

# **Rend Lake Master Plan**

**Big Muddy River, Illinois**

**Design Memorandum No. 6B**



**US Army Corps  
of Engineers** ®  
St Louis District

Original 1965  
Revised 1976  
Updated 1983, 1993 and 2009

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# **THE MASTER PLAN**

REND LAKE, ILLINOIS

DESIGN MEMORANDUM NO. 6B  
(PREPARED 1965, REVISED 1976, UPDATED 1983, 1993, AND  
2009)

Prepared by

U. S. Army Engineer District, St. Louis  
1222 Spruce St.  
St. Louis, Missouri 63101-2833

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## PREFACE

The original Master Plan for Rend Lake was approved in January of 1966 and served as a guide for the orderly and coordinated development and management of all lands and water resources of the project. It presented data on the type of development considered necessary initially and an estimate of future requirements. This Updated Master Plan presents an inventory and assessment of land and water resources and physical improvements, an analysis of resource use, anticipated influences on project operation and management, and an evaluation of existing and future needs required to protect and enhance the values of the resource base.

## Previously Issued Design Memoranda

Memorandum No.	<u>Title</u>	<u>Date Submitted</u>
1	Hydrology and Hydraulic Analysis	30 Nov 62
2	General Design Memorandum	2 Jul 63
2A	Availability of Construction Materials	8 Apr 64
3	Real Estate Subimpoundment Areas	12 Jun 64
6A	Preliminary Master Plan	1 Jul 64
3A	Real Estate - Reservoir	16 Dec 64
6B	The Master Plan	27 Aug 65
5A	Administration Building	15 Sep 65
5B	Main Dam and Spillway	19 Nov 65
4A	Relocations - Railroads	4 Feb 66
7	Low Flow Regulation	30 Jun 67
4B	Relocations - Cemeteries	3 May 67
9	Maintenance Facilities	20 Jun 68
10	Relocations – Water Lines	24 Aug 70
11	Improved Access to Public Use Areas (Re-designated as Supplement No. 6 to DM 6B)	4 Oct 74

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## Section I

### Introduction

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**MASTER PLAN**  
**DESIGN MEMORANDUM NO. 6B**  
**(UPDATED 2009)**

**REND LAKE, ILLINOIS**

**SECTION I – INTRODUCTION**

**1.01. AUTHORIZATION**

Rend Lake on the Big Muddy River, Illinois, was authorized by the Flood Control Act of 23 October 1962, Public Law 87-874, 87th Congress, HR No. 13273, in accordance with the Chief of Engineers' recommendation, contained in House Document No. 541, 87th Congress, Second Session.

Federal laws provide that land and water areas of Department of the Army lakes, constructed for the primary purposes of flood control, navigation, and/or power, shall be administered to encourage and develop collateral use, such as recreation, conservation of fish and wildlife resources, and other purposes in the public interest.

This report has been prepared with guidance contained in the following regulations.

A. ER 1165-2-400, Water Resource Policies and Authorities, Recreational Planning, Development, and Management Policies (1985).

B. ER 1110-2-400, Engineering and Design, Design of Recreation Sites, Areas and Facilities (1988).

C. EM 1110-2-400, Engineering and Design, Recreation Facility and Customer Services Standards (2004).

D. ER 1130-2-540, Project Operations, Environmental Stewardship Operations and Maintenance Policies (1996).

E. ER 1130-2-550, Project Operations, Recreation Operations and Maintenance Policies, (1996).

## ***Rend Lake Master Plan***

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### **1.02. PROJECT PURPOSES**

The authorized purposes of the project include flood control on the Big Muddy and Mississippi Rivers, water supply, water quality control, fish and wildlife conservation, recreation, and area redevelopment.

### **1.03. PURPOSE OF THE MASTER PLAN**

The original Master Plan served as a guide for the orderly and coordinated resource development and management of all land and water areas of the project. Presented in the original document were data on the scope of development considered adequate for initial public use and an estimate of future requirements. This Updated Master Plan presents an inventory and assessment of the land and water resources and related physical improvements, an analysis of resource use, and an evaluation of existing and future needs required to protect and improve the values of the resource base.

### **1.04. PRIOR PERTINENT DESIGN MEMORANDA**

A. The preliminary Master Plan was approved on 1 July 1964 and provided a plan of proposed developments on public lands and detailed cost estimates.

B. The original Master Plan was approved in January 1966 and was revised in 1976. In that time, there were a total of two letter reports and seven supplements submitted requesting changes or additions to the original document. The following paragraphs present a chronological listing of letter reports and supplements submitted subsequent to the original Master Plan.

1. Letter, LMSED-BR, this office, 12 October 1967, subject: Request for Change in Land Use - Rend Lake Reservoir, Illinois. This letter requested a change in land use for all or portions of four tracts located within areas designated for public access. The change was necessitated by a need for more land by the Rend Lake Conservancy District. The land was to be used for the Intercity Water Transmission System Treatment Plant, and the administrative complex for the Conservancy District. Letter was approved by ENG CW-OM, 2<sup>nd</sup> Endorsement, 30 October 1967.

2. Letter, LMSED-BR, this office, 23 January 1968, subject: Request for Change in Land Use - Rend Lake Reservoir, Illinois. A small tract adjacent to the location of the Intercity Water Treatment complex was required by the Conservancy District as the site for their administration building. Letter was approved by ENG CW-PV, 2<sup>nd</sup> Endorsement, 16 February 1968.

3. Supplement No. 1, 23 January 1970, proposed the excavation, shaping, and protection of nine selected boat harbor sites. The work was required to ensure adequate and safe mooring and maneuvering areas for commercial concession operations. Although many of these harbor sites were not to be utilized for several years, the cost savings of performing the necessary work in a dry condition (before lake impoundment) justified the inclusion of all nine in the proposal. Supplement was approved, subject to several comments, by 2<sup>nd</sup> Endorsement, ENGCW-PV, 26 February 1970.

4. Supplement No. 2, 15 September 1971, proposed the installation of certain facilities at the commercial concession site in the West Recreation Area. The facilities proposed were of a non-revenue producing nature, and were needed to attract a concession operator capable of developing a first-rate commercial marina operation. Supplement was approved by 2<sup>nd</sup> Endorsement, DAEN-CWP-V, 28 January 1972.

5. Supplement No. 3, 1 August 1972, proposed installation of basic non-revenue producing facilities at the commercial concession site located in the Jackie Branch Recreation Area. Supplement was approved by 2<sup>nd</sup> Endorsement, DAEN-CWP-V, 24 October 1972.

6. Supplement No. 4, 15 August 1973, proposed construction of some miscellaneous facilities, upgrading of sanitary facilities, and modification of some existing facilities at the South Sandusky and the North Sandusky recreation areas. The work was to be funded from expected savings on several contracts which were underway or to be awarded. Major improvements included: Fifty additional campsites, conversion of three picnic shelters to group use, construction of two washhouses, a sewage treatment system and distribution lines, and electric services to 250 campsites. Supplement was approved by 1<sup>st</sup> Endorsement, LMVPD-R, 7 September 1973.

7. Supplement No. 5, 24 January 1974, proposed a change in land use for approximately 90 acres of unzoned project land located near the City of Ina at the northeastern shore of the lake. The requested classification was "Recreation - Intensive Use." In addition, it was requested that provisions for a commercial concession site include some boat harbor excavation work. The Corps' participation was limited to providing a portion of the cost of excavating the harbor. Supplement was approved by DAEN-CWP-V, 2<sup>nd</sup> Endorsement, 26 March 1974.

8. Supplement No. 6, 4 October 1974, proposed improving certain access roadways for the North and South Sandusky, and the North Marcum recreation areas, and the Casey Fork Wildlife Management Area. Existing county roadways were considered inadequate and unsafe for recreation traffic. Franklin and Jefferson Counties agreed to furnish all rights-of-way, relocate utilities as necessary, establish turf, remove

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and replace culverts, apply striping and maintain the roads after construction.

Supplement was approved by DAEN-CWP-V, 2<sup>nd</sup> Endorsement, 4 April 1975.

Subsequent to Supplement No. 6, Supplement No. 1, Real Estate Memorandum No. 3A was submitted 9 June 1975 in order to gain authority to acquire lands necessary for the access road improvement proposed in Supplement No. 6. This proposed acquisition has not been approved on the basis of Public Law 90-643, Section 115 which empowers the Federal Department of Transportation to build such access roads.

9. Supplement No. 7, 31 March 1976, proposed the development of a visitor center in the Spillway Recreation Area and the provision of campsite electrical units in the South Marcum Recreation Area. This supplement was submitted to LMVPD-R for review and approval. Supplement was approved by LMVPD-R on 5 January 1977.

C. The revised Master Plan that was approved in 1976 accumulated three supplements requesting changes to the document. The following is a brief summary of the three approved supplements:

1. Supplement No. 1, 6 April 1983, provided an update of all obsolete material in the main text and revised the site plan drawings to reflect the current as-built condition. This supplement was approved by LMVPD-R in a 1<sup>st</sup> Endorsement, 22 July 1983, subject to comments. Areas of concern included: efforts being made to increase operating efficiency of the project, consideration of sustained yield forest management, revision of Section 16, coordination with District elements during the master planning process.

2. Supplement No. 2, 29 June 1988, proposed modification of three comfort stations in the Sandusky Creek Area to provide shower facilities; construction of a new shower building and pressure sewer system in the South Marcum Recreation Area; converting Sleepy Hollow Youth Area comfort station at South Marcum to waterborne and construction of an adjoining shower addition. Supplement was approved by LMV-PD-R, 3<sup>rd</sup> Endorsement, 9 September 1988.

3. Supplement No. 3, 15 June 1992, proposed the restoration of high-quality wetland habitat in the Atchison Creek area of Rend Lake with placement of an earthen dike and water control structure. Supplement was approved by LMV-PD-R, 1<sup>st</sup> Endorsement, 28 July 1992.

D. The revised Master Plan that was approved in 1993 has accumulated four supplements requesting changes to the document. The following is a brief summary of the four approved supplements:

1. Supplement No. 1, 28 October 1994, proposed the restoration of high-quality wetland habitat in the Big Muddy River Floodplain near the Rend City area of Rend Lake with the placement of earthen dikes and water control structures. Supplement was approved by CELMV-PE-R, 3<sup>rd</sup> Endorsement, 16 May 1995.

2. Supplement No. 2, 21 February 1995, proposed the connection of the North Marcum sewer line to the Rend Lake Conservancy District (RLCD) sewer line which was installed on adjacent private land. Supplement was approved by CELMV-PE-R, 3<sup>rd</sup> Endorsement, 25 August 1995.

3. Supplement No. 3, 22 February 1999, proposed the construction of a 23 mile bicycle trail around Rend Lake, with 13.5 mile located on Corps property. Supplement was approved by CEMVS-PM-E, 1<sup>st</sup> Endorsement, 22 February 1999.

4. Supplement No. 4, 27 February 2000, proposed the sanitary facilities, fee booths, and the addition of 37 sewer and water hookups in several recreation areas. Supplement was approved by CEMVS-PM-N, 1<sup>st</sup> Endorsement, 29 September 2000.

## **1.05. APPLICABLE PUBLIC LAWS**

Development and management of Federal reservoirs for various purposes is provided under several statutes. These laws cover development of recreation facilities, licensing of project lands for fish and wildlife purposes, protection of natural resources, and leasing of project lands for incidental uses other than recreation.

A. Recreation. Development and management of recreation facilities at Department of Army constructed reservoirs by the Corps of Engineers, by other governmental agencies, local groups, or individuals is authorized under the following public laws:

1. The **Flood Control Act of 1944** (PL 78-534) was approved 22 December 1944

*Section 4* authorized the Corps, under the supervision of the Secretary of the Army, to construct, maintain, and operate public park and recreational facilities at water resources development projects (16 U.S.C. 460(d)). Local interests are also permitted to construct, operate, and maintain such facilities with permission from the Secretary of the Army. Water areas of all such projects are required to be open to public use generally, for boating, swimming, bathing, fishing, and other recreational purposes, and ready access to and exit from such water areas along the shores of such reservoirs are required to be maintained for general public use, when such use is not found to be contrary to the public interest. The lease of public lands and structures at water projects

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was also authorized. Recreational uses must be consistent with State laws for the protection of fish and game. All persons designated by the Chief of Engineers for enforcement were given the authority to issue a citation for violation of the regulations adopted by the Secretary of the Army. Amendments to this Act extend the development of recreation to non-reservoir projects.

2. The **Rivers and Harbors Act** (PL 79-14) was approved 2 March 1945.

This act specified the rights and interests of the states in watershed development and water utilization and control. It also specified the requirements for cooperation with state agencies in planning for flood control and navigation improvements.

3. The **Flood Control Act of 1946** (PL 79-526) was approved 24 July 1946.

*Section 4* amended PL 78-534 to include authority to grant leases of lands in reservoir areas and licensing of lands to federal, state, and local government agencies when in the public interest (60 Stat. 641).

4. The **Flood Control Act of 1954** (PL 83-780) was approved 2 September 1954.

*Section 209* amended the Flood Control Act of 1944. It authorized the Secretary to grant leases to federal, state, or local government agencies without monetary consideration for use and occupation of land and water areas under the jurisdiction of the Department of the Army for park and recreation purposes when in the public interest (69 Stat 1256).

5. The **Flood Control Act of 1962** (PL 87-874) was approved 23 October 1962.

*Section 203* authorized Rend Lake in accordance with the recommendations of the Chief of Engineers in House Document # 541, 87<sup>th</sup> Congress.

6. The **Rivers and Harbors Act of 1963** (PL 88-96) was approved 15 August 1963.

This act amended the Flood Control Act of 1962. The modifications allowed the local contribution to the construction of Rend Lake to be fulfilled in means other than dollars. Instead of coming up with the twenty percent of the total cost of construction, the

local share could come in the form of any kind of contribution. Most of the local contribution for the construction of Rend Lake came in the form of land.

7. The **Land and Water Conservation Fund Act of 1965** was approved 1 September 1964.

This act, amended by PL 94-422, established a fund from which Congress can make appropriations for outdoor recreation. This fund derives revenue from entrance and user fees, sale of surplus federal property, and the federal motorboat fuel tax. It provides the provisions by which the Corps may charge for admission and use of its recreation areas under prescribed conditions (78 Stat. 897).

8. The **Federal Water Project Recreation Act of 1965** (PL 89-72) was approved 9 July 1965.

This act established recreation at federal water resource projects as a full project purpose. This act requires consideration of recreation opportunities and of fish and wildlife enhancement in planning water resources projects

*Section 9* contains cost sharing provisions for acquisition of lands and development of recreation facilities for water resources projects authorized after 1965. It also limited the maximum allocation for recreation and fish and wildlife enhancement to 50% of the total project cost. This act further required beneficiaries to bear part of the costs of operating and maintaining recreation developments at federal resources projects. In addition it also provides for cost sharing the development of new areas that were not a part of initial project construction (79 Stat. 231).

9. The **Architectural Barriers Act 1968** (PL 90-480)

This act requires access to facilities designed, built, altered, or leased with Federal funds. This act marks one of the first efforts to ensure access to the built environment.

10. **EO 11644 Use of Off-Road Vehicles on the Public Lands** was approved 8 February 1972.

This Executive Order required the establishment of policies and provides for procedures to ensure that the use of off-road vehicles on public lands is controlled and directed so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various uses of those lands.

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11. The **Rehabilitation Act of 1973** (PL 93-112) was approved 26 September 1973.

This act amended PL 90-480, Architectural Barriers Act of 1968, and created the Architectural and Transportation Barriers Compliance Board which ensures compliance with accessibility standards created pursuant to the Architectural Barriers Act of 1968 and examines alternative approaches to overcoming barriers to accessibility. This act was amended in 1974 (PL 93-516)

12. The **Water Resource Development Act of 1976** (PL 94-587) was approved 22 October 1976.

*Section 120* authorized the Corps of Engineers to enter into contracts with states and their political subdivisions for the purpose of obtaining increased law enforcement at water resources development projects to meet needs during peak visitation periods.

13. The **Rehabilitation, Comprehensive Services, and Developmental Disabilities Amendments of 1978** (PL 95-602) was approved 6 November 1978.

This act amended the Rehabilitation Act of 1973, providing more directives regarding universal accessibility for persons with disabilities.

14. The **Water Resource Development Act of 1986** (PL 99-662) was approved 17 November 1986.

*Section 103* required that non-federal interests for projects with costs assigned to recreation pay 50% of separable costs for any project. This requirement applies to any portion of a project that produces hydrologic effects or physical or economic benefits which are separately identifiable from those produced by other portions of the project. In addition, non-federal interest must provide for all lands, easements, rights of way, relocations, and dredged material rights of way.

15. The **Americans with Disabilities Act of 1990** (PL 101-336) was approved 26 July 1990.

This act amended the Rehabilitation Act of 1973, providing more directives regarding universal accessibility for persons with disabilities.

16. The **Water Resources Development Act of 1992** (PL 102-580) was approved 31 October 1992.

*Section 203* authorized the Secretary of the Army to accept contributions of cash, funds, materials, and services from persons including governmental entities, but excluding the project sponsor, in connection with carrying out a water resources project for environmental protection and restoration or recreation.

*Section 225* authorized the Challenge Cost Sharing Program which permits the Secretary to develop and implement a program to accept contributions of funds, materials, and services from non-federal public and private entities to be used in managing recreation facilities and natural resources.

17. The **Omnibus Budget Reconciliation Act** (PL 103-66) was approved 10 August 1993.

*Section 5001 – RECREATIONAL USER FEES* modified 16 U.S.C 460d-3 to permit the Corps of Engineers to establish and collect fees for the use of swimming beaches and boat launching ramps meeting certain criteria.

18. The **Water Resources Development Act of 1996** (PL 104-303) was approved 12 October 1996.

*Section 208 – RECREATION POLICY AND USER FEES* directed the Secretary to put increased emphasis on recreation opportunities at Corps projects and specifies that recreation fees collected at Corps projects remain for use at the project where they are collected.

*Section 519 – RECREATION PARTNERSHIP INITIATIVE* directed that, in general, the Secretary is to promote federal, non-federal, and private sector cooperation in creating public recreation opportunities at Corps projects.

19. The **Water Resources Development Act of 2000** (PL 106-541) was approved 11 December 2000.

*Section 206* authorized the Secretary of the Army to participate in the NRRS on an interagency basis.

B. **Environmental Stewardship**. The Environmental Stewardship aspects of resource development were authorized under the following public laws:

1. The **Fish and Wildlife Coordination Act (FWCA) of 1946**.

The *FWCA 1946 (PL 79-732)*, *Section 3* amended the Fish and Wildlife Coordination Act of 1934 and provided for the use of water resources projects for

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conservation, maintenance, and management of wildlife resources and wildlife habitat, to be administered by state agencies or the Secretary of the Interior.

The *FWCA of 1958 (PL 85-624)* amended the Fish and Wildlife Coordination Act and required 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 USFWS. General Plans (Land Use Maps) and Cooperative Agreements are the instruments used to establish a structured arrangement between the USFWS and Corps, and the USFWS and the states, for managing public lands.

2. The **Reservoir Area – Forest Cover Act (Forest Conservation Act)** (PL 86-717) was approved 6 September 1960.

This act declared the policy of the United States that areas owned in fee and under the jurisdiction of the Secretary of the Army and the Chief of Engineers provide for the protection and development of forest and other vegetative cover and the establishment and maintenance of other conservation measures (74 Stat. 817). The basic Corps environmental stewardship mission is carried out by identifying and implementing management practices that ensure the conservation, preservation, and protection of resources for present and future generations. The Corps will continue to promote the establishment, maintenance, and protection of vegetative cover, to include forest cover, grasses, and other herbaceous communities, in order to sustain the potential for forest production, to sustain wildlife populations, and to provide for basic erosion control during the life of the project. Corps natural resource management strategies are identified in this Project Master Plan and are further detailed and specifically explained and scheduled in the Project Operational Management Plan.

3. The **Federal Water Pollution Control Act Amendments of 1961** was approved 20 July 1961.

This act provided for a more effective program of water pollution control. Amended by PL 91-500 in 18 October 1972, Section 404 regulates the placement of dredged or fill material into jurisdictional waters.

4. The **National Environmental Policy Act (NEPA) of 1969** (PL 91-190) was approved 1 January 1970.

This act declared a national environmental policy for protection and enhancement of the environment and established a Council on Environmental Quality (CEQ). It requires that in planning and decision making, all federal agencies use, to the fullest extent possible, a systematic, interdisciplinary approach which integrates natural and social sciences and environmental design arts. NEPA set forth the requirement for an environmental impact statement on any major federal action significantly affecting the quality of the human environment.

5. The **Endangered Species Act (ESA) of 1973** (PL 93-205) was approved 28 December 1973 and amended by PL 95-632 on 10 November 1978 and by PL 97-304 on 13 October, 1982 (87 STAT. 884)

The ESA, as amended, stated the policy of Congress that all federal departments and agencies must seek to conserve endangered and threatened species.

*Section 7(a)(1)* stated that all federal agencies shall, in consultation with and with the assistance of the USFWS, utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered species and threatened species.

*Section 7(a)(2)* required each federal agency to consult with the Secretary of the Interior to ensure that authorized actions neither jeopardize the continued existence of any endangered or threatened species nor result in adverse modification of critical habitat. Unless previously complete and included in the project environmental impact statement, a biological assessment must identify any endangered species that, in the opinion of the USFWS, 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. The 1982 amendment made the act a more effective and efficient tool for the conservation of the species affected.

6. The **Water Resources Development Act of 1974** (PL 93-251) was approved 7 March 1974.

This act provided for 25% - 75% cost-sharing between federal, state, and local governments to enhance fish and wildlife on project lands.

7. The **Clean Water Act of 1977** (PL 95-217) was approved 27 December 1977.

This act amended the Federal Water Pollution Control Act and extends the appropriations authorization.

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8. The **Fish and Wildlife Conservation Act of 1980** (PL 96-366) was approved 16 September 1980.

This act provided funds to states to conduct inventories and conservation plans for the conservation of non-game wildlife. It also encouraged federal departments and agencies to use their statutory and administrative authority to conserve and promote conservation in accordance with this act.

9. The **Water Resource Development Act of 1986** (PL 99-662) was approved 17 October 1986.

*Section 1135* authorized the review of existing water resources projects to determine the need for modifications in the structures and operations of projects constructed prior to the authorization of this Act for the purpose of improving the quality of the environment in the public interest. This act initially authorized a two year demonstration program for the purposes of making such modifications, in the structures and operations of water resources projects which are feasible and consistent with the authorized project purposes, and will improve the environment. A non-Federal cost share of 25% the cost was specified along with a maximum project cost (33 U.S.C. 2294).

10. The **Water Resource Development Act of 1990** (PL 101-640) was approved 28 November 1990.

*Section 304* amended section 1135 of the Water Resources Development Act of 1986 (PL 99-662) to make it a continuing program (33 U.S.C. 2294).

*Section 306* stated that environmental protection was one of the primary considerations of the Corps in the planning, design, construction, operation, and maintenance of water resource projects.

*Section 307* established, as part of the Corps water resources development program, an interim goal of no overall net loss of the Nation's remaining wetland base, as defined by acreage and function, and a long-term goal to increase the quality and quantity of the Nation's wetlands as defined by acreage and function. This section directs the Secretary to utilize all appropriate authorities, including those to restore and create wetlands, in meeting the interim and long-term goals (33 U.S.C. 2317).

11. The **Water Resource Development Act of 1992** (PL 102-580) was approved 31 October 1992.

*Section 203 - Voluntary Contributions for Environmental and Recreation Projects* authorized the Secretary, in carrying out water resource projects for

environmental protection and restoration, or a water resources project for recreation, to accept contributions of cash funds, materials, and services from persons, including governmental entities, but excluding the project sponsor. Under the authority of this section, the Corps may accept and use contributions (cash, funds, materials, and services) to provide for operation and/or maintenance of recreation areas and the protection and restoration of natural resources at water resource development projects (33 U.S.C. 2325).

*Section 225 - Challenge Cost-Sharing Program for the Management of Recreation Facilities* authorized the Secretary of Army to develop and implement a program to accept contributions of funds, materials, and services from non-Federal public and private entities to be utilized in operating and managing recreation facilities and natural resources. The Corps is authorized to enter into cooperative agreements with non-Federal public and private entities to provide for operation and/or management and development of recreation facilities and natural resources where such facilities and resources are being maintained at complete Federal expense. The Corps' new Challenge Cost-Sharing Program provides many opportunities for non-federal public and private groups and individuals to contribute to and participate in the operation and/or management of recreation facilities and natural resources at Corps water resource development projects (33 U.S.C. 2328).

12. **EO 12962 Recreational Fisheries** was approved 7 June 1996.

This Executive Order directed federal agencies to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by means of a number of duties. In addition, it established a National Recreational Fisheries Council (NRFC) consisting of seven members, including one designated by the Secretary of Defense. The NRFC was charged with developing a comprehensive Recreational Fishery Resources Conservation Plan. This EO also directed all federal agencies to identify and minimize conflicts between recreational fisheries and requirements put forth by the Endangered Species Act of 1973 and expanded the role of the Sport Fishing and Boating Partnership Council.

13. The **Water Resources Development Act of 1996** (PL 104-303) was approved 12 October 1996.

*Section 210 – Cost Sharing for Environmental Projects* amended Section 103 of WRDA 1986 by specifying that the non-federal share of environmental restoration and protection projects shall be 35%.

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14. **EO 13112 Invasive Species** was approved 3 February 1999.

This Executive Order established the National Invasive Species Council, consisting of federal land management agencies, to provide national leadership regarding invasive species. The EO also authorized federal agencies whose actions may affect the status of invasive species to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that they cause.

C. **Other Uses.**

1. The **Area Redevelopment Act** (PL 87-27) was approved 1 May 1961.

This act created the Area Redevelopment Administration (ARA) which, among other things, was given the authority to make public facilities loans and grants where communities demonstrated that their projects would improve the opportunity for business expansion and thus provide additional employment to the area. The ARA funded a study to determine what kind of economic impact a reservoir would have on Southern Illinois. The ARA also funded a portion of the initial survey of Rend Lake, helped defray the additional expense of raising Interstate Highway 57 above the elevation of the proposed lake, and partially funded the Corps Preliminary engineering investigations for the lake.

2. The **Water Development Act of 1986** (PL 99-662) was approved 17 October 1986.

*Section 1137* required the Secretary of the Army to amend the contract between the State of Illinois and the United States for use of storage space for water supply in Rend Lake on the Big Muddy River in Illinois. This was to relieve the State of Illinois of the requirement to make annual payments for that portion of the maintenance and operation costs applicable to future water supply storage as is consistent with the Water Supply Act of 1958 (Public Law 85-500). The section further required that the relief provided by the preceding sentence apply for 5 years after the date of enactment of this Act or until the storage space is used, whichever first occurs, and apply in such proportion as the storage is used for water supply purposes.

3. The **Water Resources Development Act of 1992** (PL 102-580) was approved 31 October 1992.

Section 301 required a study on whether or not to relieve the State of Illinois of the requirement to make annual payments for unused water supply storage in Rend Lake. A report of this study was to be transmitted to Congress along with the recommendations of the Secretary. This law further relieved the State of Illinois from making payments under contract for use of storage space for water supply in Rend Lake until 6 months after the report is transmitted to Congress.

4. Title 10, United States Code, Section 2667, authorizes the lease of land at water resource projects for any commercial or private purpose not inconsistent with other authorized purposes, subject to specific restrictions thereupon, as set out in regulations, policy, and Delegations of Authority.

5. Title 16, United States Code, Section 460d, authorizes use of public lands for recreation-related purposes, including fish and wildlife, if it is in the public interest. Such uses are also subject to regulations, policy, and delegations of authority. The use of project lands for easements and licenses is authorized in various Congressional Acts and codified in Titles 10, 16, 30, 32, and 43 of the United States Code.

D. Cultural and Historical Considerations. A number of laws mandating the protection of cultural resources on public lands have been passed during the past 100 years. These laws and Executive Orders are summarized in Appendix A of St. Louis District Cultural Resource Management Policy (April 1982). The following laws subsume, clarify or supersede all previous cultural resource law:

1. The **Archaeological and Historic Preservation Act (Reservoir Salvage Act)** (PL 86-523) was approved 27 June 1960.

This act, as amended, provided for the preservation of historical and archaeological data which might otherwise be lost or destroyed as the result of flooding or any alteration of the terrain caused as a result of any Federal construction projects (16 USC 469 et seq).

2. The **American Indian Religious Freedom Act** (PL 95-314) was approved 11 August 11, 1978.

This act stated that it is the policy of the United States to protect and preserve for Native Americans their inherent right of freedom to believe, express, and exercise their traditional religions. It further required the President to direct the various Federal departments, agencies, and other instrumentalities whose duties impact on the

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religious practices of Native Americans to evaluate their policies and procedures in consultation with Native religious leaders in order to determine and implement the changes necessary to protect and preserve Native American religious cultural rights and practices. Chapter 6 of ER and EP 1130-2-540 is a result of this act.

3. The **Archeological Resources Protection Act of 1979**, (PL 96-95) was approved 31 October 1973.

This act, an update of the 1906 Antiquities Act, protected archaeological resources and sites which are on public lands and Indian land and fostered increased cooperation and exchange of information between governmental authorities, the professional community, and private individuals (16 USC 470 aa-11). This Act required and provided for permits to conduct scientific archeological excavations by qualified individuals and specified that any archaeological resources found during such excavations remain the property of the United States. This act also set felony-level penalties for excavating, removing, damaging, altering, or defacing any archaeological resource more than 100 years of age, on public or Indian lands, unless authorized by a permit. It further prohibited the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained in violation of any regulation or permit under the act or under any Federal, State, or local law.

4. The **National Historic Preservation Act Amendments of 1980** (PL 96-515) was approved 12 December 1980.

This act, an amendment to the National Historic Preservation Act of 1966, stated a policy of preserving, restoring, and maintaining cultural resources. It also required federal agencies to take in account the effect of any undertaking on any site on or eligible for the *National Register of Historic Places*.

5. The **Native American Graves Protection and Repatriation Act** (PL 101-601) was approved 16 November 1990.

This act required museums and federal agencies to identify human remains and associated funerary objects and to provide culturally affiliated tribes with the inventory of collection. The Act required repatriation, upon request, to the culturally affiliated tribes and established a grant program within the Department of the Interior to assist tribes in repatriation and to assist museums in preparing inventories and collections summaries.

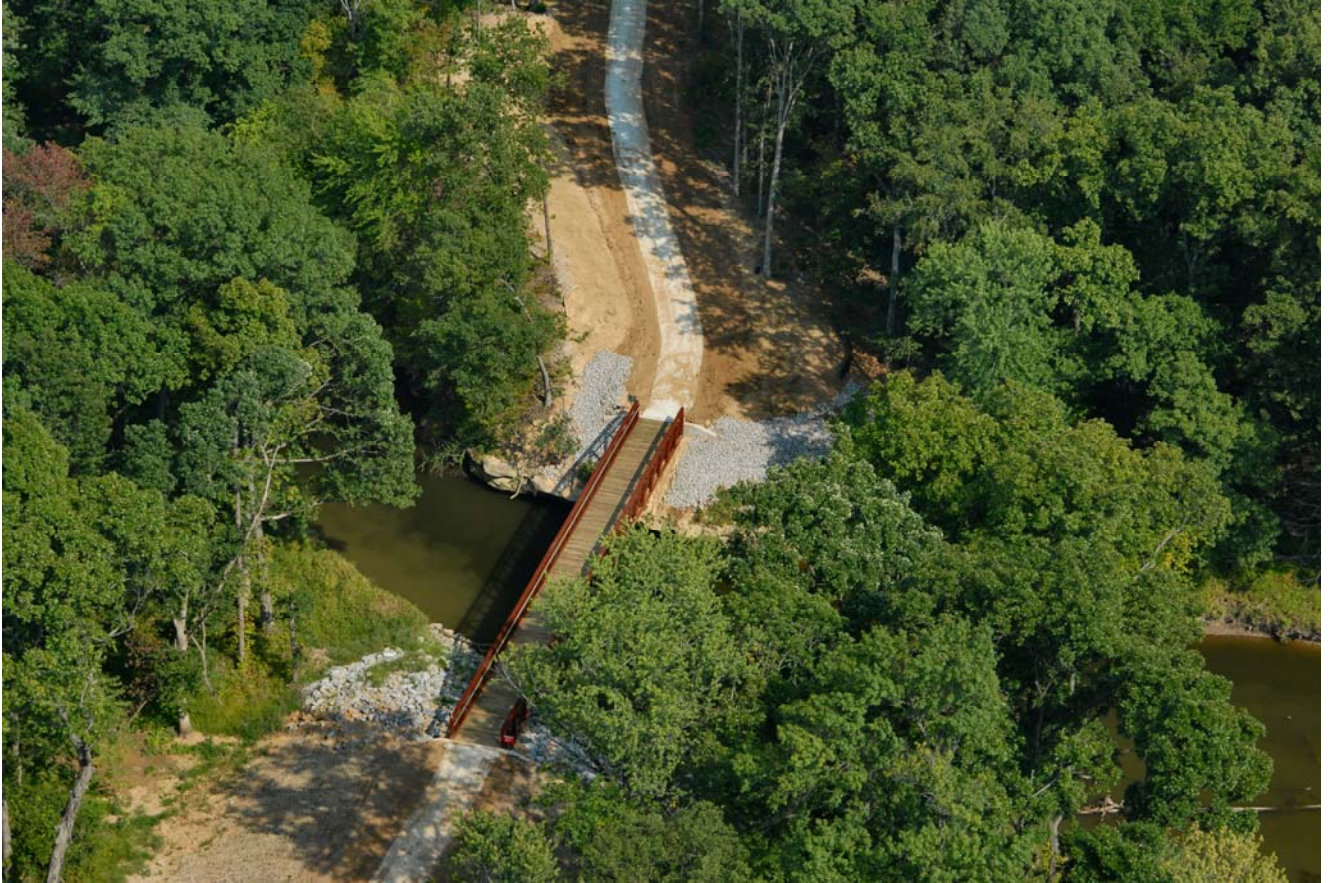
6. The **Religious Freedom Restoration Act of 1993** (PL 103-141) was approved 16 November 1993.

This act stated that the Government may not substantially burden a person's exercise of religion even if the burden results from a rule of general applicability, except if the Government demonstrates that application of the burden to the person is both in furtherance of a compelling governmental interest and the least restrictive means of furthering that compelling governmental interest.

7. **EO 13007 Indian Sacred Sites** was approved 24 May 1996.

This Executive Order required Executive Branch agencies; to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions; to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, the agency is required to maintain the confidentiality of sacred sites.

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## Section II

### Project Description

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## **SECTION II - PROJECT DESCRIPTION**

### **2.01. LOCATION**

Rend Lake is located in Franklin and Jefferson Counties of Southern Illinois. The dam site is located on the Big Muddy River, 103.7 miles upstream from its confluence with the Mississippi River and about three miles northwest of Benton, Illinois. Highways providing direct access to the project area include: Illinois Route 37, and Interstate 57 both running North-South on the east side of the project; Illinois Route 148 running North-South at the west side of the project; and Illinois Route 154 running East-West across the middle of the lake connecting the North-South routes. The location of the lake and adjacent public lands are shown on Plates 1 and 2. Population density and road network within the zone of influence are presented on Plates 6 and 7.

### **2.02. PROJECT DATA**

A. Basin Climactic Summary. The Rend Lake area is situated in a humid continental climactic region, which comprises the largest climactic region in Illinois. This broad region, extending southward from the northern cool-summer region to the ridges of Southern Illinois, provides a relatively moderate climate.

1. Temperature. The temperature in the Rend Lake area is quite variable. Air masses of polar origin meet with warm air masses from tropical regions that produce frontal activities resulting in a variety of weather types. The average annual temperature in this area is 56° F and the average maximum monthly temperature ranges from 39° F in January to 90° F in July. Average minimum monthly temperature ranges from 21° F in January to 68° F in July. The maximum temperature recorded in the area was 114° F at Mount Vernon on 14 July 1936 and the minimum temperature recorded was minus 24° F at Carbondale on 13 January 1912.

2. Wind Movement. Winds in the project area average 5 to 15 miles per hour with no set pattern of wind direction. The migration of weather systems into this relatively flat area is the governing factor. Data does indicate that a higher percentage of wind movement emanates from a south and southwest direction.

3. Humidity. The mean relative humidity varies from about 59% to 86% in the winter and from 51% to 89% percent during the other seasons of the year.

4. Precipitation. Average annual precipitation over the drainage area is 42.19 inches. During the summer, showers and thunderstorms generally occur, whereas

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other seasons normally experience longer, more widespread rainfall events. Snowfall averages about 17 inches annually.

B. Lake Shoreline, Length, and General Character. The topography of the area consists of gently rolling lands, with alluvial valleys and terraces developed along the Big Muddy River. The lake environs are of low relief. At joint-use pool elevation 405.0 feet NGVD, the lake has a water surface area of 18,900 acres; a shoreline of 162 miles; and extends upstream from the dam approximately 13 miles. Approximately 3.5 miles above the main dam, the lake is crossed by the embankment of Illinois State Route 154. Approximately 10 miles above the main dam, subimpoundment dams have been constructed across the Big Muddy River and Casey Fork, the two major tributaries of the lake.

The lake first reached its interim operating elevation, 395.0 feet NGVD, on 23 February 1971. The dam construction was completed on 15 December 1971, and full impoundment (to the top of the joint use pool of 405.0 feet NGVD) first occurred on 12 March 1973. Since that date, the lake experienced its record daily high of 413.83 feet NGVD on 19 May 1995 and its record daily low of 402.95 feet NGVD on 2 November 1974. The average lake level during this time is 406.15 feet NGVD.

Lake width varies from 1.5 to 3 miles. Water depth of the lake above the valley floor at joint-use pool elevation ranges from 23 feet at the dam to 19 feet at the State Route 154 crossing. Historically, maximum depths of 35 feet were found along the old channel.

Sedimentation and mine subsidence has changed the character of the lake bottom and average depths. Some of the coves and shoreline has seen a decrease in average depth due to sedimentation. As a part of coal mining under the lake, longwall panels in the northern and southern portions of the lake were subsided, deepening portions of the lake and creating shallow areas where formerly dry land was submerged. Issues surrounding sedimentation and mine subsidence are discussed in Section 6.09 and 10.07.

### C. Project Structures

1. Pertinent data related to project features and information related thereto is presented on TABLE 1.

2. Main dam. The main dam consists of a compacted earth embankment extending across the valley floor, an ungated concrete spillway with a stilling basin, double 4' x 6' conduits through the main embankment, and an auxiliary spillway

located in the left abutment. The crest of the embankment is at the elevation 424.0 feet NGVD, approximately 54 feet above the river bed. The total length of the dam and spillway is approximately 10,600 feet.

3. Subimpoundment dams. Two subimpoundment dams have been constructed on the Big Muddy and Casey Fork tributaries in the upper reaches of the lake. These subimpoundment dams consist of compacted earth embankments with concrete keywalls and riprap slope protection. Crest elevations are at 416.0 feet NGVD and overflow sections are at elevation 412.0 feet NGVD. Both have gravity outlets with gates which enable the pool level above the dams to be regulated for the benefit of fish and wildlife.

4. Earth Borrow and Dredge Material Areas. The lake has several old borrow areas within its boundaries used to construct the dam and other earthen features required for the construction of Rend Lake. The borrow areas have been revegetated and do not hamper the scenic qualities of the lake. All excavated material has been revegetated to blend into the natural terrain. Minor borrow areas are periodically created to construct projects such as the Rend Lake Bike Trail and the Rend City Wetlands. These borrow areas are shaped and revegetated or developed into ponds after use.

## ***Rend Lake Master Plan***

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TABLE 1

REND LAKE

Pertinent Data

General

Project Purposes: Flood control, water supply, water quality control, fish and wildlife conservation, recreation, and area re-development

Location of Dam

Stream	Big Muddy, Illinois
River mile, above mouth	103.7
County	Franklin
Nearest town	Benton, Illinois

Location of Lake

River mile above mouth	103.7 to 120
Counties	Franklin and Jefferson

Drainage area

Upstream from dam site (sq. mi.)	488
Upstream from mouth (sq. mi.)	2,360

Lake

Inactive pool

Top elevation, feet NGVD	391.3
Area, acres	5,400
Storage, acre-feet	25,000
Depth of water, maximum	21

Joint-use pool

Top elevation, feet NGVD	405.0
Area, acres	18,900
Total joint-use storage, acre-feet	160,000
Water supply storage, acre-feet	109,000
Depth of water, maximum	35
Shoreline, miles	162

## ***Rend Lake Master Plan***

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Flood Control Pool	
Top elevation, feet NGVD	410
Area, acres	24,000
Storage, acre feet	109,000
Depth of water, maximum	40
Shoreline, miles	219

### **Main Dam**

Type	Earth fill dam with ungated main and auxiliary spillways.
Elevation, top of dam, feet NGVD	424.0
Height above streambed, feet	54
Length of crest, feet	10,600

### **Main spillway**

Type	Concrete, ungated
Width, feet	435
Elevation of crest, feet NGVD *	410
Channel Bridge length, feet	605

### **Auxiliary Spillway**

Type	Concrete crest, ungated
Width, feet	800
Elevation of crest, feet NGVD	415

### **Outlet Works**

Size, feet	Double 4 x 6 reinforced concrete box
Flowline, feet NGVD	373.5

### **Subimpoundment Dams**

Big Muddy	
Type	Earthfill dam with ungated overflow section
Total length, feet	3,740
Overflow length, feet	2,435
*31-foot notch at elevation 405 feet NGVD	

## ***Rend Lake Master Plan***

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Non-overflow section, feet NGVD	416.0
Overflow section, feet NGVD	412.0
Outlet conduit, feet	8 x 8 reinforced concrete box
Flowline of conduit, feet NGVD	396.2
Casey Fork	
Type	Earthfill dam with ungated overflow section
Total length, feet	7,650
Overflow length, feet	4,485
Non-overflow section, feet NGVD	416.0
Overflow section, feet NGVD	412.0
Outlet conduit, feet	6 x 6 reinforced concrete box
Flowline of conduit, feet NGVD	396.2
Approximate fee-taking line, feet NGVD	410 + 300 feet horizontal or 416, whichever is higher
Project Acreage	40, 237
Project Boundary Line Length, miles	121

### **2.03. LAKE REGULATION**

The plan for lake regulation provides for flood control, water supply, water quality control, recreation, and fish and wildlife conservation.

#### **A. Main Dam and Spillway**

1. General. Pool fluctuations are controlled by a self-regulated spillway. Pool levels are dependent upon the amount of runoff upstream of the main dam.
2. Joint Use Pool. The joint use pool occurs between elevations 391.3 feet NGVD – 405.0 feet NGVD. A minimum down stream release of 30 cubic feet per second (cfs) is maintained through the outlet works via two double-gated conduits controlled by slide gates. During normal operation of the lake, only one conduit is used to meet the low-flow discharge requirements. The alternate conduit is reserved for maintenance or operational emergency.
3. Flood Control Pool. The flood control pool occurs between elevations 405.0 – 410.0 feet NGVD. Releases are made through the outlet conduit, as described in 2.03.A.2, above, and through the 31 ft. wide self-regulated notch in the main

spillway. The outflow in this zone is unregulated and will vary from 30 cfs to 1,030 cfs, which is the approximate downstream capacity.

4. Surcharge Pool. At pool stages above elevation 410 feet NGVD, unregulated outflow will be over the entire main spillway. Outflow will exceed bankfull capacity of the downstream channel. Above elevation 415 feet NGVD, the ungated auxiliary spillway will go into service. At maximum pool elevation, 419.7 feet NGVD, the main spillway will pass about 58,000 cfs, and the auxiliary spillway will pass approximately 29,250 cfs.

B. Subimpoundment Operation. The State of Illinois is responsible for managing the two subimpoundment dams. These dams are operated to maximize wildlife management and development. Management of these areas is also directed toward the recreational needs of the public and the overall maintenance and improvement of the natural features such as woodlands, swamps and other environmental features.

The operational plan calls for the subimpoundment conduit gates to be closed on a fall date that will allow a water elevation of 409 feet NGVD two weeks prior to the opening day of waterfowl hunting season. These pools then fill until the water reaches the subimpoundment crest at elevation 412 feet NGVD. Once the pools reach this elevation, the water then flows uncontrolled over the spillway crest into the main pool. The subimpoundment conduit gates remain closed until 31 January when they are opened to slowly release impounded waters prior to the next growing season.

C. Storage Allocations. The four storage levels of the lake and respective purposes are detailed in the following paragraphs. Presented on Plate 17 are capacity curves relative to pool area and storage. The impact of the water allocation on the management of the lake is discussed in Section 6.

1. Inactive Storage Pool. The inactive storage pool is that portion of the lake below elevation 391.3 feet NGVD. At this elevation, the lake has a storage capacity of 25,000 acre-feet. This capacity is sufficient to allow for 100 years of silt accumulation. Approximately 6,000 acre-feet of the inactive storage pool will be lost as a result of 50 years of silt accumulation.

2. Joint-Use Storage Pool. The joint-use Storage Pool is that portion of the lake between elevation 391.3 feet NGVD and 405 feet NGVD. This zone has a storage capacity of 160,000 acre-feet and a surface area of 18,900 acres. The Joint-Use storage pool is subdivided into two allocations.

## ***Rend Lake Master Plan***

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a. Water Supply. The allocation for water supply is 68.125% of the usable joint use water storage space, which is estimated to contain 109,000 acre-ft. This equates to an average yield of 70 million gallons per day (mgpd) withdrawal.

b. Low-flow Regulation. 51,000 acre-ft is allocated for downstream releases for stream flow regulation. A minimum release of 30 cfs (or 19.4 mgpd) is maintained to assure downstream flows for water quality control.

3. Flood Control Storage Pool. The flood control pool is that portion of the lake between elevations 405 feet NGVD and 410 feet NGVD, having a storage capacity of 109,000 acre-feet with a surface area of 24,800 acres. The storage in this zone is equivalent to 4.19 inches of runoff from the watershed.

4. Surcharge Storage Pool. The surcharge pool is that portion of the lake between elevations 410 feet NGVD and 419.7 feet NGVD with a storage capacity of 314,000 acre-feet and a surface area of 40,700 acres. The storage in this zone is equivalent to approximately 12.6 inches of runoff from the watershed.

### **2.04. REMEDIAL WORK AND RELOCATIONS**

The lake necessitated relocations and remedial measures to highways, railroads, utilities, oil fields, and cemeteries. These consist of the following:

A. Highways. The criteria for establishing minimum grade elevations were made to conform to design policy of the Illinois Division of Highways (Illinois Department of Transportation). Elevation 415.0 feet NGVD was used as the guide elevation to which existing county, township, and state road alterations and relocations were made. The guide elevation of 415.0 feet NGVD is estimated to provide protection against a flood having a frequency of once in 100 years. The policy of the Illinois Department of Transportation is to provide sufficient amount of freeboard above a pool elevation having a certain frequency of occurrence. The tolerable frequency of occurrence is determined by the design class of the road, which, is determined by the anticipated volume of traffic counts, resulted in the lowest class of road requiring relocation to have a minimum grade of 414.5 feet NGVD.

Approximately 3 miles of the I-57 embankment was protected, 7 miles of State of Illinois highways were raised and/or protected, and 10 miles of county and township roads were raised and/or protected.

B. Railroads. The development of Rend Lake affected three locations on a railroad owned by Chicago and Eastern Illinois Railroad. The following relocations were agreed to between the Corps of Engineers and the railroad:

1. RRA-20. This section of railroad lies in Jefferson County and crosses Atchison Creek approximately 1-1/2 miles above its confluence with Casey Fork and immediately upstream of Illinois Route 37. The relocation involved approximately 5,092 feet of track on an alignment 30 feet upstream of the existing location, the construction of one new bridge, and slope protection. The relocated track has a minimum top of rail elevation of 418.4 feet NGVD.

2. RRA-26. This section of railroad lies in Franklin County and crosses Gun Creek and Hamilton Branch approximately 1/4 miles upstream of the State Route 37 crossing. The alteration involved relocation of approximately 10,501 feet of track on an alignment 50 feet upstream of the existing location, construction of four new bridges, relocation of existing communication lines, and slope protection. The relocated track has a minimum top of rail elevation of 418.4 feet NGVD.

3. RRA-50. This section of railroad lies in Jefferson County and crosses the Big Muddy River just west of the town of Nason. The track was built high enough (elevation 416.2 feet NGVD) to satisfy lake requirements. The only modification to the existing facility was the addition of slope protection.

C. Utilities.

1. Power and Telephone Lines. Removals, relocations, and alterations of power lines owned by five companies and telephone lines owned by three companies were accomplished by negotiated agreements between the Government and the owners. Vertical clearances were accomplished in accordance with ER 1110-2-4401, Clearances for Electric Power Supply Lines and Communication Lines over Reservoirs, based on boats having projections not exceeding 15 feet above the basic water elevation of 414.8 feet NGVD in the main pool and 416.0 feet NGVD in the Big Muddy subimpoundment. Approximately 69 miles of power lines and 43 miles of telephone lines were relocated.

2. Water Lines. The project caused the relocation of two sections of the 16" water main owned by the Rend Lake Conservancy District crossing Atchison and Gun Creek within Jefferson and Franklin Counties. The work involved the realignment of 4,700 linear feet of pipeline at the Atchison Creek crossing and the lowering and reconstruction of about 100 linear feet of pipeline at Gun Creek.

3. Oil Pipeline. Approximately 5 miles of oil pipeline was relocated.

## ***Rend Lake Master Plan***

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D. Oil Fields. Prior to purchase of lands required for the lake, there were approximately 84 production, injection, and freshwater oil wells within the project boundary. At least 62 of these wells were plugged within the area which would be flooded by water to elevation 416.0 feet NGVD and also within the initial development area of the Marcum Branch recreation area. Current oil development is discussed in paragraph 6.10.b.

E. Cemeteries. Eleven cemeteries or burial grounds in the Rend Lake area were studied with respect to burial sites affected by Rend Lake. Nine cemeteries and burial grounds containing 138 burials were relocated. The remaining burial grounds were not relocated due to lack of information as to their exact location. According to approximate locations given by local residents, the remaining burial grounds will not create any problems.

### **2.05. VISITATION DATA**

A. General. The visitation unit used to estimate recreation use until Fiscal Year (FY) 92 was Recreation Days. In FY 92, the Visitor Estimation Reporting System (VERS) was installed at the lake project to administer visitation reporting. The two units of visitation measurement in VERS are visits and visitor hours.

Visits are a "head count" of visitors to a project, based on a count of vehicles and a statistical analysis of the number of people in the vehicle. It does not reflect the amount of use or length of stay. It represents the entry of one person into a recreation area or site to carry on one or more recreation activities.

Visitor hours represent the presence of one or more person's recreation on land or water for periods of time aggregating to sixty minutes. It takes into consideration the number of participants and duration of stay and provides a good estimate of the amount of use.

A Recreation Day is similar to Visitor hours, but reflects the duration of the visit in terms of days.

B. Past and Current Visitation. It was projected in the original Rend Lake Master Plan that by 1973, visitation would approach 2,170,000 Recreation Days, including fishermen and hunters, assuming adequate facilities and services were provided by Federal, State and local governments and by local enterprise.

In 1973, the actual visitation was 883,000, approximately 41% of the projected visitation. The 1975 update of the Master Plan discussed the failure of the lake to achieve

the projected visitation levels. The reduced visitation was attributed to three factors: delays in developing and opening several major access areas, both Corps and state managed; above normal lake levels; and changes in visitation recording techniques. Future visitation estimates were modified to take in account the actual level of development with a projected attendance of 1,092,000 in 1980. In 1980, the actual visitation reached 2,289,000, more than double the estimate.

The lake reached full visitation levels, over 2 million recreation days and then averaged a 1% annual increase up to 1991, when visitation started being calculated using numbers of visits. Since the method of calculating recreation differs from the method for calculating visits, no direct comparison can be made between the two. However, in the 1990's and 2000's visitation has seen an average annual increase of 8%, crossing the 3 million visits threshold in 2004. Table 2 presents a summary of actual visitation from 1972 through 2008.

C. Visitor Activity Patterns. Table 3 provides peak visitation statistics for the fiscal year (FY 07). Fiscal year 2008 wasn't used in this methodology due to budget constraints and recreation areas being closed for portions of the recreation season. The lake saw its maximum visitation during the month of June and July 4<sup>th</sup> as its busiest holiday.

Table 4 shows the change in recreation use patterns over the life of the project. Fishing was the most popular activity in 1973 partly due to the delays in developing and opening several major access areas, both Corps and State managed. By 1980, all the major access areas were open and visitation had increased 175%. As a result, participation in other activities increased and fishing declined in relative importance. A change in use patterns can be seen in the 1990's and 2000's where it appears that visitors started to engage in multiple activities during the same visit, thus allowing the Percent of Activity Use to continue to increase for almost all uses.

D. Projected Visitation. A discussion of projected visitation at Rend Lake is presented in paragraph 6-12. Institute for Water Resources Research Report 74-R1 (Estimating Recreational Facility Requirements, Volume IV) is used to determine projected user demand for recreational facilities and is discussed in Section 6-13.

TABLE 2  
Rend Lake Actual Annual Visitation  
1972 – 2008

Calendar Year	Recreation Days	Fiscal Year	Visits
1972 (actual)	520,000		
1973 (actual)	833,000		
1974 (actual)	761,000		
1975 (actual)	1,059,000		
1976 (actual)	2,101,000		
1977 (actual)	2,345,000		
1978 (actual)	2,426,000		
1979 (actual)	2,394,000		
1980 (actual)	2,289,000		
1981 (actual)	2,203,000		
1982 (actual)	2,309,520		
1983 (actual)	2,394,587		
1984 (actual)	2,103,828		
1985 (actual)	2,256,200		
1986 (actual)	2,261,299		
1987 (actual)	2,338,117		
1988 (actual)	2,420,766		
1989 (actual)	2,396,610		
1990 (actual)	2,419,832		
1991 (actual)	2,497,587		
		FY 92 (actual)	1,039,164
		FY 93 (actual)	1,010,741
		FY 94(actual)	1,124,259
		FY 95(actual)	1,435,069
		FY 96 (actual)	1,659,300
		FY 97(actual)	2,011,349
		FY 98 (actual)	2,162,200
		FY 99 (actual)	2,313,051
		FY 2000 (actual)	2,540,821
		FY 01 (actual)	2,768,592
		FY 02 (actual)	2,851,650
		FY 03 (actual)	2,956,978
		FY 04 (actual)	3,040,575
		FY 05 (actual)	3,126,629
		FY 06 (actual)	3,095,362
		FY 07 (actual)	3,216,142
		FY 08 (actual)	2,981,354

Source: U.S. Army Corps of Engineers, St. Louis District, 2009.

**TABLE 3****Peak Visitation Data**  
**Fiscal Year (FY 07)**

A.	Peak Month (June) Total Visitors	835,749		
B.	Peak Weekend (2-day) Total Visitors	140,349		
C.	Visitation Figures For Each Three-Day Weekend During the Recreation Season			
		<u>Memorial Day</u>	<u>July 4<sup>th</sup></u>	<u>Labor Day</u>
	Total Visitors	154,062	168,419	102,783
	Vehicles	48,144	52,630	32,119

**TABLE 4****Percent of Activity Use\***

<u>Activity</u>	<u>1973</u>	<u>1980</u>	<u>1990</u>	<u>2007</u>
Sightseeing	30%	32%	34%	35%
Fishing	60%	28%	37%	40%
Swimming	10%	16%	16%	18%
Picnicking	10%	14%	27%	23%
Boating	5%	17%	36%	38%
Camping	3%	14%	28%	30%
Skiing	1%	7%	8%	14%
Hunting	15%	37%	38%	36%

\*Represents peak use period for activity (i.e., November for hunting and July for other activities).

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## Section III

### Operating Projects: Status

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**SECTION III - OPERATING PROJECTS: STATUS**

**3.01. PROJECT DEVELOPMENT AND OPERATION CHRONOLOGY**

Rend Lake was authorized by the Flood Control Act of 23 October 1962 for flood control and related multiple purposes. Construction started in June 1965, and the project was placed into operation in May 1972.

**3.02. CHRONOLOGY OF EXPENDITURES FOR PUBLIC USE AND ENVIRONMENTAL CHANGE**

A. Federal Government.

1. The Corps of Engineers has completed development of six major recreation areas totaling approximately 2,292 acres. These public use areas include: West Recreation, North and South Sandusky, North and South Marcum and Gun Creek. Construction costs for these recreation facilities totaled \$1,822,517. The Gun Creek Recreation Area construction contract was completed with a total expenditure for recreation facilities of \$698,495. Featured in this development is boat launching facilities, a small picnic area, and 100 tent and trailer campsites. From 1977 to 1979 this area was leased to the Rend Lake Conservancy District (RLCD) for operation and maintenance. At the request of the RLCD, this lease was relinquished and the area is being managed by the Corps. The Sandusky Creek and Marcum Branch recreation areas are multi-purpose areas with facilities for picnickers, campers, boaters, swimmers, hikers, fishermen, and non-exclusive groups and organizations. The North and South Sandusky recreation areas were completed as originally planned and placed into operation in time for the first year of lake operation (1972).

These areas have undergone extensive modification in order to construct miscellaneous recreation facilities, improve visitor control and fee collection, and upgrade some existing facilities. Total expenditure for the upgrading at the North and South Sandusky areas was \$2,195,500. The West Recreation and North Marcum construction contract was completed with a total expenditure for recreation facilities of \$1,630,824. Construction costs for recreation facilities at the West area are in addition to the \$118,578 expended in a previous recreation facility construction contract. Construction of recreation facilities at the South Marcum area and at the adjacent spillway area was accomplished at a cost of \$1,770,234.

Previous recreation facility construction expenditures have included excavation, shaping and protection of nine selected boat harbor sites at a total expenditure of

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\$307,701; construction of six boat launching ramps at \$264,407; and \$191,641 for harbor excavation and breakwater protection at the Jackie Branch recreation area and the Robinson Curve Boat Harbor, which is located in an area leased to the Rend Lake Conservancy District. An expenditure of \$130,590 provided the non-revenue producing facilities at the future concession site in the Jackie Branch Recreation Area.

The total Construction General Funds expended for recreational development of areas developed by the Corps of Engineers was \$10,143,900. All approved and funded development has been completed.

Sanitary facilities were modified and constructed at several recreation areas in 1989 and 1990. Supplement No. 2 was submitted and approved in July 1988. Three comfort stations were modified in the Sandusky Creek Area to provide shower facilities at a cost of \$65,000.00. A new shower building and pressure sewer system in the South Marcum Recreation Area was constructed for \$603,375.00. In the South Marcum Dale Miller Group Camp, a small wash house was constructed for \$158,750.00. Total modifications and construction costs were approximately \$960,000.00.

A new shower building was constructed at South Sandusky Day Use area to replace old open air cabana showers in 1992. The new shower building is located on the northwest corner of the South Sandusky Beach and Picnic grounds. The total cost for construction was \$178,800.

The North Sandusky main shower building was replaced in 1999 due to a fire destroying the old shower building. Total cost for construction was \$265,900.

A new campground dump station and lift station was added to Gun Creek Campground which replaced the old dump station that used sewer vaults to collect grey and black water from camping units. The new system is waterborne and is connected to the RLCD sewer system. Total cost for the upgrade that was completed in 2000 was \$178,900.

In Gun Creek Campground one vault toilet was removed and replaced with a campground shower building, located between the Bluejay and Cardinal loops. This was the last campground at Rend Lake to be change to a Class A campground. The shower building was completed in 2006 and the total cost of the project was \$375,000.

The Spillway Recreation Area and Turnip Patch Multiple Resource Area both received new CXT vault toilet buildings. Two old vault toilet buildings were removed on River Road at the Spillway Recreation Area and the new CXT building was placed on the west side of the main dam spillway grounds. one old vault toilet building was replaced at

Turnip Patch Multiple Resource Area by the new CXT building in the same location. The replacement took place in 2007 with a total cost of \$41,800.

2. **Annual O&M Costs.** Operation and Maintenance costs for this project have steadily increased from \$285,300 in FY 1972 to \$1,400,000 in FY 1982 to \$3,339,100 in FY 1992 to \$4,528,700 in FY2002 and \$4,718,800 in FY 2007. The latter amount includes \$3,993,800 for operating and maintaining existing public use areas. The increase in these costs from year to year are attributed to several factors: As additional public use areas become operational there was a corresponding increase in total costs for the project's operation and maintenance; compliance with the National Environmental Policy Act, salary increases for project personnel and increased District overhead costs have also contributed to the increased O&M costs.

During 1975, the Rend Lake project received \$600,000 under the Title 10 Intensive Work Program. In addition a YCC (Youth Conservation Corps) program was conducted in 1979-80 and a YACC (Young Adult Conservation Corps) program was conducted in 1980-81, operating on budgets of \$91,800 and \$96,400 respectively. These monies were funded through the Department of Interior, Office of Youth Programs. Temporary personnel hired by these programs were used for small projects such as trails and resource management.

B. **Non-Federal Public Agencies.** Land and water areas have been outgranted to various public agencies for park and recreation development purposes. These outgrants have been made to the Illinois Department of Natural Resources, the RLCD, and the Casey Fork Park District. The latter has subsequently been terminated.

1. **Illinois Department of Natural Resources.** One major public recreation area, Wayne Fitzgerald State Park, is leased to the State of Illinois for park and recreation purposes. Land and water area leased to the Illinois Department of Natural Resources comprises approximately 3,302 acres. In addition to land and water areas leased to this agency, approximately 12,690 acres of land and water area have been licensed to the Department of Natural Resources under a "General Plan and Cooperative Agreement" per P.L. 85-624, Fish and Wildlife Coordination Act of 1958 for intensive fish and wildlife management purposes. This acreage is managed as the Rend Lake Wildlife Management Area. The following paragraphs further describe the land and water areas outgranted to the Illinois Department of Natural Resources.

a. **Wayne Fitzgerald State Park (Plate 18).** Located approximately one mile west of Interstate Route 57 on Illinois Route 154, this recreation area is the major State Park in the Rend Lake area. A total of 3,302 land and water acres

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are operated and maintained by the Illinois Department of Natural Resources. The State Park provides a wide range of diversified activity and development including a resort facility operated as Rend Lake Resort. The Resort provides a variety of overnight lodging experiences in 105 individual units. The units range from duplex cabins, a central motel with large meeting facilities and trademark waterfront units. The Windows Restaurant is a full service facility and is open year round. Other resort amenities include a gift shop, generous courtesy docking, and conference facilities. Besides the Resort, the park includes an extensive road system, large campground, picnic areas, several boat launches, stables and bridle paths, and bike trails. These facilities augment those provided by the Corps elsewhere on the project.

b. Rend Lake Wildlife Management Areas (Plates 19 - 22). At the north end of Rend Lake, three major land and water areas have been designated and are managed by the Illinois Department of Natural Resources for fish and wildlife enhancement. These areas include the Big Muddy Wildlife Management Area, the Rend Lake Wildlife Refuge, and the Casey Fork Wildlife Management Area. The Gun Creek Wildlife Management Area was returned to the Corps of Engineers in 1989 and is now classified as "multiple resource management - vegetative management". Located within the wildlife management areas are numerous minor areas which provide access for the public (Plate 2). Development at these sites has been limited to access road improvements, boat launching ramps, vault toilets, and adequate parking.

Capital investment to date by the Illinois Department of Natural Resources for the developments described in paragraphs (a) and (b) above total approximately \$28,940,165.46. A tabulation of the expenditures incurred by the State of Illinois is contained in Section 15.01, Appendix 1 of this report.

2. Rend Lake Conservancy District (RLCD) (Plate 24). Lands leased to the RLCD are located north of the City of Benton on the eastern side of the lake and are accessible from Illinois State Route 154, Interstate Route 57, and Illinois State Route 37

Approximately 95 acres along the shoreline north and south of the Gun Creek Recreation Area have been leased to the RLCD by the Corps of Engineers. An additional 14 acre area was added to the lease for parking and access to a sewage lift station. Ultimately, the complex is envisioned to be an elaborate resort-type recreation area, with services and activities such as theaters, restaurants, lodges, a golf course, marina, and various game and sport facilities. The golf course, the golf course maintenance building, driving range, pro shop, four parking lots, Season Lodge, restaurant, conference center, shooting complex and tennis courts are in operation. The RLCD manages all of these facilities directly except for the shooting complex which is subleased to a private entity.

3. Casey Fork Park District (Plate 11). Area 5, the 42 acre Ina Recreation Area was previously leased to the Park District for the purposes of park and recreational development. That lease agreement was terminated by the Corps of Engineers on 1 July 1981. The Park District lessee was not responsive to the maintenance needs of the area, and did not comply with the general terms of the lease. Located adjacent to the Interstate Route 57 near the City of Ina, the site is now managed by the Corps. Additional information is provided in paragraph 8.04.E.

C. Private Recreational Investment.

1. Commercial Concession Leases. At the present time, there are nine boat harbor/marina sites approved in the original Master Plan. These harbor sites were excavated and/or provided with breakwater protection prior to lake impoundment. Two of these sites, the sailboat harbor and the State Park West Boat Harbor are within Wayne Fitzgerald State Park. The area adjacent to the boat harbor has been fully developed into a full service resort whose operation and management is subleased to private interests.

2. Four harbors are located at Corps-developed recreation areas; these include harbors in the West, South Sandusky, South Marcum, and North Marcum recreation areas. One harbor is located in the Jackie Branch Future Recreation Area. An additional tenth harbor site was developed in the Ina Recreation Area and, as discussed above, was leased to the Casey Fork Park District. Section 10-03 further discusses a coordinated approach to the future development of marina concessions at Rend Lake. The only marina currently developed at Rend Lake is the Rend Lake Marina in the West Recreation Area. It currently provides 270 boat slips, gasoline and propane sales, holding tank pump out service, boat sales, boat repair services, and boat rentals.

D. Summary of Recreational Facilities. TABLE 5 presents all existing recreational facilities that have been provided at Rend Lake by the Corps of Engineers, the Illinois Department of Natural Resources, and the RLCD.

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Table 5  
Summary Rend Lake  
Existing Recreational Facilities

	Spillway Rec. Area	Dam West Rec. Area	South Sandusky Rec. Area	North Sandusky Rec. Area	Jackie Branch Future Rec. Area	Gun Creek Rec. Area	Ina Rec. Area	Turnip Patch Multiple Res. Area	North Marcum Rec. Area	South Marcum Rec. Area	Gun Creek Multiple Res. Area	Corps Summary	Big Muddy Wildlife Mgmt Area	Casey Fork Wildlife Mgmt Area	Rend Lake Wildlife Refuge	Wayne Fitzgerrell State Park	State Summary	Project Total
Total Campsites			130	118		100				176		524				244	244	768
Campsites (30 amp electric only)			83	21						107		211						
Campsites (50 amp electric only)			19	81		99				48		247						
Campsites (full hook-ups)			20	16		1				2		39						
Tent Sites			8							19		27				17	17	44
Picnic Sites	2	16	20	36					22	8		104				20	20	124
Group Shelters	1	1	3	3		1			2	2		13				7	7	20
Mini-showers			2	1								3						3
Comfort Station (vault)	1					6		1	3	10		21	7	4		18	29	50
Comfort Station (waterborne)	1	1	7	9								18				1	1	19
Shower Buildings			2	1		1			1	2		7				4	4	11
Drinking Water	4	2	20	22	1	17			6	17		89				36	36	125
Boat Ramp launch lanes		4	4	4	2	4	2	2	4	4	1	31	8	3		9	20	51
Beaches			1						1	1		3						3
Hiking Trails	1		1							1		3				2	2	5
Bike Trails (1)	1	1	1	1					1	1		1				1	1	1
Overlook	1										1	2			1		1	3
Trailer Dump Station			1	1		1				1		4				1	1	5
Playground Areas	1	1	4	4		3			1	3		17				5	5	22
Amphitheater	1		1			1				1		4						4
Feebooth			1	1		1				1		4				2	2	6
Visitor Center	1											1						1

1. Bike Trail total is 1 for the whole Rend Lake Bike Trail.

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## Section IV

### Coordination with Other Agencies

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## **SECTION IV - COORDINATION WITH OTHER AGENCIES**

### **4.01. GENERAL**

A high degree of coordination has been maintained with other governmental agencies throughout Rend Lake's planning, development, and operational stages. This memorandum is a revision and updating of the original plan, and therefore not all agencies involved during the original planning have been in direct coordination with the Corps of Engineers during the production of this plan. Agencies actively involved with the Corps in the planning and coordination process include the Illinois Department of Conservation and the Rend Lake Conservancy District. A brief summary of coordination by these and other agencies to date is contained in the following paragraphs.

### **4.02. FEDERAL AGENCIES**

A. National Park Service. The National Park Service worked closely with the Corps of Engineers and the Illinois Department of Natural Resources, particularly during the early planning and development of the lake. Coordination was principally concerned with estimates of anticipated annual visitation and activity use and estimates of the scope and nature of park and recreation developments required. Prior to inundation by the lake, this agency coordinated archeological studies and removal of artifacts. The National Park Service was also involved in the planning stages of the Rend Lake Bike Trail, providing a grant for the development of the bike trail brochure.

B. U.S. Fish and Wildlife Service. Since the inception of the lake, coordination with the U.S. Fish and Wildlife Service has been maintained. Coordinated planning among the USFWS, the Illinois Department of Natural Resources, and the Corps of Engineers resulted in the construction of two subimpoundments, primarily for waterfowl management. Standing groves of pin oak were protected for mast production to feed migrating waterfowl. Preimpoundment surveys of the Big Muddy River resulted in stocking substantial quantities of largemouth bass. The work of these agencies has enhanced Rend Lake as an attraction for hunters and fishermen. The USFWS Ecological Services Program assisted in the early stages of the coal mine mitigation process, providing guidance, biological opinions, and advice. The Rend Lake Staff coordinate with the law enforcement and outreach departments of the Crab Orchard National Wildlife Refuge in an effort to work together when dealing with issues concerning federal recreation sites in Southern Illinois.

C. U.S. Forest Service. The Rend Lake staff coordinate with the law enforcement and outreach departments of the Shawnee National Forest in an effort to work together when dealing with issues concerning federal recreation sites in Southern Illinois.

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D. Bureau of Land Management. This agency grants, administers, and inspects federal leases for the development of federally owned oil and gas resources. See Section 6-10, Oil and Gas. The BLM also certified the Rend Lake Boundary after a resurvey in 1984.

E. U.S. Geological Service. The USGS installed and maintains seismic monitoring equipment on the main dam and in the maintenance area.

F. National Weather Service. Rend Lake participates in the NWS Cooperative Observer Program. The NWS in Paducah, KY installed and maintains weather monitoring equipment, including an electronic rain gauge and temperature monitoring equipment. Rend Lake staff collect daily weather and lake readings and forward them to the weather service.

G. U.S. Public Health Service. A report on the mosquito control problem associated with Rend Lake was prepared by the U.S. Public Health Service in cooperation with the Illinois State Department of Public Health in April, 1963. Experience to date has proven mosquito infestation to be light as compared to the condition found in the Big Muddy flood plain prior to the lake. See Section 5-04 D.

### **4.03. STATE OF ILLINOIS AGENCIES**

A. Illinois Department of Natural Resources. Many different department of IDNR are active in the management of Rend Lake. The primary coordination with the State of Illinois for the purpose of this update of the Revised Master Plan has been with this agency.

The Department of Land Management has the responsibility of managing lands leased to the state, including Wayne Fitzgerald State Park, the Rend Lake Wildlife Refuge, and the two state wildlife areas. The leases and licenses are further discussed in Section 8 and Section 15.01, Appendix 1. In addition, this department has worked on the development and construction of the Rend Lake Bicycle Trail.

The Department of Law Enforcement has primary enforcement responsibilities of state statutes involving fisheries and aquatic life, wildlife, conservation, and boating codes. In addition, the Department of Law Enforcement assists the lake by providing training for the ranger staff.

The Department of Resource Conservation has primary responsibility for managing the fisheries and wildlife resources at the lake. Rend Lake Environmental Services staff liaison with state wildlife biologists, reservoir fisheries biologists, regional foresters, and natural heritage specialists.

The Department of Mines and Minerals is responsible for permitting and monitoring drilling activities for privately owned oil and gas, including those occurring under federal lands.

The Department of Systems and Licensing assists with the annual accessible deer hunt by facilitating the issuance of hunting licensing for participating hunters.

B. Illinois Department of Commerce and Economic Opportunity. In Illinois, this agency, formerly known as Department of Business and Economic Development, is responsible to the Governor for the coordination of all economic development planning for the State, which includes planning by State and local government agencies in connection with such projects as Rend Lake. In addition, the DCEO also spearheads state-wide tourism initiatives.

C. Illinois Department of Transportation. IDOT installs and maintains all lake directional signs located on state highways. Rend Lake staff work with IDOT to ensure that facilities are adequately identified by these signs. In addition, Rend Lake Staff have worked with IDOT in the development of the Rend Lake Bicycle Trail. IDOT provided grants for the construction of portions of trail and development of the bike trail brochure. In addition, IDOT has been performing a feasibility study to investigate the best method of routing the bicycle trail along state highway 154.

D. Illinois Environmental Protection Agency. The IEPA issues the required permits for the operation of the waste water treatment plant in the South Sandusky recreation area. In addition, IEPA staff review the wastewater treatment plant operation contract and approves the licensed contract operator. The Rend Lake staff coordinate with the IEPA in water quality, hazardous materials release, and waste water dumping issues on lake property. As a part of monitoring water quality, Rend Lake participates in the IEPA's Volunteer Lake Management Program by measuring and reporting water clarity.

E. Illinois Department of Public Health. To protect the public's health, the Rend Lake voluntarily submits beach water samples to a Department of Public Health laboratory for analysis every two weeks. If the results exceed the Department's limits, the risk of illness increases and the beach will be closed until water samples test below the Department's limits. The IDPH performs the lake's beach water testing during the summer at no cost to the government.

F. Illinois State Police. The Rend Lake staff work with the ISP on matters of public safety. ISP officers assist with traffic control during large special events and provide law enforcement assistance to rangers in recreation areas when available and needed. The ISP also notifies project staff in the event of possible hazardous material

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releases caused by vehicular accidents in the Rend Lake watershed. In addition, as a result of a grant, the ISP donated 2 Automated External Defibrillators (AEDs) to the project to be used by patrolling rangers.

### **4.04. LOCAL GOVERNMENTS AND AGENCIES**

A. Rend Lake Conservancy District. Coordination with the Conservancy District and its consultants has been maintained since the inception of the lake. Presently, plans have been presented and are awaiting financial backing for a destination type resort in the Gun Creek Complex. In addition to coordination of recreational development, the Conservancy District has developed water treatment and transmission facilities to supply water to municipalities in the area. Section 15.02, Appendix 2 presents the Conservancy District's development plans for the area.

B. Local Governments. Since the beginning of the project, coordination has been maintained with counties, cities, and villages in the Rend Lake Area. Many meetings have been held with various agencies and civic groups. The Park Manager is the primary contact for coordination between the Corps and local government agencies and organizations.

C. Tourism Offices. Rend Lake Project staff work with the Franklin County Office of Tourism to represent the project and county in regional outdoor recreation related tourism events. In addition the Franklin County Office of Tourism produces a county tourism map (Fun Trail) which includes a map of Rend Lake and its facilities. The Corps assisted in developing the map and distributes it to lake visitors.

Rend Lake Project staff participate in regional tourism coordination meetings to the mutual benefit of the Corps and Franklin, Williamson, and Jefferson Offices of Tourism.

D. Benton Chamber of Commerce. The Rend Lake Project is a member of the Benton Chamber of Commerce. The Chamber of Commerce has assisted with special events at the lake and works to build community support and marketing of the lake.

E. Fire Protection Districts. Rend Lake project lands fall under the jurisdiction of the following fire protection districts: Sesser, Ewing Northern, and Jefferson County.

#### **4.05. PARTNERSHIP AGREEMENTS**

A. Illinois Department of Natural Resources Management Agreement. This management agreement grants IDNR management authority over hunting and trapping on St Louis District Lands. It allows IDNR to create project specific hunting and trapping regulations.

B. Illinois Department of Natural Resources MOA. This Memorandum of Agreement provides for cooperation between the Corps and IDNR in regulating boating activity and identifying special restrictions on Rend Lake.

C. Franklin County Sheriff's Department and Jefferson County Sheriff's Department MOA. This Memorandum of Agreement between two Sheriff's Offices with jurisdiction at Rend Lake and USACE allows the three agencies to cooperate in all matters concerning public safety.

D. Franklin County Sheriff's Department Cooperative Law Enforcement Agreement. The Rend Lake Project has entered into a cooperative law enforcement agreement where the Sheriff's Department provides dedicated law enforcement patrolling of recreation areas on a set schedule, dispatch service to park rangers, search and rescue services, and monitoring of the project security systems. The Corps houses the Sheriff's Department's repeater in the radio building and has allowed their antenna to be placed on the radio tower.

E. City of Benton MOA. This Memorandum of Agreement between USACE and the City of Benton allows the two agencies to cooperate in matters of public safety.

F. City of Benton Challenge Partnership Agreement. This Handshake Partnership Agreement allows the extension of the existing severe weather warning system in the City of Benton to provide coverage in USACE recreation areas at Rend Lake.

G. Good Samaritan Regional Health Center MOA. Good Samaritan Regional Health Center is the certified trauma center serving the Rend Lake Area. This Memorandum of Agreement provides for cooperation with public safety activities, public safety education, and USACE employee safety training.

H. The Print Shop Challenge Partnership Agreement. This challenge partnership agreement allows The Print Shop to assist in promoting recreational opportunities around Rend Lake by supplying the Government with a joint monthly newsletter for the visitors to the area.

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I. Benton Kiwanis Club Foundation of Division 33 Cooperating Association. This cooperating association agreement allows the Benton Kiwanis Club Foundation of Division 33 to assist in providing interpretive and educational services to Rend Lake visitors.

J. Mt. Vernon Coal Company MOU. This Memorandum of Understanding outlines a plan for the prevention, minimization, or repair of damages to Corps structures, property, fish & wildlife habitat, and historic properties due to Mt. Vernon Coal Company's mining activities under federal lands.



## Section V

# Recreational and Environmental Resources of the Project Area

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**SECTION V - RECREATIONAL AND ENVIRONMENTAL  
RESOURCES OF THE PROJECT AREA**

**5.01. GEOLOGIC**

A. Geologic Features. Unusual or scenic geological formations are generally absent on the gently rolling uplands of Franklin and Jefferson Counties. Typical glacial landforms are rare and the topography to a great extent is influenced by the structure of underlying Pennsylvanian bedrock. The most physiographic contrast in the lake area is the river valley and tributaries. There is a major fault trending north-south at the west edge of the lake. Geology is further discussed in paragraph 6.06.B.

B. Soil. Essentially the soil formation in this part of Illinois is a result of Pleistocene glaciation and the subsequent erosional activities. Soils of the project area can generally be described as one to one and one-half feet of silt loam over two feet of silty clay or silty clay loam, underlain by silt loam or silty clay loam glacial till. Permeability rates for these soils are generally considered quite low. The water table is transitory in these soils, being one to three feet below the surface during wet periods but sensitive to drought periods. The low permeability and high water table prevent water from easily seeping into the ground causing it to pond at the surface. Locally loess-derived soils are highly erodible, even at low velocities and create a significant environmental problem especially around the lake shore.

C. Minerals. Franklin and Jefferson Counties are located in the heart of the Illinois Basin coal and oil production area. Vast beds of coal underlie the entire region. The mining of this coal resource has long been the dominant economic factor in the area. This coal mining and attended surface subsidence will affect all area developments, recreational, industrial, residential, etc. Significant quantities of oil have been produced from fields scattered throughout the counties. Production records indicate that the development of this resource may be decreasing, but production is expected to continue for some time. Coal and oil production are discussed in Sections 6.09 and 6.10.

**5.02. ARCHAEOLOGIC**

A. Work History. Work relevant to the prehistory of the Rend Lake area began with the excavation of mounds near Carbondale in the 1800's. Some survey and excavation work was conducted in the late 1930's near Carbondale and an excavation was conducted near Murphysboro in 1951. During the course of this work, all of it on the Big Muddy Basin, but well below Rend Lake, three successive Woodland complexes (Crab Orchard, Raymond, and Dillinger Foci) were defined.

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In the early 1960's the Highway Salvage Program (Illinois Archaeological Survey) resulted in several small excavations in the Mt. Vernon area. The Bodine #1 and #2 sites established the presence of Crab Orchard in the upper Big Muddy and led to the formulation of an early Crab Orchard stage called Sugar Hill. The Rend Lake Reservoir Salvage Project (Southern Illinois University Museum at Carbondale) was initiated in response to the proposed Corps of Engineers lake facility. The flood-pool area was surveyed, which resulted, despite unfavorable surveying conditions, in the location of 143 sites. In a 1972 PhD dissertation by Sidney Denny (SIU-C), the R.L. Salvage Project data were combined with all previous data to produce a summary of the Big Muddy Basin. In the same year, a salvage excavation of the Fry No. 1 site was conducted by Rend Lake Jr. College producing the first radio-carbon date (2100 +/- 290/300) to be associated with Crab Orchard material in the Rend Lake area.

In the winter and spring of 1978, a predictive models study of the Big Muddy Drainage was made by SIUE as part of a larger IDNR program. The environmental contexts of 874 basin sites were considered and models were constructed of land use through time. In 1978-9, SIUE conducted a Cultural Resource Shoreline Survey of Rend Lake. 185 sites in the study area were found or revisited and 127 of those were assigned cultural affiliations. Widespread erosional destruction was noted. In 1980, SIUE conducted data recovery work on two such threatened sites (RL-50 and RL-51).

The final report of the above-mentioned shoreline survey is here referenced as the most comprehensive summary of the Rend Lake cultural resources to date: A FINAL REPORT OF A CULTURAL RESOURCE SHORELINE SURVEY OF THE REND LAKE RESERVOIR, FRANKLIN AND JEFFERSON COUNTIES, ILLINOIS, by W. Woods and S. Denny, SIUE, (Contract No. DACW43-78-0178, 16 April 1980).

B. Prehistory. The prehistory of the Rend Lake reservoir area is based almost entirely upon survey data from shoreline or inundated sites. While these data have been sufficient to suggest possibilities and raise questions, the work needed to relate the prehistory of Rend Lake with any certainty or detail has yet to be conducted. Since many of the sites were inundated and many more are presently undergoing erosional destruction, the ability of the Rend Lake data to inform is rapidly decreasing. The following is a brief chronological review of the prehistory of Rend Lake as presently known.

While Paleo-Indian (ca. 11,000-8,000 B.C.) occupation occurred, that period of prehistory is poorly represented at Rend, and it is doubtful that much will ever be known concerning it. It is likely that a more substantial Paleo-component was once present, having been obliterated by prehistoric flooding and erosion.

The Early Archaic (ca. 8,000-5,000 B.C.) period is represented at 14 sites clustering in upland areas adjacent to the mouths of tributaries to the main channel.

The Middle Archaic (ca. 5,000-2,000 B.C.) is represented by 15 sites. Of this, the only single-component site was largely destroyed by campground development. Middle Archaic sites concentrate near major tributaries or the main channel near what was probably more heavily forested terrain.

The late Archaic (ca. 2,000-1,000 B.C.), though representing a time span one third as long as either of the preceding two periods, is represented in over twice as many (38) sites. A continuity in settlement system and pattern is suggested by a number of middle to late multicomponent sites.

The Early Woodland (ca. 1,000-300 B.C.) period is difficult to identify due to as yet unresolved chronological problems. Three sites have been tentatively assigned to the Early Woodland Period on the basis of projectile point typology.

Middle Woodland (ca. 300 B.C. - A.D. 600) status has been assigned to 59 sites, three of which are known to have contained structures. Salvage excavation has been conducted at one (RL-50) of those sites. Many of the 59 sites may well represent or be mixed with Early Woodland material, pending resolution of typological problems. Sites are found in all environmental zones, but center in the uplands near the main channels of Casey Fork and the Big Muddy.

Forty-eight Late Woodland (A.D. 600-900) components have been identified. It has been interestingly suggested that site distribution, similar to that of the Middle Woodland, reflects the cultivation of plants on the enriched soils of the by then abandoned Middle Woodland sites.

The Mississippian (A.D. 900 -?) is represented by only 8 sites, all of them multi-component. Structures are known at two sites, one of which (RL-57) has undergone salvage data recovery. The Mississippian Period, during which large towns, earthworks, and extensive trade networks developed elsewhere in the Midwest, appears to have been represented by a few farmsteads or hamlets in the Rend Lake Area.

### **5.03. HISTORIC**

A. Significant Historic Sites. The National Register of Historic Places does not identify any significant historic sites in the Rend Lake area (Franklin and Jefferson Counties). The State's Historical Landmark Survey for the area has been completed and one structure, which is not on Corps-managed property, but is in the vicinity of the lake, may be identified as a land mark. This is the Nason Mine (also known as the Bell and

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Zoller Mine) which is located at the North end of the lake at Nason. The mine and the town of Nason were founded by the Consolidated Coal Company in 1922 and 1923, respectively. The original name of the mine was Jefferson No. 20; it was changed to the Bell and Zoller Coal Company. The mine has a large powerhouse, emissions stack, and other related structures which are different from today's modern mines. The town was designated and laid out as a model city by the planning staff for the mine. The town was founded 15 May 1923; however, neither the mine, nor the town grew to their anticipated size. After an ownership change and various setbacks, the mine closed in 1952. At the present time, the mine and the town of Nason are essentially in ruins with only the sidewalks, boulevard trees, a few houses, and taverns and the various mine structures remain.

B. Historic Narrative. Written history of the region began in 1673 with the French explorations of Marquette and Joliet. The Jesuits and fur traders followed close behind the explorers. The first permanent European settlement within the Central Mississippi Valley area occurred at Cahokia, Illinois, in 1699. In that year, the Holy Family Parish was established at the Illini Indian village in that location. The settlement of Kaskaskia followed in 1702 and this village soon became the dominant commercial center of the area. Construction of Fort Chartres, Randolph County, Illinois (completed in 1720) coincided with an increase in mining activities within the region. These activities continued into the first quarter of the 19th Century. The French influence in the area officially ended in 1763 at the end of the French and Indian War, at which time the British received all the land east of the Mississippi River except for some small areas owned by the Canadians. To insure trade monopoly for the British, settlement in the area was forbidden and the land was only given out by grants from an Illinois Administrator by the name of Colonel Wilkins.

This arrangement did not last much longer than earlier attempts, because in 1775, the War for Independence started. Most of the British troops in the area left, leaving only the militia behind and the Indians were once again set against the Colonists. By 1778, most of the strength was gone from the King's forces and a small colonial force led by George Rogers Clark debarked from flatboats on the Ohio River, crossed Southern Illinois from Fort Massac via Crab Orchard Creek and the Big Muddy River, and took Fort Kaskaskia without a fight. The following winter Clark's capture of Vincennes secured the West for the United States.

Until the Revolution, Illinois had been a part of the State of Virginia, but it was ceded along with the rest of the land north of the Ohio River to the Federal Government. By 1798 Illinois had a population of 5,000 white males which allowed it to become a territory under the Northwest Ordinance.

Conflicts with the British and the Indians between 1700 and 1800 made the going rough in Southern Illinois during this period and the 1800's seemed to be starting in the same manner. In 1812, the second war with the British began and again the Indians were used against the people of the area. The threat was quickly curtailed; however, Indian uprisings continued even after Illinois became a state in 1818. The final defeat of the Indians came with the termination of the Black Hawk War in 1832.

After the War of 1812, a migration of people from the East populated the area and new roads and riverboats allowed trade to build in Southern Illinois. Farming was the main industry in the early statehood of Southern Illinois, and until the railroads were built in the 1850's, coal mining was located along the rivers and operated on a small scale. In 1861 the Civil War began, calling upon Southern Illinois for men and resources which taxed the struggling area once again.

After the war there was a brief farming boom and the coal mining continued to grow with a network of railroads supplying inexpensive transportation needed for growth. Franklin and Jefferson Counties produced 221,954 tons of coal between 1890 and 1900. Between 1911 and 1920, these two counties produced 80,666,484 tons of coal. Coal production had expanded rapidly; however, the demand was seasonal and by the 1920's, after World War I, the demand for coal declined. The area was almost entirely dependent on the mining and farming industries, and with coal production dropping, many found it necessary to move elsewhere in order to maintain employment. This trend continued until the early 1960's when Southern Illinois University and the Federal redevelopment programs began to simulate economic growth in the area.

### **5.04. ECOLOGIC**

A. Wildlife Resources. Over 284 species of birds have been recorded as residents or migrants within the different habitats in the lake area. These habitats provide nesting sites, cover, forage, and structure for many assemblages of birds at Rend Lake. Mudflat habitat, with its slow, natural, late summer/fall drawdown attracts 37 species of migratory shorebirds requiring rest areas and foraging habitat. Thirty-three species of waterfowl also migrate through or winter on the open water, shallow water, lakeshore crop fields, flooded timber, and moist soil habitats primarily on the north end of the lake. Mature upland and bottomland hardwood forest patches are moderately significant for forest interior neotropical migrants such as eastern wood pewee, Acadian flycatcher, wood thrush, cerulean warbler, and scarlet tanager. Flooded bottomland timber and slough/oxbows provide breeding habitat for prothonotary warbler, while bottomland forest edge is favored by northern parula.

Many mammals' species occur at Rend Lake including white-tailed deer, cottontail rabbit, fox and gray squirrel, otter, mink, muskrat, beaver, raccoon, opossum, striped

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skunk, long-tailed weasel, bobcat, coyote, and red and gray fox. Although less well known, many small, primarily nocturnal species are found here such as the marsh rice rat, deer mouse, prairie vole, short-tailed shrew, and red bat. Many, although not all of these species depend upon forested and wetland habitats.

Other terrestrial vertebrates include the reptiles and amphibians. Rend Lake is not included within the range of any poisonous species of snake, although there are records for nearby localities. Bullfrogs, leopard frogs, spring peepers, tiger salamander, eastern box turtle, snapping turtle, northern water snake, rat snake, and racer are examples of herptiles that can be found here in a variety of habitats. There are records (i.e.: vouchered specimens, photographic records, verified sightings or pre-1980 records from the literature) for 17 species of amphibians and 28 species of reptiles for Franklin/Jefferson counties.

Invasive and special status species are discussed in Sections 6.6 and 6.7

B. Aquatic Resources. Historically there have been few submerged or emergent aquatic plants in Rend Lake. A combination of turbidity, wave action, and water level fluctuations has prevented aquatic and semi-aquatic plants from colonizing the lake. However, more recently turbidity has declined and several coves have established dense stands of aquatic vegetation. Submerged and floating leaf plants currently established in Rend Lake include lotus, milfoil, coontail, southern naiad, leafy pondweed, creeping water primrose, duckweed, and american pondweed. Emergent plants include cattails, Phragmites sp., water smartweed.

Sampling and analysis of Rend Lake benthos and plankton were done from 1970-1976 by a Southern Illinois University biologist. Generally the data shows that from year to year the diversity of species present in both bottom sediment samples, and the plankton communities has been increasing. Typically found in benthic samples are oligochaetes, chaoboros larvae, chironomid larvae, ceratopogonidae larvae, and snails. The wide diversity of these organisms in Rend Lake samples indicate that waters are in good condition. Plankton surveys also had shown increasing diversity of floating organisms indicating favorable water quality conditions.

Over 119 species of fish have been recorded from the Big Muddy Basin. The major fish species providing a sport fishery at Rend Lake are white crappie, black crappie, bluegill, channel catfish, flathead catfish, white bass, hybrid striped bass and largemouth bass,. No cold water fish habitat or fishery occurs at the lake. See Section 11.10 for information on fisheries management. Currently, Asian carp (i.e.: silver and bigheaded) have been recorded from downstream sites, but as of yet there has only been one record

for these species in the main body of the lake. Invasive species could pose a serious threat to the aquatic resource.

The Illinois Department of Natural Resources, through their Division of Fisheries, provides for fish management at Rend Lake. The fisheries management program is designed to provide a greater variety of fishing opportunity by using techniques to primarily favor game species. The Corps supports the Division of Fisheries' management recommendations whenever such recommendations are consistent with other lake purposes. A successful commercial fishing season has been held on the lake for many years. Removal of marketable rough fish enhances the aquatic habitat for game species and recreation fishing. Some fish habitat is provided by flooded timber, which is decreasing 30 plus years after impoundment. Sport fishing, as a whole, has increased substantially in the area since the completion of Rend Lake.

C. Vegetative Resources. The vegetative resources at Rend Lake can be classified as follows: bottomland hardwood forest, upland hardwood forest, old field, grassland, croplands, and wetlands.

The bottomland hardwood forests are essentially low wetland areas of the Big Muddy River flood plain. The tree species found are the typical bottomland tree species of red maple, sweetgum, green ash, and pin oak. Elm, river birch, sycamore, and black willow are also present as minor associations. On the better drained alluvial soils, white, bur, and swamp white oaks; shagbark hickory; and various other hickories occur. The understory is composed largely of the young of the dominant trees and a variety of woody and herbaceous plants such as buttonbush, poison ivy, spotted touch-me-not, and smartweeds. Leaf and twig litter typify the ground cover situation. These areas are poorly drained, but contain some of the best timber and wildlife values on the lake. Over 4900 acres are classified as palustrine-forested wetland by the OMBIL wetland classification system.

Upland hardwood forest tree species are the oak-hickory association. Trees that will be found; depending on the moisture characteristic, aspect, and drainage of the area; are black oak, northern red oak, southern red oak, shingle oak, post oak, black cherry, sassafras, red mulberry, and black walnut. Understory vegetation consists of the young of these tree species and scattered mixtures of dogwood, witch hazel, hophornbeam, and red bud. Where openings occur in forest crown and at forest edges, autumn olive, poison ivy, blackberry, coralberry, multiflora rose, greenbrier, and Virginia creeper are also evident. The ground cover consists of small herbaceous plants, leaf twig litters, and a thick humus layer.

The majority of the lands in fee ownership are open lands or old field. Most of these areas were previously agricultural fields or pasture land. A selected percentage of

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these fields are maintained in a weedy cover with an invasion of woody plants and are maintained in a three year range of succession. A typical field of this type would contain various perennials such as common ragweed, giant ragweed, goldenrod, foxtails, beggar tick, fleabane, and woody shrub/pioneer tree species such as poison ivy, blackberry, multiflora rose, sumac, elm, persimmon, and sassafras. Autumn olive, planted as a wildlife food and cover species in the early eighties, is now an invasive species and can dominate a field within three years. Management is geared towards disturbing, manipulating, or retarding ecological succession to maintain old field plant communities.

The majority of the remaining open areas are maintained cropland. At present, there are 3 agricultural leases managed by the Corps, one by Wayne Fitzgerald State Park, and 8 by the Rend Lake State F&WA. A typical field of this type contains a border strip of grasses, herbaceous annuals and legumes with a percentage of various agriculture crops left in the field for wildlife use, especially waterfowl.

Wetlands, in its broadest definition according to US Fish and Wildlife Service criteria, comprise the largest segment of the lake and fee title lands. Over 26,000 acres, including the lake itself are classified as either lacustrine, palustrine or riverine system wetlands. This includes such seemingly diverse habitats as the lake itself, shoreline, emergent vegetation wetlands, and bottomland forests. Additionally, the Corps and IDNR manage numerous areas that are seasonally flooded and vegetation managed, either planted or moist soil plants, to enhance wildlife habitat and recreation opportunities.

The objectives of vegetative management are to increase biological diversity and the value of all lake lands for recreation and to maintain wildlife populations. Vegetative resources are managed to increase their total recreation, wildlife, and scenic values. Management for these objectives involves maintaining soil fertility; controlling erosion; promoting forest stand growth; retarding or enhancing ecological succession; controlling or eradicating invasive species; and protecting vegetative resources from insects, disease, fire, and overuse.

The major threats to vegetative diversity and plant communities at Rend Lake are the increase in the number of invasive species and the impact of mineral development. Loss of vegetative resources has occurred due to inundation by lake waters as a result of long-wall coal mine subsidence. This loss has been mitigated through memorandums of agreement with Zeigler/Old Ben, Consol, and Freeman coal companies. Section 6.9 further discusses issues associated with long wall coal mining at Rend Lake.

D. Insect and Vector Problems. Prior to Rend Lake's construction, a significant limiting factor to the public's use of the Big Muddy Basin for recreational purposes was abundance of insects, which during summer months swarmed in great numbers. Experience to date has proven mosquito infestation to be light as compared to heavy

swarms previously found in the Big Muddy flood plain. Several factors may be responsible for this: changes in environmental laws concerning oil well operation, greater exposure of backwater pools to wind action which disturbs mosquito breeding, growth of surface feeding minnows in the lake, and incidence of falling water levels during critical breeding time. Although Rend Lake has eliminated many of the former breeding grounds for mosquitoes and other insects, some nuisance insects are present and are preyed upon by numerous birds, reptiles, amphibians, fish, and insects.

#### **5.05. ENVIRONMENTAL AND SCENIC QUALITIES**

A. Topographic Qualities. The topography of the lake area consists of gently rolling uplands with alluvial valleys and terraces developed along the Big Muddy River. The lake area is one of low relief. A more extensive description of Rend Lake area topography is presented in paragraph 6-06a.

B. Vegetative Qualities. The vegetative types were discussed in paragraph 5.04.C. above. Trees found around the periphery of the lake are mostly the edges and remnants of bottomland trees. As one moves away from the lakeshore, the amount of woodland decreases, being found mainly in scattered woodlots and along streambeds. Because most of the land surrounding the lake was once cropland, the wooded areas take on additional value as contrast and variety in the landscape.

C. Project Land Uses. Land management of lake lands is, for the most part, complementary to scenic qualities. Areas have been revegetated for recreational, wildlife, and scenic purposes. The zoning of the land and water resources is further discussed in Section VIII.

D. Water Quality. The water quality of Rend Lake has been designated as suitable for aquatic life, agriculture use, water supply, primary and secondary contact recreation, and most industrial uses. A more extensive description of water quality is presented in Section 6.08.

E. Visual Qualities. The lake itself is the largest, strongest visual element in the area. Due to the predominantly flat topography, the character of the shoreline edge takes on increased visual importance. When the lake was first constructed, the shoreline along the lake tended to be a series of broad, open, gentle slopes with scattered areas of trees. Now, the shoreline is primarily forested with 2<sup>nd</sup> growth hardwoods and some mudflats and agricultural fields in the northern areas of the lake and open areas adjacent to developed recreation areas.

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F. Status of Environmental Impact Statement. The Final Environmental Impact Statement on operation and maintenance for Rend Lake was completed and printed in December 1976.

### **5.06. RECREATIONAL DEVELOPMENT**

The recreational developments at Rend Lake offer exceptional opportunities for outdoor recreation. Major activities of the visiting public consist of sightseeing, fishing, boating, waterskiing, camping, picnicking, swimming, hiking, biking, wildlife viewing, and hunting. Park and recreation areas have been provided for both overnight and day-use opportunities. Included in these recreation areas are campsites (both tent and trailer), picnic sites, boat launching ramps, beaches, nature interpretive facilities, and trails.

Current trends show that visitors are no longer using picnic areas as they had in the past. With this type of recreation seeing little use, plans are in place to change part of a day use area to a group camping facility. This change is necessary to meet the needs of the public and lower the O&M of the areas that are seeing little use.

There has been an increased demand for full service campsites for larger camping units and with these larger units comes an increased demand for power. Campers have also requested water hookups if full service are not available.

In addition, an increased interest in bicycling opportunities has been seen in the region. As a result, the Rend Lake Bike Trail has been developed as a cooperative effort between the Corps, IDNR, Rend Lake Conservancy District, IDOT, and several other partner agencies. The development of the bike trail is further discussed in Section 10.06.



## Section VI

# Factors Influencing and Constraining Resource Development and Management

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## **SECTION VI - FACTORS INFLUENCING AND CONSTRAINING RESOURCE DEVELOPMENT AND MANAGEMENT**

### **6.01. GENERAL**

Development and management at Rend Lake is influenced by both physical and social factors. Several factors, such as the geology, archeology, history, ecology, environmental and scenic qualities, and recreational development, were previously discussed in Section V. The influence of these and other factors on resource management and development are examined in this section. It is the objective of the Corps to consider these factors in order to provide for the continued enjoyment and maximum sustained use by the public of the lands, waters, forests, and associated resources, consistent with their carrying capacity and their aesthetic and biological values.

### **6.02. DEMOGRAPHICS AND AREA INFLUENCE**

A. General. Rend Lake is located in Franklin and Jefferson Counties, Illinois. It is part of the Southern Illinois region and is situated in the Big Muddy River Basin which includes these two counties and five others: Hamilton, Jackson, Perry, Washington and Williamson counties. The Census of 2000 and U.S. Census Bureau State and County Quick Facts figures for this area show an increase in population between 1990 and 2007. Rural areas with little or no urbanization have experience a positive growth when those areas are compared with urban clusters. Table 6 shows population figures and rates of change for the study area.

TABLE 6

POPULATION OF U.S., ILLINOIS, AND BIG MUDDY BASIN COUNTIES - 1970-2007

	1970	1980	1990	2000	2007
U.S.	203,065,772	231,065,210	248,710,000	296,410,404	298,757,310
Illinois	11,113,976	11,418,461	11,431,000	12,419,293	12,783,049
Franklin	38,329	43,201	40,319	39,018	39,468
Hamilton	8,665	9,172	8,499	8,621	8,335
Jackson	55,008	61,522	61,067	59,612	58,990
Jefferson	31,446	36,354	37,020	40,045	40,153
Perry	19,757	21,714	21,412	23,094	22,632

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Washington	13,780	15,472	14,965	15,148	14,927
Williamson	<u>49,021</u>	<u>56,538</u>	<u>57,733</u>	<u>61,296</u>	<u>63,956</u>
7-County	216,006	243,973	241,015	246,834	248,461

SOURCE: 1. U.S. Census Bureau Census 2005-2007 3 year estimates  
2. U.S Census Bureau, Census 2000

### **B. Population.**

1. Growth and Distribution. Franklin and Jefferson Counties are primarily agricultural. Approximately 78 percent of those living in Franklin County and 55 percent of those living in Jefferson County reside in cities or villages, with populations greater than 275 persons, rather than on farms. Jefferson County, with an area of 584 square miles, has a lower density of people per square mile (70) than Franklin County (96), which has an area of 431 square miles. While the high percentage of people in both counties live in cities and villages, the 2007 Census of Agriculture indicates that approximately 232,531 acres of land in Jefferson County and approximately 207,877 acres of land in Franklin County was in farms. Between 2000 and 2006, the population of Franklin County and Jefferson County increased. Franklin County, which had a 2000 population of 39,018 increased to 39,862 in 2006. Jefferson County, which had a 2000 population of 40,045 increased to 40,523 in 2006. The largest influence on Franklin County's population is the town of West Frankfort, the population increased from 8,196 in 2000 to 8,285 in 2006. The population of Mt. Vernon, the Jefferson county seat, increased from 16,269 in 2000 to 16,344 in 2006. There are various reasons for changes in directions and rates of population growth in rural areas. One reason that may apply to the Rend Lake area of influence is an individual's amenity preference. Both counties and communities have attracted residents due to their close proximity to urban areas and the amenities provided there. However, individuals may also choose to live in a rural area and commute to their urban work locations.

2. Land Use and Area Development. Land in Franklin and Jefferson Counties is generally committed to rural use, with most of this rural land being devoted to crops. Farming dominated the area since the early nineteenth century. Roads served the primary purpose of enabling a farmer to get his goods to market. Recent trends toward mechanized farming and larger farms, however, have resulted in an expansion of towns, and the towns in turn have recognized the need for industry as an employment source. As the options and stability of the non-farming population have increased, more non-farm residence have appeared and dispersed throughout the counties. While non-farm residences are no longer restricted to the towns, most are still centered round them. Agriculture remains the dominant use of land in both counties, although recent developments are beginning to change the traditional agrarian pattern. Rend Lake has been one of the main influences in attracting non-agricultural land uses.

Urbanized areas are distributed somewhat differently within each of the two counties. Mount Vernon contains nearly one-half of Jefferson County's population. Benton and West Frankfort represent nearly one-half of the total population for Franklin County. Franklin also contains a group of smaller communities grouped in the southwest corner of the county, corresponding to the area of early coal mining activity which began dominating Franklin County in the early twentieth century. Between 2000 and 2006, Franklin County's population has increased by 2.1 percent and Jefferson County's population has increased by 1.2 percent. Most of the increase can be attributed to the rise in employment in state government, retail trade and manufacturing.

3. Existing Land Use. In 1965, Franklin and Jefferson Counties were almost entirely agricultural and coal mining with the exception of scattered incorporated areas. This pattern remained reasonable intact until the construction of Rend Lake, which removed thousands of acres from agricultural use. The major change in land use is the public access to the lake shoreline. Considerable land is currently developed for either recreational or conservation use. In total, 19,887 acres in Franklin and Jefferson Counties have been changed from primarily agricultural use to that of primarily recreational.

a. New commercial construction since 1972 has also resulted in some changes in land use to allow for recreation-oriented commercial activities. The principal businesses are bait shops, small private campgrounds, marina, storage sheds, resorts, restaurants and golf course. The State of Illinois completed construction of the Southern Illinois Arts and Crafts Marketplace on Rte. 154 west of I-57 in 1990 and the Rend Lake Resort at Wayne Fitzgerald State Park in 1992. Construction was completed on a destination type resort hotel in 1999 on lands controlled by the Rend Lake Conservancy District (RLCD) at Gun Creek. The RLCD has expanded to a 27 hole golf course with a driving range with plans for further expansion i.e. cabins, business park, rental and residential development and a future 18 hole golf course.

b. Private land holdings adjacent to the West Recreation Area are now being subdivided and several new houses have been constructed.

c. There are three boat factories in Franklin County that produce pleasure boats geared towards use at lakes such as Rend Lake. One of the factories is currently in operation and two are temporarily closed due to the slumping economy.

4. Future Land Use. Future land use in Franklin and Jefferson Counties will be determined to a great extent by the amount of use Rend Lake receives as a major regional recreation area. Land use forecasts made for the both counties indicate a resurgence in coal mining. Due to new technologies that allow for more

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environmentally friendly use of high sulfur coal, the coal industry should begin to increase in the area again.

5.     Employment. Jefferson and Franklin Counties were greatly dependent upon agriculture until the turn of the century. Franklin County then became a major coal producing county in the state. However, since 1930 the county has experienced a steady decline in coal mining production and employment. Jefferson County has remained largely agricultural with a fair degree of railroad employment. However, employment in the coal mining industry more than doubled in Jefferson County (from 800 employees in 1970 to over 2,100 in 1980). This trend in mining employment continued in the decade, 1980-1990 and the county became the second leading coal producer in the state. Both counties continued to lose population from 1960 to 1970, but the rate of decline slowed and began a turnaround from 1970 to 1980. This again reversed itself between 1980 to 1990 in Franklin County but sustained a mild increase in Jefferson County. The same happened from 1990 to 2000 with a slight decrease in Franklin County and an increase in Jefferson County. In 2006 both counties had a slight increase due to the increased employment in the retail trade, manufacturing and state government. Unfortunately, population losses tend to be heaviest among young adults who leave to find better job opportunities or for higher education. Recent years have experienced minimal fluctuations in employment characteristics. Table 7 displays the numeric and percentage breakdown by industry for civilian labor force employees of Franklin and Jefferson Counties.

Agriculture, however, remains a major factor in the economy of both Franklin and Jefferson Counties, as well as in the State of Illinois as a whole. Recent trends indicate a continued increase in the size and value of farming units, and value of products sold, for both counties and state. Table 8, 9, and 10 display these and other characteristics. The figures for both counties shown in Tables 8 and 9 approximate those for the State of Illinois shown in Table 10. The median age for all the residents of Franklin County in 2007 was 40.3 years old, for Jefferson County was 37.6 years old, and for Illinois was 34.8 years old.

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TABLE 7  
CIVILIAN EMPLOYMENT BY INDUSTRY, 2007

Industry	<u>Franklin County</u>		<u>Jefferson County</u>	
	Employed Persons	Percent of Labor Force	Employed Persons	Percent of Labor Force
Ag., Forestry, Fishing, Hunting and mining	730	4.7	455	2.5
Construction	815	5.2	1167	6.5
Manufacturing	2130	13.7	2176	12.1
Wholesale Trade	557	3.6	631	3.5
Retail Trade	2006	12.9	2523	14.0
Transportation, warehousing, and utilities	778	5.0	1793	9.9
Information	369	2.4	351	1.9
Finance, Insurance and Real Estate.	610	3.9	733	4.1
Professional, scientific, management, and administrative and waste management services	780	5.0	942	5.2
Educational services, and health care and social assistance	3301	21.2	3783	21.0
Arts, entertainment and recreation, and accommodation, and food services.	1515	9.7	1937	10.7
Other services, except public administration	964	6.2	815	4.5
Public Administration	993	6.4	727	4.0
TOTAL	15548		18033	

SOURCE: U.S. Census Bureau, Census 2005-2007 3 year estimates

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TABLE 8

CHARACTERISTICS OF AGRICULTURE  
For Franklin County, Illinois

	<u>1997</u>	<u>2002</u>	<u>2007</u>
Farms	658	727	785
Acres	179,588	179,694	207,877
Average Size (acres)	273	247	265
Value of Land and Buildings:			
Average/Farm	\$297,123	\$468,860	\$671,184
Average/Acre	\$1,112	\$1,573	\$2,535
Market Value of Products Sold (\$1,000)	\$31,638	\$26,894	\$56,626
Crops (\$1000)	\$24,814	\$16,438	\$45,490
Livestock (\$1000)	\$6,824	\$10,457	\$11,137
Average/Farm	\$48,082	\$36,993	\$72,135
Market Value of all Machinery and Equipment Average/Farm	\$53,862	\$75,087	\$80,319
Average Age	55.9	58	57

SOURCE: U.S. Census of Agriculture, 2007

TABLE 9

CHARACTERISTICS OF AGRICULTURE  
for Jefferson County, Illinois

	<u>1997</u>	<u>2002</u>	<u>2007</u>
Farms	962	1,168	1,156
Acres	229,512	259,294	232,531
Average Size (acres)	239	222	201
Value of Land and Buildings:			
Average/Farm	\$285,222	\$319,517	\$570,152
Average/Acre	\$1,075	\$1,333	\$2,834
Market Value of Products Sold (\$1,000)	\$35,217	\$32,063	\$50,961
Crops (\$1000)	\$28,174	\$23,694	\$40,688
Livestock (\$1000)	\$7,043	\$8,369	\$10,273
Average/Farm	\$36,608	\$27,451	\$44,084
Market Value of all Machinery and Equipment Average/Farm	\$60,565	\$53,455	\$72,646
Average Age	54	54.7	56.9

SOURCE: U.S. Census of Agriculture, 2007

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TABLE 10

CHARACTERISTICS OF AGRICULTURE  
for the State of Illinois

	<u>1997</u>	<u>2002</u>	<u>2007</u>
Farms	73,051	73,027	1,156
Acres	27,204,780	27,310,833	232,531
Average Size (acres)	372	374	201
Value of Land and Buildings:			
Average/Farm	\$773,141	\$913,251	\$570,152
Average/Acre	\$2,126	\$2,425	\$2,834
Market Value of Products Sold (\$1,000)	\$8,556,486	\$7,676,239	\$50,961
Crops (\$1000)	\$6,567,164	\$5,871,542	\$40,688
Livestock (\$1000)	\$1,989,323	\$1,804,697	\$10,273
Average/Farm	\$117,130	\$105,115	\$44,084
Market Value of all Machinery and Equipment Average/Farm	\$90,447	\$102,242	\$72,646
Average Age	53.4	55.1	56.2

SOURCE: U.S. Census of Agriculture, 2007

6. Income. Income is generally lower in rural areas than in urban or metropolitan areas. This can be seen in Table 11 which shows the median family and household incomes for Franklin and Jefferson Counties, as well as the largest city in each, along with the same information for several nearby counties and urban areas. For the purpose of discussion related to Table 11 the family is defined as two or more persons occupying the same housing unit who are related by birth, marriage, or adoption, and household is defined as one or more persons occupying the same housing unit who are not necessarily related by birth, marriage, or adoption.

a. The difference in income is attributable to urban areas having more job opportunities at a higher wage rate that can be found in rural towns. This is a result of the concentration of commerce and manufacturing found in urban clusters, such as in major metropolitan areas.

Table 11

MEDIAN INCOMES FOR SELECTED AREAS, 2007

	<u>FAMILY</u>	<u>HOUSEHOLD</u>
Franklin County	\$42,316	\$33,963
West Frankfort	\$38,858	\$28,930
Hamilton County	\$44,691	\$37,500
McLeansboro	\$41,039	\$25,446
Jefferson County	\$49,453	\$41,705
Mt. Vernon	\$45,411	\$32,134
Jackson County	\$48,924	\$31,146
Carbondale	\$40,449	\$18,141
Perry County	\$48,612	\$38,983
DuQuoin	\$44,639	\$33,409
Washington County	\$57,490	\$48,727
Nashville	\$52,792	\$48,227
Williamson County	\$48,525	\$38,914
Marion	\$44,559	\$34,747

SOURCE: 1. U.S. Census Bureau, Census 2005-2007 3 year estimates  
2. City-Data.com, Estimated 2007

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b. Table 12 shows general labor force statistics for Franklin and Jefferson Counties obtained during the 2007 Census estimates.

Table 12

CIVILIAN LABOR FORCE STATUS  
FRANKLIN AND JEFFERSON COUNTIES AND THE STATE OF ILLINOIS  
2007

	<u>Franklin</u>	<u>Jefferson</u>	<u>Illinois</u>
Population 16 years and over	31,621	32,355	9,946,551
Civilian Labor Force	17,207	19,058	6,581,924
Percent in Labor Force	54.4	58.9	66.2
Percent Employed	44.8	53.5	58.7
Percent Unemployed	9.6	5.4	7.5

SOURCE: U.S. Census Bureau, Census 2005-2007 3 year estimates

7. Housing. In 1980, approximately one-third of all housing in Franklin and Jefferson counties had been built since 1960. This is considered to be the period of influence or the period when local people knew that Rend Lake was being constructed. Most housing around the lake was constructed on small tracts of land not in subdivisions so there are no zoning controls. Table 13 shows the single-unit residential construction history of both counties and the major city of each.

TABLE 13

SINGLE UNIT RESIDENTIAL HISTORY

FRANKLIN COUNTY

	<u>2000</u>	<u>2007</u>
NUMBER OF HOUSING UNITS	18,105	18,393
PERCENT OWNER OCCUPIED	70.4	68.4
PERCENT RENTER OCCUPIED	20.2	19.3
PERCENT VACANT	9.3	12.3

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***Rend Lake Master Plan*****CITY OF WEST FRANKFORT**

NUMBER OF HOUSING UNITS	3,973	3,967
PERCENT OWNER OCCUPIED	61.5	60.9
PERCENT RENTER OCCUPIED	29.0	29.4
PERCENT VACANT	9.5	9.7

**JEFFERSON COUNTY**

NUMBER OF HOUSING UNITS	16,990	17,523
PERCENT OWNER OCCUPIED	67.5	67.4
PERCENT RENTER OCCUPIED	23.0	22.9
PERCENT VACANT	9.5	9.7

**CITY OF MT. VERNON**

NUMBER OF HOUSING UNITS	7,814	7,845
PERCENT OWNER OCCUPIED	53.9	54.0
PERCENT RENTER OCCUPIED	35.6	35.1
PERCENT VACANT	10.6	10.9

SOURCE: 1. U.S. Census Bureau, Census 2000  
2. City-Data.com, estimated 2007

**6.03. ECONOMIC POTENTIAL**

A. The economic potential relative to water recreation commercial uses can generally be based on the degree of visitor attraction the project possesses. At Rend Lake, visitation increased slowly from 1972, when the lake opened, until reaching its peak in 2007 visits. In 2006 visitation decreased due to severe weather in the spring but rebounded in 2007. Visitation was also down in 2008 due to budget constraints and parks remaining closed. Since 1994, visitation has increased every year except for 2006 and 2008. The past three years comparison of visits are 2006 had 3,095,362, 2007 had 3,216,132 and 2008 had 2,981,354.

B. Severe weather conditions occurring during December, January, and February generally restrict recreational use of the project during that period, except for waterfowl, deer and small game hunting and some fishing. The peak visitation months are usually May, June, July and August.

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C. Rend Lake continues to be an important regional attraction. The lake has unique physical qualities not found elsewhere in Southern Illinois. The sloping, tree covered banks of the coves attract fishermen and the lake is considered one of the best crappie fishing lakes in the region. The lake is quite scenic by boat, automobile, or on foot. The 2008's data indicate that 35 percent of the visitation consisted of sightseers.

D. Recent development in the state parks and private development in the project area has the potential to attract additional visitation. Local area tourism groups work hard at promoting the project and its activities, which could also increase visitation. The increased interest in personal watercraft has changed the complexion of boating and shows indications of increasing project use. The developments at the lake include the Rend Lake Marina, Wayne Fitzgerald State Park Resort, and the Rend Lake Conservancy District Golf Course, Seasons Lodge, Restaurant and Conference Center.

E. Another positive factor of economic consideration is the project accessibility. The regional highway network allows ease of travel by Interstate 57. Although Chicago is 300 miles away, the drive is completely on the interstate. Other major metropolitan areas such as the St. Louis have the same easy drive with quick access to the lake off of the interstate.

F. Presently, there are two concessionaires at Rend Lake offering water based recreational services. These include power boat sales and service, rental slips, boat rentals, marine supplies, fishing supplies, and food and drink concessions. Based on actual demand for facilities and services, these concessionaires may wish to expand their marina operations in future years. Requests for marina expansion will be carefully considered. However, any future energy crises, especially affecting gasoline supply and cost, and the current recession could be a factor affecting the economic outlook of these commercial operations.

G. There are two areas designated for possible concessionaires. One is the Jackie Branch Future Recreation Area which is designed for a future marina site. The other area is North Marcum Future Recreation Area which could be used for anything from primitive camping to cabin type facilities. Any development would be fully described in a supplement to the master plan.

H. A positive recommendation based on a market feasibility study will be required before construction of any more commercial concessions, marinas and/or overnight accommodation developments on public lands/waters at Rend Lake. A market feasibility study has not been performed at Rend Lake since August 1985.

1. The Wayne Fitzgerald State Park Resort has 105 rooms and 11 cabins containing two units in each and some with fireplaces, an outdoor swimming

pool, tennis courts, bike trail, restaurant, convenience store, gift shop, boat rentals and a conference center that can accommodate 25 to 600 people.

2. Because of ever increasing fuel costs and the economy in a recession, more families will vacation close to home rather than traveling across country. Overnight accommodations at Rend Lake are attractive to people from St. Louis, Chicago, urban places from central and southern Illinois, southern Indiana, western Kentucky and southeast Missouri. This information was referenced from the Outdoor Recreation Management Suite "Facility Utilization Detail Report" and "Reservation Customer Demographics Report."

#### **6.04. HIGHWAY AND ROAD ACCESS**

A. Major Highways. Regional access to Rend Lake is excellent and is provided by Interstate 57, which runs north and south through the State of Illinois and crosses the lake. Interstate 64 provides an east and west connection between St. Louis, Missouri and Louisville, Kentucky. Interstate 24 connects Interstate 57 at Marion, Illinois to Paducah, Kentucky. North and south circulation is further supplemented by State Highway 148 on the west side of the lake, and State Highway 37 on the east. Access from the east and west is provided by State Routes 154, 14 and 34.

B. Primary and Secondary Roads. These are county and township roads that provide access from the major highway networks to Rend Lake. Primary roads are the principal travel routes. Those roads used less often are classed as secondary roads. Generally the condition of these roads varies from good to poor relative to their paving, width, and cross section. Many are narrow in width, reducing their carrying capacities during peak visitor weekends and presenting hazardous conditions for the visiting public.

Access road problems and the priority of road needs are explained in Section 10-09. The following is a descriptive listing of primary and secondary roads. These roads are shown and indexed on Plate 4.

1. Road 1. Park Street Rd. Secondary access from State Highway 148 to Rend City, Illinois. Condition: fair; paving: asphalt, 18' wide; 2-4' shoulders.

2. Road 1a. Water Rd. Condition: fair, part is gravel and part is paved: asphalt, 18' wide, 2-4' shoulders.

3. Road 2. Rend City Road. Primary access from Illinois Highway 14 to Illinois Highway 154. This road provides primary access for the following access areas: West Access Area, North and South Sandusky, and Jackie Branch. This road is

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divided into sections due to different surface types and conditions, and are briefly described below:

a. State Highway 14 to Dam. Condition: good; paving: concrete, 24' wide; 8' shoulders.

b. Dam to Park Administration Building. Condition: good; paving: asphalt, 20' wide; 4' shoulders.

c. Administration Building to South Sandusky. Condition: good; paving: asphalt, 18' wide; 1-2' shoulders.

d. South Sandusky to North Sandusky. Condition: good; paving: asphalt, 18' wide; 1-2' shoulders.

4. Roads 2a, b, c, d, e, f, g, h. (Old Ben Road, Mine 21 Rd, N. Timbuktu Ln, N. Spruce Ln, Banister Rd, Horse Prairie Rd, E. Harper Rd, and Waltonville Access Rd.) Secondary access from North Sandusky and State Highway 154 to the Sesser and Turnip Patch Access Area and the Big Muddy Wildlife Management Area. Condition: good; paving: asphalt, 18' wide; 1-2' shoulders. E. Ragtime Rd is gravel and dirt and is in average shape.

5. Road 3. Peach Orchard Rd. Secondary access from State Highway 148 to the South Sandusky Access Area. Condition: good; paving: asphalt, 18' wide; 1-2' shoulders.

6. Road 4. Keller Mine Rd., Barren Rd., and Coal St. Secondary access from State Highway 148 at the town of Sesser to North Sandusky Access Area. Condition: Same as Road 3.

7. Road 5. Illinois Highway 154. Connects State Highways 148 and 37 and Interstate 57. The road runs from Sesser across Rend Lake and connects Whittington on the east side of the lake. This route provides primary access for Jackie Branch, Wayne Fitzgerald State Park, and the Gun Creek Access Area. Condition: excellent; paving: concrete, 24' wide; 8' shoulders.

8. Road 6. E. Emerson City Rd. Secondary access road from Illinois 148 to the northern portion of the Sesser Multiple Resource Area and the Turnip Patch Access Area. Condition: poor.

9. Road 7. E. Casper Rd. Provides secondary access from State Highway 148 to the Big Muddy Subimpoundment Dam. Condition: fair.

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10. Road 8. Illinois Highway 148. Provides access from Waltonville to State Highway 37 at Mt. Vernon. This road provides access to the northern reaches of the lake and the Big Muddy Wildlife Management Area. Condition: good; paving: 24' wide; 1-4' shoulders.
11. Road 9. N. Cherryville Rd. Provides secondary access from Illinois Highway 148 to the east side of the Big Muddy Subimpoundment dam. Condition: fair.
12. Road 9a. E. Bonnie Rd. Condition: fair
13. Road 9b. E. Springsteen Rd. Condition. fair
14. Road 10. N. Nason Ln. Provides primary access from Illinois Highway 148 to Nason, Illinois. Condition: good; paving: asphalt, 18' wide; 1-2' shoulders.
15. Roads 10a, b, c, d. E. Jefferson Rd., E. Deer Valley Rd., N. Keystone Ln., E. Vail Rd. County Roads providing secondary access to Willbanks Woods, Elk Prairie, and Bluegill Hole access points. Condition: Same as Road 10
16. Road 11. E. Bonnie Rd. Provides access from Illinois Highway 148 to Casey Fork Wildlife Management Area. Condition: Same as Road 10.
17. Road 11a. N. Vermont Ln. Condition: Same as Road 10.
18. Roads 11b, c, d. N. Cooley Ln, E. Saddleclub Rd., and E. Redwood Rd. Provides access to the Bonnie Access Areas. Condition: Similar to Road 10 with some stone surface.
19. Roads 11e, f, g. Elizabeth Rd., E. Adams Rd., and N. Ludwig Ln. Provides access from Highway 37 to Bonnie Lane, Atchison Creek and Whitetail Ridge Access points. Condition. good paving, asphalt, 18' wide with 1' to 2' shoulders with some stone surface.
20. Road 12. N. Ken Grey Parkway. Provides access from Illinois Highway 37 to the Rend Lake Community College, the Ina Access Area, and to Ina, Illinois. Condition: good; paving: asphalt, 20-24' wide; 3-6' shoulders.
21. Road 13. Gun Creek Trail. Primary access from Illinois Highway 154 to the Gun Creek Area. Development of this access road is by the Rend Lake Conservancy District and the Illinois Department of Transportation. Condition: good; paving: concrete, 24' wide; 8' shoulders.

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22. Road 14. Marcum Branch Rd. Primary access from Highway 37 to the North Marcum Access Area and the Rend Lake Conservancy District's water treatment plant and administrative offices. Condition: good; paving: asphalt, 20' wide; 4' shoulders.

23. Road 15. DuQuion St., Licata Rd. Primary access from Benton to South Marcum Access Area, the Dam, and the Spillway Access Area. Condition: good; paving: asphalt 22' wide; no shoulders.

24. Road 15a. Petroff Rd. Condition: Same as Road 2a, but in fair condition with 1' shoulders.

25. Road 16. Central Street, Mine 24 Rd. Primary access from Benton to South Marcum Access Area, the Dam, and the Spillway Access Area. Condition: good, paving: asphalt 22' wide; no shoulders.

### **6.05. RELATED RECREATIONAL RESOURCES**

Within the Rend Lake zone of influence, several water-oriented recreational resources are available. Major recreational opportunities include Crab Orchard National Wildlife Refuge, which contains three lakes (Crab Orchard, Little Grassy, Devil's Kitchen) totaling 8,800 acres of water surface; Kincaid Lake, located in the 278,500 acre Shawnee National Forest, which contains approximately 3,000 water surface areas; Lake of Egypt has about 2,300 acres of surface water and a portion of the lake is located within the Shawnee National Forest; Carlyle Lake and Lake Shelbyville, which are Corps of Engineer water-resource projects, are located north of Rend Lake and contain 26,000 and 11,100 water surface acres respectively. In addition to these recreational areas, the area of influence contains numerous state parks, memorials, and conservation areas. Many of these provide some form of water-oriented recreation. TABLE 14 contains a summary of the related recreational areas in Southern Illinois.

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Table 14

Related Recreational Resources in Southern Illinois

	Land Acreage	Water Acreage	Campin g	Picnicking	Boatin g	Fishing	Huntin g	Swimmin g	Hikin g Trails	Natur e Trails	Horsebac k Riding	Lodging Facilities	Concession s
Crab Orchard National Wildlife Refuge (NSFWS)	35,200	8,800	X	X	X	X	X	X	X	X	X		X
Shawnee National Forest (USFS)	278,531	18,800	X	X	X	X	X	X	X	X	X		X
Kincaid Lake (Kincaid – Reed Cons. District & IDNR)	4,300	2,750	X	X	X	X	X	X	X	X			X
Lake of Egypt (So. IL Power Co-Op)	N/A	2,300	X	X	X	X		X					X
Carlyle Lake (USACE)	19,200	26,000	X	X	X	X	X	X				X	X
Lake Shelbyville (USACE)	13,780	11,100	X	X	X	X	X	X	X	X	X	X	X
Giant City State Park (IDNR)	4,000		X	X		X	X		X	X	X	X	X
Ferne Cliff State Park (IDNR)	2,430	16	X	X		X	X		X		X		
Dixon Springs State Park (IDNR)	801		X	X			X	X	X	X			X
Lake Murphyboro State Park (IDNR)	877	150	X	X	X	X		X	X	X			X
Cave-in-Rock State Park (IDNR)	204		X	X	X	X		X	X			X	X
Ft. Massac State Park (IDNR)	1,450		X	X	X	X	X		X	X			X
Ft. Defiance State Park (IDNR)	38			X	X	X							X
Mermet Lake Conservation Area (IDNR)	1940	690		X	X	X	X		X	X			X
Horseshoe Lake Conserva tion Area (IDNR)	7,800	2,400	X	X	X	X	X						X
Union County Conserva tion Area (IDNR)	5,350	1,100				X	X						
Trail of Tears State Forest (IDNR)	5,114		X	X			X		X	X	X		
Pyramid State Park (IDNR)	19,201	500	X	X	X	X	X		X		X		
Washington County Conserva tion Area (IDNR)	1,440	248	X	X	X	X	X		X				X
Ten Mile Creek Fish and Wildlife Area (IDNR)	5,820	200			X	X	X						

(USFWS) U. S. Fish and Wildlife Service  
(USACE) U. S. Army Corps of Engineers

(USFS) U. S. Forest Service  
(SO. IL. POWER CO-OP) Southern Illinois Power Co-Op

(IDNR) Illinois Department of Natural Resources

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## **6.06 TOPOGRAPHY AND GEOLOGY**

A. Topography. The broad flat valley of the Big Muddy River and its tributaries: Casey Fork, Gun Creek, and Atchison Creek, are bordered by gently rolling uplands with some areas relatively flat. The relatively flat terrain does not impede high winds. The wave action created by these winds has resulted in the erosion along the Illinois Highway 154 causeway and the upstream slope of the dam. Erosion protection and maintenance is implemented only for critical lake shoreline, areas which includes the upstream slope of the dam, exit and spillway channels, the subimpoundment dams, the Highway 154 causeway and selected recreational use areas such as boat ramps. This low relief topography coupled with fluctuations in lake level results in adverse effects on the plants of the wetlands community and the exposure of mudflats. Although extensive mudflat areas have not developed to date, the potential exists. However, the mudflats that have developed are beneficial in terms of providing habitat for various species of migrating waterfowl and shorebirds. Management of areas taking on this character will include the introduction of vegetation suited to intermittent flooding.

B. Geology. There are several potentially adverse geological influences on the development and management of the Rend Lake facility. The main factors to be considered are the effects of economic mineral extraction, faulting, and regional seismicity.

Coal and oil production are major industries in the Rend Lake area. Issues surrounding extraction and subsidence are discussed in Sections 6-09 and 6-10. Even though coal mining is down in the region for now there have been major improvements in the mining industry for use of the high sulfur coal from this region and mining is expected to make a major return in the near future.

The Rend Lake fault zone extends beneath the Rend Lake dam. This fault zone, which appears to be related to the Centralia fault zone, is known to extend north-south at least 15 miles. The Rend Lake fault zone, as revealed by coal mine investigation, has a total vertical displacement of 50 feet from high angle, vertical faults. The faults have been inactive for significant geologic time. Since recent displacement along the faults has not occurred, new movement along the fault zone is unlikely. Fault gouge, as viewed within the coal mines, is relatively impermeable to water movement. There is no water seepage into the coal mines along the fault. The fault gouge, along with the overburden cover, acts to restrict water flow through the fault zone from the lake.

Rend Lake borders a major seismic risk zone of the United States Seismic Risk Map. An earthquake of 5.3 magnitude, Modified Mercalli Intensity VII, occurred on 9 November 1968 about 25 miles from the dam site. Historically, no severe earthquakes have occurred in the lake area. As the seismic instrumentation of the region has

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improved, sitings of small seismic events has increased. There is no correlation of any seismic event to geologic structures in the area. There is no evidence of surface faulting due to seismic activity in the area. The potential for the Rend Lake fault zone to have displacement produced by an earthquake is low. An extensive earthquake analysis of the dam and foundation was completed by the Corps in 1981. This study concluded that the dam was safe under normal conditions; however there is potential for slope failures on the dam during a large (7.5 magnitude) New Madrid event.

### **6.07 WATER ALLOCATION**

As discussed in 2.03C, Rend Lake's water storage pool is divided into four pools: Inactive, Joint-Use, Flood Control, and Surcharge. The Joint-Use pool, the portion of the lake between elevation 391.3 feet NGVD and 405 feet NGVD, has a capacity of 160,000 acre-ft and a maximum surface area of 18,900 acres. The Joint-Use storage pool is further subdivided into two allocations: Water Supply and Low-Flow Regulation.

A. Water Supply. The allocation for water supply is 68.125% of the usable joint use water storage space and is estimated to contain 109,000 acre-ft. This equates to an average yield of 70 million gallons per day (mgpd) withdrawal. The State of Illinois has entered in a water storage contract with the Corps of Engineers for the use of the water in this storage space.

Under this contract, the State receives requests and issues water contracts to entities who wish to withdraw water from the lake. According to the contract, the Corps of Engineers is required to permit structures necessary for the purpose of water withdrawal. The Corps of Engineers approves the design and location of such structures and considers recreational and environmental impacts of such construction in the approval process.

At this point in time, one entity, Rend Lake Conservancy District, is withdrawing water from Rend Lake at an average rate of 17.5 mgpd. They supply 300,000 people in 60 communities close to 17.5 million gallons per day. The state has also issued preliminary permits for other entities for the withdrawal of an additional 46.8 mgpd, but no entity has approached the Corps requesting permits to build intake structures.

Adena/Akin Energy, LLC has a signed water supply agreement with the Illinois Department of Natural Resources for withdrawal of 6.5 million gallons of water per day to be removed from Rend Lake. In order to remove the water from Rend Lake they will be placing a water intake structure in the lake at a location approximately 100 yards east of the South Marcum Boat ramp. They will build a pumping station on top of the bluff directly south of the intake structure. The water will be pumped from Rend Lake and will travel through a 20" water main to a water holding pond located at a coal mine, which is currently under construction near Thompsonville, IL. The route that the water main will

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travel is still under discussion. The proposed location for the water main would travel from the pumping station south and intersect with the Rend Lake Bike trail and the South Marcum entrance road. The line will be drilled under both the bike trail and the entrance road and proceed in a south/southeast direction to the Main Dam Road. The proposed route will be for the water line to travel east and then south to follow right of way along the Main Dam road. At the intersection of Licata road Adena would like to have the line travel east inside the power line easement of the CIPS and the Southeastern Illinois Electric Cooperative. The line will turn back north on Corps of Engineers property until it reaches a point where it will turn back east and proceed on private land to the coal mine approximately 20 miles east.

B. Low Flow Regulations. The remaining 51,000 acre-ft of water stored in the Joint-Use pool is allocated for maintaining a minimum downstream flow for pollution abatement. Prior to the construction of the Rend Lake dam, the Public Health Service indicated that the forecasted future population growth in the basin would contribute a large domestic and industrial waste load to the stream, even after such waste loads had been processed through a high degree of sewage treatment. Under low flow conditions characteristic of the Big Muddy River, a severe degradation of the water quality will take place. As a result, a minimum down stream release of 30 cfs is maintained.

C. Other Water Uses. There is no outright allocation of water for recreation or fish and wildlife management. According to the U.S. House document that authorized the lake, the storage available for water supply and pollution abatement (low flow regulation) will afford opportunity for the improvement of fish and wildlife resources. In addition, with approximately 18,900 surface acres available at normal pool elevation, the U.S. House document states that the project is favorable for recreational development and use.

Concerns have been raised within the waterfowl hunting groups that insufficient attention has been given to the possible impacts of withdrawing the full water supply allocation, especially during drought conditions. The waterfowl hunter groups' concerns center around the wetland and mudflat ecology and the negative impacts a drawdown of the lake level would have on the habitat quality and migration patterns of waterfowl in the area. In addition, there is some concern that this possible reduced lake levels would adversely effect recreation at the lake. Recreation at Rend Lake has become a driving factor in the area's economy, with visitors adding approximately \$73 million annually to the regional economy.

Initial studies of water availability in the joint use pool may not have fully examined the impacts to recreation and aquatic resources if the full water supply allocation is withdrawn, especially during periods of drought. Studies are needed to examine this

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issue fully to ensure that the water withdrawals do not adversely affect the other authorized uses of the lake, mainly recreation and fish and wildlife conservation. This will be discussed further in Section 10-06.

### **6.08 WATER QUALITY**

A. Water Usage. The water quality of Rend Lake is associated with four distinct water usage categories. The first use is primary contact recreation, which includes swimming and other activities in which water may be accidentally ingested. The second major water use is secondary contact recreation, which represents such activities as boating, wading and fishing. The third usage category is public water supply since the Rend Lake Conservancy District uses Rend Lake for its water supply. The fourth and final usage is aquatic habitat. The Water Pollution Regulation of Illinois considers all of these uses and specifies water quality criteria.

B. Compliance with State Regulations. Generally, the water quality of Rend Lake is in compliance with the state regulations. The water quality of the tailwater, unless affected by runoff conditions, generally is good. At certain times, however, the water quality of the tributary streams exceeds the nutrient loading specified by the State of Illinois. This is generally associated with a runoff event from the Mt. Vernon Urban Area of the agricultural area of Rayse Creek. As the water enters the pool area from the tributaries, the velocities decrease causing settling to occur, which reduces the majority of nutrient loading experienced in the upper reaches of the tributaries. The majority of nutrients settle within the subimpoundment areas. During the late summer months the dissolved oxygen values in the pool, because of higher temperatures and a slow rate of surface aeration, drop below the State's minimum requirement of 5.0 mg/l. Since algae are not prominent and little diurnal variation occurs, these low values cause little or no noticeable problems. The water quality of the lake, except for the minor dissolved oxygen problem, is suitable for all uses specified.

C. Monitoring of Water Quality. Seven stations within the Rend Lake Drainage Basin are monitored in a joint effort between the State of Illinois and the St. Louis District. Both physical and chemical data are gathered. Three of the seven stations are pool stations, one is a tailwater station, and three are tributary stations. Water samples collected from these locations are analyzed for approximately 20 parameters to enable potential water quality problems to be detected early and appropriate solutions developed.

### **6.09 COAL MINING**

Rend Lake overlies the largest reserves of thick, relatively low sulfur coal in the State of Illinois. This area is known locally as the "Quality Circle" and has been extensively mined since the late 1800's. The reservoir area overlies the Herrin No. 6 coal

seam, which is 5-8 feet thick at a depth of 600-675 feet below the surface, and the Springfield coal seam (formerly known as Harrisburg No. 5), which is 4-6 feet thick and 640-715 feet below the surface. The government purchased mineral rights for the main dam, the subimpoundment dams, and several other major structures for safety and structural reasons. The remainder of the coal under project lands and water is owned by several major corporations. At the time of design and construction of the lake, the Corps recognized the rights of the corporations to mine and extract the coal reserves from the project areas. At that time, it was believed that the impoundment of water on the surface should have no adverse effect on the mining of the coal beneath, and the mining of coal should have no adverse effect on the impounded waters above. However, changes in mining techniques have had far reaching impacts which were not originally envisioned.

A. History of Mining Technology Around Rend Lake. Most of the abandoned mines near and under the lake utilized the room and pillar mining method with 50 to 60 percent extraction. Normal room and pillar mining left enough coal underground to support the roof. However, subsidence of the surface due to collapse of the subjacent void can occur, but it is random and impossible to predict.

In the late 1940's the Old Ben Coal Co. began to utilize a higher extraction (60 to 80 percent) mining method. This method, called high extraction retreat mining, is a form of room-and-pillar mining that extracts most of the coal. Rooms and pillars are developed in the panels, and the pillars are then systematically removed. This method is also used in second mining of existing room-and-pillar mines, where the existing pillars are removed. This mining method results in subsidence of the surface above the mined area within weeks.

In 1976, the Old Ben Coal Company, in association with the U.S. Bureau of Mines, initiated the first successful longwall mining operation in Illinois. Longwall mining is a method of extracting coal in which the coal seam is removed in one continuous operation along a long working face by means of a cutting machine and conveyor system protected by a shield-type roof support system. The working face and mining equipment advance in a continuous line several hundred yards long parallel and connected to an access shaft. The space from which the coal has been removed is allowed to collapse immediately behind the advance of the roof support shield. This development of new technology allows for the complete extraction of the coal vein. This has resulted in almost immediate subsidence of the surface as it settles behind the mining equipment. As a result, the 600 to 900 foot wide, mile long (longwall) "panels" have had and will continue to have a profound affect on some facilities.

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B. Mining Impacts. According to the Illinois State Geological Survey, high-extraction mining methods, longwall mining and high extraction retreat mining, result in surface subsidence starting above the mined area within several days or weeks after the coal has been removed. The subsiding of the overburden over the mined-out area may continue for years. The initial large and rapid ground movements associated with this mining method diminish rapidly after a few months. Once subsidence has decreased to levels that no longer cause damage to structures, the land may be suitable for development.

Today all the coal companies operating around Rend Lake use longwall mining technology. The extraction rate inside the panel is 100 percent. Panel length is about 5000 feet and width is 400 to 800 feet. The maximum subsidence, in the center of the panel, is 70 to 75 percent of seam height (8 ft. seam = 6 ft. surface subsidence). Subsidence at the surface extends about 300 to 400 ft. from the panel sides. Ground strains are high and structural damage can be severe. Deformation occurs at the surface above the mined area within hours following extraction. Significant deformations continue at the surface for up to a year following coal extraction.

Subsidence due to coal mining has had significant influence on the lake margin. It has had the effect of deepening the lake and changing bottom contours, of causing structural damage to Government property, and of altering the reservoir shoreline configuration and elevation such that reservoir water has inundated or encroached on additional Government land. This new inundation has negatively impacted wildlife habitat. Bottomland hardwood forests have been flooded so that areas that were periodically flooded became permanently flooded, killing the trees. Agricultural fields have been inundated or access to them has been cut off, thus impairing the manipulation of the habitat to benefit waterfowl and other early succession wildlife. Subsidence has also damaged mudflat habitat by deepening the water and changing the slope, thereby making the mudflats unavailable to wading shorebirds and other wildlife that rely on shallow mudflat habitat. Subsidence around the lake may also cause slope instability; erosion problems; road hazards including cracks, buckling, and differential settlement (especially adverse at bridges); buried conduit disruption, and sewage disposal problems.

In the future, subsidence occurring near private land may cause reservoir water to encroach on privately owned land. Depending on the severity of the flooding, the government may be required to obtain flood easement rights for the affected land or to purchase the land in fee.

C. Remediation Efforts. The St. Louis District recognized during the early project planning process that coal would eventually be mined and that occasional subsidence was possible. The potential effects of mining subsidence on the

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performance of the dam and reservoir have been studied since the original design and location were selected in 1967. Studies by CELMS-ED-G include analysis of the effect of subsidence on the main dam (1979 & 1989), on the North Marcum Recreation Area (1984), and on the reservoir lands (1986 & 1990). Real estate acquisition did not consider that there would be significant subsidence since the primary method of mining occurring during the time land was being acquired was the room and pillar method.

In 1984, after substantial damage due to subsurface mining had occurred to the project due to longwall mining, the St. Louis District explored its legal options to remedy this damage. In 1977 the Surface Mining Control and Reclamation Act was enacted. This Act placed responsibilities upon the coal companies to mitigate or repair the damages created on the surface by underground mining activities. While the exact effect of this Act was unclear, the coal companies mining beneath Rend Lake; Ziegler/Old Ben Coal Company, Mt. Vernon Coal Company, Freeman United & Coal Mining Company, and Consolidation Coal Company; entered into Memoranda of Understanding (MOU's) with the St. Louis District whereby they agreed to take all reasonable measures to prevent, minimize, or remedy the adverse impacts of mining operations and surface subsidence upon the project. These MOU's varied to some degree, but all of them recognized the impact that underground coal mining has on government facilities. They constitute a voluntary and amicable plan for the prevention, minimization, or repair of damages to Corps structures, property, fish & wildlife and wildlife habitat, and historic properties from coal mining and surface subsidence.

Through these MOU's and subsequent MOU's subsidence damage at the North Marcum and Dam West Day Use Areas were repaired, and lands were transferred to the Corps for compensation for lands that were flooded as a result of subsidence. A Memorandum of Agreement (MOA) 29 August 1995 with the Old Ben/Zeigler Coal Company resulted in 50 acres being mitigated due to coal mining activities in Franklin County. The Lawrence property located south of the Rend Lake Dam was acquired.

Consolidation Coal Company conducted underground mining operations from February 1, 1983-June 30, 2003. Through several MOAs (06/26/1995, 07/18/2000, 2008) a total of 316.49 acres were mitigated. The acquired acres are located in the Counties of Franklin and Jefferson. Prior owners were John Clark, Betty Smith, Rosalee Jones, Howard Merriman, Billy Kash, Rend Lake Conservancy District (Nason Point area), and Kiselewski (Ward Branch area).

Mining activities by Ziegler/Old Ben Coal Company ceased in the mid to late 1990's. The shaft located north of the Sugar Creek access parking lot has been plugged. All aboveground infrastructure on project lands has been removed, the lands remediated, and accepted by the Corps. Mining activities by Consolidated Coal

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Company ceased in 2003. The shaft, located south of Turnip Patch Multiple Use Area, has been plugged, and the company is responsible ensuring the safety of the plugged shaft and for placing and maintaining signs in the area warning visitors of the plugged shaft. All aboveground infrastructures have been removed and the company is in the process of remediating the lands. At this time all lands owned by the Corps of Engineers and the Rend Lake Conservancy District have been mitigated.

D. Mining Resurgence. Although all mines under Rend Lake are currently closed, the coal industry is market driven. The significant coal resources that still exist under Rend Lake, especially along the eastern shore of Nason and north of the Casey Fork Subimpoundment, could be reopened to mining. These areas, with their broad flat mudflats, extensive mast-producing mature bottomland hardwood forests and flooded agricultural fields, provide optimal habitat for dabbling ducks, geese, wading birds, bald eagles, and shorebirds. Subsidence in these areas would result in significant and catastrophic damage to the natural resource as well as recreation opportunities and economics. If mining operations resume under project lands, lake and St. Louis District staff will work with the coal companies to attempt to minimize impacts on the surface and to ensure that the lake resources are protected, mitigated and/or remediated when damages occur.

### **6.10 OIL & GAS**

Ownership of oil and gas mineral rights at Rend Lake is a “mixed bag”. In some areas, the government owns all the oil and gas mineral rights. In other areas, the oil and gas mineral rights are privately owned. In some areas, government owned oil and gas overlays privately owned oil and gas. This variation of oil and gas ownership causes different agencies to become involved when entities wish to drill for oil and gas on project lands.

Leases for federally owned oil and gas development are granted and administered by the Department of Interior (DOI) through the Bureau of Land Management (BLM). BLM is the managing agency for all government-owned minerals. The Illinois Department of Natural Resources, Office of Mines and Minerals, is responsible for permitting and monitoring drilling activities for privately owned oil and gas. The St. Louis District Corps of Engineers (St. Louis) is responsible for issuing licenses to permit surface occupancy for entities who either have a BLM lease to extract government owned oil or who own the privately held rights and for protecting the resource and minimizing the impact to environmental and recreational uses.

Currently, three companies have active oil wells on project lands. Great Plains Illini, L.L.C. is extracting privately owned oil in the Sail Boat Harbor area of the Wayne Fitzgerald State Park and is operating four oil wells and one storage battery. Gessell

(H&W Oil Company) is extracting government owned oil in the North Marcum Multiple Resource Area and is operating three oil wells and one storage battery. Continental Resources of Illinois, Inc. is extracting government owned oil in the North Marcum Multiple Resource Area and in the North Marcum Future Recreation Area and a mix of government and private oil in the South Marcum Recreation Area. Continental operates a total of seven oil wells, one injection water disposal well, and four storage batteries.

The Corps issued surface occupancy licenses for these facilities stipulate that the licensee may not pollute the air, ground, or water, including ground water, or create a public nuisance. These licenses protect historical, archaeological, architectural, and other cultural artifacts, relics, vestiges, remains, and objects of antiquity. The licensee must use all reasonable means available to protect the environment and natural resources from damage arising from its oil and gas exploration, development and production activities and must reclaim the damaged resources where damages occur. After expiration of the license or relinquishment by the licensee, the licensee must remove their property and restore the premises to pre-use condition.

Rend Lake Staff has used the conditions of the leases as much as possible to benefit wildlife management by creating openings in brushy areas and requiring the planting of desirable grasses and legumes as well as other requirements. Drilling activities are scheduled to create as little nuisance as possible and pumps are required to muffle sound. Tank batteries are kept to a minimum and the sites are required to be screened by plantings and fenced to protect the public.

The sites are inspected by BLM, Corps Real Estate personnel, and more frequently by project staff to ensure compliance with license requirements and to protect the environment.

## **6.11 ANTICIPATED ATTENDANCE**

A. General. The 2007 visitation at Rend Lake was approximately 3,216,142. Visitation was projected based on historical data, population growth, demand factor analysis, and competition of lake resources within the area of influence.

B. Forecast Methodology. Visitation growth was assumed to be at least as great as the rate of population increase within a 50-mile driving radius of the project (approximately the service area). The population in the Rend Lake Service Area went up 0.7% between 2000-2007 while lake visitation rose from 2,540,821 in 2000 to 3,216,142 in 2007, an increase of almost 21%. 2008 visitation numbers were not used in this methodology due to park closures because of budget constraints in FY 2008. Since actual visitation is not correlating with the service area population numbers, both actual and projected, a regression analysis was performed on the Rend Lake visitation

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data from 1976 to 2007. It projects 3,305,551 for 2010 and a yearly increase of approximately 22,000. For the purposes of this Master Plan, it will be assumed that visitation will correspond to the results of the regression analysis or an increase of approximately 22,000 per year (less than 1% growth). This approximates population growth projections for the service area supplied by the Greater Egypt Regional Planning and Development Commission.

C. Use Projection. Rend Lake, which is south of Lakes Shelbyville and Carlyle, became operational in May 1972. Based on past and projected population growth rates, comparison with the other projects and competition from surrounding lakes, visitation at Rend Lake would be expected to increase at a rate of less than 1% per year. The visitation rate may increase as recreation and tourist developments, both completed and planned, attract more visitors. Also, marketing strategies employed by the Corps and the Southern Illinois Tourism Office in Whittington may be successful in attracting visitors from beyond the 50 mile range. TABLE 15 depicts the projected growth through year 2020.

D. Activities Projection. The forecasting technique used is based on user data collected from Rend Lake visitation surveys. The activity use percents have been relatively consistent during past recreational seasons. The peak month (June) for 2007 activity rates were determined, and utilized for this study. The proportion of these peak month projections expected on weekends, approximately 50%, is within the range reported nationwide. Section 2-05 describes visitor activity patterns and percent of activity use for the years 1973 through 2007, TABLE 4.

Table 15  
Rend Lake  
Estimated Annual Attendance

2010 – 2020	
2010 (estimated)	3,305,551
2015 (estimated)	3,529,073
2020 (estimated)	3,752,594

Source: U.S. Army Corps of Engineers, St. Louis District, 2009.

### **6.12 RECREATION FACILITY REQUIREMENTS**

A. Existing User Demand. The existing user demand can be reflected when 2007 visitation is used as a basis for computations. Existing facility requirements are

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based on current visitation, present planning and design criteria and the guidelines detailed in the Institute for Water Resources' Research Report 74-R1, Estimating Recreational Facility Requirements, Volume IV of V. The facility requirements are oriented toward key facilities which include campsites, picnic units, boat launching lanes, and beach areas.

1. Facility Design Day Load. This determination represents the anticipated number of users visiting the project on an average weekend day during the peak month of use. Based on the 1995, 2000, 2005, and 2007 visitation, the facility design day loads are 20,342, 20,772, 21,200 and 28,716 respectively.

2. Summary of Existing User Demand. Utilizing the facility design day load, participation rates for each activity requiring facilities, and the appropriate activity turnover rates, the principal recreation facility requirements were estimated. The existing facility user demand is presented in TABLE 16.

3. Summary of Existing Facility Supply. The existing supply of key park and recreation facilities is presented in TABLE 16. Although other agencies have developed facilities, the principal agencies include the Corps of Engineers and the Illinois Department of Natural Resources.

4. Evaluation of Existing Supply and Demand. Comparison of existing supply and demand, as presented in TABLE 16, indicates an insufficient supply of camp units.

B. Projected User Demand. Using the projected visitation, present planning and design criteria, and the procedures and guidelines outlined in the Institute for Water Resources' Research Report 74-R1, Volume IV, the projected recreation facility requirements through 2020 were calculated and are presented in TABLE 17. Estimates of user demand indicate that boat launch lanes and picnic units will be sufficient through the year 2010. Swimming beach areas are sufficient for existing and future demand. Campgrounds are not sufficient to meet present demand or projected future use. Campground occupancy figures show that occupancy rates in the four campgrounds for 2006-2008 averaged 50-55%. On weekends, the average ranged between 85-90%.

Section 15.01, Appendix 1 discusses the recreation facility development by the Illinois Department of Natural Resources, which contributes to the supply of picnic units, campsites, and boat launching ramps.

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Table 16

Principal Recreation Facilities:  
Existing Supply and Demand Study

	Existing Supply				Existing Demand	Supply Excess/Shortage
Facility	Corps	State	RLCD <sup>1</sup>	Total		
Camp Units <sup>2</sup>	524	283		807	927	-120 <sup>8</sup>
Picnic Units	170 <sup>3</sup>	96 <sup>4</sup>		266	266	0
Boat Launch Lanes	31 <sup>5</sup>	18 <sup>6</sup>	4 <sup>7</sup>	53	53	0
Swimming Beach area	173,100 sq. ft			173,100 sq. ft.	165,000 sq. ft.	+8,100 sq. ft.

Source: U. S. Army Corps of Engineers, St. Louis District, 2009.

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<sup>1</sup> Rend Lake Conservancy District.

<sup>2</sup> Camp Units include sites designated for tent camping only.

<sup>3</sup> Corps total picnic units include 104 picnic sites, 5 picnic shelters (30 tables), and 6 group picnic shelter (36 tables).

<sup>4</sup> Illinois Department of Natural Resources total picnic units include 72 picnic sites and 4 picnic shelters (24 tables).

<sup>5</sup> Corps total boat launch lanes (6 4-lane ramps, 3 2-lane ramps and 1 1-lane ramp).

<sup>6</sup> Illinois Department of Natural Resources total boat launch lanes (6 2-lane ramps and 6 1-lane ramps).

<sup>7</sup> RLCD total boat launch lanes (1 4-lane ramp).

<sup>8</sup> New camping units will be added to existing approved campgrounds: North Sandusky 40 sites, South Sandusky 30 sites, Gun Creek 35 sites and South Marcum 15 sites.

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Table 17

Summary: Projected Recreation Facility Requirements

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	<u>2010</u>	<u>2015</u>	<u>2020</u>
Camp Units	936	981	1,026
Picnic Units	266	285	304
Boat Launch Lanes	54	55	57
Swimming Beach Area	167,000	170,000	173,000
	Sq. Ft.	Sq. Ft.	Sq. Ft.

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Source: U. S. Army. Corps of Engineers, St. Louis District, 2009

### 6.13 SPECIAL STATUS SPECIES

Special Status Species include any species which is listed, or proposed for listing, as threatened or endangered by the U.S. Fish and Wildlife Service (FWS) under the provisions of the Endangered Species Act (ESA); any species designated by the FWS as a "listed," "candidate," "sensitive," or "species of concern;" and any species which is listed by the State in a category implying potential danger of extinction.

ER 1130-2-540, Project Operations – Environmental Stewardship Operations and Maintenance Policies, requires that inventories are made of special status species occurring on water resources development project lands. It is the policy of the Corps to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally-listed endangered and threatened species, "take" species, or result in the destruction or adverse modification of the habitat of such species which is determined by the FWS to be critical. As a result, special status species and/or their habitats that occur on project lands are protected and conserved in accordance with the ESA and with state statutes. The Corps cooperates in the management of state-listed and protected species where feasible.

No legally declared FWS critical habitat occurs on the public lands at Rend Lake. However, several special status species have been identified as occurring or potentially occurring on project lands. Table 18 provides a listing of the special status species at Rend Lake and their frequency of occurrence. A species is considered as potentially occurring on project lands when the lands fall within the species' range and

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there is habitat on the project that is suitable for the species.

When planning construction or management projects, project staff consider the potential impact to special status species and modify the project when possible to minimize the impact. In addition, habitat improvement projects are implemented to benefit special status species when feasible.

### **6.14 INVASIVE SPECIES**

An invasive species is a plant or animal “that is not native and has negative effects on our economy, environment, or human health” (Midwest Invasive Plant Network, 2007). While not all introduced species are harmful, invasive species are particularly aggressive, spread rapidly, and can cause major changes to local ecology. “Alien”, “noxious”, “pest” and “exotic” are other terms used to describe these species. Some studies indicate that as much as 18% of plants in Midwest national parks are exotic (MIPN, 2007).

Invasive species can limit land use patterns now and in the future. Invasive species are known to alter ecological succession, plant composition, and biological diversity in wetlands, prairies, forests, and aquatic habitats. These impacts can alter or decrease the potential for recreational opportunities and negatively impact our ability to maintain healthy and sustainable environments as required under the Environmental Stewardship Program.

Executive Order 13112, signed in 1999, established the National Invasive Species Council, consisting of federal land management agencies, to provide national leadership regarding invasive species. The EO also authorizes federal agencies whose actions may affect the status of invasive species to

1. prevent the introduction of invasive species,
2. detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner,
3. monitor invasive species populations accurately and reliably,
4. provide for restoration of native species and habitat conditions in ecosystems that have been invaded,
5. conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species,
6. promote public education on invasive species and the means to address them, and
7. not authorize, fund, or carry out actions that the agency believes are likely to cause or promote the introduction or spread of invasive species.

Table 18  
Special Status Species Occurring at Rend Lake

Federally Listed Species		
Common Name	Scientific Name	Inventoried Occurrence
Indiana Bat	<i>Myotis sodalis</i>	Potential
Illinois Listed Species		
Common Name	Scientific Name	Inventoried Occurrence
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Common
American Bittern	<i>Botaurus lentiginosus</i>	Occasional
Black Tern	<i>Chlidonias niger</i>	Uncommon
Black-Crowned Night Heron	<i>Nycticorax nycticorax</i>	Uncommon
Brown Creeper	<i>Certhia americana</i>	Uncommon
Forster's Tern	<i>Sterna forsteri</i>	Uncommon
Little Blue Heron	<i>Florida caerulea</i>	Uncommon
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Uncommon
Northern harrier	<i>Circus syaneus</i>	Uncommon
Osprey	<i>Pandion haliaetus</i>	Uncommon
Red-Shouldered Hawk	<i>Buteo lineatus</i>	Uncommon
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Rare
Black Rail	<i>Laterallus jamaicensis</i>	Rare
Common Moorhen	<i>Gallinula chloropus</i>	Rare
Common Tern	<i>Sterna hirundo</i>	Rare
Least Bittern	<i>Ixobrychus exilis</i>	Rare
Least Tern	<i>Sterna antillarum</i>	Rare
Peregrine Falcon	<i>Falco peregrinus</i>	Rare
Piping Plover	<i>Charadrius melodus</i>	Rare
River Cooter	<i>Pseudemys concinna</i>	Rare
Sandhill Crane	<i>Grus canadensis</i>	Rare
Short-Eared Owl	<i>Asio flammeus</i>	Rare
Snowy Egret	<i>Egretta thula</i>	Rare
Upland Sandpiper	<i>Bartramia longicauda</i>	Rare
Wilson's Phalarope	<i>Phalaropus tricolor</i>	Rare
Yellow-Crowned Night-Heron	<i>Nyctanassa violacea</i>	Rare
Common Barn Owl	<i>Tyto alba</i>	Potential
Henslow's Sparrow	<i>Ammodramus henslowii</i>	Potential

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ER 1130-2-540, Environmental Stewardship Operations and Maintenance Guidance and Procedures (15 Nov. 96), provides guidance and authority “to manage natural resources on Corps of Engineers administered land and water in accordance with ecosystem management principles, to insure their continued availability” and “to provide outdoor recreation opportunities ... on a sustained basis.” This document also provides authority to control pest species and develop a program to ensure safety to Government employees, including training and medical health monitoring.

Certain weed species have been declared “noxious” by the Illinois legislature and their control is required by law (505 ILCS 100/; Illinois Noxious Weed Law). Corps staff have worked with IDNR to issue a state Administrative Order restricting capture and use of alien fish as bait and their transportation to protect aquatic environments (17 Ill. Admin. Codes). The Operations and Maintenance Business Information Line (OMBIL) provides a database of plant and animal invasive species recorded at Rend Lake or have the potential to occur here, Table 19. At present, 29 species have been recorded and are monitored by the Environmental Stewardship staff.

The costs associated with monitoring, control, and elimination of invasive species is significant and is expected to increase in the next decade as we learn more about the impact of these species, their identification, their distribution, and abundance. At present it is estimated that fully one-third of the Environmental Stewardship budget is spent on the control of invasive species, either chemically, physically, or mechanically.

Table 19  
Invasive Species Occurring at Rend Lake

Occurrence Rate	Common Name	Scientific Name
Abundant	spiny water flea	<i>Daphnia lumholtzi</i>
	house mouse	<i>Mus musculus</i>
	common reed	<i>Phragmites australis</i>
	autumn olive	<i>Elaeagnus umbellata</i>
Common	bighead carp	<i>Hypophthalmichthys nobilis</i>
	bull frog	<i>Rana catesbeiana</i>
	common carp	<i>Cyprinus carpio</i>
	European starling	<i>Sturnus vulgaris</i>
	feral cat	<i>Felis sylvestris</i>
	house sparrow	<i>Passer domesticus</i>
	Eurasian water-milfoil	<i>Myriophyllum spicatum</i>
	Japanese honeysuckle	<i>Lonicera japonica</i>
	white sweet clover	<i>Melilotus alba</i>
	yellow sweet clover	<i>Melilotus officinalis</i>
Occasional	cattail	<i>Typha angustifolia</i>
	purple loosestrife	<i>Lythrum salicaria</i>
	multiflora rose	<i>Rosa multiflora</i>
	Russian olive	<i>Elaeagnus angustifolia</i>
Uncommon	Eurasian collared dove	<i>Streptopelia decaocto</i>
Rare	nutria	<i>Myocaster coypus</i>

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Occurrence Rate	Common Name	Scientific Name
Potential	silver carp	<i>Hypophthalmichthys molitrix</i>
	zebra mussel	<i>Dreissena polymorpha</i>
	Asian long-horned beetle	<i>Anoplophora glabripennis</i>
	Asian tiger mosquito	<i>Aedes albopictus</i>
	emerald ash borer	<i>Agrilus planipennis</i>
	European gypsy moth	<i>Lymantria dispar</i>
	kudzu	<i>Pueraria montana</i> var. <i>lobata</i>
	oriental bittersweet	<i>Celastrus orbiculatus</i>
	tree-of-heaven	<i>Ailanthus altissima</i>

### **6.15 APPLICATION OF COST SHARING REQUIREMENTS**

Requirements for cost sharing recreational development with non-Federal public interests will be considered when the need for such new facilities and recreation areas can be sufficiently demonstrated.

The current Administration policy as provided by the Office of Management and Budget in EC 11-2-121 is that all new recreational development above the existing authorized development levels on Federal public lands will require at least a 50 percent cost-sharing by non-Federal public agencies. The non-Federal sponsor is required to enter into a cost-sharing contract with the Corps prior to construction and agree to assume operation and maintenance responsibilities for the completed recreation area. The only exception to this policy is for upgrading sanitary facilities in existing Corps managed recreation areas to meet urgent sanitation needs in accordance with the provisions of applicable State and Federal laws and minimum facility requirements for public health and safety per regulations and policies.

This Master Plan does not contain any cost-sharing proposals, but may in the future serve as a basis for initiating such actions.



## Section VII

### Resource Use Objectives

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## **SECTION VII - RESOURCE USE OBJECTIVES**

### **7.01. GENERAL**

The purpose of this section is to state and define a series of recreation, natural, and cultural resource use objectives for Rend Lake. Resource use objectives provide general guidance and direction for the use, development, and stewardship of project resources.

A. As stated in Section I, the authorized purposes for Rend Lake are flood control on the Big Muddy and Mississippi Rivers, water supply, water quality control, fish and wildlife conservation, recreation, and area redevelopment.

B. The development of sound resource use objectives should assist in the minimization of conflicts between project purposes through compromises that do not seriously detract from achievement of any or all project purposes. Resource use objectives based on project purposes at Rend Lake are identified and discussed in the following paragraphs.

### **7.02. RESOURCE USE OBJECTIVES**

#### **A. General.**

1. Administration and Management. Ensure that quality administration and management of all lands, waters, and other associated man-made, natural, and cultural resources are consistent, thorough, and in accordance with the Master Plan for the lake. Seek to continually increase efficiency, cost effectiveness, and innovation in projects while keeping public use and enjoyment a goal of achievement.

Discussion: Project administrative and management decisions and actions will adhere to all applicable laws, regulations, policies, and agreements. Consistent coordination internally and with other applicable federal, state, and local government agencies; private organizations; and individuals will be maintained. Actions and plans will be implemented in a manner compatible with authorized project purposes and all applicable social and environmental factors to ensure maximum benefits. Compromise will be utilized to minimize conflicts in project uses and development.

The major concerns of management are twofold. First, is the identification of facilities for renovation or replacement, provision of efficient support facilities, public health and safety, provision of accessible facilities, and maintaining the integrity of the operational structures, i.e. the main dam. Second is the maintenance of a healthy and sustainable environment

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2. Partnering. Partner with other agencies, groups, organizations and individuals to accomplish resource use objectives and improve efficiency in operations.

Discussion: The use of partners to assist with the operation and management of the project will be fully employed. When feasible, donations and the challenge partnership program will be utilized to accomplish work. Section 225 of Public Law 102-580 grants authorization to the Corps of Engineers to enter into cooperative agreements with non-federal public and private entities to provide for operation and management of recreation facilities and natural resources at civil works projects. The Corps of Engineers may accept contribution of funds, materials, and services from non-federal public and private entities. The services of volunteers may be accepted under Public Law 98-63 to carry out any activity of the Corps of Engineers except policy making or law regulatory enforcement.

### **B. Flood Control.**

1. Maintenance of Dam Structures. Inspect and maintain dam structures to protect from deterioration.

Discussion: Instruments have been installed on the dam to monitor various aspects of the dam's health and to identify problems before they become severe. Routine maintenance is done on the dam structure and instrumentation and various types of inspections are performed periodically to ensure that the dam structure is structurally sound.

2. Critical Infrastructure. Protect operational facilities and structures designated as Critical Infrastructure.

Discussion: Operational facilities and structures designated as Critical Infrastructure under the Risk Assessment Methodology for Dams (RAM-D) method are protected under the guidelines of the Critical Infrastructure Security Program. Security equipment and countermeasures are inspected, maintained, and monitored in accordance with established protocols.

### **C. Water Supply.**

1. Impact reduction. Endeavor to reduce any recreational or environmental impact that may arise from water withdrawal.

Discussion: The state of Illinois has the right, under contract, to utilize approximately 68 percent of the usable joint use water storage space at Rend Lake between elevations 391.3 feet NGVD and 405.0 feet NGVD. This storage space is used

to pond water for present and anticipated demand or need for municipal and industrial water supply. This allocation was estimated to contain 109,000 acre feet in 1988, which equates to an average yield of 70 million gallons per day.

Currently, the state is using twenty-five percent (an estimated 27,250 acre-feet which equates to an average yield of 17,500,000 gallons per day) of the water storage capacity, and the remaining seventy-five percent is allocated for future use water storage. As a result, the state may increase the water withdrawal from the lake as demand warrants. As such, the state has the right to construct structures necessary for the purpose of water withdrawals, subject to approval by the Corps of the design and location. Recreational and environmental impacts of the construction will be considered in the approval process.

Sedimentation and mine subsidence under the lake are issues that may affect the water supply, recreation, and the environment. The impacts of these processes need to be evaluated.

D. Water Quality Control.

1. Water Quality Monitoring. Conduct water quality monitoring in accordance with ER 1110-2-8154 Water Quality & Environmental Management for Corps Civil Works Projects and ETL 1110-2-362 Environmental Engineering Initiatives for Water Management.

Discussion: Seven permanent sites are monitored monthly from April through October. A report on the results is issued annually by the St. Louis District, Water Quality Section. The Big Muddy watershed is primarily agricultural lands and is thus vulnerable to non-point source pollution.

2. Water Quality Protection. Respond aggressively when there is a threat to the water supply and work with other state and federal agencies such as USEPA, IEPA, IEMA, ISP, and local responders to manage the hazard.

Discussion: Water quality is also one of the basic emphasis of the ERGO program as well as the Spill Containment and Control Plan and the Hazardous Communications Plan. All employees are briefed on this subject annually.

E. Environmental Stewardship.

1. General. Continue to monitor and manage our natural resources to ensure protection against fire, overuse, erosion, insect and disease infestation, and invasive species. The overall objective of natural resource management is to maintain the

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environment or return the environment to a healthy and sustainable condition. Take corrective actions when warranted.

Discussion: To assure the protection of these resources and our heritage, we will remain committed to providing responsible stewardship by the preservation and restoration of diverse habitat, as well as the conservation or wise use of these habitats, for the benefit of these ecosystems and their functions and values. Use of all areas for public enjoyment will be encouraged while minimizing any environmental degradation. The Corps' Environmental Operating Principles (EOP) will be the keystone of our management and stewardship of our natural resources.

2. Terrestrial Ecosystem Management. Manage natural communities to promote regional environmental values occurring on project lands.

Discussion: The lands and waters of Rend Lake compose an "island" of habitat in a "sea" of former coal mine lands and an agricultural landscape. This altered landscape makes the federal lands and waters at Rend Lake even more valuable in terms of public use and conservation.

a. **Habitat Management**

(1) **Forest**. Manage forests on project lands for multiple use.

Discussion: The Forest Cover Act provides statutory authority for the Corps to manage forests on project lands for multiple use. This management strategy benefits vegetative conditions, species composition, forest structure, fish, watersheds, wildlife, soils, and recreation. Over 7000 acres of high quality upland hardwood and bottomland hardwood forests occur on project lands. Priority of management for this forest resource for wildlife, recreation and watershed protection, precludes managing on a sustained yield basis.

(2) **Grasslands/Prairie**. Manage and maintain grasslands on project lands.

Discussion: The Forest Cover Act also provides statutory authority for the Corps to manage and maintain grasslands on project lands. This can include any quality grassland as well as plantings of warm season grasses and restoration of native prairies and forbs. Maintenance of this cover type includes seeding of grass and forbs, control of brushy vegetation, mowing, and performing prescribed burns on three year cycles. Grassland avifauna, plant species diversity, upland game bird species, and public use derive direct benefit from this resource management.

(3) Wetlands. Construct, maintain, protect, and manage wetlands for multiple use on a regional landscape scale.

Discussion: A combination of federal legislation and policy; including but not limited to the Water Resource Development Act, Clean Water Act, and the North American Waterfowl Management Plan; provide the Corps with statutory authority to construct, maintain, protect, and manage wetlands for multiple use on a regional landscape scale. With less than 1% of this habitat type left in Illinois, management and conservation of wetlands; including restoration of wetland plant species, restoring hydrological regimes, and maintaining hydric soils, take on more importance. Types of wetland habitat found on project lands at Rend Lake include bottomland hardwood forests, marshes/emergent vegetation, shallow water ponds, backwater sloughs, and mudflats. 26,971.6 acres of wetlands exist at Rend Lake including lacustrine, palustrine, and riverine systems.

(4) Soils. Utilize conservation practices designed to minimize the effects of agriculture and other impacts, including water and wind erosion, based on recommendations of the Natural Resources Conservation Service.

Discussion: Best Management Practices (BMPs) will be incorporated in all state and federal agricultural leases as well as construction contracts. A soil type inventory has been developed for Jefferson and Franklin counties in Illinois. The soil type and erodibility will be considered in all management decisions.

b. Wildlife Resource Management

(1) Wildlife. Encourage optimal utilization by the greatest number of wildlife species through the manipulation, management, and protection of diverse habitats. Non-consumptive uses of wildlife such as nature study, wildlife watching, and photography will receive equal consideration with that of consumptive uses, such as hunting and trapping.

Discussion: Wildlife is managed through various federal regulations and Corps policies and with a management agreement on hunting and trapping activities at St. Louis District lakes in Illinois with the Illinois Department of Natural Resources. IDNR has the responsibility, with consultation from USACE, to manage wildlife and enforce laws and regulations.

The wildlife carrying capacity of public lands can be maintained through the application of a variety of habitat control measures. Management activities will include succession control, native grass plantings, agricultural leases, tree plantings, and selective timber thinning. Den trees will be saved wherever possible, and artificial nesting

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structures will be erected to provide additional nesting sites for squirrels, songbirds, bats, and ducks. Shrub and vine cover between activity areas, near the periphery of recreation areas, and at fence corners will be maintained, providing food, cover, and nesting opportunities for a variety of wildlife.

(2) **Special Status Species.** Threatened and endangered species and species of concern will be given high priority in all natural resource planning.

Discussion: The Endangered Species Act requires that Federally listed threatened and endangered species be considered in all activities that have the potential of adversely impacting their populations. At present, one endangered species the Indiana bat is either known to occur or are suspected to occur, based on habitat types, on federal land at Rend Lake. As a result, Indiana bat habitat is protected in accordance with established protocol.

In addition, there are 28 species that have either been identified by the state as being endangered or threatened that are known to occur or are suspected to occur, based on habitat types, at Rend Lake. Where appropriate, natural resource management actions are taken to improve the habitat for these animals.

(3) **Invasive Species.** Control of invasive and alien species, both plant and animal, will be given the highest priority in the management of natural resources.

Discussion: Invasive species are organisms that are not native (exotic) to a geographical region and cause a problem in the ecosystem. They can threaten the lake's resources, potentially out competing native species, thereby decreasing plant and animal diversity and negatively impacting the native ecosystem. A 1999 executive order requires that Federal agencies identify and take actions to control invasive species to the extent possible and provide for the restoration of native species. State statues also require control of both noxious and alien plant species.

Invasive species detection, monitoring, and eradication are a continuing management problem. This problem is expected to continue into the future and possibly even increase in magnitude as the implications of this problem are realized. At present management and control of alien species of plants such as autumn olive, purple loosestrife, fescue, and phragmites through mechanical and chemical means utilizes close to one-half the environmental resource and stewardship budget. An additional emphasis in the future will be on detection, mapping, and monitoring of these species in individual compartments on federal lands. Use of GPS and GIS technology should aid in this task. Increased awareness of the effects and efficiency of various treatment techniques will become more important with shrinking budgets and a growing problem.

3. Fisheries Management. Maintain a viable fisheries program through the protection of water quality, fish cover habitat, and the supplemental stocking of fry in Rend Lake and in the surrounding ponds.

Discussion: The Illinois Department of Natural Resources has taken the lead role in the management of these cooperated activities. Coordination efforts and management strategies focus on optimizing a quality fishery and fishing success. Largemouth bass, crappie, and catfish are the primary species that benefit the majority of visitors. The IDNR and the Corps maintain the brood ponds located on project lands, assist in the placement of artificial structure, stock prey species, and perform population surveys. A commercial fisheries program also contributes to the health and sustainability of the total fishery.

4. Cultural Resources. Continue to identify, evaluate, and preserve archaeological sites In accordance with state and federal laws.

a. NAGPRA. All inadvertent discoveries, recovered artifacts, and funerary objects will be handled in compliance with the North American Graves Protection and Repatriation Act. Reports of inadvertent discoveries will be acted on aggressively in consultation with District personnel.

b. Site Protection and Monitoring. All known and recorded sites will be monitored and legally protected by the ranger staff.

Discussion: More than 200 archaeological sites have been identified on project lands. A Historic Properties Data Synthesis and Management Plan have been completed and describe in detail how these areas are to be managed. Approximately one-third of all known sites are monitored annually during compartment updates by environmental stewardship personnel. Sites are checked for erosion, environmental degradation, vandalism, and looting. Cultural resource material is considered government property and any theft is pursued and cited.

F. Recreation.

1. Quality Recreational Experiences. Seek to increase the quality of visitor's experiences by maintaining and developing purposeful, functional recreation facilities that meet the needs of visitors to the region.

Discussion: Rend Lake and the facilities and amenities provided within its boundaries are a part of the regional resources that draw visitors to Southern Illinois. As such, Rend Lake must be treated as a part of the whole regional recreational resource.

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A regional approach must be taken to assess visitors' needs and to determine what facilities and amenities should be added to project lands to improve recreational opportunities and what facilities and amenities would be better sited on private lands.

2. Facility Management. Maintain, rehabilitate, and replace existing facilities to stop deterioration and environmental degradation.

Discussion: An aggressive maintenance program will continue to be utilized in order to maintain the quality of all recreational and operational areas. Rehabilitation efforts designed to stop environmental degradation and facility deterioration will continue to be a top priority.

3. Changing Visitor Needs. Maintain, develop, and alter facilities to meet the changing and diverse use patterns of the visitors to the lake while maintaining the aesthetic integrity of public lands and waters.

Discussion: Care must be taken to recognize that visitors interests and needs change over time and that the facilities and policies at the lake must change to accommodate them. Use trends and customer surveys will be used to recognize changes and to guide decisions on the removal, alteration, or addition of facilities and amenities as demand dictate. These demands must be balanced with safety, aesthetic, and environmental issues with the understanding that not all visitor demands may be accommodated.

4. Barrier Free Access. Improve outdoor recreational opportunities for special needs visitors by providing barrier free access. Continue to identify, build, modify, and redesign areas and facilities to promote accessibility and remove architectural barriers.

Discussion: All persons must be given access to a wide range of outdoor recreation activities through careful and appropriate planning, design, and program implementation. Accordingly, consideration is given to access facilities and services for disabled persons in the planning, design, and operations of existing recreation areas and the development of future public use areas at the project. At a minimum, all facilities will be designed to meet the requirements of EM 1110-1-400, Recreation Facility and Customer Services Standards, Uniform Federal Accessibility Standards (UFAS), Americans with Disabilities Design Guidelines (ADDG), and new recreation accessibility standards when they are developed.

5. Visitor Services.

a. Continue to provide services to meet the goals and primary purposes of the Visitor Center and Interpretive Services and Outreach Department by providing information to the visiting public about the Corps, its mission, the project, lake facilities, visitor safety, and the geographic area where the project is located.

b. Continue to maintain and communicate the objectives of the Interpretive Services department as well as Visitors Centers set forth by the Corps. These objectives include enhancing the public's understanding of the multidimensional role of the Army, the Corps and their contributions to the nation; purpose and operation of the project, its archeological, historic, man-made, natural and cultural features; develop public appreciation for the proper and safe use of project resources; foster the spirit of personal stewardship of public lands; orient the visitor to the project and its recreational opportunities; and reduce overall project operation and maintenance costs by building partnerships.

Discussion: These objectives will be met by means of maintaining a strong Interpretive Services and Outreach program (ISOP), which has been in effect at Rend Lake since the mid 1970's. The ISOP should play a vital role in enhancing public knowledge and understanding of the Corps, the natural and cultural features of the lake and the surrounding areas, and should promote visitor safety on both land and water areas. A visitor center features a variety of exhibits highlighting the lake and its purposes. The lake also features interpretive nature trails, bulletin boards, and interpretive activities. These include special events, campground programs, special events, safety programs, and visitor center presentations. Media used to communicate to the public includes a traveler information station (530 khz), news releases, radio and newspaper contacts, informational handouts, posters, lighted marquee, and monthly newsletters to the campers.

6. Concession Development and Operations. Provide adequate locations and support for viable recreation-oriented concession leases – existing and proposed. These will include both lodging and marina type services.

Discussion: There is currently one Corps of Engineers administered full service marina concession operating at the lake. A resort and accessory facilities are provided at the Wayne Fitzgerrell State Park. A resort, golf course and accessory facilities are provided on adjacent land by the Rend Lake Conservancy District, with a portion of the facilities developed on federal land.

Any proposed concession development must adhere to the requirements of the Recreation Development policy for Outgranted Land, dated December, 2005. This policy

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requires, in part, that any future recreation development be dependant on the project's natural or other resources.

Locations on the lake have been identified as suitable for development of an additional marina and ancillary services. When the need arises, the Corps of Engineers will accommodate and support legitimate concession developments on either Corps of Engineers or State of Illinois managed areas if they do not adversely affect the growth of the existing concession services. Prior to any additional concession development, the Corps of Engineers will require market analysis and feasibility studies by interested parties to determine demand for the level and type of concession services being considered and the ability of the concessionaire to return a profit on a yearly basis.

7. Environmental Protection. Provide a rewarding experience for visitors by continually monitoring, maintaining, and improving the aesthetic and environmental quality of the area.

Discussion: Site deterioration will be monitored and steps taken to prevent or rehabilitate areas before site impacts have any negative effects on visitors' experiences or the environment.

G. Area Redevelopment.

1. Regional Economic Growth. Contribute to and develop a partnership with agencies, groups, and individuals with the common goal of lake and regional tourism and economic development.

Discussion: An effort to promote and develop upon both the water resources of the area and recreational opportunities available can be most efficiently accomplished through the joint effort of the Corps and other groups and individuals. The continued development of joint projects designed to inform and attract visitors to the region will benefit the entire area. Current associations with interested parties have proven to be very successful. The expansion of these partnerships will continue to increase area tourism and economic growth. The establishment of a cooperative association would allow the Corps to provide goods and services that at the present time it is unable to do.



## Section VIII

### Resource Plan

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**SECTION VIII - RESOURCE PLAN**

**8.01. ZONING OF LAKE LANDS AND WATERS - LAND AND WATER USE**

A. Purpose

Project zoning provides guidance for the orderly development, use, and management of the lake's resources. Resource planning will recognize the authorized project purposes and the opportunities and constraints that influence development and management. All development will be screened to determine compatibility with the lake's natural and cultural resources. Primary planning and zoning considerations include, but is not limited to: seasonal flooding; soils; ecological conditions; wildlife distribution; special status species; existing and projected recreation demand; state and local participation and interest; and applicable laws, regulations, and policies.

Recreational development has generally proceeded as described in the original Master Plan for Rend Lake. All lake area lands have been allocated for the authorized purposes for which they were acquired. The land area allocations are depicted in color on Plate 1 and the land area classifications are represented by a letter or letter/number on Plate 2, the Land Classification Map. An analysis of the resources and use classifications of all lake lands and waters has been made. The objective of classifying lands is to provide an integration of appropriate land and water uses into a balanced plan for the wise use of all lake resources in the public interest. Descriptions of the applicable land and water use categories follow.

B. Land Allocation

The project required public lands and waters total approximately 40,218 acres. These lands are allocated in accordance with the authorized purposes for which they were acquired. Two land allocation categories exist for Rend Lake:

1. Operations. These were lands acquired in accordance with the authorizing documents for operation of the project, i.e. flood control, water supply, water quality control, and fish and wildlife conservation.

2. Recreation. These were lands acquired in accordance with authorizing documents for public recreation and the Preliminary Master Plan.

C. Land and Water Classification

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Land and water use classifications have been determined through the guidance contained in EP 1130-2-550, dated 15 November 1996. The land use zoning for project lands is shown on Plate 2. Land use classifications and descriptions are:

1. Project Operations. The objective of this resource classification is to provide adequate land for safe and efficient operation and management of the lake's land and water resources for all authorized purposes. Lands classified in this category include the main dam, the two subimpoundment dams, a land waste treatment system, the RLCD raw water intake structure, and lands required for administrative and maintenance needs. Waters classified in this category include two locations along the main dam and a perimeter around the RLCD raw water intake structure. Section 8 - 03 further details this land resource classification and use.

2. Recreation Lands. The objective of this zoning is to classify lands and waters, by virtue of location and natural resources, for recreational use. These park and recreation areas are developed to provide for the recreational activities of the visiting public. No agricultural uses are permitted on the lands except on an interim basis for terrain adaptable for maintenance of open space and/or scenic values. Factors such as road access, natural resources, recreational facility design, and management practices make these lands conducive to accommodating sustained recreational use by the visiting public. Lands in this classification include areas for concession, quasi-public, and group use development. Waters classified in this category include all portions of the lake not otherwise classified as Project Operations or Multiple Resource Management, Wildlife Management. Section 8 - 04 further details the development and use of lands and waters on Corps land at Rend Lake.

3. Mitigation Lands. This is land acquired or designated in accordance with authorizing documents to offset losses associated with development of the project. No mitigation lands currently exist at Rend Lake.

4. Environmental Sensitive Areas. Lands classified as environmental sensitive areas contain significant scientific, ecological, cultural, or aesthetic features. These areas are normally located within one of the other classification categories and must be considered by management to ensure the sensitive areas are not impacted. Normally limited or no development of public use is contemplated on land in this classification. No environmentally sensitive areas exist at Rend Lake.

5. Multiple Resource Management. This classification further distributes lands to one or more of the following uses based on their location and natural resources: (a) Recreation - Low Density, (b) Wildlife Management General, (c) Vegetative

Management and (d) Inactive and/or Future Recreation Areas. Areas in these categories are found in Section 8-06 and shown on Plate 2.

a. Recreation – Low Density. Lands zoned in this category offer recreation to the public in an unstructured natural setting as an alternative to the experience generally associated with intensively developed recreation areas. These areas also serve as a buffer between other land uses. Uses for these areas include hiking, walk-in hunting and fishing, and nature study. Lands required for ecological workshops and forums are also included in this allocation.

b. Wildlife Management – General. These lands and waters are continuously available for low-density recreational activities. Agricultural leases are allowed to the extent practicable and compatible with other uses of the project. These activities generate revenue and maintain habitat beneficial to wildlife. Sections 7-02.E.2.b and Section 12-10 of this plan describe the objectives and goals of the Corps of Engineers operated and administered fish and wildlife management areas. The Operational Management Plan (OMP) describes the general practices and techniques employed to implement a viable program for fish and wildlife at Rend Lake and contains condensed versions of the compartment prescriptions. Lands on the northern end of the lake, managed by the Illinois Department of Natural Resources (IDNR), have been assigned to this land-use classification and are covered by a real estate instrument (license). Waters classified in this category include a perimeter surrounding the Rend Lake Wildlife Refuge.

c. Vegetative Management. Management activities for these lands provide for, maintain, restore, and enhance existing natural ecosystems in various stages of ecological succession. These ecosystems include wetlands, old fields, prairie grasslands, bottomland hardwood forests, upland hardwood forests, and pine plantations.

d. Inactive and/or Future Recreation Areas. These areas include those areas designated for future intensive recreation or those lands that have been used for intensive recreation in the past and are now temporarily closed. When they recover or are needed for recreation use, they will be opened or reopened for intensive recreation. Interim use will follow the guidelines described for low-density recreation.

6. Easement Lands. The Corps of Engineers holds an easement interest on 906 acres of land outside the fee boundary. Use and management of these lands is in accordance with the terms and conditions of the easement estate, which was acquired for the project. Easement lands at Rend Lake are flowage easements. These

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easements give the government the right to flood lands that are below 416 feet NGVD. Construction on easement lands is regulated by permit and permits are required for the placement of dredged or fill material. In order to be in compliance with the Clean Water Act, flowage easement permits or consents will not be issued until a Section 404 Permit has been issued or until the Regulatory Office (OD-F) provides notice, in writing, that none is required. The Regulatory Branch of the St. Louis District will review the Section 404 application concurrent with the flowage easement permit process.

District flowage easement policy allows for exceptions without compensatory storage, but at Rend Lake, only for Natural Resources Conservation Service approved designed wetlands.

### **8.02. MANAGEMENT AREA PLANS**

Section 8-03 describes existing operational areas and proposed actions. Existing recreational lands and facilities are described in Sections 8.04 through 8.06 and include a discussion of proposed activities. Proposed facilities that are in addition to existing facilities are listed under the Proposed New Actions heading. Facilities that are proposed for consolidation, renovation, or are a replacement for existing facilities are listed under Proposed Consolidation, Replacement, Renovation (CRR) Actions heading. Proposed Cost estimates for New and CRR actions are provided in Section XIII and their approval is requested. Actions that may occur beyond the ten-year time frame of this Master Plan update are listed under Future Actions. Facility load and other design criteria for the proposed actions are explained in Section 6-12.

Prior to implementation of any future actions or major facility expansions, a supplement to the master plan that references a feasibility analysis with a detailed design will be completed. The supplement will be based on Chapter 3 of ER 1130-2-550 and will address all environmental and fiscal laws, regulations, and policies. Proposed new facilities are within authorized development levels as per EC 11-2-121.

### **8.03. PROJECT OPERATIONS LANDS**

The following paragraphs provide a brief description of all lands classified as Project Operations. Areas are depicted on Plate 2 or additional plate, and described in a clockwise order around the lake. All routine maintenance and replacement work will be completed as funding is available.

A. OP-1. Rend Lake Main Dam (Plate 5). This area is 131 acres. The main dam consists of a compacted earth embankment extending across the valley floor of the Big Muddy River. The total length of the dam and spillway is approximately 10,600 feet.

The crest of the embankment is at elevation 424.0, approximately 54 feet above the river bed. Other pertinent data can be found in Table 1.

The Rend Lake Dam Road runs along the crest of the main dam, over a 605 ft bridge spanning the spillway approach channel, and along the crest of the auxiliary spillway. This road connects Rend City Road to Mine 24 and Licata Roads. It provides access to the Spillway and South Marcum recreation areas.

Two water areas upstream of the dam have been classified for project operations. A square area around the intake structure on the dam has been established and classified for project operations. No boats are permitted within 100 ft of the structure which is delineated by orange pumpkin buoys placed along the square perimeter. An area of the intake channel has also been classified as project operations. No boats are permitted within 200 ft. of the bridge that crosses the intake channel. "No Boats" buoys and a line of pumpkin buoys have been placed to mark this boundary to deter boats from approaching the concrete spillway.

No New or Future Actions are proposed for this area.

Proposed CRR Actions:

Completely clean and repaint spillway bridge superstructure and install bridge deck drain extensions. Light to moderate corrosion can be found intermittently throughout the steel structure and is becoming more noticeable. Secondary findings include more minor repairs such as tightening nuts, repairing cracked welds and asphalt repairs at the approach.

Install small craft barriers at spillway and intake structure. This would reduce the risk of waterborne attack and improves boater safety at the spillway and intake structure. It also reduces the risk of dam failure and downstream flooding.

B. OP-2. USACE Maintenance Complex (Plate 6). This area is 31 acres, located just west of the main dam. Facilities include maintenance supervisor and work leaders offices, a carpenter shop, lunch and change rooms, an electrician shop, open and closed storage bays, fenced vehicle and equipment compound, fuel tanks, and employee and visitor parking areas. All offices will be consolidated into the new Administration Building described in OP-3.

No New or Future Actions are proposed for this area.

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### Proposed CRR Actions:

The maintenance buildings need repainting and replacement of rotten exterior siding, metal roofing, fascia and guttering; all doors with ADA compliant, fiberglass, reinforced doors and frames, weather stripping on overhead doors, re-adjust doors, and replace springs and other worn parts; all of the lights inside and outside of all three maintenance buildings with energy efficient fixtures and bulbs, the fire/water hydrant and fire tool shed, and mill and overlay the existing lot with asphalt to meet the grade of the expanded parking area.

Construct a 30' long by 96' wide and 16' high metal storage building and a 3 sided open storage bay building 30' long by 60' wide by 16' high. The new building will replace 4 wooden portable storage buildings that have become deteriorated.

Expand the existing fence to accommodate additional buildings and vehicle and pedestrian traffic to the new administration building. It will also accommodate the division Rapid Response Vehicle (RRV).

Install hazardous material storage building. The current storage facilities for hazardous materials do not provide for sufficient containment and segregation of stored hazardous materials, as recommended by ERGO standards. In addition, they do not contain an integrated fire suppression system. This will allow for continued compliance with all federal policies on hazardous materials.

C. OP-3. USACE Administration Complex (Plate 6). This area is 3 acres, located at the west end of the main dam, north of the maintenance complex. The complex consists of a 4,465 sq. ft. administration building with managerial, secretarial, and ranger offices and visitor reception area; a 720 sq. ft. trailer with ranger offices; 3 storage sheds; a fenced radio compound with a 200 ft radio tower and concrete block radio building; a weather station; a fenced vehicle compound; and visitor and employee parking lots.

Because the current administration office complex has exceeded its design life and the current layout of offices is inefficient and does not meet current standards for accessibility, the consolidated administration complex is necessary. The building is not energy efficient and needs many upgrades to reduce energy use and waste. Section 8.03.C provides more information on the proposed consolidated administrative complex. The fenced radio compound, radio tower and concrete block radio equipment building, service road to the radio compound and two parking spaces will remain in the area and everything else will be removed and restored to an open space.

No New or Future Actions are proposed for this area.

Proposed CRR Actions:

The current administration building has exceeded its design life and the current layout of offices is inefficient and does not meet current accessibility standards, the removal of the administration office and the development of a replacement consolidated administrative/visitor center/maintenance complex is necessary. The current administration building was constructed in 1962 for the resident engineer's office. The building had administration offices in the front and a vehicle garage in the rear. Since then, the office additions have included offices for ranger and administration staff. In 1988, a rehabilitated office trailer was added to the complex to meet staffing needs. The current buildings are very energy inefficient as the office facilities are out of date. The office space is very basic, decades old, and spread out over a large area. Consolidating the administration building with the maintenance compound and visitor center would allow more efficient operations and maintenance, improve staff communication and would increase staff availability to the public. It would be a great improvement over the present, disjointed four building complex.

The plans are to make the buildings energy and water efficient with the use of energy efficient materials in the design. The goal is to construct a "green" building which is more environmentally friendly and reduces operational costs. It will minimize non-renewable energy consumption, optimize site potential, use environmentally preferable products, protect and conserve water, enhance indoor environmental quality and optimize operational and maintenance practices. The selected site provides close proximity to the maintenance yard, in OP-2 Maintenance Complex, and requires minimal new paving and utility runs. The new building design would provide a relatively compact, straight forward, cost effective solution to the user's program requirements.

The design of the new visitor center will include high quality exhibitory that is highly interactive, and of sufficient depth of content so as to appeal to repeat visitors. It will also include a reception area, office space, storage, indoor auditorium, public restrooms, environmental resource library and storage. The current Visitor Center will be converted back to its original structure of two open-air picnic shelters, which will accommodate community functions and special events. Consolidating the visitor center with the administration building and maintenance compound would allow more efficient operations and maintenance, improve staff communication and would increase staff availability to the public. It would be a great improvement over the present, disjointed four building complex. The goal is for this building to be constructed "green" like the administration building.

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The proposed actions would result in new energy efficiencies and reduce future maintenance and operations cost.

Remove the current Administration Building and parking lots after the construction of the new Administration/Visitor Center Complex. The area will still be operational due to the radio tower and radio repeater building remaining. The entrance road and two parking spaces will remain for maintenance of radio tower and equipment.

D. OP-4. Sandusky Land Treatment Facility (Plate 8). This area is 12 acres. This wastewater treatment facility was completed in December of 1991 to replace the treatment plant located in South Sandusky campground. A stabilization pond and spray field treats the incoming waste from three recreation areas, the Rend Lake Marina, and the administration and maintenance complexes. The treatment facility will be reaching its maximum capacity in the near future and connecting to the City of Sesser's sewer force main will be a good option then remove the treatment facility. Other facilities include an operators building, lift station, and access road.

No New Actions are proposed for this area.

### Proposed CRR Actions:

Develop plans and specifications for connecting to the City of Sesser sewer force main. This will eliminate this wastewater treatment system and the Corps of Engineers' responsibility for maintaining wastewater treatment facilities in this area, which will reduce Operation & Maintenance (O&M) costs and increase efficiency. This wastewater treatment facility services the Maintenance Compound, the Administration Building, Dam West, Rend Lake Marina, South Sandusky Recreation Area and North Sandusky Recreation Area.

### Proposed Future Actions:

Connect to City of Sesser's sewage treatment system as discussed in Section 10.07. This will connect the west side of the lake to Sesser's sewer main, which will include the Administration/Visitor Center/Maintenance Compound, Dam West, Rend Lake Marina, South Sandusky Recreation Area and North Sandusky Recreation Area.

At the time Sesser is ready to handle all of our west side waste needs the existing wastewater treatment facility will be decommissioned. All work will be done with the appropriate permits from the IEPA. This is discussed further in Section 10.07.

E. OP-5 and OP-7. Big Muddy and Casey Fork Subimpoundment Dams (Plate 2). Big Muddy is 25 acres and Casey Fork is 25 acres. Located on the Big Muddy and Casey Fork tributaries in the upper reaches of the lake, these two subimpoundment dams enable manipulation of the water surface elevation for the benefit of fish and wildlife values of the project.

The two subimpoundment dams were built using the same design, compacted earth embankment, concrete keywall, and overlying revetment. However, the Casey Fork Subimpoundment Dam required repairs in 1993, during which the concrete wall was removed and steel sheet piling was put in its place. Other pertinent design data can be found in Table 1.

IDNR and the Corps cooperate in the management of the Subimpoundment dams, where the Corps maintains and repairs the structures, while IDNR operates the water control structures to manage water levels in the subimpoundments.

No New, CRR or Future Actions are proposed for this area.

F. OP-6. IDNR Rend Lake Wildlife Management Area (Plate 2). This area is 8 acres and is within the confines of the Rend Lake Wildlife Refuge, where IDNR maintains a Refuge Headquarters. This complex contains the Site Superintendent's office, an administrative and maintenance building, a hazardous materials storage building, an above-ground gasoline and diesel fuel storage tank and pump with secondary containment, 2 equipment storage sheds, and a gravel lot.

No New or Future Actions are proposed for this area.

Proposed CRR Actions:

Replace the existing roof on the superintendent office site and make any necessary repairs on the site service building. The project may include inspection and replacement of decking, new underlayment and flashings, new dimensional shingles on the residence, new guttering, replacement any soffit or fascia material, and ventilation or insulation.

G. OP- 8. IDNR Wayne Fitzgerald State Park Office (Plate 18). This area is 109 acres and is within the confines of the Wayne Fitzgerald State Park, where the Illinois Department of Natural Resources (IDNR) maintains a Park Office. This complex contains the Site Superintendent's residence, an administrative and maintenance building, a hazardous materials storage building, an above ground gasoline and diesel fuel storage tank and pump with secondary containment, 2 equipment storage sheds, and a gravel lot.

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No New or Future Actions are proposed for this area.

### Proposed CRR Actions:

Construct a visitor center at Wayne Fitzgerald State Park. The building will contain space for interpretive exhibits, tourism promotion and staff office space. It is expected the building will be approximately 6,300 sf. in size. Specific elements will include the following:

Exhibit room 1,100 sf.; conference/break room 500 sf.; A/V room 750 sf.; public restrooms 600 sf.; parking for 25 cars, 3 bus/RV spaces; clerical space 300 sf.; furniture purchase budget (\$35.0); interpreter office 125 sf.; staff office spaces 3 @ 125 sf.; mechanical/walls and circulation 1200 sf.; publication storage 250 sf.; staff restroom 120 sf. All site furniture, cabinetry, merchandise/sales 400 sf. and merchandise sales area; site landscaping/flagpole/lighting/signs will be included; utility connections.

H. OP-9. RLCD Rend Lake Golf Course Maintenance Building (Plate 24). This area is 1 acre and is within the confines of the Rend Lake Conservancy District leased area in the Gun Creek Recreation Area, where RLCD maintains a maintenance complex. This complex consists of a building containing the greens keeper's office and maintenance facility, an equipment storage lean-to, and a raw water intake structure for the golf course irrigation system. The RLCD pulls approximately 9 million gallons of raw water from the lake each year for irrigation.

No New, CRR or Future Actions are proposed for this area.

I. OP-10. RLCD Intake Structure & Pipeline (Plate 2). Inside the North Marcum Recreation Area, approximately 4 acres of land have been leased to the Rend Lake Conservancy District for a raw water intake structure and associated infrastructure. An underground pipe carries raw water to the water treatment plant, located on adjacent RLCD-owned land. This area will continue under lease for the water treatment structures.

A perimeter in the water around the raw water intake structure has been established and classified as project operations. No boats are permitted within 100 ft. of the structure, and "No Boats" buoys have been placed to mark this perimeter.

No New or Future Actions are proposed for this area.

### Proposed CRR Actions by RLCD:

Replace pumps in the intake structure and replace the water gate on the intake structure once the pumps are replaced.

#### **8.04. RECREATION LANDS**

A description of all recreational facilities at Rend Lake is presented in this section. Nine areas are classified as recreational. A summary of existing and proposed development at these areas is presented below. The recreation areas are described in a clockwise order around the lake as shown on Plate 2, the "Land Classification Map". A detailed cost estimate for each of the proposed developments is found in Section XIII, Cost Estimates. All routine maintenance and replacement work will be completed as funding is available.

A. Spillway Recreation Area (1) (Plate 5). This 84-acre area is developed as a day use area and serves as a focal point for visitors to the lake. It is a popular location for fishing, wildlife viewing, sightseeing, and hunting. It is divided up into 2 areas, River Road and the Visitor Center Complex.

River Road provides access to the area south of the dam between the outlet works and the concrete structure of the dam. Facilities include 1 vault comfort station and 3 parking lots. Walking trails lead from the various parking lots to the riverbank, providing access for bank fishing. A gravel walking trail leads from the south parking lot to a pedestrian bridge which provides access to the adjoining Main Dam Multiple Use Area (VM-1).

The Visitor Center is a primary location for visitors to obtain information about the lake and its facilities. The 5500 sq. ft. visitor center building, built in 1976, conveys the project story through interpretive displays and audio-visual programs. Facilities around the complex include a waterborne comfort station, an amphitheater, a group picnic shelter, a playground, 2 picnic sites, 4 water fountains and/or hydrants, wildlife demonstration area, demonstration wetland and prairie plot and a pedestrian trail around the demonstration areas. The Visitor Center was built for a temporary solution to supply visitors with a place to gather information about the lake. It was initially two open-air shelters that had walls added to them with an added enclosed breeze-way between the two shelters. The building is very inefficient in energy use and has poor drainage during rain events. When large rain event occur the rain run-off leaks into the building which is causing the walls to deteriorate and carpets to mold which could become a health hazard. The displays are very old and out of date and need replaced. The current location of the Visitor Center is very inefficient in the operation of this facility.

A 0.7 mile portion of the Rend Lake Bicycle trail runs through this area, connecting the South Marcum Recreation Area to the Main Dam Multiple Resource Area. With its proximity to the Main Dam and Visitor Center, this portion of the bike trail has become its

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acknowledged starting point. An interpretive plan has been created to provide facilities at the entrance of the bike trail, in this recreation area, and along the trail in the Main Dam Multiple Resource Area.

No New or Future Actions are proposed for this area.

### Proposed CRR Actions:

Combine the Visitor Center with the new administration building and convert the existing Visitor Center back into two open-air picnic shelters rentable to the public.

Develop picnic facilities along the Spillway with 3 covered picnic tables with 1 grill at each, located near the concrete vault comfort station and 3 covered picnic tables with 1 grill at each, on the opposite side of the spillway channel. This picnic area will provide facilities on the east and west side of the spillway, a very popular shoreline fishing spot. This will replace some of the picnic sites that were removed due to underutilization in the North Sandusky Day Use area.

Replace the amphitheater stage, seating, and landscaping

The amphitheater hosts cultural heritage and environmental learning programs, special events, and special use requests. It is used on a weekly basis during the recreation season (April – October) and intermittently during the off season (November – March.) The existing facilities are approximately 20 – 25 years old and have outlived their design life. All of the wooden structures are deteriorating and becoming unsafe; the concrete walking surface in the seating area has settled, cracked, and has been patched repeatedly, creating tripping hazards; there is insufficient electric to accommodate the sound and lighting needs of event sponsors; the location of the main electric supply box is inconvenient and obscures the view of the stage area by spectators; lighting equipment is difficult to install and correctly direct during evening events; and the uncovered stage provides no shade for programmers or performers during the heat of the day. The lack of stage covering not only creates overheating issues for performers, but also requires that the performers risk damage to expensive equipment in the event of rain during a performance.

It is proposed that the stage be replaced with a concrete and split block structure covered with a metal roof and that the seating area be redesigned to include a seating section with permanently mounted benches made of recycled plastic boards and two seating sections made of concrete with no benches designed to accommodate both persons with disabilities and visitors who wish to bring portable seating such as lawn chairs or blankets. The electrical control center will be relocated to behind the stage, out

of the public's view, and upgraded to accommodate the needs of modern sound and lighting equipment. In addition, the surrounding ground will be contoured and re-landscaped to better accommodate overflow visitors sitting outside the designated seating area.

B. Dam West Recreation Area (2) (Plate 6). This 114-acre area has been developed primarily for day use, with a picnic area, boat ramp, and leased marina. Future development plans for the marina include overnight facilities.

The day use area is divided into two areas, a picnic area and a boat ramp area. The picnic area features 16 individual picnic units, a playground, and a 33 car parking lot. The boat ramp area features a 4-lane boat ramp, a courtesy dock, a waterborne comfort station, 2 combination fountain/hydrants, a group picnic shelter, a horseshoe pit, a volleyball court, and a 17 vehicle and 100 vehicle-trailer parking lot.

The Rend Lake Marina has leased 48.6 acres of this recreation area under Lease # DACW43-1-94-14. Current development at the marina includes 270 wet boat slips, an office/showroom building, a combination rigging shop and storage building, two repair shops and dry storage buildings, a dry storage building, an above-ground gasoline storage tank, a small cylinder propane refill station, a sewage pump-out barge, and a 120 car and 10 trailer parking lot.

The Marina's 5 year development plan includes the addition of up to 10 single family cabins with bathroom and sleeping accommodations, a dry boat storage building, a small restaurant/snack bar facility, dock-side sewage facilities, and additional slips on the houseboat dock. In addition, the marina plans on the replacement of the concrete deck slabs on Open Dock 2 and the replacement of the northwest docks with pontoon slips.

No New Actions are proposed for this area.

Proposed CRR Actions:

Extend the Rend Lake Bike Trail across Rend City Road to the new Administration Office and Visitor Center Location.

Proposed Future Actions:

The picnic area has become a popular destination for families and small groups to come and picnic and fish along the shoreline. In addition, it is one of the few areas on the

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lake where visitors can pull their boat to shore and picnic, sunbathe, or wade with their pets.

It is proposed to add the following facilities in the area to improve the visitor's experience:

Install a retaining wall and place fill on an approximately 205 ft portion of the shoreline where erosion is occurring and a drop-off has formed. This will provide for shoreline protection and can be developed with an accessible sidewalk on the fill behind the wall to provide for shoreline access for those with disabilities.

Place sand on the southern portion of the shoreline where boats currently tie their boats. This will provide for a better surface for the boats and for waders.

Install a prefabricated concrete waterborne comfort station and water fountain. There is currently no comfort station or water in the picnic area. Visitors have to walk or travel to the boat ramp to use the facilities. This is difficult for visitors with small children and those with disabilities.

Install an accessible picnic site adjacent to the proposed accessible sidewalk.

Install accessible fishing access along the shoreline. This will involve a concrete sidewalk leading from the parking lot to the shoreline and a fishing pier or concrete platform for lake fishing access.

C. South Sandusky Recreation Area (3) (Plate 7 & 8). This 453-acre area has been developed for multi-use. This area is further divided into three recreation sub-areas, South Sandusky Day Use Area, Blackberry Nature Trail, and South Sandusky Campground. Approximately 2.4 miles of the west leg of the Rend Lake bike trail runs through this area. In addition, the South Sandusky Land Treatment Facility, OP-5, lies inside this area.

The facilities in the South Sandusky Day Use Area include a 4-lane boat launching ramp; a courtesy dock; a 660 ft. sand beach; 3 waterborne comfort stations; a shower building; 2 picnic shelters; 20 picnic units; a playground; a sand volleyball court; 2 horseshoe pits; 3 covered bench shelters; a boat ramp parking lot accommodating 40 vehicles and 98 vehicle-trailers; 4 day use parking lots accommodating 169 vehicles; a concession parking pad with 50 amp electric, water, and sewer service; 6 fountains and/or hydrants; and a lift station. One of the dam trilateration stations is also located in this area.

The Blackberry Nature Trail is a one-half mile interpretive trail. The stops along the trail interpret the varying habitat types that occur along the trail. Facilities at the trail include a 14-vehicle parking lot and information kiosk. The access road to OP-5, Sandusky Land Treatment Facility, crosses through the parking lot.

The South Sandusky Campground is a popular campground with 130 total campsites: 83 campsites with 50 amp electric service; 19 sites with 30 amp electric service, 20 campsites with electric, water, and sewer service; and 8 walk-in tent only campsites without electricity. The campground facilities include a shower building, 2 waterborne comfort stations with attached shower facilities, 4 waterborne comfort stations, 3 playgrounds, 9 parking lots accommodating 66 vehicles, a volleyball court, an amphitheater, a fee collection booth, a trailer sewage dump station, and 3 lift stations. This area will continue to provide camping, swimming, boating, and related services to the public.

Proposed New Actions:

**Campground** (See full description of renovations in section 11.02).

Convert 46 campsites to full hook-ups (water and sewer). See Table 24 for reference on financial cost analysis.

Install additional water hook-ups to 32 campsites. See Table 24 for reference on financial cost analysis.

Proposed CRR Actions:

**Day Use Area**

Install 10 picnic sites on the north end of the picnic area removing 10 picnic sites from the North Sandusky Day Use. Due to the increase visitation at the South Sandusky Day Use more picnic sites are needed.

**Campground** (See full description of renovations in section 11.02).

Renovate 75 campsites in the campground. See description of renovations in Section 11.02.

Replace add-on shower buildings and associated comfort stations with prefabricated concrete mini-shower buildings at existing site locations (Red Bud and Sycamore loops). The existing add-on shower buildings and associated comfort stations

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have reached the end of their projected design life of 25 years and are in need of major rehabilitation.

Replace all seven masonry comfort stations in the campground and day use. The design life is 50 years on the buildings but due to the extreme use in the summer and the freezing and thawing effects in the winter the buildings need replaced. In addition, these buildings do not comply fully with the Uniform Federal Accessibility Standards for the Handicapped which will require complete rehabilitation of the interiors to correct.

Replace deteriorated campground fee collection booth with a larger, handicap accessible, secure building with restroom facilities. The existing building is not accessible and was designed to be a temporary structure. Therefore, it has inadequate wall structure, electrical service, and insulation. In addition the size and layout of the existing structure are not conducive to installing and operating the park management computer systems.

Relocate gate attendant's site to a location near the fee booth to provide better security and availability to visitors.

### Proposed Future Actions:

#### **Day Use Area**

Install floating courtesy docks at the north end of the beach to facilitate the temporary mooring of boats for visitors who access the beach by water. This area is very popular for boaters, with dozens of boats pulled onto shore each weekend. However, the boat mooring area on the north side of the beach is shallow, making it difficult to pull large boats to shore, and popular, causing crowding issues. Floating boat docks would allow larger boats to access the shore and allow for more usage.

D. North Sandusky Recreation Area (4) (Plate 9 & 10). This 498-acre area has been developed for multi-use. This area is subdivided into three recreation areas, North Sandusky Day Use, North Sandusky Campground, and Shagbark Group Camp. Approximately 2.7 miles of the west leg of the Rend Lake Bicycle Trail runs through this area. In addition the North Sandusky fish brood pond is located in this recreation area.

The facilities in the day use area include a 4-lane boat launching ramp, a courtesy dock, 4 waterborne comfort stations, 3 group picnic shelters, 2 fire rings, 3 horseshoe pits, a volleyball court, 2 playgrounds, 36 picnic units, a boat ramp parking lot accommodating 54 cars and 77 trailers, 10 day use parking lots accommodating 389 vehicles, 9 water fountain and/or hydrants, a trailer sewage dump station, and 2 lift stations

The North Sandusky Campground is a very popular campground with 118 total campsites: 81 campsites with 50 amp electric service and 16 campsites with 50 amp electric, water, and sewage service. Facilities in the campground include a shower building, a waterborne comfort station with attached shower facilities, 4 waterborne comfort stations, 2 playgrounds, 4 parking lots accommodating 40 vehicles, a fee collection booth, 13 water fountains and/or hydrants, and 2 lift stations.

The Shagbark Group Camp is a campground loop inside of the North Sandusky Campground that has been separated off and designated as a group camp. It consists of 21 campsites with 30 amp electric service, a waterborne comfort station, a fire ring, a horseshoe pit, a volleyball court, 2 parking lots accommodating 10 vehicles, and 2 water fountains and/or hydrants.

Proposed New Actions:

**Campground** (See full description of renovations in section 11.02).

Convert 38 campsites in the campground to full hook-ups (water and sewer). See Table 24 for reference on financial cost analysis.

Install additional water hook-ups to 26 campsites in the campground. See Table 24 for reference on financial cost analysis.

Proposed CRR Actions:

**Campground** (See full description of renovations in section 11.02).

Renovate 75 campsites in the campground.

Replace deteriorated campground fee collection booth with a larger, handicap accessible, secure building with restroom facilities. The existing building is not accessible and was designed to be a temporary structure. Therefore, it has inadequate wall structure, electrical service, and insulation. In addition the size and layout of the existing structure are not conducive to installing and operating the park management computer systems.

Replace all nine masonry comfort stations in the campground and day use. The design life is 50 years on the buildings but due to the extreme use in the summer and the freezing and thawing effects in the winter the buildings need replaced. In addition, these buildings do not comply fully with the Uniform Federal Accessibility Standards for the Handicapped which will require complete rehabilitation of the interiors to correct.

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Replace the comfort station and add-on shower in Maple/Sweetgum with a prefabricated concrete mini-shower building to be relocated centrally between Maple, Sweetgum, White Oak, Hickory and Shagbark loops near the lift station, providing better and closer shower facilities for campers in these loops. The existing comfort station and associated add-on shower buildings have reached the end of their projected design life of 25 years and are in need of major rehabilitation.

Relocate gate attendant's site to a location near the fee booth to provide better security and availability to visitors.

### Proposed Future Actions:

Divide day-use area into 2 areas – North Picnic Area and South Group Camp. Remove road between the two areas and leave walking/bicycle path between them.

#### **New Day Use**

- Move playground to the open field across from new boat-in area.

#### **New Group Camp**

- Replace comfort station #15 with a mini-shower building.
- Construct walls onto existing shelter #3 to create an enclosed shelter.
- Remove roadway between new day use and new group camp and replace with cul-de-sacs and put in concrete walking path between them.
- Develop 10 RV sites with water and 50 amp service.
- Develop 15 tent sites
- Install playground equipment
- Construct a floating boat dock and accessible fishing facilities with a sidewalk to the shoreline from the new enclosed shelter #3.

#### **Day Use Area**

Install accessible fishing access along the shoreline near the boat ramp. The shoreline around this area has been protected from erosion with rip-rap and makes it difficult to access the shoreline. It will involve placing a concrete sidewalk from the parking lot to a fishing pier or concrete platform.

### **Campground**

Construct 10 campsites in the center of White Oak loop. The North Sandusky campground as a whole has high utilization rates, and the new location of these sites will take advantage of North Sandusky's popularity.

E. Ina Recreation Area (5) (Plate 11). This 28-acre site is developed for day use, primarily boat access. Facilities include a two-lane boat launch ramp, a courtesy dock, a waterfowl hunter sign-in box, an information bulletin board, a fee collection honor vault, and a boat trailer parking lot.

This recreation area is developed around an excavated harbor protected by rip-rapped breakwaters. In 1974 it was leased to the Casey Fork Park District for the development of marina and resort development. On 1 July 1981, the lease was terminated and the management of the land reverted back to the Corps of Engineers. All marina related infrastructure was removed with the exception of the wood support pilings in the harbor. These pilings are used by the commercial fishermen to mount temporary fish nets during the commercial fishing season.

This area is used by sightseers, recreational fishermen, commercial fishermen, and waterfowl hunters. It provides access to the Casey Fork arm of the lake. It will continue to provide lake access and related services to the public.

No New or CRR Actions are proposed for this area.

### **Proposed Future Actions:**

Install accessible fishing access along the shoreline. The shoreline around this area has been protected from erosion with rip-rap and makes it difficult to access the shoreline. It will involve placing a concrete sidewalk from the parking lot to the fishing pier or concrete platform.

F. Wayne Fitzgerald State Park (6) (Plate 18). This park area is leased to the Illinois Department of Natural Resources. The site, as leased, comprises 2539 acres of land and 763 acres of water. Factors such as diversity of development, physical size, and location contribute to making this State Park a major recreation area at Rend Lake.

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The State of Illinois completed the fourth phase of development at the Rend Lake Resort in 2004. The development now includes two, 10 unit "boatels", one 15 unit boatel, 11 duplex cabins, a 48 unit motel with ample conference facilities, tennis court, swimming pool, restaurant, and a concession building. Rend Lake Resort is a major destination area for Southern Illinois and attracts visitors from throughout the Midwest. Section 15.01, Appendix 1 presents the existing and proposed development for this area. The area will continue as a state area providing recreational services to the public.

Consolidation Coal Company originally had plans to undermine portions of the park with subsidence mining. However, the mine was closed and only 7.7 acres of subsidence was recorded in the northwest section of the park. This acreage is being mitigated as part of a larger negotiation between CONSOL and USACE. As of this date a completed mitigation plan has not been finalized.

The Sail Boat Harbor, located at the southern end of the park, contains three oil wells, a tank battery with a separate entrance off State Route 154, and buried electric and oil pipe lines. Surface occupancy is handled under a real estate instrument (lease). Depending upon the market, future permit requests for oil development are expected; the cumulative impact of this type of development could be significant.

### **Proposed New Actions:**

Construct a seasonal concession/hunter check-in station at Wayne Fitzgerald where existing hunter check-in station is located. It is expected the building will be a slab on grade masonry block or brick construction, wood trusses and shingle roof. The project will include the following: Dining/meeting space for 75 persons (1000 sf.); check-in station (530 sf.) and connected to meeting space with doors; food prep, dishwashing and pantry for short order menu (650 sf.); restrooms and janitor closet (400 sf.); vestibule (110 sf.); mechanical/circulation/walls (500 sf.). Include kitchen equipment and walk in cooler/freezer. Resealing and striping of an existing parking lot. Exterior lights, landscaping, signage. All interior floors with stained and sealed concrete. Walls to be masonry block or painted drywall.

### **Proposed CRR Actions:**

Resurface and modify culverts on approximately 4.0 miles of the Rend Lake Bike Trail. The project will include topdressing the existing aggregate surface, correcting cross slopes at three locations and extending or adding end sections on existing culverts. Construct Segment C which will extend the trail into the campground and terminate at the campers boat ramp (the estimated length is approximately 2,500 ft.).

Extend the water lines in the campground and day use areas. Replace the existing water hydrants and fountains with IDNR standard units. Add additional hydrants and fountains to provide better access to water for campers. Make 1 existing campground loop (Bay Area-31 sites) into full-service campsites with individual water, sewer, and electric service. Extend a sewer force main and install a collection system and lift pumps as needed. Add another 50 hydrants throughout the campground and 10 drinking fountains to improve water service. Add flush hydrants as needed to meet public health and safety standards. Replace 243 ground-mounted grills with new, permanently anchored grills at each campsite. At ADA sites, increase the height of the grill to meet current standards. Install one lantern post at each campsite (243 needed). Install standard drinking fountains with hydrants at 4 picnic shelters. Extend electric service to Shelters 1, 2, and 3. Install new security lights at each shelter and at 3 road intersection locations.

Replace 12 lift station pumps and guides at 6 lift stations throughout the park.

Inspect, repair and replace the roofing systems on 5 structures in Wayne Fitzgerald. Replace all deteriorated decking, underlayment and shingles or steel panels as needed. Re-coat or paint steel panel roofs and sidewalls as needed to keep them from rusting and weathering. Replace all deteriorated flashings, drip edges, fascia and soffits, guttering and downspouts. Replace, add or improve roof ventilation with vents or fans. Add to or replace insulation as needed to meet current standards.

Renovate three shower buildings in the Class A campground. The project will provide for installation of new plumbing fixtures and hardware, new shower and toilet partitions, new lighting fixtures and electrical outlets, new wiring if needed, add or replace insulation, replace or add new ventilation systems, install new energy efficient windows and doors, new interior and exterior finishes, painting and caulking and new sidewalks as needed. Install new roofs, flashings, soffits and fascia and guttering if needed. At each location, construct a new three-sided information kiosk to display park regulations and notices with surrounding concrete paving. Add new security lighting at each location.

Replace the resort playground surfacing by removing existing fall zone material and replacing it with a new unitary rubberized mat using either mats adhered to a concrete substrate or use of a poured in place system to meet safety standards for fall zone material. Install new drainage in the fall zone if needed. Replace the edging on the adjacent sidewalks and existing steel edging along the surrounding sidewalks with a rounded concrete curb. Reset the existing pavers abutting the curbing.

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Install a courtesy dock system at their boat ramp facility, located within the campground, which meets ADA guidelines. Improve parking to meet ADA guidelines including a new concrete sidewalk or striped crosswalks of existing paving as needed to make an accessible route from the nearest ADA parking. Install one perpendicular (to shoreline) floating dock 6' by 30' with a transfer railing. Install a parallel (to shoreline) floating dock approximately 10' by 60'. Install a new security light and one three sided kiosk to house fishing regulations and boater safety information.

Construct a barrier-free ADA fishing pier (approximately 12' wide x 155' long) with access to deep water fish habitat. Construct an accessible concrete ramp or sidewalk for access route (6' x 195'). Add 3 security lights and paved accessible parking spaces 2 (16' x 20' each). Fishing pier could either be a fixed structure or made from floating docks.

Construct a full service swimming facility to include the following: Parking for 116 vehicles, dredging approximately 2100 CY, sand beach and swimming area, water hydrants 1 for 350 to 400 users, drinking fountains, play equipment, riprapped stone breakwaters, concrete sidewalks, facility building with bather preparation area (approximately 810 sf.).

Plans for the Sailboat Harbor Area include constructing a restroom facility with vending machine operation, approximately 35' x 50' in size. Other planned improvements include installation of floating docks, drinking fountains, concrete sidewalks, landscape improvements, a picnic shelter with a second story observation deck, and security fencing.

No Future Actions are proposed for this area.

G. Gun Creek Recreation Area (7) (Plate 12). This 223-acre area has been developed for multi-purpose and contains a campground and day use area. The campground contains 100 total campsites: 99 campsites with 50 amp electric service and 1 campsite with 50 amp electric, water, and sewer service. Facilities in the campground include 1 shower building, 4 vault comfort stations, 2 playgrounds, an amphitheater, a fee collection booth, 3 parking lots accommodating 16 vehicles, a trailer dump station, 13 water fountains and/or hydrants, and a lift station. The facilities in the day use area include a 4 lane boat launch ramp, a courtesy dock, a group picnic shelter, a playground, a boat ramp parking lot accommodating 15 vehicles and 96 vehicle-trailers, a day use parking lot accommodating 63 vehicles, 2 vault comfort stations, and 4 fountains and/or hydrants.

Proposed New Actions:

**Campground** (See full description of renovations in section 11.02).

Convert 49 campsites to full hook-ups (water and sewer). See Table 24 for reference on financial cost analysis.

Install additional water hook-ups to 25 campsites. See Table 24 for reference on financial cost analysis.

Proposed CRR Actions:

**Campground** (See full description of renovations in section 11.02).

Renovate 50 Campsites.

Replace deteriorated campground fee collection booth with a larger, handicap accessible, secure building with restroom facilities. The existing building is not accessible and was designed to be a temporary structure. Therefore, it has inadequate wall structure, electrical service, and insulation. In addition the size and layout of the existing structure are not conducive to installing and operating the park management computer systems.

Consolidate and replace 4 masonry vault comfort stations with 2 waterborne facilities. Comfort stations #1 in Nighthawk and #4 in Eagle will be removed. Comfort station #2 will be removed and replaced with a new prefabricated concrete waterborne comfort station; and comfort station #5 will be removed and replaced with a prefabricated waterborne mini-shower. The new and improved facilities will reduce future costs by reducing the number of facilities to be operated and maintained thereby increasing operations efficiency and better meeting the current and future needs of project visitors.

Relocate gate attendant's site to a location near the fee booth to provide better security and availability to visitors.

Develop sewer system plans and specifications for the entire Gun Creek Campground. Develop plans and specifications for a sewer system that complies with public health and EPA regulations while providing system improvements to reduce maintenance and operations costs and improving service for project visitors.

Construct sewer system in the entire Gun Creek Campground to connect all new waterborne comfort stations, mini-showers and full hook-up sites.

Proposed Future Actions:

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### **Day Use Area**

Install an accessible fishing access along the shoreline by the group shelter. The shoreline around this area has been protected from erosion with rip-rap and makes it difficult to access the shoreline. This will involve placing a concrete walkway from shelter #10 to the fishing pier or concrete platform.

Convert a portion of the day use area near Shelter 10 into camping to meet projected demand. Boat ramp area will remain a day use.

### **Campground**

Construct a half-mile spur, Phase 7, of the Rend Lake Bicycle Trail to connect the Gun Creek Campground to the existing bicycle trail. The Rend Lake Bicycle Trail has become very popular with visitors, and the Gun Creek Campground is now the only campground that does not have direct access to it. Visitors currently have to ride along the roadways, through the Rend Lake Conservancy Recreation Complex, which is heavily used in the summer and is not designed to accommodate bicycle traffic.

H. North Marcum Recreation Area (8) (Plate 13). This 74-acre area is developed for day use, with a boat ramp, picnic areas, and sand shoreline for boat mooring facilities. The Rend Lake Conservancy District Water Intake and Pipeline (OP-11) is also located in this area. Facilities in the North Marcum Recreation Area include a shower building, 3 vault comfort stations, 2 group picnic shelters, 22 picnic sites, a 300 ft. sand shoreline for boat mooring use, a 4-lane boat launch ramp, a courtesy dock, a boat ramp parking lot accommodating 15 vehicle and 50 vehicle-trailers, 4 day use parking lots accommodating 374 vehicles, 2 horseshoe pits, a basketball court, a sand volleyball court, a grass volleyball court, 4 covered bench shelters and 6 water fountains and/or hydrants. In addition, there is a concessionaire concrete pad with 50 amp electric, water, and sewer service. This area will continue to provide swimming, boating, picnicking, and related services to the public.

#### Proposed New Actions:

Install a picnic shelter south of the boat mooring parking area (near the breakwater) to serve boat users. Existing shelters in this recreation area are heavily reserved during the summer. Revenue generated by reservations will offset the costs. The visitors have stressed the need for a shelter near the boat mooring.

#### Proposed CRR Actions:

Consolidate the two deteriorated vault comfort stations in the day use area with one centrally located, prefabricated, concrete waterborne comfort station. The consolidated facility would substantially reduce future costs by reducing the number of facilities to be operated and maintained, thereby increasing operations efficiency and better meeting the current and future needs of project visitors. The two existing vault comfort stations located in the North Marcum Day-use area have reached the end of their projected design life of 25 years and are in need of major rehabilitation. In addition they do not comply with the handicapped accessibility standards set in EM 1110-1-400.

Replace the deteriorated vault comfort station at the boat ramp with a prefabricated concrete vault comfort station. The existing comfort station located at the boat ramp has reached its projected design life of 25 years and is in need of major rehabilitation. In addition, it does not comply with the handicapped accessibility standards stated in EM 1110-1-400.

**Proposed Future Actions:**

Install an accessible fishing access along the shoreline. The shoreline around this area has been protected from erosion with rip-rap and that makes it difficult to access the shoreline. This will involve placing a concrete walkway from the parking lot to the fishing pier or concrete platform.

I. **South Marcum Recreation Area (9) (Plate 14 & 15)** This 395-acre area has been developed for multi-use. It is subdivided into 3 sub-areas: South Marcum Campground, South Marcum Day Use Area, and the Dale Miller Youth Area.

The South Marcum Campground consists of 176 total campsites: 48 campsites with 50 amp electric service, 97 campsites with 30 amp electric service, 2 campsites with 50 amp electric, water, sewer service, and 14 non-electric walk-in tent only campsites. Facilities in the campground include a shower building, 9 vault comfort stations, a playground, 2 basketball hoops, a campsite shelter, an amphitheater, a fishing pond, a 0.3 mile walking trail, 10 parking lots accommodating 92 vehicles, a fee collection booth, a 2-lane trailer dump station, 13 water fountains and/or hydrants, and a sewage lift station. The Green Heron Pond is located inside the campground.

The facilities in the South Marcum Day Use Area include a 4-lane boat launch ramp, a courtesy ramp, a boat ramp parking lot accommodating 20 vehicle and 100 vehicle-trailers, a day use parking lot accommodating 99 vehicles a vault comfort station, a group picnic shelter, a playground, 8 picnic units, a trail access point for the west leg of the Rend Lake Bicycle Trail, and 2 water fountains.

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The Dale Miller Youth Area is a group use camping area that accommodates up to 200 people and contains 5 group mini-shelters, 10 trailer campsites with 30 amp electric service and 5 designated tent campsites. Facilities in this area include an enclosed group shelter, a shower building, a group fire ring, a playground, a 140 ft. beach, 2 parking lots accommodating 39 vehicles, a tennis court, a basketball court, a baseball field, and a fitness trail. The Dale Miller Youth Area is very popular for family reunions and organizational outings.

Oil extraction development facilities inside the South Marcum Recreation Area, adjacent to the campground include a gated gravel access road, two well heads, and a series of tank batteries and associated separators. Issues surrounding oil and gas extraction at Rend Lake are discussed in Section 6.10, Factors Influencing and Constraining Resource Development and Management, Oil & Gas.

### Proposed New Actions:

**Campground** (See full description of renovations in section 11.02).

Convert 75 campsites to full hook-ups (water and sewer). See Table 24 for reference on financial cost analysis.

Install additional water hook-ups to 37 campsites. See Table 24 for reference on financial cost analysis.

### Proposed CRR Actions:

#### **Day Use Area**

Replace the deteriorated vault comfort station at the boat ramp with a prefabricated concrete vault comfort station. The existing wooden comfort station has reached the end of its projected design life of 25 years and is in need of major rehabilitation. In addition, it does not comply with the handicapped accessibility standards set in EM 1110-1-400.

**Campground** (See full description of renovations in section 11.02).

Develop sewer system plans and specifications for South Marcum Campground. Develop plans and specifications for a sewer system that complies with public health and EPA regulations while providing system improvements to reduce maintenance and operations costs and improving service for project visitors.

Construct sewer system in the South Marcum Campground to connect all new waterborne comfort stations, mini-showers and full hook-up sites.

Widen campground roads. EM 1110-1-400 provides minimum design requirements for park roadway design. These design requirements include a minimum paved width of 24 ft for two-way roads and 14 foot for one-way roads and a 2 ft wide shoulder base material on each side for both types of roads. The roads in this campground do not comply with these standards. Approximately 6 miles of road would be widened.

Renovate 100 Campsites.

Replace the deteriorated campground fee collection booth with a larger, handicap accessible, secure building with restroom facilities. The existing building is not accessible and was designed to be a temporary structure. Therefore, it has inadequate wall structure, electrical service, and insulation. In addition, the size and layout of the existing structure are not conducive to installing and operating the park management computer systems. The location for the new building will be determined in the future once policies concerning entrance fees have been finalized.

Relocate gate attendant's site to a location near the fee booth to provide better security and availability to visitors.

Remove nine deteriorated wooden vault comfort stations in the campground and replace with six new facilities. Completely remove Comfort Stations #41, #44 and #46. Replace Comfort Stations #39, #42, and #48 with a prefabricated concrete waterborne comfort station and replace comfort stations #40, #45, and #47 with prefabricated concrete mini-shower buildings. The vault comfort stations in this campground have reached the end of their projected design life of 25 years and are in need of major rehabilitation. In addition, they do not comply with handicapped accessibility standards set in EM 1110-1-400. The new consolidated facilities will substantially reduce future costs by reducing the number of facilities to be operated and maintained and better meet the current and future needs of the lake visitors.

Convert the trailer dumping station from a holding vault to a waterborne facility. This will be done in conjunction with the conversion of vault comfort stations to waterborne facilities and the installation of full hookup service on some campsites. This will result in more efficient facilities that will serve the public better.

### **Dale Miller Youth Area**

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Convert 5 primitive campsites in Dale Miller Youth Area along the beach entrance road into 50 amp electric sites with RV pad, grill, lantern post, and picnic table.

### Proposed Future Actions:

#### **Day Use Area**

Install floating boat docks and accessible fishing facilities along the shoreline on the picnic area point. The addition of docks will be attractive to shelter users and boat ramp users alike.

#### **Campground**

Renovate Green Heron Pond, removing aquatic vegetation and installing an accessible fishing pier. This is a small pond that is a part of the IDNR's Department of Fisheries Pond Stocking Program. It has the potential for becoming an accessible, child-friendly fishing facility in the campground. Most of the shoreline surrounding the South Marcum Campground has been protected from erosion with riprap, making it difficult to access the shoreline.

Install an accessible fishing access and floating docks adjacent to camping loops Buck Ridge and Covey Point along the shoreline. The shoreline around these areas has been protected from erosion with rip-rap and that makes it difficult to access the shoreline and moor boats. It will involve constructing a concrete walkway to the shoreline and installing a fishing pier or concrete platform along with a courtesy dock.

#### **Dale Miller Youth Area**

Build a new enclosed mini-shelter on the end of the turnaround overlooking the lake in the Dale Miller Youth Area.

Install an accessible fishing access and a floating dock adjacent to Mini-shelter #3 along the shoreline in the Dale Miller Youth Area. The shoreline around these areas has been protected from erosion with rip-rap and that makes it difficult to access the shoreline and moor boats. It will involve constructing a concrete walkway to the shoreline.

### **8.05. MULTIPLE RESOURCE MANAGEMENT LANDS.**

The following areas have been classified as Multiple Resource Management Lands with primary classifications as listed below. Primary classifications include

vegetative management, recreation - low density, wildlife management general and future recreation. These areas are shown on Plate 2 of this plan.

A. Vegetative Management.

1. VM-1. Main Dam Multiple Resource Area (Plate 2). This 792-acre area consists of varying habitats, dominated by bottomland hardwoods. A 60 acre native prairie grass plot and upland hardwood forests also occur in this area. Approximately 3.1 miles of the Rend Lake Bicycle Trail is located in this area.

The naturally occurring quality bottomland forests, west of the Big Muddy River, were impacted by coal mine subsidence from the mining operations of the Ziegler/Old Ben Coal Company. Changes in the topography resulting from subsidence increased flooding and caused the establishment of permanent pools of water that killed portions of the original bottomland forest.

The Rend City Wetlands project completed in 2005, established approximately 230 acres of wetland habitat in this area. This project re-established hydric conditions and allowed for the manipulation of water flow patterns to restore the wetland characteristics of this degraded site. Wetland benefits were further maximized by implementing vegetative management techniques that promote the growth of native, moist soil herbaceous plants and improve the quality of bottomland hardwood forest composition. This wetland habitat has been segmented and managed as 4 units: 2 greentree units, 1 moist soil unit, and 1 permanent wetland unit containing a series of shallow ponds. A series of low levees have been constructed and water levels are controlled by 2 gated and 10 stop-log water control structures and 3 overflow weirs.

Two access parking lots, Prairie Hill and Sugar Creek, provide safe, off-road parking for visitors. In addition, visitors may park at 2 locations in the adjacent Spillway Recreation Area (Area 1) and access the Main Dam MRA from there.

No New Actions are proposed for this area.

Proposed CRR Actions:

Remove the old wooden railroad bridge across the Big Muddy River and the old concrete silo located in field just east of Rend City Road. This action would correct a public safety deficiency and would restore the ecological value to the area.

Proposed Future Actions:

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Construct a siphon to provide water to the wetland complex compartments. The wetland development was approved on 28 October 1994 in Supplement 1 of the 1993 Master Plan. This supplement included the construction of an efficient siphon and ditch system that will carry water directly from the lake, over the dam, to each wetland management unit. This will eliminate the need to pump water, which is generally associated with managed wetlands.

Construct a gravel access parking lot near the Rend City Road and recently acquired mitigation lands to provide safe off-road parking for visitors using the area.

2. VM-2. Sandusky Creek Multiple Resource Area (Plate 2). This 124-acre area contains the lands surrounding the upper end of Sandusky Creek, west of the Rend City Road. The ecosystem in this area consists of natural bottomland hardwood forests and marsh habitats.

The marsh ecosystem has seen a natural establishment of aquatic submerged and emergent plants. This increased wetland plant diversity provides good habitat for aquatic and semi-aquatic animal species.

This area is primarily used for hunting, fishing and other dispersed uses. It will continue to be managed to provide bottomland forest and marsh habitat.

No New, CRR or Future Actions are proposed for this area.

3. VM-3. North Sandusky Multiple Resource Area (Plate 2). This narrow, irregular-shaped 118-acre parcel of land, between the normal pool elevation and the project boundary, borders a cove and tributary to the lake. The management strategy is to allow natural succession. The area lies between the intensive recreation development in North Sandusky and State Highway 154, the primary travel route bisecting the lake. Management practices will be carried out to maintain plant diversity and shoreline habitat.

No New, CRR or Future Actions are proposed for this area.

4. VM-4. Jackie Branch Multiple Resource Area (Plate 2). This 167 acre area is a small parcel of land with an irregular boundary line that surrounds the upper reaches of Jackie Branch. The vegetative cover is mostly bottomland hardwood forest. Two access parking lots, North and South Jackie Branch, provides safe off-road parking for visitors entering the area. Management practices will be carried out to maintain the bottomland hardwoods and plant diversity.

No New, CRR or Future Actions are proposed for this area.

5. VM-5. West Multiple Resource Area (Plate 2). This block of land is approximately 956 acres and slopes gradually towards the lake. It consists primarily of old agricultural fields and some second growth bottom land hardwoods.

The area is managed to provide a diversity of ecological habitats by controlling the ecological succession of various portions of the area. Management techniques such as agricultural leases, successional mowing and disking, planting of food plots and warm season grasses, and prescribed burning allow for the creation and maintenance of a variety of habitat types. These habitat types include active farm fields, old fields, shrublands, and woodlands. This diversity of habitat types in this area benefits a wide variety of game and non-game species.

This area is used by the public for hunting, wildlife viewing, and hiking. Four access parking lots, Honker's Point, Lambrusco, Mine 21, and Countyline, provide safe off-road parking for visitors. The Mine 21 brood pond, the Jackie Branch Pond, and an accessible goose hunting pit are located in this area.

This area will continue to be managed to provide a mixture of successional stage habitats.

No New, CRR or Future Actions are proposed for this area.

6. VM-6. Ward Branch Multiple Resource Area (Plate 2). This area of land, comprising approximately 739 acres, slopes gradually toward the lake. The majority of this land is open with tree and shrub vegetation being limited exclusively to fence rows and drainage areas. Portions of the north-end of the area are bottomland hardwoods. Significant mudflats and shallow water habitat are present along the shoreline, which provides foraging and loafing areas for shorebirds, especially during fall migration when water levels undergo a natural drawdown. Dabbling ducks, other waterfowl species, and post-breeding season dispersing wading birds are also attracted to this area.

Two access parking lots, C & E and Ward Branch, provide safe off-road parking for visitors using the area.

Management objectives in this area are to maintain the bottomland hardwood forests; open, low grain and grass fields; moist soil plant habitat; and open, willow-free mudflats. The maintenance of open areas is accomplished through agricultural leases, other agricultural practices, succession mowing, and prescribed burning.

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No New, CRR or Future Actions are proposed for this area.

7. VM-7. Atchison Creek Multiple Resource Area (Plate 2). This 606-acre area is comprised predominately of bottomland hardwood forest with some wetland management units, upland old field and prairie grass habitat.

Parts of this area are subject to annual flooding of variable duration. In order to improve the quality of the wetlands in the area, a levee system and a creek diversion structure were constructed in the late 1990's. The created wetlands are divided into 3 moist soil units, and wetland benefits are maximized with vegetative management emphasis placed on promoting native moist soil plant species.

Three access parking lots: Bonnie Lane, Whitetail Ridge, and Atchison Creek; provide safe, off road parking for visitors to this area.

No New, CRR or Future Actions are proposed for this area.

8. VM-8 Ina Multiple Resource Area (Plate 2). This 641-acre area is mostly comprised of open, flat fields with some bottomland forest habitat. Most fields are maintained in the early to middle stage of succession through agricultural leases, other agricultural practices, succession mowing, and prescribed burning.

Significant mudflats and shallow water habitat are present along the shoreline, which provides foraging and loafing areas for shorebirds, especially during fall migration when water levels undergo a natural drawdown. Dabbling ducks, other waterfowl species, and post-breeding season dispersing wading birds are also attracted to this area.

Two access parking lots, Ina and Ken Gray, provide safe, off road parking for visitors to this area. The North Ina Pond is located in this area.

No New, CRR or Future Actions are proposed for this area.

9. VM-9. Gun Creek Multiple Resource Area (Plate 2). This 1,431-acre area is comprised predominately of bottomland hardwood forest with some wetland management units and upland old field and prairie grass habitat.

Parts of this area are subject to annual flooding of variable duration. In order to improve the quality of the wetlands in the area, a levee system and 8 stoplog water control structures were constructed in 1990. The created wetlands are divided into 2 greentree units and 8 moist soil units. Wetland benefits are maximized with vegetative

management emphasis placed on mimicking natural water regimes in the greentree units and promoting native moist soil plant species in the moist soil units.

Seven access parking lots; West Gun Creek, White Oak Pond, Cypress View, Woodcock Ridge, Buttonbush Bay, Hamilton Branch, and Oak Grove; provide safe, off road parking for visitors to this area. In addition, one access parking lot, Cypress View, contains a 1 lane gravel boat ramp that provides small boat access to the upper reaches of Gun Creek.

No New, CRR or Future Actions are proposed for this area.

10. VM-10. Sims Multiple Resource Area (Plate 2). This 180-acre area lies between the North Marcum Future Recreation Area (FR-2), the Gun Creek Recreation Area (Area 7), and Rend Lake Conservancy District operations. It consists mainly of a mixture of upland habitats.

A portion of the area consists of old fields that are maintained to remain open and are vegetated with a mixture of grasses and wildlife food plots. Other areas have been allowed to grow up into shrub habitat, and there are a few remnants of second growth forest lands.

The Rend Lake Bicycle trail runs through the southern portion of this area, connecting the North Marcum Future Recreation Area to the Rend Lake Conservancy District's Bicycle Trail.

An exploratory oil well was drilled in 2006, but was abandoned because oil was not found. Issues surrounding oil and gas extraction at Rend Lake are discussed in Section 6.10, Factors Influencing and Constraining Resource Development and Management, Oil & Gas.

No New, CRR or Future Actions are proposed for this area.

11. VM-11. Marcum Creek Multiple Resource Area (Plate 2). Located to the east of Interstate 57 along Marcum Branch, this 88-acre area is a narrow parcel of land with an irregular boundary. Vegetative cover is primarily bottomland hardwood forest species. Natural succession is occurring in this area which serves as a buffer between privately owned land and the lake. Management practices will maintain the bottomland hardwoods and provide a diversity of mature unfragmented forest habitat.

No New, CRR or Future Actions are proposed for this area.

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12. VM-12. South Marcum Multiple Resource Area (Plate 2). This 82-acre area, situated west of I-57 and south of Marcum Cove provides a buffer between South Marcum Campground and Interstate 57. It consists of an old apple orchard site, bottomland forest in low areas, and upland forest on better drained ridges. The area is accessible only by water or by walking from the South Marcum Campground. As a result, this area has experienced a lack of development, and the forests have been allowed to mature. This area will continue to be managed for mature, closed canopy upland and bottomland forests.

No New or CRR Actions are proposed for this area.

Proposed Future Actions:

Construct Phase 5 of the Rend Lake Bike Trail that connects the South Marcum Campground to the North Marcum Recreation area. A portion of this segment will run through this area. The path of the trail will be sited to provide a safe, aesthetically pleasing bicycle ride.

B. Recreation - Low Density.

1. LD-1. Stockpile Storage Area (Plate 2). This approximately 107 acre area, located north of the Rend Lake Marina, is a location where bulky, weather resistant supplies such as road rock, rip-rap, concrete anchors, and culvert pipe are stored. Approximately 0.5 miles of the west leg of the Rend Lake bike trail runs through this area.

No New, CRR or Future Actions are proposed for this area.

2. LD-2. Turnip Patch Multiple Resource Area (Plates 2 and 11). This 13-acre site is an extension of the West Multiple Use Area (VM-5) and was designed primarily to serve fishermen and sightseers in the northern reaches along the Big Muddy tributary of the lake. Existing facilities include a gravel access road, a 45 vehicle gravel parking area, a two-lane concrete boat launching ramp, one vault toilet, and electric service. The management objective is to provide opportunity for dispersed low density recreation activities including boating.

No New, CRR or Future Actions are proposed for this area.

3. LD-3. Shooting Complex (Plate 2). This 61-acre tract of land serves as a state of the art shooting facility. It is owned by the Rend Lake Conservancy District and is contracted to a private concessionaire. The facility offers 38 sporting clay stations,

2 tower and 2 pond stations, 2 elevated stands, 7 trap machines – 3 lighted and all with voice pulls, lighted 5-stand, lighted skeet field, monthly registered shoots and a shooter's pro shop. It also contains a 3D archery range featuring 20 targets with primitive, intermediate and master set-ups. It is also ADA accessible.

No New, CRR or Future Actions are proposed for this area.

4. LD-4. I-57 Multiple Resource Area (Plate 2). This 5-acre tract of land serves as a buffer zone between the Illinois Department of Transportation (IDOT) Rest Area along south-bound Interstate Highway 57 and Rend Lake. IDOT acquired 36.5 acres from the Corps for the adjacent rest area. In the event that those lands are no longer needed for highway purposes, the 36.5 acres will be returned to the Corps and incorporated into this multiple resource area. This area will continue to be managed to provide a buffer between the rest area and the lake.

No New, CRR or Future Actions are proposed for this area.

5. LD-5. North Marcum Multiple Resource Area (Plate 2). Mentioned in paragraph 8-03 h. above, this 630-acre area was the site of the North Marcum Campground prior to 1982. The campground was closed in May 1982 in a nationwide effort to increase the cost effectiveness of Federal recreation areas. The northern portion of the area was subsided by long wall mining in 1990 which caused damage to campsites and comfort stations. Since that time the campground facilities have been removed for safety and health reasons. The area is now designated for group use camping and development by the Corps of Engineers and/or other public agencies. Appropriate type development could consist of anything from primitive camping to enclosed mini-shelters. Any development would be fully described in a supplement to the Master Plan. In the interim, access and parking is provided for hiking, biking, sightseeing, bird-watching, boat-in picnicking, and the North Marcum Fishing Pond. The south area consists of bottomland populated with tree species such as sycamore, river birch, silver maple and ash and uplands with oak-hickory woods and pines. Eight oil wells, 3 tank batteries and 1 salt water injector are currently producing in the area. The cumulative impacts of this mineral development should be considered in future planning and permitting.

Two access parking lots, East Palestine and West Palestine, provide safe, off road parking for visitors to this area.

The management objective is to continue to permit oil wells while maintaining the vegetative buffers to screen the oil tanks and pumps from the public and also to suppress the noise created from the wells so that it cannot be heard from South Marcum Campground and the North Marcum Recreation Areas. Applications for new oil well

## ***Rend Lake Master Plan***

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easements in this area will be critically reviewed based upon cumulative impacts. The area will continue to be available for dispersed low density recreation activities.

No New or CRR Actions are proposed for this area.

Proposed Future Actions:

Construct Phase 5 of the Rend Lake Bike Trail that connects the South Marcum Campground to the North Marcum Recreation area. The majority of this segment will run through this area. The path of the trail will be sited as to minimize conflicts with the extensive oil extraction development in the area.

Construct a target shooting range. This shooting range will provide a safe and convenient place for public firearm enthusiasts and hunters to practice and sight-in their guns. This facility is envisioned to serve as a training facility for hunter education classes, area law enforcement, and new shooters. A challenge partnership agreement will be pursued for the construction and management of this area.

### **C. Wildlife Management General**

1. WM-1. Rend Lake Wildlife Refuge (Plates 2 and 23). This refuge comprises approximately 5,000 acres of land and water licensed to the Illinois Department of Natural Resources. The land portion of the refuge is comprised of 1,291 acres. The IDNR manages the refuge for the benefit of migrating and wintering waterfowl and is instrumental in the waterfowl hunting opportunities available on the Big Muddy and Casey Fork Wildlife Management Areas. It is located on Nason Point which divides the upper part of Rend Lake into two distinct arms. Section 15.01, Appendix 1 describes the facilities and management activities in the waterfowl refuge.

Consolidation Coal Company originally had plans to undermine portions of the refuge with subsidence mining. However, the mine was closed but not before 423.72 acres was impacted. This acreage is being mitigated as part of a larger negotiation between CONSOL and USACE. As of this date a completed mitigation plan has not been finalized. It will undoubtedly alter the boundary of the refuge and/or state managed lands on Nason Point. This additional mitigated land may be used as refuge or as wildlife management areas open to recreation/hunting.

No New Actions are proposed for this area.

Proposed CRR Actions:

Remove 7 sets of wooden privies, including tops and vaults, and install 5 standard concrete block privies with vaults in the same proximity at access points. Install miscellaneous concrete sidewalks to improve accessibility and install ADA parking spaces if needed, sign and stripe.

Proposed Future Actions:

Due to changing trends in the migration and ecology of waterfowl, especially Canada geese, agricultural leases and crop/forage planting plans may be altered or changed and additional wetland/moist soil units are proposed to enhance dabbling duck habitat in the refuge. Also, due to changing trends in waterfowl use, land use patterns may be changed, including alteration of the refuge boundary.

Depending upon the future market for coal and mining technology, the northern portion of the refuge and the Casey Fork Wildlife Management Area, north of the Casey Fork Subimpoundment, could still be impacted by mineral development, specifically, subsidence related to long-wall coal mining.

2. WM-2. Big Muddy Wildlife Management Area (Plate 2). This 4,205-acre area of land and water above the Big Muddy Subimpoundment Dam is licensed to the IDNR for fish and wildlife purposes. A program of intensive waterfowl management is presently being implemented by IDNR. The access points within the area are presented on Plates 19 and 20. Section 15.01, Appendix 1 provides further description of the area and associated access points. Three of these minor access points (Plates 19 and 20) are known as the Waltonville South Access Area (166 land and water acres), the Waltonville East Access Area (143 land and water acres), and the Nason Access Area (104 land and water acres). IDNR has determined that the potential operating costs for these remote areas prohibit development beyond the scope of providing access points. ADA compliant courtesy docks, ramps, walkways and comfort stations were completed in 2007.

No New or Future Actions are proposed for this area.

Proposed CRR Actions:

Replace the subimpoundment pump engines with new ones or convert the diesel engines over to propane.

3. WM-3. Casey Fork Wildlife Management Area (Plate 2). This 2,773-acre area, licensed to IDNR for fish and wildlife purposes, includes all the land and water area above the Casey Fork Subimpoundment Dam. A program of intensive

## ***Rend Lake Master Plan***

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waterfowl management is presently being implemented by IDNR. The locations of minor access points within the area are presented on Plates 21 and 22. Section 15.01, Appendix 1 further describes the area and associated access points. ADA compliant courtesy docks, ramps, walkways and comfort stations were completed in 2007.

No New or Future Actions are proposed for this area.

### Proposed CRR Actions:

Resurface the township road providing access to the Bonnie Dam and South Bonnie Access areas. The project will include base repair and compaction, ditch cleanout and replacement of drainage structures as needed. Due to the flood prone nature of this area, a bituminous concrete surface (binder and surface courses) should be used for parking and road areas. Install regulatory signage and stripe and sign parking areas.

Upgrade the subimpoundment pump engines by converting them from diesel over to propane or replace them.

Two shallow water moist soil unit wetlands are currently funded for construction with state Duck Stamp money on the north end of the refuge adjacent to the west end of the Casey Fork subimpoundment dam.

Construct a permanent hunter check station at the Cottonwood Access Area at Rend Lake. It will be a pole building 22' x 36' with a 10' overhang across the front to provide shelter during blind drawings. It will have a sealed concrete floor throughout, 2 walk through doors, 1 insulated overhead door, electric service, outlets, lighting, 2 pole mounted exterior security lights, security fence enclosure with 1 vehicle gate, and 1 standard IDNR unit toilet.

### **D. Future Recreation.**

1. FR-1. Jackie Branch Future Recreation Area (Plates 2 and 11). This 82 acre area is located north of Illinois Highway 154, the east and west access across Rend Lake. It is reserved for future recreation development as demand warrants. Existing facilities include access and service roads, a 56 vehicle parking area, an excavated harbor area and a two-lane concrete boat launching ramp. A hunting and fishing access point is located on the west side of this area.

### Proposed New Actions:

Install a fish cleaning station. There are no fish cleaning stations at Corps managed areas at Rend Lake. This station will provide a much needed service to the public and remove fish remains from project dumpsters. A new grinder type station will be installed.

Proposed CRR Actions:

Install a prefabricated vault comfort station. This is the required minimum facility for public health and safety as per ER 1165-2-400. The area is very popular with waterfowl hunters and fisherman, and the increased use over the years warrants providing these facilities. In addition, the addition of the comfort station will allow for the charging of day use fees in this area.

Proposed Future Actions:

Replace and relocate the boat ramp. The current location in the back of the cove is in an area that is shallow and is experiencing extensive siltation. In addition, the boat ramp was originally built by placing preformed slabs of concrete in place and then was extended in length by sliding additional slabs of concrete into place in the water. The concrete slabs have shifted and subsided, causing cracks & voids in the slabs and in between individual slabs.

Install an accessible fishing access along the shoreline. The shoreline around this area has been protected from erosion with rip-rap. This makes it difficult to access the shoreline. It will involve constructing a walkway from the parking lot to the shoreline and installing a pier or concrete platform.

2. FR-2. Gun Creek Complex (Plate 24). The Rend Lake Conservancy District is the agency responsible for development of the Gun Creek Complex. The Complex includes land leased from the Federal Government and land owned in fee by the Conservancy District. The leased land and water areas comprise approximately 40 acres. This acreage includes a narrow bank between the lake and the Gun Creek Complex, and a portion of the 27 hole golf course. Most of the development is on Conservancy District lands. Planned development includes an extensive commercial recreation complex oriented toward the resort, convention, and vacation market. Section 15.02, Appendix 2 details the existing and proposed development for this area.

No New, CRR or Future Actions are proposed for this area.

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## Section IX

### Facility Load and Other Design Criteria

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## **SECTION IX – FACILITY LOAD AND OTHER DESIGN CRITERIA**

### **9.01. SITING**

A. Consideration of Seasonal Fluctuations. All proposed structures, except boat launching ramps and beaches, will be located above the flood control pool, elevation 414 feet NGVD, and site selection will be based on soil types, erosion potential, and present shoreline erosion problems.

B. Universal Accessibility (UA). All new and updated facilities and environments shall be designed to be universally accessible. The target is for 100 percent of facilities such as campsites and picnic sites to be universally accessible. The standard that must be met is that the minimum number of universally accessible facilities such as campsites and picnic sites comply with the current UA guidance. Existing facilities will be retrofitted to become universally accessible as funding allows.

C. Buildings. Areas around buildings are landscaped with appropriate vegetation to provide the recreation user with isolation and screening from other uses or activities, while also providing an aesthetically pleasing area.

D. Utilization of Pre-fabricated Facilities. If any facilities are constructed such as, but not limited to shower buildings, comfort stations, and any type of group shelter, the option of using a pre-fabricated facility will be considered when determining the most cost effective approach.

E. Feasibility of Utilities. The feasibility of connecting to existing electricity, water, and/or sewer utilities will be considered when determining the best location for proposed facilities.

F. Utilities Placement. Power and communication lines inside recreation areas should be placed underground. If overhead power lines are absolutely necessary they shall be placed where they will not become a safety hazard and in accordance with ER 1110-2-4401, "Engineering and Design – Clearance for Electric Power Supply Lines and Communication Lines Over Reservoirs."

G. Topography. The topography of the area will be utilized to the best possible advantage by placement of buildings to provide the user with a scenic view, and to accommodate people with disabilities.

H. Trails. The placement of trails was determined by the locations that would provide the best water and nature orientation, while considering the needs of the user to get from one location to another. Trails are generally located above 412 flood pool elevation. To maintain the trails, operational vehicles will have access to most area of the trails. Various types of trails have been developed at Rend Lake: hiking, nature, interpretive, equestrian and multi-purpose, which includes bicycles.

The Rend Lake Bike Trail is a multi-partnered regional initiative centered on Rend Lake. This is more than a simple trail project. There is already 19.2 miles of the trail complete for recreational opportunities with approximately 15 more miles proposed. The Rend Lake Bike Trail is just a small portion of the Southern Illinois Regional Bicycle Trail Plan that will develop hundreds of miles of trails throughout Southern Illinois. A further description of the Rend Lake Bike Trail can be found in Section 10.6.

EM 1110-2-410, "Design of Recreation Areas – Access and Circulation," contains detailed specifications for trails.

I. Roads. Recreation area road placement was limited to level areas located away from existing tree cover where possible.

J. Campgrounds. Required, recommended, and optional considerations concerning new construction or renovation of campgrounds can be found in EM 1110-1-400 "Recreation Facilities and Customer Services Standards."

### **9.02. SIGNS**

All new signs are to be installed, as required, under the direction of project personnel and conform to the Corps of Engineers Sign Standard Manual, EP 310-1-6a & b and the Graphic Standards Manual, EP 310-1-6.

### **9.03. MISCELLANEOUS**

If any of the following facilities are constructed, the Corps of Engineers Recreation Facilities and Customer Service Standards Manual, EM 1110-1-400, will be utilized.

A. Sanitary Dump Stations.

B. Support Items. Picnic tables, fire rings, grills, lantern hangers, water hydrants, benches, and self-pay stations.

C. Comfort Station and Shower House Buildings. Comfort Stations shall be provided within campgrounds and day use areas. Shower houses shall be provided at campgrounds and at beaches when feasible.

Specific building features for all comfort stations and shower houses within a campground where water and sewage treatment are available include:

Recommended:

1. Provide a minimum of one restroom fixture per gender for each 25 campsites.
2. One sink per each 25 campsites per gender.

3. Provide a minimum of one showerhead per gender for each 25 campsites.

Required:

1. One electric hand dryer or paper towel dispenser per every two sinks.
2. Shelf for toiletries in shower stall, shelving above sinks, and clothing hooks nearby.
3. Vandal proof mirror above every sink.
4. Drinking fountain.
5. Provide a minimum of one fully equipped unisex shower unit each campground.
6. An individual dressing area for each shower stall.

D. Campsite. Campgrounds may be developed with a range of campsite types from fairly primitive tent-only sites to highly developed multi-purpose sites that will accommodate modern recreational vehicles. Campgrounds may also include group and multi-unit campsites. This provides a diversity of camping opportunities to accommodate different user types and groups. Campsites may also be more efficiently sited within a campground by utilizing a range of campsite types with differing spatial and spacing requirements.

Specific building features required for campsites include:

1. A hardened living area, 400 to 625 square feet, with a fine crushed stone or other hard surface, picnic table, fire ring/grill, and lantern hanger provided for each campsite.
2. Living area bordered by concrete curbing, plastic or wooden timbers, or other approved materials.
3. As a minimum, one water spigot shall be provided per four campsites. Individual campsite water hookup required at administrative sites and recommended at multi-purpose sites.
4. Have 50, 30 and 20 amp electrical hookups located at the campsite pedestal. This is optional for tent-only campsites.
5. Individual campsite sewage hookup required at administrative sites and optional at multi-purpose sites where demand exists and local factors allow for installation.

E. Boat Launching Ramp. Boat launching ramps shall provide convenient and safe public access to the water.

F. Courtesy Docks. Courtesy docks shall be provided at launch ramps for short-term docking, loading of gear, and passenger safety and convenience. Docks shall have a minimum width of six feet and minimum length of twenty feet. Docks should be located to avoid boat traffic congestion and ensure continued use of the

ramp. Portable facilities such as floating docks, cable-guided docks, and push-pull docks are recommended if the water fluctuation difference is more than three feet.

G. Playgrounds. Playgrounds should be integrated within the site with access to parking and safe pedestrian access routes that provide separation from vehicular traffic. Playgrounds should be located in close proximity to other high-use activities such as group use facilities. The shape or limits of playgrounds are influenced by the existing conditions of the site and the play components that are provided. The playground area may be defined to allow the placement of desirable trees within the limits of the playground to provide shade.

H. Entrance Stations. Entrance stations are buildings located at park area entrances and designed for purposes such as fee collection, security, and dispensing customer information.

I. Group Shelters. Group shelters can range from small shade structures covering one or two picnic tables, to large screened or enclosed structures. The character and size of the structure should be consistent with the design theme and typical group sizes that use the park. Related amenities should be considered to serve large groups and extended family gatherings. Consideration should be given to the use of pre-manufactured shelters for durability, ease of construction, and ease of maintenance.

### **9.04. INTERPRETIVE DEVICES**

Interpretive devices provided include, but are not limited to, the following: trails, signs, visual aids, programs, events, brochures, and displays. All activities under the Interpretive Services and Outreach Program (ISOP) shall be designed to accomplish one or more goals listed in ER 1130-2-550, Chapter 4, 15 November 1996.

A. Visitor Center. Visitor Center operation is necessary and an integral part of total project management. The primary purpose of the Visitor Center program is to provide interpretive information to the visiting public about the Corps, its mission, the project and its facilities, visitor safety and geographic area where the project is located. Visitor Center provides the information necessary to visitors for safe and enjoyable use of Corps facilities. Exhibits and other interpretive communications should be designed to stimulate interest and convey information. Chapter 5 of ER 1130-2-550 "Visitor Center Program" establishes guidance governing planning, development, management, and cooperation of USACE Visitor Center facilities at civil works water resource projects.

B. Amphitheaters. Amphitheater facilities should be constructed of materials that are indigenous to the site or reminiscent of a local character and style so that the structure blends with the natural environment of the park. Durable construction materials that can withstand exposure to weather and the year-round impacts of users

should be used. Table 5.17 of EM 1110-1-400 contains amphitheater design guidelines.

### **9.05. WASTE AND DISPOSAL**

Trash, refuse collection, and disposal services are contracted out to private industry. Section 4.8 and Table 4.5 of EM 1110-1-400 contains guidance for trash service support items.

### **9-06 WATER AND SEWER DESIGN CRITERIA**

A. Waste Water Collection and Treatment. Sewer design is in accordance with the requirements of the Federal Environmental Protection Agency, Illinois Environmental Protection Agency and Corps Of Engineers Memorandum EM 1110-1-400: "Planning and Design Criteria", and other standards and conditions as required by the Corps of Engineers. Septic systems are not permitted.

1. Generally, sewers are located to obtain maximum use of gravity flow mains by following contours. Lift stations and force mains are provided as necessary to transfer flow from locations having low ground elevations relative to elevations downstream. Where possible, gravity sewers from several buildings are grouped to intersect at a common lift station. For planning purposes, gravity sewers are based upon 8-inch diameter PVC mains and 4-inch PVC service laterals.

2. Lift station sizing is based upon all sewage being pumped within an 18 hour day with a peak flow factor of 2.5 times and average 30 gallons per day (GPD) per person for campers and 5 GPD per person for picnickers using waterborne toilets. Minimum size for force mains is 4-inch diameter. Minimum discharge from the lift stations is based upon 100 GPM for flooded suction pumps.

3. Equalization tanks are anticipated to regulate flow to treatment plants where lift stations occur. Sizing of flow equalization tanks for planning purposes is based upon storage equal to one-half the capacity of the sewage treatment plant. Sewage treatment is in accordance with the requirements of the Federal Environmental Protection Agency, Illinois Environmental Protection Agency and Corps of Engineers Memorandum EM 1110-1-400 "Planning and Design Criteria" and other standards and conditions as required by the Corps of Engineers. Facility loading is based upon all camping spaces fully occupied on a weekend day without any additional overflows permitted to occur during seasonal or holiday peaks. Peak population is based upon eight persons per day for each campsite, and four persons per day for picnic tables. For planning purposes, facility sizing is based upon 20 pounds Biochemical Oxygen Demand (BOD) or less per 1,000 cubic feet for an extended aeration package treatment plant. At campsites, the BOD per capita day is assumed at .08 pounds and at picnic areas the BOD per capita is assumed at .02 pounds. For treatment plants of 40,000 GPD and above, dual aeration tanks are assumed. Tertiary treatment is required based upon use of gravity filter type treatment.

4. Currently one land treatment system is operated in the recreation areas.

5. The Corps of Engineers is currently negotiating with the City of Sesser to connect facilities to a regional sewer system maintained by the responsible municipality. Connecting to the city would eliminate the need for the Corps of Engineers to operate and maintain the land treatment system. All work concerning the regional sewer system will be done in accordance with the appropriate permits from the IEPA.

B. Water System. Water systems design is in accordance with the requirements of the Corps of Engineers Memorandum EM 1110-1-400, "Planning and Design Criteria," and other standards and conditions as required by the Corps of Engineers.

1. For planning purposes, the source of water supply for domestic purposes for each site is based upon 50 GPM at a pressure of 50 psi available at the connection to the main of the Rend Lake Conservancy.

### **9.07. POLICIES AND PROCEDURES PUBLICATIONS**

A. General policies and procedures for planning, design, operation, and maintenance of recreation facilities at USACE Civil Works projects are given in Engineer Manuals (EM), Engineer Regulations (ER), and Engineer Pamphlets (EP) referenced below:

EM 1110-1-400 Recreation Planning and Design Criteria

This Engineer Manual is located on the Natural Resource Management Gateway web page; <http://corpslakes.usace.army.mil> under the Policy and Procedures in the Recreation Facilities Standards Section. This manual includes required, recommended, and optional criteria for all new or renovated facilities on Corps of Engineers land.

ER 1110-2-400 Design of Recreation Sites, Areas, and Facilities

EP 1130-2-550 Chapter 3: Project Master Plans and Operational Management Plans

ADAAG ADA Accessibility Guidelines

UFAS Uniform Federal Accessibility Standards

EP 1130-2-540 Chapter 2: Recreation Management

ER 1165-2-400 Recreational Planning, Development, and Management Policies

EP 310-1-6 Graphic Standards Manual

EP 310-1-6 a&b Sign Standards Manual

EM 385-1-1 Safety and Health Requirements Manual

B. These publications guide the development of recreational facilities to assure they are of the highest quality while serving the health, safety and enjoyment of the visiting public.

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Section X

Special Concerns

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**SECTION X - SPECIAL CONCERNS**

**10.01. OFF-ROAD VEHICLE USE**

In accordance with the policies, procedures and criteria set forth in ER 1130-2-405 and the "Standards for Designating Areas for Off-Road Vehicle Use" (established by the St. Louis District), public lands at Rend Lake were evaluated for their suitability as off-road vehicle use areas. Study results indicate that off-road vehicle use would adversely affect both the natural resource and the environmental values of the area. The designation of off-road vehicle areas has been precluded due to the limited size of possible areas and the destruction of flora and fauna which would result. Based upon these findings, land use and resource allocation is not conducive to this type of recreational activity.

**10.02. RECREATIONAL FACILITIES FOR THE HANDICAPPED**

Under the auspices of the St. Louis District, Corps of Engineers, a study relative to the outdoor recreational facilities for handicapped persons at Rend Lake was conducted by the Department of Design, Southern Illinois University, Carbondale, Illinois. The study made an evaluation of the population of handicapped persons which would be served by special accommodations at Rend Lake and assessed the existing facilities to determine their accessibility by handicapped persons.

The report indicated that of the approximately 400,000 individuals within a 50-mile radius of Rend Lake, an estimated minimum of 36,000 are physically handicapped. It was reported that there exist another 40,000 persons in the same area that are 65 or older. These two groups comprise at least 20 percent of the total population potentially visiting Rend Lake.

The existing facilities at Rend Lake were generally praised by the handicapped individuals who inspected them during the course of the study. Of the approximately two dozen facility improvement suggestions produced by the study, three were considered most important. These facility recommendations include nature trails, beach improvements and a fishing pier. 22 campsites and one picnic site have been provided that are barrier free and designated as Accessible. Additional sites will be upgraded as demand warrants.

### **10.03. FUTURE MARINA CONCESSION DEVELOPMENT**

The existing marina with 274 slips, located at the West Recreation Area near the dam, has almost reached capacity. The State of Illinois has withdrawn its request to provide a full service marina in Wayne Fitzgerald State Park. The Corps recognizes the need for a second marina on the lake and will assist with plans to develop a second marina if recommended by a feasibility study. A promising location would be the Gun Creek area near Illinois Rt. 154.

### **10.04. ENVIRONMENTAL IMPACTS**

The Final Environmental Impact Statement for Rend Lake, Section 5, "Adverse Environmental Effects as a Result of Operation and Maintenance Activities" describes impacts which are considered both unavoidable and undesirable. The number of unavoidable, undesirable effects is relatively few. These adverse effects are indirect and difficult to attribute to any specific aspect of the project. Primary concerns include lake management effects, mineral resource management policy, and side effects of encouraging area redevelopment. Lake management effects are related to the fluctuation of water levels, lake sedimentation, and downstream scour. Mineral resource management policies involve the effects of unpredictable coal mine subsidence and the abandonment of oil resources. Adverse side effects due to encouraging area redevelopment include rapid uncontrolled growth, the influence of social change, conflicts with fish and wildlife resources, and the conflict between mining and surface development. Impacts at the project are occurring as described in the Final Environmental Impact Statement.

### **10.05. MAJOR FACILITY REHABILITATION AND REPLACEMENT**

The majority of existing facilities at Rend Lake were constructed during the early to mid 1970's. While these facilities were adequate at the time of construction, some have now exceeded their estimated useful life. Age of the facilities, combined with increasing demands from visitors, have in many cases resulted in facilities in such a condition that routine maintenance is not sufficient to make repairs. These facilities now require either major rehabilitation or complete replacement of the existing facility in order to remain operational. (See Table 20)

While the 17 masonry comfort stations located in North Sandusky Recreation Area and South Sandusky Recreation Area would normally have a useful life of up to fifty years, and two wooden mini-showers up to twenty five years, many factors significantly reduce this estimate. These buildings are unheated and their masonry/wooden construction are subjected to the full effects of freeze and thaw actions during the winter. Intensive cleaning services required because of heavy use have increased the amount of moisture

in building materials. As a result, a series of cracks have begun to develop in the concrete slabs which serve as foundations for these structures. In addition, the masonry block walls, as well as the mortar joints, have begun to deteriorate along with the wood beginning to rot. These conditions will require full replacement of both the buildings and foundations. In addition, these buildings do not comply fully with the Uniform Federal Accessibility Standards for the Handicapped which will require complete rehabilitation of the interiors to correct.

In-ground electrical service lines have an estimated useful life of eight to ten years. The existing electrical lines in North Sandusky Recreation Area and South Sandusky Recreation Area which provide service to two hundred twenty-eight campsites are deteriorating. Insulation surrounding the electric cable has begun to break down and cause periodic faults and loss of power within the campgrounds. Electrical usage during periods of peak times in the recreation season often exceeds the capacity of the electrical service lines resulting in brown-out conditions or low voltage to camping areas. Also, the current amperage requirements for existing electrical hookup boxes located at the campsites exceed the amperage available in the electric distribution panels. Many new recreational vehicles have electrical systems wired for 50 amp service. Existing electrical hookup boxes provide a maximum of 30 amp service. Rehabilitation of the electrical service for these areas will require the replacement of all in-ground service lines, as well as replacing the electrical distribution panels with panels which will allow for higher amperage. Individual electrical hookup panels at campsites will require upgrading to provide for 50 amp service.

Wastewater system lift stations serving North and South Sandusky Recreation Areas, the Rend Lake Administration Building and Maintenance Compound have an estimated useful life of twenty-five years. However, many of the components of the lift stations, such as pump motors and compressors have exceeded their useful life of eight to ten years. These lift stations were designed to provide service for limited facilities. Increased development within the recreation areas has resulted in each of these lift stations providing service for several comfort stations and shower facilities. Also, since the locations of the lift stations are in close proximity of the lake and the associated groundwater, even with anode protection many of the steel tanks have rusted through and required major repair work. The total capacity for transfer of wastewater through these low flow lift stations has been further reduced due to deterioration of pump housings, compressors, and pressure sewer connections. This reduction in transfer capacity has resulted in periodic backup of wastewater in the system. The pump control panels for these lift stations have begun to deteriorate due to operation in the highly corrosive atmosphere found in lift station operation chambers. Rehabilitation of the lift stations will require replacement of the pumps, compressors, pressure sewer connections, and pump

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control panels. Less expensive package units are now available that is made of non-corrosive fiberglass and requires less maintenance.

The fifteen vault comfort stations located in the South Marcum and North Marcum recreation areas have an estimated useful life of twenty to twenty-five years. These facilities were not constructed with materials treated to resist moisture. This has allowed decay to form in the inner walls and the structural framing of these facilities. The concrete vaults which collect waste water in some of these facilities are not water tight and allows ground water to enter and exit the vault depending on groundwater levels. These structures will require complete rehabilitation of the existing buildings.

Picnic shelters will also have to be replaced or rehabilitated within the next ten years. At a minimum, these structures will need roofs replaced and the concrete, which has cracked and heaved over the years, will also need repair or replacement. Prefabricated shelters are now available from many companies which will make replacement more appealing and cost effective than repair.

**TABLE 20**

**Major Facility Rehabilitation - Replacement**

Area/Item	10	11	12	13	14	15	16	17	18	19
North Sandusky Comfort Stations		X								
North Sandusky Electric Upgrade/Full Hookups						X				
Picnic Shelters North Sandusky	X					X				
South Sandusky Shower Rehab					X					X
North Sandusky Shower Rehab		X	X							
South Sandusky Comfort Stations			X	X						
South Sandusky Electric Upgrade/Full Hookups					X					

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Area/Item	10	11	12	13	14	15	16	17	18	19
Lift Station Upgrade	X	X	X	X	X	X	X	X	X	X
Picnic Shelters South Sandusky		X						X		
Picnic Shelter Gun Creek										X
Picnic Shelter South Marcum						X				
Comfort Stations South Marcum	X									
Comfort Stations North Marcum	X	X								
South Marcum Electric Upgrade/Full Hookups		X								
Picnic Shelters North Marcum								X		
North Marcum Shower Rehabilitation			X							
Gun Creek Electric Upgrade/Full Hookups		X					X			
Gun Creek Comfort Stations	X	X								

### **10.06 SEDIMENTATION AND SILTATION**

Sedimentation deposits are becoming an issue at Rend Lake, especially during low water events. Erosion from shorelines, sedimentation run-off from agricultural fields and deposits from streams feeding the lake has become a major concern to Rend Lakes water supply demand, recreation use and aquatic resources. A comprehensive sedimentation management study is required to be performed every 15 years and the study will be conducted in 2010 to deal with the issue before it becomes a major problem. The study will confirm water storage capacities for use by the Corps, state and partners to manage the resource reducing potential for over allotment potentially impacting public health, industry, and environment. The management plan should consist of several management alternatives appropriate to the specific problems.

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The most significant issue is water supply since Rend Lake distributes water to 60 communities and 300,000 customers. As sedimentation settles in the lake the joint use pool of Rend Lake continues to shrink. If sedimentation continues to worsen then the question is will there be enough water storage in the lake, especially during low water events to keep up with the supply and demand of the public.

The other significant issue to the sedimentation issue is recreation. For the past several years during low water events the Rend Lake Management Office has been forced to close several boats ramps to access Rend Lake. These ramps remain closed until the lake level reaches a safe depth. The main concern is safety of lake visitors and the protection of the visitor's equipment such as boats and boat motors. Many of the coves at the lake have also been affected by sedimentation and cause major concerns during low water events. This affects all water users of Rend Lake, fishermen, hunters and water recreation users included. Without dredging of certain coves and boat ramps, many of these areas will be unusable in the near future.

Aquatic resources are another issue that needs to be examined in the study. If the joint use pool continues to decrease the aquatic resources will continue to decrease. If the aquatic resources begin to diminish, such as fishing, then one of Rend Lake's major draws will decrease.

### **10.07 CITY OF SESSER SEWER CONNECTION**

The recreation areas on the west side of Rend Lake south of Highway 154 to the Main Dam Road are all connected to the South Sandusky land treatment facility. The areas connected are: Dam West Recreation Area, the Administration and Maintenance Complexes, Rend Lake Marina, South Sandusky Recreation Area and North Sandusky Recreation Area. The South Sandusky land treatment facility is nearing its maximum capacity level and as visitation increases each year the maximum level will be met in the near future.

Plans and specifications need to be developed for future use that will tie in the existing west side sewer system to the city of Sesser Municipal Sewer Treatment Facility. The plans and specifications should comply with public health and EPA regulations while providing system improvements to reduce maintenance and operation and improved service for the customers. This may include reversing existing lift stations located in the recreation areas and Sesser adding additional sewer line to Highway 154 down to federal lands for the connection to Sesser's main sewer line.

## **10.08 ACCESS TO PUBLIC LANDS**

Several parcels of remote project lands at Rend Lake, totaling several hundred acres, are inaccessible because they are not contiguous to any public road, and can only be reached by crossing private land. Access to these lands is essential for the following reasons:

- A. Resource management through planting of food plots, succession control, reforestation, archeological survey, etc.
- B. Fire protection of government land and protection of adjacent private property from fires originating on project lands.
- C. Cleanup and debris removal.
- D. Protection of the resource through enforcement of Title 36.
- E. Boundary surveillance.

It is proposed that land for right-of-entry easement be obtained. These easements will provide a means of ingress and egress by management personnel to be 14 parcels of public land. The proposed easements are identified on Plate 2 together with the land areas to which they will provide access. Technical details, costs, and descriptive information will be provided in a supplement to the Real Estate Design Memorandum.

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Section XI

Special Programs

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## **SECTION XI - SPECIAL PROGRAMS**

### **11.01. REND LAKE BICYCLE TRAIL (RLBT)**

The Rend Lake Bicycle Trail (RLBT) is a cooperative project developed in partnership with the Corps of Engineers (Corps), Rend Lake Conservancy District (RLCD), Rend Lake College (RLC), The Southern Illinois Bicycle Trails Coalition, Inc., the Illinois Department of Natural Resources (IDNR), Illinois Department of Transportation (IDOT), the Office of Economic and Regional Development, Southern Illinois University (OERD), National Park Service (NPS), local communities, and volunteer organizations. The RLBT was designated a National Recreation Trail in 2008.

The RLBT is envisioned to be a multi-phase project that, when complete, will provide superb recreational and transportation opportunities to Rend Lake visitors, linking them to various cities, attractions, and facilities in the area. Trail design will allow for multiple uses, including bicycling, hiking, and sightseeing. Watchable Wildlife sites will be identified along the trail route to assist visitors in locating prime wildlife viewing locations. The completed trail will link all the primary recreational facilities operated by the Corps at Rend Lake, including four campgrounds, two beaches, several picnic areas, and the Rend Lake Visitor Center. The RLBT is also envisioned as a part of a network of bicycle trails in Southern Illinois that will connect cities, points of interest, and recreational opportunities throughout the region. Community leaders anticipate that the development of the trail will complement and enhance current transportation and recreational opportunities and will have a positive economic impact on the region.

#### **Background**

The OERD was issued a planning grant from the IDNR to develop a plan for future bicycle trails in Southern Illinois in 1997. One of the results of this planning effort was a document entitled Southern Illinois Regional Bike Trails Plan, which was published in early 1999. One of the first trails that the OERD targeted as a feasible project was a 23-mile trail around Rend Lake, to be developed in six phases, with spur trails to area communities and attractions. The OERD received over 200 letters of support from area businesses, local, state, and federal politicians. In addition, the OERD held two public meetings with no negative comments being received.

As a result of this Regional Plan, Supplement #3 to the 1993 Rend Lake Master Plan was submitted and approved. It proposed the development of the RLBT in 6 phases. Due to funding and constructions constraints and property issues, the phases of construction and routing of the RLBT have undergone some modifications. Table 21 summarizes the modified phases of construction; both completed and proposed future development.

The RLCD, with the assistance of the OERD, applied for and received a \$200,000 IDNR Illinois Bicycle Path Grant Program matching grant. This grant was used to construct the portions of the RLBT running from the Wayne Fitzgerald State Park (WFSP) to the Rend Lake College and from the Southern Illinois Artisan's Shop to the entrance to the North Marcum Day Use Area. The IDNR grant required that the trail be 8 ft. wide. The Corps developed a challenge cost share agreement that allowed the Corps to accept construction materials purchased with the grant and provide labor and equipment to construct the portion of the trail that traverses Corps land.

In conjunction with the bike trail portions constructed with grant money, IDNR constructed the 5-mile portion of the RLBT that runs the length of the WFSP using in-house labor and materials. The Corps also constructed a spur to connect the bicycle trail with the North Marcum Boat Ramp to provide for better access and parking.

In 2000, the Corps applied for and received a Transportation Equity Act for the 21st Century (TEA-21) grant to construct the portion of the RLBT that runs from the Dedication Parking Lot in the Spillway Recreation Area to the North Sandusky Campground. This 1.3 million dollar grant was a matching grant and required that any bicycle trail constructed with its funds be constructed to comply with the American Association of State Highway and Transportation Officials (AASHTO) standards put forth in the Guide for the Development of Bicycle Facilities. In 2007, The Corps constructed a spur trail to connect the South Marcum Recreation Area to the RLBT.

### **Future Development**

As with completed sections, future development of the RLBT will require grant applications and challenge partnerships with other entities to allow construction. Future development has been broken into 5 more phases (5 – 9). Each RLBT section has been designed to function independently, in the case funds do not become available to complete the entire trail route. The last 3 phases are designed to provide improved access. Individual trail segments will be developed when funded and will not necessarily be constructed in the order that they are numbered.

### **Phase 5**

Phase 5 of the RLBT will connect the South Marcum Campground to the North Marcum Day Use Area, thereby connecting Phase 1 with Phase 4. This entire section of the RLBT will be routed through areas that have already been impacted by development, either roadways, utility right-of-ways, or overgrown fields.

This phase will be routed along recreation area roads from the boat ramp to the Trail Head road, an operations road in South Marcum, and to its terminus (1.5 miles). It will then cut across an old field invaded by autumn olive (600 ft) and follow a Southeastern Electric Cooperative Utility Right of Way (.4 miles). It will cross the Marcum Cove at a location approximately 1700 ft. downstream of the I-57 bridge embankment. This crossing was selected due to several factors: inability to obtain permission to use the I-57 bridge embankment as a crossing, inability to route the trail

around or under I-57, the narrowness of the cove at the selected location (approximately 500 ft) and the shallowness of water (approximately 2 – 4 ft. deep). The crossing will be constructed using an earthen embankment with adequate culverts to allow for normal flow of water traveling down Marcum Branch. The trail will then continue along the utility right-of-way to the Marcum Branch Road. It will then follow the road right-of-way to the entrance to the entrance of the old South Marcum Campground, where the trail will follow the old roadways to connect with the portion of the RLBT constructed in phase 1.

The South Marcum campground roads between the boat ramp and the trail head will be marked as shared roadways, advising vehicle drivers that bicycles are present on the roadway. This will benefit campers in this area, as well as riders of the RLBT. There is already substantial bicycle usage by campers at the four Corps campgrounds at Rend Lake. The development signed shared roadways will increase the safety and usability of these roadways for recreational bicycling by both day and overnight users. Therefore the trail in these areas should have an overall positive environmental impact.

## **Phase 6**

Phase 6 of the RLBT will run along the Highway 154 and Rend City Road rights-of-way, connecting the east and west sides of the bike trail (Phases 1 and 2), creating a loop. It will require a cooperative effort involving the Corps, IDNR, IDOT, RLCD, and Franklin County because the majority of this phase will be on roadway rights-of-way.

An IDNR funded bicycle feasibility study to accommodate bicycle use on Illinois Rt. 154 is currently underway. It recognizes the need for bicycle accommodations on Rt. 154. The current IDOT Official Bicycle Map has rated this section of road as least suitable for bicycle use. However, Rt. 154 provides the only means for bicyclists to travel from the between the east and west sides of the lake and would further the completion of a looped trail system. The scope of work recognized that the existence of the bicycle trail at the current stage of development is causing bicyclists to use the existing 154 roadway in increasing numbers with out any associated improvements.

This feasibility study will evaluate possible improvements to Rt. 154 resulting in greater suitability for bicycle use and will select a preferred alternative. It will examine the following 2 alternatives:

1. Shared facility, providing paved shoulders on the existing roadway and new vehicle bridges with a designated bicycle lane.
2. A separated facility, providing a separated bike trail using embankments to provide the necessary width for a bike trail an barricade between the roadway and bike trail, and either a separate bridge structure or cantilevered off the existing bridge.

This phase will also connect to the segment of the RLBT that exists in the Wayne Fitzgerald State Park.

### **Phase 7**

Phase 7 of the RLBT will provide access to the Gun Creek Campground. It will be routed from the Nighthawk loop to Phase 6, along the 154 right-of-way. This segment will run along a Southeastern Electric Cooperative Utility Right of Way, thereby reducing the environmental impact of this phase.

Currently, Gun Creek visitors access the RLBT by riding along the roadway through the Rend Lake Recreation Complex, a highly trafficked area containing a 27-hole golf course, lodge, condominiums, and restaurant. This development will reroute this traffic, thus reducing conflict between bicycles, vehicles, and golf carts.

### **Phase 8**

As a part of Phase 2 of the RLBT, the trail was routed along the roadway in the North Sandusky recreation area, from the Maple loop to the day use area. These roads were signed as shared roadways, advising vehicle drivers that bicycles are present. This option was chosen in order to make best use of construction funds at the time.

Phase 8 of the RLBT will create a dedicated trail around the North Sandusky Recreation Area, routing bicycle thru-traffic off the existing roadways. This trail will follow along the Rend City Road right-of-way to the entrance to the North Sandusky Recreation area, where it will connect with the segment of the RLBT constructed in Phase 6.

### **Phase 9**

As a part of Phase 5 of the RLBT, the trail will be routed along the roadway in the South Marcum recreation area, from the day use area to the trail head operational roadway. These roads will be signed as shared roadways, advising vehicle drivers that bicycles are present. This option was chosen in order to make best use of construction funds at the time.

Phase 9 of the RLBT will create a dedicated trail inside the South Marcum Recreation Area, routing bike traffic off the existing roadways. This trail will follow along campground roadway right-of-way from the day use area to the Trail Head road. This will route the majority of bicycle traffic off the campground roadways, making for a safer ride for both campers and bicycle thru-traffic.

Table 21  
Rend Lake Bike Trail  
Phases of Construction

	Description	Corps Property	Other Property	Spur Trail Connections
Phase 1 (Complete)	Highway 154 near the Rend Lake Artisan's Shop to North Marcum Recreation Area; 1.5 mile segment at the Rend Lake College	2.5 miles	1.8 miles RLCD 1.7 miles RLC	WFSP trail (5 miles – Complete)
Phase 2 (Complete)	Dam West Recreation Area to North Sandusky Campground	3.5 miles		
Phase 3 (Complete)	Dam West Recreation Area to Spillway Recreation Area (Dedication Lot)	4.0 miles		Benton/West City (Proposed)
Phase 4 (Complete)	Dedication Lot to South Marcum Boat Ramp	0.7 miles		
Phase 5	South Marcum Campground to North Marcum Day Use	2.5 miles		
Phase 6	Along Highway 154 right-of-way & along Rend City Road to North Sandusky Day Use		1,000 feet Franklin County (Rend City Road ROW)	Sesser, Mt. Vernon (Proposed)
Phase 7	Gun Creek Campground to Highway 154	0.5 miles		
Phase 8	Inside North Sandusky Campground – from Maple Loop to Day Use Area	2.0 miles		
Phase 9	Inside South Marcum Campground – from Day Use Area to Trail Head	1.5 miles		
Total		10.7 miles complete 6.5 miles proposed	3.5 miles complete 6 miles proposed	

### **11.02 CAMPSITE IMPROVEMENTS**

#### **A. Full Hookups.**

These are in great demand by today's campers as they provide electric, water, and sewage disposal for individual campsites. The goal of providing full hook-up services to 50% of all campsites in each recreation area will provide better service to the visitors and increase usage to these sites. The additional costs of installation are easily amortized over their lifespan by the higher user fees that will be generated and higher occupancy rates. The locations for the new full hook-up campsites will be selected based on existing campsite locations and occupancy rates, and preference will be given to areas with the ability to gravity drain to existing sewage lift stations.

#### **B. Water Hookups.**

These are in demand by today's campers as larger RV's have significantly smaller fresh water storage tanks than sewage storage tanks. Therefore, they have the capacity hook to a water source and store their generated sewage until the end of a typical stay. The goal of providing water hook-ups to 75% of all campsites in each campground will provide better service to the visitors and increase usage to these sites. The additional costs of installation should be amortized over their lifespan by higher occupancy rates and higher user fees that will be generated.

#### **C. Campsite Impact Pads.**

Due to the high use at campsites, grass and other vegetation have been greatly impacted. When it rains, customers have to walk through mud and water instead of wet grass. Customer surveys have shown that the sites with existing campsite impact pads are the campers' favorites. The impact pads allow the campers to place chairs and other equipment on the concrete and extend their awning over it, thus protecting them from inclement weather. The impact pads also decrease the impact on the remaining grass and vegetation around the site.

#### **D. Renovate Campsites.**

EM 1110-1-400 provides minimum design requirements for multiple use campsites. These design requirements include a hardened impact site; a level parking spur; and a vehicle spur with a minimum width of 12 feet and, where terrain allows, a minimum length of 70 ft. All of the campsites in project campgrounds are multi-purpose sites, and many do not comply with these minimum standards. In addition, some of the campsites have degraded due to the age of the campsites. Tree roots have heaved portions of some vehicle pads and erosion has caused drop-offs and tripping hazards on many vehicle pads, impact pads, and table pads.



## Section XII

### Project Resource Management

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## **SECTION XII - PROJECT RESOURCE MANAGEMENT**

### **12.01. GENERAL**

A detailed discussion of project resource management is contained in the project's Operational Management Plan. The operational concepts and policies set forth in this section are to ensure consideration, if only in general terms, of some basic factors relative to management of the lake.

### **12.02. OPERATIONAL CONCEPTS**

A. Recreation. In the administration of the lake, an important objective must be to reduce any undesirable conditions that may influence this purpose. Recreational concepts include:

1. The provision of a wide range of outdoor opportunities and recreation facilities in a relatively natural environment.
2. Reduction in the conflict of use through activity and area zoning.
3. The interpretation of natural resources and lake objectives through a viable interpretive program.
4. The development of policies which provide for maximum sustained public use without undue deterioration of natural and lake resources.
5. The provision of additional recreational opportunities through partnerships with other government entities and the private sector.
6. The maintenance of facilities and grounds in an efficient manner and to a high standard.
7. The provision of a safe and rewarding outdoor recreation experience to the using public.

B. Fish and Wildlife Conservation. The Corps has licensed land and water acreage to the Illinois Department of Natural Resources for the primary purpose of wildlife management. The State has stocked the lake with game fish and is carrying out a fish management program to maintain desirable species at appropriate population densities. This subject is further discussed in Section 12.10, below. Additional project lands managed by the Corps require vegetative management practices to improve wildlife habitat and establish forest cover. The goal of the Corps is to provide maximum populations of wildlife species, consistent with habitat carrying capacity.

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C. Water Supply. Rend Lake provides the water resources for an inter-city water supply system which is operated by the Rend Lake Conservancy District. In 1971, the inter-city water system became operational. Treated water from Rend Lake began to flow to the first of 52 communities and rural customers in a five-county area. The influence of water withdrawal for water supply purposes will have a minor effect on lake elevations. During extremely dry years the lake level gradually goes down until inflows are received. See section 10.06 and 12.10 for more discussions on water supply issues.

D. Flood Control. Management practices undertaken to reduce the effect of flooding on the recreational activities include the planting of water-tolerant trees and shrub species to preserve vegetative covers on low-lying recreation land and shoreline protection of key areas which are subject to erosion at high pool stages. In drought years low water levels may be a problem. Low water levels affect recreation in that beaches are not fully usable, the bare strip around the lake is aesthetically displeasing, and the desire for boating is diminished. Launching ramps were constructed to accommodate boats during a moderate drawdown.

E. Water Quality Control. A minimum release of 30 c.f.s. will be maintained to provide downstream flows for water quality control. A water quality analysis program routinely samples water from the lake and tributary areas. The Corps Environmental Quality Section takes water samples from the lake. The Illinois Environmental Protection Agency takes water samples from tributaries.

F. Area Redevelopment. Although the Big Muddy watershed of Southern Illinois is rich in natural resources the one vital ingredient missing was an adequate water supply. Rend Lake has eliminated this past barrier.

### **12.03. STAFFING AND ORGANIZATION**

The staff at Rend Lake fluctuates between 20 and 45 employees including both permanent and part-time, due to workload.

### **12.04. LAW ENFORCEMENT**

Enforcement of Federal, state, and local civil statutes and game and fish codes on all lake lands are conducted primarily by Illinois Department of Natural Resources enforcement officials, State Police Officers, the County Sheriff's Office, and Corps Rangers. These agencies patrol lands at various intervals enforcing laws under their jurisdiction as they observe violations or when summoned by Corps of Engineers Rangers. Corps Rangers, when on patrol, are in direct radio contact with the County Sheriff and the Department of Conservation officials, and can summon assistance from

the proper authorities when violations are encountered that warrant such action. Rangers also have citation authority under Title 36, Code of Federal Regulations.

#### **12.05. SAFETY**

This aspect of lake resource management is discussed in The Project Safety Plan that is contained in the Operational Management Plan. The purpose of the Plan is to identify common recurring hazards or unsafe conditions in each major phase or area of operation. Such areas include construction, maintenance, public use areas, visitor protection, equipment operation, and office operations. Precautionary actions to be taken to prevent, reduce, or control hazardous situations are planned therein.

#### **12.06. CONCESSION ACTIVITIES**

Management of concessions includes periodic inspections by Real Estate and lake personnel to ensure compliance with lease terms and safety to visitors. In addition, District personnel are constantly alerted to any unsafe conditions that may develop between inspections. The concessionaire at the Rend Lake Marina also cooperates with Corps personnel when emergencies arise or weather becomes a factor in safe boating. Concession activities are further discussed in sections 3-02 and 10-03.

#### **12.07. VISITOR INTERPRETATION AND EDUCATION**

Programs aimed at informing the public of facts and enhancing an individual's visit to the lake are provided. The lake management staff has established an interpretive program utilizing temporary "stay-in-school" park interpreters to present programs to the visiting public. These programs include campfire talks, guided nature walks, exhibitions, special demonstrations, radio programs and other activities designed to give the visitor a better understanding of Corps management and the environment.

#### **12.08. FOREST MANAGEMENT**

A. Forest Management Plan The purpose of the Forest Management Plan is to develop, manage, and protect the vegetative resources at Rend Lake. The scope of the plan includes providing an inventory of existing vegetative conditions, the implementation of vegetative management for recreational use, the preservation and improvement of wildlife habitats and aesthetic values, the control of soil erosion, the promotion of natural ecological conditions, and development of dependable future resources of available wood products through reforestation, and accepted forest conservation practices.

B. Plan Preparation. Preparation of the Forest Management Plan is a coordinated effort involving Operations, Planning, and Real Estate elements. The

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general format of the plan divides the project area into workable compartments and provides a treatment prescription for each, consistent with its land use allocation.

C. Program Needs. During the life of the Forest Management Plan, certain needs will dominate. The most important of these are as follows:

1. Establishment of suitable forest cover on recreation areas. There is a need for vegetative cover to serve as shade, screening, buffers, erosion control protection, and wildlife cover.
2. Selection of those open areas which should be reforested and replant them with desirable species.
3. Protection of steep banks from erosion.
4. Development and maintenance of high populations of desirable wildlife.
5. Protection of areas from overuse.
6. Reestablishment of suitable vegetative cover on areas denuded by overuse and high water.
7. Management of present resource to establish a quality program of timber management which will support a future sustained yield timber harvesting effort.

### **12.09. FIRE PROTECTION**

A. Purpose. A fire protection plan serves as a guide for prevention and suppression of forest and grass fires on lake lands at Rend Lake. The Fire Protection Plan is contained in the Operational Management Plan for Rend Lake.

B. Fire Protection Objectives. The objectives of fire protection at Rend Lake are three-fold: fire prevention, presuppression and fire suppression. These objectives are based on the following guidelines:

1. Fire Prevention. The purpose of fire prevention is to reduce the number of man-caused fires to the lowest practical minimum. To accomplish that aim, it is necessary to determine the major fire problem areas, using past experience as a guide.
2. Presuppression. Presuppression planning is aimed at preparing an efficient fire control organization, well equipped, instructed, and supervised, which will be able to handle its own responsibilities. Even though lake management provides its own

fire-fighting force, close coordination with the Illinois Department of Natural Resources and local fire departments takes place.

3. Fire Suppression. It is the policy and practice to suppress all wild fires on lake lands, or those threatening lake lands from the outside. It will be standard procedure to take aggressive action to control fires while they are still small, and once controlled, to make sure they do not escape. It will be normal practice to never leave a fire unmanned until it is completely safe.

C. Annual Updating. The Fire Protection Plan is updated annually by the Operations Manager. All items in the plan are considered so that improved techniques can be incorporated. Special attention is given to the sections on prevention problems, State, Local, and Corps fire organizations and fire training.

## **12.10. FISH AND WILDLIFE MANAGEMENT**

A. Purpose. The program objective is to provide the maximum number of fish and wildlife species needed for the use and enjoyment of the public, consistent with the joint-use objectives of the lake and habitat carrying capacity. The Operational Management Plan, Natural Resources Management Section describes a plan for a fish and wildlife habitat development and management program. The scope of the plan is to biologically evaluate fish and wildlife habitat on specific areas and prescribe practices for improving or maintaining habitat on these areas; to evaluate the success of the plan as it relates to wildlife populations; and to maintain cooperation between the Corps of Engineers and other Federal and State agencies in the development of water resource programs. Lake operation procedures are continually being reevaluated and updated as required. Coordination is maintained with the Illinois Department of Natural Resources relative to favorable water levels for fish and wildlife enhancement programs.

B. Wildlife Management.

1. Illinois Department of Natural Resources. A portion of the public fee land and water in the northern area of the lake has been licensed to the Illinois Department of Natural Resources. On this land and water area, two sub-impoundment wetland areas have been created and a refuge established. The primary effort of the Department has been the development of waterfowl habitat. This is achieved by planting grains, promoting wetland plants and maintaining favorable water levels for waterfowl during the fall and winter seasons. Efforts have also been expended for quality habitat improvement for upland and forest wildlife species. Habitat development consists of establishing native prairies, managing successional growth with prescribed fire, and planting food plots.

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The State's management objectives for the licensed areas at Rend Lake are as follows:

- a. To manage the area to provide maximum habitat conditions for wildlife species that use the Rend Lake area and to provide for the protection of threatened and endangered species;
- b. To consider the overall ecology of the river basin from conservation, aesthetic, and recreation standpoint;
- c. To make these lands and waters available to the public and;
- d. To provide a maximum number of visitor days of outdoor recreation that is compatible with the resources.

2. Corps Wildlife Management Program. In accordance with the objectives of the Wildlife Management Program, non-consumptive uses of wildlife such as sightseeing, interpretation and photography; will receive equal consideration with that of consumptive uses, such as hunting. Lands available for intensive wildlife management at Rend Lake are well suited to commonly accepted wildlife management techniques. Habitat development methods directed at improving wildlife populations will be mainly that of providing food and cover habitat through manipulation of plant species. The land management practices that will be used at Rend Lake follow:

- a. Plant trees, grasses, shrubs, and wetland plants beneficial to a variety of wildlife.
- b. Establish upland wildlife food plots.
- c. Allow limited agricultural plantings to control succession, feed wildlife, and maintain good soil practices through the Agriculture Leasing Program.
- d. Control erosion.
- e. Identify, reestablish, protect, and promote wetland areas and plants.
- f. Maintain and monitor a variety of nesting box structures.
- g. Establish native grasses.
- h. Control succession where practical.

C. Fisheries Management.

The fish management program is supervised by lake fisheries biologists from the Illinois Department of Natural Resources. The goal of the State's fishery program is to produce the best fishing possible for the maximum number of people. The program is guided by a "Strategic Plan for Fish in Reservoirs" that identifies fisheries problems and strategies, and sets five year objectives. The Corps cooperates and supports the recommendations which are consistent with lake purposes.

The major fish species providing the sport fishery at Rend Lake are the white and black crappie, bluegill, channel catfish, white bass, largemouth bass, striped bass hybrids, and freshwater drum. To achieve the goal of providing the best fishing possible for the maximum number of people requires a multifaceted management strategy that includes commercial harvest of rough species, habitat enhancement, forage base enhancement, supplemental stocking, and species specific length and creel limits. No coldwater fish habitat or fishery occurs at the lake.

The commercial fishing program harvests an average of approximately 340,000 pounds of rough fish being harvested each year. Conflicts with sport fishermen and waterfowl management have been minimized by having a winter season only. The program provides fish that are sold for human consumption and a variety of other uses on the commercial market. Since the program was initiated in 1979, over 9.3 million pounds of rough fish, primarily buffalo and carp, have been harvested. The program provides direct benefits to sportfish and to several important species of forage fish by significantly reducing competition for available food sources.

Habitat maintenance, restoration, and enhancement are especially critical to the Rend Lake sport fishery. Shoreline stabilization projects help to reduce erosion and siltation, and prevent further degradation of existing habitat. These projects also providing valuable spawning and nursery habitat for sportfish and their prey, and can help reduce turbidity, making conditions for plant growth more favorable. Most shoreline stabilization projects at Rend Lake have been accomplished by placing rip rap along strategic areas of shoreline. The Corps. has also stabilized the bank and improved habitat by placing trees and woody brush along the shoreline when available.

Aquatic plants are an essential component of quality fish habitat. They provide valuable cover for small fish, support a diverse array of food organisms such as aquatic invertebrates, help stabilize the shoreline, and provide spawning substrate. Due primarily to wave action and high turbidity, aquatic plants have historically been scarce in Rend Lake. However, in recent years turbidity has declined and aquatic plants have become increasingly abundant. The reason for the decline in turbidity is unclear, but is likely the

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result of several factors including improved shoreline stabilization, lake eutrophication, and timing and volume of rain events. Shoreline stabilization is the only one of these factors that can be readily influenced, and future efforts to improve aquatic habitat should concentrate on stabilizing as much of the shoreline as possible. An additional habitat project is the placement of discarded Christmas trees to provide cover and encourage the harvest of panfish. This is an annual cooperative effort between the Corps and IDNR.

As a part of the Big Muddy River and its associated watershed, Rend Lake is an open system. This allows fish to emigrate from the lake during high water events. The loss of fish over the spillway complicates management efforts, especially for species such as hybrid striped bass and to a lesser extent other species, including largemouth bass. Constructing a fish barrier on the spillway that would prevent fish escapement but allow debris to pass would provide significant long term benefits to the fisheries resource in Rend Lake. It may also help to prevent unwanted exotic species such as the silver carp and bighead carp from entering the lake. The Illinois Department of Natural Resources has proposed a study to determine the feasibility of a spillway barrier.

Overall the fish population is in good shape. Management efforts focus on supplementing the forage base with annual stockings of threadfin shad, supplemental stocking of largemouth bass and hybrid striped bass, and applying species specific length and creel limits as needed. Three nursery ponds are operated to produce advanced-sized largemouth bass and hybrid striped bass for release into the lake. Biological surveys are conducted annually to monitor the fish population and assess management techniques. Periodic creel surveys help to determine angler preferences and harvest. Improvements in the sport fishery are anticipated as current management techniques improve habitat, increase the number of top predators, enhance the forage base, and manage the harvest. However, there are areas of concern that if left unaddressed could have serious impacts on the Rend Lake fishery.

**Immediate concerns** - There are two imminent threats to the aquatic natural resources at Rend Lake; increased water demand, and the potential immigration of asian carp. Actions to prevent, minimize, or mitigate these threats need to be implemented as soon as possible.

The demand for municipal and industrial water from Rend Lake is expected to increase significantly over the next 5 - 10 years. Unless measures are taken to address this issue, this increased water allocation will have a significant impact on the sport fish population and recreational opportunities at Rend Lake. Low water levels resulting from

the increased demand for water will result in a significant loss of aquatic habitat and a measurable reduction in water quality. In years with low water levels, sportfish reproduction and recruitment are inadequate to maintain the population. Increasing the frequency and extremes of low water levels will exacerbate these problems and result in a decline in many popular species of sportfish. Lower water levels will also result in a decline in water quality and an increase in shoreline erosion. The poor water quality associated with these lower water levels will increase the frequency and magnitude of disease outbreaks and fish kills that will occur in Rend Lake, and favor pollution tolerant species such as carp and buffalo. An increase in the rough fish population resulting from the decline in water quality will cause further detriment to the sport fish in Rend Lake, and will manifest itself in the form of a reduction in growth rates and further declines in recruitment.

Also of immediate concern is the potential for asian carp to become established in Rend Lake. Silver carp and bighead carp are abundant in the Big Muddy River below the Rend Lake spillway. If either of these species is able to migrate into the lake and successfully reproduce (in the river and streams that feed Rend Lake), their impact on recreational boating, skiing, and angling will be catastrophic. A single bighead carp was caught and removed from the lake by commercial fishermen in 2006. Measures to prevent further immigration need to be implemented as quickly as possible before either of these species have the opportunity to become established. Failure to act quickly will significantly increase the magnitude of the damage and recovery costs.

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## Section XIII

### Cost Estimates

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**SECTION XIII – COST ESTIMATES****13-01. INTRODUCTION**

A. General. Preliminary cost estimates for new and replacement facilities at Rend Lake have been developed by the project staff. The quantities and costs represent a typical Corps of Engineers guide specification level of design and materials. All routine maintenance will be completed as funding and budgets allow. Costs for IDNR proposed items were provided by the State. Costs for the Rend Lake Conservancy District were provided by the RLCD. During actual detailed design of each element, variations in types and quantities of materials, modifications and facilities, inflationary trends, and results from additional engineering tests will undoubtedly occur. Costs are based on 2008 prices received for similar items of work in the St. Louis District. Total for proposed consolidation, rehabilitation and replacement (CRR) actions does not include contingency, PED, or construction management costs because these are mostly done in-house. Estimates were provided by HNC on items they are constructing.

B. Summary of Costs. Preliminary costs estimates for proposed new actions for Corps of Engineers and State facilities are listed in Table 22. Proposed CRR actions are listed in Table 23.

TABLE 22  
PRELIMINARY COST ESTIMATES FOR PROPOSED NEW ACTIONS

<b>US ARMY CORPS OF ENGINEERS</b>						
<b>RECREATION AREAS</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
South Sandusky Recreation Area Section 8.04.c.	Convert 46 campsites to full hook-ups	46	EA	\$2,000	\$92,000	Routine
	Install water hook-ups to 32 campsites	32	EA	\$1,000	\$32,000	Routine
North Sandusky Recreation Area Section 8.04.d.	Convert 38 campsites to full hook-ups	38	EA	\$2,000	\$76,000	Routine
	Install water hook-ups to 26 campsites	26	EA	\$1,000	\$26,000	Routine
Gun Creek Recreation Area Section 8.04.g.	Convert 49 campsites to full hook-ups	49	EA	\$2,000	\$98,000	Routine
	Install water hook-ups to 25 campsites	25	EA	\$1,000	\$25,000	Routine
North Marcum Recreation Area Section 8.04.h.	Install a picnic shelter south of the beach parking area	1	JB	\$30,000	\$30,000	< 5 years

## ***Rend Lake Master Plan***

	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
South Marcum Recreation Area Section 8.04.i.	Convert 75 campsites to full hook-ups	75	EA	\$2,000	\$150,000	HNC/Routine
	Install water hook-ups to 37 campsites	37	EA	\$1,000	\$37,000	Routine
<b>MULTIPLE RESOURCE MANAGEMENT LANDS AREA (FUTURE RECREATION)</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
Jackie Branch FR-1 Section 8.05.d.1	Install a fish cleaning station	1	JB	\$50,000	\$50,000	< 5 years
<b>ILLINOIS DEPARTMENT OF NATURAL RESOURCES FACILITIES</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
IDNR - Wayne Fitzgerald State Park Section 8.04.f.	Construct a seasonal concession building	1	JB	\$500,000	\$500,000	

TABLE 23  
PRELIMINARY COST ESTIMATES FOR PROPOSED CRR ACTIONS

<b>US ARMY CORPS OF ENGINEERS</b>						
<b>PROJECT OPERATIONS FACILITIES</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
Main Dam OP-1 Section 8.03.a	Paint Spillway Bridge	1	JB	\$700,000	\$700,000	HNC
	Purchase and install small craft barrier at spillway and intake structure	1	JB	\$400,000	\$400,000	Routine
USACE Maintenance Complex OP-2 Section 8.03.b.	Replace roofing, doors, lighting, and siding. Add additional storage buildings, replace storage building, extend fencing and upgrade compound lot	1	JB	\$300,000	\$300,000	HNC
	Install hazardous materials storage building	1	LS	\$70,000	\$70,000	HNC
USACE Administration Complex OP-3 Section 8.03.c	Replace and consolidate the Administration Complex, Visitor Center and the Maintenance Complex	1	JB	\$10,000,000	\$10,000,000	HNC
	Remove existing Administration Building, roads and parking lots except for road leading to back lot and two parking spots	1	JB	\$100,000	\$100,000	HNC

	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
Sandusky Land Treatment Facility OP-4 Section 8.03.d.	Develop plans and specifications for connecting to City of Sesser's sewer force main	1	JB	\$250,000	\$250,000	Engineering/ Funded
<b>RECREATION LANDS</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
Spillway Recreation Area Section 8.04.a.	Convert existing Visitor Center into two open-air picnic shelters	1	JB	\$25,000	\$25,000	HNC
	Create 3 covered picnic sites on both sides of spillway channel	6	EA	\$10,000	\$60,000	< 5 years
	Replace the amphitheater stage, seating and landscaping	1	JB	\$100,000	\$100,000	Routine
Dam West Recreation Area Section 8.04.b.	Extend bike trail across Rend City Road to new location for the Visitor Center	1	JB	\$25,000	\$25,000	HNC
South Sandusky Recreation Area Section 8.04.c.	Install 10 picnic sites in the day use	10	EA	\$1,000	\$10,000	Routine
	Renovate campsites in Campground to meet minimum design requirements	75	EA	\$10,000	\$750,000	Routine
	Replace add-on mini-showers in Red Bud and Sycamore Loops with new prefabricated concrete mini-shower	2	EA	\$94,000.00	\$188,000.00	Routine
	Replace all masonry comfort stations in the day use and campground	7	EA	\$34,000	\$238,000	Routine
	Replace campground fee booth with a larger fee booth that is ADA accessible containing a restroom facility	1	JB	\$150,000	\$150,000	HNC
	Relocate gate attendant's campsite to a location near the fee booth	1	JB	\$35,000	\$35,000	HNC
North Sandusky Recreation Area Section 8.04.d.	Renovate campsites in campground to meet minimum design requirements	75	EA	\$10,000	\$750,000	Routine
	Replace campground fee booth with a larger fee booth that is ADA accessible containing a restroom facility	1	JB	\$150,000	\$150,000	HNC

## ***Rend Lake Master Plan***

	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
	Replace all masonry comfort stations in the day use and campground	9	EA	\$34,000	\$306,000	Routine
	Replace Maple loop mini-shower with a prefabricated concrete mini-shower and relocate near lift station past Sweetgum loop	1	EA	\$94,000.00	\$94,000	Routine
	Relocate gate attendant's campsite to a location near the fee booth	1	JB	\$35,000	\$35,000	HNC
Gun Creek Recreation Area Section 8.04.g.	Renovate campsites in campground to meet minimum design requirements	50	EA	\$10,000	\$500,000	Routine
	Replace campground fee booth with a larger fee booth that is ADA accessible containing a restroom facility	1	JB	\$150,000	\$150,000	HNC
	Consolidate and replace 4 masonry comfort stations with 1 prefabricated concrete waterborne comfort stations and 1 prefabricated concrete mini-shower	1	JB	\$150,000	\$150,000	HNC
	Relocate gate attendant's campsite to a location near the fee booth	1	JB	\$35,000	\$35,000	HNC
	Develop sewer system plans and specifications	1	JB	\$100,000	\$100,000	HNC
	Construct sewer system for entire Gun Creek Campground	1	JB	\$250,000	\$250,000	HNC
North Marcum Recreation Area Section 8.04.h.	Consolidate 2 comfort stations in day use with 1 centrally locate concrete prefabricated waterborne comfort station	1	JB	\$82,000.00	\$82,000	HNC
	Replace deteriorated vault comfort station at the boat ramp with prefabricated vault comfort station	1	JB	\$13,600.00	\$13,600	HNC
South Marcum Recreation Area Section 8.04.i.	Replace deteriorated vault comfort station at the boat ramp with prefabricated vault comfort station	1	JB	\$13,600.00	\$13,600.00	HNC

## ***Rend Lake Master Plan***

	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
	Develop sewer system plans and specifications	1	JB	\$200,000	\$200,000	HNC
	Construct sewer system for entire South Marcum Campground	1	JB	\$750,000	\$750,000	HNC
	Widen campground roads to meet minimum requirements	1	JB	\$500,000	\$500,000	HNC
	Renovate campsites in campground to meet minimum design requirements	100	EA	\$10,000	\$1,000,000	HNC
	Replace campground fee booth with a larger fee booth that is ADA accessible containing a restroom facility	1	JB	\$150,000	\$150,000	HNC
	Relocate gate attendant's campsite to a location near the fee booth	1	JB	\$35,000	\$35,000	HNC
	Remove 9 vault comfort stations and replace 3 with waterborne concrete vault comfort station and 3 small prefabricated concrete mini shower buildings	1	JB	\$404,400	\$404,400	HNC
	Convert the trailer dump station from holding vaults to a waterborne facility	1	JB	\$40,000	\$40,000	HNC
	Convert 5 tent sites on drive to beach in Dale Miller Youth Area into electric campsites with 50 amp service	5	EA	\$35,000	\$175,000	Routine
<b>MULTIPLE RESOURCE MANAGEMENT LANDS AREA (VEGETATIVE MANAGEMENT)</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
Main Dam VM-1 Section 8.05.a.1	Remove wooden railroad bridge and silo	1	JB	\$200,000	\$200,000	HNC
<b>MULTIPLE RESOURCE MANAGEMENT LANDS AREA (FUTURE RECREATION)</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
Jackie Branch FR-1 Section 8.05.d.1	Install a prefabricated concrete vault comfort station at the boat ramp	1	JB	\$13,600.00	\$13,600.00	HNC

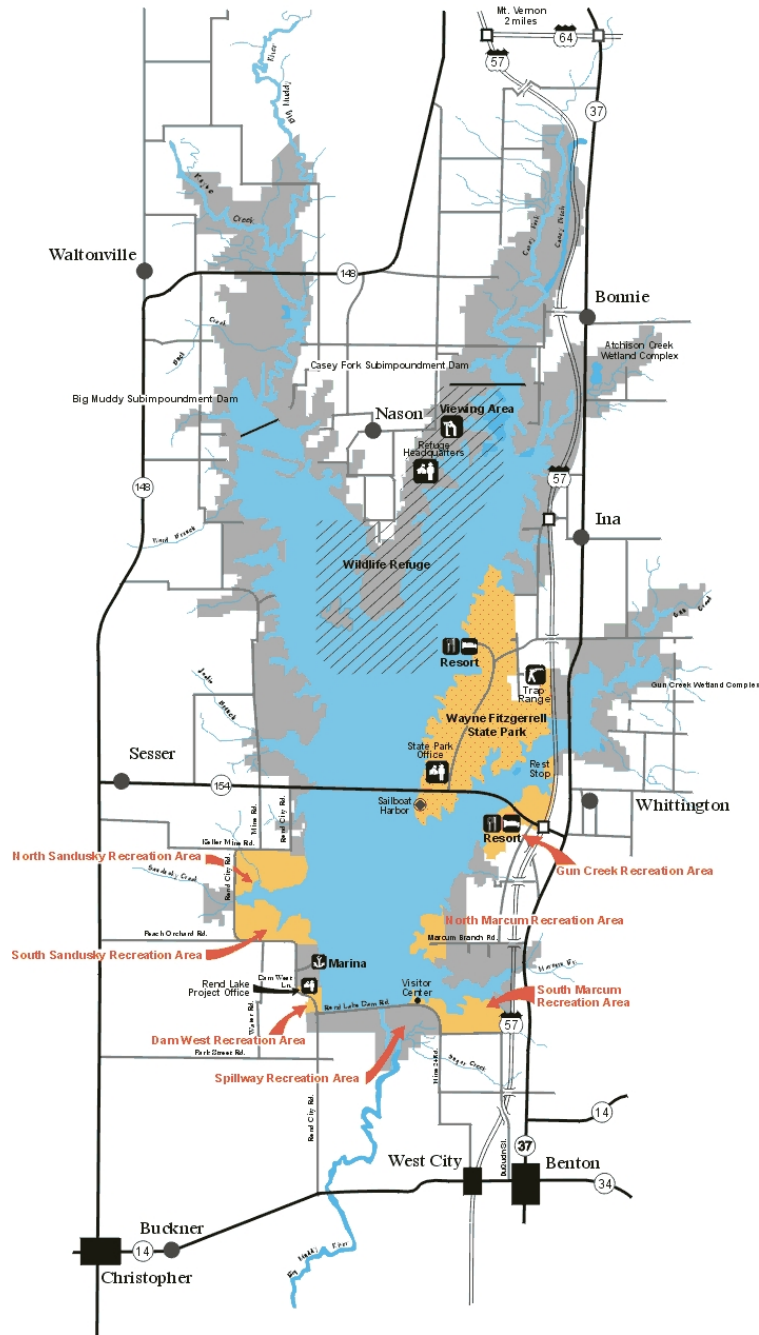
## ***Rend Lake Master Plan***

<b>REND LAKE CONSERVANCY DISTRICT FACILITIES</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
RLCD Intake Structure and Pipeline OP-10 Section 8.03.i.	Replace pumps and water gates in the Intake Structure	1	JB	\$250,000	\$250,000	
<b>ILLINOIS DEPARTMENT OF NATURAL RESOURCES FACILITIES</b>						
	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
IDNR – Wayne Fitzgerald State Park OP-8 Section 8.03.g.	Construct a Visitor Center	1	JB	\$2,500,000	\$2,500,000	
IDNR – Wayne Fitzgerald State Park Section 8.04.f.	Bike Trail Completion, resurface, modify culverts	1	JB	\$155,000	\$155,000	
	Replace drinking fountains, hydrants, grills and add lantern posts to campsites, create full hookup campsites, add more hydrants and drinking fountains	1	LS	\$1,248,000	\$1,248,000	
	Replace sanitary lift station pumps	1	JB	\$200,000	\$200,000	
	Replace roofs throughout the park on buildings	1	JB	\$261,000	\$261,000	
	Renovate shower buildings	1	JB	\$395,000	\$395,000	
	Update the resort playground surface to meet the consumer product safety commission standards	1	JB	\$25,000	\$25,000	
	Install ADA floating courtesy docks, concrete sidewalk, security light and 3-sided kiosk	1	LS	\$215,000	\$215,000	
	Construct an ADA fishing pier, sidewalk, security light, and paved parking	1	JB	\$175,000	\$175,000	
	Construct a swim beach in existing day use area	1	JB	\$730,000	\$730,000	
	Completion of the Sailboat Harbor area	1	JB	\$650,000	\$650,000	
IDNR – Wildlife Management Area OP-6 Section 8.03.f.	Replace roofing system on site superintendents office and service building in refuge	1	JB	\$25,000	\$25,000	

	Items or Description	Qty	Unit	Unit Price	Estimated Amount	Constructed By
IDNR – Wildlife Management Area Section 8.05.c.1	Replace deteriorating vault toilets throughout WMA access areas to meet ADA requirements	1	JB	\$192,000	\$192,000	
IDNR – Wildlife Management Area. Big Muddy WMA Section 8.05.c.2	Replace sub impoundment engines	1	JB	\$400,000	\$400,000	
IDNR – Wildlife Management Area. Casey Fork WMA Section 8.05.c.3	Resurface township road and access road and parking to Bonnie Dam and South Bonnie Access Areas	1	JB	\$750,000	\$750,000	
	Upgrade sub impoundment pumps engines	1	JB	\$500,000	\$500,000	
	Construct 2 shallow water moist soil unit wetlands on the north end of the refuge	1	JB	\$400,000	\$400,000	
	Construct a pole barn hunter check station at Cottonwood Access Area	1	JB	\$85,000	\$85,000	

TABLE 24  
FINANCIAL COST ANALYSIS FOR NEW FACILITIES

<b>Typical Campground Water and Sewer Hookups Analysis</b>								
<b>Benefits</b>	Days	Occupancy Rate	Total Days Occupied	Daily Increase in Fee	Annual	Number of Campsites	Total Annual Revenue	Initial Cost
Increased fee collection \$2.00/camp site/hookup	150	0.45	67.5	\$8	\$540	208	\$112,320	
Increased fee collection \$2.00/camp site/hookup	30	0.4	12	\$4	\$48	120	\$5,760	
Total Additional Annual Revenue							\$118,080	
<b>Costs</b>								
Increased O&M Annual Expenses					\$100			
Annualized Construction Cost					\$6,181			\$308,875
Total Annual Costs					\$6,281			
Benefit/Cost Ratio					3.90			



## Section XIV

## Plates

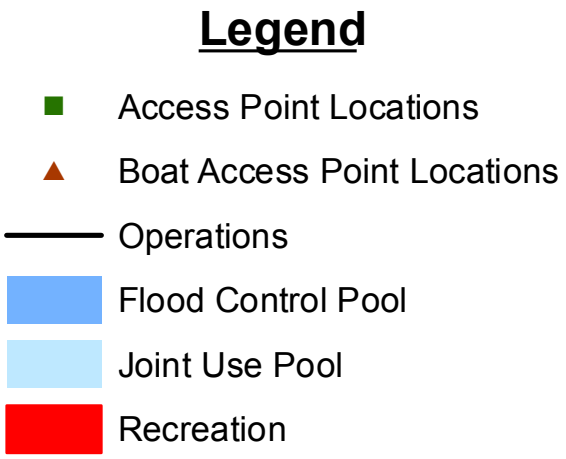
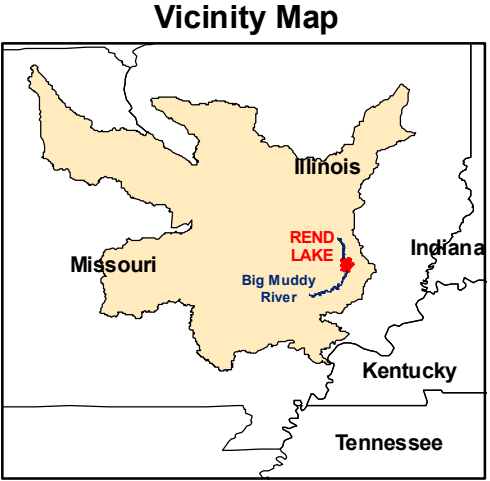
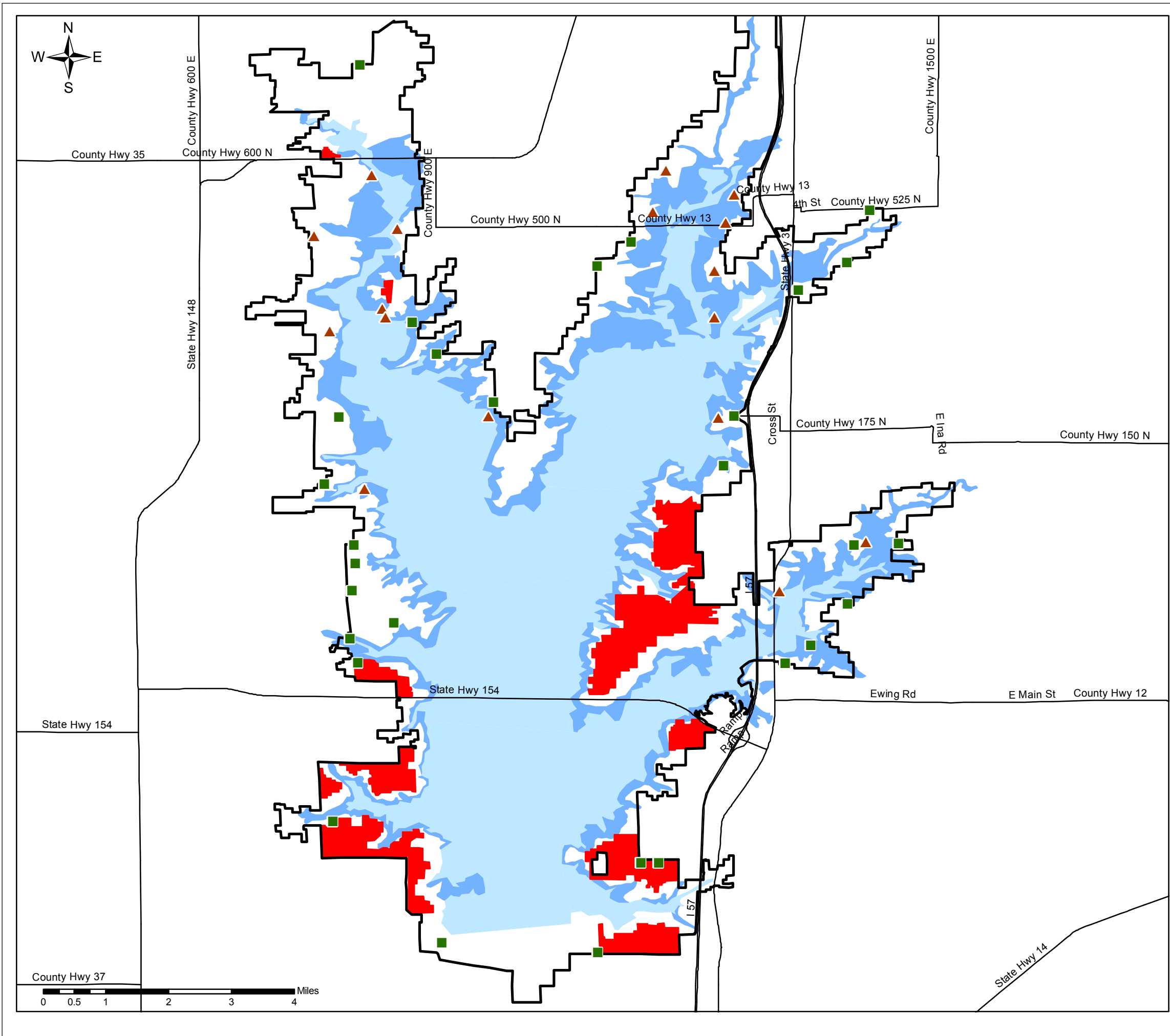
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**SECTION XIV – PLATES**

**14.01. GENERAL**

Plates pertaining to Corps managed areas are included in this section.

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 <b>US Army Corps of Engineers</b> ® St. Louis District	REND LAKE BIG MUDDY RIVER MASTER PLAN REVISED OCTOBER 2009
	<b>Land Allocation</b>

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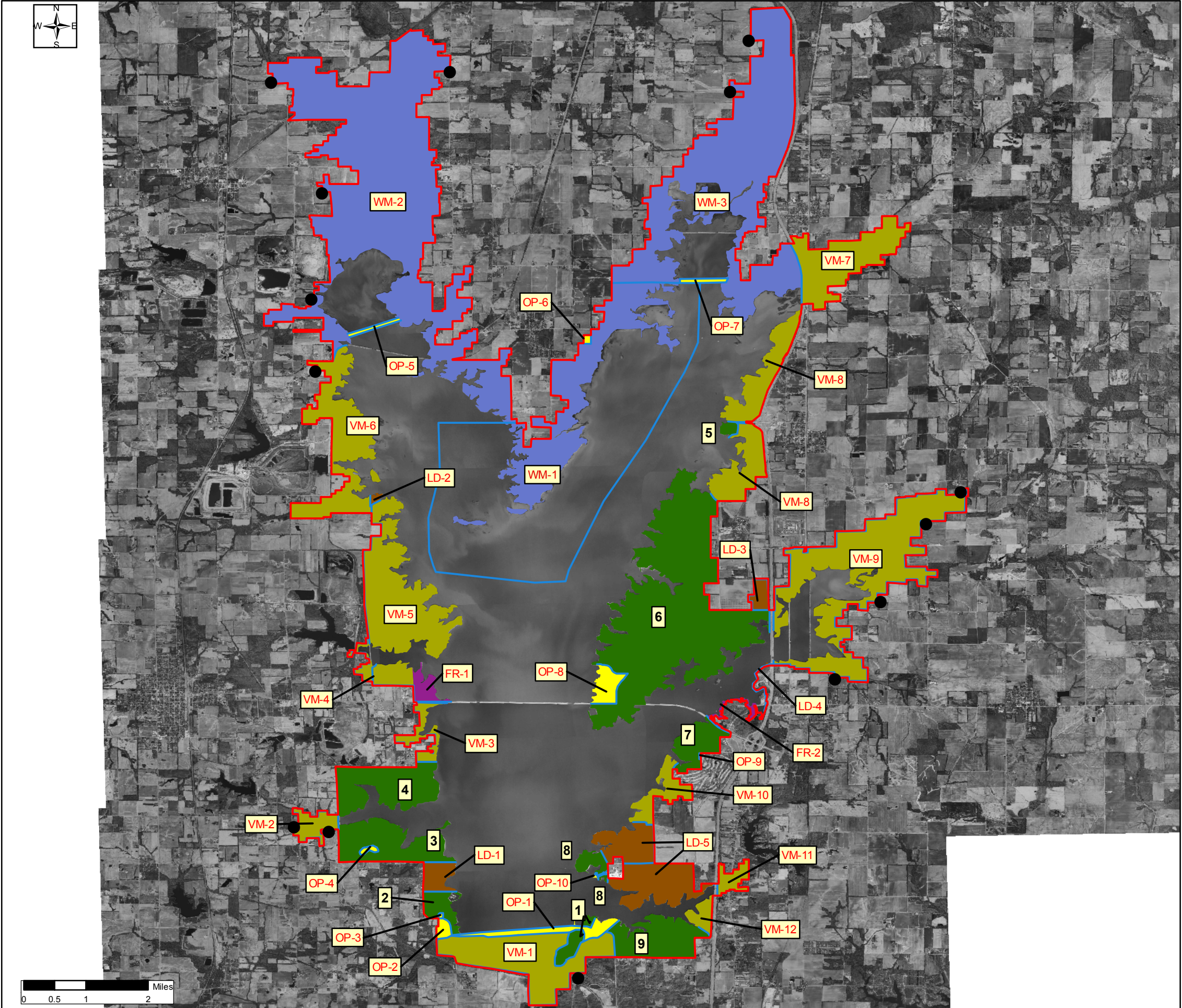


PLATE NO.	AREA NO.	LOCATION NAME	ACRES
RECREATION AREAS			
	1	SPILLWAY RECREATION AREA	84
	2	WEST RECREATION AREA	114
	3	SOUTH SANDUSKY RECREATION AREA	453
	4	NORTH SANDUSKY RECREATION AREA	498
	5	INA RECREATION AREA	28
	6	WAYNE FITZGERRELL STATE PARK	2539
	7	GUN CREEK RECREATION AREA	223
	8	NORTH MARCUM RECREATION AREA	74
	9	SOUTH MARCUM RECREATION AREA	395
		TOTAL	4408
MULTIPLE RESOURCE MANAGEMENT AREAS - RECREATION - LOW DENSITY			
	LD-1	STOCKPILE STORAGE AREA	107
	LD-2	TURNIP PATCH MULTIPLE RESOURCE AREA	13
	LD-3	REND LAKE SHOOTING COMPLEX	61
	LD-4	I-57 MULTIPLE RESOURCE AREA	5
	LD-5	NORTH MARCUM MULTIPLE RESOURCE AREA	630
		TOTAL	816
MULTIPLE RESOURCE MANAGEMENT AREAS - FUTURE RECREATION			
	FR-1	JACKIE BRANCH FUTURE RECREATION AREA	82
	FR-2	GUN CREEK COMPLEX	40
		TOTAL	122
MULTIPLE RESOURCE MANAGEMENT AREAS - WILDLIFE MANAGEMENT			
	WM-1	REND LAKE WILDLIFE REFUGE	1291
	WM-2	BIG MUDDY WILDLIFE MANAGEMENT AREA	4205
	WM-3	CASEY FORK WILDLIFE MANAGEMENT AREA	2773
		TOTAL	8269
MULTIPLE RESOURCE MANAGEMENT AREAS - VEGETATIVE MANAGEMENT			
	VM-1	MAIN DAM MULTIPLE RESOURCE AREA	792
	VM-2	SANDUSKY CREEK MULTIPLE RESOURCE AREA	124
	VM-3	NORTH SANDUSKY MULTIPLE RESOURCE AREA	118
	VM-4	JACKIE BRANCH MULTIPLE RESOURCE AREA	167
	VM-5	WEST MULTIPLE RESOURCE AREA	956
	VM-6	WARD BRANCH MULTIPLE RESOURCE AREA	739
	VM-7	ATCHISON CREEK MULTIPLE RESOURCE AREA	606
	VM-8	INA MULTIPLE RESOURCE AREA	641
	VM-9	GUN CREEK MULTIPLE RESOURCE AREA	1431
	VM-10	JONES MULTIPLE RESOURCE AREA	180
	VM-11	MARCUM CREEK MULTIPLE RESOURCE AREA	88
	VM-12	SOUTH MARCUM MULTIPLE RESOURCE AREA	82
		TOTAL	5924
PROJECT OPERATIONS			
	OP-1	REND LAKE MAIN DAM	131
	OP-2	MAINTENANCE COMPLEX	31
	OP-3	ADMINISTRATION OFFICE	3
	OP-4	SANDUSKY LAND TREATMENT FACILITY	12
	OP-5	BIG MUDDY SUBIMPOUNDMENT DAM	25
	OP-6	IDNR REND LAKE WILDLIFE MANAGEMENT AREA	8
	OP-7	CADEY FORK SUBIMPOUNDMENT DAM	25
	OP-8	IDNR WAYNE FITZGERRELL STATE PARK OFFICE	109
	OP-9	RLCD REND LAKE GOLF COURSE MAIN BUILDING	1
	OP-10	RLCD INTAKE STRUCTURE AND PIPELINE	4
		TOTAL	349
PROJECT FEE LANDS			TOTAL 19888
EASEMENT LANDS			TOTAL 906
GENERAL RECREATION WATERS			TOTAL 20331
PROJECT FEE LANDS AND WATERS			TOTAL 41124

Legend

- Proposed Access Easements
- Future Recreations
- Inactive Use
- Project Operations
- Recreation Areas
- Recreation- Low Density
- Vegetative Management
- Wildlife Management
- Land Use Boundary
- Rend Lake Boundary

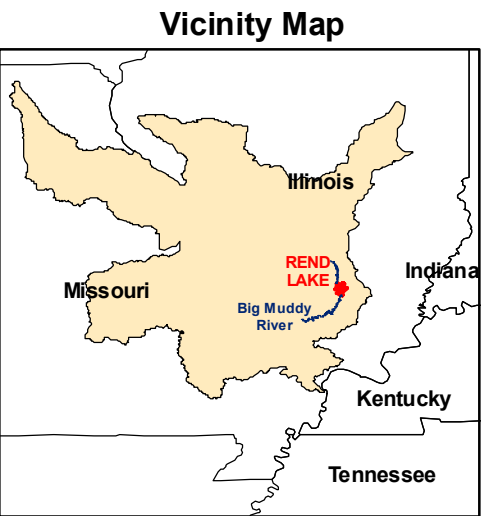
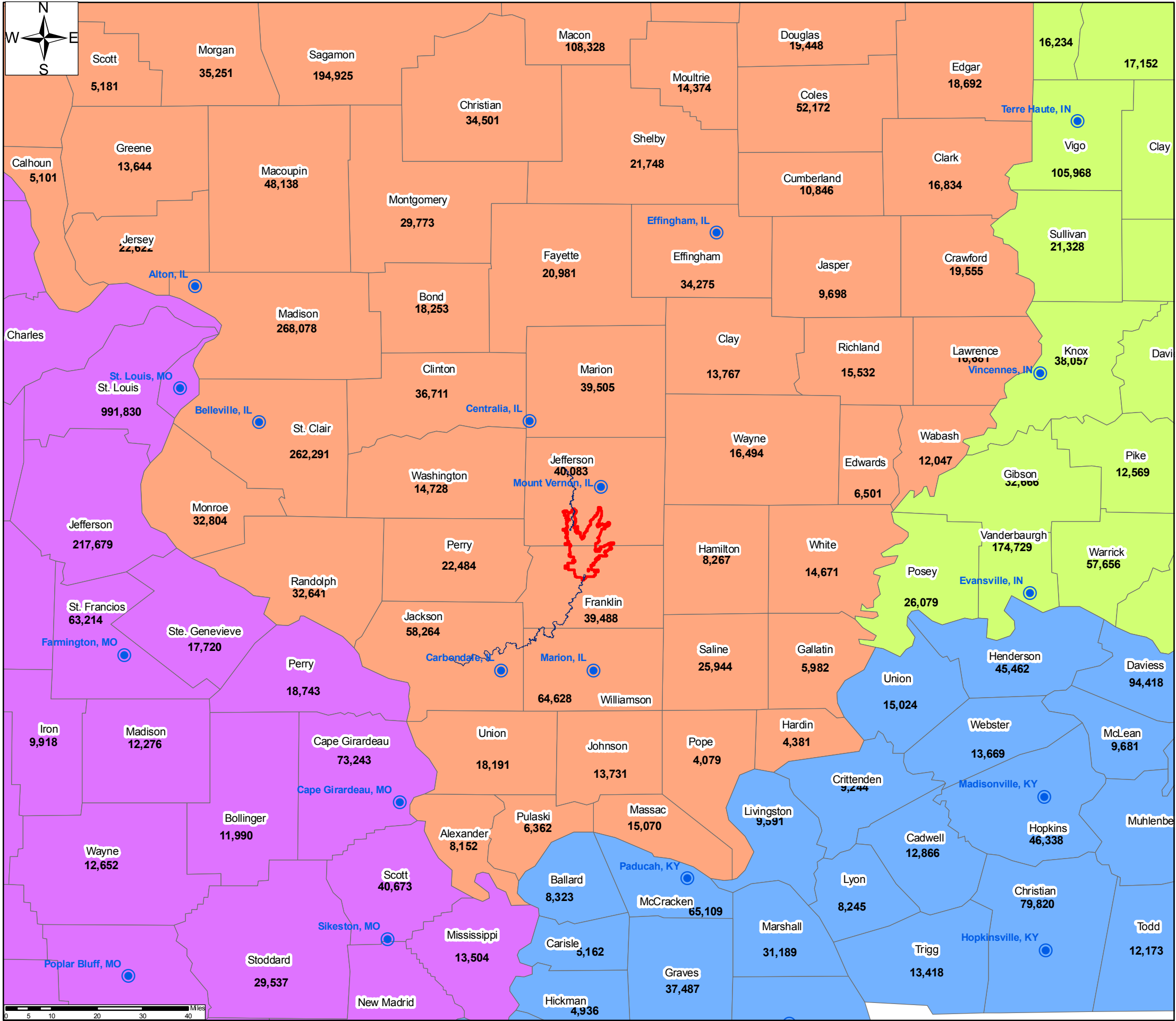


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REND LAKE  
BIG MUDDY RIVER  
MASTER PLAN REVISED  
OCTOBER 2009

Land Classification


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DISTANCE FROM REND LAKE, ILLINOIS	
CITY	DISTANCE
Alton, Illinois	118 mi
Belleville, Illinois	89 mi
Carbondale, Illinois	33 mi
Centralia, Illinois	48 mi
Effingham, Illinois	90 mi
Marion, Illinois	27 mi
Mount Vernon, Illinois	30 mi
Evansville, Indiana	112 mi
Terre Haute, Indiana	157 mi
Vincennes, Indiana	136 mi
Hopkinsville, Kentucky	147 mi
Madisonville, Kentucky	102 mi
Murray, Kentucky	121 mi
Paducah, Kentucky	76 mi
Cape Girardeau, Missouri	75 mi
Farmington, Missouri	125 mi
Popular Bluff, Missouri	145 mi
Saint Louis, Missouri	100 mi
Sikeston, Missouri	98 mi

### Legend

- City
- Big Muddy River
- Rend Lake Boundary
- Illinois
- Indiana
- Kentucky
- Missouri

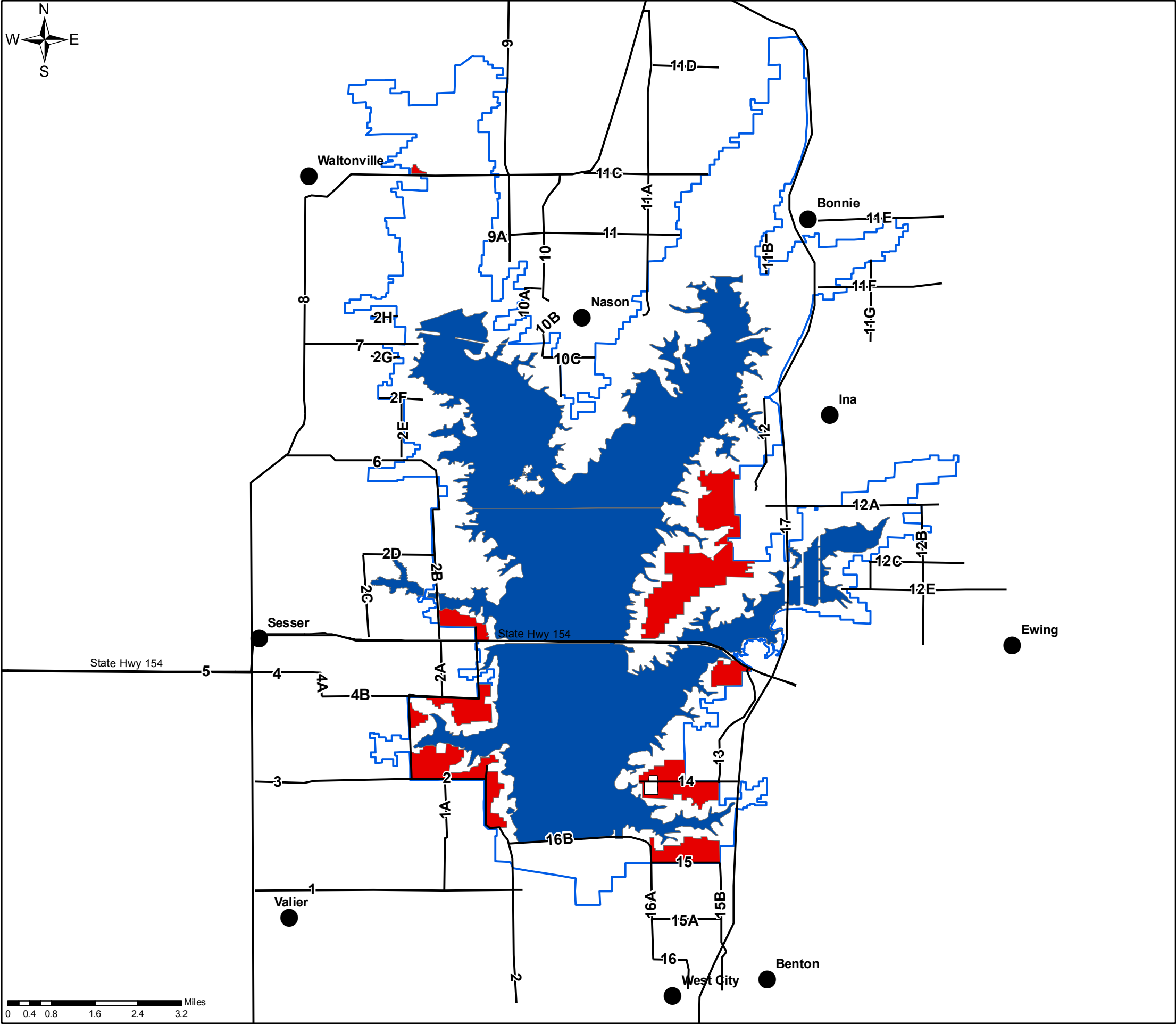
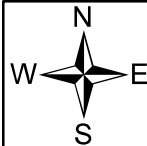


**US Army Corps of Engineers**  
St. Louis District

REND LAKE  
BIG MUDDY RIVER  
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**Population Density  
in the Zone of Influence**

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Vicinity Map



NUMBER	NAME
1	Park Street Road
1A	Water Road
2	Rend City Road
2A	Old Ben Road
2B	Mine 21 Road
2C	Banister Road
2D	Horse Prairie Road
2E	North Tumbuktu Road
2F	East Ragtime Road
2G	East Harper
2H	Waltonville Access Road
3	Peach Orchard Road
4	Coal Street
4A	Barren Road
4B	Keller Mine Road
5	State Highway 154
6	East Emerson City Road
7	East Casper Road
8	State Highway 148
9	North Cherryville Lane
9A	Country Road 500
9B	East Springsteen Road
10	North Nason Lane
10A	Peanut Road/ Russet Road
10B	Southwestern Road
10C	Keystone Lane
10D	North Keystone Lane
11	East Bonnie Road
11A	North Vermont Lane
11B	North Cooley Lane
11C	East Saddle Club Road
11D	East Redwood Road
11E	Elizabeth Road
11F	East Adams Road
11G	North Ludwig Lane
12	North Ken Grey Parkway
12A	East Franklin Road/ North County Line
12B	Bean Road
12C	Friar Road
12D	Buxton Road
12E	Rescue Church Road
13	Gun Creek Trail
14	Marcum Branch Road
15	Licata Road
15A	Petroff Road
15B	Du Quoin Street
16	Central Street
16A	Mine 24 Road
16B	Rend Lake Dam Road
17	Interstate 57

Legend

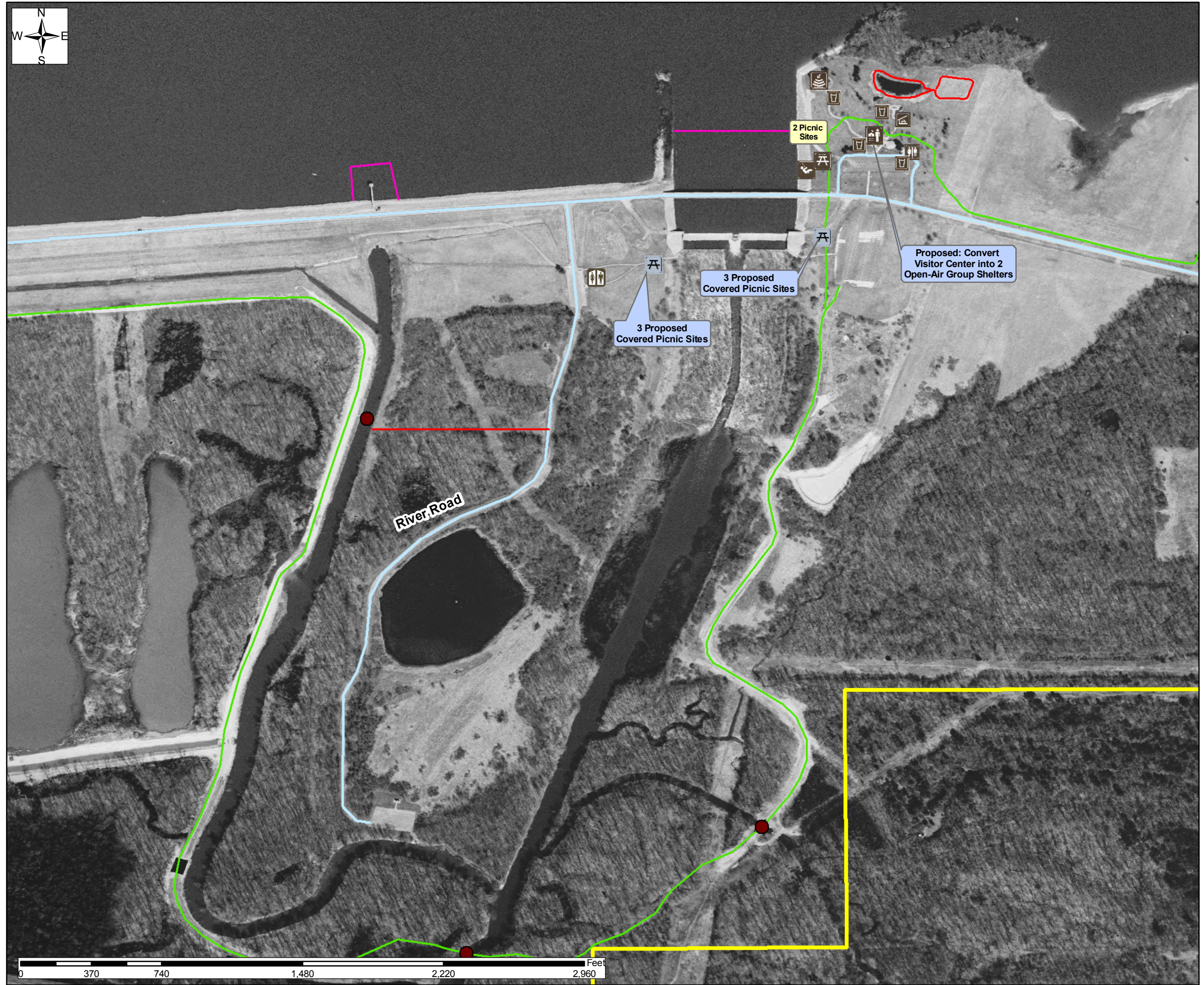
- Cities
- Roads
- Water
- Recreation
- Rend Boundary



REND LAKE  
BIG MUDDY RIVER  
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Road Networks

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	Existing	Proposed
Amphitheater	1	
Bridge (Bike/ Pedestrian)	3	
Drinking Water	4	
Group Shelter	1	2
Hiking Trail	2	
Picnic Sites	2	
Picnic Sites (Covered)		6
Playground	1	
Small Craft Barrier		2
Vault Comfort Station	1	
Visitor Center	1	-1
Waterborne Comfort Station	1	

- Amphitheater
- Bridge
- Drinking Water
- Group Shelter
- Picnic Area
- Playground
- Vault Comfort Station
- Visitor Center
- Waterborne Comfort Station
- Proposed Picnic Sites
- Bike Trail
- Hiking Trail
- Proposed Small Craft Barrier
- Roads
- Rend Lake Boundary

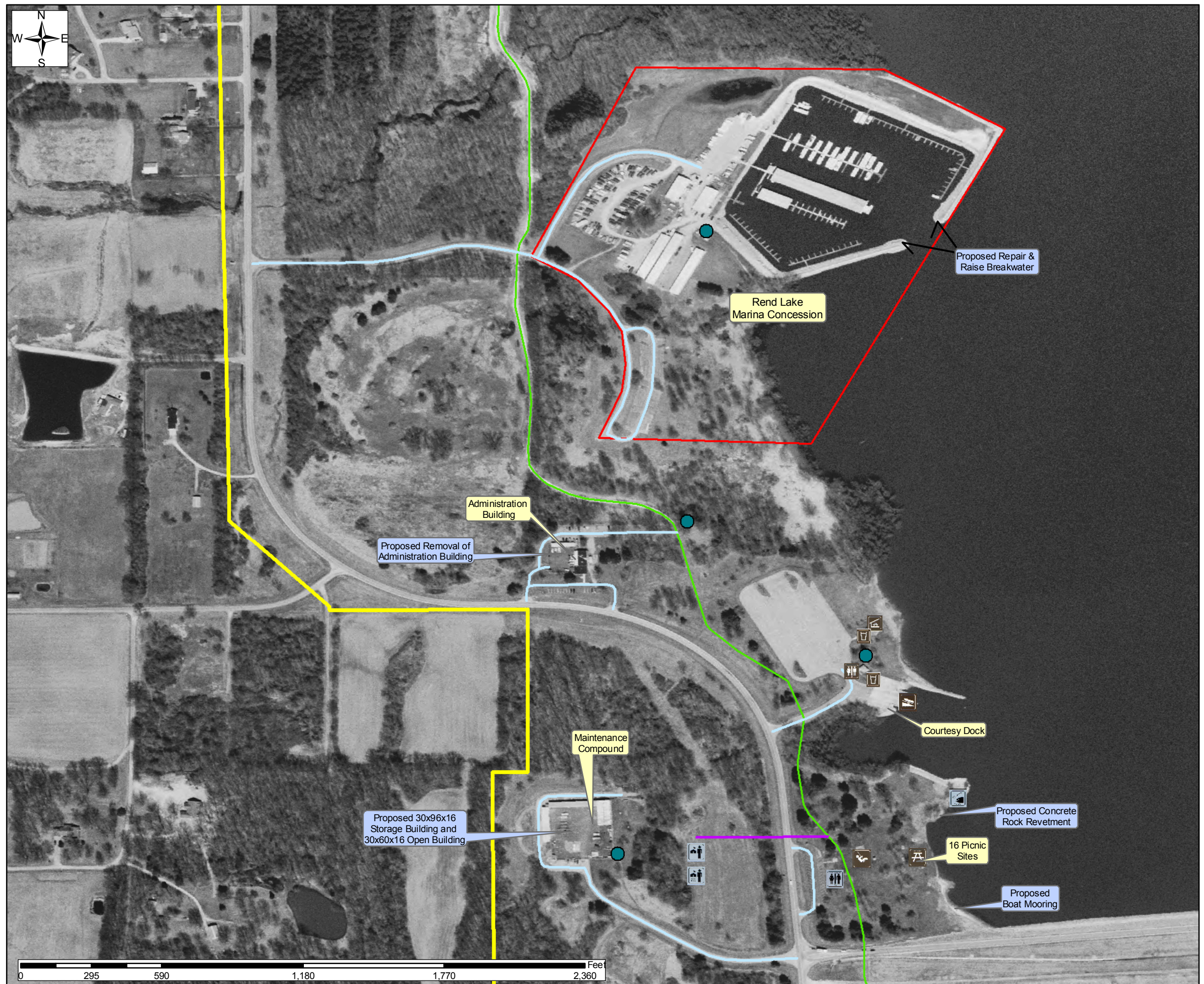


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REND LAKE  
BIG MUDDY RIVER  
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**Spillway Recreation Area**

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	Existing	Proposed
Accessible Fishing Pier		1
Administration Building	1	
Boat Ramp	1	
Courtesy Dock	1	
Drinking Water	2	
Group Shelter	1	
Lift Station	4	
Maintenance Compound	1	
Picnic Sites	16	1
Playground	1	
Waterborne Comfort Station	1	1
Visitor Center		1

- Boat Ramp
- Drinking Water
- Group Shelter
- Lift Station
- Picnic Area
- Playground
- Waterborne Comfort Station
- Proposed Accessible Fishing Pier
- Proposed Administration
- Proposed Comfort Station
- Proposed Visitor Center
- Bike Trail
- Proposed Bike Trail
- Roads
- Rend Lake Boundary
- Marina Boundary



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**REND LAKE  
BIG MUDDY RIVER  
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**Dam West  
Recreation Area**

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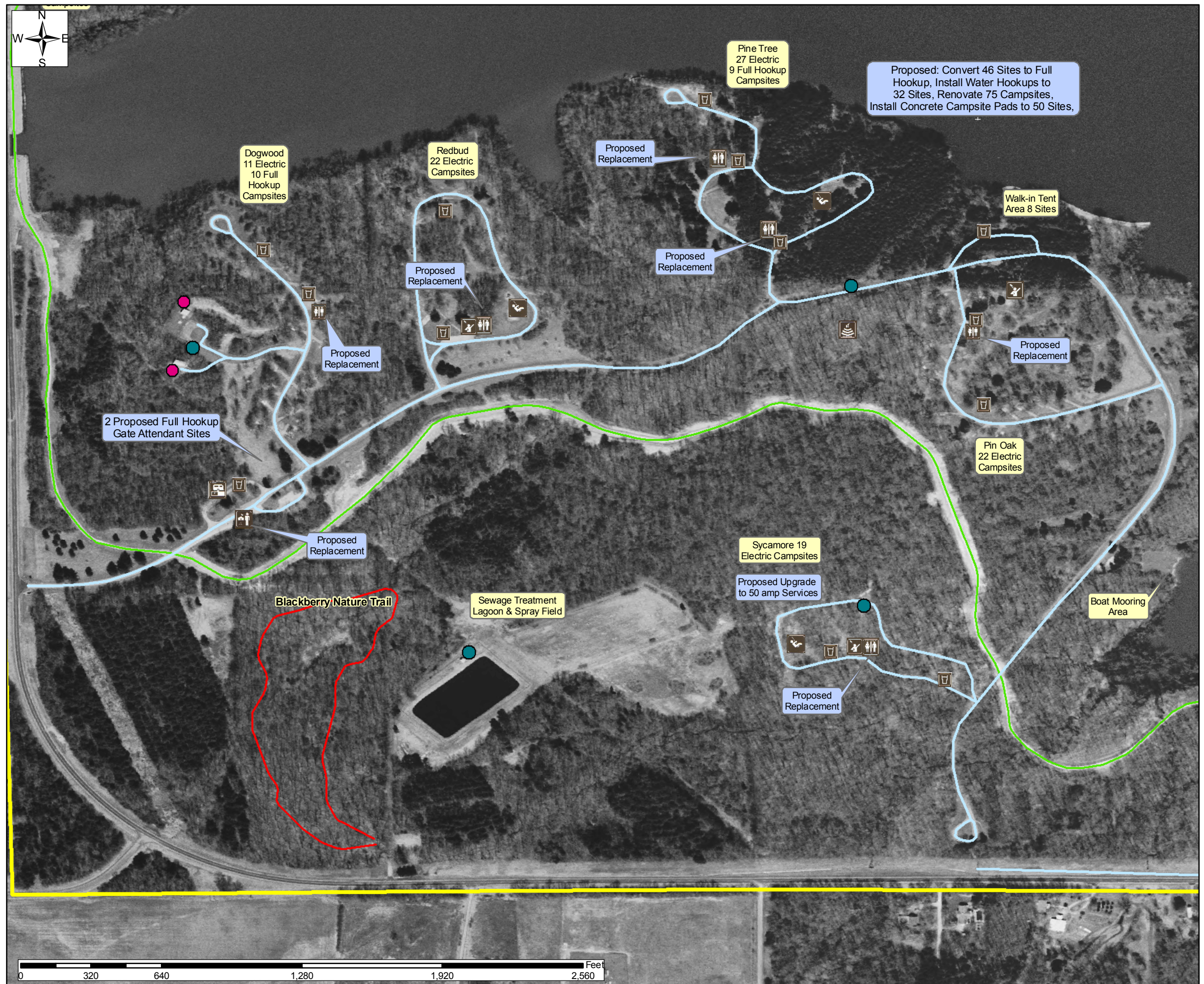


	Existing	Proposed
Boat Ramp	1	
Courtesy Dock	1	2
Covered Bench	4	
Drinking Water	7	
Foot Shower Tower	3	
Group Shelter	3	-1
Lift Station	1	
Picnic Sites	20	10
Playground	1	
Shower Building	1	
Waterborne Comfort Station	3	

	Boat Ramp
	Covered Bench
	Drinking Water
	Foot Shower Tower
	Group Shelter
	Lift Station
	Picnic Area
	Playground
	Shower Building
	Waterborne Comfort Station
	Proposed Picnic Sites
	Bike Trail
	Roads
	Rend Lake Boundary


 <b>US Army Corps of Engineers</b> St. Louis District	REND LAKE BIG MUDDY RIVER MASTER PLAN REVISED OCTOBER 2009
	<b>South Sandusky Day Use</b>

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	Existing	Proposed
Amphitheater	1	
Drinking Water	13	
Dump Station	1	
Electric Campsites	102	
Feebooth	1	
Full Hookup Campsites	20	48
Hiking Trail	1	
Lift Station	4	
Mini Shower Building	2	
Playground	3	
Shower Building	1	
Storage Building	2	
Walk-In Tent Area Campsites	8	
Waterborne Comfort Station	4	
Water/Electric Campsites		32

- Amphitheater
- Drinking Water
- Dump Station
- Feebooth
- Lift Station
- Mini Shower Building
- Playground
- Shower Building
- Storage Building
- Waterborne Comfort Station
- Bike Trail
- Hiking Trail
- Roads
- Rend Lake Boundary



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BIG MUDDY RIVER  
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**South Sandusky  
Campground**

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	Existing	Proposed
Accessible Fishing Pier		2
Boat Ramp	1	
Covered Bench	1	
Courtesy Dock	1	1
Drinking Water	9	
Dump Station	1	
Fish Brood Pond	1	
Group Shelter	3	
Lift Station	2	
Mini Shower Building		1
Picnic Sites	36	-10
Playground	2	2
Tent Sites		15
Waterborne Comfort Station	4	-1
Water/Electric Campsites		10

Boat Ramp

Covered Bench

Drinking Water

Dump Station

Feebooth

Fish Brood Pond

Group Shelter

Lift Station

Picnic Area

Playground

Shower Building

Waterborne Comfort Station

Proposed Accessible Fishing Pier

Proposed Mini Shower Building

Proposed Playground

Proposed Bike Trail

Roads

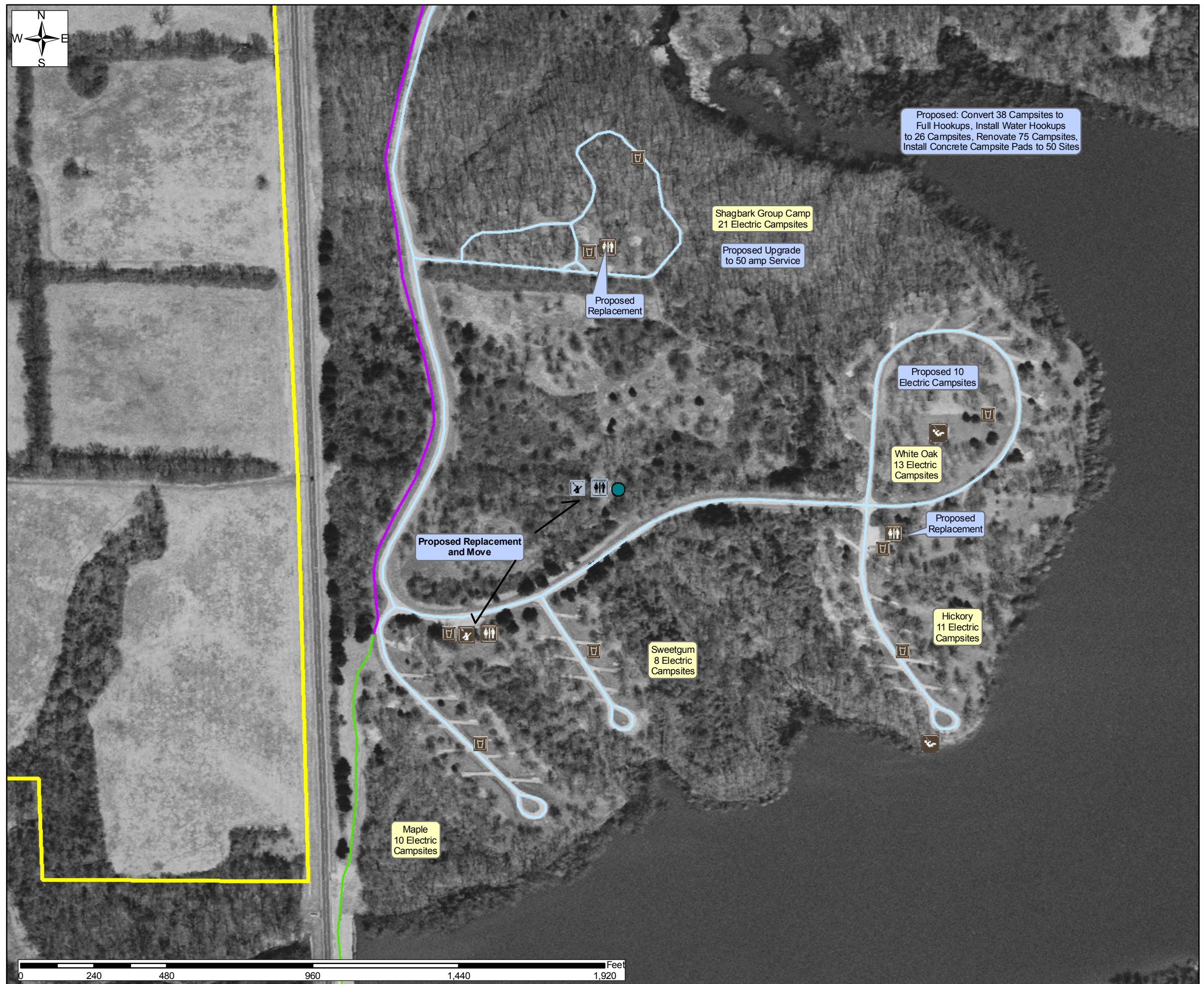
Rend Lake Boundary

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REND LAKE  
BIG MUDDY RIVER  
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OCTOBER 2009


North Sandusky  
Day Use (Campground)

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	Existing	Proposed
Drinking Water	13	
Electric Campsites	102	10
Feebooth	1	
Full Hookup Campsites	16	40
Lift Station	2	
Mini Shower Building	1	
Playground	2	
Shower Building	1	
Water/Electric Campsites		26
Waterborne Comfort Station	5	

- Drinking Water
- Lift Station
- Mini Shower Building
- Playground
- Waterborne Comfort Station
- Proposed Mini Shower Building
- Bike Trail
- Proposed Bike Trail
- Roads
- Rend Lake Boundary



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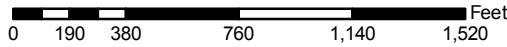
REND LAKE  
BIG MUDDY RIVER  
MASTER PLAN REVISED  
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**North Sandusky  
Campground**

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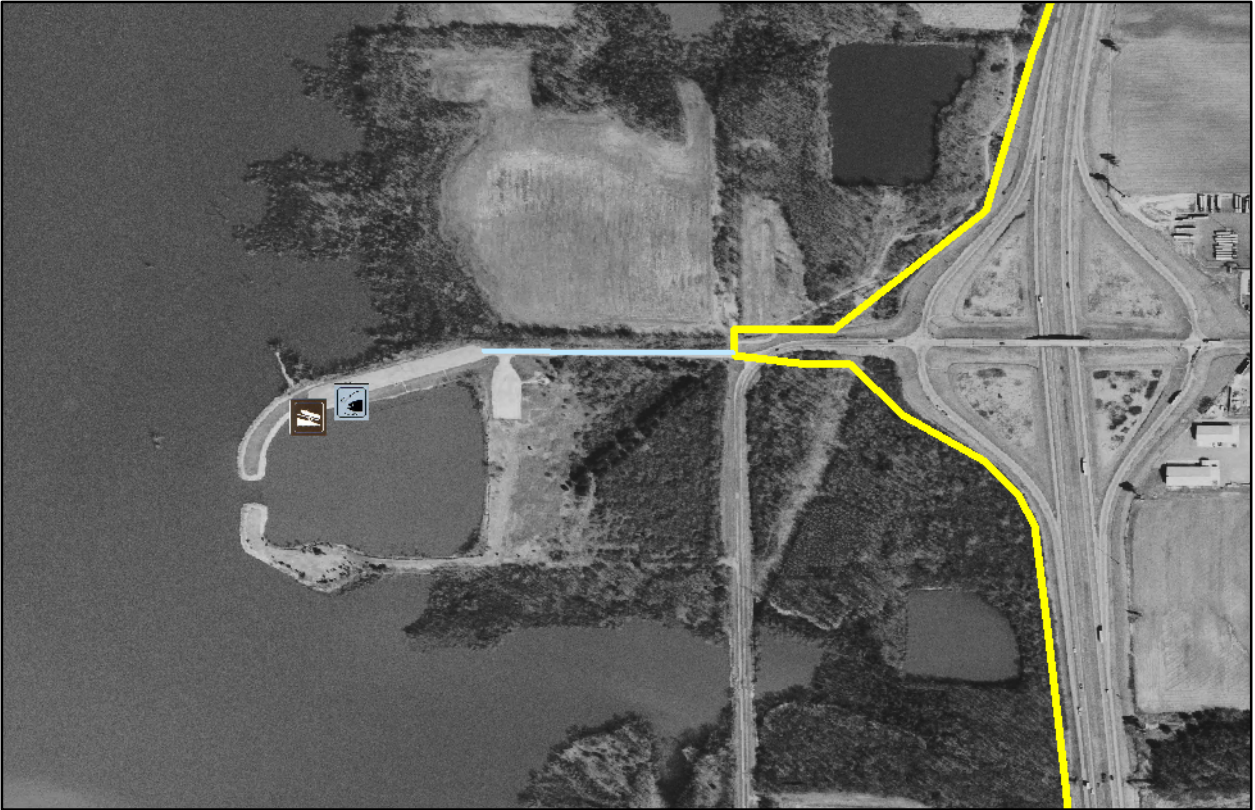
JACKIE BRANCH



TURNIP PATCH



INA



Jackie Branch	Existing	Proposed
Accessible Fishing Pier		1
Boat Ramp	1	
Drinking Water	1	
Fish Cleaning Station		1
Vault Comfort Station		1

Turnip Patch	Existing	Proposed
Boat Ramp	1	
Vault Comfort Station	1	

Ina	Existing	Proposed
Accessible Fishing Pier		1
Boat Ramp	1	

Boat Ramp

Drinking Water

Vault Comfort Station

Proposed Accessible Fishing Pier

Proposed Fish Cleaning Station

Proposed Vault Comfort Station

Roads

Proposed Bike Trail

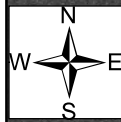
Rend Lake Boundary

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BIG MUDDY RIVER  
MASTER PLAN REVISED  
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Jackie Branch, Turnip Patch  
& Ina Recreation Areas

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Convert 49 Campsites to Full Hookups, Install Water Hookups to 25 Campsites, Renovate 50 Campsites, Install Concrete Campsite Pads to 20 Sites

Cardinal  
8 Electric  
Campsites

Blue Jay  
10 Electric  
1 Full Hookup  
Campsites

Nighthawk  
40 Electric  
Campsites

Proposed  
Waterborne  
Station

Proposed  
Removal

Eagle  
41 Electric  
Campsites

Proposed  
Removal

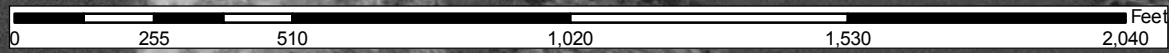
Proposed Replacement  
with Mini Shower

2 Proposed Full Hookup  
Gate Attendant Sites

Proposed  
Camping Loop


Proposed  
Replacement

Courtesy Dock



	Existing	Proposed
Accessible Fishing Pier		1
Amphitheater	1	
Boat Ramp	1	
Courtesy Dock	1	
Drinking Water	17	
Electric Campsites	99	
Feebooth	1	
Full Hookup Campsites	1	51
Group Shelter	1	
Lift Station	1	
Mini Shower Building		1
Playground	3	
Shower Building	1	
Trailer Dump Station	1	
Vault Comfort Station	6	-4
Waterborne Comfort Station		1
Water/Electric Campsites		25

- Amphitheater
- Boat Ramp
- Drinking Water
- Feebooth
- Group Shelter
- Lift Station
- Playground
- Shower Building
- Trailer Dump Station
- Vault Comfort Station
- Proposed Accessible Fishing Pier
- Proposed Mini Shower Building
- Roads
- Proposed Bike Trail
- Reid Lake Boundary



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REID LAKE  
BIG MUDDY RIVER  
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**Gun Creek  
Recreation Area**

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	Existing	Proposed
Accessible Fishing Pier		1
Boat Ramp	1	
Courtesy Dock	1	
Covered Bench	4	
Drinking Water	6	
Foot Shower Tower	2	
Group Shelter	2	1
Lift Station	1	
Picnic Sites	22	
Playcourt	1	
Playground	1	
Shower Building	1	
Vault Comfort Station	3	-2
Waterborne Comfort Station		1

Boat Ramp

Covered Bench

Drinking Water

Foot Shower Tower

Group Shelter

Lift Station

Picnic Area

Playcourt

Playground

Shower Building

Vault Comfort Station

Proposed Accessible Fishing Pier

Proposed Group Shelter

Proposed Waterborne Comfort Station

Bike Trail

Roads

Rend Lake Boundary

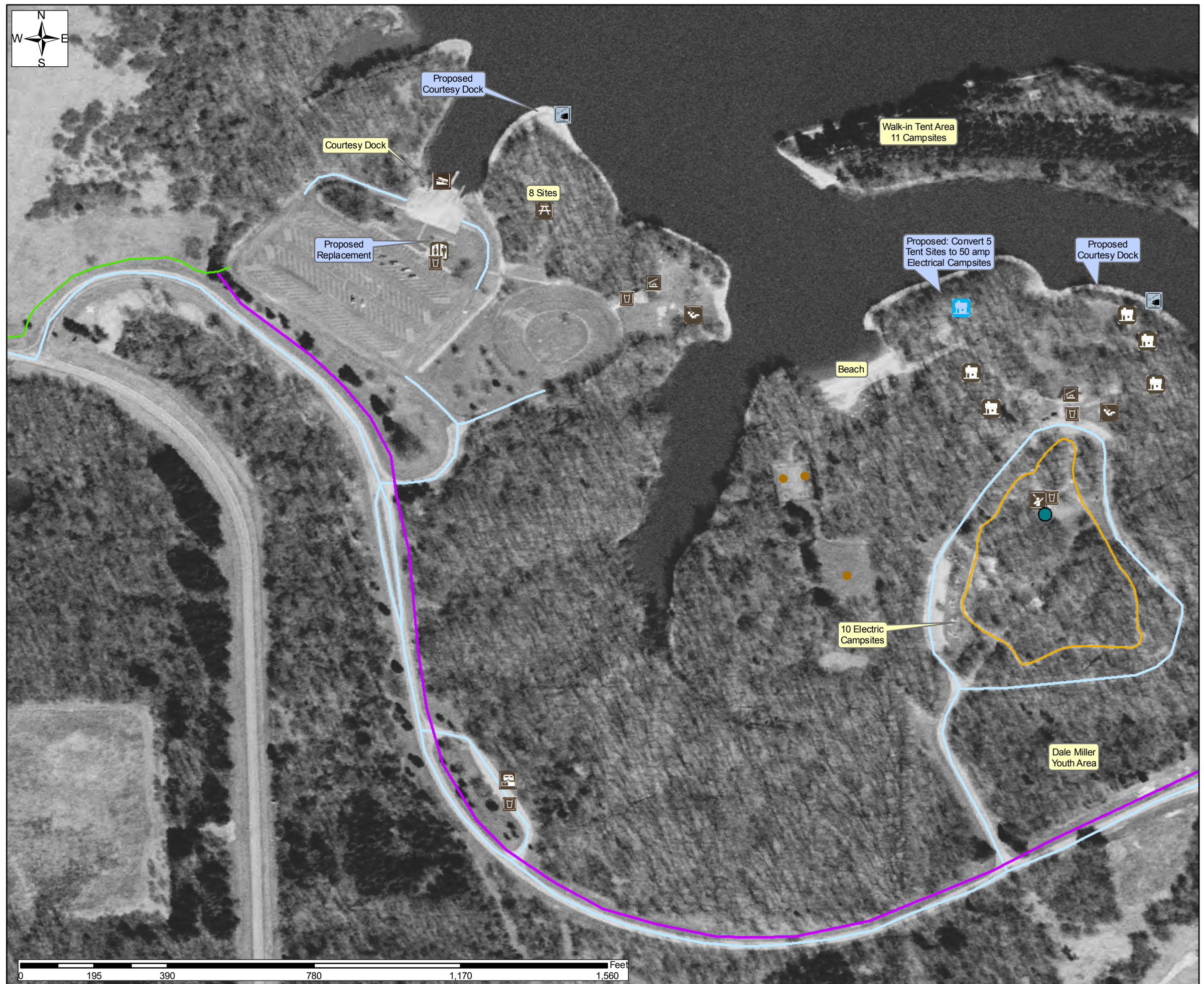


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REND LAKE  
BIG MUDDY RIVER  
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North Marcum  
Day Use

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	Existing	Proposed
Accessible Fishing Pier		2
Boat Ramp	1	
Courtesy Dock	1	2
Drinking Water	5	
Electric Campsites	10	5
Fitness Trail	1	
Group Shelter	2	
Lift Station	1	
Mini Shelter	5	1
Picnic Sites	8	
Playcourt	3	
Playground	2	
Shower Building	1	
Trailer Dump Station	1	
Vault Comfort Station	1	
Walk-in Tent Area Campsites	5	

- Boat Ramp
- Drinking Water
- Group Shelter
- Lift Station
- Mini Shelter
- Picnic Area
- Playcourt
- Playground
- Shower Building
- Trailer Dump Station
- Vault Comfort Station
- Proposed Accessible Fishing Pier
- Proposed Mini Shelter
- Bike Trail
- Fitness Trail
- Proposed Bike Trail
- Roads
- Rend Lake Boundary



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REND LAKE  
BIG MUDDY RIVER  
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**South Marcum Day Use  
& Dale Miller Youth Area**

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	Existing	Proposed
Accessible Fishing Pier		1
Amphitheater	1	
Courtesy Docks		2
Drinking Water	12	
Electric Campsites	145	
Feebooth	1	
Full Hookup Campsites	2	77
Hiking Trail	1	
Lift Station	1	
Mini Shower Building		3
Playcourt	1	
Playground	1	
Shower Building	1	
Vault Comfort Station	9	-9
Walk-in Tent Area Campsites	14	
Water/Electric Campsites		37
Waterborne Comfort Station		3

- Amphitheater
- Drinking Water
- Feebooth
- Lift Station
- Playcourt
- Playground
- Shower Building
- Vault Comfort Station
- Proposed Accessible Fishing Pier
- Proposed Mini Shower Building
- Hiking Trail
- Proposed Bike Trail
- Roads
- Rend Lake Boundary

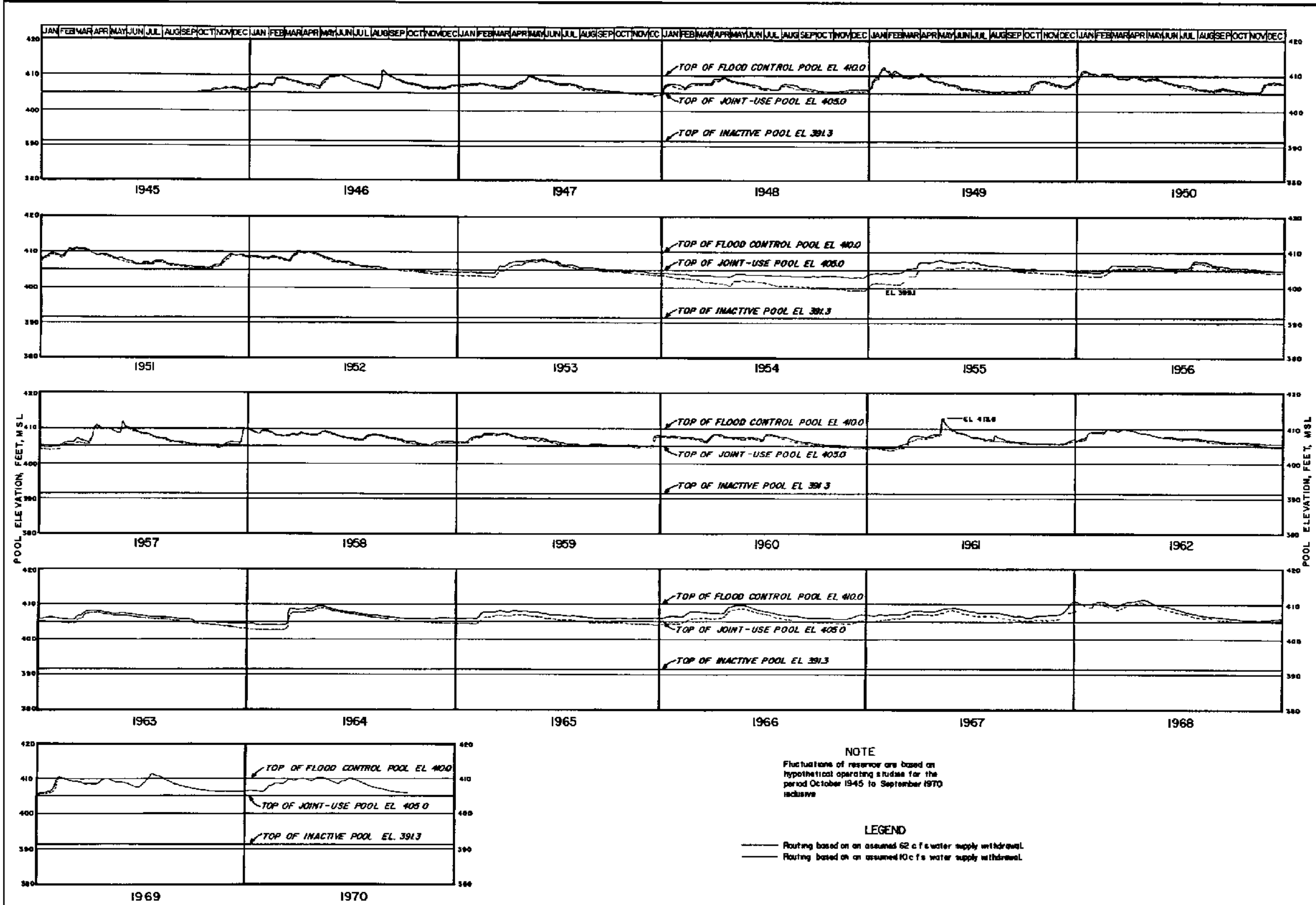


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St. Louis District

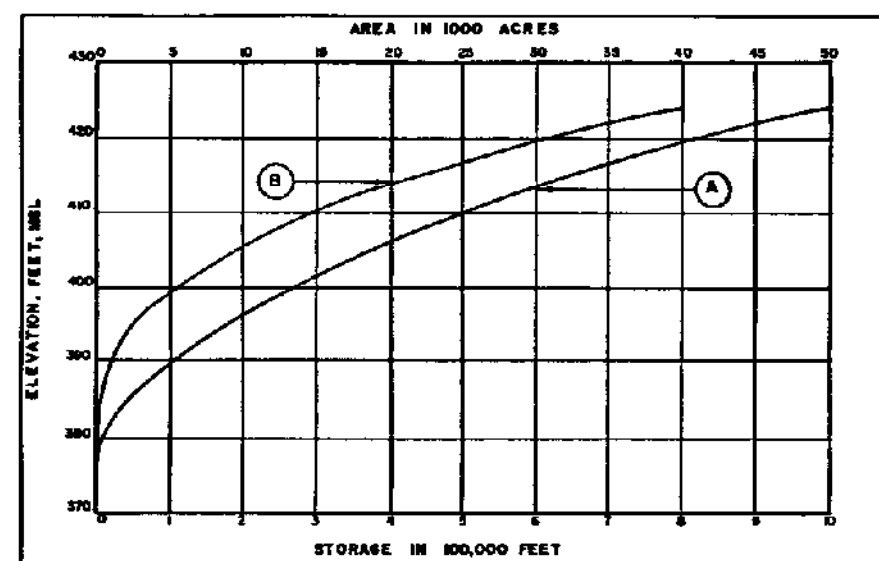
REND LAKE  
BIG MUDDY RIVER  
MASTER PLAN REVISED  
OCTOBER 2009

**South Marcum  
Campground**

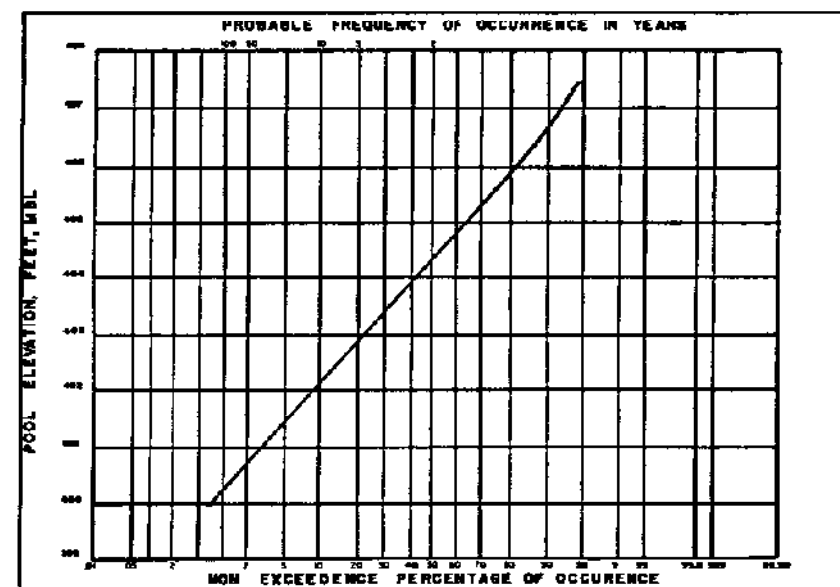
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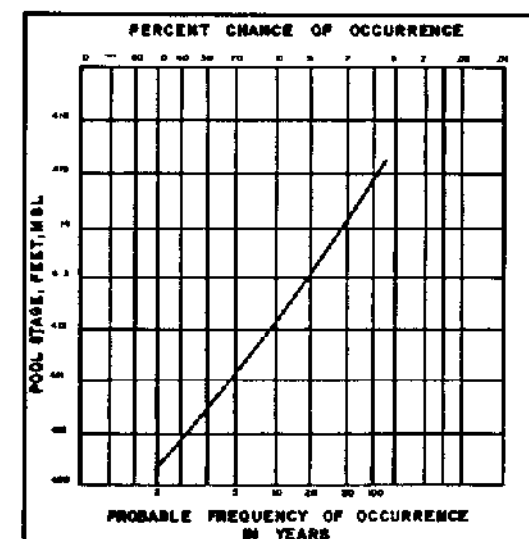
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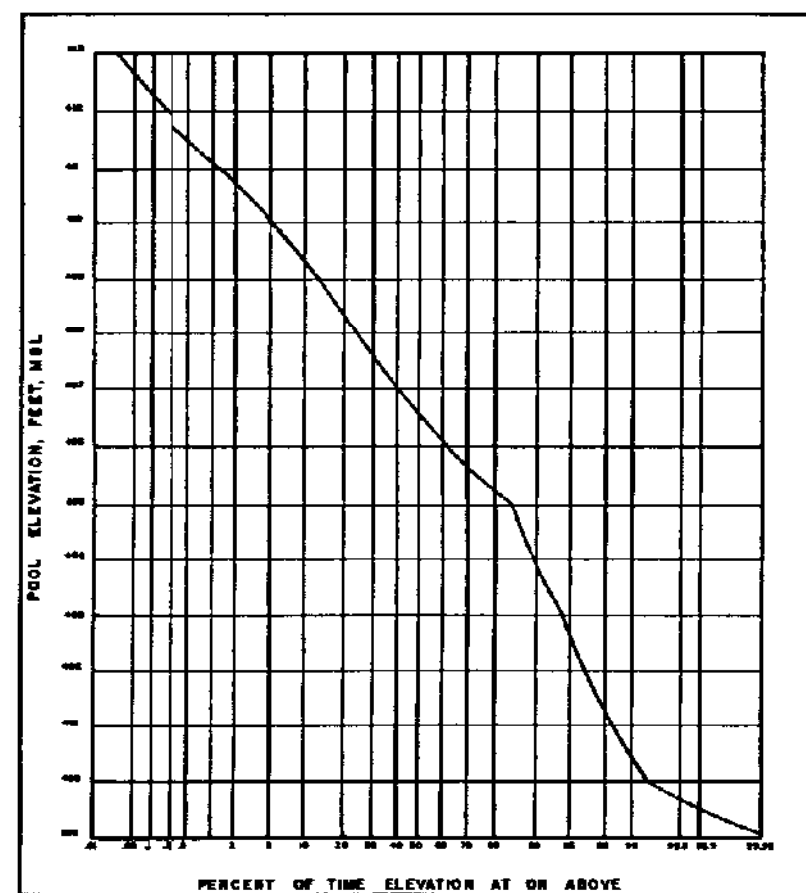
REND LAKE  
AREA AND STORAGE  
CAPACITY CURVES



REND LAKE  
MINIMUM POOL STAGE  
FREQUENCY CURVE



REND LAKE  
MAXIMUM POOL STAGE  
FREQUENCY CURVE



REND LAKE  
POOL STAGE DURATION  
FROM 1945-1949  
JAY 25-174

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Section XV

Appendices

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**SECTION XV - APPENDICES**

**15.01. APPENDIX 1 - ILLINOIS DEPARTMENT OF NATURAL RESOURCES**

The following appendix represents the recreation resource development plans submitted by the Illinois Department of Natural Resources for lands outgranted to this agency. Plates 18 through 23 are also part of this submission.

A. Recreation-Resources Development by State of Illinois

Three recreational/resource developments are provided by the State at Rend Lake. They are: (a) a state park, (b) two major wildlife management areas with public access areas, and (c) a wildlife refuge.

1. State Park Leased to the Illinois Department of Natural Resources

a. Wayne Fitzgerald State Park - Area 6 (Plate 18). Located on Illinois Route 154, this site represents a major intensive use recreation facility at Rend Lake with over 1.5 million visitors annually. Significant improvements have been made at this facility which provide numerous and varied recreational activities. These activities include overnight lodging, full service restaurant, banquet and meeting facilities, concession/bait shop, boat ramps and parking areas, picnic areas with and without shelters, camping areas, sailboat harbor, stables, kennels, marina basin, and necessary service support facilities and utilities.

Improvements currently in the planning stage include a visitor center, a second concession building, hike/bike trail, fishing pier, swimming beach, and sailing support facilities. These improvements are currently on hold until funds become available.

2. Wildlife Management Areas Licensed to the Illinois Department of Natural Resources

a. Big Muddy Wildlife Management Area - Area WM-2 (Plates 19 and 20). Developments in this area include boat access for pleasure boaters, fishermen, and hunters, and field access for hunters, at the following locations:

(1) Waltonville South Access Area - Area A (Plate 19). Located on the west abutment of the Big Muddy subimpoundment dam, this facility provides boating access primarily for fishermen. Existing site improvements include access road, parking areas, two-lane boat ramp, and vault toilets.

## ***Rend Lake Master Plan***

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(2) Waltonville East Access area - Area C (Plate 19).

Located adjacent and south of Illinois Route 148 on Big Muddy subimpoundment area, this facility provides boating access for fisherman and hunters. Existing site improvements include access road, parking areas, and a one-lane boat ramp.

(3) Ryder Bottoms Hunter Access Area - Area D (Plate 19).

Located on the upper reaches of the Big Muddy subimpoundment area, this facility provides field access for hunters. Existing site improvements consist of a gravel parking area.

(4) Dareville Access Area - Area E (Plate 19).

Located on the east shoreline of the Big Muddy subimpoundment area midway between the dam and Illinois Route 148, this facility provides boating access for fishermen and hunters. Existing improvements include access road, parking areas, a one-lane boat ramp, and vault toilets.

(5) Nason Access area - Area F (Plate 20).

Located on the east shoreline of the Big Muddy subimpoundment dam, this facility provides boating access for pleasure boaters, fishermen, and hunters. Existing site improvements include access roads, parking areas, one-lane boat ramp, two-lane boat ramp, and vault toilets.

(6) Willbanks Woods Access Area - Area G (Plate 20).

Located southeast of the Nason Access Area off 350N, it provides field access for hunters.

(7) Elk Prairie Hunter Access Area - Area H (Plate 20).

Located southwest of Nason, Illinois, this facility provides field access for hunters.

(8) Bluegill Hole Access Area - Area I (Plate 20).

Located on the main lake south of Nason, Illinois the facility provides boating access for fishermen. Existing site improvements include access road, two parking areas, a one-lane concrete boat ramp and vault toilets.

(9) Buck Creek Access Area. Area B (Plate 19).

Located on the west side of the Big Muddy subimpoundment southwest of Waltonville, consists of a gravel parking area and a seasonal boat access lane for waterfowl hunters.

b. Casey Fork Wildlife Management Area - Area WM-3 (Plates

21 and 22). Developments in this area include boat access for pleasure boaters, fishermen, and hunters; and field access for hunting or observing wildlife at the following locations:

(1) West Casey Fork Hunter Access Area - Area K (Plate 21). Located northeast of Nason, Illinois this facility provides field access for hunters. Existing site improvements consist of a gravel parking area.

(2) Silo Hunter Access Area - Area M (Plate 21). Located on the northwestern reach of the area, this facility provides field access for hunters. Existing site improvements consist of a gravel parking area, and a seasonal boat ramp.

(3) East Casey Fork Access Area - Area O (Plate 22). Located northwest of Bonnie, Illinois, this facility provides field access for hunter. Existing site improvements consist of a gravel parking area and a seasonal boat ramp.

(4) Bonnie Access Area - Area Q (Plate 22). Located on the east abutment of the Casey Fork Subimpoundment Dam, this facility provides boating access for pleasure boaters, fishermen, and hunters. Existing site improvements include access roads, parking areas, one-lane boat ramp and vault toilets.

(5) Bonnie South Access Area - Area Q (Plate 22). This area is located at the confluence of Atchison Creek with Casey fork just south of the Casey Fork Subimpoundment Dam. Existing facilities include a two lane boat ramp, gravel parking lot and vault toilets.

(6) Cottonwood Access Area - Area N (Plate 22). Located on the west side of the Casey Fork Subimpoundment, this area provides gravel surfaced parking and seasonal boat access for hunters.

(7) Whistling Wings Hunter Access Area - Area J (Plate 21). Located west of the Casey Fork subimpoundment dam and northeast of Nason, this facility provides field access for hunters. Site improvements consist of gravel surfaced parking.

(8) Pin Oak Flats Access Area - Area P (Plate 22). This area, southwest of Bonnie along the east side of Casey Fork Subimpoundment, provides a seasonal boat access ramp and gravel parking for hunters.

(9) Lemons Hill – Area L (Plate 21). Located on the northwestern reach of the area, this facility provides field access for hunters. Existing site improvements consist of a gravel parking area.

## ***Rend Lake Master Plan***

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### 3. Wildlife Refuge licensed to the Illinois Department of Natural Resources.

a. Rend Lake Wildlife Refuge - Area WM-1 (Plate 23). Located on a peninsula between the Big Muddy and Casey Fork arms of Rend Lake, this facility provides sanctuary, food, and habitat for numerous forms of wildlife. Existing site improvements include the Site Manager's residence, service complex, waterfowl observation area and a gravel access road. The road is primarily for access to wildlife food crops.

#### B. Expenditures

1. The capital investments for physical and environmental developments at the state controlled facilities through June 30, 1982, were approximately \$4,174,500. The following is a tabulation of these expenditures:

Phase I - Underwater portion of boat ramp at the Waltonville South, Waltonville East, Dareville, Nason, Bonnie Access Areas, and Wayne Fitzgerald State Park. Sailboat Harbor and Marina at Wayne Fitzgerald State Park. Selective clearing and tree planting at all locations. \$473,000.00

Phase II - Completion of boat ramps, construction of main access roads and parking areas at Waltonville South, Waltonville East, Dareville, Nason, Bonnie Access Areas, and Wayne Fitzgerald State Park. \$1,442,000.00

Phase III & IV - Construction of secondary roads, parking areas, campground, service buildings, sewage treatment plant, utilities-sewer, electric, and water service at Wayne Fitzgerald State Park. \$1,395,900.00

Service Complex - Site Manager's residence and Maintenance Building at Rend Lake Wildlife Refuge. \$137,500.00

Refuge Road and Hunter Access - Service Access roadway at Rend Lake Wildlife Refuge and parking areas at Ryder Bottoms, Elk Prairie, West Casey Fork, Silo, East Casey Fork, North Gun Creek, South Gun Creek, and Hamilton Branch Hunter Access Areas. Parking areas and gravel boat ramp at Bluegill Hole Access Area. \$32,050.00

Minor Capital Improvements - Force account and small contract work including: picnic tables, vault toilets, camp stoves, signs, picnic shelter, and playground equipment. \$121,650.00

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## ***Rend Lake Master Plan***

Building Construction and Site Improvement - Service building and residence for State Park; stable, kennels, and miscellaneous field trial facilities; subimpoundment pumps; service roads for staff access and management; various hunter/fisherman access facilities and miscellaneous site improvements. \$ 572,400.00

Additional Expenditures - Subsequent to the Phase I - Phase IV, Initial Site Development, additional expenditures for building construction and site improvements raised the total Department of Natural Resources capital investment to \$11,824,500.00 as of June 30, 1991. This includes expenditures for Wayne Fitzgerald State Park as well as the Rend Lake Wildlife management areas. These improvements included the following:

1. Campground Electrical Rehab. .... \$440,000.00
2. Lodge/Resort Development
  - Phase I ..... \$2,741,758.29
  - Phase II ..... \$3,258,033.20
3. Lodge Parking Lot Renovation ..... \$511,000.00
4. Shoreline Protection and 2 Shower Bldgs ..... \$461,000.00
5. Internal Road Surfacing/Rehab ..... 588,000.00
- Subtotal ..... \$7,999,791.49

2. Between July 1, 1991 and November 1, 2007, the Department of Natural Resources has made a number of additional permanent improvements and repairs to facilities at Wayne Fitzgerald State Park and the Rend Lake Wildlife Management Area. These improvements have included the following:

### Rend Lake WMA

1. Underground Fuel Storage Tank ..... \$200,451.84
2. Pump Repairs/Replacement ..... \$251,405.00
3. Parking Lots ..... \$53,266.69
4. Internal Roads ..... \$178,424.82

## ***Rend Lake Master Plan***

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- 5. Pump Engine Replacement.....\$63,412.00
- 6. Hazmat Building.....\$29,011.00
- 7. Boat Access Improvements .....\$297,578.00

### Wayne Fitzgerald State Park

- 8. Fish Cleaning Station.....\$26,007.00
- 9. Underground Fuel Storage Tank.....\$167,832.85
- 10. Sewage Lift Station Rehab.....\$70,935.00
- 11. Facilities Building Replacement.....\$49,000.00
- 12. Playground Equipment.....\$71,800.00
- 13. Sewage Force Main, Replacing Lagoon.....\$327,094.16
- 14. Resort Dock Electric.....\$34,449.00
- 15. North Entrance Road.....\$557,450.11
- 16. Handicapped Access to Docks.....\$106,475.50
- 17. ADA Compliance Plan.....\$287,007.03
- 18. ADA Construction Phase 1.....\$240,220.03
- 19. ADA Construction Phase 2.....\$425,000.00
- 20. Resort Expansion Phase 3.....\$3,200,000.00
- 21. Resort Storage Building.....\$36,716.00
- 22. Playground Equipment Installation.....\$22,482.00
- 23. Bike Trail A "Campground to Resort".....\$146,945.22
- 24. Boat Access off of Route 154.....\$445,167.63
- 25. Resort Expansion Phase 4.....\$4,994,070.58

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## ***Rend Lake Master Plan***

26. Vault Toilets.....	\$296,992.00
27. Various Improvements.....	\$299,741.89
28. Internal Roads.....	\$2,032,055.00
29. Shoreline Stabilization, Phase 1 and 2.....	\$676,235.21
30. Replace Heat Pumps.....	\$193,449.76
31. Remodel Windjammer and Windows Rest.....	\$299,741.89
32. Bike Trail C "Resort to College".....	\$90,103.00
Subtotal Major Improvements (1991-2007).....	\$16,170,520.21

Other Expenditures related to ongoing significant maintenance projects for the repair and upkeep of buildings and facilities such as painting, carpet replacement, door replacements, landscape improvements, lift station repairs, fencing and miscellaneous other projects are in the following summary:

Subtotal Minor Improvements and Repairs (1991-2007):.....	\$945,145.25
Total Expenditures (1991-2007):.....	\$17,115,665.46

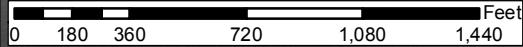
The following represents a summary of total capital expenditures for State of Illinois managed lands at Rend Lake:

1973-1982:.....	\$4,174,500.00
1982-1991.....	\$7,999,791.49
1991-2007.....	\$17,115,665.46

Total Capital Expenditures:.....\$29,289,956.95

(As of November 2007)

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Wayne Fitzgerald State Park	Existing	Proposed
Accessible Fishing Pier		1
Bike Trail	1	
Boat Ramp	3	
Camp Site	243	
Concession		1
Courtesy Dock		1
Drinking Water	36	
Dump Station	1	
Feebooth	1	
Fishing Pier		1
Kennel	1	
Maintenance Building	1	
Picnic Shelter	6	
Picnic Site	72	
Playground	4	
Residence	1	
Sewage Treatment Plant	1	
Shower Building	3	
Stable	1	
Swimming Beach		1
Tent Site	28	
Vault Comfort Station	18	
Visitor Center		1
Wayne Fitzgerald Site Office	1	

Rend Lake Resort	Existing	Proposed
Boat Ramp	3	
Botel	3	
Cabins	11	
Comfort Station	1	
Courtesy Dock	6	
Fuel Dock	1	
Playground	1	
Resort & Conference Center	1	
Restaurant	1	
Store	1	
Swimming Pool	1	
Tennis Court	1	

- Boat Ramp
- Dump Station
- Fee Booth
- Group Picnic Shelter
- Picnic Area
- Playground
- Shower Building
- Vault Comfort Station
- Proposed Swim Beach
- Proposed Visitor Center
- Bike Trail
- Roads
- Rend Lake Boundary



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Wayne Fitzgerald  
State Park

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**BUCK CREEK**



**DAREVILLE**



**RYDER BOTTOMS**



**WALTONVILLE SOUTH**



**WALTONVILLE EAST**



Buck Creek	Existing	Proposed
Boat Ramp	1	
Parking Lot	1	

Dareville	Existing	Proposed
Boat Ramp	1	
Parking Lot	1	
Vault Comfort Station	1	

Ryder Bottoms	Existing	Proposed
Parking Lot	1	


Waltonville East	Existing	Proposed
Boat Ramp	1	
Parking Lot	1	

Waltonville South	Existing	Proposed
Boat Ramp	1	
Parking Lot	1	
Vault Comfort Station	1	

**Legend**

- Boat Ramp
- Parking Lot
- Vault Comfort Station
- Rend Lake Boundary

0 140 280 560 840 1,120 Feet



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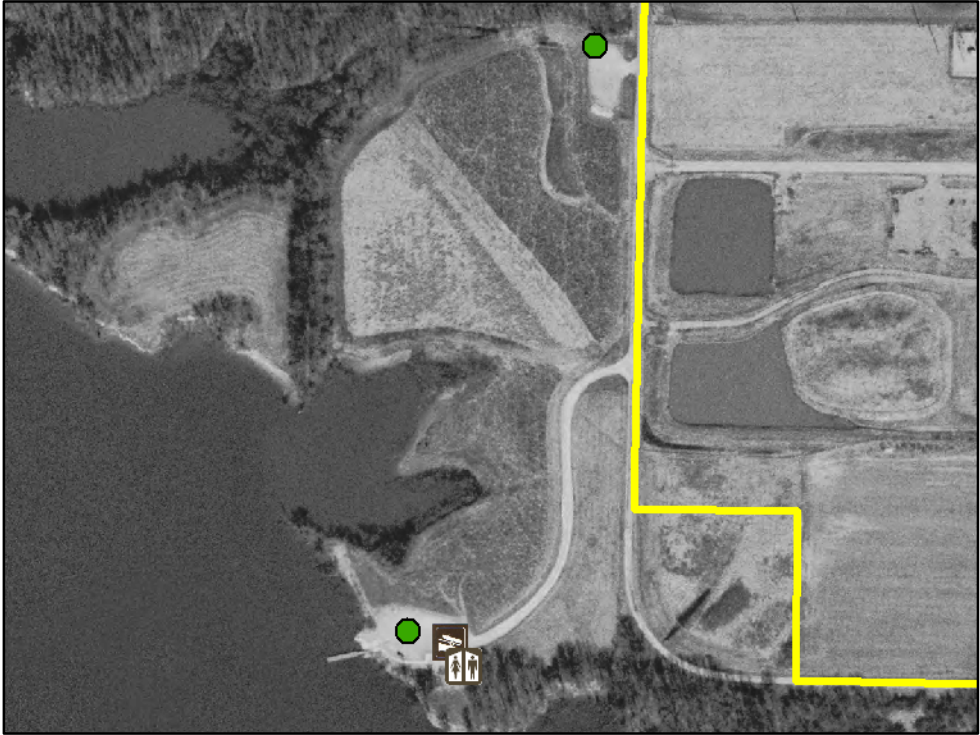
REND LAKE  
BIG MUDDY RIVER  
MASTER PLAN REVISED  
OCTOBER 2009

**Big Muddy WMA  
Access Area**

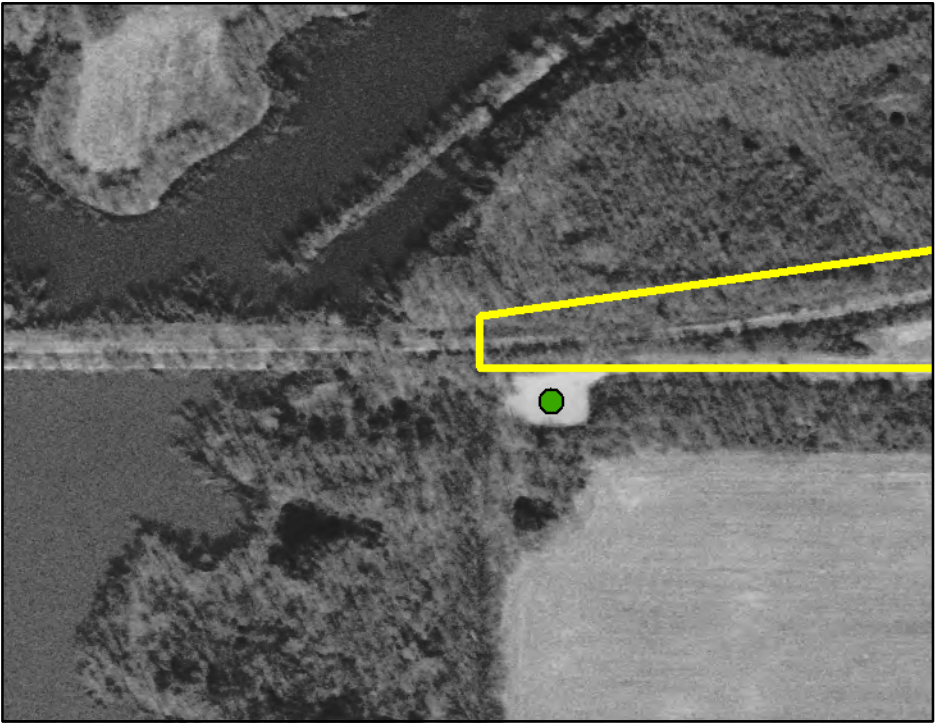
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**BLUEGILL HOLE**



**ELK PRAIRIE**



Bluegill Hole	Existing	Proposed
Boat Ramp	1	
Parking Lot	2	
Vault Comfort Station	1	

Elk Prairie	Existing	Proposed
Parking Lot	1	

Nason	Existing	Proposed
Boat Ramp	2	
Parking Lot	2	
Vault Comfort Station	1	

Willbanks Woods	Existing	Proposed
Parking Lot	1	

**NASON**

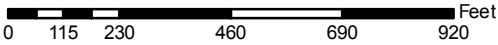


**WILLBANKS WOODS**



**Legend**

- Boat Ramp
- Parking Lot
- Vault Comfort Station
- Rend Lake Boundary



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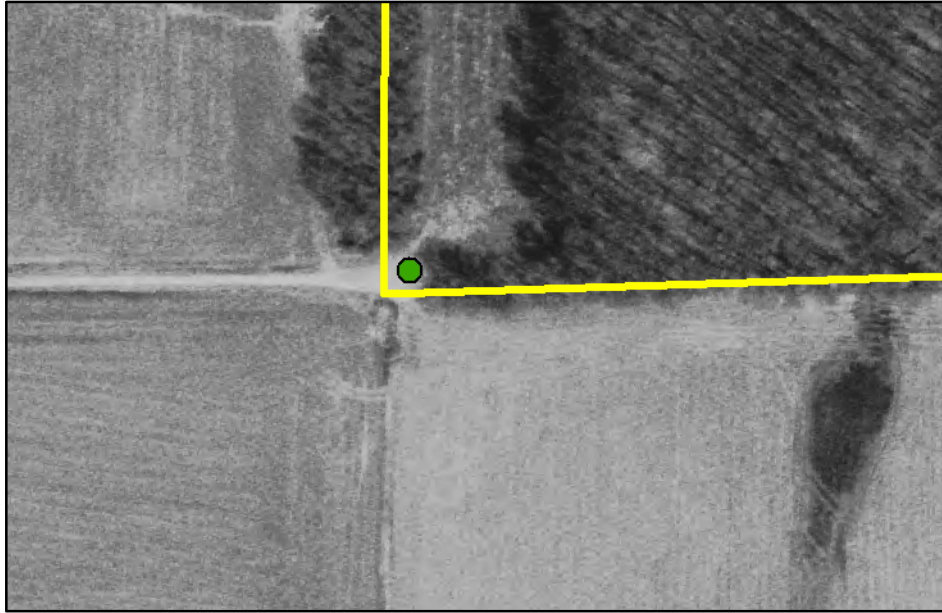
REND LAKE  
BIG MUDDY RIVER  
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**Big Muddy WMA  
Access Area**

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**LEMMONS HILL**



**SILO**



Lemmons Hill	Existing	Proposed
Parking Lot	1	

Silo	Existing	Proposed
Boat Ramp	1	
Parking Lot	1	

West Casey Fork	Existing	Proposed
Parking Lot	1	

Whistling Wings	Existing	Proposed
Parking Lot	1	

**WEST CASEY FORK**



**WHISTLING WINGS**



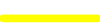
**Legend**



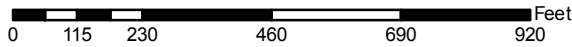
Boat Ramp




Parking Lot



Rend Lake Boundary





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BIG MUDDY RIVER  
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**Casey Fork WMA  
Access Areas**

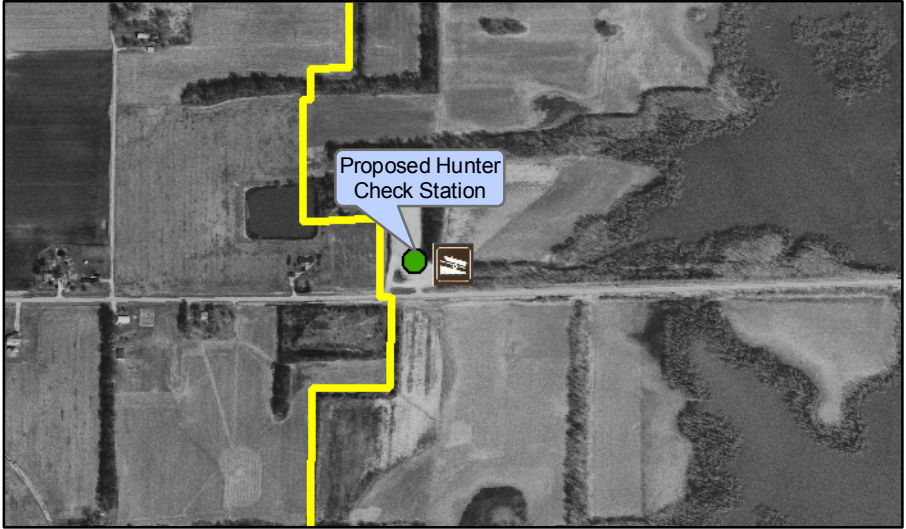
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**BONNIE ACCESS AREA**



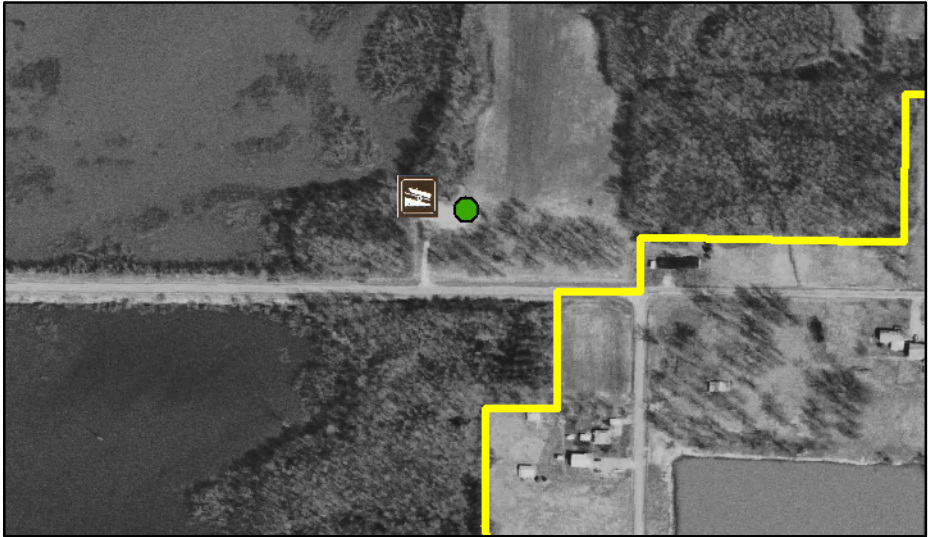
**COTTONWOOD**



**EAST CASEY FORK**



**PIN OAKS FLAT**



Bonnie Access Area	Existing	Proposed
Boat Ramp	2	
Parking Lot	2	
Vault Comfort Station	2	

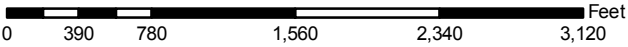
Cottonwood	Existing	Proposed
Boat Ramp	1	
Hunter Check Station		1
Parking Lot	1	


East Casey Fork	Existing	Proposed
Boat Ramp	1	
Parking Lot	2	

Pin Oaks Flat	Existing	Proposed
Boat Ramp	1	
Parking Lot	1	

**Legend**

- Boat Ramp
- Parking Lot
- Vault Comfort Station
- Rend Lake Boundary



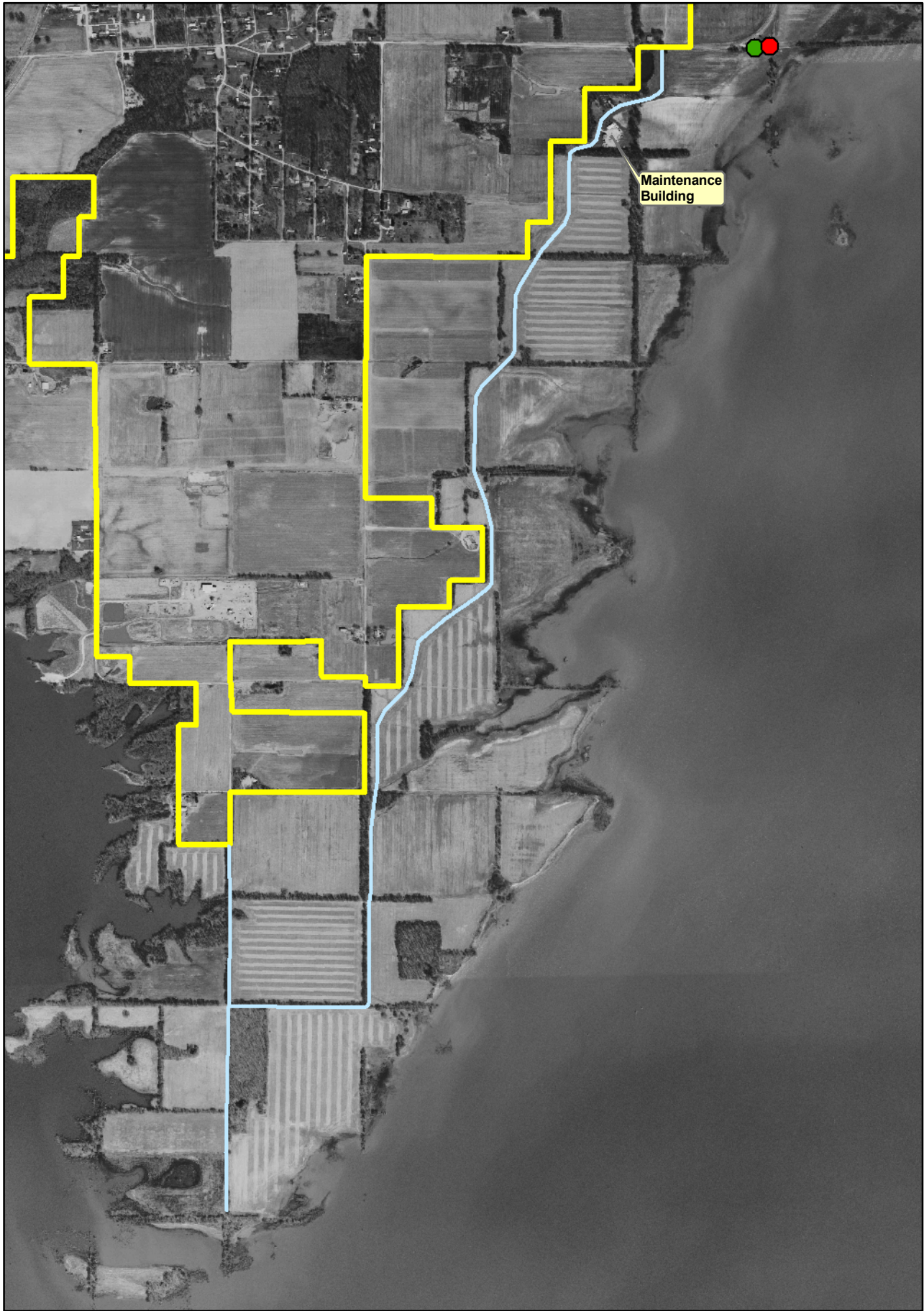


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**Casey Fork WMA  
Access Areas**

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Wildlife Refuge	Existing	Proposed
Maintenance Building	1	
Parking Lot	1	
Viewing Tower	1	

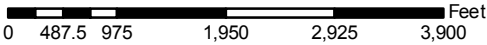
**Legend**


Parking Lot

Viewing Tower

Roads

Rend Lake Boundary





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**Rend Lake  
Wildlife Refuge**

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**15.02. APPENDIX 2 - REND LAKE CONSERVANCY DISTRICT**

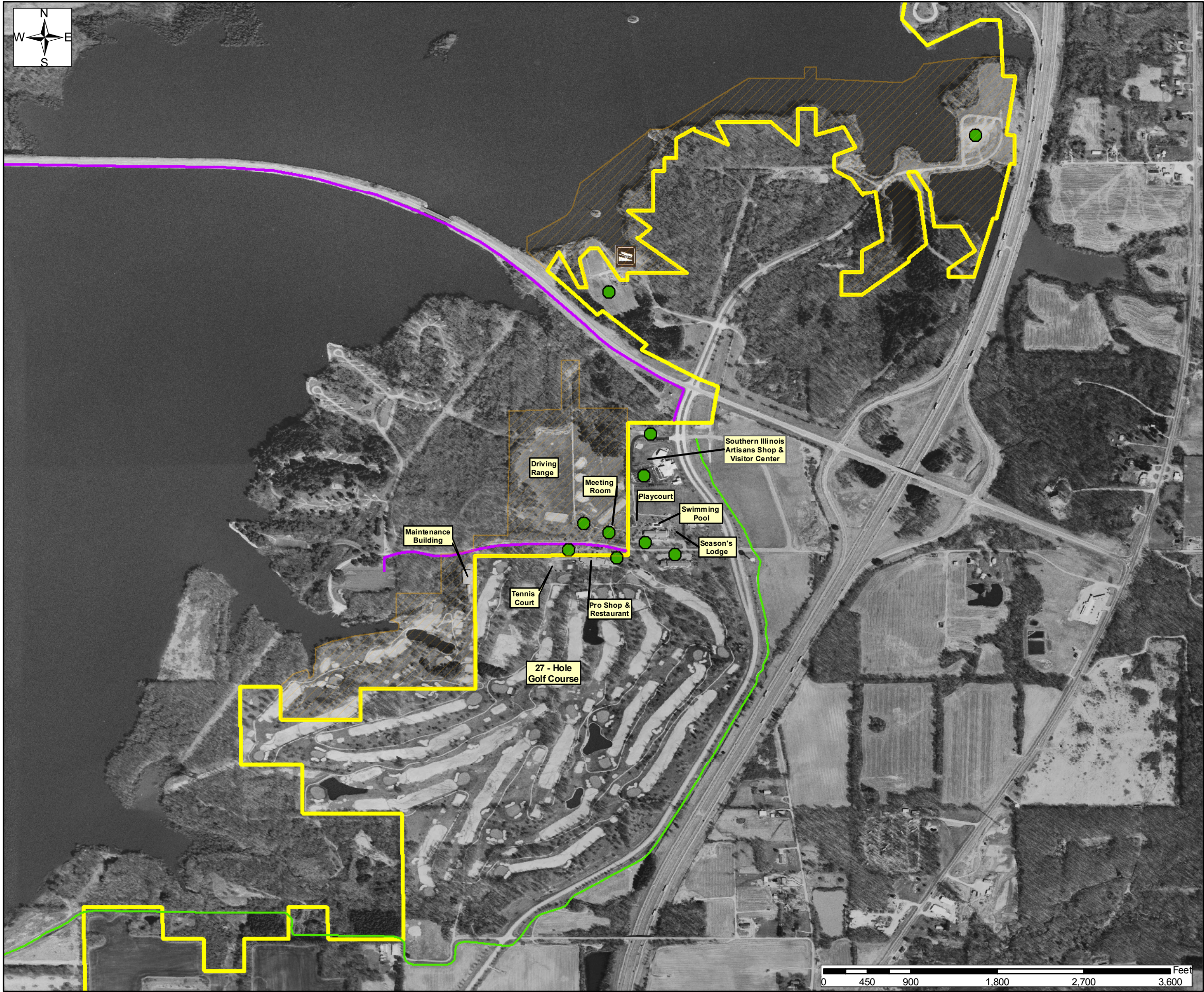
The following appendix represents the recreation resource development plans submitted by the Rend Lake Conservancy District for lands outgranted to this agency as well as certain fee owned lands. Plate 24 presents information provided by this agency.

Rend Lake Conservancy District






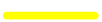
A. EXISTING DEVELOPMENT


1. Maintenance building and storage sheds by Gun Creek Campground Entrance.
2. Irrigation pump station.
3. Restroom by hole number 22 green and hole number 23 tee.
4. Driving range
5. Conference cabana and parking lot.
6. Northern most section of parking lot for the golf course and restaurant.
7. Two lift stations
8. Marina site parking lot.
9. Portions of golf course holes 12, 13, 23, 24, 25, 26
10. Water plant intake structure, pump and control building, transformers and electric line feeding the transformers.
11. Rend Lake Shooting complex.

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Conservancy District	Existing	Proposed
Bike Trail		1
Boat Ramp	1	
Driving Range	1	
Golf Course (27-Hole)	1	
Maintenance Building	1	
Meeting Room	1	
Parking Lot	10	
Playcourt	1	
Pro Shop & Restaurant	1	
Season's Lodge	1	
Southern Ill. Artisans Shop & Visitor Center	1	
Swimming Pool	1	
Tennis Court	1	

-  Boat Ramp
-  Parking
-  Bike Trail
-  Proposed Bike Trail
-  Leased Boundary
-  Rend Lake Boundary



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St. Louis District

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BIG MUDDY RIVER  
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**Rend Lake  
Conservancy District**

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**15.03. APPENDIX 3 - REND LAKE MARINA**

The following appendix represents the information as received from the concessionaire for the recreation resource development at this concession area. Plate 6 also reflects this information.

REND LAKE MARINA

A. EXISTING NEW DEVELOPMENTS

1.	Flammable liquid storage building	\$600.00
2.	New mechanic Shop	\$60,000.00
3.	Eleven additional covered dry storage	\$25,000.00
4.	Boat Hoist redesign and electric lifting motors installed.	\$5,000.00
5.	Wiring for Houseboat dock with meters	\$75,000.00
6.	Rebuilt and replaced damaged shoreline moorings with floating docks.	\$300,000.00
7.	Installed 500 gallon propane tank for small cylinders tanks.	\$2,500.00

B. DEVELOPMENTS IN THE PROCESS OF BEING COMPLETED

1. None

C. PROPOSED MAJOR IMPROVEMENTS

1.	Construction of ten single family cabins with bathroom and sleeping accommodations.	\$400,000.00
2.	Construct a small restaurant/snack bar facility	\$100,000.00
3.	Install courtesy dock for cabin users.	\$50,000.00
4.	Expand showroom.	\$25,000.00

## ***Rend Lake Master Plan***

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### **D. EXISTING DEVELOPMENT**

1. Sales building (including office and living space)
2. 42' X 97' Storage building.
3. Above ground gasoline storage tank and pump.
4. 49 open slips.
5. 70 covered slips.
6. 108 shoreline moorings.
7. 47 houseboat berths.
8. 2 boat hoists.
9. Electric service and water supply to docks.
10. Gravel and asphalt parking.

### **E. DEVELOPMENT PREVIOUSLY APPROVED, BUT NOT EXISTING**

1. Remove northwest docks and replace with pontoon slips
2. Construct a new dock-side sewage facility

**15.04. APPENDIX 4 - FACILITY COMPARISON CHARTS**

## Facility Comparisons – Spillway Recreation Area

	Existing	Proposed	Difference
Accessible Fishing Pier	0	1	+1
Amphitheater	1	0	0
Boat Ramp	0	1	+1
Bridge (Bike/ Pedestrian)	3	0	0
Drinking Water	4	0	0
Group Shelter	1	2	+2
Hiking Trail	1	0	0
Picnic Sites	2	0	0
Picnic Sites (Covered)	0	6	+6
Playground	1	0	0
Small Craft Barrier	0	2	+2
Vault Comfort Station	1	0	0
Visitor Center	1	0	0
Waterborne Comfort Station	1	0	0

## Facility Comparisons – Dam West Recreation Area

	Existing	Proposed	Difference
Accessible Fishing Pier	0	1	+1
Administration Building	1	0	0
Boat Ramp	1	0	0
Drinking Water	2	0	0
Group Shelter	1	0	0
Lift Station	4	0	0
Maintenance Building	1	0	0
Picnic Sites	16	1	+1
Playground	1	0	0
Visitor Center	0	1	+1
Waterborne Comfort Station	1	1	+1

## ***Rend Lake Master Plan***

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### Facility Comparisons – South Sandusky Recreation Area

	Existing	Proposed	Difference
Amphitheater	1	0	0
Boat Ramp	1	0	0
Courtesy Dock	0	2	+2
Covered Bench	4	0	0
Drinking Water	20	0	0
Dump Station	1	0	0
Electric Campsites	102	0	0
Feebooth	1	0	0
Foot Shower Tower	3	0	0
Full Hookup Campsites	20	48	+48
Group Shelter	3	0	0
Hiking Trail	1	0	0
Lift Station	5	0	0
Mini Shower Building	2	0	0
Picnic Sites	20	0	0
Playground	4	0	0
Shower Building	2	0	0
Storage Building	2	0	0
Walk-In Tent Area Campsites	8	0	0
Waterborne Comfort Station	7	0	0
Water/Electric Campsites	0	32	+32

### Facility Comparison – North Marcum Recreation Area

	Existing	Proposed	Difference
Accessible Fishing Pier	0	1	+1
Boat Ramp	1	0	0
Covered Bench	4	0	0
Drinking Water	6	0	0
Foot Shower Tower	2	0	0
Group Shelter	2	1	+1
Lift Station	1	0	0
Picnic Sites	22	0	0
Playcourt	1	0	0
Playground	1	0	0
Shower Building	1	0	0

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***Rend Lake Master Plan***

Vault Comfort Station	3	0	0
Waterborne Comfort Station	0	1	+1

## Facility Comparison – North Sandusky Recreation Area

	Existing	Proposed	Difference
Accessible Fishing Pier	0	1	+1
Boat Ramp	1	0	0
Covered Bench	1	0	0
Drinking Water	22	0	0
Dump Station	1	0	0
Electric Campsites	102	10	+10
Feebooth	1	0	0
Fish Brood Pond	1	0	0
Full Hookup Campsites	16	40	+40
Group Shelter	3	0	0
Lift Station	4	0	0
Mini Shower Building	1	1	+1
Picnic Sites	36	0	0
Playground	4	2	+2
Shower Building	1	0	0
Tent Sites	0	15	+15
Waterborne Comfort Station	9	0	0
Water/Electric Campsites	0	36	+36

## Facility Comparisons – Gun Creek Recreation Area

	Existing	Proposed	Difference
Accessible Fishing Pier	0	1	+1
Amphitheater	1	0	0
Boat Ramp	1	0	0
Drinking Water	17	0	0
Electric Campsites	99	0	0
Feebooth	1	0	0
Full Hookup Campsites	1	51	+51
Group Shelter	1	0	0
Lift Station	1	0	0
Mini Shower Building	0	1	+1

## ***Rend Lake Master Plan***

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Playground	3	0	0
Shower Building	1	0	0
Trailer Dump Station	1	0	0
Vault Comfort Station	6	0	0
Waterborne Comfort Station	0	1	+1
Water/Electric Campsites	0	25	+25

### Facility Comparisons – South Marcum Recreation Area

	Existing	Proposed	Difference
Accessible Fishing Pier	0	3	+3
Amphitheater	1	0	0
Boat Ramp	1	0	0
Courtesy Docks	0	4	+4
Drinking Water	17	0	0
Electric Campsites	155	5	+5
Feebooth	1	0	0
Fitness Trail	1	0	0
Full Hookup Campsites	2	77	+77
Group Shelter	2	0	0
Hiking Trail	1	0	0
Lift Station	2	0	0
Mini Shelter	5	1	+1
Mini Shower Building	0	3	+3
Picnic Sites	8	0	0
Playcourt	4	0	0
Playground	3	0	0
Shower Building	2	0	0
Trailer Dump Station	1	0	0
Vault Comfort Station	10	0	0
Walk-in Tent Area Campsites	19	0	0
Water/Electric Campsites	0	37	+37
Waterborne Comfort Station	0	3	+3

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***Rend Lake Master Plan*****Facility Comparisons – All Areas**

	Existing	Proposed	Difference
Accessible Fishing Pier	0	8	+8
Administration Building	1	0	0
Amphitheater	4	0	0
Boat Ramp	6	1	+1
Bridge (Bike/Pedestrian)	3	0	0
Courtesy Docks	0	6	+6
Covered Bench	9	0	0
Drinking Water	88	0	0
Dump Station	4	0	0
Electric Campsites	457	15	+15
Feebooth	4	0	0
Fish Brood Pond	1	0	0
Fitness Trail	1	0	0
Foot Shower Tower	5	0	0
Full Hookup Campsites	39	216	+216
Group Shelter	13	3	+3
Hiking Trail	3	0	0
Lift Station	17	0	0
Maintenance Building	1	0	0
Mini Shelter	5	1	+1
Mini Shower Building	3	5	+5
Picnic Sites	104	1	+1
Picnic Sites (Covered)	0	6	+6
Playcourt	5	0	0
Playground	17	2	+2
Shower Building	7	0	0
Small Craft Barrier	0	2	+2
Storage Building	2	0	0
Vault Comfort Station	10	0	0
Visitor Center	1	0	0
Walk-in Tent Area Campsites	27	15	+15
Water/Electric Campsites		130	+130
Waterborne Comfort Station	18	6	+6

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**15.05 APPENDIX 5 – COMMENT FORM RESPONSES**

Rend Lake Master Plan  
Comment Form Responses

From: Lawrence Jr. & Marilyn Ghidina  
Address: 1214 Parkway Dr.  
Pekin, IL 61554

Area Visited: Not listed

1. Do nothing. Everyone we come in contact with was friendly and polite. The campground was very clean. The restrooms are the cleanest we have ever used. KOA's where not this nice & clean. If god willing, we hope to see you in September. Thank you.

From: Cliff Burgess  
Address: 3831 Upper Saxtown Rd  
Millstadt, IL 62260

Area Visited: Not listed

2. Upgrade campsites, more water available to sites, more parking for boats, bigger playgrounds

From: Jim H. Burgess Jr.  
Address: 21 Willett Dr  
St. Jacob, IL 62281

Area Visited: North Sandusky

3. Upgrade sites, more campsites, more parking, Keep Linda & Amos Richardson. The are good camp hostess.

From: Mr. & Mrs. William D. Barrett  
Address: 527 S. 12th St  
Woodriver, IL 62095

Area Visited: North Sandusky & South Sandusky

4. Water on sites or more waterh thru-out c. ground's. Finish patio's at all sites. Fish Cleaning Stations. More new tables at campsites. We are very pleased with the clearings to lake area. Thanks to all the crew here for keeping things going & cleanness of park facilities. Good gate attendants like Amos & Donna. Our favorite campgrounds - North Sandusky & South Sandusky. Keep up the good work.

## ***Rend Lake Master Plan***

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From: Craig & Julie Briley

Address: P. O. Box 146  
Elkville, IL 62932

Area Visited: North Sandusky

5. 1. Water hookup at each site would be wonderful. (sewer hookup would be great). 2. More camping sites (more non-reservable too). 3. Light in parking lot of shower houses. 4. More bathroom facilities. 5. A fenced in excersize area for pets to run & get excersize would be very nice. 6. Keep Amos & wife at North Sandusky as hosts! They are great!. 7. Tents kill grass. Build tent sites only with (tent boxes - sand cedar bark).

From: Michelle Kreitler

Address: 12927 Friedman Rd  
St. Genevieve, MO 63670

Area Visited: Not listed

6. Lights by showerhouse. Swimming pool or more beaches for those that don't have boats so kids would have something to do. Better playground in front of shower house. Hot showers - last 2 times we were here, it was cold. More water hydrants. Fireworks were excelent. Showers if there is a desinated time, they need to post it. Lights at the end of the loops.

From: Stephen D. Courson

Address: 1173 CR 300 N  
New Haven, IL 62867

Area Visited: Not listed

7. I would like to see each campground have fish cleaning facilities with disposal and running water. Another improvement would be overflow parking within the campground. More sites with full hookups (especially at Gun Creek) would be a benefit for those on extended stays. Upgrade sites to have the gravel areas around the tables.

From: Virginia Penrod

Address: 602 Main St.  
Grand Tower, IL 62942

Area Visited: North Sandusky

8. More first come first serve sites. Keep Maple and Sweetgum open until park closes. Good work keep it up.

From: Don C. Lowery  
Address: 14680 N. IL Hwy 37  
Mt. Vernon, IL 62864

Area Visited: Not listed

9. The management is just great. That's why I always come here every year. My suggestion for improvement is to have water and sewer hookup. Otherwise, everything is as good as it gets. P.S. Stop reservations. Make more money.

From: Patton  
Address: 2818 Sharp Ln.  
West Frankfort, IL 62896

Area Visited: South Marcum

10. Need more first come sites and more full hookups for campers with disabilities. Need fish cleaning stations. Need closer dumpstations at each campgrounds.

From: Ronald Lee Burns  
Address: 1909 "C" Rd  
West Frankfort, IL 62896

Area Visited: North Sandusky

11. Make dump stations. Ours was 1.7 miles from our campsite in North Sandusky (Maple #8). Our small dump tanks & solid ruber wheels can't make that trip! We had to physically load & unload these tanks! Clear more brush from the banks for boat parking (people fighting for parking spaces). We stayed 28 days & had a good time except for these few problems.

From: Wilber Mefford  
Address: 2904 Jamison Blvd  
Mt. Vernon, IL 62864

Area Visited: Not listed

12. Recently new bath houses were built at Nason & Waltonville impoundment dam. Which they needed and was a very good idea but the boat docks that they put in at the boat ramps cannot be used. All year they have set there with the walk-way flooded - Why? Mr. Lynch why is the grass mowed and the bathhouses open at Maple & Sweetgum the whole season and yet the pads remain closed for 3 months of the season. This is a waste of money and also there is no (first come, first serve) at N. Sandusky for 3 month out of the year. If I owned these two loops they would be open the whole year and I know if you owned them they would be opened. We both know that the pads woud be used. The shower house that is going in at Gun Creek is

## ***Rend Lake Master Plan***

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very much needed and I know everyone will be overjoyed when it is completed. Also the concrete slabs going in on the pads is the best idea that has been used for a long time. It would be nice if all of the pads had the concrete slabs and maybe one-day it will happen - I hope so. My wife & I are retired & we live at Mt. Vernon, Ill. and we have camped at Rend Lake since the first part of the 70's & we enjoy it very much. I am not complaining because I am glad we have Rend Lake it has been a pleasure to us. You also have some fine help at Rend Lake. Thank you for reading this: Wilber Mefford July 2006.

From: Don C. Bellot  
Address: 104 N. Jackson St.  
Fairbury, IL 62739

Area Visited: North & South Sandusky

13. Fish Cleaning Stations near the boat ramps are needed. My wife and I spend 3 to 4 months here each summer enjoying your wonderful campgrounds and good fishing. Cleaning fish on the same table that you eat your meals on is not good. A place to clean fish would be a major improvement

From: Mike Felderman  
Address: 2380 Samantha Dr  
Dubuque, IA 52002

Area Visited: Gun Creek

14. Have a beach w/in the campground. Modern bathrooms w/shower.

From: Clyde N. Furlow  
Address: 3141 State Hwy 14  
Mulkeytown, IL 62865

Area Visited: South Sandusky

15. Need additional water sources in Pin Oak and other areas where there are only a couple of hydrants. Really like the full hook-up sites. Need more when possible.

From: Kenneth D. Hill  
Address: 11363 Old Lake Rd  
Benton, IL 62812

Area Visited: Not listed

16. 1. Designate one dumpster for fish waste, or have a fish cleaning station at each campground. 2. Flush Toilets. 3. Replace worn out river-rock with blacktop, 4. Move to another site for another 14 days. 5. Enforce the rules

allread in place.

From: Linda Lack  
Address: 8565 Rutherford Rd  
Shipman, IL 62685

Area Visited: North Sandusky

17. I wanted to take this opportunity to thank you for having such a nice clean facility. We have been coming to your campground sinc 1985. We look forward to summer weekends at your campgroud. You keep everythings so nice & neat. The lake and beaches are really great. We love the nice big campsites & concrete pads. There's one thing I can think of & that is you need a fish cleaning station at each campground. We have no where to go to clean fish. Also trim up your trees along campsites. Thanks again.

From: Roger and Carol Hoffmann  
Address: 207 Osterhage  
Waterloo, IL 62298

Area Visited: Gun Creek

18. Please continue to clear underbrush along lake sites to create more sites with lake views! A playground is needed in Gun Creek. Please put the proper slope on the sewer dump roads so that your sewer empties better!

From: Sharon Leffler  
Address: 14650 E. Mick Rd  
Mt. Vernon, IL 62864

Area Visited: Gun Creek

19. Improve: Showers, water at each site, sewer at each site, mow sites more often. 5 stars: Continue with park rangers, clean areas - mowed sites - great price - large sites with concrete pads & tables - friendly and helpfull at check in.

From: Jerry Loker  
Address: RR 1, Box 20  
Keenes, IL 62851

Area Visited: South Marcum

20. Boat moorings need to be cleaned out and make more room. There are more pontoons anymore & take up more space. Maybe some docks built out into the water. Bath-showers need new faucets so you can control your own temperature. Need 50 amp. electric.

## ***Rend Lake Master Plan***

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From: Stephen & Georgia Sharkey

Address: P. O. Box 714  
Morganfield, KY 42437

Area Visited: North Sandusky

21. 1. 50 Amp South Marcum, Whispering Pines, 2. Water at all the sites (Rend Lake Campgrounds), 3. Senior citizen stay at site, possibly longer than 28 days. Moving is hard on senior citizens, have one loop strictly for senior citizens. 4. Bench at dump stations (bench at gate so as senior citizens have place to sit down while waiting to sign in. 5. Outside toilet at Whispering Pines need to be closed or torn down. South Marcum. 6. South Marcum shower room sink needs bath lines hot & cold new faucets, shower room also needs new faucets, get rid of the push buttons, 7. South Marcum Whispering Pines site needs tree removed lots of roots, pad needs smoothing out - site 131. We have seen a lot of improvements lots of brush cleared away, some sites in pine tree, South Sandusky has water and sewer at pads. Bathrooms super clean, painted and lights shine bright. 8. Although we need counter top between sinks - South Marcum, North Sandusky. 9. Need more dumpsters in parks.

From: Derwood Baker

Address: 13088 N. Woodlawn Ln  
Woodlawn, IL 62898

Area Visited: Gun Creek

22. The greatest rec. area in Southern Ill. The think I think would make the Corps area better is to have no reserve area campong, a lot of the camping areas are left open most of the times. It looks like a great loos of revenue for the state as well as an inconvenience to campers who wouldn't have to tear down for a weekend. We all know at this time the state could use the revenue. Thanks for asking for comments from the public. Derwood Baker.

From: Johnny L. Bouknight

Address: 120 James Ballentine Rd.  
Irmo, SC 29063

Area Visited: North Sandusky

23. Water to all campsites. Beautiful park - well maintained. We always enjoy our stay at a Corp. of Engineers park and the price is right for seniors. Thanks.

## ***Rend Lake Master Plan***

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From: John & Wilda Bettis

Address: P. O. Box 146  
Login, IL 62856

Area Visited: South Marcum

24. 1. More and better areas to moor your boats - less rocks. 2. Fishing access by handicapped from camping areas. 3. Scrub brush removed along the campsite areas for better view of lake. 4. Fish cleaning stations. 5. Ability for camping longer periods of time in one area if there are areas available - instead of having to move from area every 2 wks. There are lots of sites not utilized during week. 6. Access to firewood - smaller pieces that can be carried easily. 7. More use of amphitheater. 8. Some volleyball areas - more playground.

From: David Lawrence

Address: 1209 E. Fifth St.  
West Frankfort, IL 62896

Area Visited: Gun Creek

25. I would like to see part of the campground stay open later than Oct 31. There are several people who like to cold weather camp. To hunt, fish, or just camp. Thank you D. Lawrence and Deborah Lawrence

From: unk unk

Address: unk  
unk,

Area Visited:

26. More full hookup. Fix around tables. Ligh at shower house. Fix fire pit 8 - 9 - 150 & ???

From: S. Marquardt

Address: 701 James St.  
Waterloo, IL 62298

Area Visited: All 4 camgrounds

27. Additional dump station in S. Sandusky. More boxed and graveled campsites in all campgrounds.

From: Don & Mary Jo Henderson

Address: 3911 Cr 183  
Alvin, TX 77511

Area Visited: South Sandusky

28. At Rend Lake you have some really great camping and recreation areas here around the lake. We would like to see more full hook-up sites and

## ***Rend Lake Master Plan***

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more sites available for driveups without reservations. Many of the sites you have are unlevel so they can only be used by tents. New sites on the lake would be great & water available at each site. One site where we camped badly needs leveling - no. 135 in S. Sandusky. Our motorhome had to be raised 1 foot in the rear to make it livable - it was still low in back. The site is a great shady, full hook-up site otherwise! Thank you for your many times of courtesies & cleanliness.

From: Tom Gore  
Address: 835 Cedar Ave  
Elgin, IL 60120

Area Visited: Not listed

29. Please do not over modernize. We enjoyed the park & hope to return.

From: Noel K. Whittington  
Address: 13816 Lake Benton Rd  
Whittington, IL 62897

Area Visited: Gun Creek

30. Water & sewer hookups sure would be nice.

From: John & Karen Jones  
Address: 605 E. Franklin  
Bridgeport, IL 62417

Area Visited: Gun Creek

31. We are at the campground quite a bit and really like it. But we would like it if it could stay open longer in the season. Really nice camp hosts

From: Forestine Matthews  
Address: Rt. 2  
Bluford, IL 62814

Area Visited: South Sandusky

32. Basket ball goals in each recreational area for older boys (teenagers) to have something to do & not that expensive

From: Robert & Carla Anderson  
Address: P. O. Box 21  
Dale, IL 62829

Area Visited: Gun Creek

33. 1. More water faucets in Gun Creek. anywhere needed. 1 per 3 or 4 campsites. 2. Change the rule when the campground isn't full after the 28 days are up. You shouldn't have to move out of Gun Creek (the last time

we were here in Eagle there were 17 campsites full out of 40 at the end of our 28 days) But we still had to move. This would make it a lot easier for the disabled like me & the elderly. Staying at Eagle in Gun Creek is easy access to the interstate which makes it a lot easier for my wife to go to work. We camp quite a bit in the summer & she goes to work from there.

From: Elta Barrett  
Address: 527 S. 12th St  
Wood River, IL 62095

Area Visited: Not listed

34. More water in park. More 1st come 1st serve sites. A fish cleaning station. Leave North Sandusky loops Maple & Sweet Gum open year around. Cut more fire wood. Have some one to come through and pump out holding tanks weekly. More rangers on duty in campgrounds. Keep campgrounds clean as they are now you're doing a great job.

From: Robert & Mona Diefenbach  
Address: 20244 Galatia Post Rd  
Pittsburg, IL 62974

Area Visited: Gun Creek, Rend Lake

35. Let me say the area is clean & mowed & have great host. It would be nice to have sewer & water hookup at every site. The nitely (sat) entertainment at the dam would be nice every weekend and the concrete road so to markum beach needs repaired. Thank You.

From: Delbert Shelton  
Address: 13780 E. Green Rd  
Mt. Vernon, IL 62864

Area Visited: Gun Creek

36. 1. Water hookup at each campsite. 2. More lighting around camping area.

From: Dale & Suzie Aycock  
Address: 8562 D. Rd  
Waterloo, IL 62298

Area Visited: North & South Sandusky's & South Marcum

37. Spend less money on bike trails (I never see anyone on them) and use that money in the following areas: Mow grass more often (the chiggers are really bad). Improve the electric situation (2006 not so bad, but 2005 was expensive for us as well as hot when the electric would go out). And a full more "Full hoook-up" sites added to any 3 of the campgrounds. Less "partying", some of this partying has turned into foul language & fights. I do

## ***Rend Lake Master Plan***

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want to add that the fact that you all did some clearing of brush around the edges of the lake has made the view in those areas just spectacular, it's beautiful and we have new "favorite" campsites now. Thank you for that. But more importantly, thank you for asking for our suggestions and input.  
Suzie