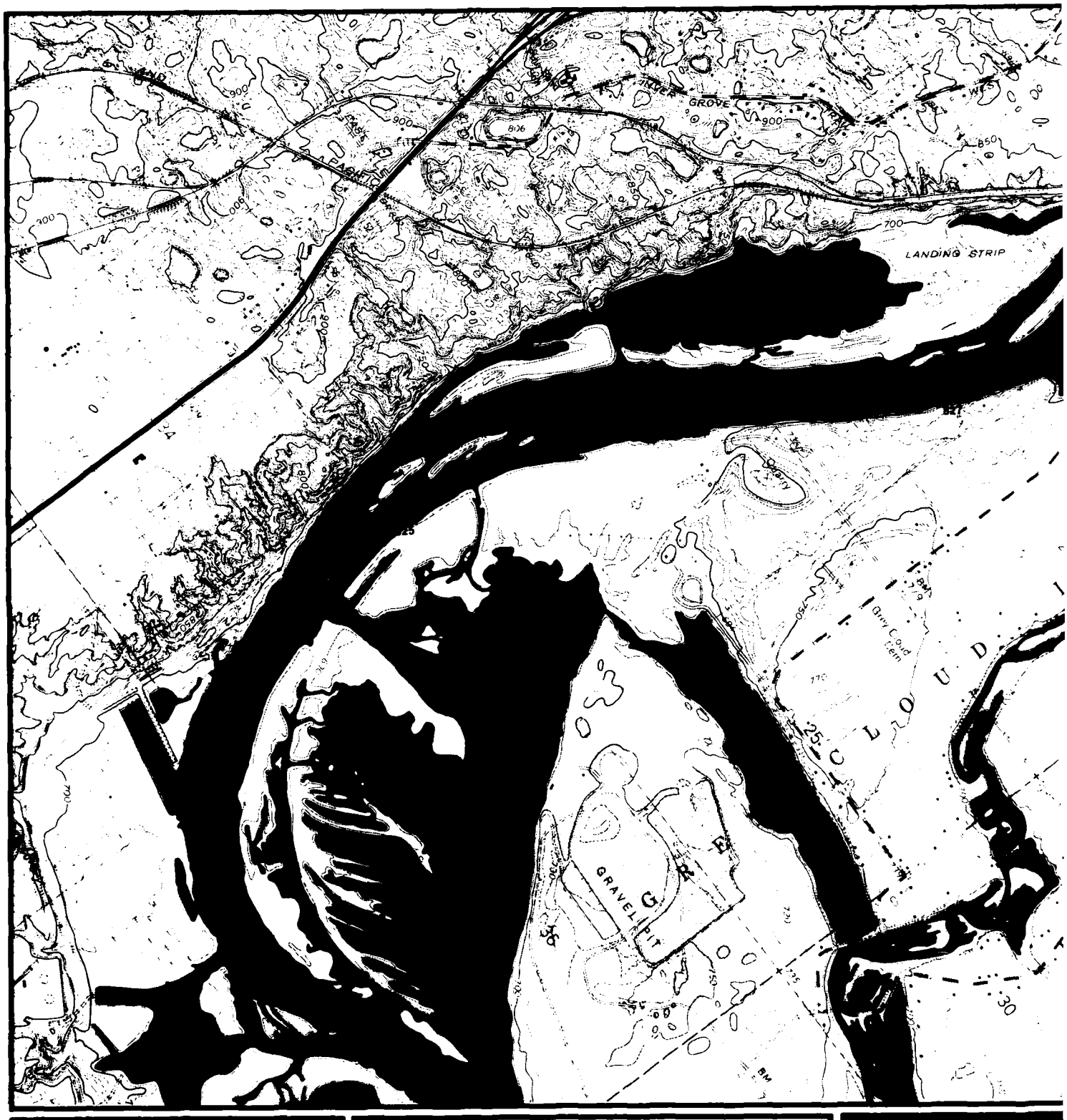
Checked by: Russell K. Snyder

Submitted by: [signature]

Approved by: Charles E. Wahnow

Land Use Allocation

Pool 2 **Mile 828.4-832.3** **Plate 6 of 66**



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

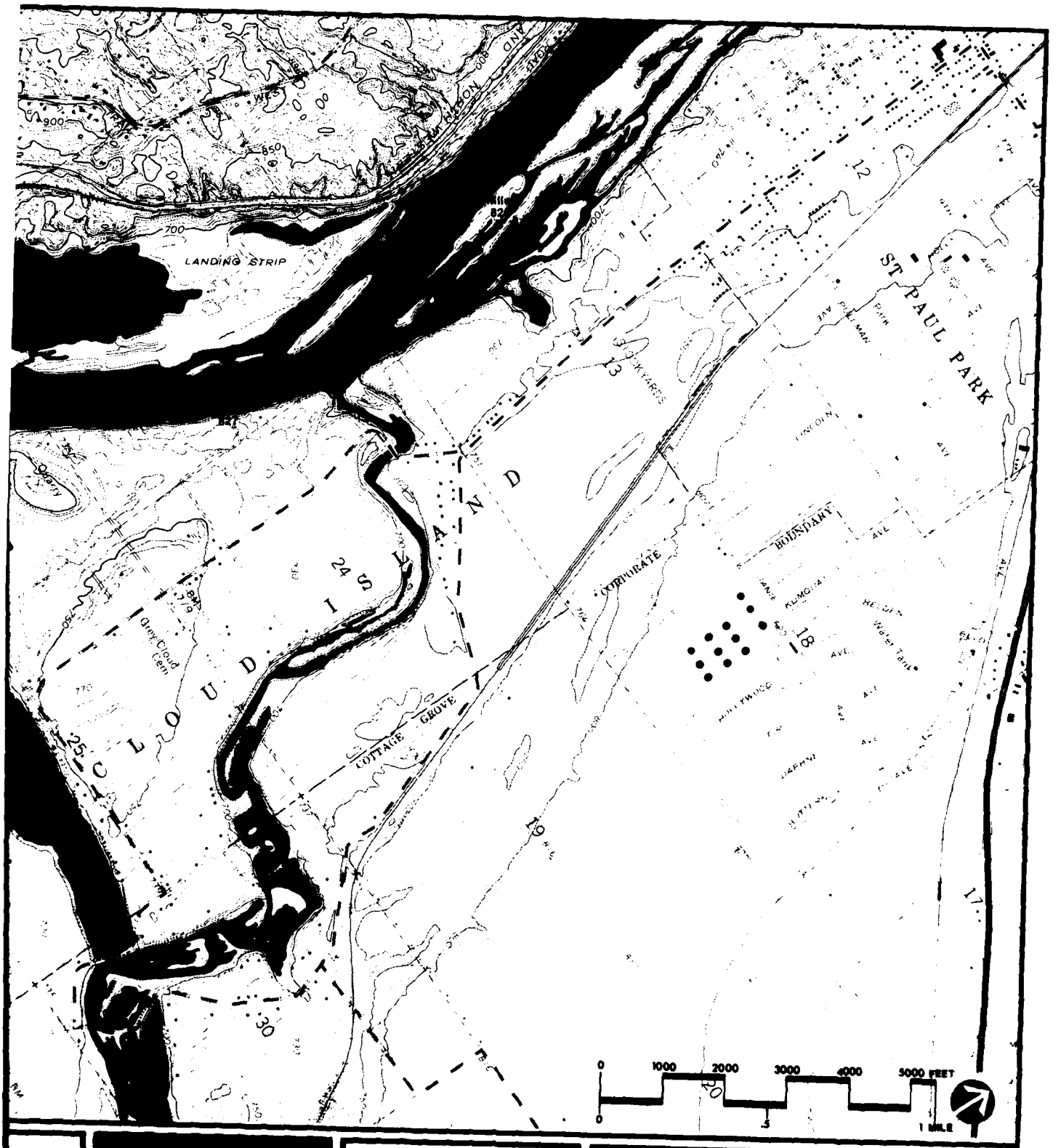
State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



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US Army Corps of Engineers

Drawn by B.V/RS

Checked by Russell K Snyder

Submitted by

Approved by Charles E Watkinson

Land Use Allocation

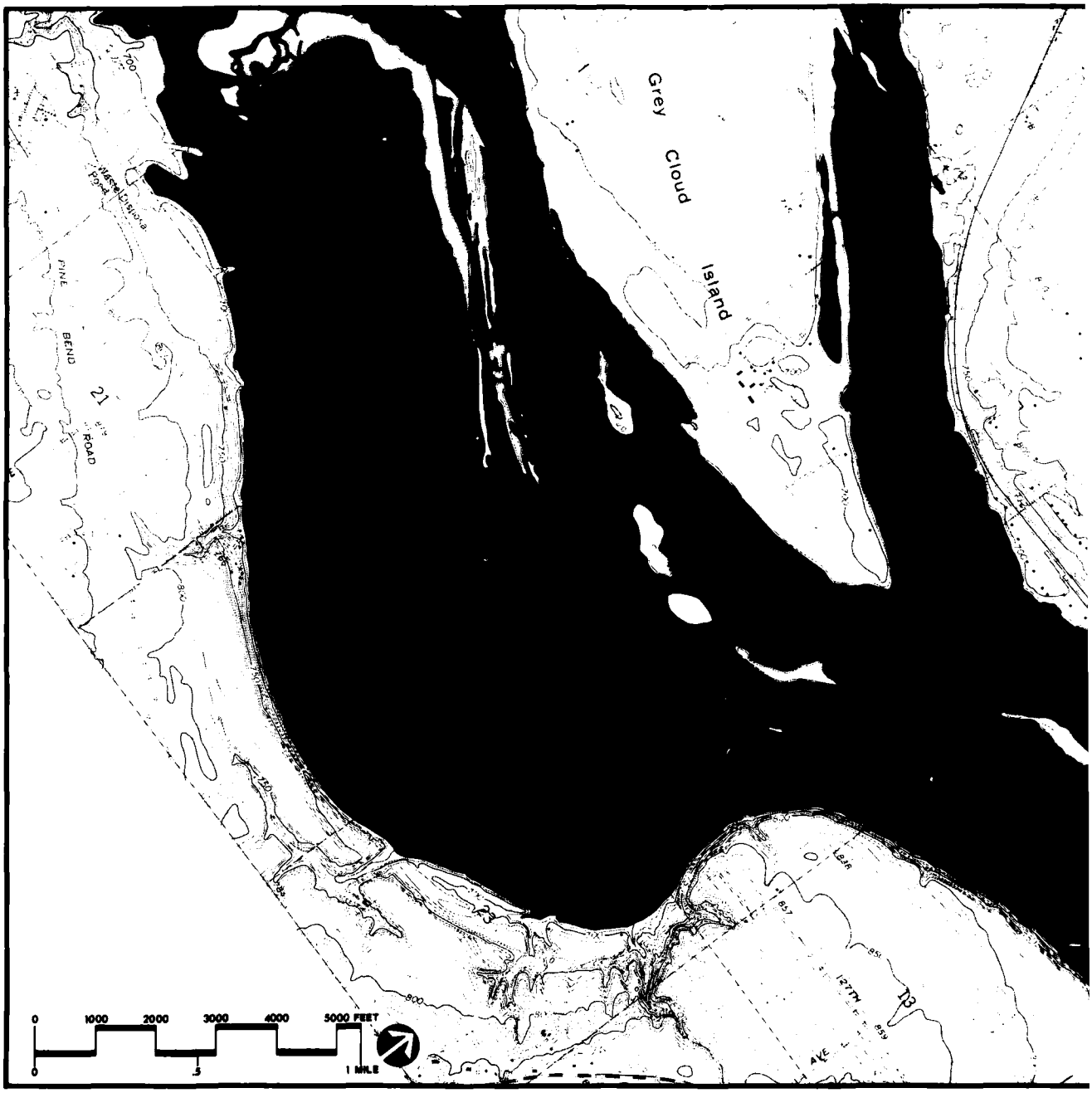
Pool 2 **Mile 822.7-828.8** **Plate 7 of 66**

Use Development and
Resource Management
Upper Mississippi River

Project Operations
Recreation / Intensive Use
Recreation / Low-Density
Natural Area
Wildlife Management

State Boundary
FWS Refuge Boundary
Miles Above Ohio River
* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



Master Plan for Public
Use Development and
Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
Miles Above Ohio River
* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

Boundary
Refuge Boundary
Above Ohio River
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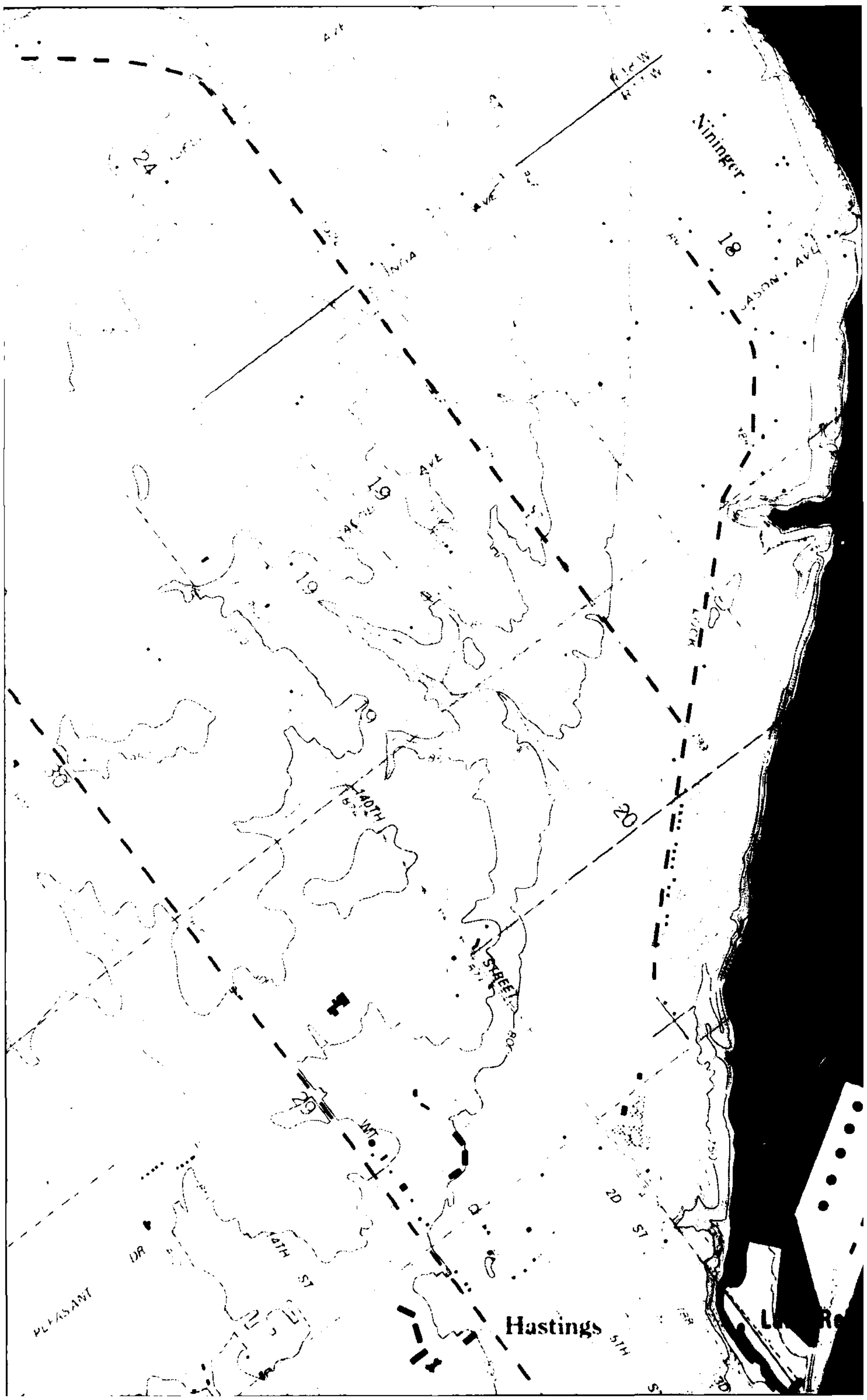
US Army Corps of Engineers

Drawn by: B.V / RS.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E Wakeman

Land Use Allocation

Pool 2 **Mile 818.0-822.9** **Plate 8 of 66**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Checked by:
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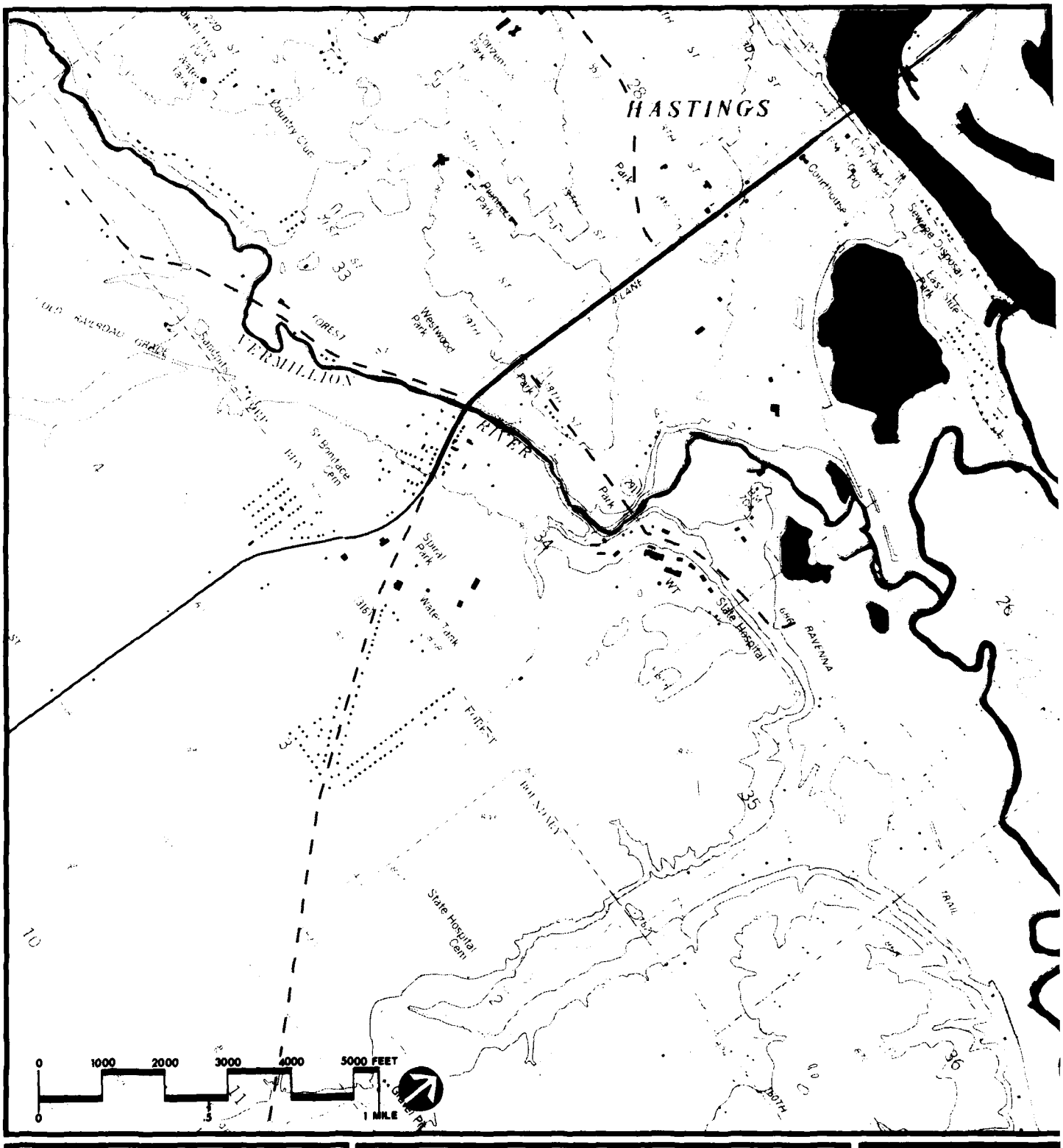
Land Use Allocation

L & D 2 Mile 814.0-818.2 Plate 9 of 66



Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

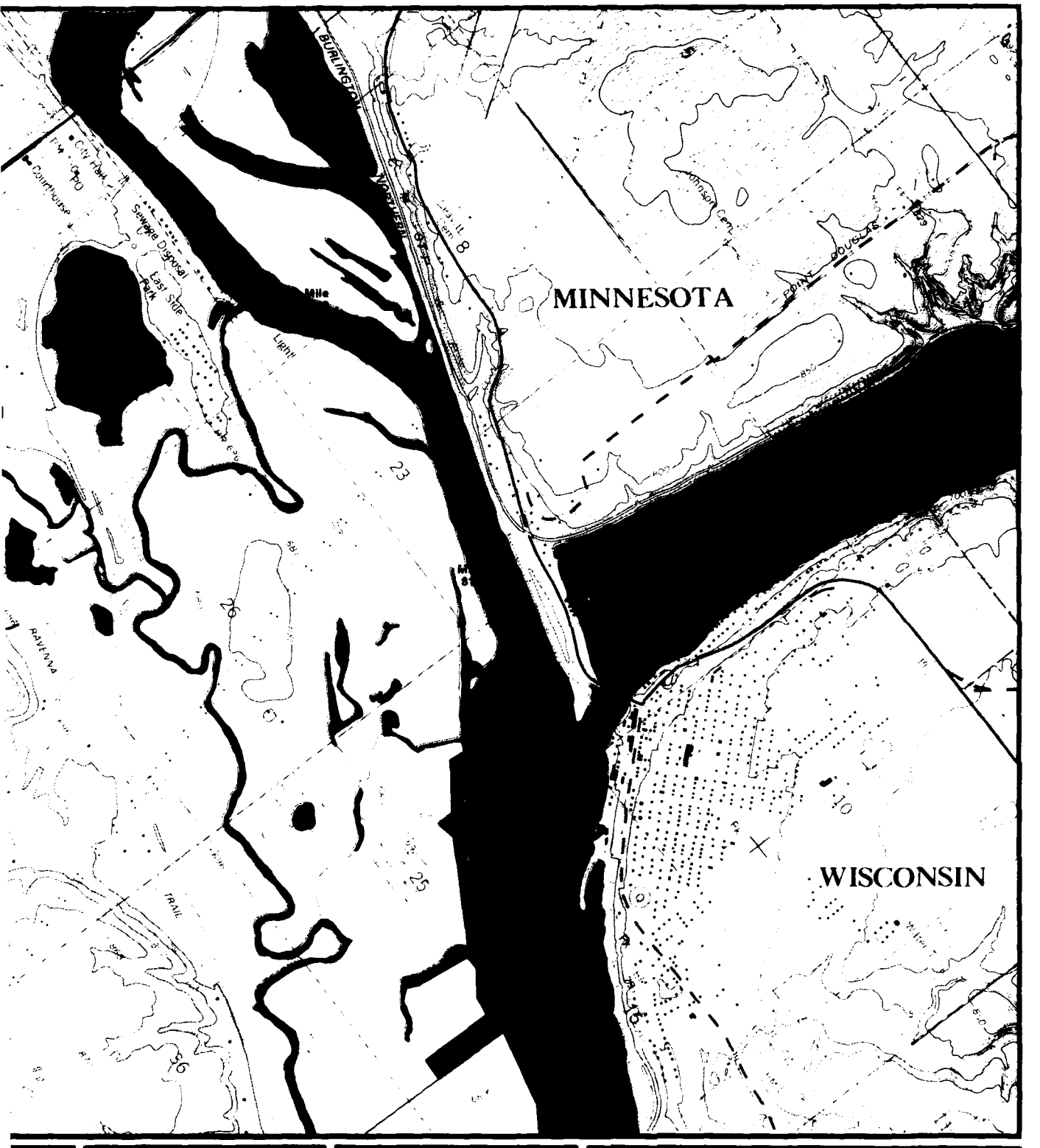
State Boundary

FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



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Drawn by B.V./R.S.

Checked by: Russell K Snyder

Submitted by

Approved by Charles E. Wakeman

Land Use Allocation

Pool 3 Mile 810.2-814.2 Plate 10 of 66

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	▨	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

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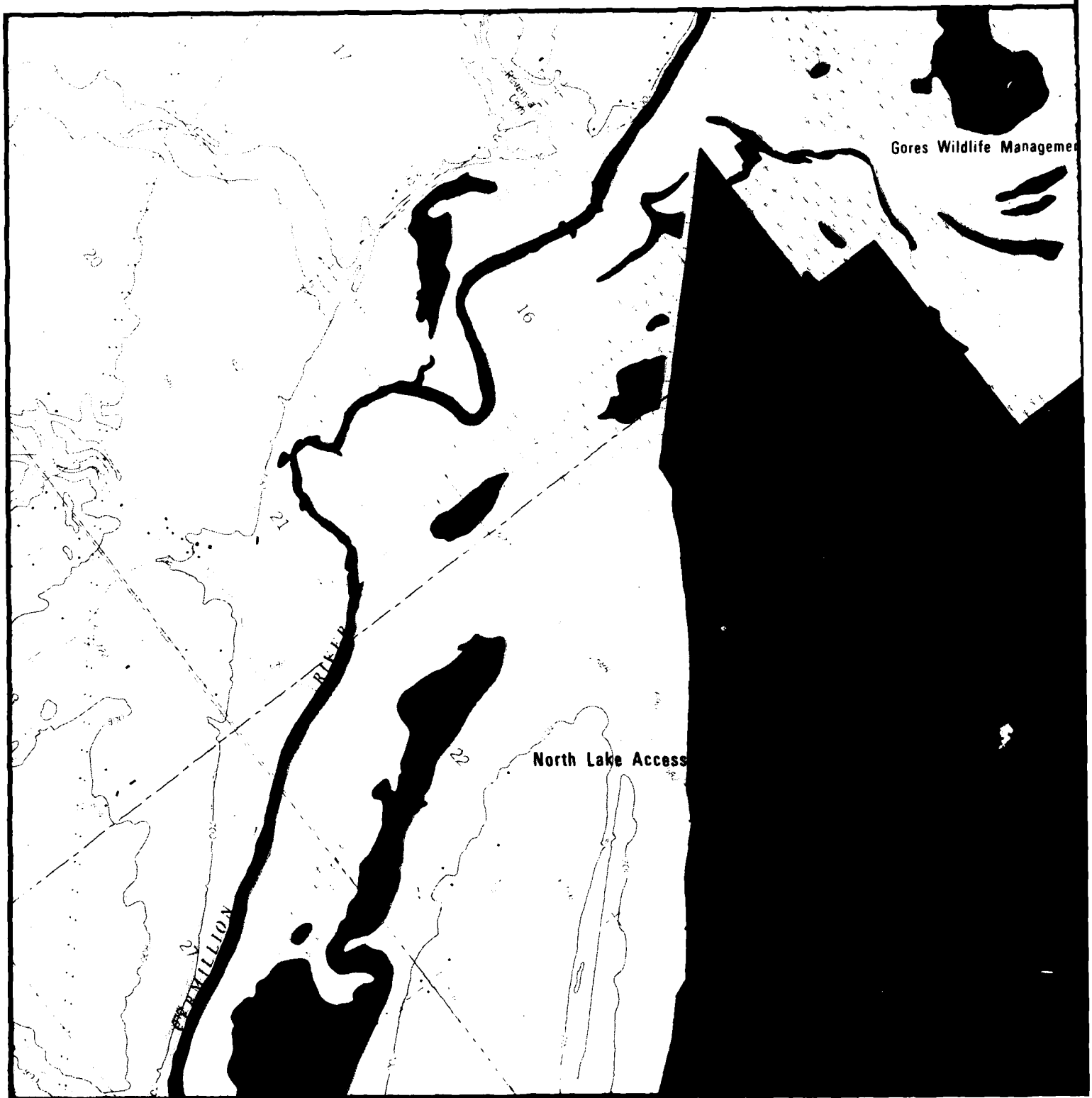
Drawn by: BV/RS.
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 3 Mile 806.8-810.4 Plate 11 of 66



Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation - Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— ~ — FWS Refuge Boundary

+ 726 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

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US Army Corps of Engineers

Drawn by: B.V/RS.

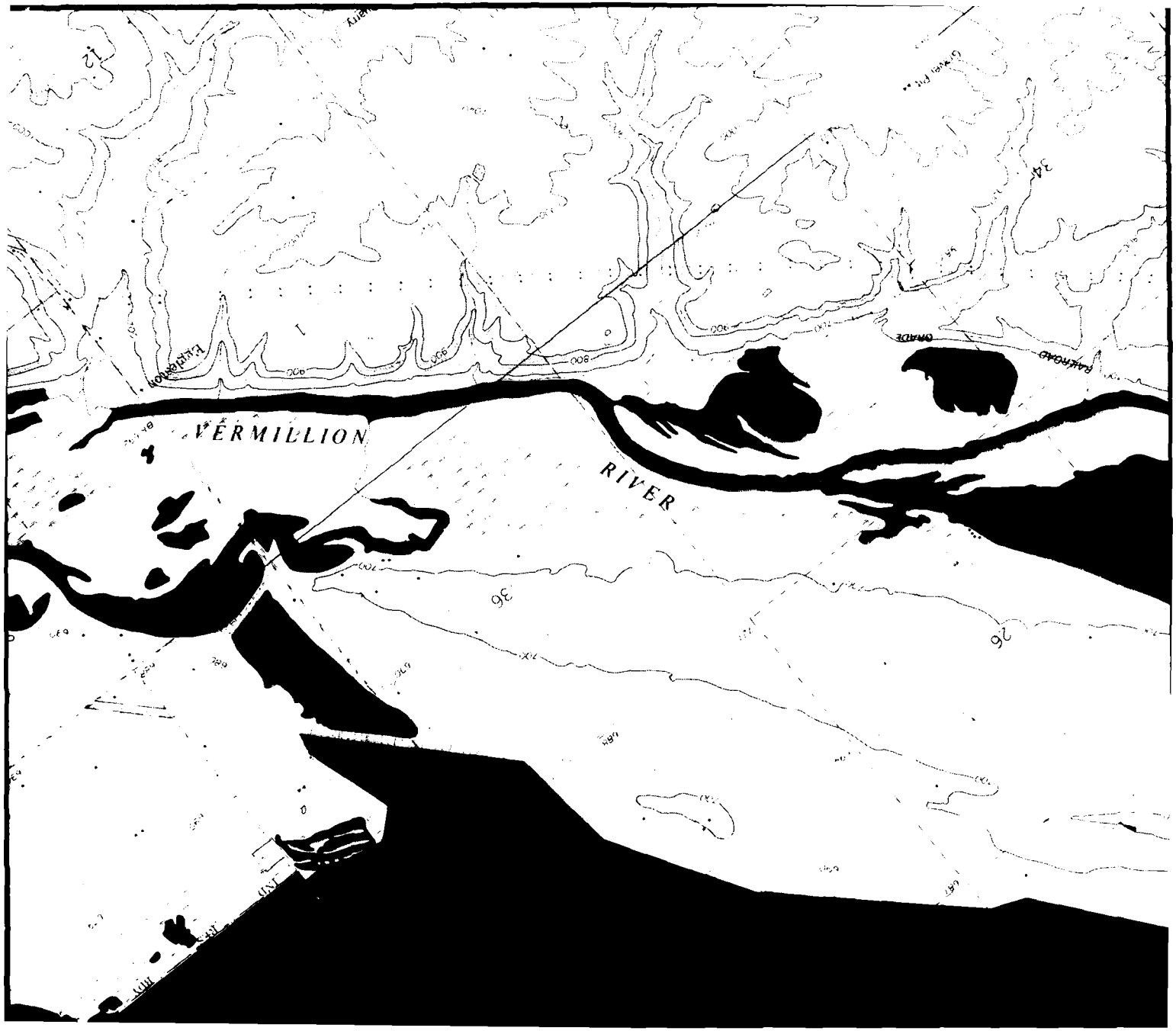
Checked by: Russell K Snyder

Submitted by:

Approved by: Charles E Wakeman

Land Use Allocation

Pool 3 Mile 803.6-807.0 Plate 12 of 66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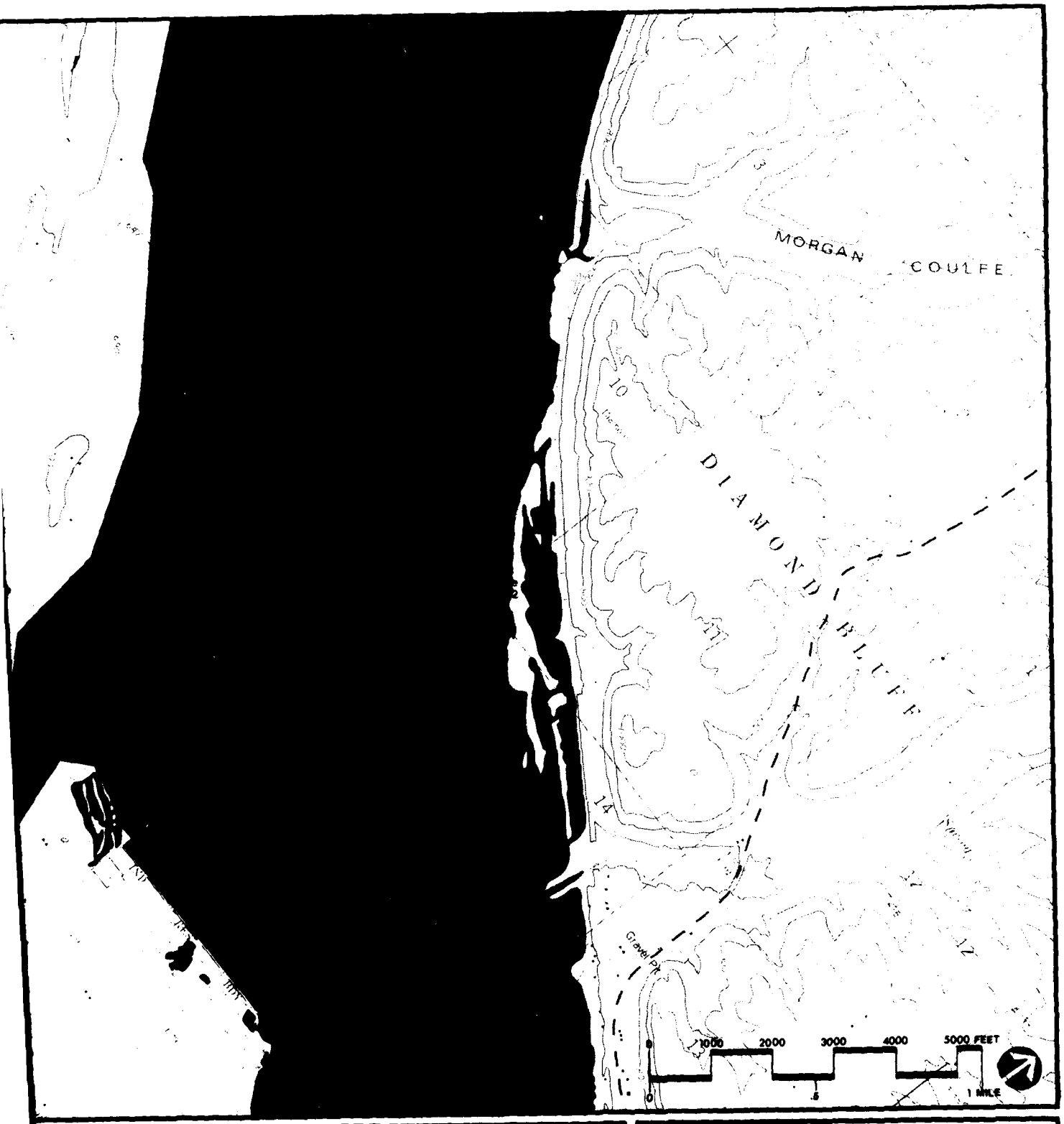

Boundary
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US Army Corps
of Engineers

Drawn by: BV/RS
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E Wakeman

Land Use Allocation

Pool 3 Mile 800.2-803.8 Plate 13 of 66

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation - Intensive Use
		Recreation - Low-Density
		Natural Area
		Wildlife Management

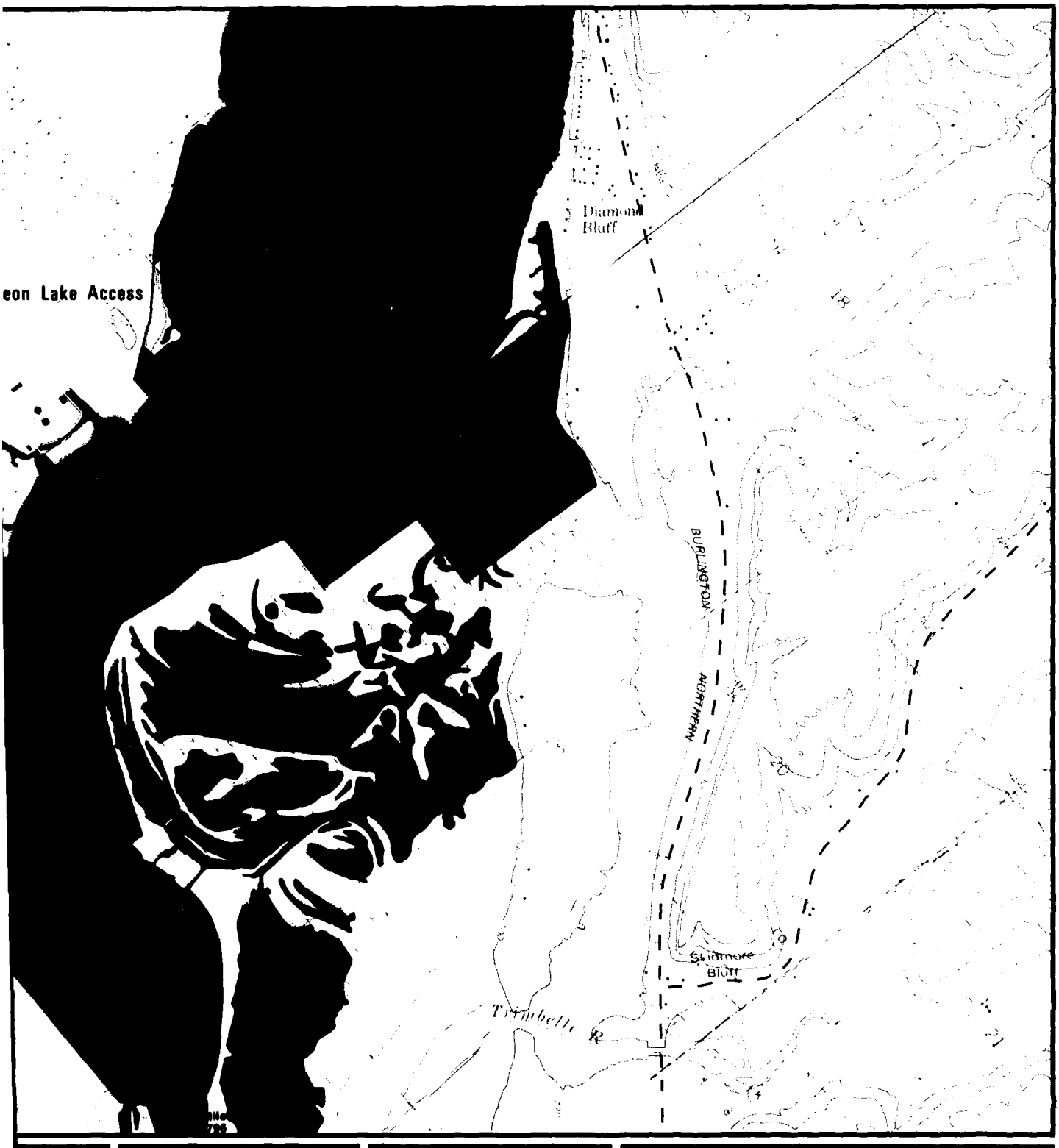
State Boundary

FWS Refuge Boundary

Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



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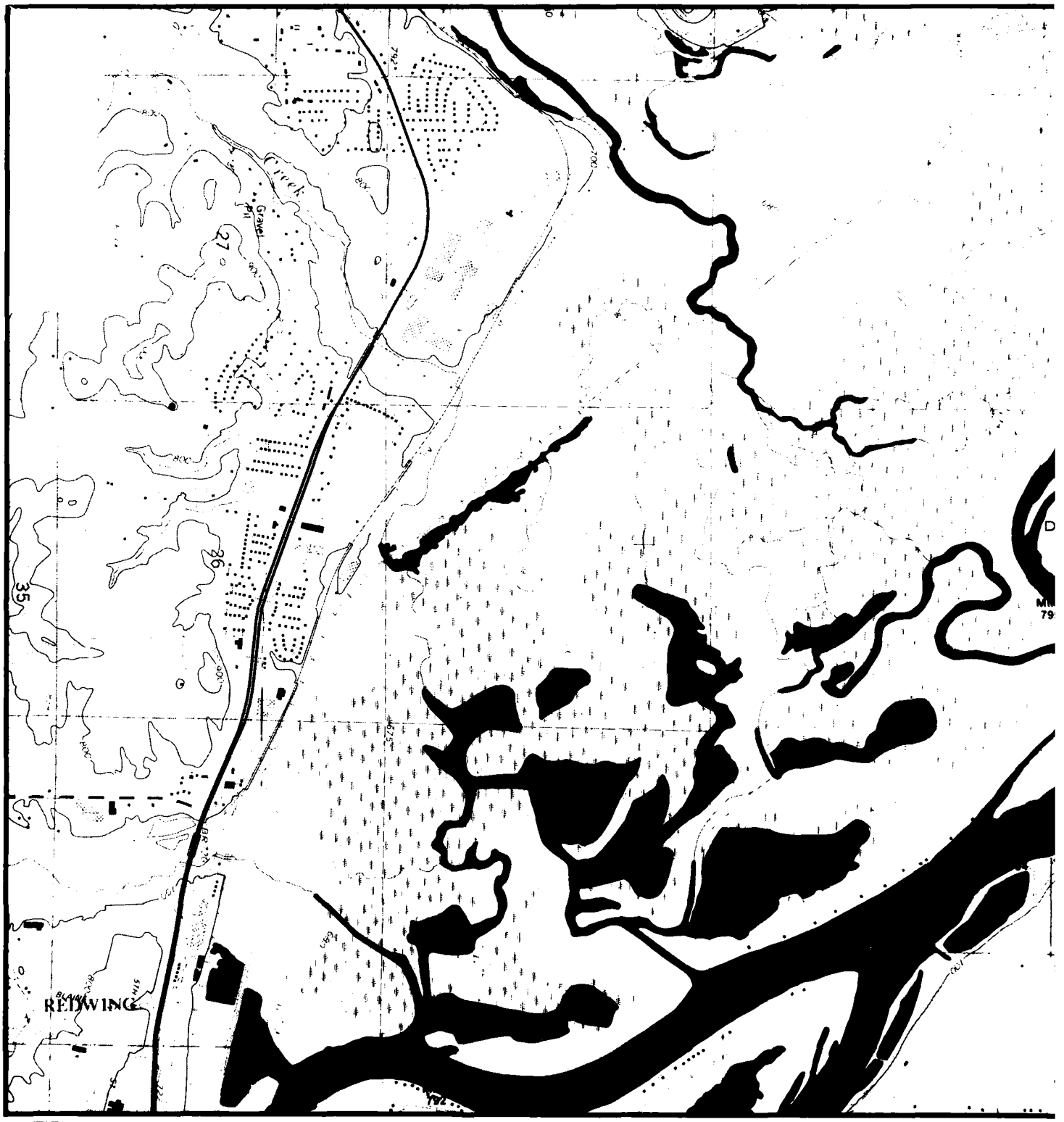
for definitions
categories

US Army Corps of Engineers

Drawn by: B.V/RS.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E Wakeman

Land Use Allocation

L & D 3 Mile 796.0-800.5 Plate 14 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

Boundary
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Above Ohio River
for definitions
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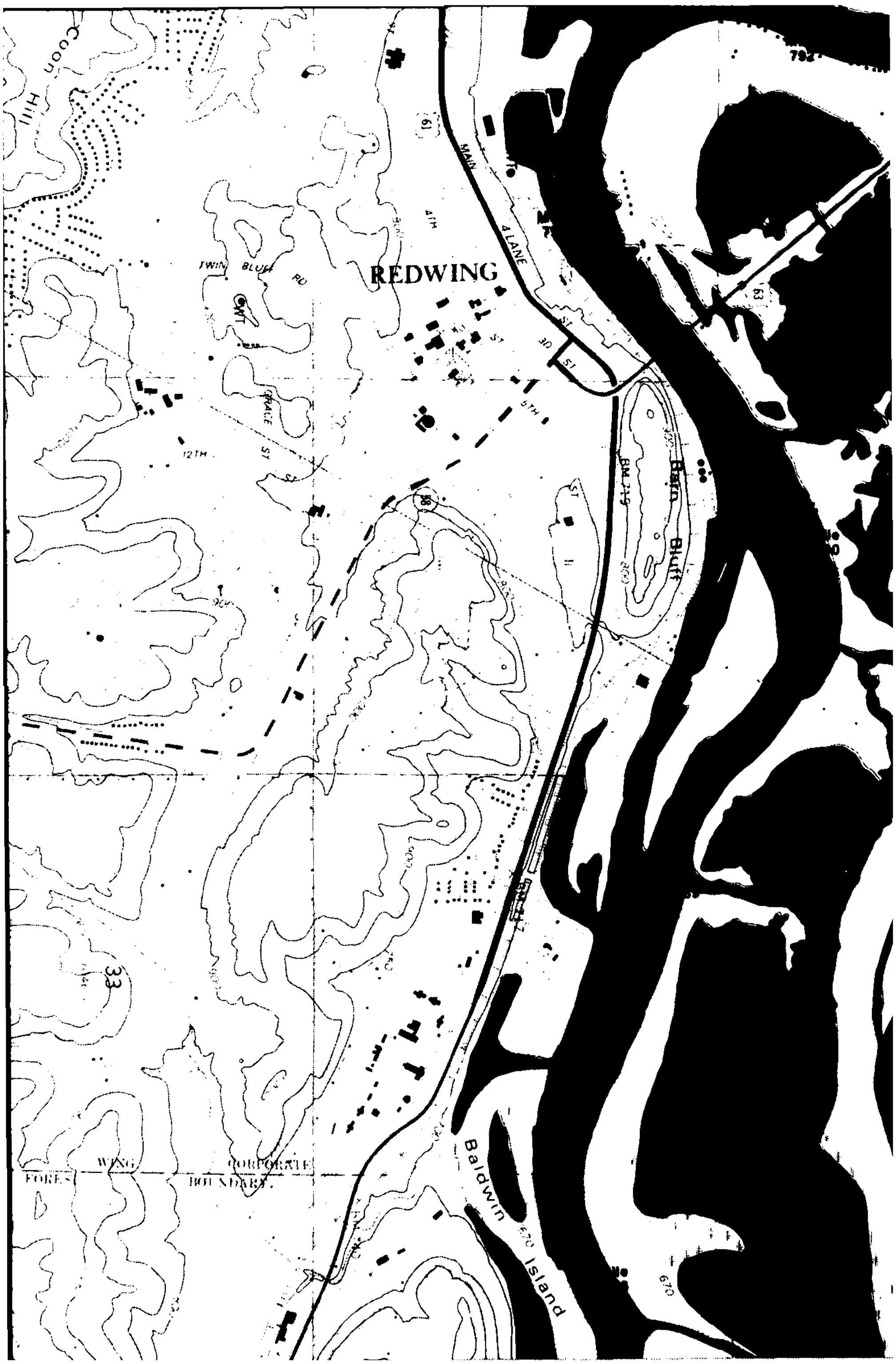
US Army Corps of Engineers

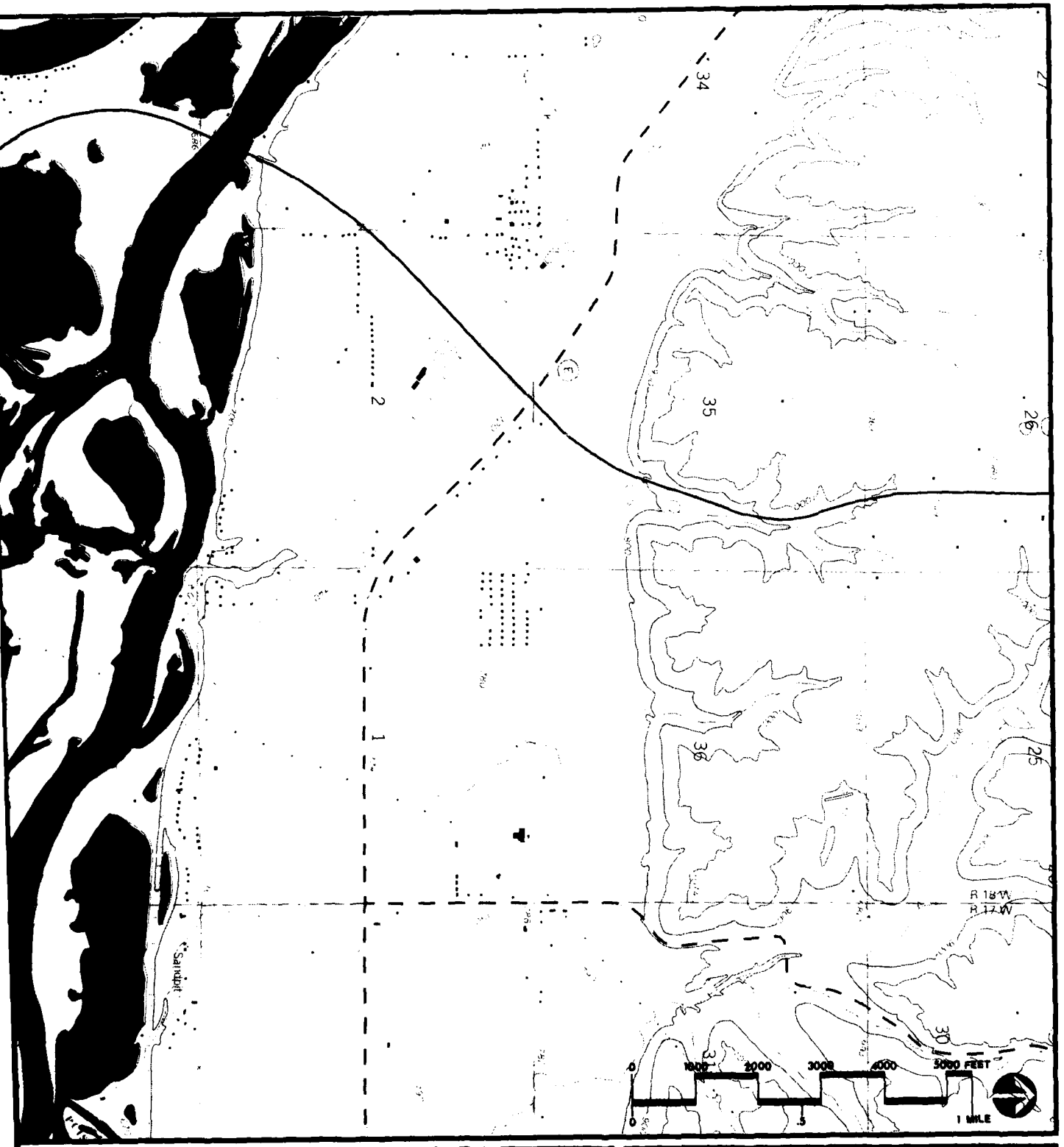
Drawn by: B.V./RS.
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 4 Mile 791.5-797.2 Plate 15 of 66



Coon Hill
REDWING
MAIN
4 LANE
4TH
TWIN BLUFF RD
CMT
GRACE ST
12TH
5TH
3D ST
Barn Bluff
BM 719
Baldwin Island
WING
CORPORATE
FOREST
BOUNDARY
33
670



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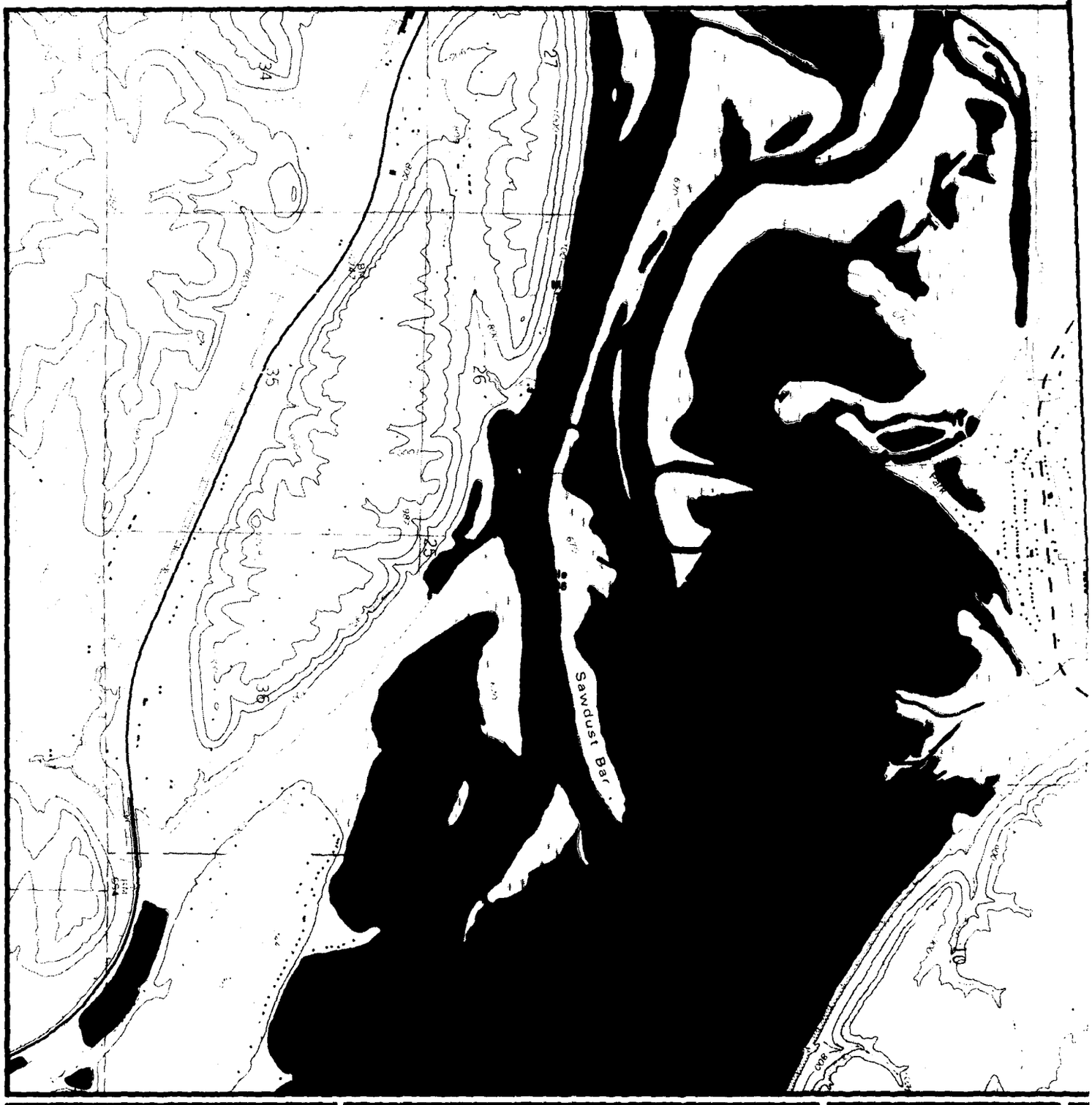
categories

US Army Corps
of Engineers

Drawn by: BV/RS
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E. Wakeman

Land Use Allocation

Pool 4 **Mile 787.7-792.5** **Plate 16 of 66**



Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

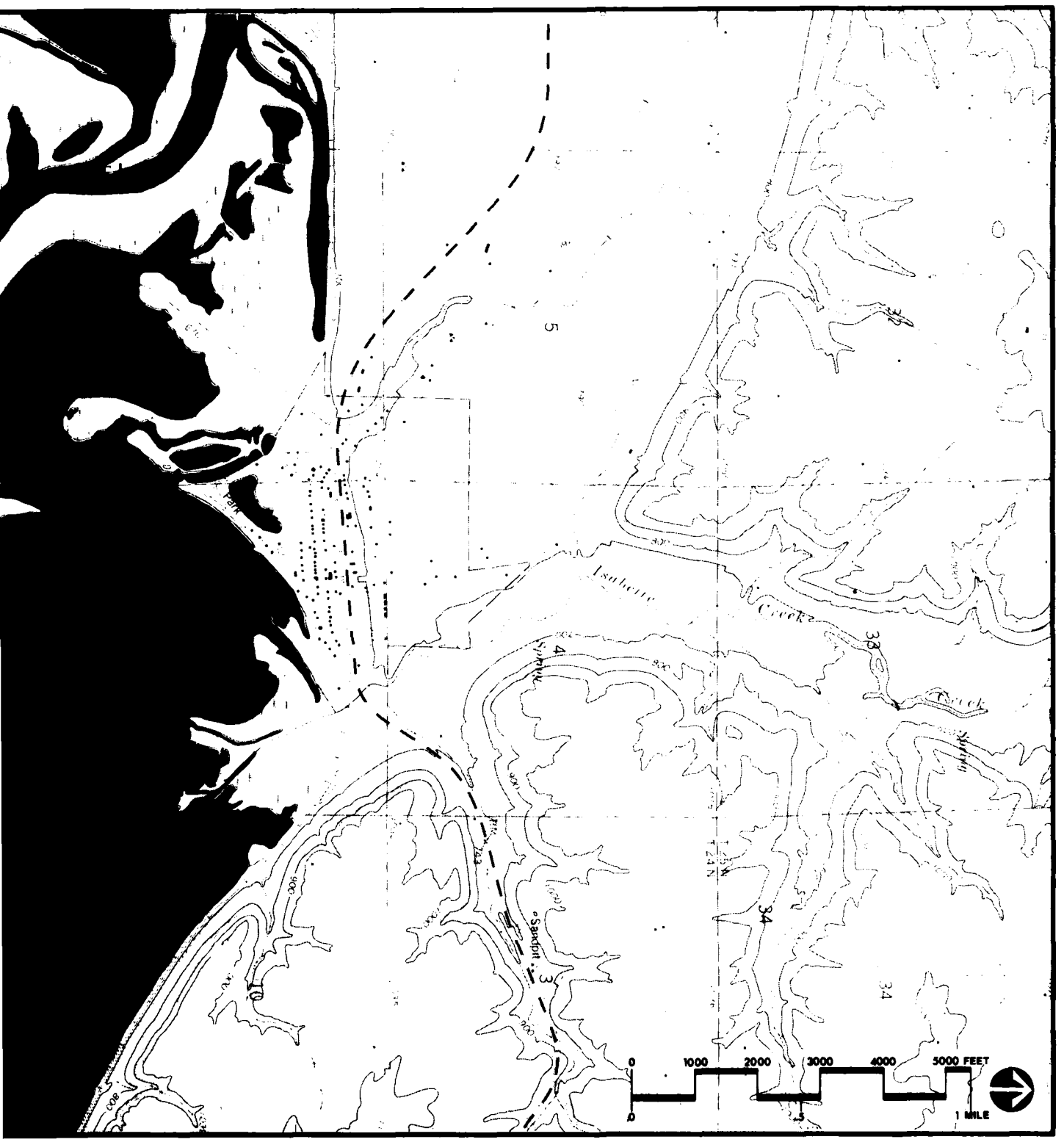
State Boundary

FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



e Boundary
3 Refuge Boundary
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US Army Corps of Engineers

Drawn by: BV/RS

Checked by: Russell K Snyder

Submitted by:

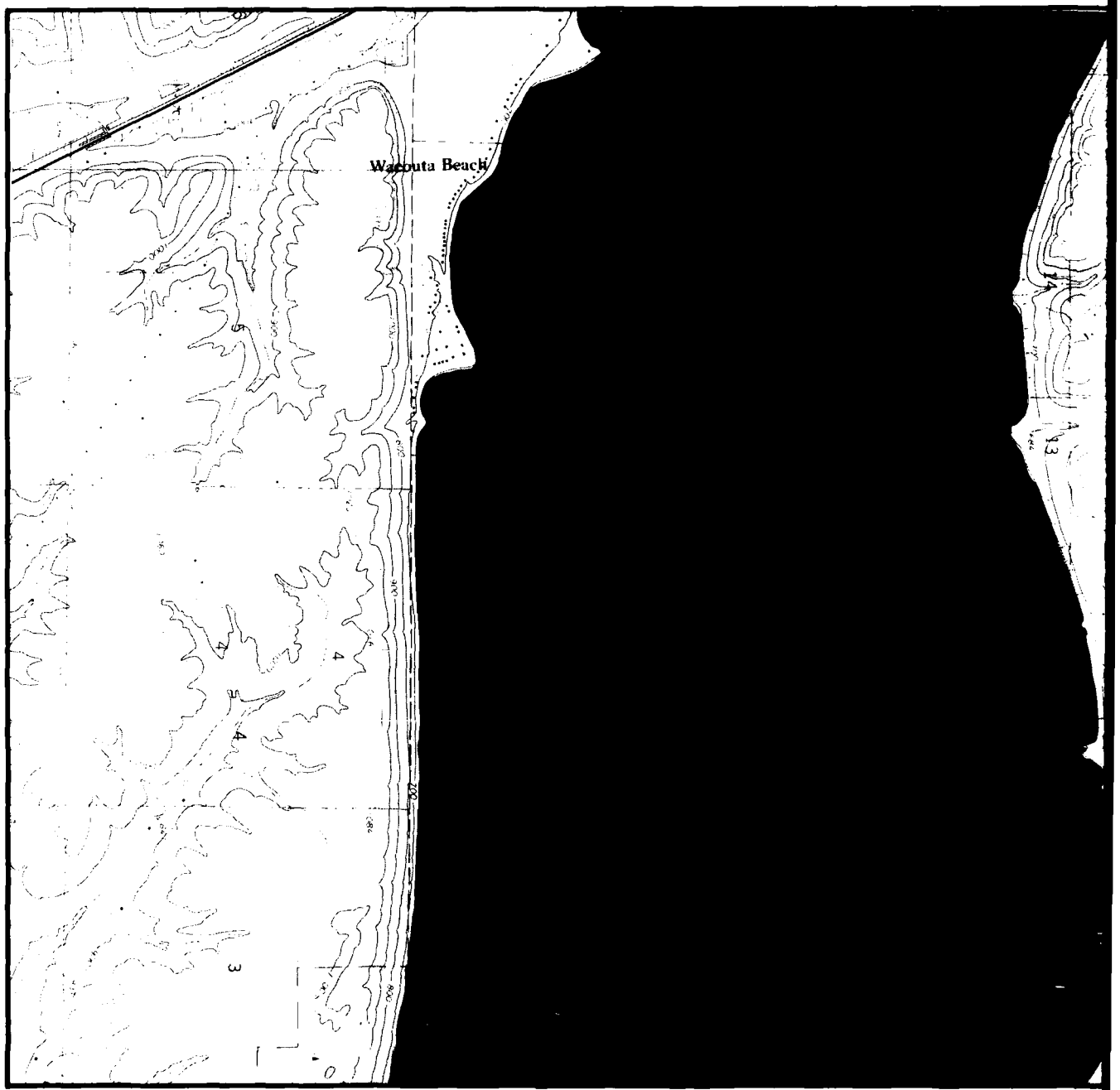
Approved by: Charles E. Wakeman

Land Use Allocation

Pool 4 Mile 784.3-787.9 Plate 17 of 66

Upper Mississippi River

Natural Area
Wildlife Management
725 Miles Above Ohio River
* See text Section 50 for definitions of land use allocation categories
of Engineers



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
725 Miles Above Ohio River
* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

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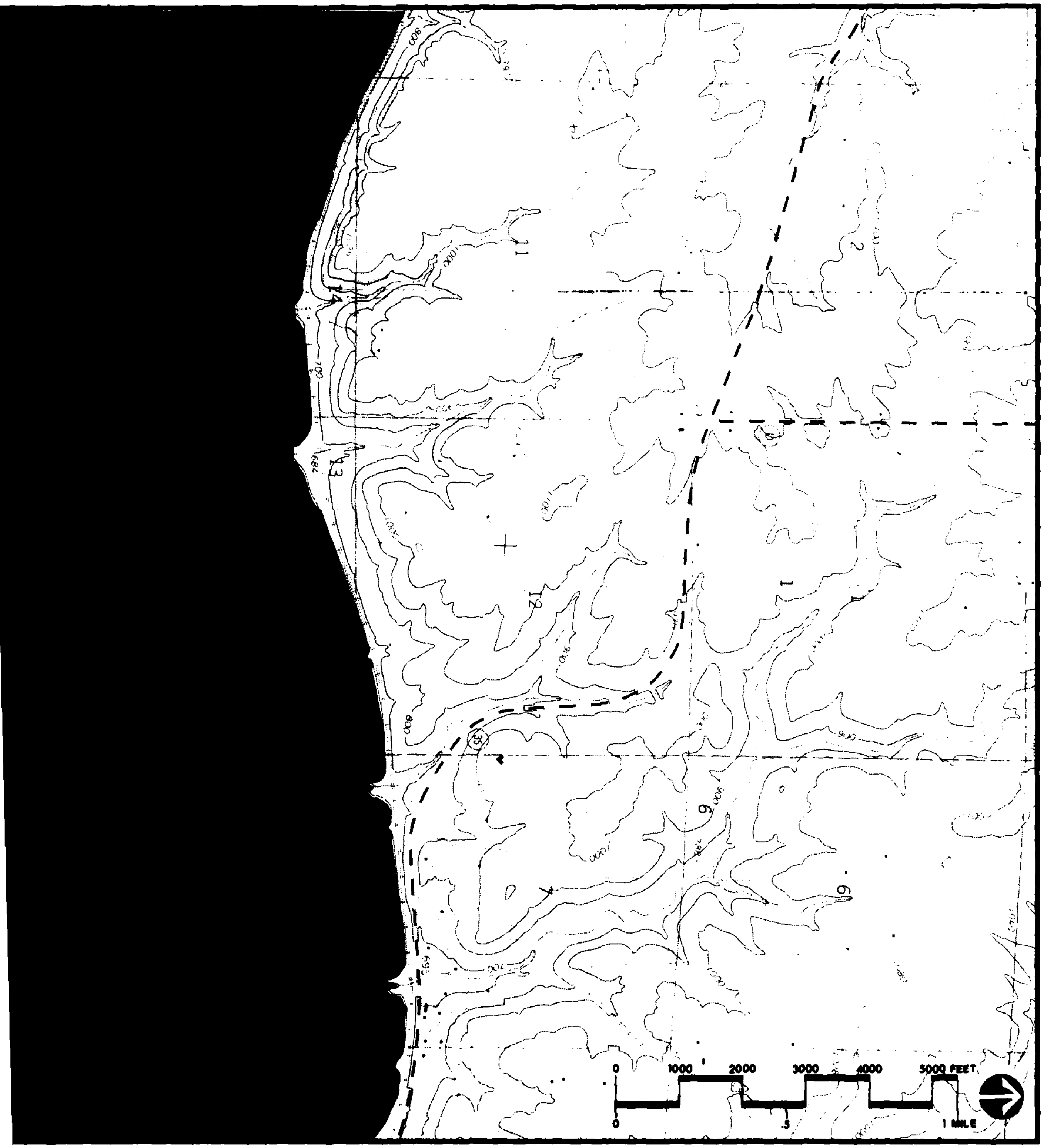

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Drawn by: B.V./RS.
Checked by: [signature]
Submitted by: [signature]
Approved by: [signature]

Land Use Allocation

Pool 4 Mile 781.0-785.5 Plate 18 of 66

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

+ Mile 728 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

Boundary
Refuge Boundary
Above Ohio River
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US Army Corps of Engineers

Drawn by: BV/RS
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E. Wahnsen

Land Use Allocation

Pool 4 **Mile 776.5-781.3** **Plate 19 of 66**

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

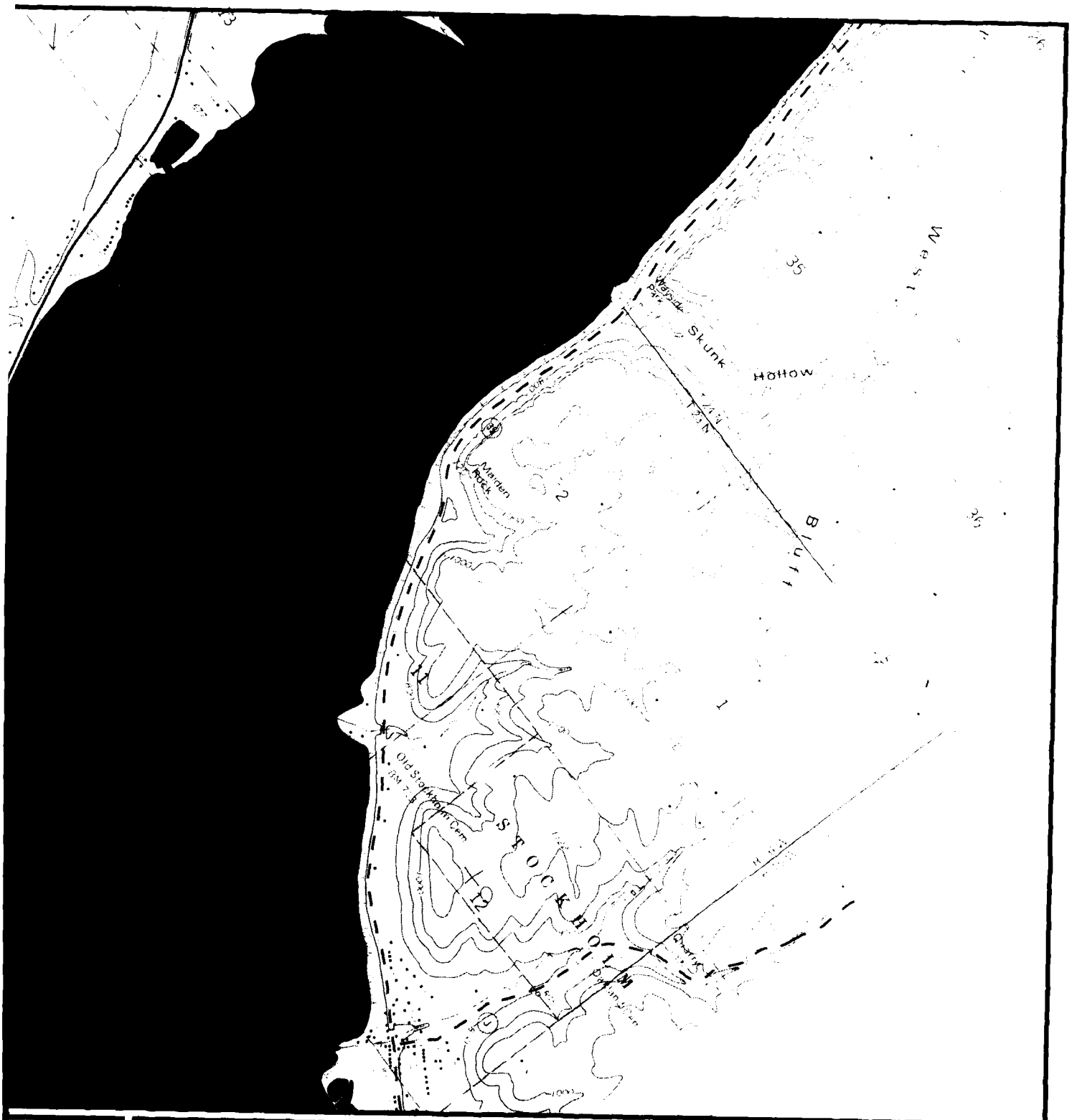
State Boundary

FWS Refuge Boundary

+ Mile 729 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



ate Boundary
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cation categories

US Army Corps of Engineers

Drawn by: B.V/RS

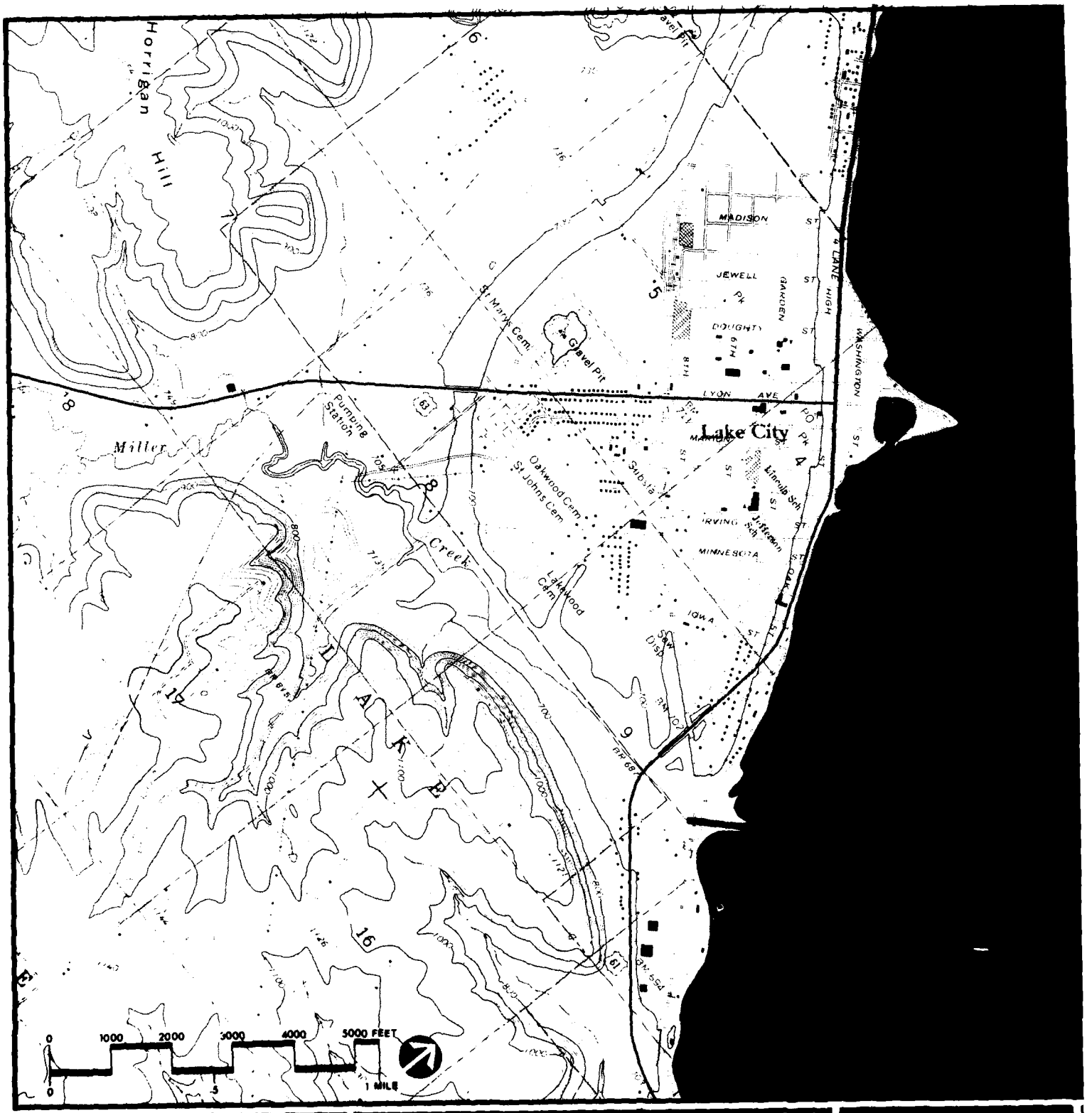
Checked by: Russell K Snyder

Submitted by: Thomas Hill

Approved by: Charles E. Watterson

Land Use Allocation

Pool 4 **Mile 774.0-778.0** **Plate 20 of 66**



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

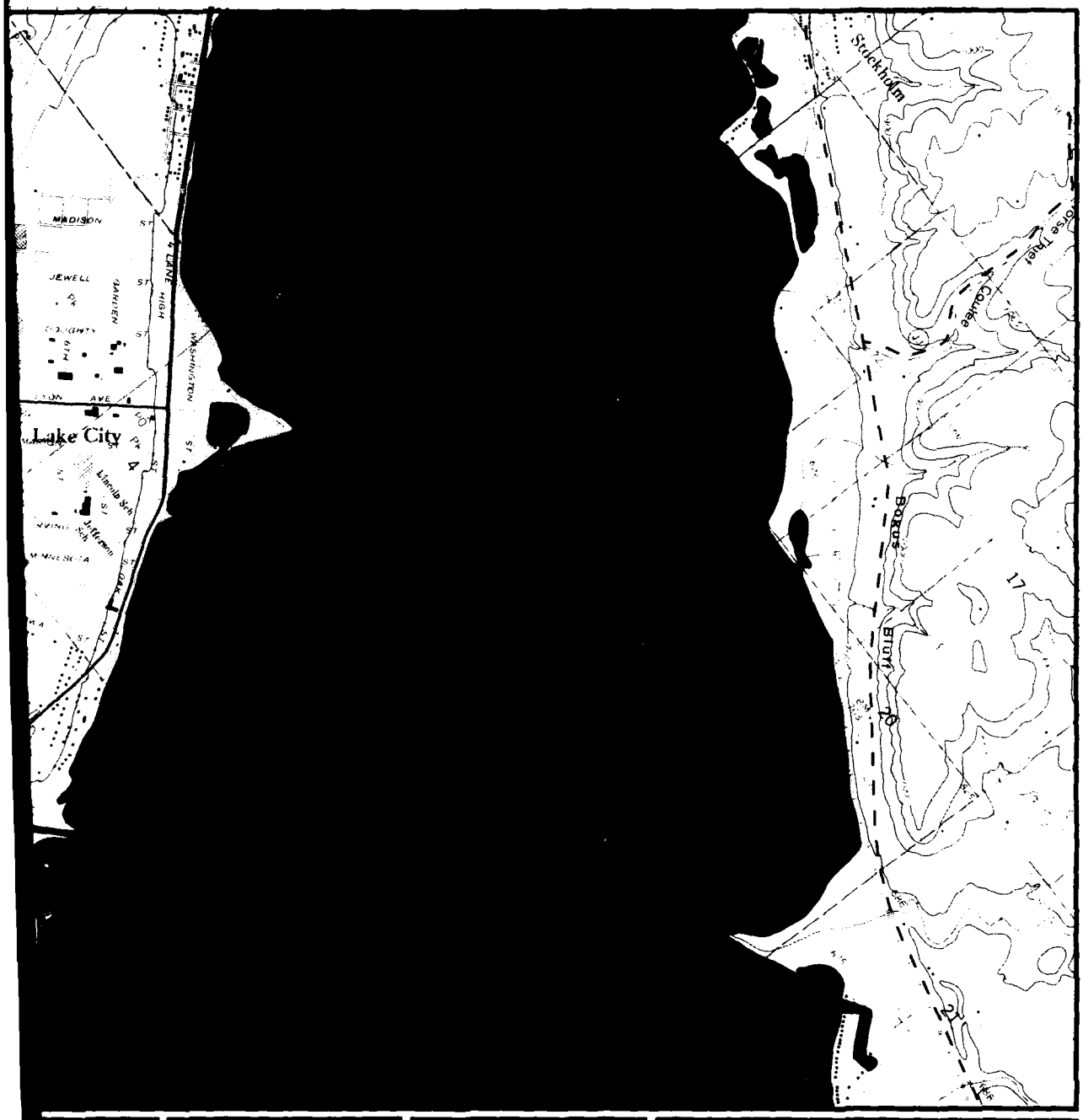
US Army Corps of Engineers

ove Ohio River
for definitions
categories

Submitted by:
Approved by: Charles E. Wakerson

Land Use Allocation

L & D 3 Mile 796.0-800.5 Plate 14 of 66



ate Boundary
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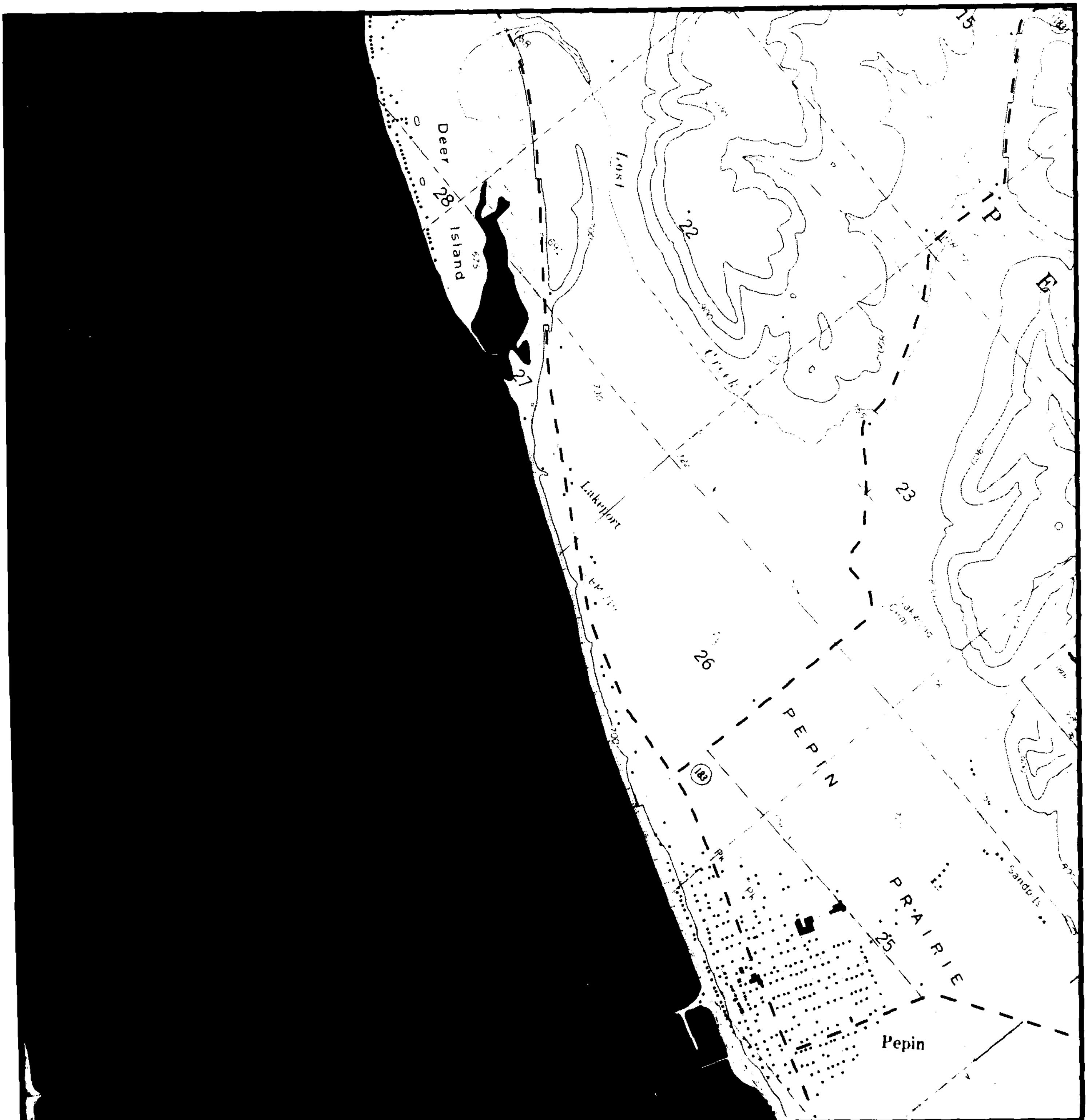
US Army Corps of Engineers

Drawn by: BV/RS
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E. Wakerson

Land Use Allocation

Pool 4 Mile 770.8-774.2 Plate 21 of 66


Spring
Coulee
15
14
Coulee
23
Riley
24
18
Keeler
Coulee
0
1000
2000
3000
4000
5000 FEET
0
.5
1 MILE



ate Boundary
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US Army Corps of Engineers

Drawn by: B.V / RS.
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 4 Mile 767.3-771.0 Plate 22 of 66


Maple Springs
Rattlesnake Hill
Coulee
Dutchman
Climb
0
1000
2000
3000
4000
5000 FEET
1 MILE

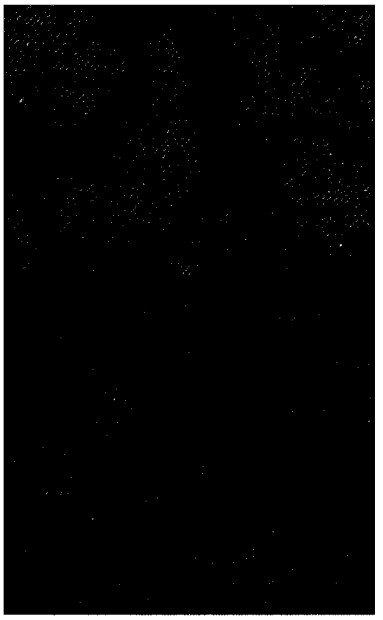
State Boundary
FWS Refuge Boundary
Miles Above Ohio River
...tion 50 for definitions
...llocation categories

US Army Corps of Engineers

Drawn by: B.V/RS
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 4 Mile 763.9-767.5 Plate 23 of 66



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US Army Corps
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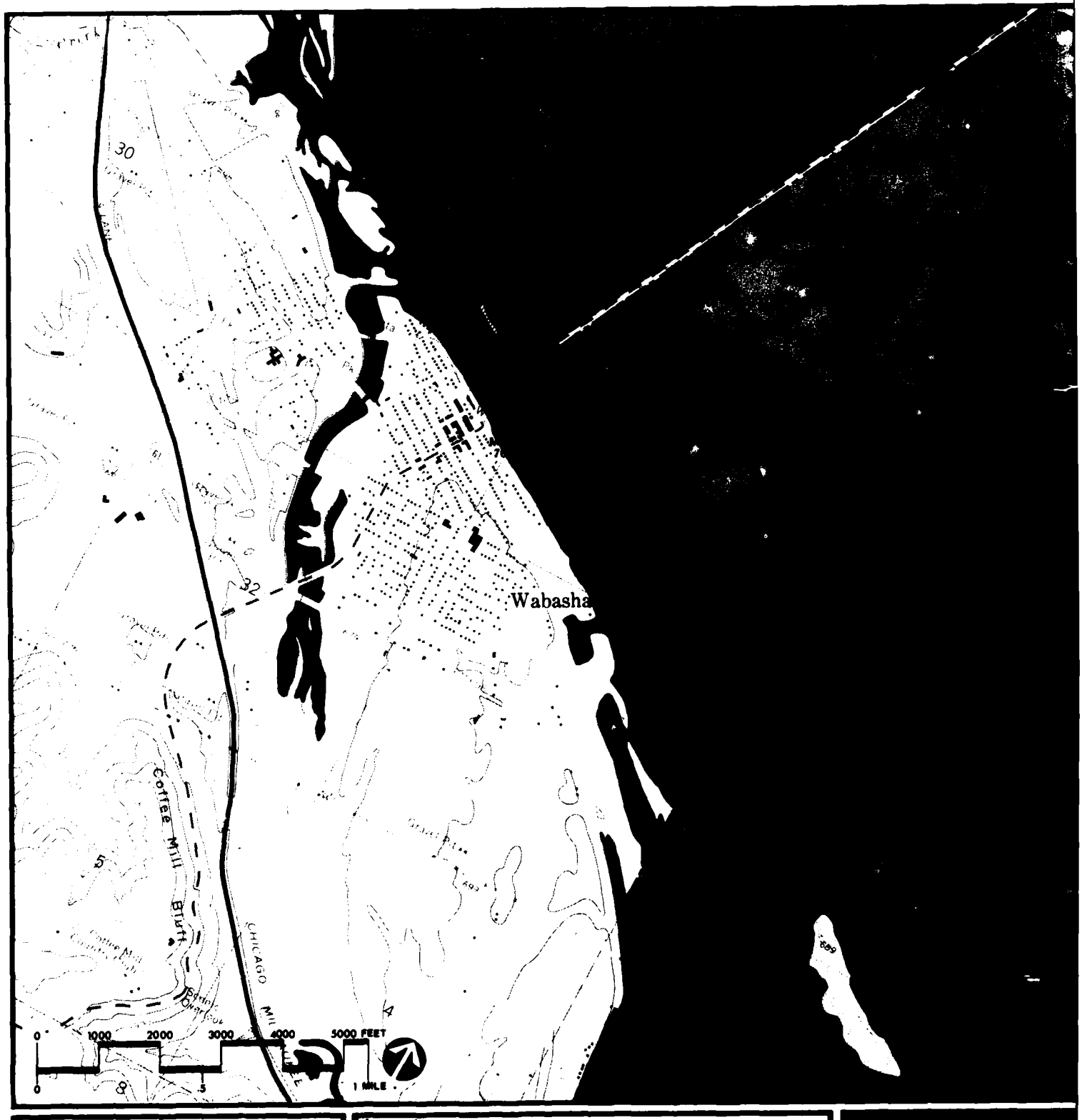
Drawn by: BV/RS/KN.
Checked by: Russel K Snyder
Submitted by: [signature]
Approved by: Charles E. Wakeman

Land Use Allocation

Pool 4 Mile 760.2-763.7 Plate 24 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

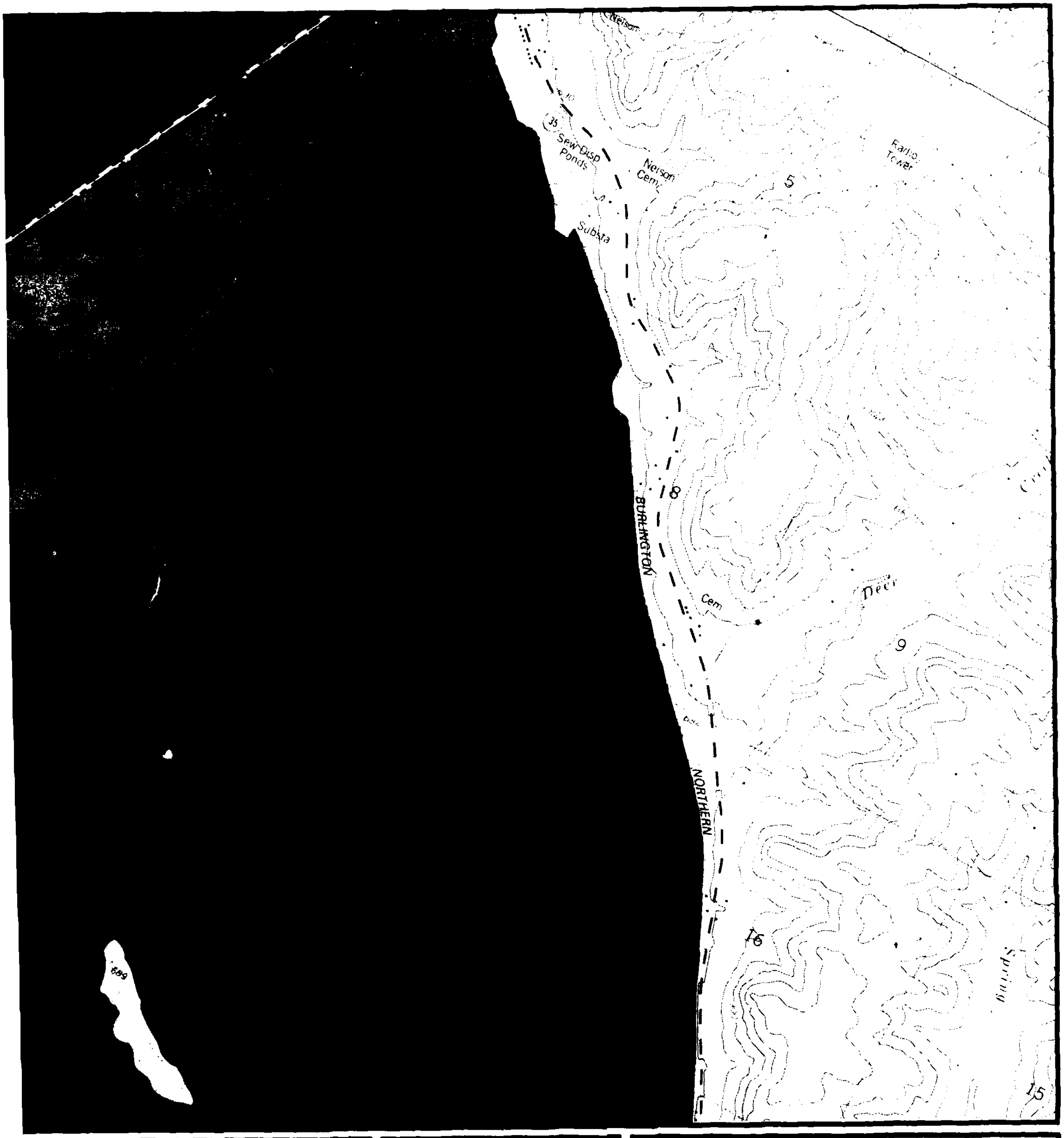
— — — State Boundary

— — — FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



Boundary
Refuge Boundary
Above Ohio River
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US Army Corps of Engineers

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Checked by: [signature]
Submitted by: [signature]
Approved by: [signature]

Land Use Allocation

Pool 4 Mile 757.3-761.5 Plate 25 of 66

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

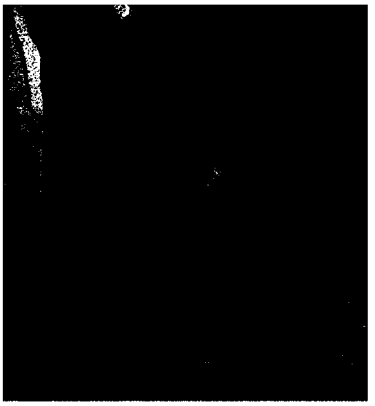
CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

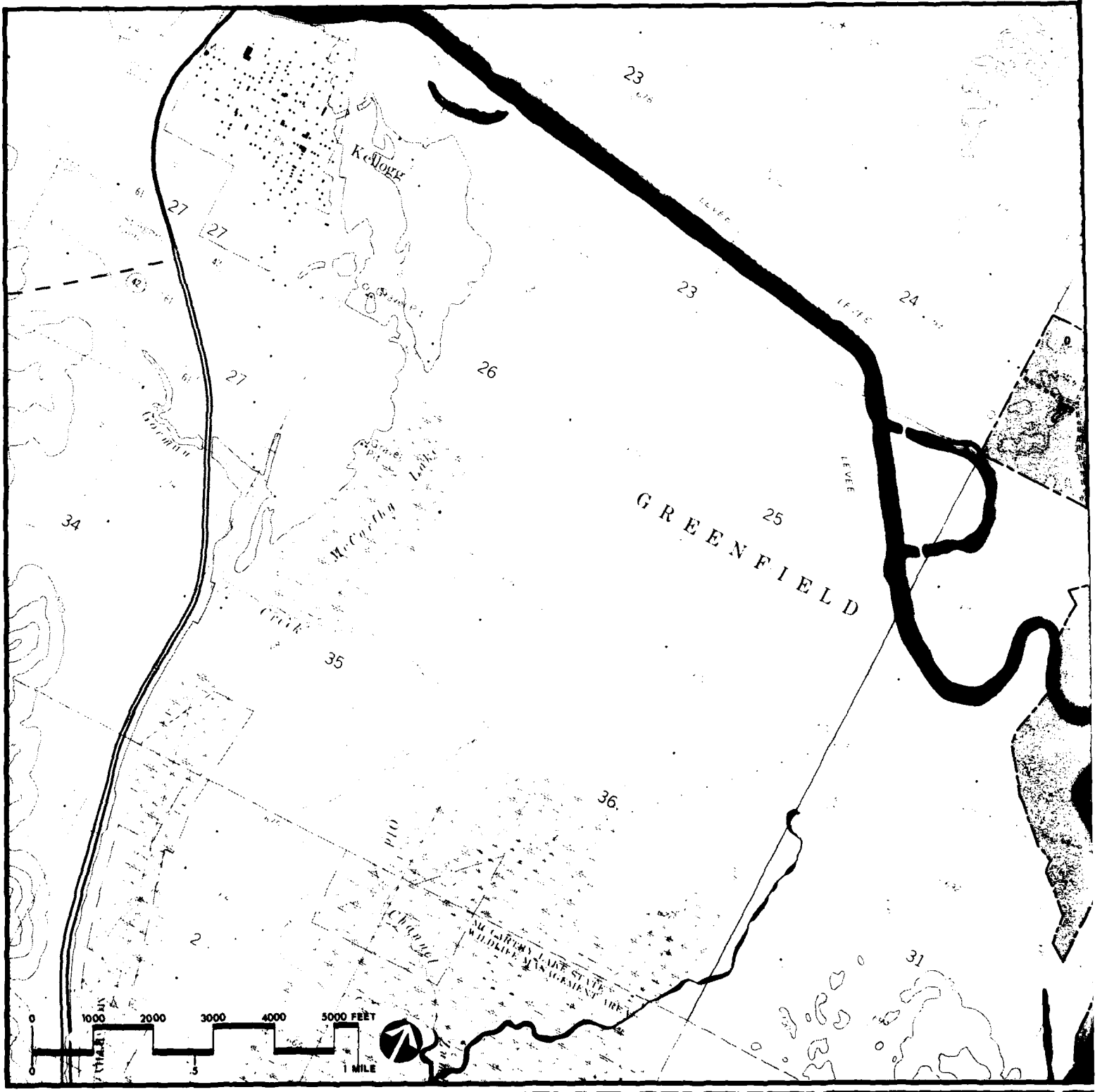
State Boundary

FWS Refuge Boundary

Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories





Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

+ MINN 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

ate Boundary
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cation categories

US Army Corps of Engineers

Drawn by: B.V/RS/K.N.

Checked by: Russell K Snyder

Submitted by:

Approved by: Charles E. Wakeman

Land Use Allocation

L & D 4 Mile 749.7-754.0 Plate 27 of 66

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— — — FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers


31
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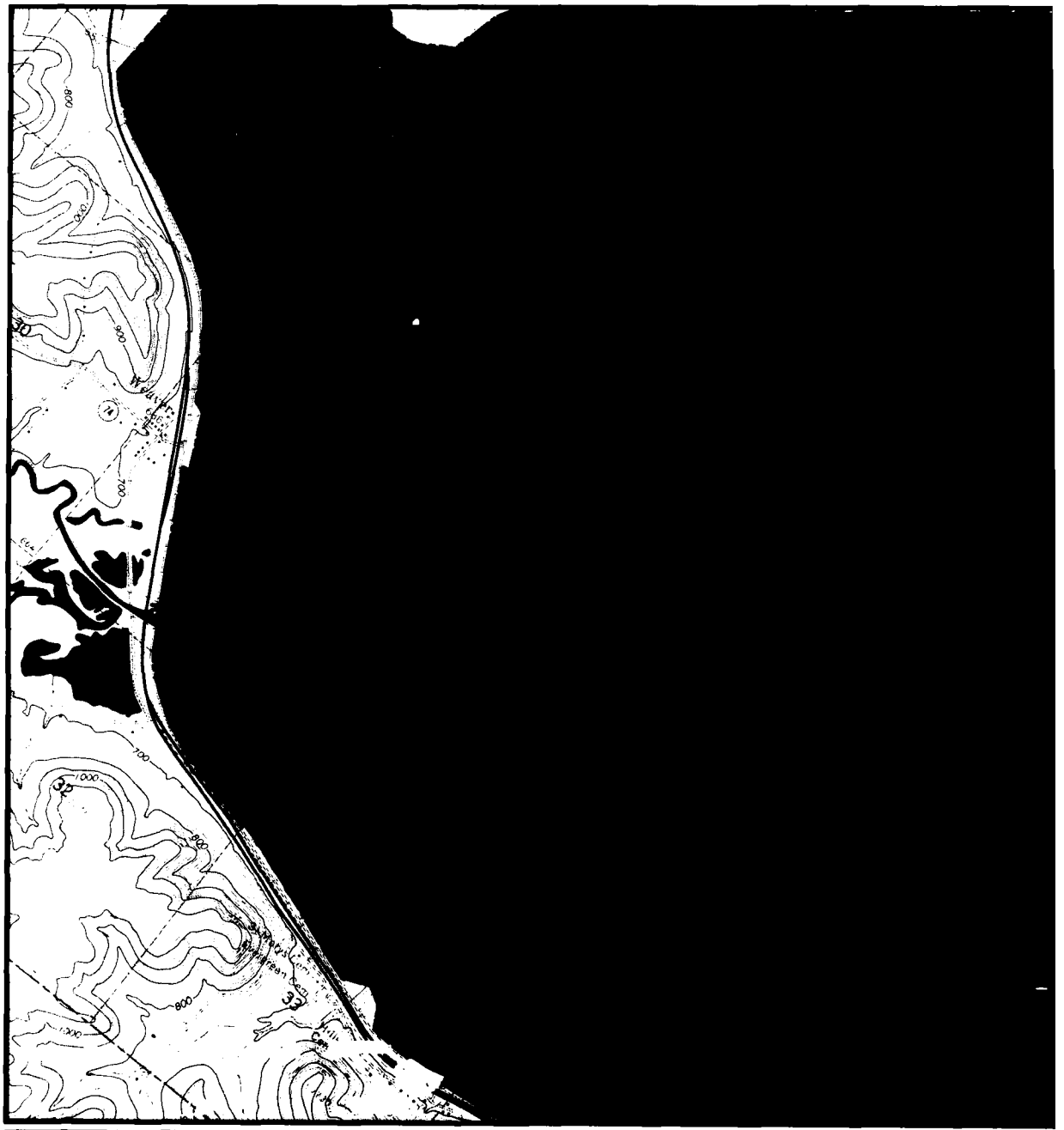
Resource Management
Upper Mississippi River

Recreation / Low-Density
Natural Area
Wildlife Management

+ 726 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories



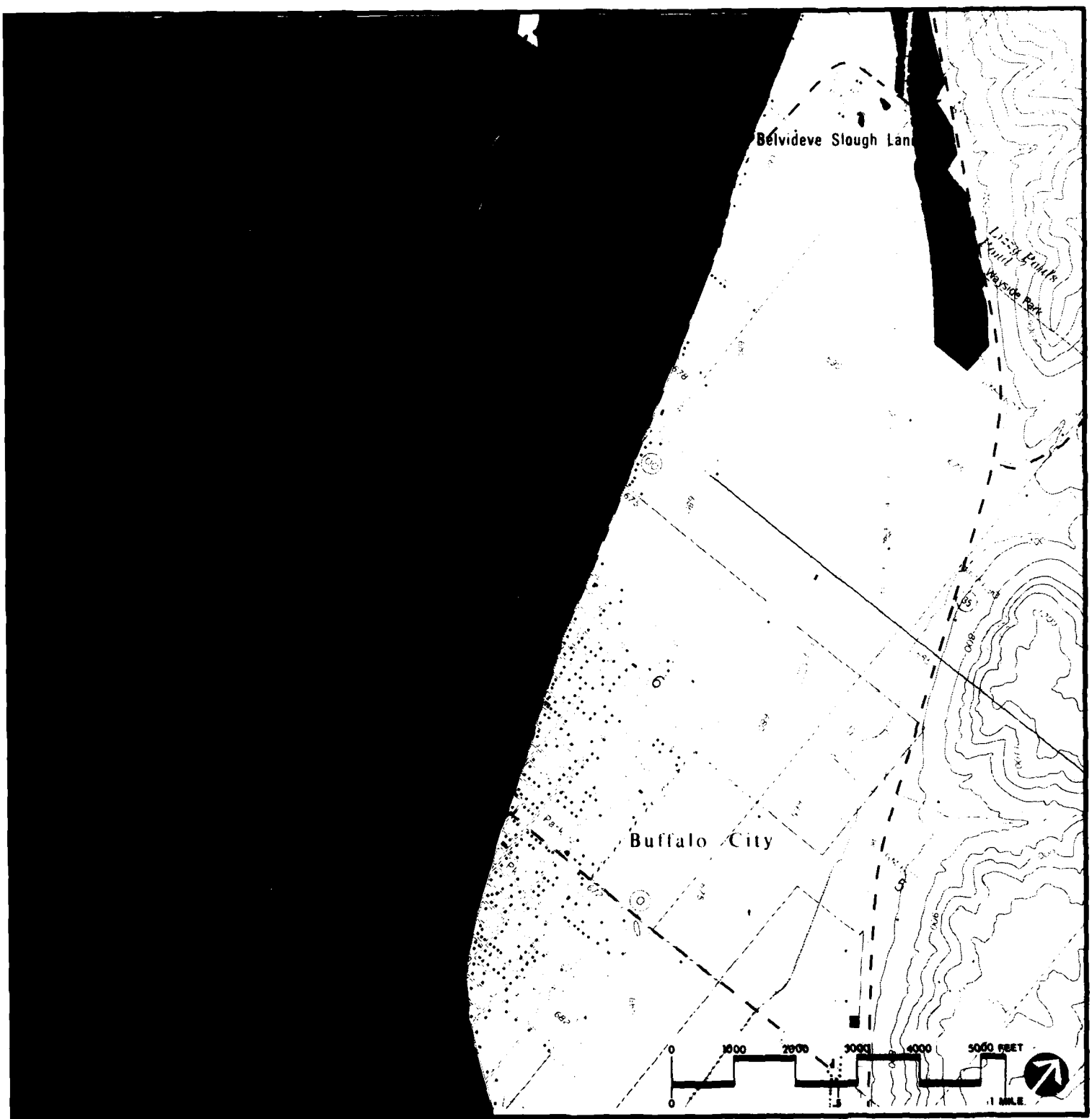
Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
+ 726 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories



— State Boundary
— FWS Refuge Boundary
Miles Above Ohio River

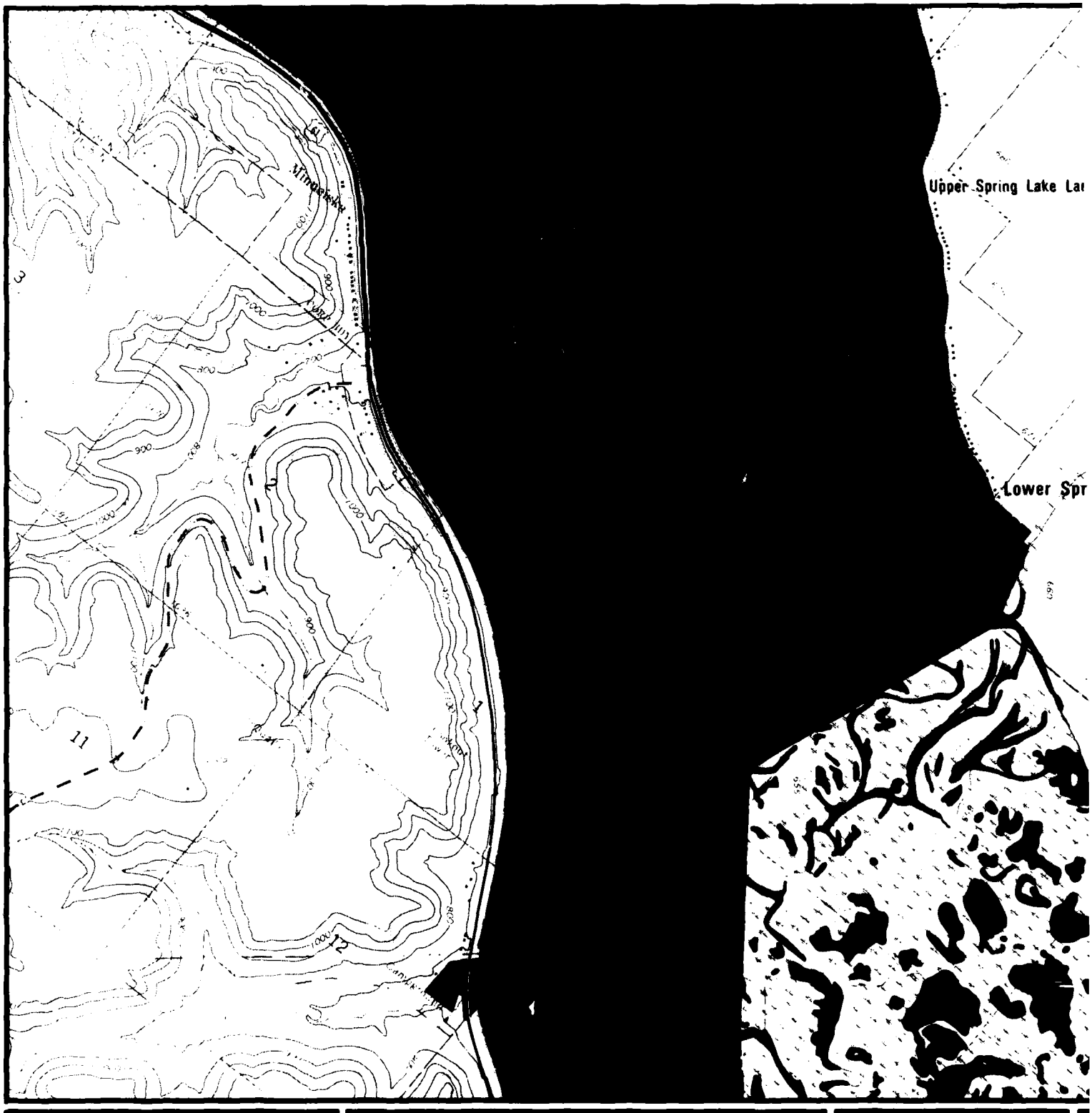
Section 50 for definitions
ee allocation categories

U.S. Army Corps
of Engineers

Drawn by: BV/RS/K.N.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles C Wakeman

Land Use Allocation

Pool 5 Mile 742.9-747.2 Plate 29 of 66



Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

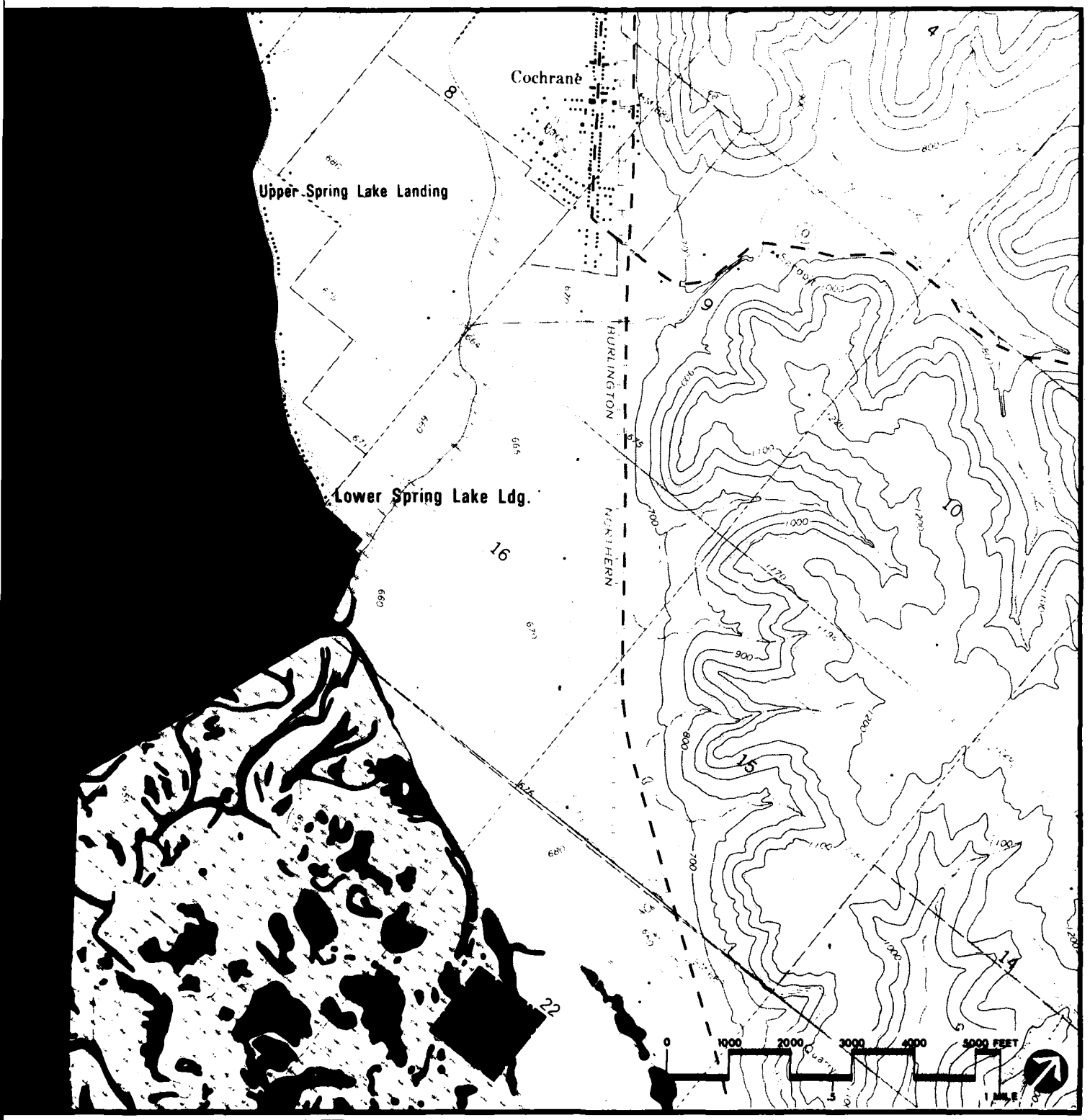
State Boundary

FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



— State Boundary
— FWS Refuge Boundary
Miles Above Ohio River
t Section 50 for definitions
use allocation categories

US Army Corps of Engineers

Drawn by: B.V/RS/K.N.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles C Wahrman

Land Use Allocation

Pool 5 **Mile 739.6-743.1** **Plate 30 of 66**

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— - — FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

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US Army Corps of Engineers

Drawn by: B.V./R.S./K.N.

Checked by: Russell K Snyder

Submitted by: [signature]

Approved by: Charles E. Wakeman

Land Use Allocation

L & D 5 Mile 736.0-739.8 Plate 31 of 66

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— — — FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

ate Boundary
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Drawn by: BV/RS/KN.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E Watkinson

Land Use Allocation

Pool 5A Mile 732.2-736.2 Plate 32 of 66

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

State Boundary

FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

State Boundary
FWS Refuge Boundary
Miles Above Ohio River
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U.S. Army Corps of Engineers

Drawn by: BV/RS/K.N.
Checked by: Russell K Snyder
Submitted by: [signature]
Approved by: Charles E. Wakeman

Land Use Allocation

L & D 5A Mile 728.4-732.4 Plate 33 of 66

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— — — FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

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on 5.0 for definitions
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US Army Corps of Engineers

Drawn by BV/RS/KN
Checked by Russell K Snyder
Submitted by
Approved by Charles E. Watkinson

Land Use Allocation

Pool 6 Mile 725.8-729.8 Plate 34 of 66

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

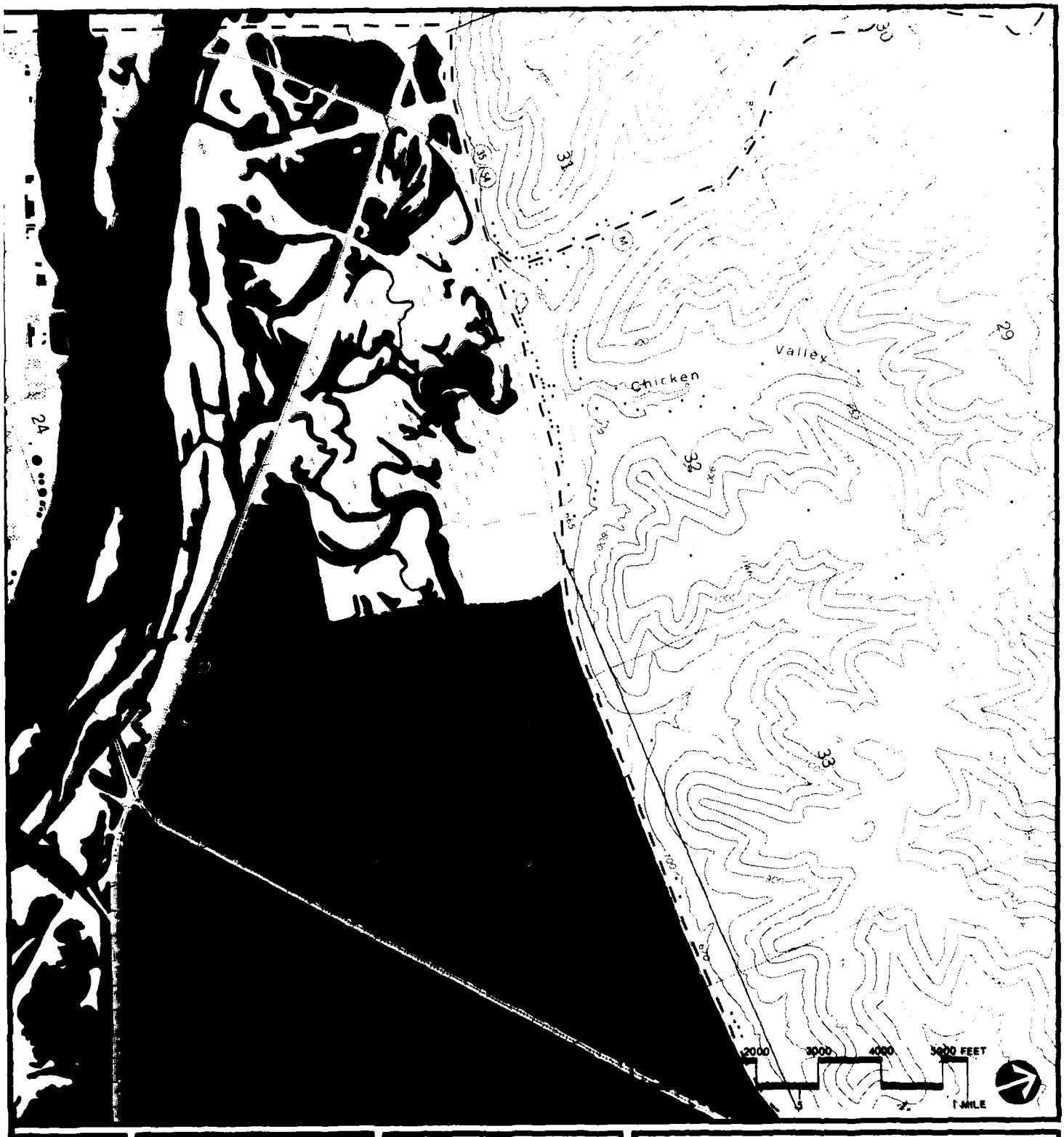
State Boundary

FWS Refuge Boundary

Mile 726 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



e Boundary
S Refuge Boundary
s Above Ohio River
n 50 for definitions
cation categories

US Army Corps of Engineers

Drawn by: BV/RS/K.N.
Checked by: Russell K Snyder
Submitted by: Norman Hill
Approved by: Charles E Watkins

Land Use Allocation

Pool 6 Mile 722.4-726.0 Plate 35 of 66

Master Plan for Public
Use Development and
Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
+ Miles 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

Master Plan for Public
Use Development and
Resource Management
Upper Mississippi River

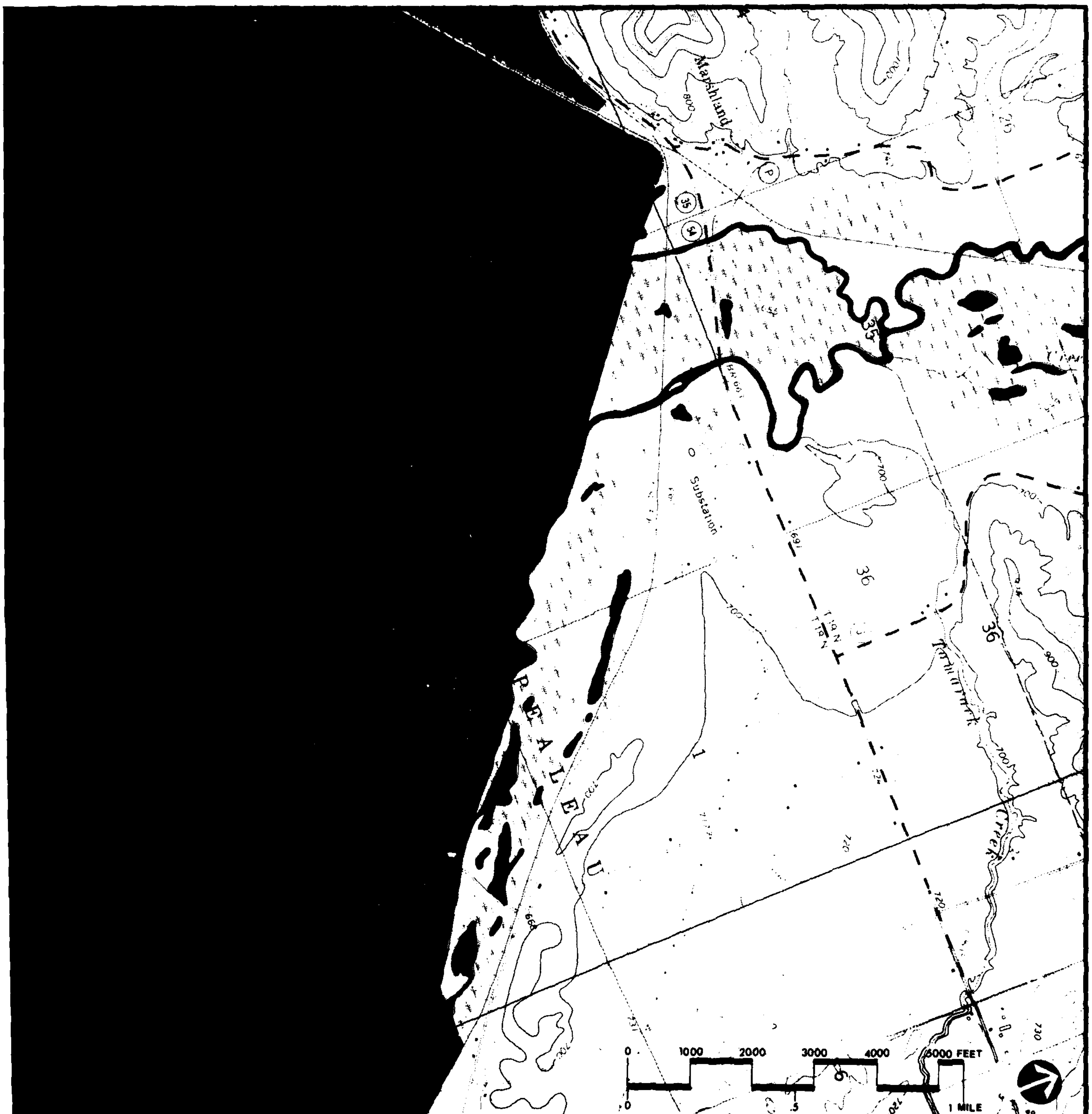
Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
+ Miles 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



State Boundary
FWS Refuge Boundary
Miles Above Ohio River
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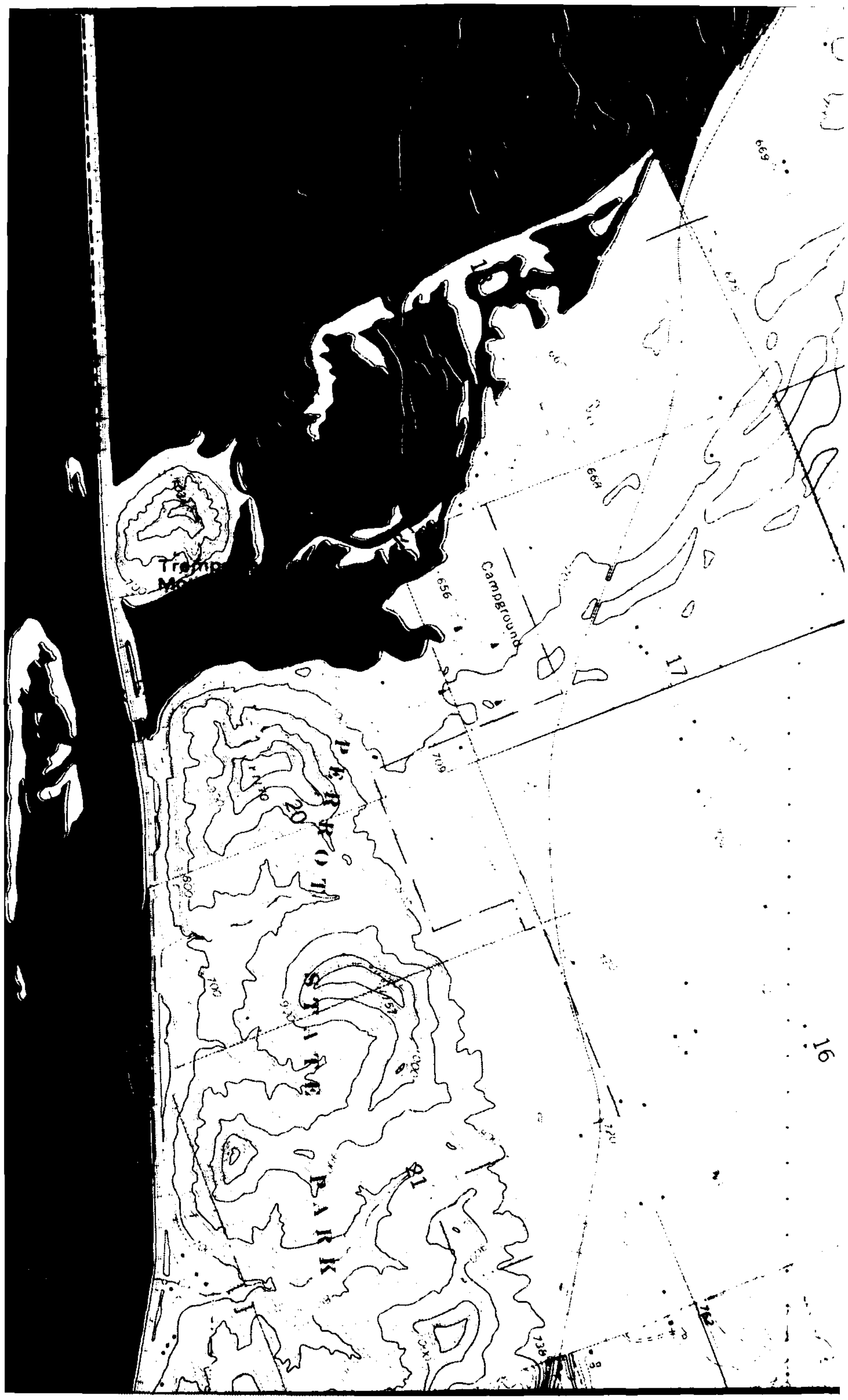
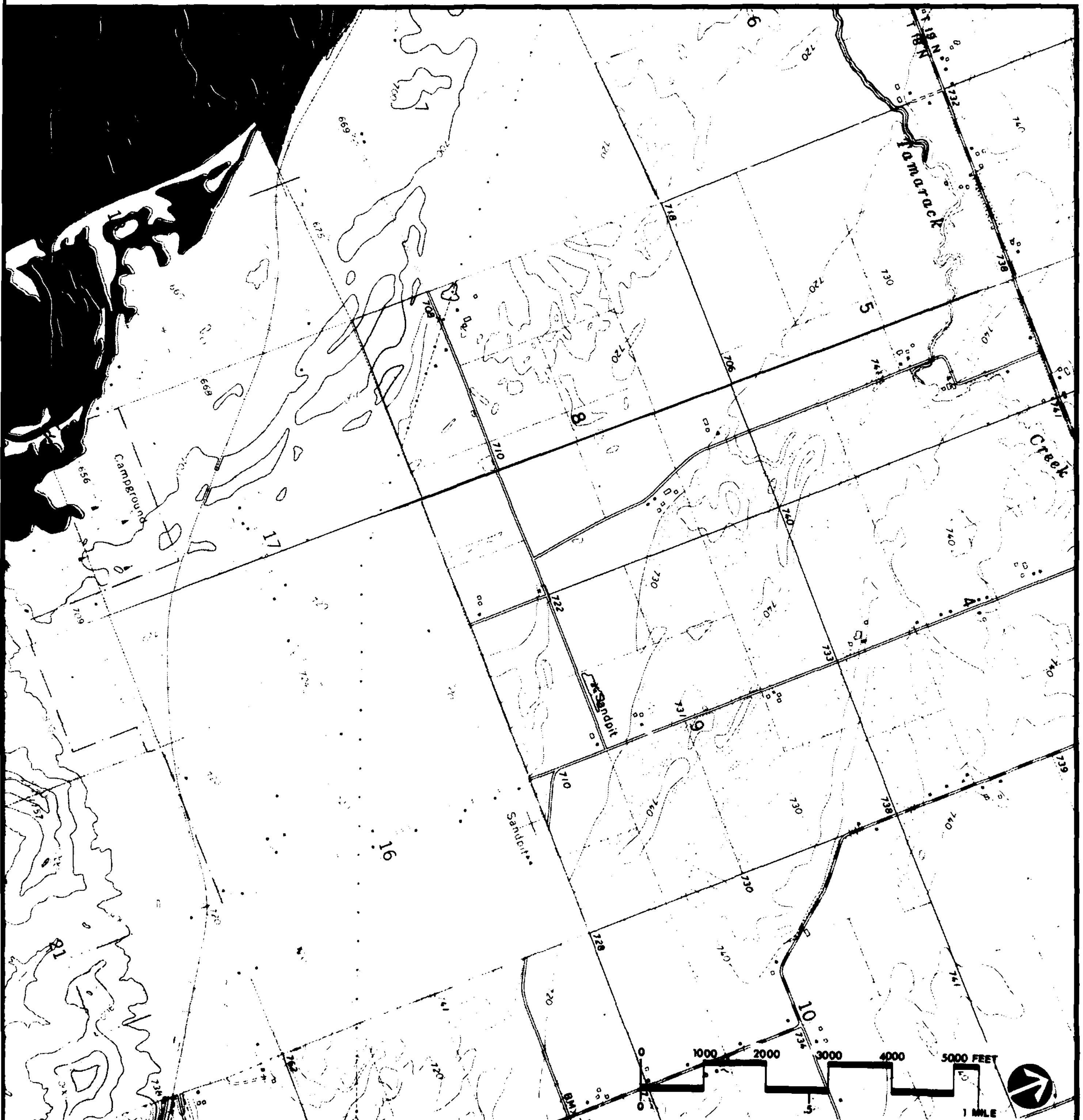
Land Use Allocation

Pool 6 Mile 718.9-722.6 Plate 36 of 66


Campground
PERROT STATE PARK



State Boundary
FWS Refuge Boundary
Miles Above Ohio River
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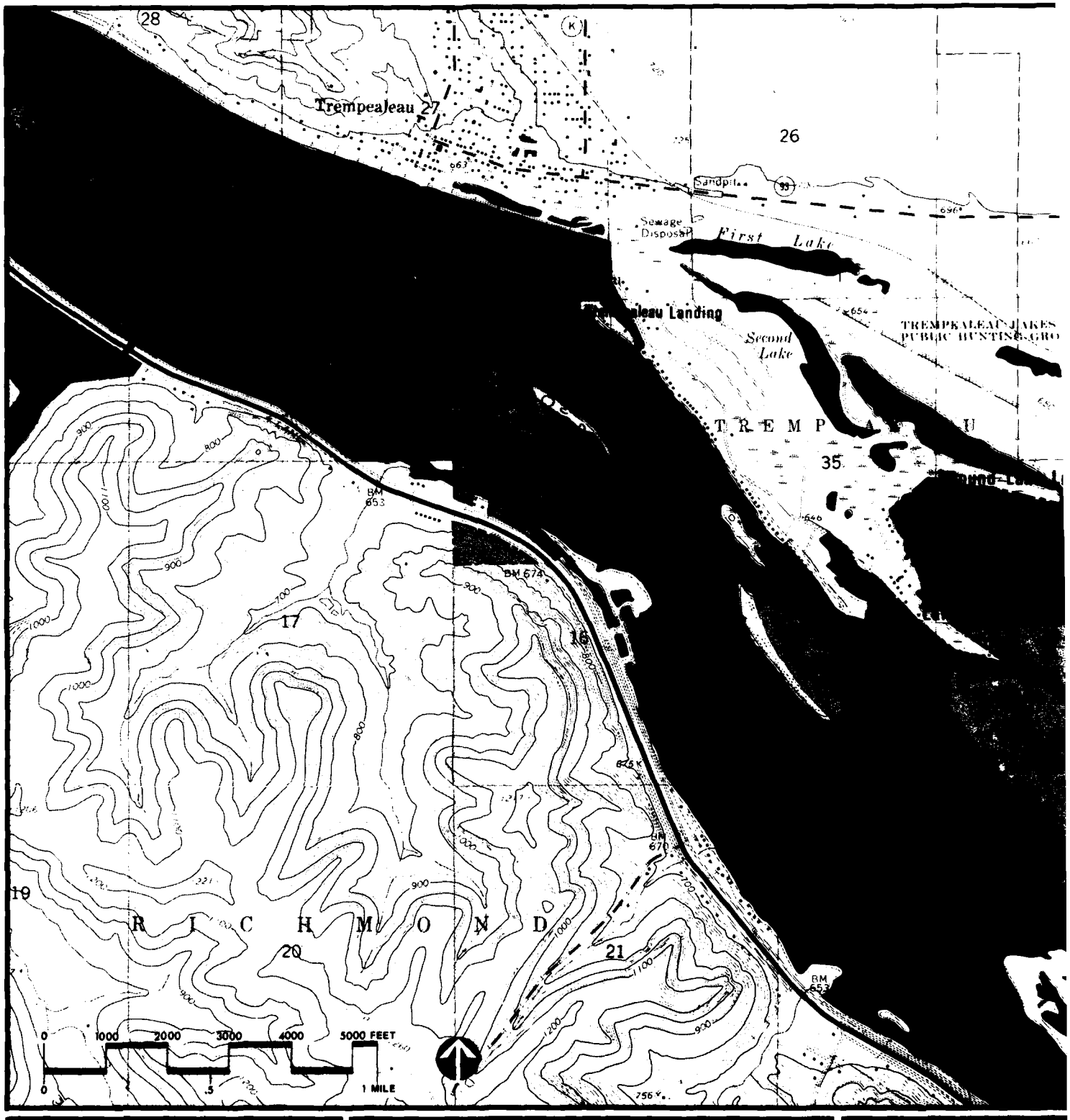
US Army Corps of Engineers

Drawn by: B.V./R.S./K.N.
Checked by: Russell K. Snyder
Submitted by: [signature]
Approved by: Charles E. Wakeman

Land Use Allocation

Pool 6 Mile 715.4-719.1 Plate 37 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

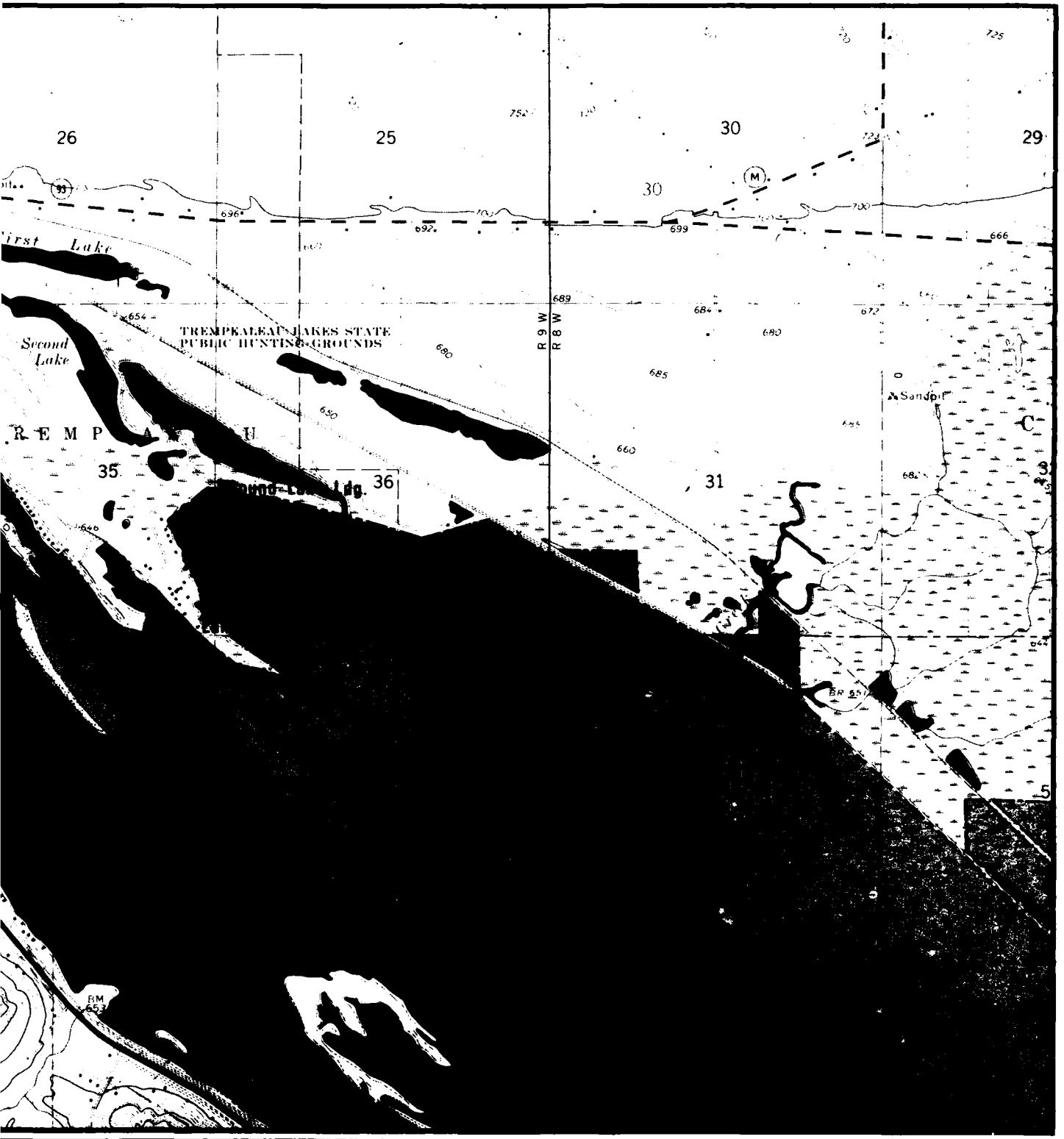
Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

- State Boundary
- FWS Refuge Boundary
- + Miles 728 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



e Boundary
3 Refuge Boundary
s Above Ohio River
50 for definitions
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Drawn by: B.V./R.S./K.N.

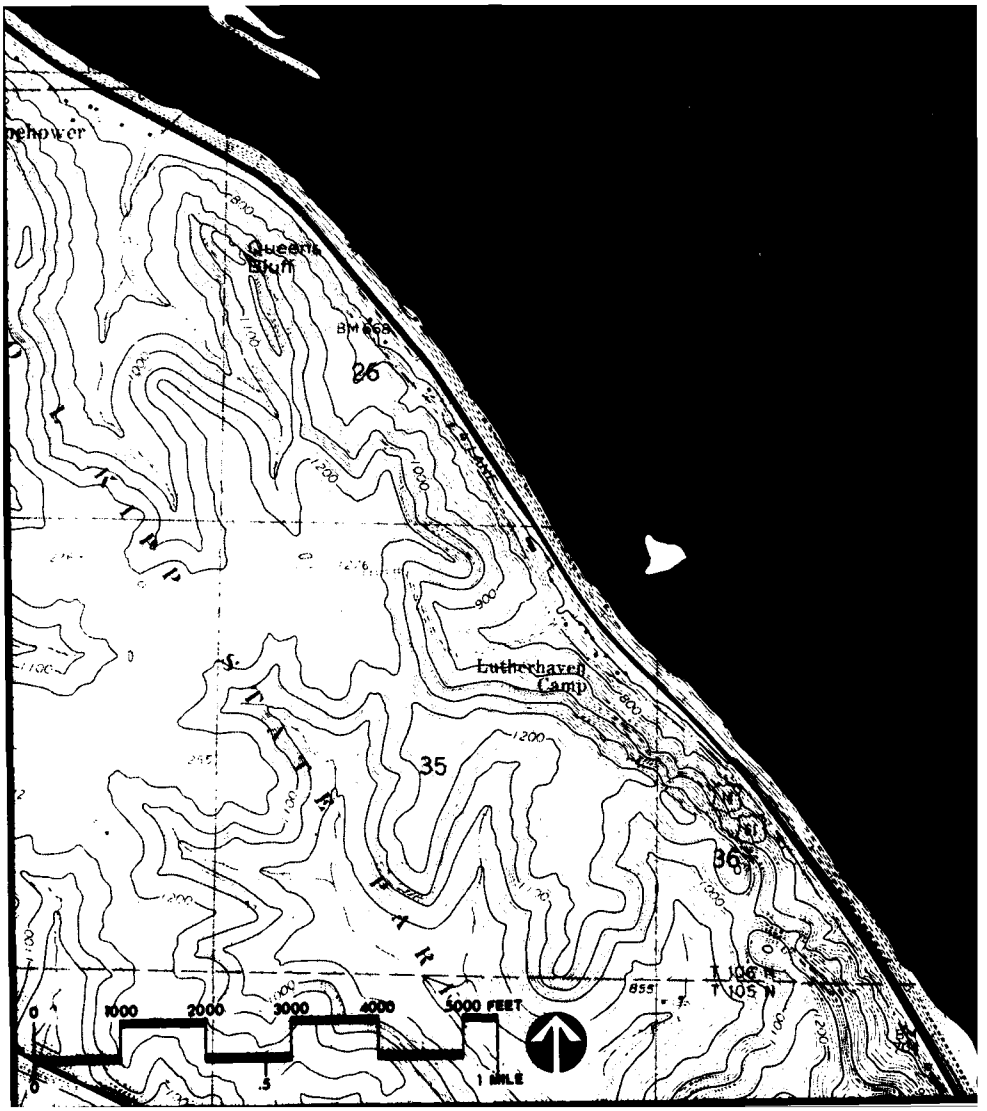
Checked by: Russell K. Snyder

Submitted by: Thomas Hill

Approved by: Charles E. Wakeman

Land Use Allocation

L & D 6 Mile 711.0-716.0 Plate 38 of 66


Queens Bluff
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26
35
36
Lutherhaven Camp
T 106 N
T 105 N
1000
2000
3000
4000
5000 FEET
1 MILE


662
Z
ZN
15
655
Radio Tower

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

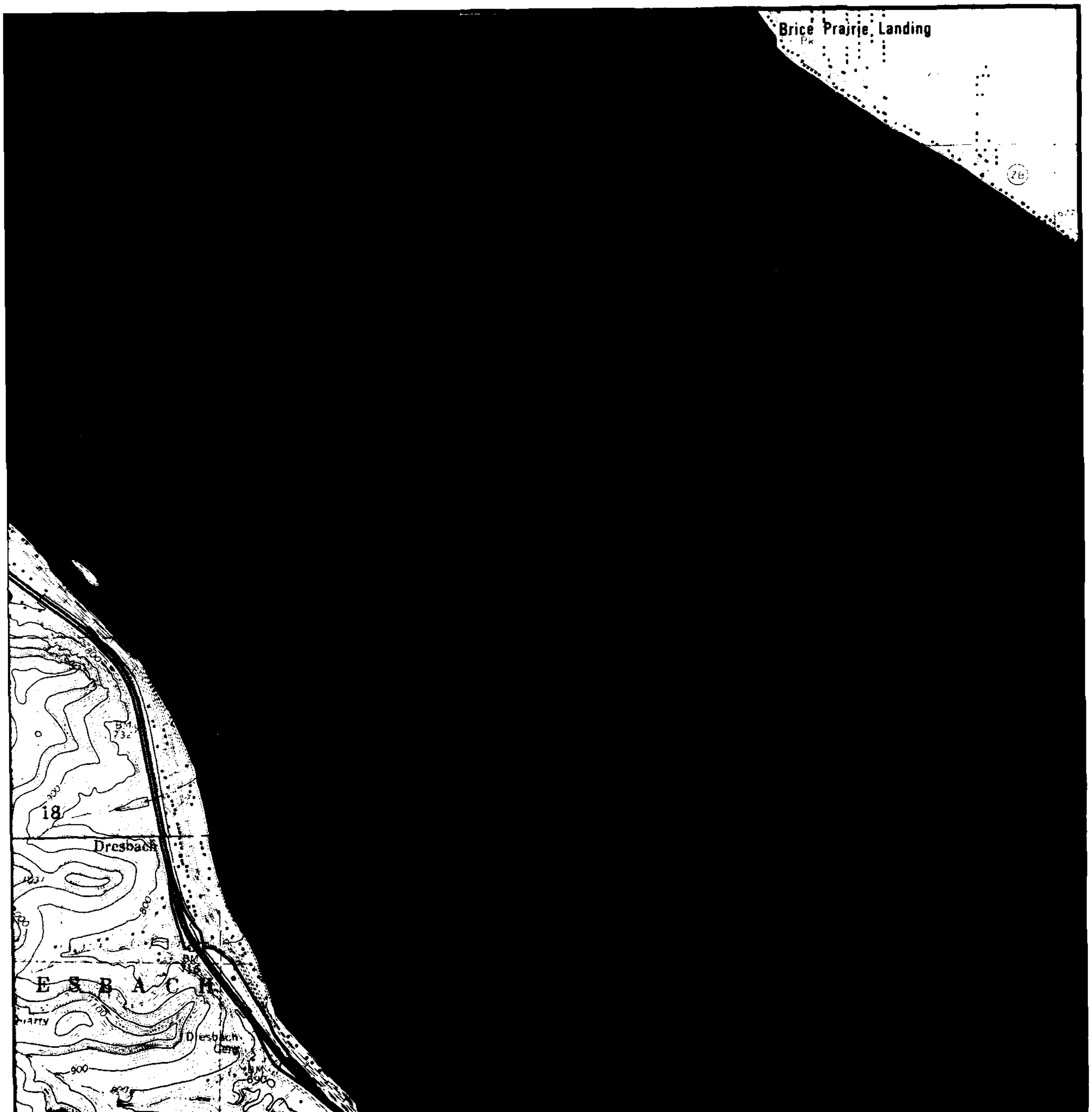
State Boundary
FWS Refuge Boundary
Miles Above Ohio River
ction 5.0 for definitions
allocation categories

US Army Corps of Engineers

Drawn by: B.V./R.S./K.N.
Checked by:
Submitted by:
Approved by:

Land Use Allocation

L & D 5A Mile 728.4-732.4 Plate 33 of 66



State Boundary
FWS Refuge Boundary
Miles Above Ohio River
Section 5.0 for definitions
e allocation categories

US Army Corps of Engineers

Drawn by: B.V./R.S./K.N.
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 7 Mile 703.7-708.3 Plate 40 of 66

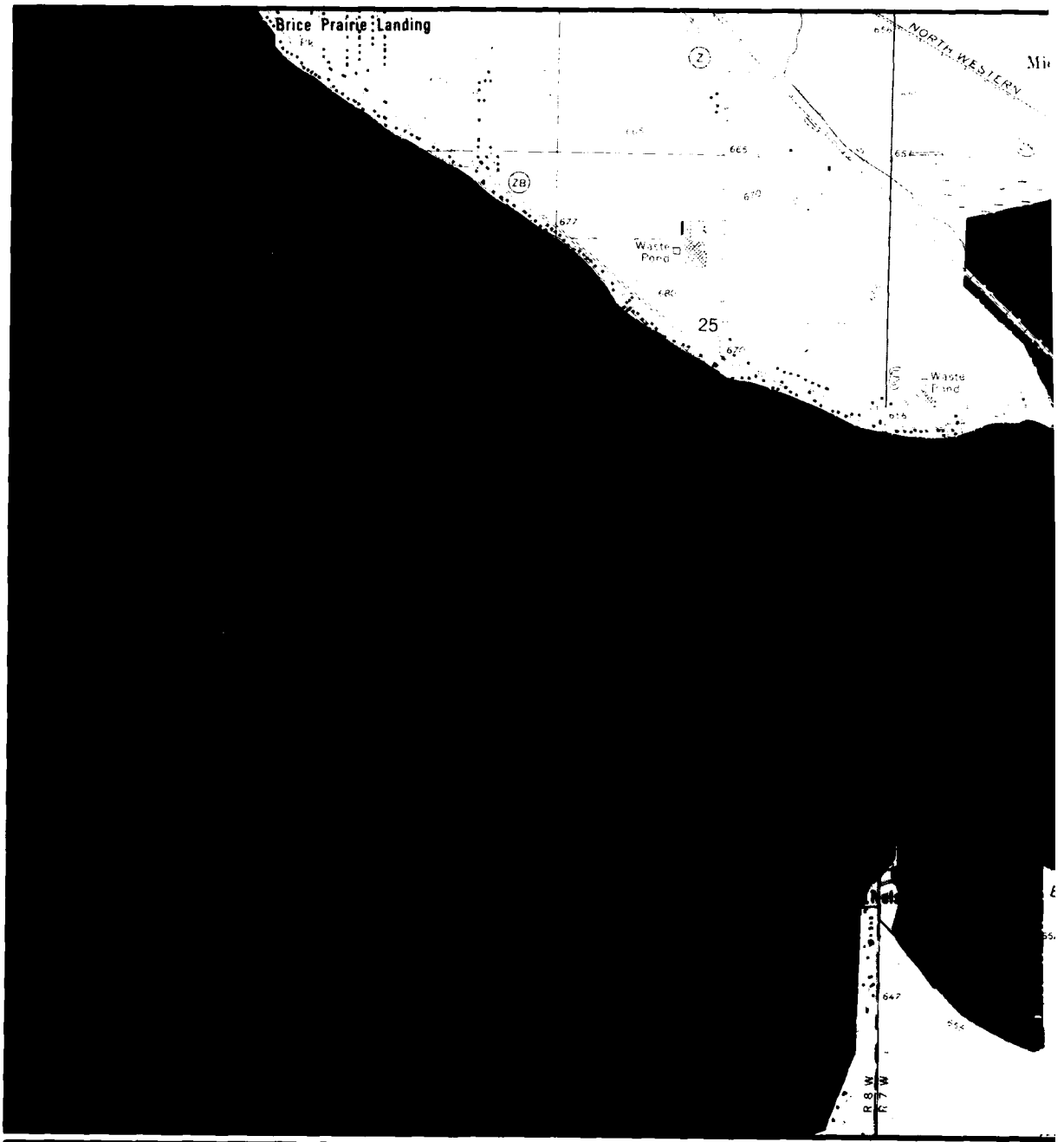
Use Development and
Resource Management
Upper Mississippi River

Project Operations
Recreation / Intensive Use
Recreation / Low-Density
Natural Area
Wildlife Management

FWS Refuge Boundary
+ 5886 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



Master Plan for Public
Use Development and
Resource Management
Upper Mississippi River

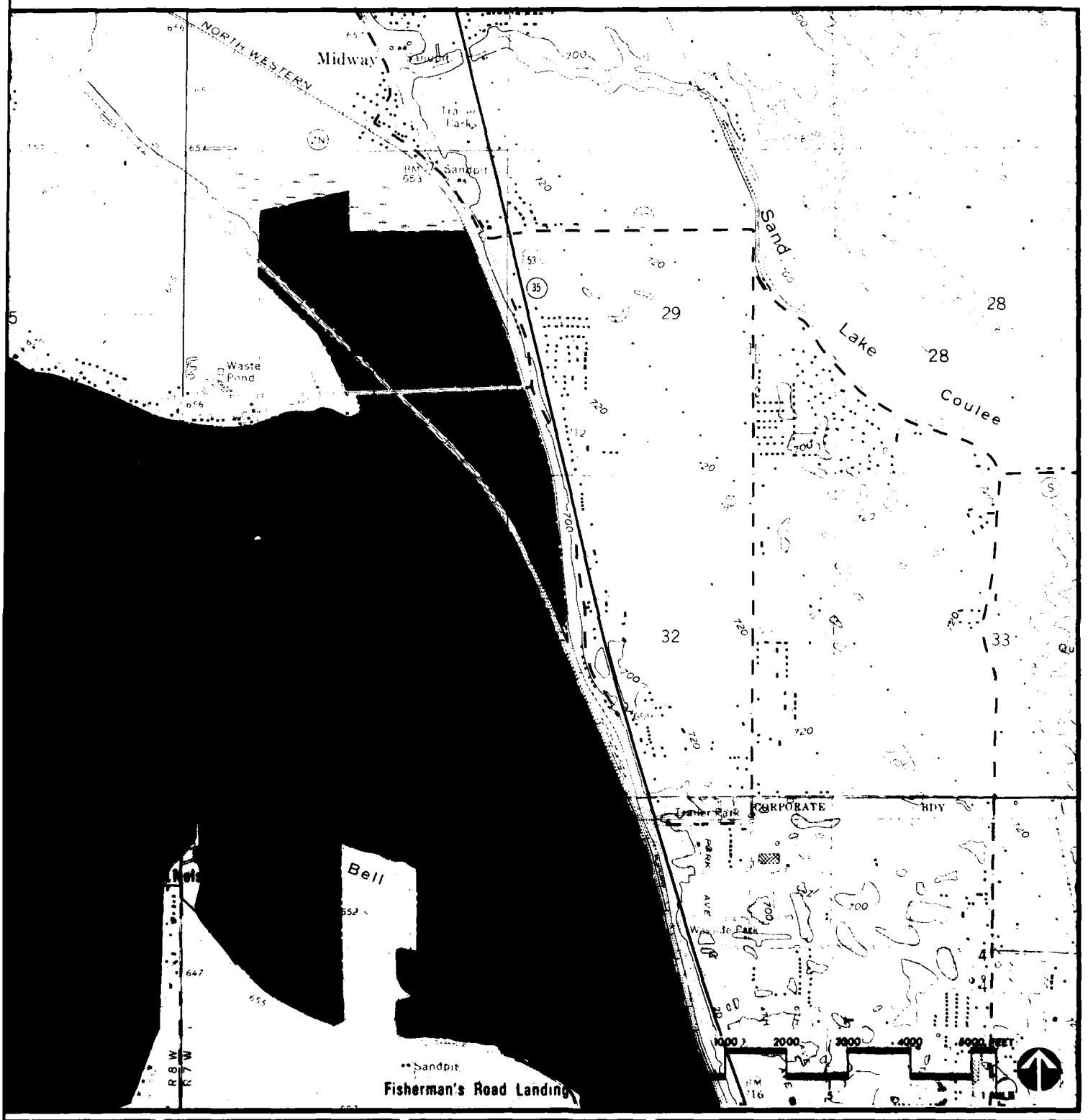
Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
+ 5886 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



State Boundary
FWS Refuge Boundary
Miles Above Ohio River
Section 50 for definitions
use allocation categories

US Army Corps of Engineers

Drawn by: BV/RS/KN
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E Wakeman

Land Use Allocation

Pool 7 **Lake Onalaska** **Plate 41 of 66**

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— — — FWS Refuge Boundary

+ Miles 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

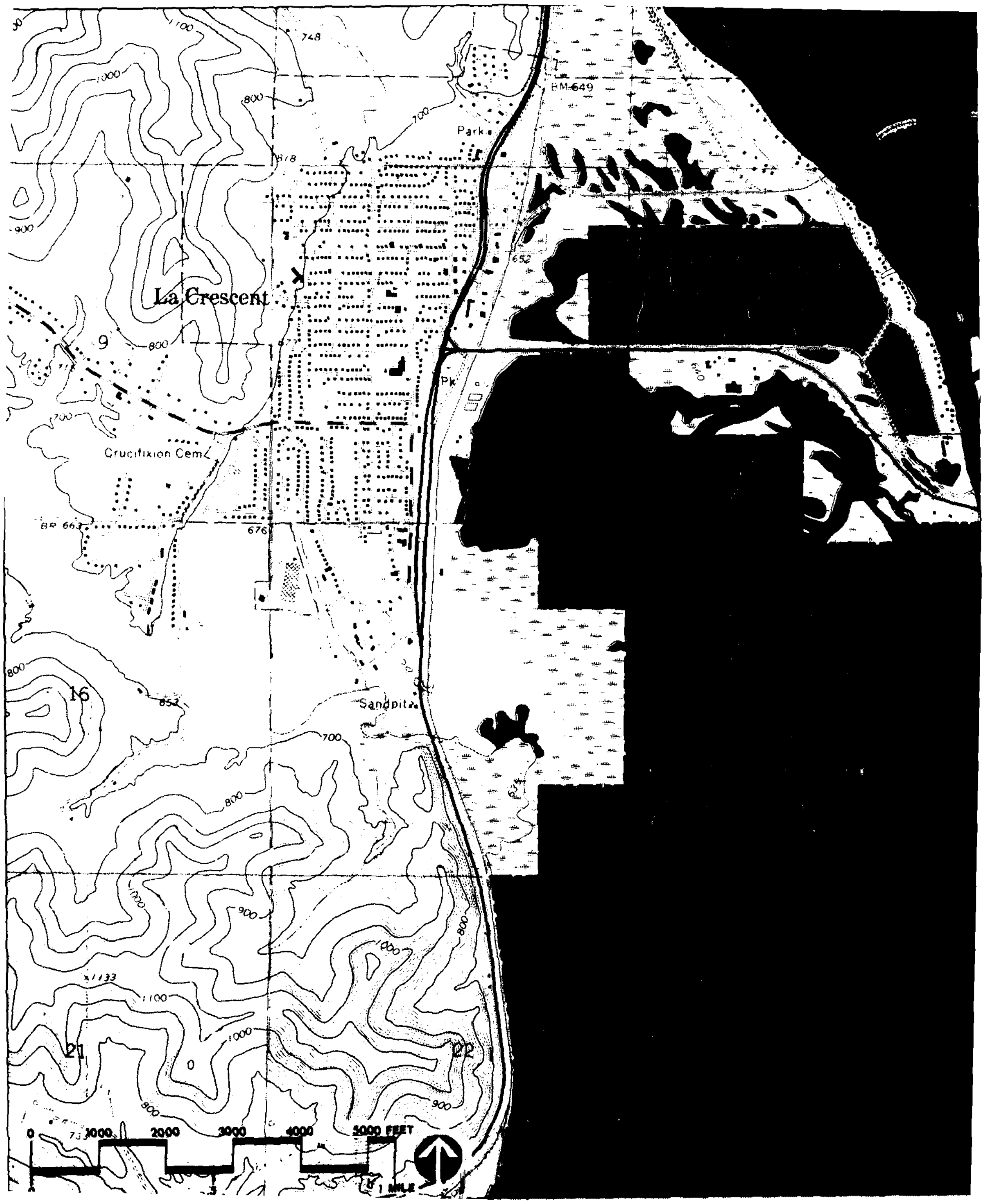
State Boundary
FWS Refuge Boundary
Miles Above Ohio River
tion 5.0 for definitions
llocation categories

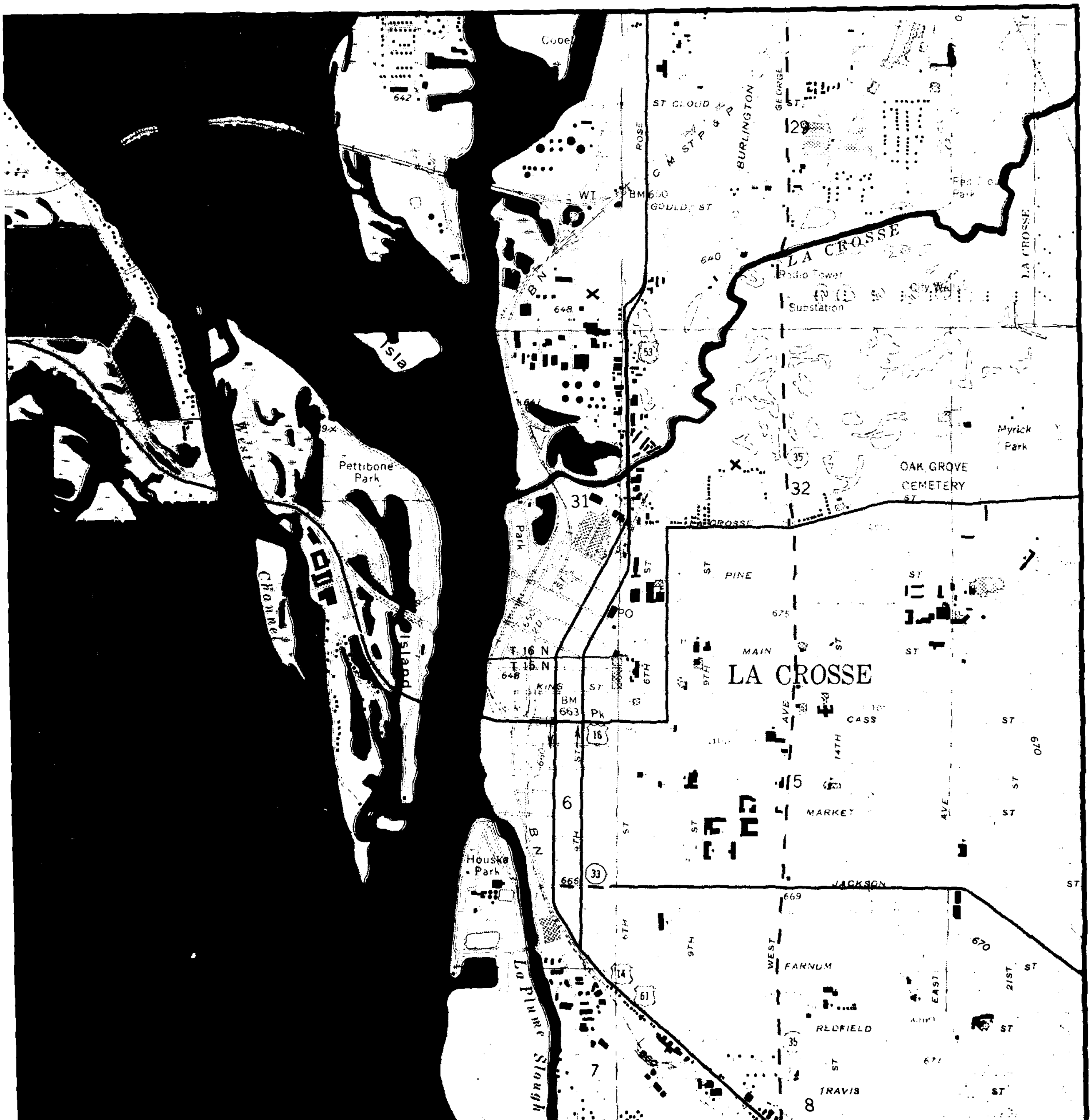
US Army Corps of Engineers

Drawn by: BV/RS/KN.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E Wakeman

Land Use Allocation

L & D 7 Mile 700.2-703.9 Plate 42 of 66


La Crescent
Park
BM 649
652
Pk
Crucifixion Cem
BR 663
676
Sandpits
9
16
21
22
x1133
0
1000
2000
3000
4000
5000 FEET
1 MILE



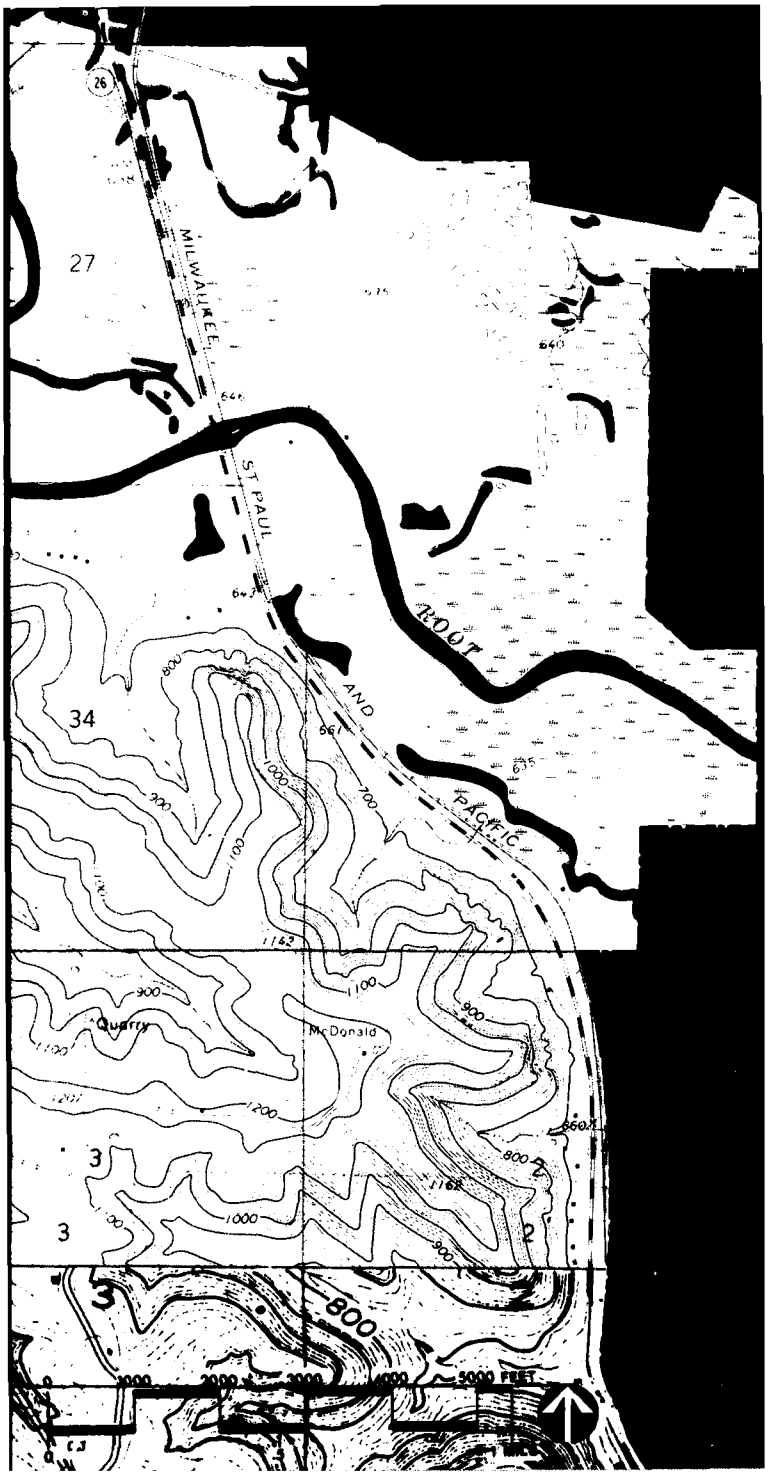
State Boundary
FWS Refuge Boundary
Miles Above Ohio River
tion 50 for definitions
llocation categories

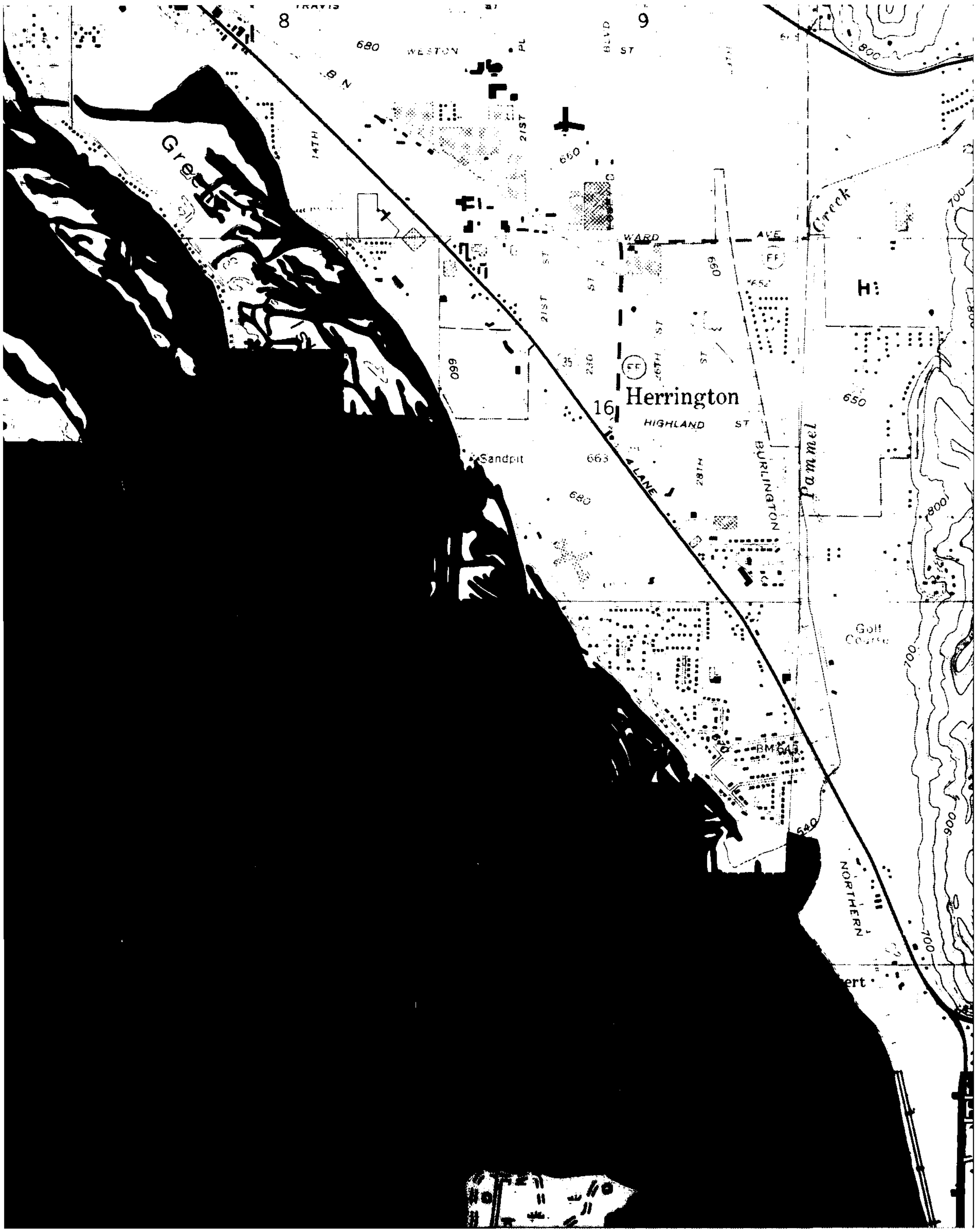
US Army Corps of Engineers

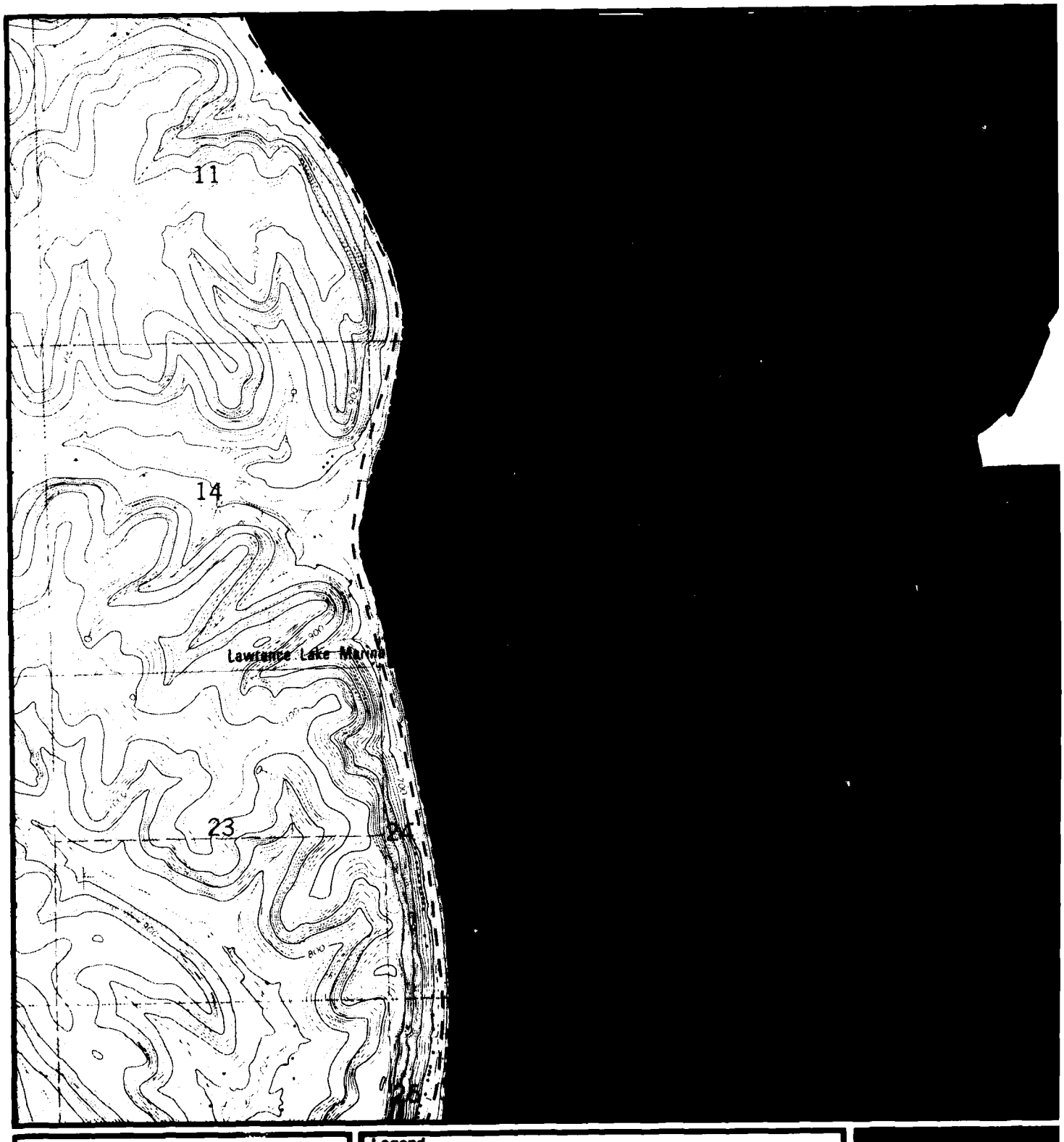
Drawn by: B.V./RS/K.N.
Checked by: Russell K Snyder
Submitted by: [signature]
Approved by: Charles E Wakeman

Land Use Allocation

Pool 8 Mile 696.2-700.4 Plate 43 of 66


MILWAUKEE
ST PAUL
AND
PACIFIC
ROUT
27
34
3
2
Quarry
McDonald
800
1000
1100
1200
5000 FEET


8
9
680
WESTON
B N
Creek
660
WARD
AVE
Creek
Herrington
16
HIGHLAND
ST
Sandpit
663
680
BURLINGTON
Pammel
Golf Course
BM 645
640
NORTHERN
650
700
800
900



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
■	■	Project Operations
▭	▭	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— — — FWS Refuge Boundary

+ Mile 726 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

ate Boundary
WS Refuge Boundary
iles Above Ohio River
ion 5.0 for definitions
ocation categories

US Army Corps
of Engineers

Drawn by: B.V./RS./K.N.
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 8 Mile 689.2-692.8 Plate 45 of 66

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— — — FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

...late Boundary
...WS Refuge Boundary
...iles Above Ohio River
...on 50 for definitions
...ocation categories

Drawn by: B.V./R.S./K.N.

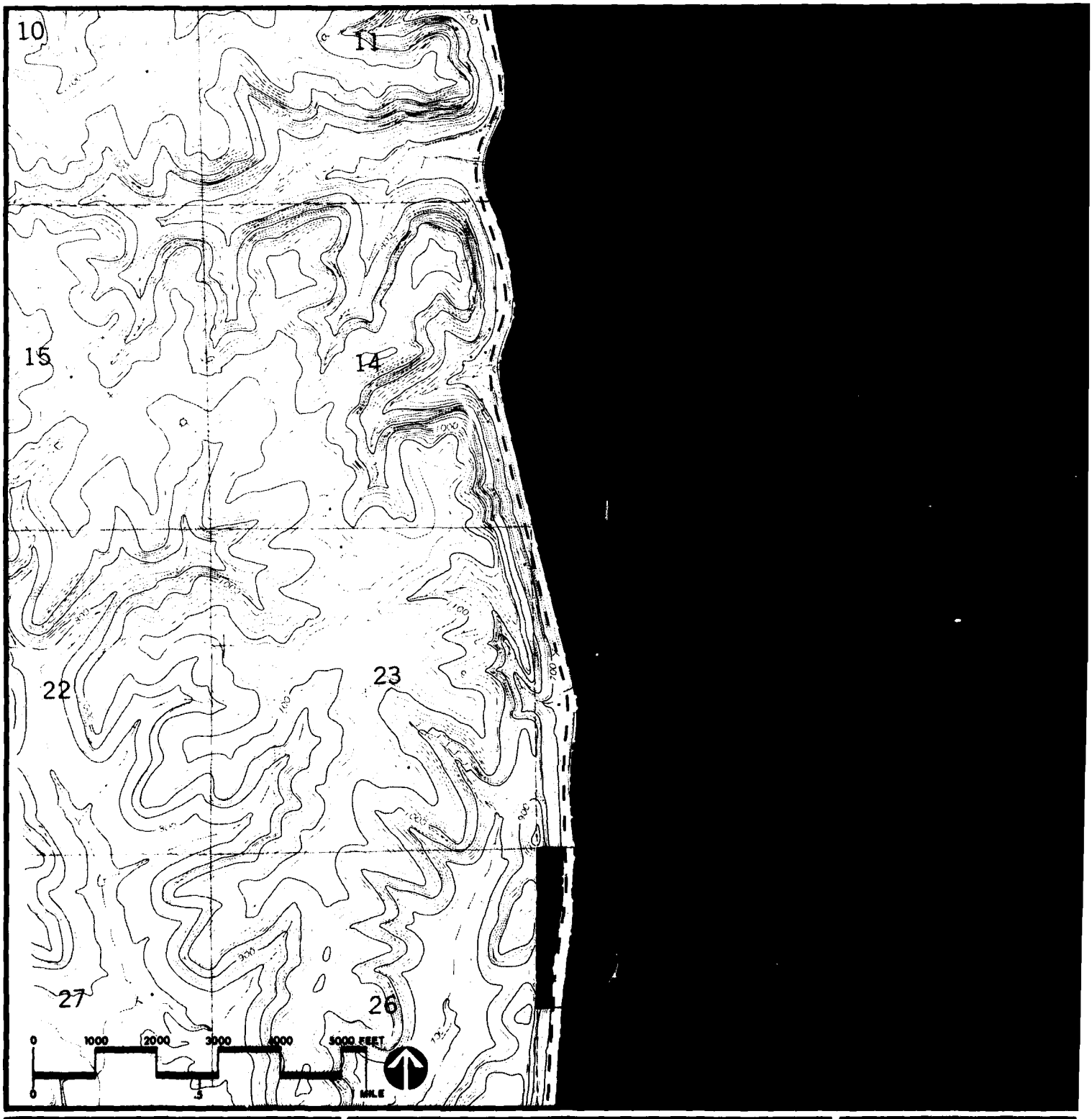
Checked by: Russell K Snyder

Submitted by: Norman Hill

Approved by: Charles E. Watkinson

Land Use Allocation

Pool 8 **Mile 685.6-689.4** **Plate 46 of 66**



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

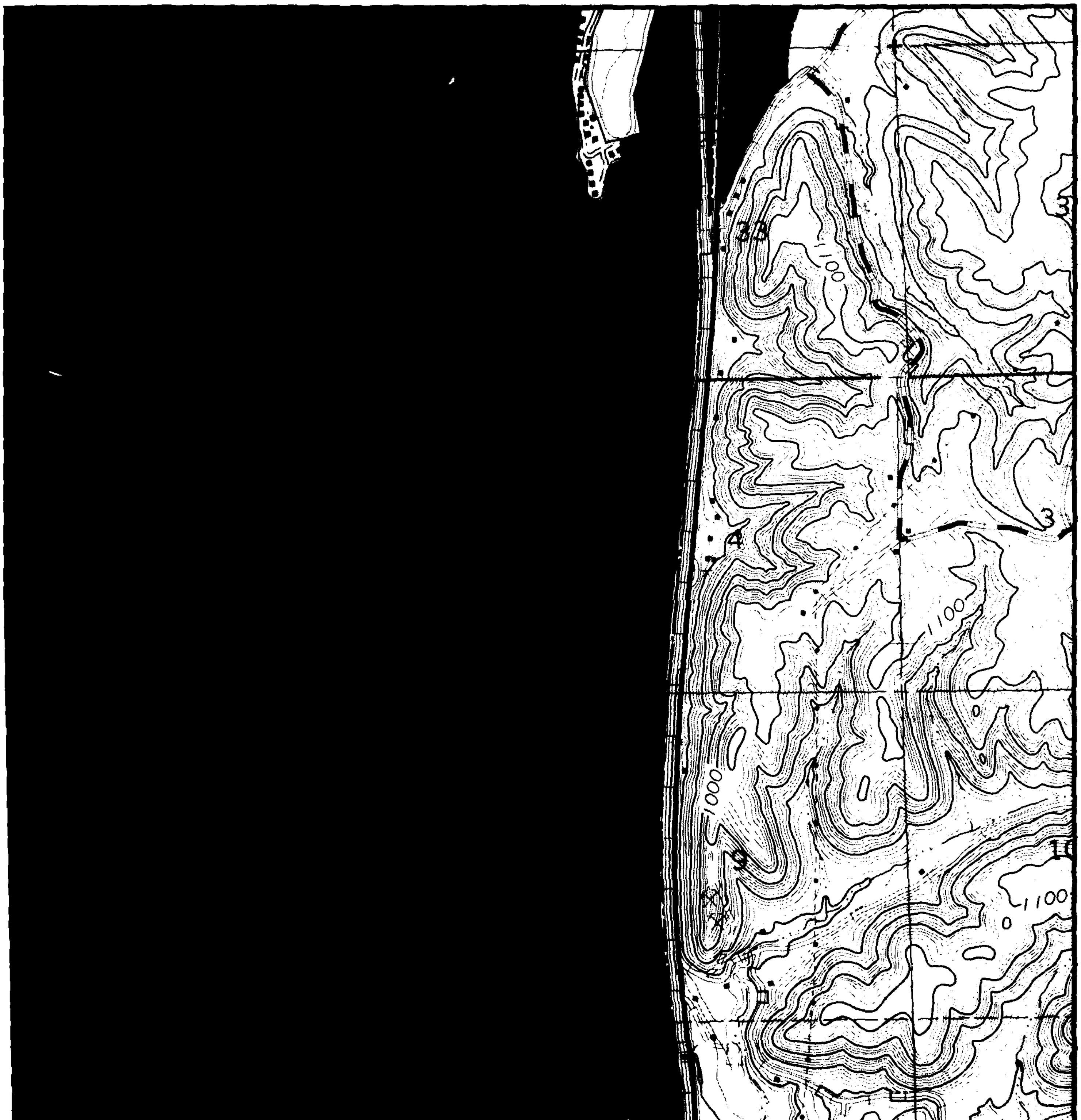
— — — State Boundary

— — — FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



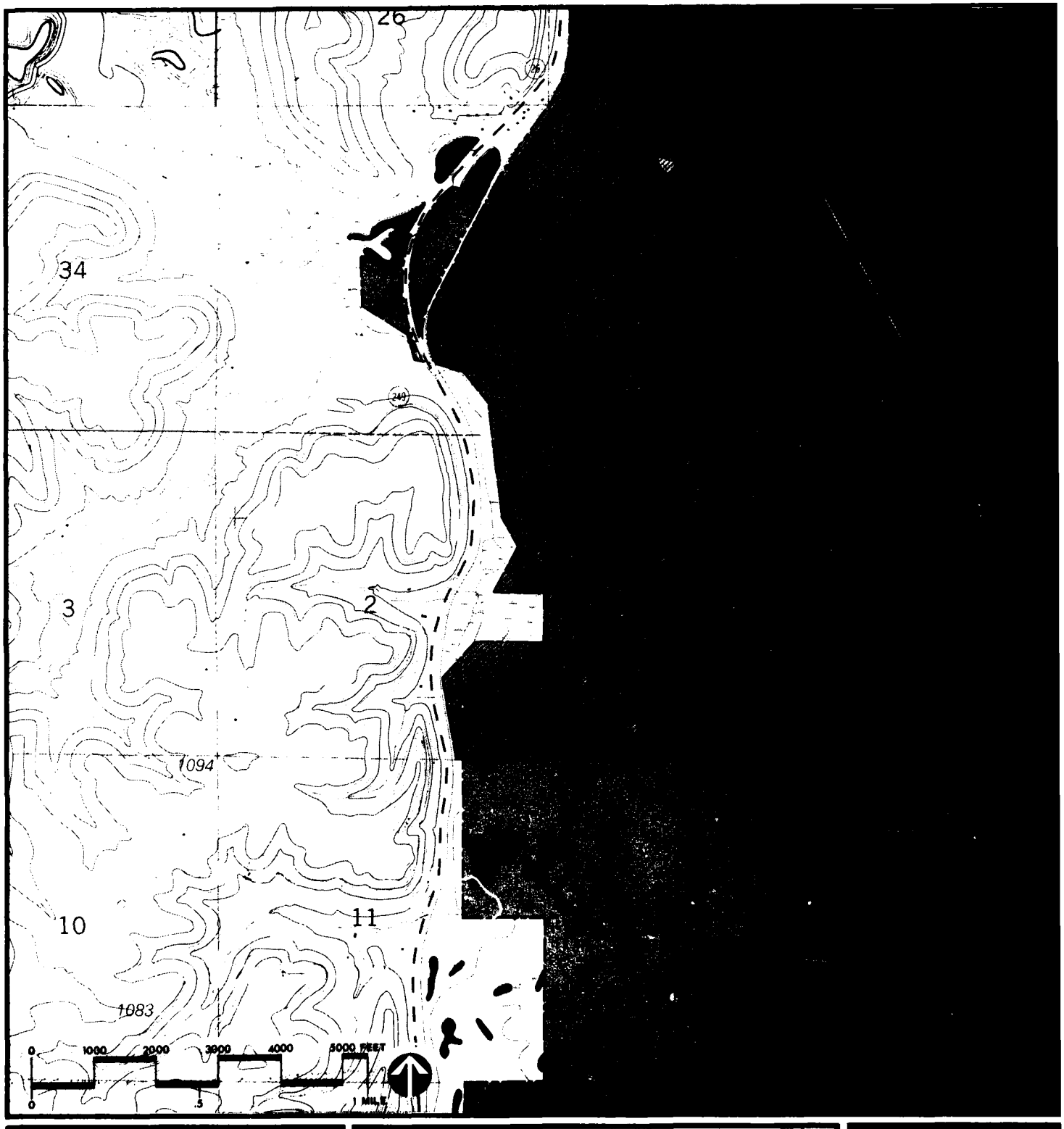
ate Boundary
VS Refuge Boundary
es Above Ohio River
n 5.0 for definitions
cation categories

US Army Corps
of Engineers

Drawn by: B.V./R.S./L.N.
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 8 Mile 681.7-685.4 Plate 47 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

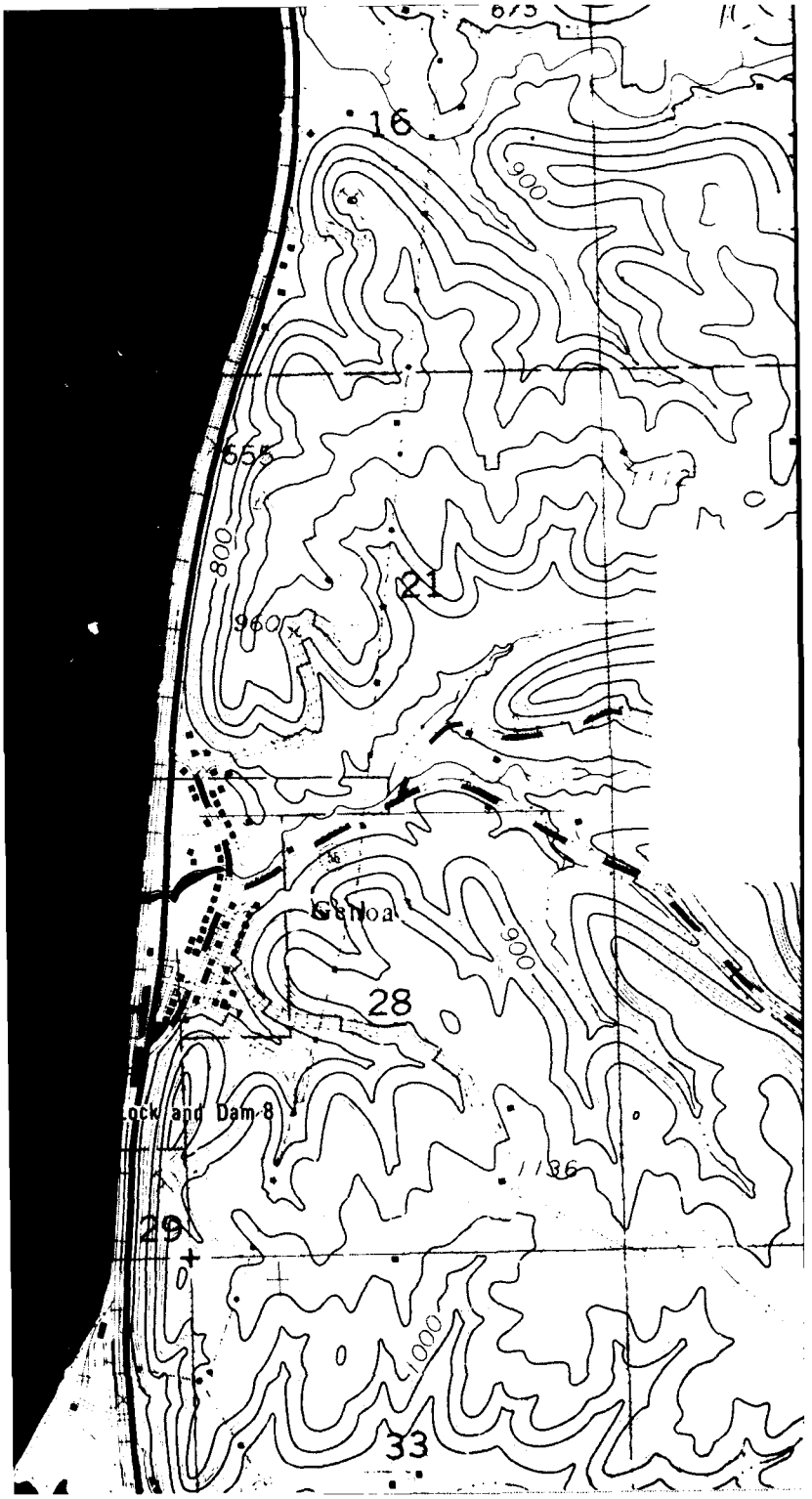
State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

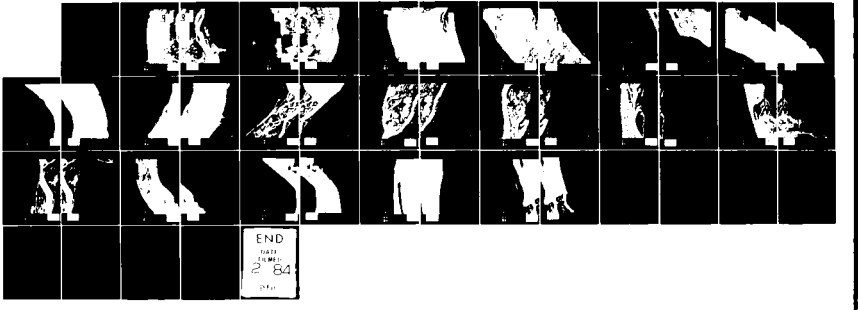
* See text Section 5.0 for definitions of land use allocation categories

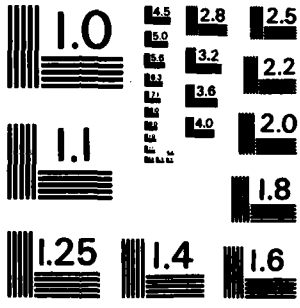
US Army Corps of Engineers


16
900
655
800
21
960
Genoa
900
28
Lock and Dam 8
1186
29
1,000
33

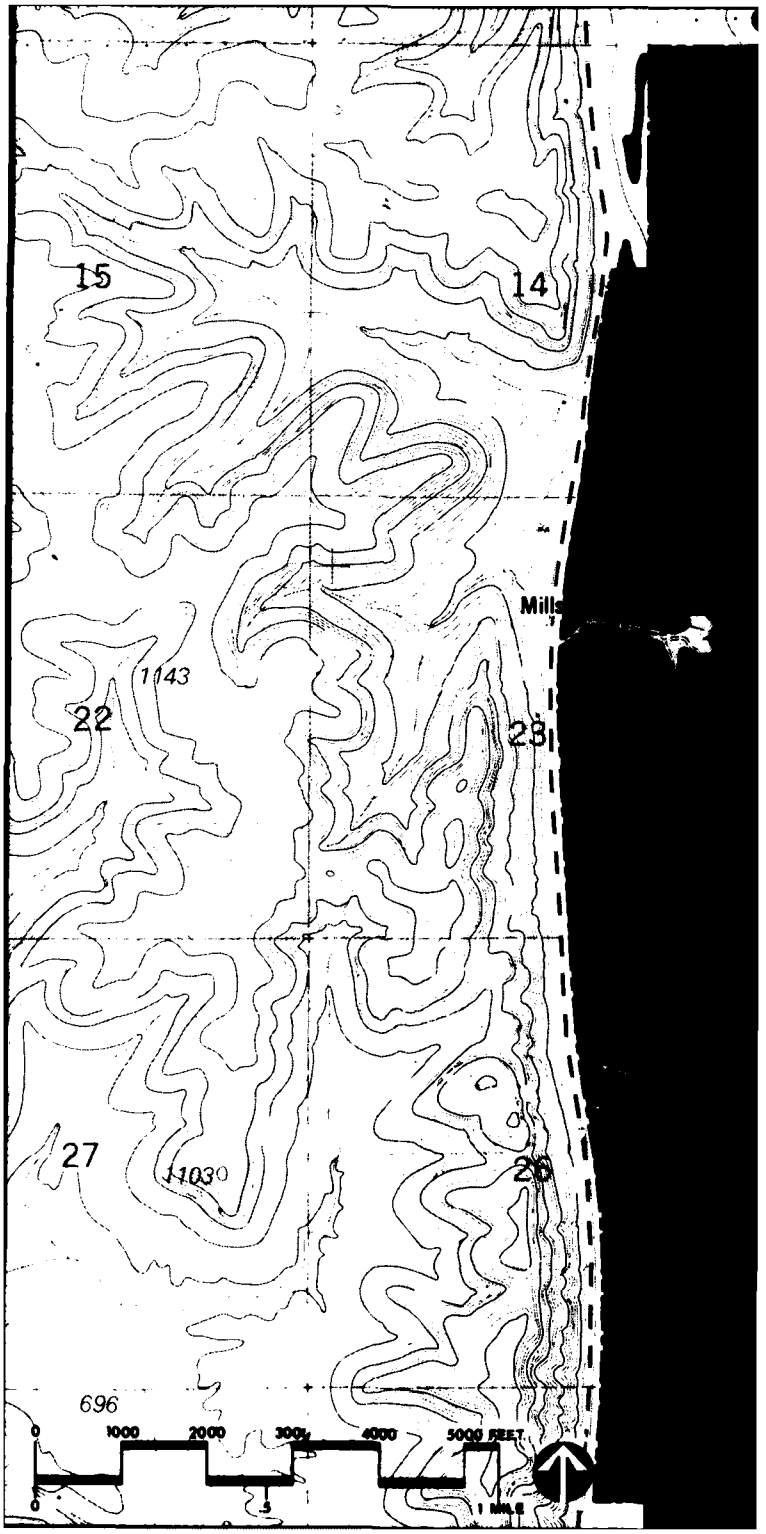
AD-A136 602 UPPER MISSISSIPPI RIVER LAND USE ALLOCATION PLAN MASTER PLAN FOR PUBLIC U..(U) CORPS OF ENGINEERS ST PAUL MN ST PAUL DISTRICT SEP 83 4/4

UNCLASSIFIED F/G 5/4 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963 - A


15
14
Mills
1143
22
23
27
1103
26
696
1000
2000
3000
4000
5000 FEET
1 MILE

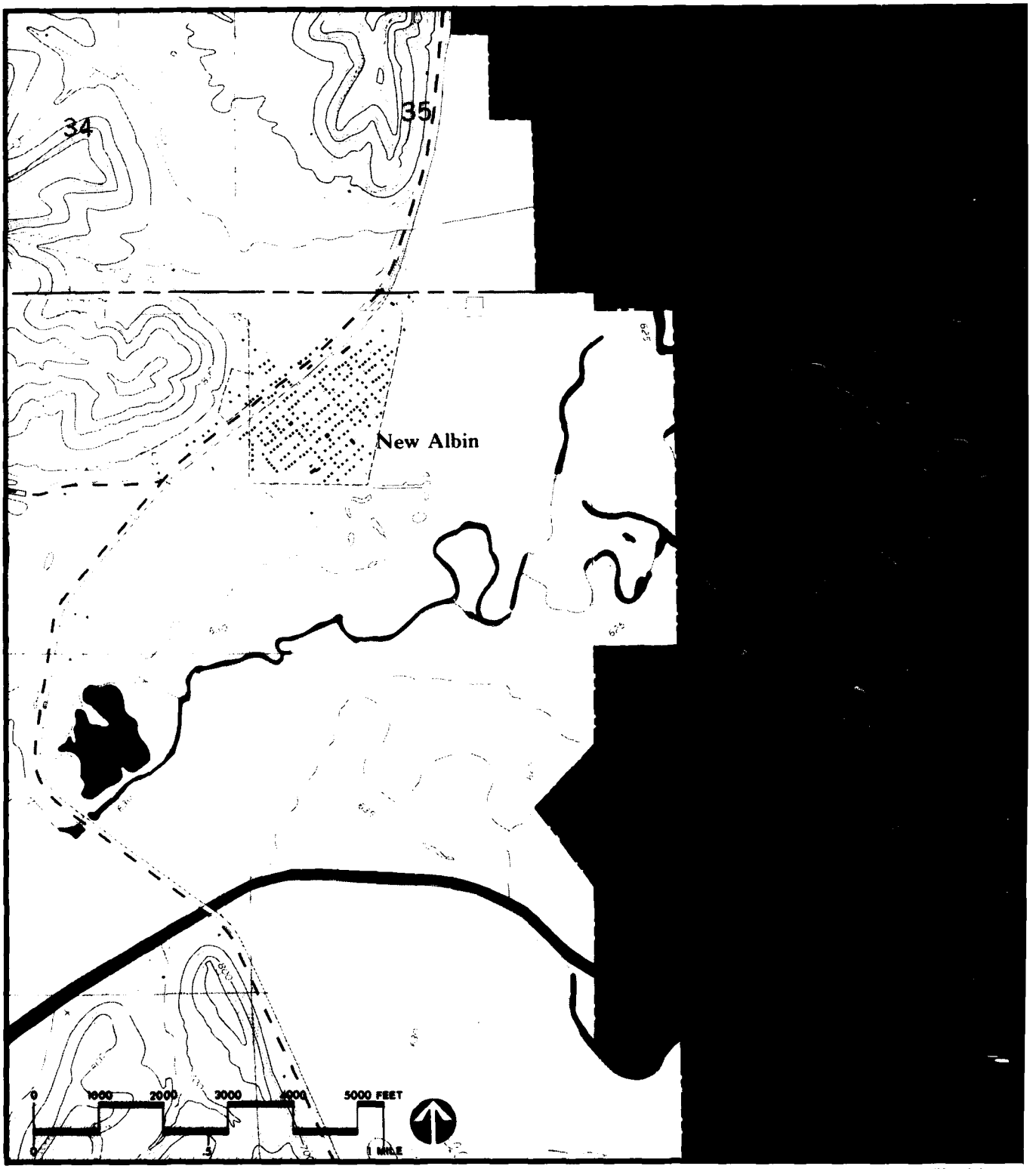
tate Boundary
WS Refuge Boundary
iles Above Ohio River
on 5.0 for definitions
ocation categories

US Army Corps of Engineers

Drawn by: B.V./R.S./K.N.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E. Watkinson

Land Use Allocation

Pool 9 **Mile 674.5-678.4** **Plate 49 of 66**



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

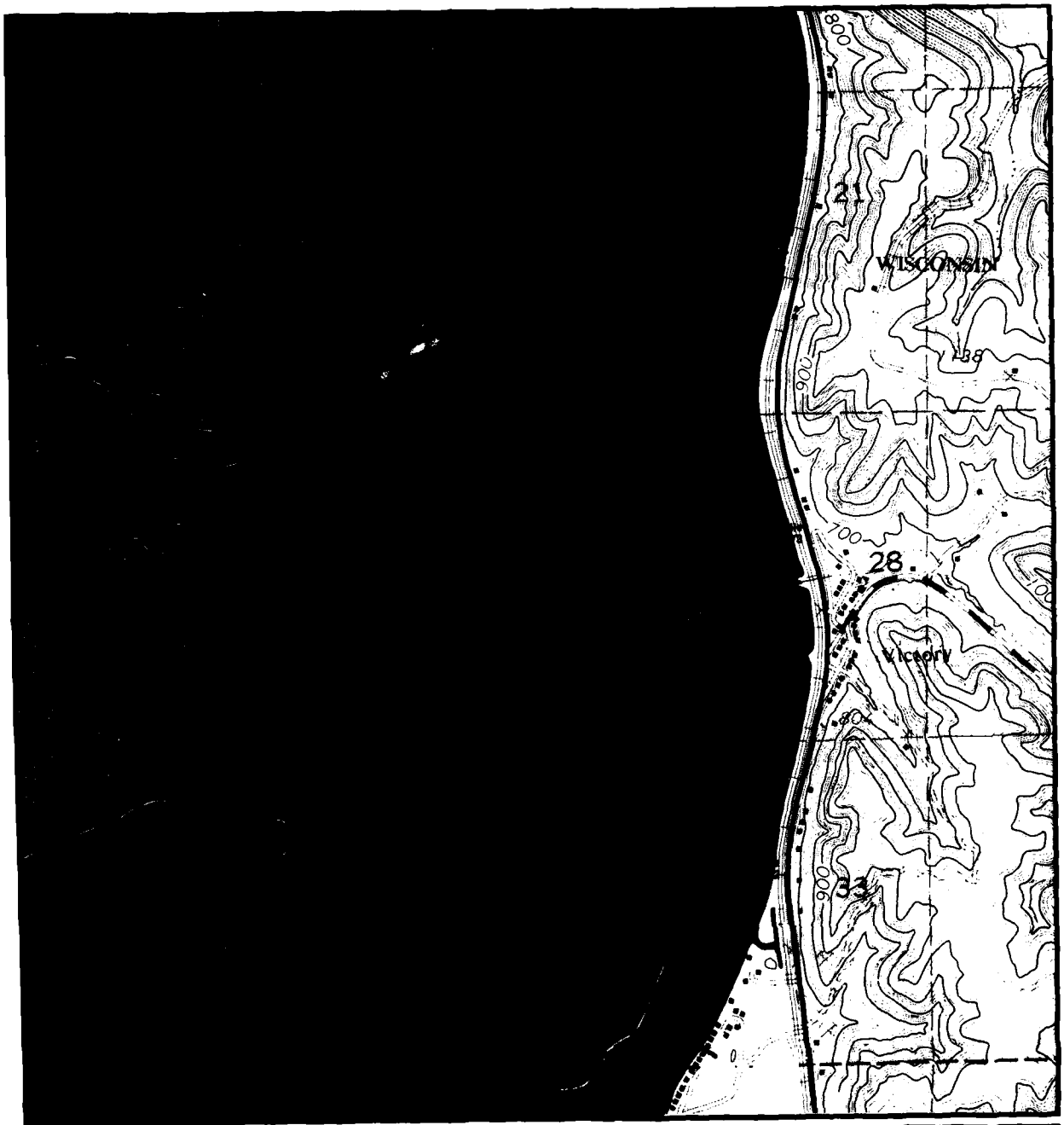
CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

State Boundary

FWS Refuge Boundary

+ 858.0 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories



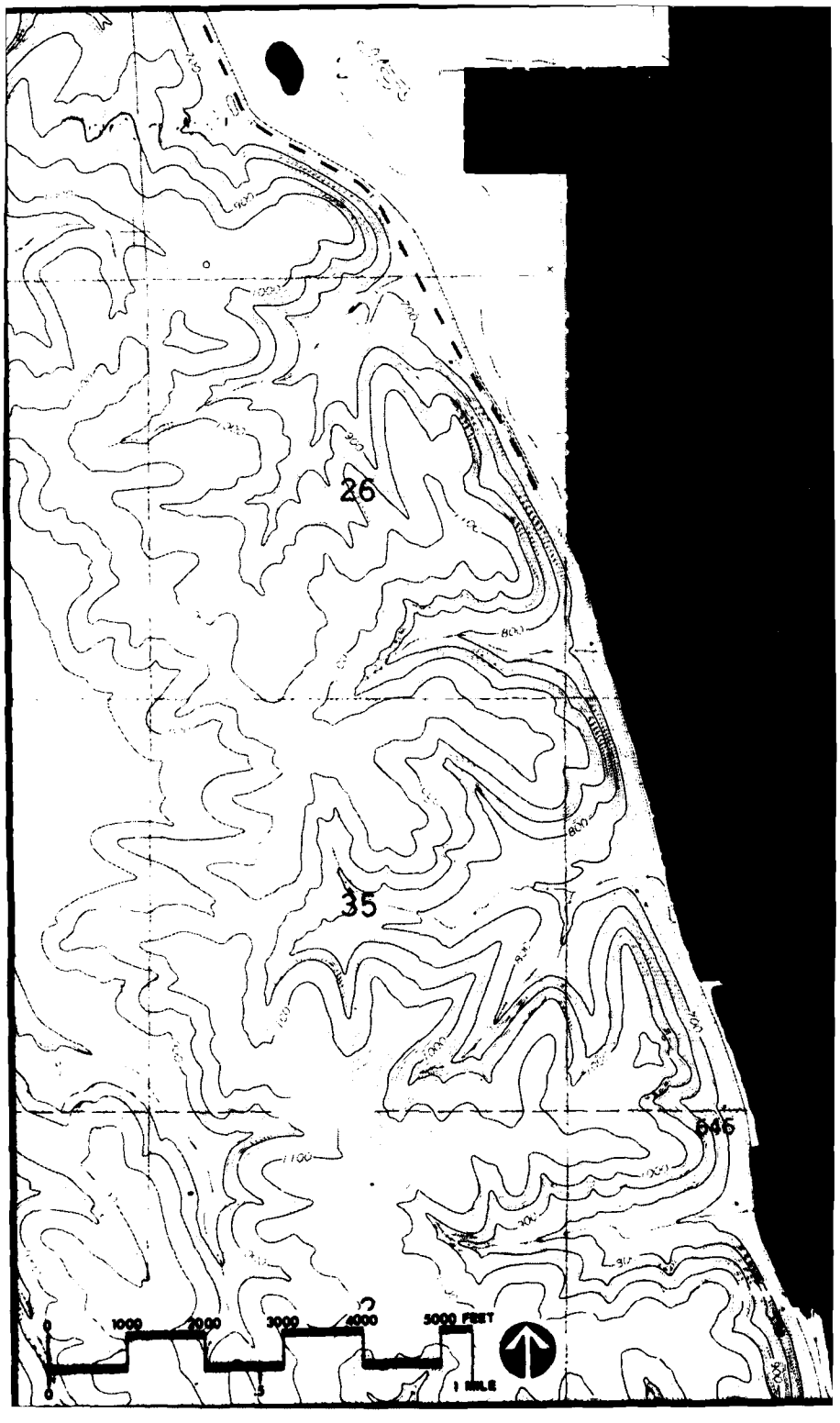
Boundary
Refuge Boundary
Above Ohio River
0 for definitions
on categories

U.S. Army Corps of Engineers

Drawn by: B.V / RS / K.N.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles C. Wilkinson

Land Use Allocation

Pool 9 **Mile 671.0-674.7** **Plate 50 of 66**


26
35
646
1000
2000
3000
4000
5000 FEET
1 MILE

625

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

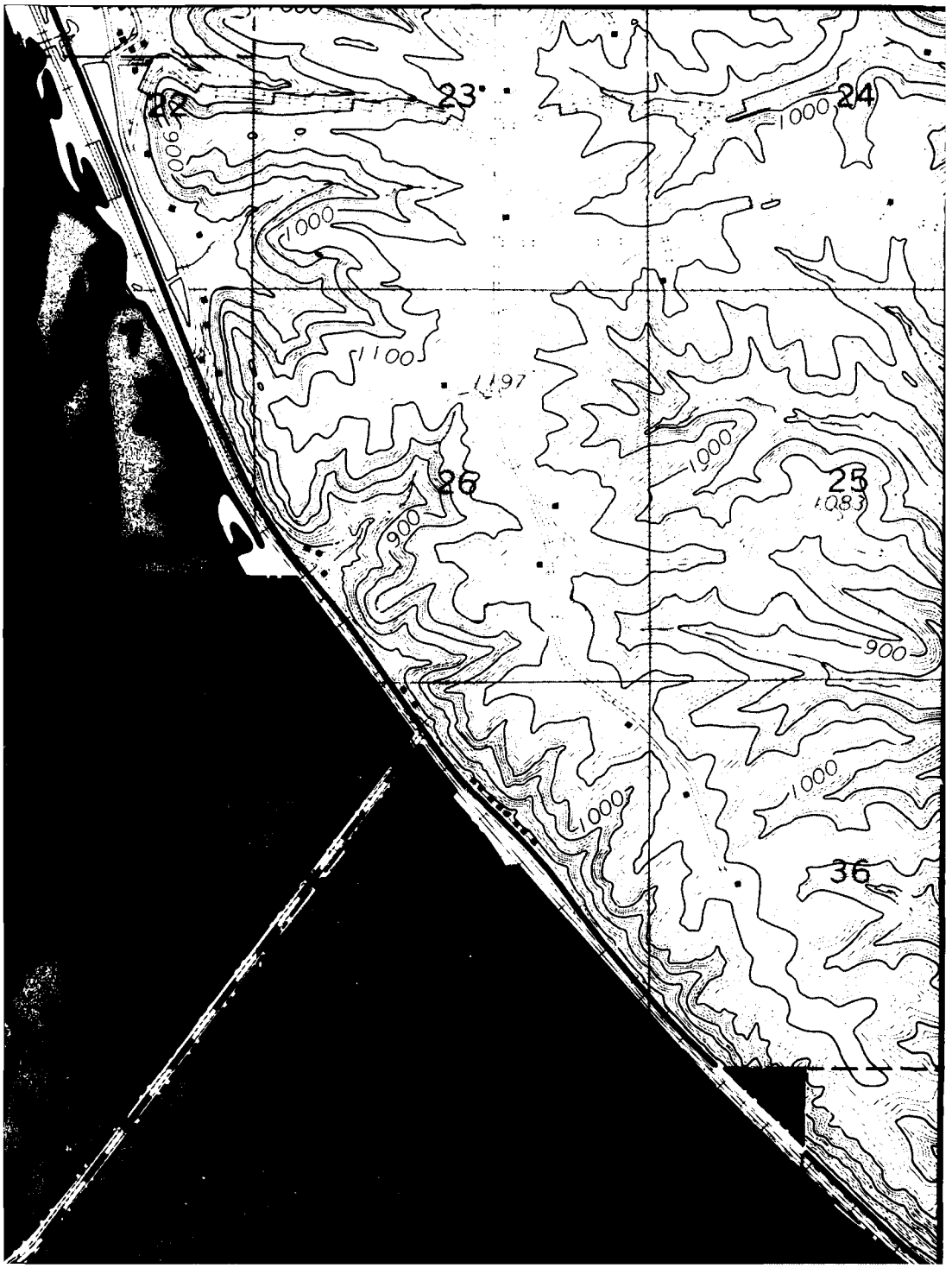
State Boundary

FWS Refuge Boundary

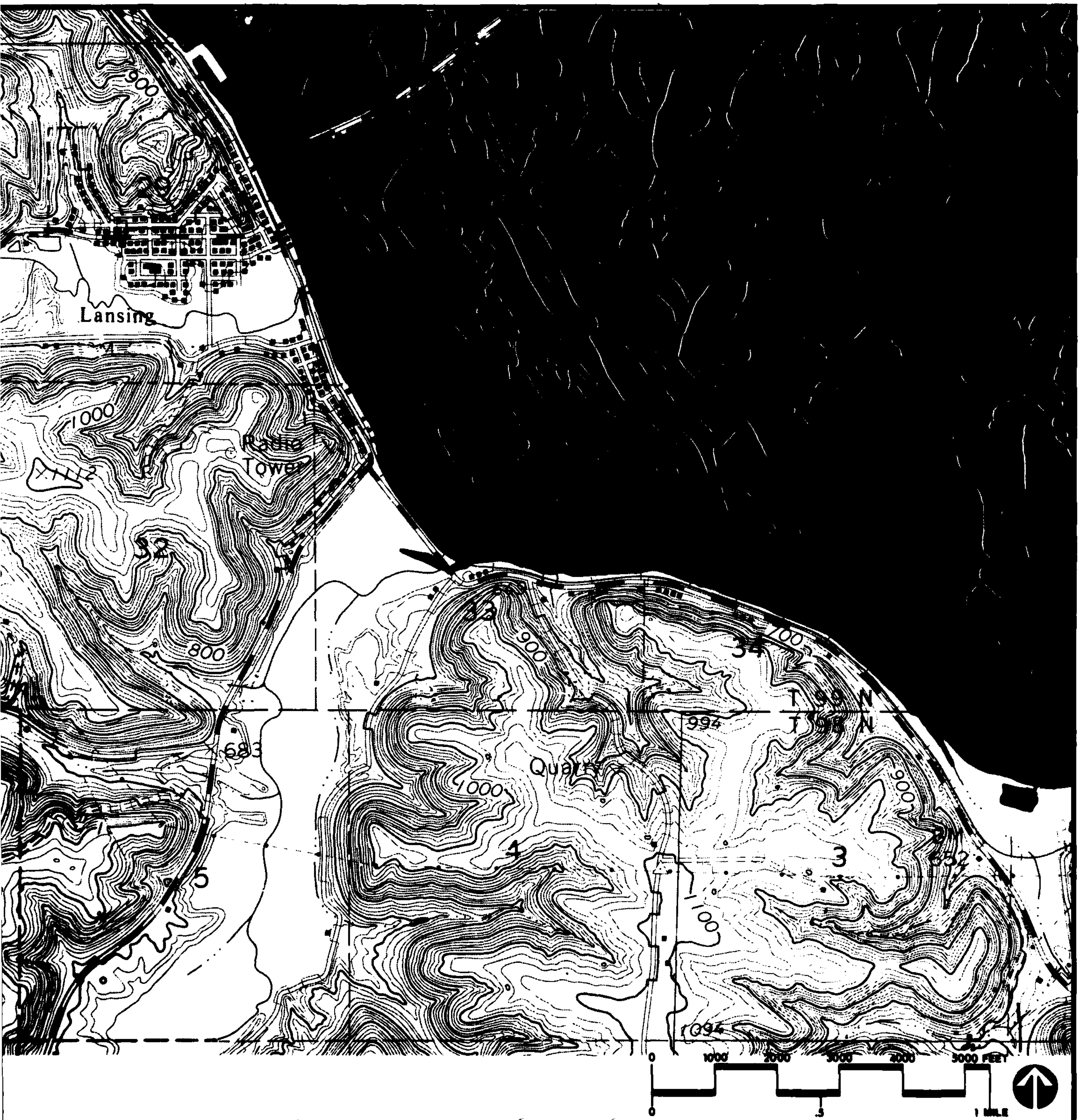
Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers


22
23
24
1000
900
1000
1100
1197
1000
26
25
1083
900
900
1000
1000
36

Creek
25
30
30
Lansing
31
31
31
32
Radio
Tower
1000
1000
1000
1100
800
900
683
6
5
R4W
R3W

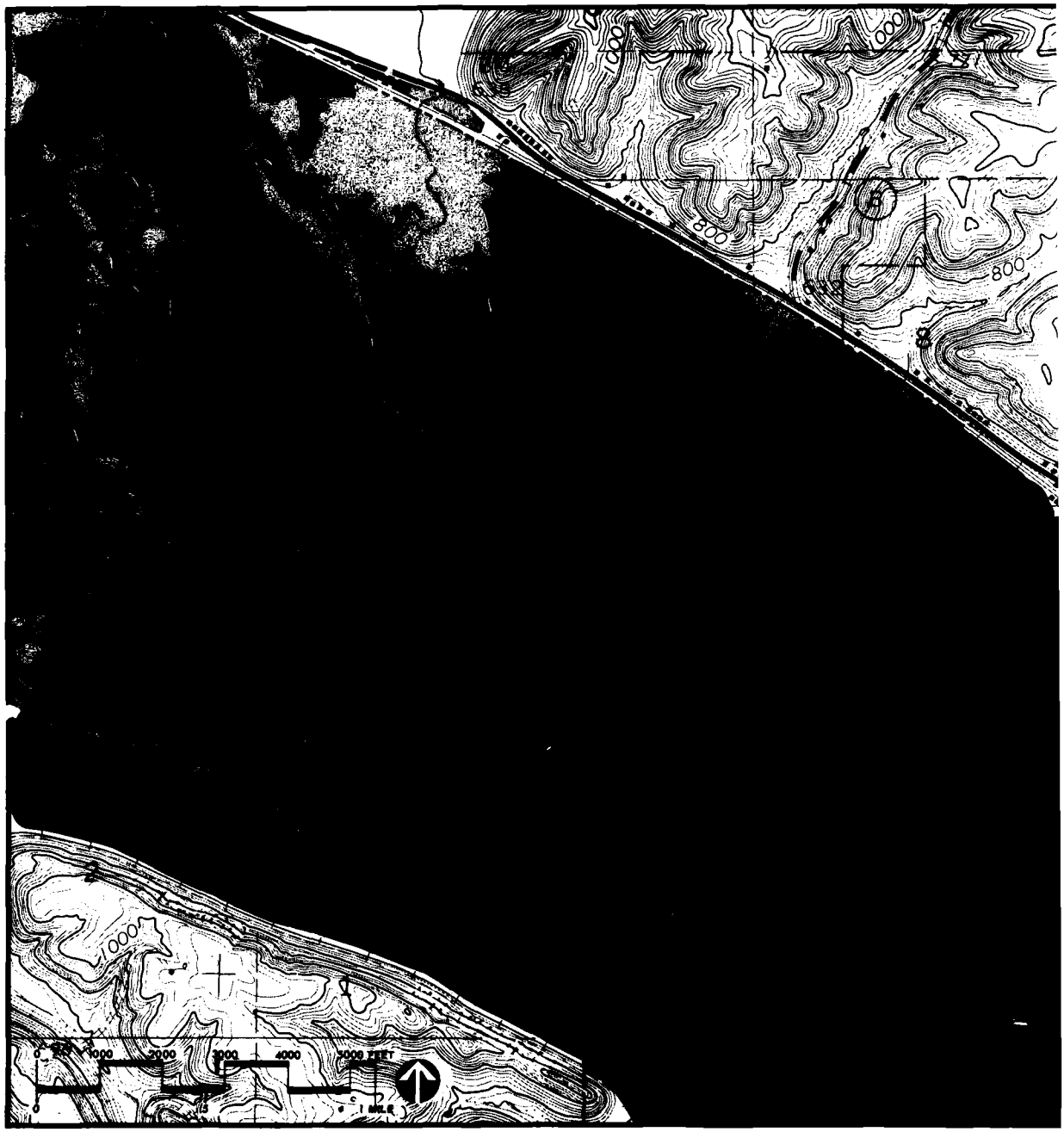


State Boundary
FWS Refuge Boundary
Miles Above Ohio River
...ction 5.0 for definitions ...allocation categories

Drawn by: ...
Checked by:
Submitted by:
Approved by:

Land Use Allocation

Pool 9 Mile 659.8-663.9 Plate 53 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
▭	▭	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

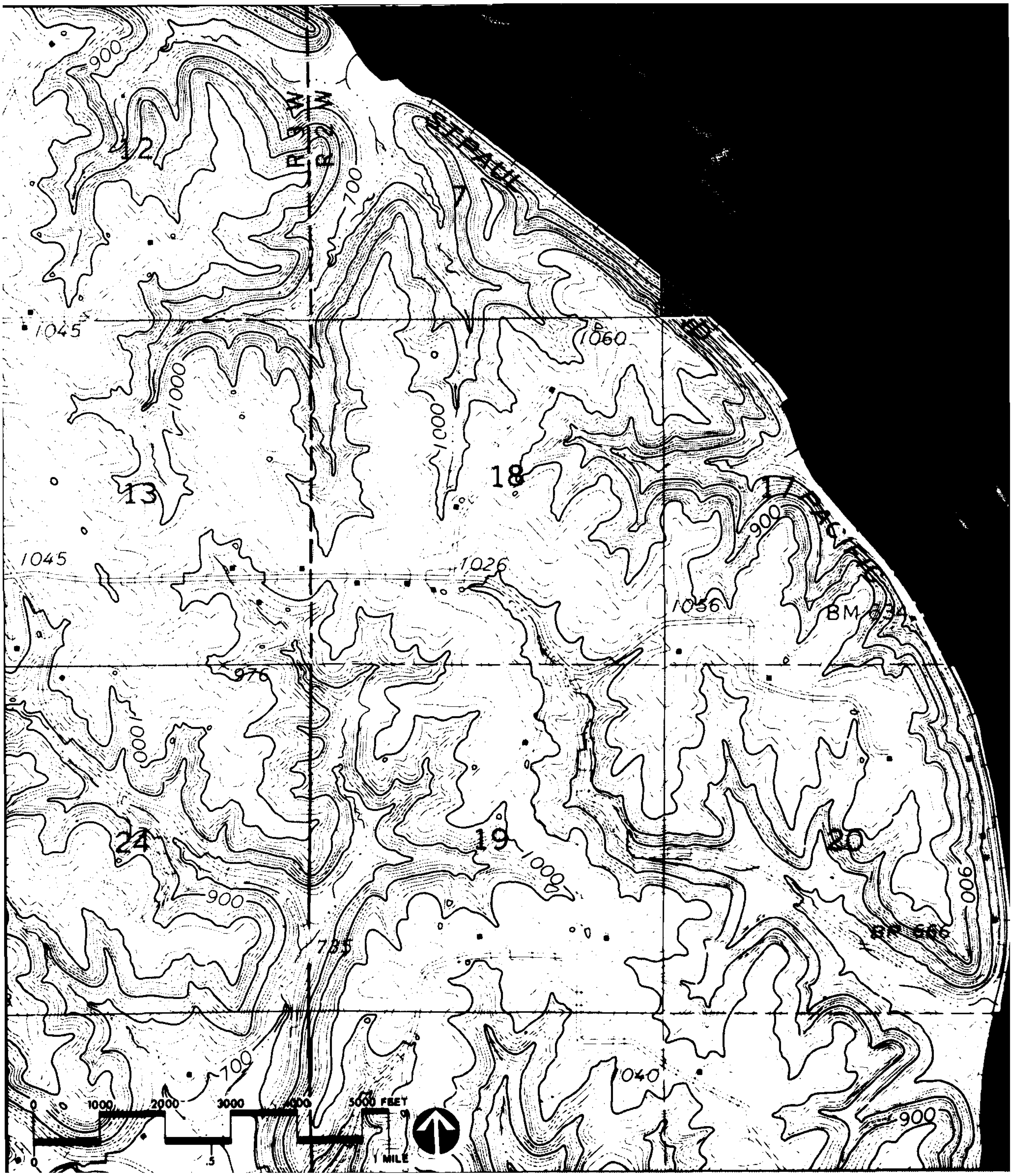
— — — FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers


1000
700
B
800
1000
8
9
10
900
700
Perryville
BM 634
900
C
800
900
635
635



R 3 W
R 2 W
ST. PAUL
PACIFIC
12
7
13
18
17
24
19
20
900
700
1000
1045
1060
1026
1036
976
735
1040
0
1000
2000
3000
4000
5000 FEET
.5
1 MILE

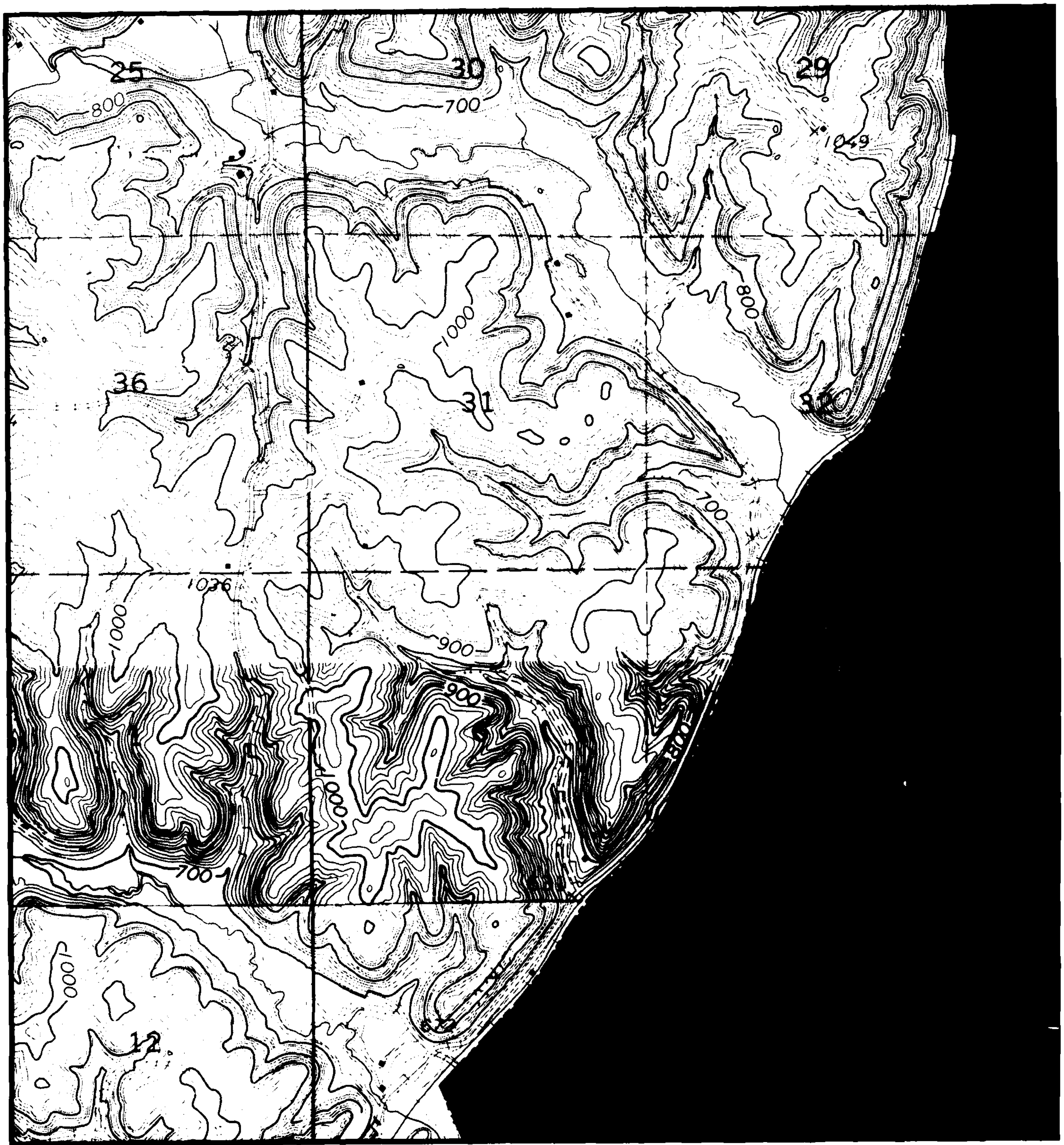
State Boundary
FWS Refuge Boundary
Miles Above Ohio River
ction 50 for definitions
location categories

US Army Corps of Engineers

Drawn by: B.V/RS/L.N.
Checked by: Russell K Snyder
Submitted by: [signature]
Approved by: Charles E. Watkinson

Land Use Allocation

Pool 9 Mile 653.7-657.9 Plate 55 of 66



Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

— — — State Boundary

—— — —— FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers

Miles Above Ohio River

...on 5.0 for definitions
...ocation categories

Submitted by:

Approved by: Charles E. Wahnow

Land Use Allocation

Pool 9 Mile 674.5-678.4 Plate 49 of 66

— State Boundary

— FWS Refuge Boundary

Miles Above Ohio River

...Section 5.0 for definitions
...use allocation categories

US Army Corps of Engineers

Drawn by: B.V./RS./K.N.

Checked by: Russell K. Snyder

Submitted by:

Approved by: Charles E. Wahnow

Land Use Allocation

Pool 9 Mile 649.7-653.9 Plate 56 of 66


800
800
800
1027
1682
700
13
14
1000
800
23
800
1000
Harpers
Ferry
900
Delphey
800
800

ndary
ge Boundary
e Ohio River
definitions
ategories

US Army Corps of Engineers

Drawn by: B.V/RS/K.N.

Checked by: Russell K Snyder

Submitted by: [illegible]

Approved by: Charles E. Wakeman

Land Use Allocation

L & D 9 Mile 645.4-649.9 Plate 57 of 66

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

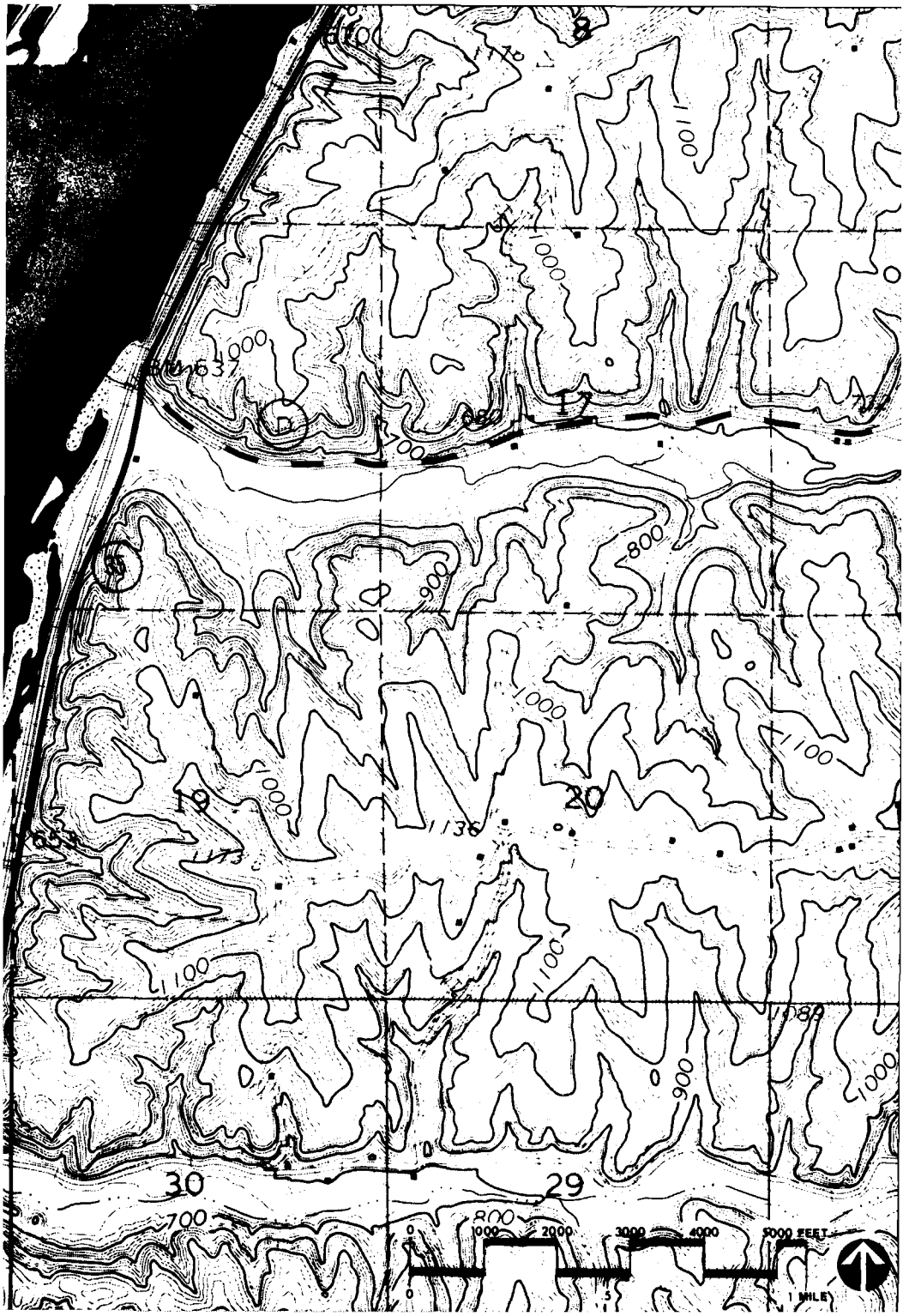
CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary

FWS Refuge Boundary

+ 726 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories


8
19
20
30
29
1100
1000
900
800
700
1136
1080
0
1000
2000
3000
4000
5000 FEET
1 MILE

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

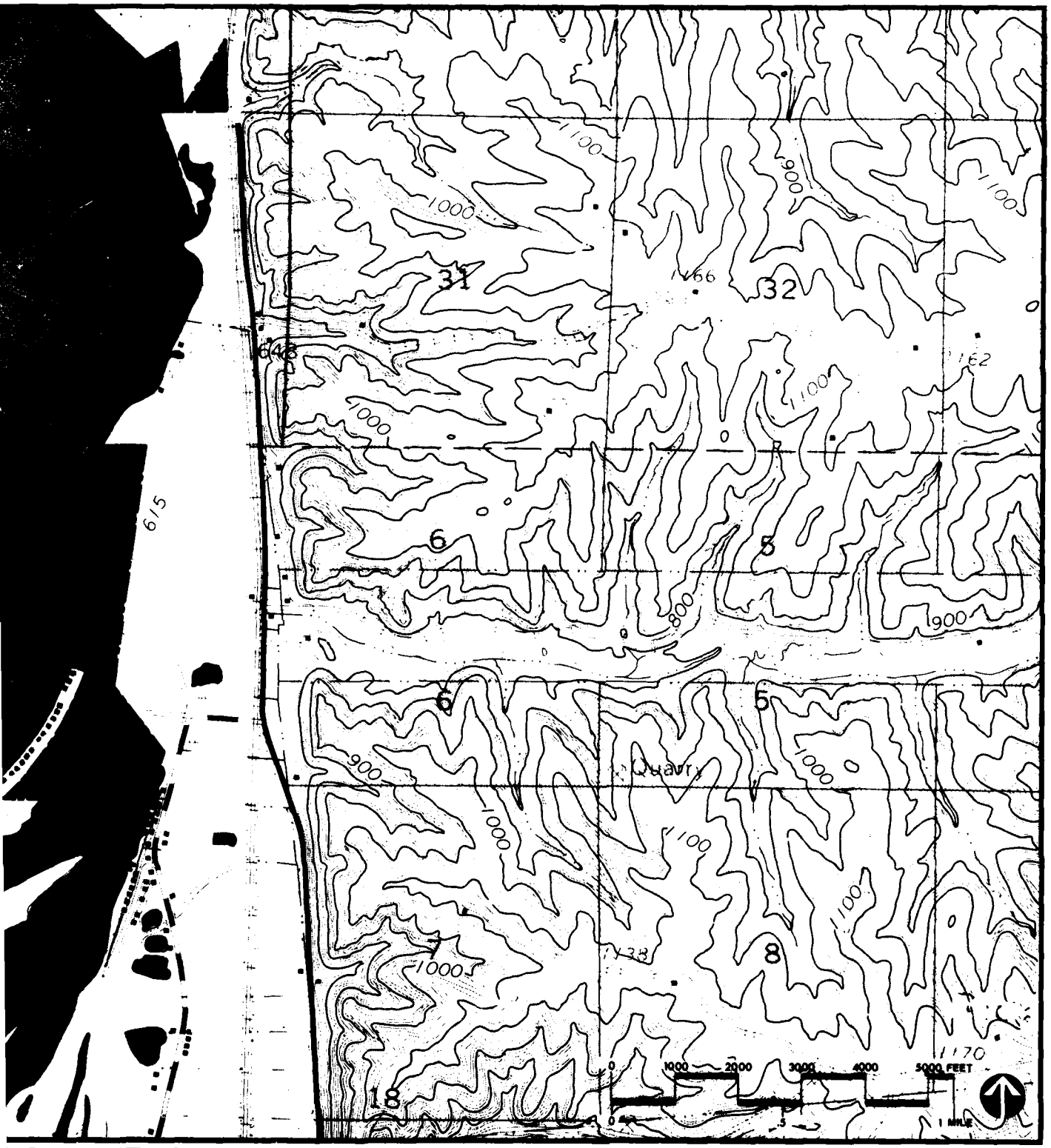
CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

State Boundary

FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories



undary
luge Boundary
ve Ohio River
or definitions
categories

U.S. Army Corps of Engineers

Drawn by: BV/RS/K.N.
Checked by: Russell K Snyder
Submitted by: [signature]
Approved by: Charles E. Watkins

Land Use Allocation

Pool 10 Mile 637.7-641.2 Plate 59 of 66

Resource Management
Upper Mississippi River

Recreation / Low-Density
Natural Area
Wildlife Management

+ 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

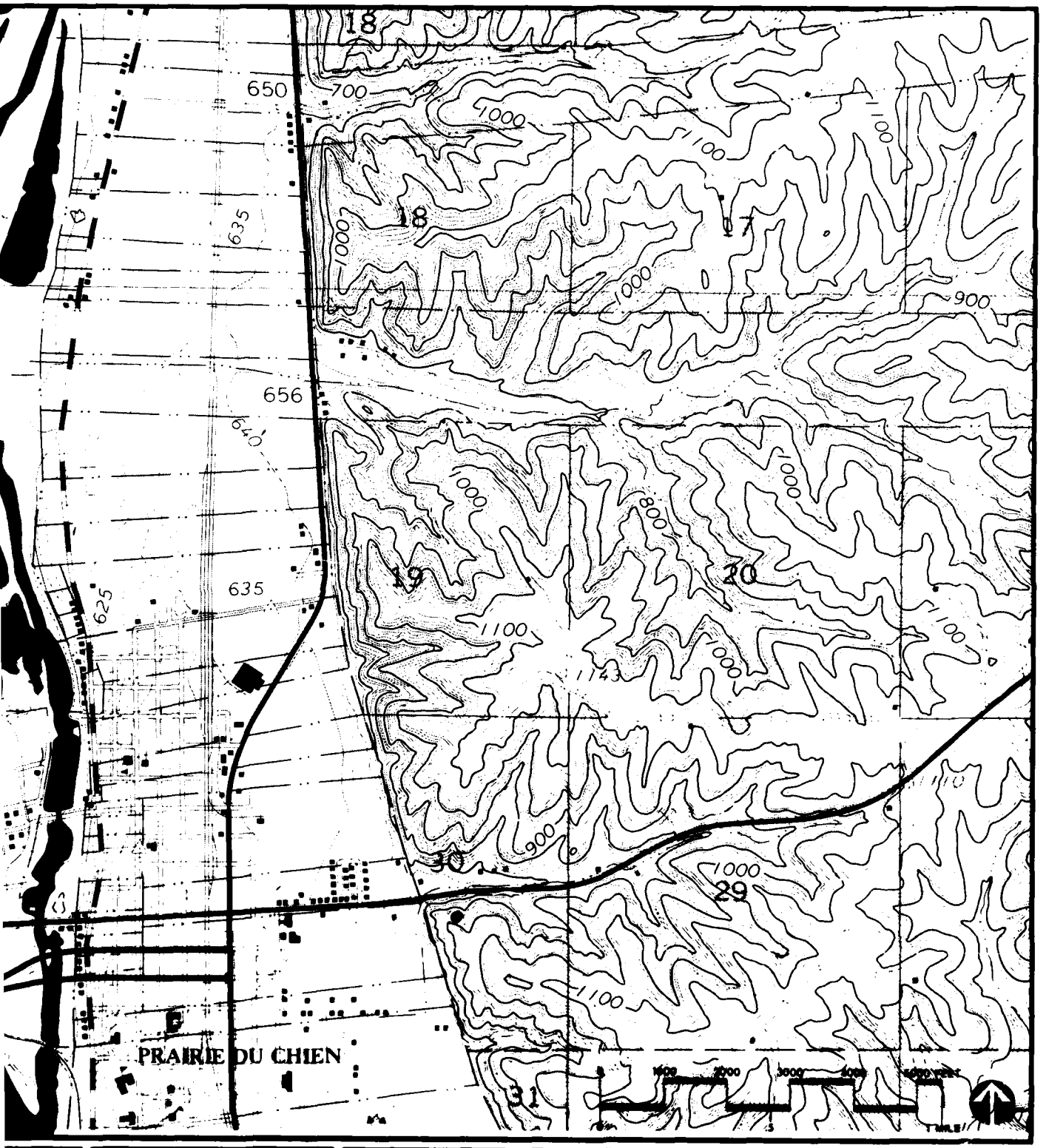
Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
+ 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



ndary
ge Boundary
e Ohio River
definitions
ategories

Drawn by BV/RS/K.N.

Checked by Russell K Snyder

Submitted by

Approved by Charles E. Watkins

Land Use Allocation

Pool 10 Mile 634.4-637.9 Plate 60 of 66

Master Plan for Public Use Development and Resource Management

Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	■	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

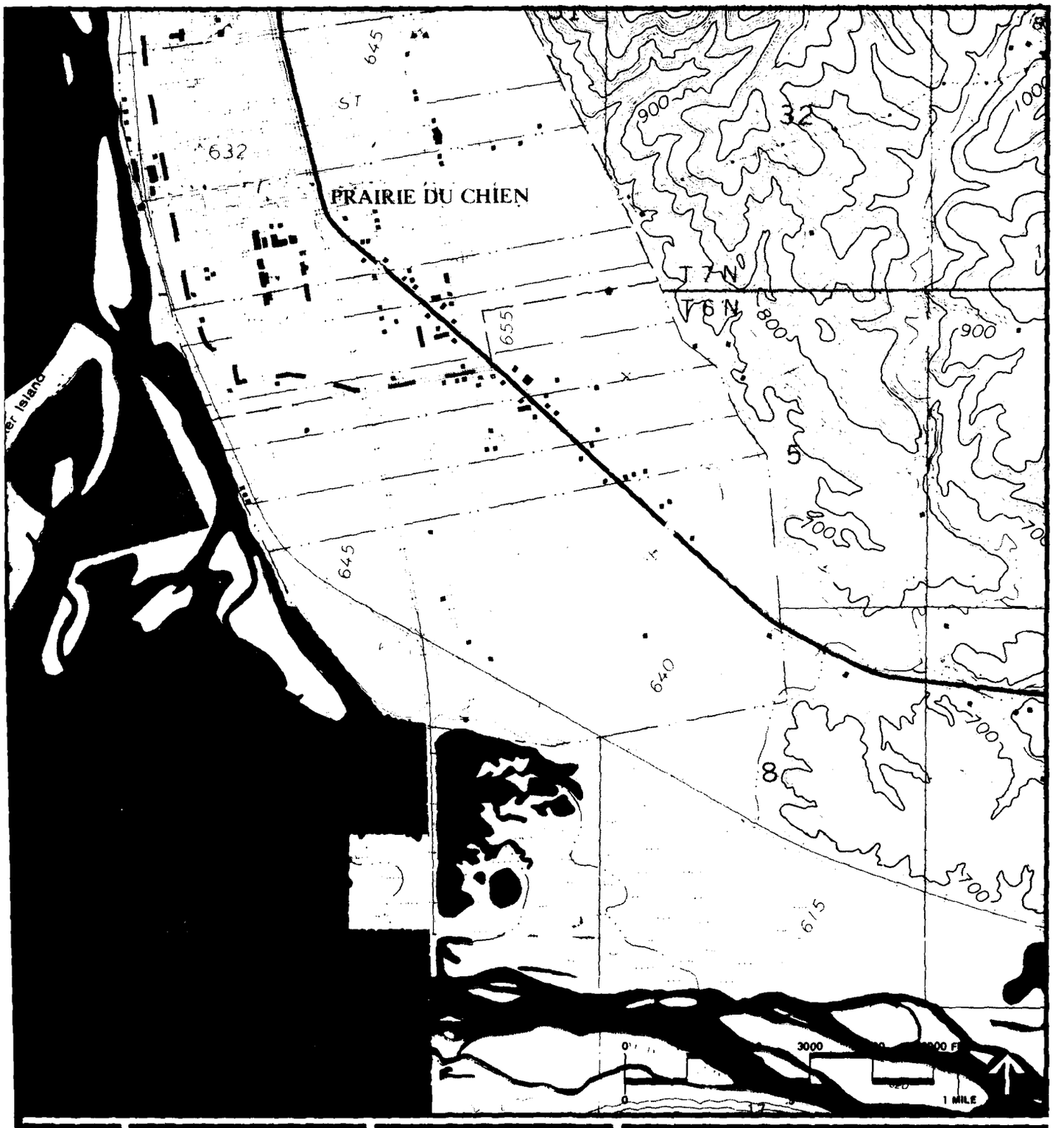
State Boundary

FWS Refuge Boundary

+ Mile 725 Miles Above Ohio River

* See text Section 50 for definitions of land use allocation categories

US Army Corps of Engineers



Boundary
Refuge Boundary
Above Ohio River
0 for definitions
on categories

US Army Corps
of Engineers

Drawn by: B.V/RS/K.N.
Checked by: Russell K Snyder
Submitted by: Hill
Approved by: Charles C. Watkinson

Land Use Allocation

Pool 10 Mile 631.0-634.6 Plate 61 of 66

Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

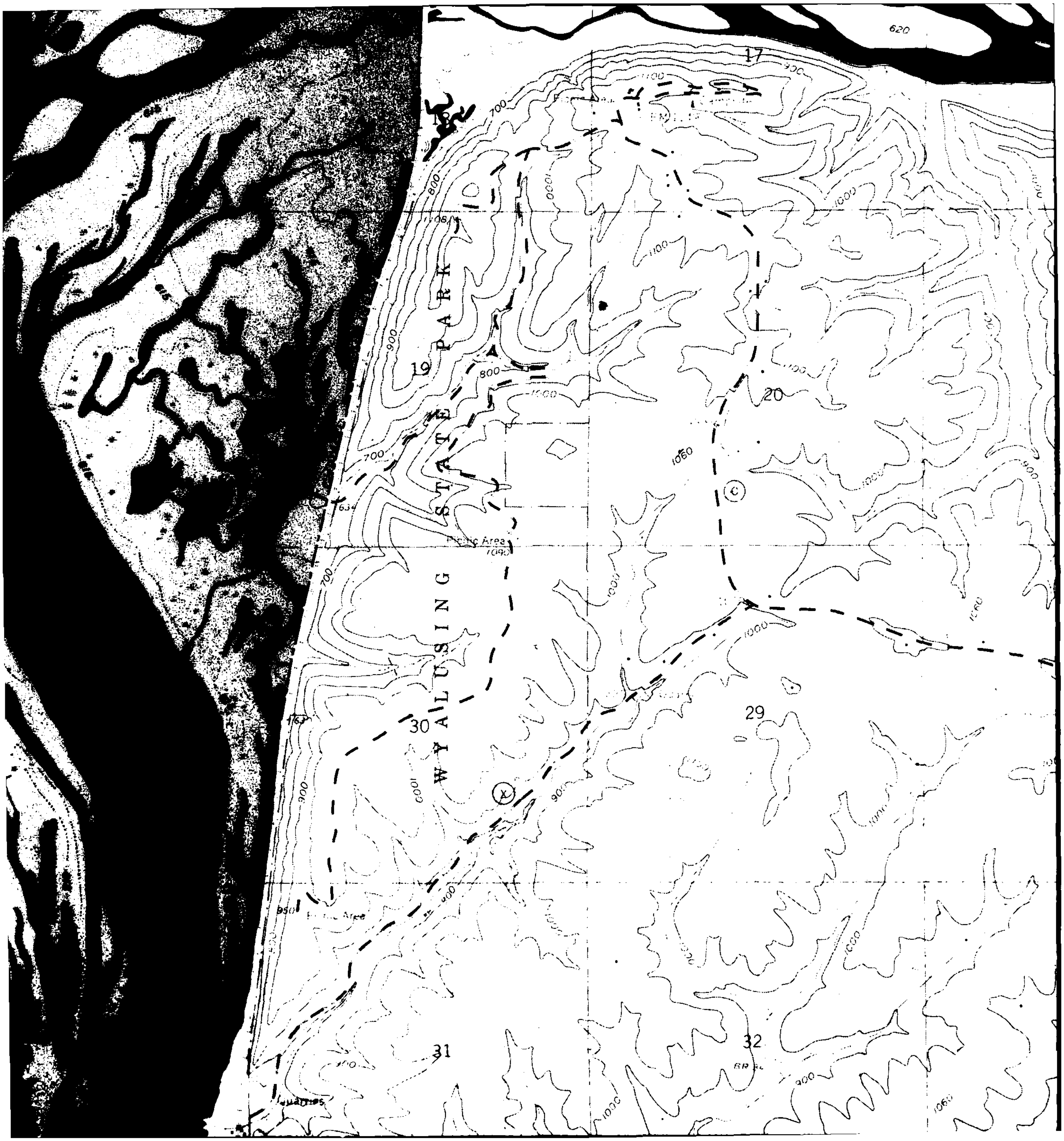
State Boundary

FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

US Army Corps of Engineers



WYALUSING STATE PARK
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18
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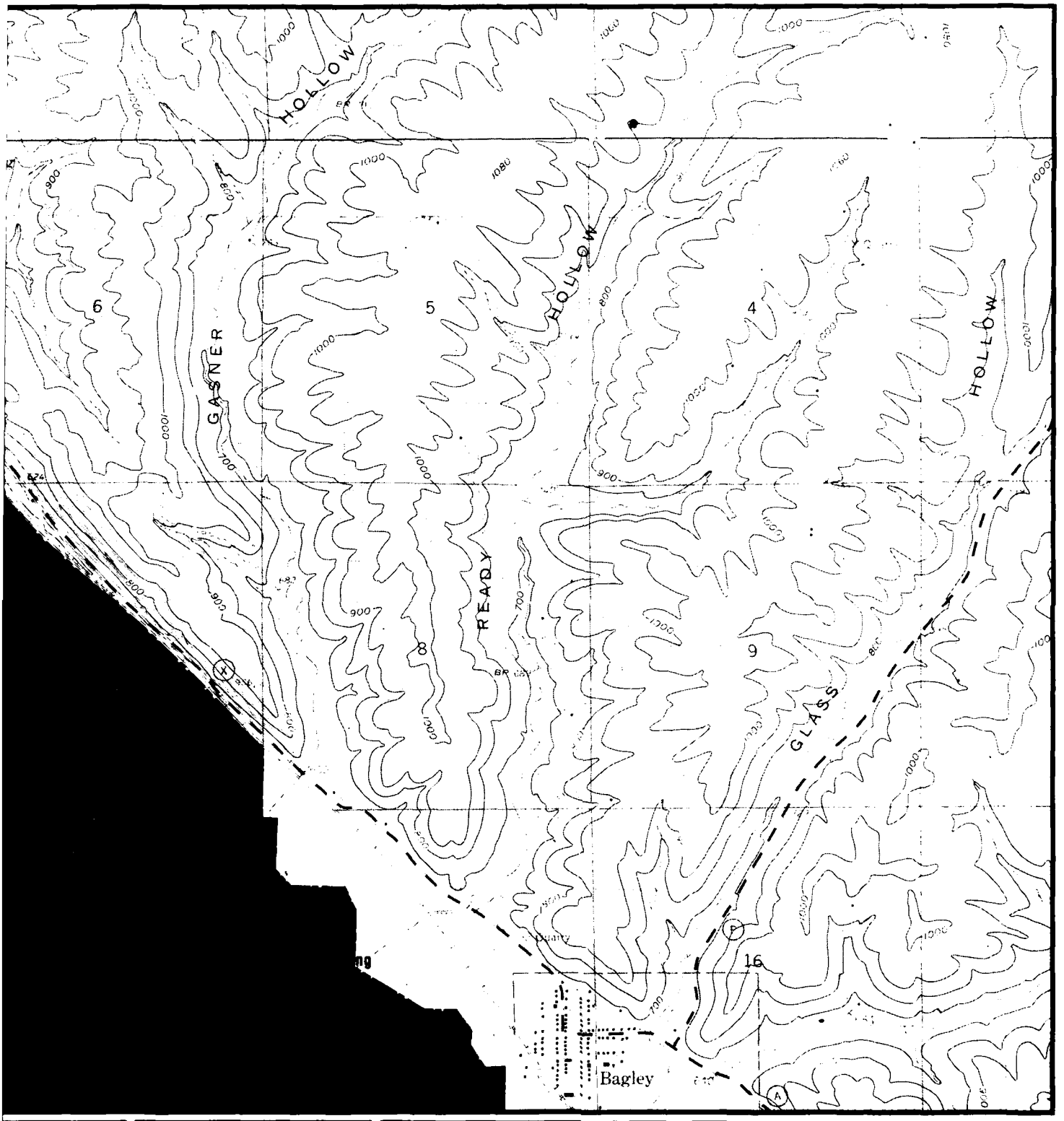
1060
Picnic Area



State Boundary
FWS Refuge Boundary
Miles Above Ohio River
tion 5.0 for definitions
location categories

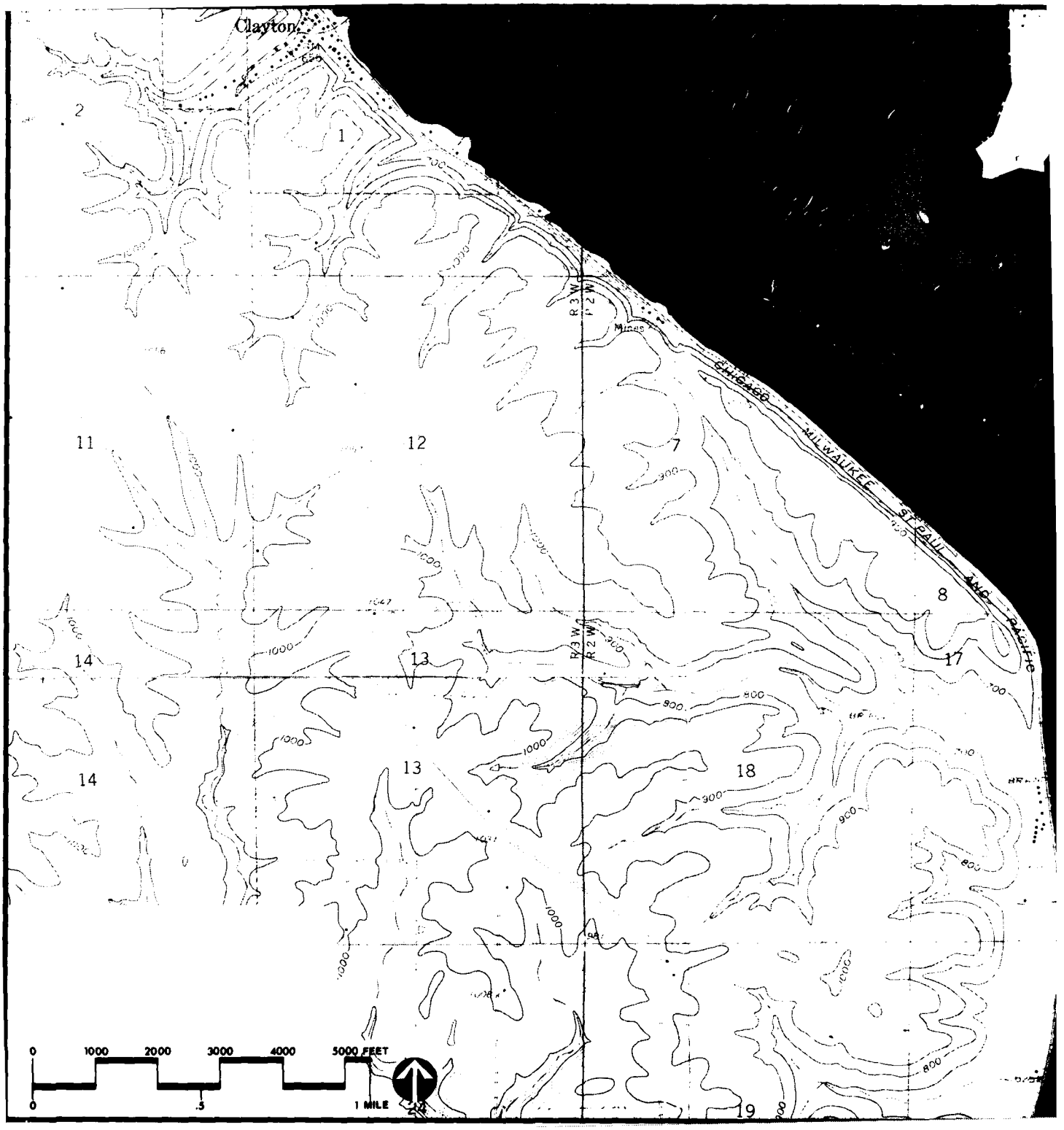
US Army Corps of Engineers

Drawn by: B.V/RS/K.N.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles E. Watkins

Land Use Allocation

Pool 10 Mile 624.5-628.0 Plate 63 of 66

2


Clayton
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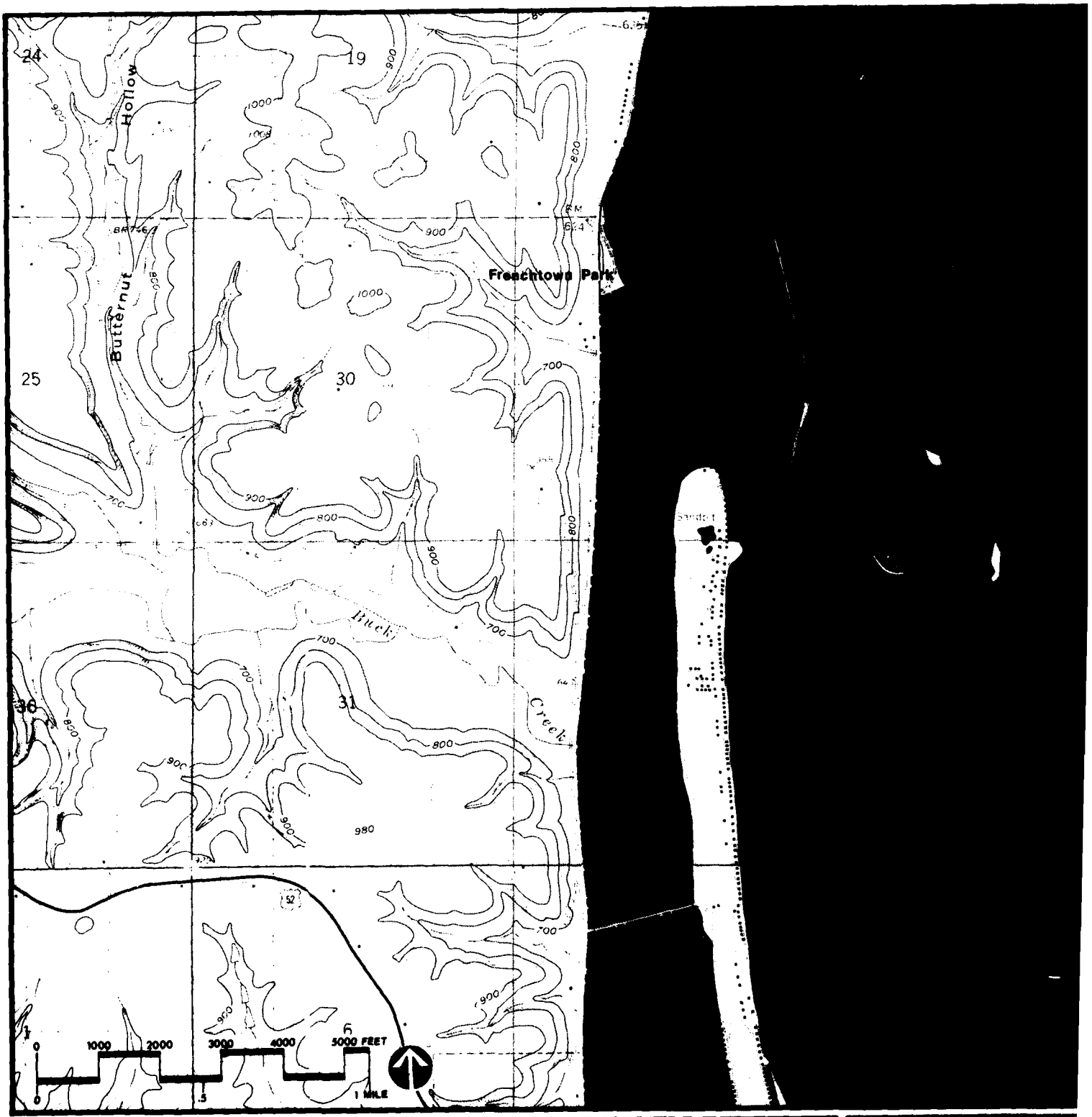


Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS *
■	■	Project Operations
□	□	Recreation / Intensive Use
■	□	Recreation / Low-Density
■	■	Natural Area
■	■	Wildlife Management

— — — State Boundary

— - — FWS Refuge Boundary

+ 725 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

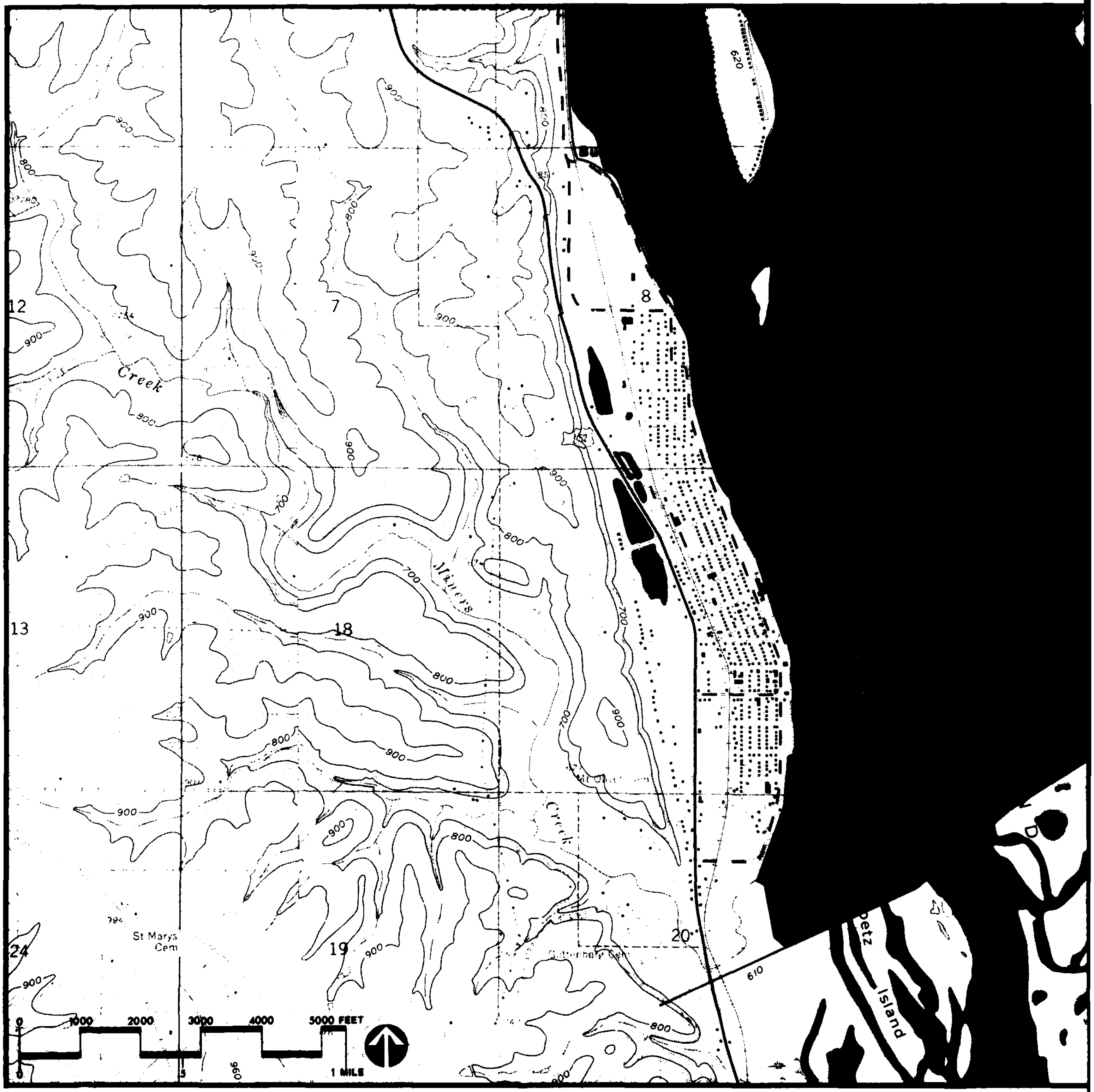
US Army Corps of Engineers

Boundary
Refuge Boundary
Above Ohio River
0 for definitions
ion categories

Drawn by: B.V/RS/K.N.
Checked by: Russell K Snyder
Submitted by:
Approved by: Charles C Watkinson

Land Use Allocation

Pool 10 Mile 616.8-620.5 Plate 65 of 66



Master Plan for Public Use Development and Resource Management
Upper Mississippi River

Legend

CORPS LANDS	FWS LANDS	LAND USE ALLOCATIONS*
		Project Operations
		Recreation / Intensive Use
		Recreation / Low-Density
		Natural Area
		Wildlife Management

State Boundary
FWS Refuge Boundary
+ Mile 726 Miles Above Ohio River

* See text Section 5.0 for definitions of land use allocation categories

Boundary
Refuge Boundary
Above Ohio River
0 for definitions
on categories

US Army Corps of Engineers

Drawn by: B.V/RS./K.N.
Checked by: Russell K Snyder
Submitted by: Ken Hill
Approved by: Charles E. Wakeman

Land Use Allocation

L & D 10 Mile 613-617.0 Plate 66 of 66

GLOSSARY

Bold letters in a definition indicate that term is also defined in this glossary.

activity occasion - A recreation planning term usually defined as a single person undertaking a single recreation activity for all or a reasonable part of a single day. A person may engage in more than one activity during that day and thereby generate more than one activity occasion. For example, a person who fishes during an afternoon accounts for one fishing activity occasion, while a person who goes on a picnic that includes swimming would account for a picnicking activity occasion plus a swimming activity occasion. Activity occasion estimates are used to determine the number/size of facilities that should be provided.

average pool elevation - The mean or average elevation of the **pool** surface above mean sea level. Since water flows downriver, the upper end of a pool will ordinarily be the high point, with the elevation declining toward the lower end.

backwater - A general term for lakes, ponds, sloughs, and other aquatic habitats lying off the main **channel** of a river. Usual backwater characteristics include shallowness, a lack of current, and, in many instances, profuse growth of aquatic vegetation.

carrying capacity - The maximum population size of a given species or group in an area, beyond which no significant increase is possible without damage to the area.

channel - (1) The deeper portion of a body of water, especially the portion used for navigation, which may be dredged to maintain appropriate depths. Also see **9-foot navigation channel**. (2) A streambed or riverbed; a river may form more than one natural channel.

closed areas - Defined areas within the refuge that are closed to specific activities during certain times of the year.

closing dam - A structure, usually of rock and brush, designed to close off side channels, sloughs, and **backwaters** to confine flows to the main river **channel** during low-flow periods. Many were built along the **Upper Mississippi** for the 4½-foot channel.

Code 710 Program - A Federal program that allows minimal public use developments at Federal projects for health and safety (usually in lieu
extensive developments cost-shared by a loca
and the Federal Government).

commercial concessionaire - A commercial
licensed to provide prescribed services for
on Federal lands. This type of license
private-use license.

community - In the biological sense, all of
and animals in an area; a complex **associati**
containing both animals and plants.

community docks - Privately-owned public u
ties on Federal land that are in **limited de**
areas. Such facilities are operated by a gr
a community to provide boat access from Fede
line lands. Details on community docks ma
in the **operational management plan** (to be
later).

Cooperative Agreement (February 14, 1
agreement between the Department of the Arm
Department of the Interior, Bureau of Sport
and Wildlife (now **FWS**), that makes certain C
available for conservation and wildlife m
See also **General Plan Agreement**.

cost-share - In the context of this report
of construction costs for recreational f
between a local government and the Federal G

critical habitat - The environment necess
continued existence of a certain species, us
in reference to **endangered species**.

cultural resources - A generic term used
archeological, historic, and architectural
that have significance in terms of historic
tion.

demand - A recreation planning concept
estimate of the total possible particip
recreational activity (derived from cu
patterns), usually expressed in **activity occ**

DNR - Department of Natural Resources.

District Engineer - The head of an Arm
Engineers District. In the context of t
District Engineer refers to the military co
chief administrator of the **St. Paul Distric**

safety (usually in lieu of more ɔments cost-shared by a local sponsor Government).

essionaire - A commercial interest ide prescribed services for the public s. This type of license is not a **ıse.**

the biological sense, all of the plants ı area; a complex **association** usually animals and plants.

; - Privately-owned public use facili- land that are in **limited development** ilities are operated by a group and/or rovide boat access from Federal shore- ails on community docks may be found **ıal management plan** (to be published

greement (February 14, 1963) - An en the Department of the Army and the e Interior, Bureau of Sport Fisheries w FWS), that makes certain Corps lands onservation and wildlife management. **Plan Agreement.**

the context of this report, division costs for recreational facilities government and the Federal Government.

t - The environment necessary to the nce of a certain species, usually used **endangered species.**

ces - A generic term used to refer to istoric, and architectural resources icance in terms of historic preserva-

eation planning concept that is an total possible participation in a ctivity (derived from current use y expressed in **activity occasions.**

of Natural Resources.

eer - The head of an Army Corps of ict. In the context of this study, refers to the military commander and tor of the St. Paul District.

DO - Dissolved oxygen. A measurement of the amount of free oxygen available in water.

draft - The water depth that a vessel displaces.

drawdown - Lowering the water level of a reservoir or pool by releasing water impounded behind a dam.

dredged material disposal islands - (1) Islands formed by deposits of dredged material (spoil), usually composed of sand; (2) naturally-formed islands used for historic placement of dredged material or under consideration for future disposal; (3) shoreline areas where material has been or will be deposited. Such "islands" often offer various recreational opportunities.

endangered and threatened species - Endangered species are in danger of extinction; threatened species are declining in population and may become endangered. The U.S. Department of Interior and individual States have prepared lists of such species and have granted special legal protection to many of these plants and animals.

EA - Environmental assessment. An analysis of the environmental impacts of a proposed program or project, usually a minor action (see EIS below) with no significant environmental impacts, which does not require an EIS.

EIS - Environmental impact statement. A document that analyzes the impacts of a proposed program or project on the natural, social, economic, and cultural environment. **NEPA** requires an EIS for all major Federal actions with significant impacts upon the human environment.

ER - Engineer Regulation. Regulations issued by the Office of the Chief of Engineers in Washington for the entire Corps of Engineers.

fecal coliforms - Any of several bacilli found in human and animal intestines; the presence of these in water indicates fecal **pollution** (e.g., from sewage, barnyard, or pasture runoff).

fiscal year - The Federal budgetary year; the 12-month period for which the Federal Government plans its budget. Formerly July 1 to June 30, the Federal fiscal year is now October 1 to September 30.

GLOSSARY

floodplain - The portion of a river valley covered during high-water (flood) periods; ordinarily populated (unless it has been developed) by organisms not greatly harmed by short inundations.

General Plan Agreement(s) - Agreements for Federal management of 9-foot channel project lands, which involve the Departments of the Interior and the Army plus the appropriate State agencies. A separate agreement was signed for each State along the Upper Mississippi. The General Plan Agreements include maps that demarcate lands to be managed by each Federal agency, including those co-op lands referenced in the 1963 **Cooperative Agreement** between the Corps of Engineers and the **FWS.**

GREAT/GREAT I - The Great River Environmental Action Team was an interagency team under the leadership of the Fish and Wildlife Service and the Corps of Engineers, organized to identify and assess the problems associated with multi-purpose use of the Upper Mississippi River system and to develop recommendations for improved management. The GREAT I study covered the St. Paul District, Corps of Engineers, portion of the river.

head of navigation - The uppermost point in a waterway to which navigation ordinarily extends. On the Upper Mississippi, the head of navigation is in Minneapolis, Minnesota (**river mile** 857.6).

land use allocation plan - A plan that presents specific recommendations for the interim and ultimate uses to which all land and adjacent water areas will be dedicated, limits on the densities and locations of development and use, desired relationship of developments to natural and/or scenic protection zones, and a balanced integration of appropriate uses of all project resources in the public interest.

LAWCON - Land and Water Conservation Fund Act of 1965 (**Public Law** 88-578). This act provides funds for planning agencies to meet recreation needs.

lease - A written document that transfers certain rights of use and occupancy of land and/or structures from the owner to another person or entity for a specified period of time in return for a specified rent payment.

Level B studies - Cooperative efforts be that lead to policy documents. Such st critical water and related land resource require solutions within 15 to 25 years.

license - A written document that provi permission granted and the associated responsibilities, and liabilities imp license holder for specified use(s) of Also see **private-use license** and **permits/license.**

limited development area - A designate administered lands where **community dock** facilities may be permitted.

lockage - The movement of watercraft fro pool to another level through a **lock.** lockage refers to the movement of recreational watercraft through a lock.

lock/lock(s) and dam - On the **Upper Miss** Corps of Engineers lock and dam complex navigation. The dam holds back and r water to form a flat-water pool; the lo raises or lowers river traffic from another and allows it to go past the obs by the dam.

LUAP - Land use allocation plan.

main channel border - The zone of the r the **9-foot navigation channel** and the m islands, or submerged definitions for th poundment) main river **channel.** Often cha very productive biologically, although li on this zone is available. Most rive (**riprap, wing dams,** and some **closing da** main channel border zone.

maintenance - Actions necessary to keep operating condition. On the **Upper** **dredging** is the primary Corps of Enginee activity.

massasauga - A brown and white, ve rattlesnake.

master plan - A report that describes all project lands, waters, forests

Cooperative efforts between agencies
y documents. Such studies focus on
related land resource problems that
within 15 to 25 years.

n document that provides evidence of
d and the associated obligations,
and liabilities imposed upon the
r specified use(s) of the property.
e-use license and **special-use**

ent area - A designated area of Corps
where **community dock** privileges or
permitted.

ment of watercraft from one level or
vel through a **lock**. A recreational
o the movement of one or more
craft through a lock.

m - On the **Upper Mississippi River**,
lock and dam complexes facilitate
dam holds back and regulates the
at-water pool; the lock (or locks)
river traffic from one level to
it to go past the obstacle created

location plan.

er - The zone of the river between
ion channel and the main riverbank,
ged definitions for the old (preim-
er channel. Often characterized as
logically, although little research
vailable. Most river structures
, and some **closing dams**) are in the
r zone.

ions necessary to keep a project in
on. On the **Upper Mississippi**,
imary Corps of Engineers maintenance

brown and white, venomous swamp

eport that describes in detail how
ds, waters, forests, and other
resources will be conserved, enhanced, developed, managed, and used in the public interest throughout the life of the project.

Memorandum of Agreement (April 18, 1963) - An agreement between the Corps and the U.S. Coast Guard clarifying jurisdiction and responsibilities to regulate certain activities in navigable waters.

Memorandum of Understanding (October 17, 1980) - This memorandum documents the joint decision of the Fish and Wildlife Service and the Corps to place a moratorium on granting **special-use permits** and licenses for new private recreational structures or associated actions within the **Upper Mississippi National Wildlife and Fish Refuge.**

mile - **River mile.**

mounds (conical, linear, effigy) - An elevation of earth constructed to contain or be placed over a grave. Burial mounds along the Mississippi River date to the Woodland Period (1000 BC - AD 1600). The later effigy mounds were constructed in the shapes of animals and humans.

National Register of Historic Places - A listing of districts, sites, buildings, structures, and objects significant in American history, architecture, archeology, and culture. This list is maintained by the National Park Service under authority of the National Historic Preservation Act of 1966.

natural area - An area officially recognized for its unique geologic, scenic, scientific, or natural features. An area in a condition as nearly natural as possible, which exemplifies typical or unique vegetation and associated biotic, geologic, and aquatic features. Such areas are maintained in the natural condition by allowing physical and biological processes to operate, usually without direct human intervention.

natural landmark - An officially recognized significant and/or unique physical and/or biological unit (e.g., an area, rock formation, forest) that illustrates or interprets the natural heritage of our Nation.

GLOSSARY

need - A recreation planning term used to express the result of comparing **demand** to **supply**. Generally, need is expressed in terms of facilities required to accommodate the total possible participation, minus the existing supply, hence the equation, "demand minus supply equals need." Need can also be derived by using accepted standards such as a certain number of tennis courts for a given level of population.

nine-foot navigation channel - The widened and deepened **channel** of the Upper Mississippi River created and maintained by the Corps of Engineers to a 9-foot depth, usually with several extra feet of overdepth dredging for economy. The **lock and dam** system and **maintenance** dredging are integral parts of this project.

normal flat pool - The flatwater area formed under normal flow conditions at normal operating water levels.

North Central Division - The Corps of Engineers Division, based in Chicago, that coordinates and oversees the work of the **St. Paul** (see below), Rock Island, Detroit, Buffalo, and Chicago Districts.

operational management plan - A detailed plan for operations of Federal lands (printed separately from the master plan). This plan contains information on shoreline/lakeshore management, fish and wildlife management, fire protection, safety, forest management, and park management.

PCB - Polychlorinated biphenyls. A toxic, highly dangerous substance formerly used widely as a transformer fluid and similar uses because of its extreme resistance to decomposition.

plan of development - The guidelines to be followed when providing the facilities called for in a **master plan**. Part III of this master plan will be the plan of development.

pool - The flat-water area impounded by a dam to facilitate navigation. On the Upper Mississippi, each pool takes its number or name from the **lock and dam** that forms it (i.e., pool 1 is impounded behind locks and dam 1).

primitive camping - Informal tent (c
camping that does not use developed facil
camping activity is encouraged on lands
low-density recreation areas and is not r
lands allocated as wildlife management ar

public law - An Act of Congress that cr
applicable throughout the United States.
(e.g., Public Law 91-190) refers to the
Congress (91st Session) and the specific
190) passed during that session.

public use - The use of an area by the ge
such as occurs in parks. The opposite
exclusive use, which restricts use of an a
persons.

recreation day - A unit for measuring us
Because people often engage in more thar
ational activity during a park visit, th
activity occasions generated is divided by
number of different activities engaged
recreation days. The number of recreat
closer to the actual number of people v
area than is the number of activity occas

refuge - An area established as a wildlif
sanctuary, usually administered by the **FW**
agency.

river mile - **Upper Mississippi River mil**
the distance (following the main river **ch**
the mouth of the Ohio River. Miles of
River tributaries refer to the distanc
confluence with the Mississippi.

RM - **River mile**

RRMS - Recreation Resource Monitoring
system designed to collect and analyze an
tion facilities and recreation resource
information for each Corps project wit
visitation of 5,000 **recreation days** or mo

private-exclusive use - Also referred t
use, private special use, or special use.
an area by a limited group rather than
public.

mping - Informal tent (or tentless) ›es not use developed facilities. Such ty is encouraged on lands allocated as :reation areas and is not restricted on as wildlife management areas.

An Act of Congress that creates a law ughout the United States. The number -aw 91-190) refers to the session of Session) and the specific act (number ·ing that session.

he use of an area by the general public, in parks. The opposite is **private-** which restricts use of an area to a few

- A unit for measuring use of an area. often engage in more than one recre- ty during a park visit, the number of **ons** generated is divided by the average erent activities engaged in to yield s. The number of recreation days is actual number of people visiting the e number of activity occasions.

a established as a wildlife and/or fish lly administered by the **FWS** or a State

per Mississippi River miles refer to llowing the main river **channel**) above he Ohio River. Miles of Mississippi ies refer to the distance above the the Mississippi.

e

ion Resource Monitoring System. A to collect and analyze annual recrea- and recreation resource management each Corps project with an annual 000 **recreation days** or more.

ve use - Also referred to as private cial use, or special use. The use of nited group rather than the general

St. Paul District - The Corps of Engineers District which includes the **Upper Mississippi River** down to lock and dam 10, near Guttenberg, Iowa. It includes parts of Minnesota, Wisconsin, Iowa, North Dakota, and South Dakota; and it has regulatory (permit-issuing) authority for all of Minnesota and Wisconsin. This District is part of the **North Central Division.**

scientific area - An area formally designated for preservation, legal protection, and management for the values inherent in its natural or undisturbed condition because its features offer unique opportunities for scientific study; such areas are generally not intended for a broad range of recreational use but rather for scientific study and educational uses.

shoreline management plan - Also known as the lakeshore management plan, this document will be a detailed appendix to the **master plan.** This appendix will be part of the **operational management plan.** This appendix will identify limited development areas and provide details of how private uses of Federal lands will be administered.

slip - A docking place for a boat, particularly one near a pier or dock.

special-use permits (Department of the Interior) and/or **special-use license** (Department of the Army - Authorization of a structure/structures or specified act/acts on Government land, with no property rights in real estate or any other exclusive privileges.

supply - An actual count of the recreation facilities and/or recreation areas available to the public. Usually expressed in an actual count, such as the number of launching ramps, or in the number of **activity occasions** of **demand** that it can satisfy. For example, assuming a group size of four persons and two groups using a table during a day, a picnic table would supply eight activity occasions daily.

suspended solids - Solid (particulate material) held in suspension in water, usually caused by turbulance or a disturbance such as dredging; capable of settling out when the cause ceases. Also see **turbidity.**

GLOSSARY

Title 36 authority - Synonymous with Title 36 regulations. The rules and regulations governing public use of water resource development projects administered by the Corps of Engineers.

turbidity - A condition of water resulting from suspended matter and affecting its ability to allow light to pass through. Water is turbid when its load of suspended material is conspicuous, causing a muddy or cloudy appearance. Also see **suspended solids.**

UMR - Upper Mississippi River.

UMRBC - Upper Mississippi River Basin Commission.

Upper Mississippi River - The portion of the Mississippi above the mouth of the Ohio River.

Upper Mississippi National Wildlife and Fish Refuge - This **refuge** comprises over 195,000 acres managed by the **FWS** for the conservation, maintenance, and management of wildlife resources and fish within and adjacent to the navigation pools of the Upper Mississippi.

user - Anyone who engages in a recreational activity.

visitation - The total use of an area. For example, an increase in visitation means that total use of the area has increased.

visually sensitive - The sensitivity of a resource to accommodate visual changes. A highly visually-sensitive resource is one in which relatively small changes in management practices or visual intrusions can have significant effects. Conversely, a resource with a low visual sensitivity can accommodate a number of small changes or a large change before there are any significant visual effects.

water-contact activities and sports - Activities in which people are likely to contact water: e.g., swimming, wading, waterskiing. This category excludes activities where water contact is unintentional, accidental, or uncommon: e.g., boating, fishing. Sometimes called body-contact sports.

Wild and Scenic Rivers - River rivers) that can be characterized within an undeveloped/unintru containing outstanding natural amenities. Such rivers may be pr generations by inclusion in the Scenic Rivers System (established b and Public Law 90-542). Some Sta and Scenic River designations tha rivers.

wing dam - Low rock and brus structures extending out from shore varying distances to constrict low main **channel.**

Rivers - Rivers (or portions of
be characterized as free-flowing,
eloped/unintruded corridor, and
anding natural and/or cultural
rivers may be protected for future
nclusion in the National Wild and
em (established by Public Law 88-29
-542). Some States also have Wild
designations that protect certain

rock and brush (often willow)
ng out from shore into the river for
to constrict low water flows to the

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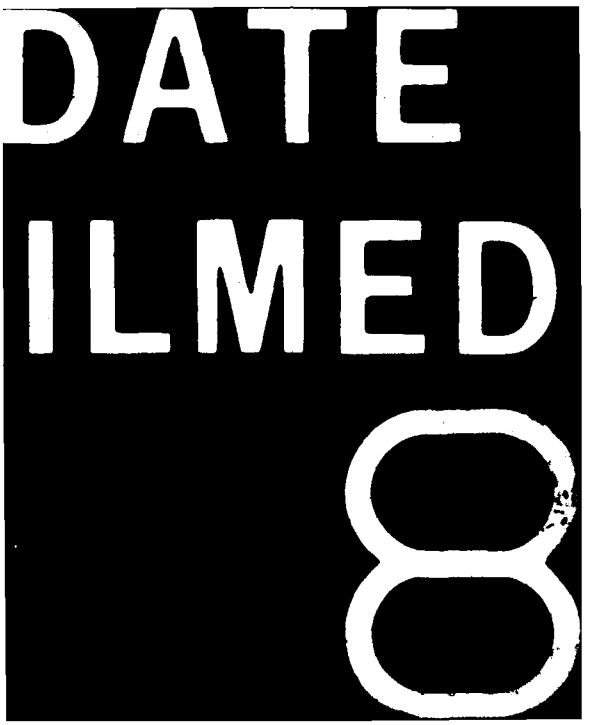
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