WHITE RIVER WATERSHED
ARKANSAS AND MISSOURI
WHITE RIVER
BULL SHOALS LAKE

MASTER PLAN FOR DEVELOPMENT AND MANAGEMENT OF BULL SHOALS LAKE

DRAFT: July 2015

PREFACE

The Master Plan for Bull Shoals Lake was first approved July 30, 1951. Subsequent revisions were prepared with the latest revision approved on April 16, 1975. The Master Plan is intended to serve as a guide for the orderly and coordinated development, management, and stewardship of all lands and water resources of the project. It presents data on existing conditions, anticipated recreational use and the type of facilities needed to service anticipated use, sensitive resources requiring protection, and an estimate of future requirements. Since the 1975 master plan revision, forecasted public use and development in the Bull Shoals Lake region has not occurred as planned on the public lands and resources of the project. Based on this information and to bring in line with current management practices at the project, as well as new guidance and directives within U. S. Army Corps of Engineers (USACE), these actions have dictated the preparation of this Master Plan revision.

This revised Master Plan presents an inventory of land resources and how they are classified, existing park facilities, an analysis of resource use, anticipated influences on project operation and management, and an evaluation of future needs as required to provide a balanced management plan for cultivating the value of the land and water resources. Included in the revised Master Plan is an evaluation of expressed public opinion, new resource use objectives, and a new land classification system. The format utilized for this plan is outlined in Engineer Regulation/Engineer Pamphlet 1130-2-550 (dated 30 January 2013), which sets forth policy and procedure to be followed in preparation and revision of project Master Plans. This guidance is different from the original Master Plan format, which was a design memorandum. Bull Shoals Lake original Master Plan can be found in Design Memorandum 1-G; a listing of all the previous Master Plan design memorandums and prior supplements can be found in Appendix B.

U.S. Army Corps of Engineers

Commonly Used Acronyms and Abbreviations

404(b)(1) – Water quality permit per CWA 77

AAR –After Action Review

AF – Acre Feet

AFB – Alternatives Formulation Briefing

AOR – Area of Responsibility

ASA(CW) – Assistant Secretary of the Army for Civil Works

ASAP – As Soon as Possible

ATR - Agency Technical Review

BC – Benefit Cost

BCR – Benefit Cost Ratio

BFE – Base Flood Elevation

BLUF – Bottom Line Up Front

BMP—Best Management Practice

BOD – Biological Oxygen Demand

BY – Budget Year

C - Construction

CDR - Commander

CE – Corps of Engineers

CERCLA – Comprehensive Environmental Response, Compensation and Liability Act, 1980 (Superfund)

CERL – Construction Engineering Research Laboratory

CEQ – Council on Environmental Quality

CF – Copy Furnished

CFR – Code of Federal Regulations

CFS – Cubic Feet per Second

CG - Construction General/ Commanding General

COL – Colonel

CONUS – Continental United States

COP – Community of Practice

CRA – Continuing Resolution Authority

CW – Civil Works

CWA – Clean Water Act, 1977

CX – Center of Expertise

CY – Cubic Yard/ Current Year

DA – Department of Army

DCW – Director of Civil Works

DDC – Deputy District Commander

DDE – Deputy District Engineer

DE – District Engineer/ Division Engineer

DEIS – Draft Environmental Impact Statement

DIV – Division

DMP – Decision Management Plan

DOD – Department of Defense

DOE – Department of Energy

DOI – Department of Interior

DOJ – Department of Justice

DOT –Department of Transportation

DQC - District Quality Control

DP – Decision Point

DPM – Deputy for Project Management

DPR – Detailed Project Report

DSAP – Dam Safety Assurance Program

DX - Directory of Expertise

E&D – Engineering and Design

EA—Environmental Assessment

EC – Engineering Circular

EIS – Environmental Impact Statement

EM – Engineering Memorandum

EO – Executive Order

EOY – End of Year

EP – Engineering Pamphlet

ER – Engineering Regulation

ERDC – Engineering Research & Design Center

EPA – Environmental Protection Agency

ESA Endangered Species Act

EQ – Environmental Quality

FWL – Fish and Wildlife

FWS – Fish and Wildlife Service

FCA – Flood Control Act

FCSA – Feasibility Cost Sharing Agreement

FEIS – Final Environmental Impact Statement

FEMA – Federal Emergency Management Agency

FERC – Federal Energy Regulatory Commission

FOIA – Freedom of Information Act

FONSI - Finding of No Significant Impact

FPMS – Floodplain Management Services

FR – Federal Register

FRM – Flood Risk Management

FS – Feasibility Study

FSM – Feasibility Scoping Meeting

FUDS – Formerly Used Defense Site

FUSRAP – Formerly Utilized Sites Remedial Action Program

FY – Fiscal Year

FYI – For Your Information

FYSA- For Your Situational Awareness

GI – General Investigations

GIS - Geographic Information Systems

GNF – General Navigation Features

GRR – General Reevaluation Report

GS – General Schedule

H&H – Hydrology and Hydraulics

HAC – Hydropower Analysis Center

HAZMAT – Hazardous Materials

HEC – Hydrologic Engineering Center

HEP – Habitat Evaluation Procedures

HES – Habitat Evaluation System

HHS – Health and Human Services

HQ - Headquarters

HQUSACE – Headquarters, U. S. Army Corps of Engineers

HTRW – Hazardous, Toxic, and Radioactive Wastes

HU – Habitat Unit

I - Investigations

IDIQ – Indefinite Delivery, Indefinite Quantity

IEPR – Independent External Peer Review

IG – Inspector General

IN – Inland Navigation

IPR – In-Progress Review

IRC – Issue Resolution Conference

ITR – Independent Technical Review (now ATR)

IWR – Institute for Water Resources

IWW – Inland Waterways

IWTF – Inland Waterway Trust Fund

L&D – Lock and Dam

LDA – Limited Development Area

LER – Lands, Easements, and Rights-of-Way

LERR – Lands, Easements, Rights-of-Way, and Relocations

LERRD – Lands, Easements, Rights-of-Way, Relocations, and Disposal

LOI – Letter of Intent

LPP – Locally Preferred Plan/ Local Protection Project

LRR – Limited Reevaluation Report

LTC – Lieutenant Colonel

M&I – Municipal and Industrial

MCX – Mandatory Center of Expertise

MFR – Memorandum for Record

MG – Major General

MHW – Mean High Water

MIPR – Military Interdepartmental Purchase Request

MLW – Mean Low Water

MOA – Memorandum of Agreement

MOU – Memorandum of Understanding

MR&T – Mississippi River and Tributaries

MRC – Mississippi River Commission

MSC – Major Subordinate Command

MSL – Mean Sea Level

NAS – National Academy of Sciences

NAV – Navigation

NDC – Navigation Data Center

NED – National Economic Development

NER – National Ecosystem Restoration

NEPA –National Environmental Policy Act

NFIP - National Flood Insurance Program

NGO - Nongovernmental Organization

NGVD – National Geodetic Vertical Datum

NHPA - National Historic Preservation Act

NLT – No Later Than

NOAA – National Oceanographic and Atmospheric Administration

NPS – National Park Service

NRHP –National Register of Historic Places

NTE –Not to Exceed

NTP – Notice to Proceed

O&M – Operations and Maintenance

OBE – Overcome by Events

OC – Office of Counsel

OMB – Office of Management and Budget

OMRR&R – Operations, Maintenance, Repair, Replacement and Rehabilitation

OWPR – Office of Water Project Review

P&D – Planning and Design

P&G – Principles and Guidelines

P&S – Principles and Standards/ Plans and Specifications

PA – Planning Associate/ Per Annum

PAB – Planning Advisory Board

PAC – Post-authorization Change

PACR – Post-authorization Change Report

PAS – Planning Assistance to States

PCoP – Planning Community of Practice

PCX – Planning Center of Expertise

PDT – Project Delivery Team

PE – Professional Engineer

PED – Pre-construction Engineering and Design

PGM – Project Guidance Memorandum

PGN – Planning Guidance Notebook

PL – Public Law

PM – Project Manager/Management

PMBP – Project Management Business Process

PMP – Project Management Plan

PMF – Probable Maximum Flood

POC – Point of Contact

POTUS – President of the United States

PPA – Project Partnership Agreement

PRB – Project Review Board

PTL – Planning Technical Lead

Q's & A's – Questions and Answers

QA/QC – Quality Assurance / Quality Control

R&D – Research and Development

R&H – River and Harbor

R&U – Risk and Uncertainty

RBRCR – Remaining Benefits, Remaining Costs Ratio

REC - Recreation

RED – Regional Economic Development

REP – Real Estate Plan

RIT – Regional Integration Team

RFP - Request for Proposal

RP – Review Plan/ Resource Provider

RMB – Regional Management Board

RMC – Risk Management Center

RMO – Review Management Organization/Resource Management Office

RMP – Risk Management Plan

ROD – Record of Decision

ROW – Right of Way

RR – Risk Register

RTS – Regional Technical Specialist

S&A – State and Agency/Supervision and Administration

S&I – Supervision and Inspection

SAR – Safety Assurance Review

SCORP – State Comprehensive Outdoor Recreation Plan

SCOTUS – Supreme Court of the United States

SCS – Soil Conservation Service

SEPWC – Senate Environment and Public Works Committee

SES – Senior Executive Service

SFO – Support for Others

SHPO – State Historic Preservation Office

SITREP – Situation Report

SMART – Specific Measurable Attainable Risk-Informed Timely

SME – Subject Matter Expert

SOP – Standard Operating Procedure

SOS – Scope of Services/Scope of Studies

SOW – Scope of Work

T&ES – Threatened and Endangered Species

T&I – Transportation and Infrastructure (House)

TBA – To be Announced

TBD – To be Determined

THPO – Tribal Historic Preservation Office

TMDL -Total Maximum Daily Load

TRC – Technical Review Conference

UDV – Unit Day Value

USACE – U. S. Army Corps of Engineers

USC – United States Code

USCG – United States Coast Guard

USEPA – United States Environmental Protection Agency

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

VE – Value Engineering

VT – Vertical Team

VTC – Video Teleconference

WMP – Watershed Management Plan

WQ – Water Quality

WRC – Water Resources Council

WRDA – Water Resources Development Act

WS – Water Supply

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Chapter 1 Introduction

a. Project Authorization

Authorization is defined as permission to undertake a specific activity. In the context of this Master Plan revision, project authorization refers to congressional legislation which granted authority to the USACE to study, construct, and eventually operate the White River Basin reservoirs, specifically Bull Shoals Lake. Initial authorizations for the project included the primary project purposes of flood control and generation of hydroelectric power, followed by subsequent authorizations for recreation, fish and wildlife habitat, and water supply.

In 1937 the Chief of Engineers presented a report to Congress providing an overview of flood-control plans for the Ohio and Mississippi Valleys. The report stressed the need for construction of a system of flood control reservoirs in the White River Basin. In reviewing the Chief of Engineers' report, the House Committee on Flood Control determined that in addition to flood control, permanent pools for recreation, power generation, and conservation of water for other useful purposes would significantly increase the value and utility of reservoir projects without sacrificing flood control values.

The Bull Shoals Lake project was originally authorized as one of the multiple-purpose reservoir projects in the White River Basin for control of floodwaters, generation of hydropower, and other purposes by Section 4 of the Flood Control Act of 1938 and as amended by the Flood Control Act of 1941.

Bull Shoal Lake project authorizations include the following:

- The Flood Control Act approved 28 June 1938 (Public Law No. 761, 75th Congress, 3rd Session) as modified by the Flood Control Act approved 18 August 1941 (Public Law No. 228, 77th Congress, 1st Session) to include the authorization of the project for flood control and generation of hydroelectric power.
- Section 4 of the Flood Control Act approved 22 December 1944 (58 stat 889), as amended by Section 4 of the Flood Control Act approved 24 July 1946 (60 stat 642), as amended by Section 209 of the Flood Control Act approved 3 September 1954, as further amended by Section 207 of the Flood Control Act of 1962, as further amended by Section 2 of the Land and Water Conservation Fund Act of 1965;
- Section 210 of the Rivers and Harbors Flood Control Act of 1968 authorized the Chief of Engineers, under supervision of the Secretary of the Army, to provide for recreational development and use of the lake projects under his control.
- Section 6, Public Law 78-534. Under Section 6 of Public Law 78-534 (the 1944 Flood Control Act), the Secretary of the Army is authorized to enter into agreements for surplus water with states, municipalities, private concerns, or individuals at any reservoir under the control of the Department of the Army. The price and terms of the agreements may be as the Secretary deems reasonable. These agreements may be for domestic, municipal, and industrial uses, but not for crop irrigation.

- Title III of Public Law 85-500 (the 1958 River and Harbor Act) is entitled the "Water Supply Act of 1958." Section 301(a), established a policy of cooperation in development of water supplies for domestic, municipal, industrial, and other purposes. Section 301(b) is the authority for the Corps to include municipal and industrial (M&I) water storage in reservoir projects and to reallocate storage in existing projects to M&I water supply. However, as specified in Section 301(d), modifications to a planned or existing reservoir project to add water supply would seriously affect the project, its other purposes, or its operation requires congressional authorization. This act was amended by Section 10 of Public Law 87-88 and by Section 932 of Public Law 99-662.
- Section 10 of Public Law 87-88 (the Federal Water Pollution Control Act Amendments of 1961) modified the 1958 Water Supply Act. This modification permitted the acceptance of assurances for future water supply to accommodate the construction cost payments for future water supply.
- Section 932 of Public Law 99-662 (the Water Resources Development Act 1986), amended the Water Supply Act of 1958. This amendment applies to Corps projects but not to Bureau of Reclamation projects. The amendment eliminated the 10-year interest free period for future water supply, modified the interest rate formula, limited repayment to 30 years, and required annual operation, maintenance and replacement costs to be reimbursed annually. This latter requirement had always been a part of Corps policy and repayment procedures.
- Public Law 88-140, approved 16 October 1963, extended to the non-Federal sponsor of water supply storage the right to use the storage for the physical life of the project subject to repayment of costs. This removed an uncertainty as to the continued availability of the storage space after the 50-year maximum period previously allowed in contracts.
- Public Law 104-303 (the Water Resources Development Act of 1996) authorized recreation and fish and wildlife mitigation as purposes of the project to the extent that the additional purposes do not adversely affect flood control, power generation, or other authorized purposes of the project.
- Public Law 109-103 White River Minimum Flows Section 132(a) of the FY 2006 Energy and Water Development Appropriations Act (EWDAA)a uthorized and directed implementation of two of the Reallocation plans described in the July 2004 White River Minimum Flows Reallocation Report: BS-3 at Bull Shoals and NF-7 at Norfork Lake.

b. Project Purpose

Bull Shoals is a multiple-purpose power generation and flood risk management project and is a major unit in a comprehensive plan for development of the water resources of the White River Basin in Missouri and Arkansas. Additional purposes include Recreation, Water Supply, and Fish/Wildlife purposes to the extent that those additional purposes do not adversely affect flood control, power generation, or other authorized purposes of the project.

c. Purpose and Scope of Master Plan

This revised Master Plan replaces Design Memorandum No. 1-G, Updated Master Plan for Development and Management of Bull Shoals Reservoir approved February 1975. Regulation and guidance for master plan revisions are provided by Engineer Regulation (ER) and Engineer Circular (EC) 1130-2-550; Engineer Manual (EM) 1110-1-400; and ER 1105-2-100.

The Master Plan is the strategic land use management document that guides the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resource project. The Master Plan guides the efficient and cost-effective management, development, and use of project lands. It is a vital tool for the responsible stewardship and sustainability of project resources for the benefit of present and future generations.

The Master Plan guides and articulates Corps responsibilities pursuant to federal laws to preserve, conserve, restore, maintain, manage, and develop the project lands, waters and associated resources. The Master Plan is a dynamic operational document projecting what could and should happen over the life of the project and is flexible based upon changing conditions. The Master Plan deals in concepts, not in details, of design and administration. Detailed management and administration functions are addressed in the Operational Management Plan (OMP), which implements the concepts of the Master Plan into operational actions.

The Master Plan will be developed and kept current for Civil Works projects operated and maintained by the Corps and will include all land (fee, easements, or other interests) originally acquired for the projects and any subsequent land (fee, easements, or other interests) acquired to support the operations and authorized missions of the project.

The Master Plan is not intended to address the specifics of regional water quality, shoreline management, or water level management; these areas are covered in a project's shoreline management plan or water management plan. However, specific issues identified through the Master Plan revision process can still be communicated and coordinated with the appropriate internal Corps resource (i.e. Operations for shoreline management) or external resource agency (i.e. Missouri Department of Natural Resources and Arkansas Department of Environmental Quality for water quality) responsible for that specific area.

d. Brief Watershed and Project Description

The project is located in the scenic Ozark Mountain region of southern Missouri and north central Arkansas. The total area contained in the Bull Shoals project, including both land and water surface, consists of 104,573.3 acres. Of this total, 12.9 acres are in flowage easement (Note: a small difference in acreage figures exist throughout this document due to using GIS/survey plats data which is more accurate and based on new technology versus the deed language which was derived many years ago without the aid of technology). The region is characterized by narrow ridges between deeply cut valleys that are forested with deciduous trees and scattered pine and eastern red cedar. When the lake is at the top of the conservation pool (659 mean sea level), the water area comprises 48,225.3 surface acres and 822 miles of shoreline. The shoreline is irregular with topography ranging from steep bluffs to gentle slopes. Additional information on headwaters/tailwaters, major streams associated with the lake, etc. can be found in Chapter 2, under Section b. Hydrology and Groundwater.

Construction of Bull Shoals Dam was initiated in June 1947. The dam was completed in July 1951, and the powerhouse and switchyard were completed in 1953. Bull Shoals Lake was declared operational for public use in 1953. There are 37 public use areas around Bull Shoals Lake. Nine campgrounds and six access points on the lake are operated by the Corps of

Engineers. In 2012, a district lead Recreation Adjustment Plan evaluated all the parks on Bull Shoals Lake and for budgetary reasons, leased the camping portion of Dam Site Park and Pontiac Parks. In both cases, the boat ramps continue to be operated and maintained by the Corps. There are twelve parks and ten access points operated by city, county, or state agencies, marinas, church groups, or schools around the lake. A more detailed description of the Corps parks follows in Chapter 2.

At the drafting of this final Master Plan, no significant park operational changes are anticipated. Since 1975, parks have been evaluated using an efficiency review process. Those parks chosen for closure for budgetary reasons were offered for lease through standard leasing procedures. Closed parks could be reopened at such time as adequate funding becomes available. There are four parks Woodard, Lowery, Spring Creek, and Dam Site that have been reduced to lake access only. One State Park (Bull Shoals-White River State Park) is located on Bull Shoals Lake and the White River and it is operated by the Arkansas Department of Parks and Tourism. Three Parks (Bull Shoals, Ozark Isle, and Pontiac) are operated by a commercial concessionaire. One park (Shadow Rock) is operated by the City of Forsyth, Missouri. Two parks (Highway K and Kissee Mills) are operated by Taney County, Missouri. One park (Lead Hill City Park) is operated by the City of Lead Hill. One park (Shoal Creek) is operated by City of Protem. Two parks (Point Return and Danuser City Park) are operated by the City of Bull Shoals.

e. Listing of Prior Design Memorandum

A listing of prior design memorandums and accompanying supplements are provided in a table listing in Appendix B. The supplements are also provided in Appendix B and with the release of this Master Plan, are considered incorporated into this document.

f. Pertinent Project Information

Although this revised Master Plan is focused on management of land and water surface related to project purposes of outdoor recreation and environmental stewardship of natural and cultural resources, the following information about primary project facilities is provided to aid in understanding how all project purposes are interrelated.

Bull Shoals Dam is located at river mile 418.6 on the White River in Marion and Baxter Counties, Arkansas; about seven miles north of Cotter, Arkansas; and ten miles west of Mountain Home, Arkansas. The lake extends north westerly along the White River and its tributaries to the Empire Electric Company Dam (Lake Taneycomo) located at mile 506.1 and comprises lands in Baxter, Marion and Boone Counties in Arkansas and Ozark and Taney Counties in Missouri. Bull Shoals Lake is one of a series of five lakes in the Upper White River Basin in northern Arkansas and southern Missouri. The other lakes in the series are Beaver, Table Rock, and Taneycomo located upstream on the White River, and Norfork on the North Fork River.

The Bull Shoals project includes a concrete gravity-type dam and a hydro-electric generating plant. The dam is 2,256 feet in length and has a maximum height of 258 feet above streambed. The spillway section is controlled by 17 tainter crest gates 28 feet high by 40 feet wide. In the base of the dam there are 16, 4 feet by 9 feet high conduits and eight, 18-foot diameter power penstocks. The power generating plant consists of 8 Francis turbine generating units with a total

installed generating capacity of 340 MW. At 15% overload the max capacity is 391 MW. Table 1-1 summarizes the pertinent engineering data on the project.

Construction of Bull Shoals Dam was authorized in August 1941. Construction began in April 1946 was completed in July 1951. Power Pool began filling in July 1951 and Top of Power Pool was reached in March 1953. Commercial power generation began in September 1952. The power pool elevation has since been raised to elevation 659 feet (m.s.l.) from 654 feet (m.s.l.) for the implementation of minimum flows in July 2013.

Operation of the project related to the storage in the pools is twofold. Conservation pool storage is designed for holding water to be used for authorized purposes, both during normal conditions or during an extended period of below normal rainfall. The flood pool zone is for the temporary impoundment of water to be released after downstream high water has receded. The hydroelectric power plant produces electricity which is marketed by the Southwestern Power Administration, U.S. Department of the Energy. The dam was designed with spillway capacity to pass inflow with a maximum pool elevation of 703 feet above mean sea level (m.s.l.) Under less than extreme conditions, the lake is operated for a nominal flood control pool elevation of 695 feet m.s.l. Withdrawals of storage for authorized conservation uses, can cause the lake elevation to fluctuate between 659 feet m.s.l., which is the top of the conservation pool, and 628.5 feet m.s.l., the bottom of the conservation drawdown pool. Under prolonged extreme conditions of low rainfall and runoff, the reservoir may be drawn as low as the maximum probable drawdown (elevation 588 feet m.s.l.) to meet the long-range hydro-electric power commitments. During flood conditions, the lake level may rise into the flood control pool and it is possible to exceed the top of the flood control pool by raising the tainter gates. The lake can exceed the top of the flood control pool by as much as eight feet when raising these gates in an operation known as an induced surcharge operation. A summary of the inflow to the lake is shown in Table 1-4.

In 2005, the USACE started Screening for Portfolio Risk Analysis (SPRA). This analysis screened each dam in the USACE inventory based on available information, to expeditiously identify and classify every dam according to perceived risk. The screening has yielded a basic understanding of the greatest risks and priorities for dams throughout USACE. The Dam Safety Action Classification System (DSAC) is intended to provide consistent and systematic guidelines for appropriate actions to address the dam safety issues and deficiencies of USACE dams. USACE dams are placed into a DSAC class based on their individual dam safety risk considered as a combination of probability of failure and potential life safety concerns. Other considerations such as economic and environmental issues, while important, are secondary compared to life safety issues. The DSAC table presents different levels and urgencies of actions that are commensurate with the different classes of the safety status of USACE dams. These actions range from recognition of an urgent situation requiring immediate action through normal operations and dam safety activities for dams without known issues.

DSAC I (Very High Urgency of Action) – Dams where progression toward failure is confirmed to be taking place under normal operations and the dam is almost certain to fail under normal operations within a time frame from immediately to within a few years without intervention, or the combination of life and/or economic consequences make probability of failure extremely high.

DSAC II (High Urgency of Action) – Dams where failure could begin during normal operations or be initiated as the consequence of an event. The likelihood of failure from one of these occurrences, prior to remediation, is too high to assure public safety, or the combination of life and/or economic consequences make probability of failure very high.

DSAC III (Moderate Urgency of Action) – Dams that have issues where the dam is significantly inadequate, or the combination of life, economic, and/or environmental consequences make the risks moderate to high.

DSAC IV (Low Urgency of Action) – Dams are inadequate but with low risk such that the combination of life, economic, and/or environmental consequences make a probability of failure low, although the dam may not meet all essential USACE engineering guidelines.

DSAC V (Normal) – Dams considered adequately safe, meeting all essential agency guidelines and the residual risk is considered tolerable.

Initially, Bull Shoals Dam was classified as a DSAC IV (low urgency) in 2008. The dam underwent a detailed periodic assessment (PA) in 2014. The PA team recommended the dam be reclassified to a DSAC III (moderate urgency) due to risk associated with overtopping and potential instability of the dam during very rare flood events and seismic events. Approval of the DSAC change was finalized on June 3, 2015 from the Dam Safety Oversight Group and USACE Headquarters. An Interim Risk Reduction Management Plan (IRRMP) is currently under development for Bull Shoals Lake Dam.

For more information on USACE Dam Safety, please reference the following website:
http://www.usace.army.mil/Missions/CivilWorks/DamSafetyProgram/ProgramActivities.aspx

Table 1.1 General Dam Information

General

Type of Dam ..... Concrete Gravity

Approximate Quantities

Concrete, cubic yards 2,100,000

Excavation, cubic yards. 770,000

Significant Dimensions, feet

Maximum height 284

Dam crest length. 2,256

Spillway length, over-all 808

Spillway length, net 680

Stilling basin length, normal to dam axis 210

Spillway Control

Tainter gates, 40 ft by 28 ft 17

Outlets

Conduits, 4 by 9 feet 16

Significant Elevations, feet m.s.l.

Top of dam (parapet) 711.08

Top of dam (roadway) 708.00

Top of spillway crest gates 695.00

Spillway crest.....667.00

Conduits (invert)

Intake.....477.06

Outlet.....437.50

Stilling basin

Floor..... 437.20 to 466.50

End sill 450.50

Training walls 505.00

Stream bed (approximately).....450.00

Base of overflow section (approximately).....432.00

Hydraulic

Drainage Areas (Square Miles)

Bull Shoals Dam 6,036

Mouth of White River.....27,765

Table 1.2 - Reservoir Data

	Elevation	Total Storage Capacity (acre-feet)	Area (acres)	Shore-line (miles)	Run-off Storage (Inches)
Top of Conservation Pool	659	3,281,000	48,165	821	10.22
Spillway Crest	667	3,682,000	52,931	885	11.47
Top of Crest Gates	695	5,408,000	70,269	1,096	16.84

Table 1.3 – Flow at Dam Site

Period of estimated flow – October 1921 to September 1942, inclusive		
	Acre-feet	Average Rate, c.f.s.
Average Annual (22 years)	4,644,000	6,420
Maximum Year (1927)	10,901,000	15,080
Minimum Year (1936)	1,859,000	2,560
Maximum Month (April 1927)	3,397,000	57,190
Minimum Month (August 1936)	9,330	152

Original Spillway Design flood Data

Peak rate, natural flow at dam site, c.f.s. 632,000

Peak rate, inflow to full reservoir, c.f.s. *792,000

Total volume of rainfall, inches 15.2

Total volume of run-off, acre-feet *4,077,000

Total depth of run-off, inches *12.7

Duration of flood, days *10

Pool elevation at start of flood, feet, m.s.l. 695.0

Conduits ..... Inoperative

Elevation of spillway crest, feet, m.s.l. 667

Net length of spillway crest, feet 680

Maximum pool stage reached, elevation, feet, m.s.l. 702.3

Design pool elevation selected.....703

Spillway discharge at elevation 702.3, c.f.s. 545,000

*With Table Rock Reservoir functioning as modified by the Supplement to Basis of Design for Table Rock Dam and Reservoir, dated September 1944.

Table 1.4 Bull Shoals Inflow Data

Inflow Design Flood Data (updated 2013): ER 1110-8-2(FR) 1991

Peak rate, inflow to full reservoir, includes upstream releases, c.f.s. 2,326,382

Total peak outflow, c.f.s. 994,653

Turbines at 15% overload capacity, c.f.s. 26,000

Spillway (orifice) discharge, c.f.s 703,284

Weir flow over dam, c.f.s.....265,369

Conduit discharge, c.f.s.....Assumed inoperative

Total volume of 72 hr rainfall Bull Shoals basin only, inches.....19.93

Total volume of 72 hr rainfall Table Rock basin only, inches.....20.57

Total volume of 72 hr rainfall Beaver basin only, inches.....18.31

4 day total volume of run-off (excludes baseflow and upstream releases), acre-feet1,812,851

Total depth of run-off Bull Shoals basin only, (excludes baseflow) inches 17.2

Total depth of run-off Table Rock basin only, (excludes baseflow) inches 17.6

Total depth of run-off Beaver basin only, (excludes baseflow) inches 14.2

Above top of flood control pool, days 6

Above top of dam, hours.....54

Pool elevation at start of flood, feet, m.s.l. 688.5

Elevation of spillway crest.....667

Net length of spillway crest, feet 680

Maximum pool reached, elevation, m.s.l.....720.6

Maximum height overtopped without wave runup, feet.....12.6

Hydroelectric

Elevations, feet, m.s.l.

Upper level, power pool.....659

Lower Level, power pool.....588

Low tailwater (approximately 3,000 c.f.s. flow) 453

Average tailwater (approximately 11,000 c.f.s. flow) 456

Powerhouse design tailwater.....501

Storage Capacities, acre-feet

Power draw-down 2,045,000

Dead storage.....964,400

Maximum Draw-down of Power Pool, feet.....71

Net Average Regulated Flow (Critical Period), c.f.s. 3,950

Gross Head on Turbines, feet

Power Pool at upper level 198

Power Pool at lower level 132

Average (period of study, 1923-1940).....182

Size of Intake Gates, feet .....(approx) 25.8 height by 19.3 wide

Penstocks

Number 8

Diameter, feet.....18

Elevation of centerline at outlet, feet, m.s.l. 463

Assumed Characteristics of Initial Power Development

Number of units 3

Type of turbine.....Francis

Total turbine capacity at average head, hp.....185,000

Total generator capacity, kw.....120,000

Power

Prime capacity at 60 percent load factor, kw. 75,000

Prime annual energy output, kw-hr.....394,000,000

Total average annual output, kw-hr 596,000,000

Chapter 2 Project Setting and Factors Influencing Management and Development (Existing Conditions)

a. Description of Reservoir

Bull Shoals Lake is located in the Ozark Mountain region of north central Arkansas and south central Missouri. Having 822 miles of shoreline and over 48,000 water surface acres, Bull Shoals is one of the largest lakes in the central United States and is the oldest Corps' of Engineers White River lakes. With a relatively undeveloped shoreline and exceptional water quality, the Lake has remained the jewel of reservoirs on the White River system, providing great benefits to the Ozark region since its impoundment.

The lake provides a more remote and natural setting, which offers a unique recreational experience. Many arms and coves of the Lake offer secluded areas for traditional activities such as fishing, skiing, and scuba diving, but also allow for passive recreation opportunities like photography and nature observation. Recreation areas offering developed facilities to support camping, boating, and swimming are located across the Lake. Commercial concessions, such as marinas and resorts, provide services ranging from fuel and supplies to overnight lodging.

Arkansas Department of Environmental Quality (ADEQ) has designated the Arkansas portion of Bull Shoals Lake as an Extraordinary Resource Water (ERW). The designation provides for more stringent water quality standards at the lake. Specific water quality standards for Bull Shoals Lake can be verified by contacting ADEQ. This designation recognizes the integrity of undeveloped public land around the Lake, high water quality, valuable wildlife habitat, and aesthetic and recreational value. Mile-long limestone bluffs, striking vistas, and heavily wooded shorelines combine to offer a unique natural environment.

In addition, Federal lands on the Missouri portion of Bull Shoals Lake are under license (DACW03-3-14-1094) with the State of Missouri for Fish and Wildlife Activities. The license is granted for a twenty-five year term, which began on September 1, 2013 and will expire on August 31, 2038. A copy of the license is included under Appendix E.

b. Hydrology and Groundwater

Bull Shoals Lake is located on the White River and was formed by the construction of the Bull Shoals Hydroelectric Dam in Marion County, Arkansas, which was begun in 1947 and completed in 1951. The elevation of the top of the conservation pool is approximately 659 feet NGVD29 with the flood pool being at 695 feet NGVD29. The conservation pool top area is approximately 48,225.3 surface acres and the flood pool top area is approximately 71,240 acres. The shoreline length of the design conservation pool is approximately 822 miles, and the flood pool is approximately 1,050 miles in length. Bull Shoals Lake is located within the White River Drainage Basin, which drains approximately 27,765 square miles in northern Arkansas and southern Missouri. The lake has an average depth of 67 feet.

There are five other large lakes in the Bull Shoals Lake vicinity: (1) Beaver Lake; (2) Table Rock Lake; (3) Lake Taneycomo on the White River upstream of Bull Shoals; (4) Norfork Lake approximately 20 miles to the east of Bull Shoals Lake on the North Fork River; and (5) Greers

Ferry Lake on the Little Red River, approximately 60 miles to the south of Bull Shoals Lake. With the implementation of the White River Minimum Flows Project, the total water storage capacity of Bull Shoals Lake is 5.408 million acre-feet, with 2.127 million acre-feet of flood control storage, 1.236 million acre-feet of conservation storage, and 2.045 million acre-feet of inactive storage.

Bull Shoals Lake is an impounded area of the White River which begins at an elevation of approximately 2,050 feet NGVD29 near the Ozark National Forest in northwest Arkansas. NGVD29 is the National Geodetic Vertical Datum of 1929 and is a means of vertical control surveying used in the United States. The river runs southeast through northeast Arkansas to its confluence with a branch of the Arkansas River very near its confluence with the Mississippi River in Desha County, Arkansas. The White River traverses about one-third of its length through the Ozark highlands to around Independence and Jackson Counties, Arkansas, where it enters a lowlands area with lower gradient change.

The upper one-third of the river has a gradient change of about three to four feet per mile and the lowlands portion averages about one foot per mile. The flood plain ranges from 200 to 400 feet in width in the highlands to two miles in the lowlands below Independence County.

Another major tributary to the White River is the Buffalo River running easterly to the south of Bull Shoals Lake and meeting the White River in Marion County. The Buffalo River is America's first National River and remains as one of the few unpolluted rivers in the lower 48 states, with both swift running and placid reaches. About 135 miles of the 150 mile total length is set aside as the Buffalo National River. It begins as a small stream in the Boston Mountains about 15 miles from the beginning of the national river designated area. The river winds its way through massive limestone cliffs and bluffs while travelling eastward through the Ozark Mountains to the White River. The river's high quality waters serve as an ideal recreation source as well as aquatic habitat offering sport fishing for smallmouth bass, channel catfish, green and long-eared sunfish, and spotted bass.

Other major rivers in the Bull Shoals Lake area include the Little Red River in the southern part of the basin, and the Current River and Black River in the eastern portion of the basin. The Current River empties into the Black River in Randolph County, Arkansas and the Black River joins the White River in Independence County.

c. Sedimentation and Shoreline Erosion

According to the White River 1993 Water Control Master Manual, the inflow to the White River reservoirs has not historically had a major sediment load; therefore, initial sediment ranges for the lake were established as index ranges to be surveyed only on a spot basis unless a sedimentation problem was identified. Some sediment ranges were resurveyed in 1961, 1962, 1964, and the last time in August of 1978. With these surveys, no major sediment deposits were identified. Many of the ranges have not been resurveyed.

Erosion of the residual soil containing cherts and clay accounts for the tumbled gravels found in streambeds of the watershed. Slopes can be as steep as 90 degrees and tend to be steeper in areas

close to creeks or water bodies. Noticeable erosion can be found where gravel roadways lead up to boat launches and docks. Most of these embankments are steep and allow stormwater to pick up speed as it heads toward the lake. As gravel washes into Bull Shoals Lake it also carries smaller sediments and soils. Sediment is a large contributor to nutrient input into any water body.

d. Water Quality

Most ground water withdrawn from water wells occurs in the Quaternary alluvium in the Bull Shoals Lake area, with most wells being completed at a depth of about 200 – 300 feet below surface. The recharge (outcrop) area for this formation is in southern Missouri. The formation is made up of predominantly limestone, dolomite, sandstone, and shale. The primary porosity of these rocks has been greatly reduced by compaction and cementation, thus a reduction in their ability to supply large withdrawal rates. Ground water occurs mainly in fractures and joints in the sandstone and in solution openings in the limestone and dolomite.

Much of the ground water produced in this area contains high levels of radium 226, radium 228, fluoride, uranium, radon, hydrogen sulfide, and other undesirable naturally occurring substances which are difficult to treat. The radium 226, radium 228, fluoride, and radon levels found in many wells consistently exceed the maximum contaminate (MCL) levels established by the National Primary Drinking Water Regulations. Wells completed in shallower water bearing layers are often infiltrated with surface runoff water that tends to contain contaminants that pose potential health risks (ESI, 2009).

Overall surface water quality in the Bull Shoals Lake area is very high and has been designated as an ERW by ADEQ as mentioned in Section a. The waters of the Arkansas portion of the White River watershed have all been designated by ADEQ for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEQ, 2012). Bull Shoals Lake is classified by ADEQ as a Type A water body, which includes most larger lakes of several thousand acres in size, in upland forest dominated watersheds, having an average depth of 30 to 60 feet, and having low primary production (i.e., having a low trophic status if in natural [unpolluted] condition). This is mainly due to temperature stratification, which is natural and occurs in many deep reservoirs such as Bull Shoals Lake. During the warmer months, lake waters of the upper layer (the epilimnion) are warmer and contain more dissolved oxygen, while the denser, lower layer waters (the hypolimnion) are colder and contain very little or no dissolved oxygen. As the stratified epilimnion cools in the late fall and winter, the layers begin to mix (de-stratify) and dissolved oxygen (DO) is more evenly distributed. This condition is more favorable to the fishery of the lake and overall water quality.

In 2004, ADEQ placed the first three miles of the Bull Shoals tailwater on the Water Quality Limited Waterbodies list (303(d) list) due to violation of the 6 mg/L dissolved oxygen (DO) standard. The listed source of the DO violation is hydropower (HP). Section 303(d) of the Clean Water Act requires states to list waters that do not meet Federal water quality standards or have a significant potential not to meet standards as a result of point source dischargers or non-point source run-off. Subsequent to listing on the 303(d) list, the statute requires that the states develop and set the Total Maximum Daily Load (TMDL) for water bodies on the list within 13 years. A TMDL establishes the maximum amount of a pollutant that can enter a specific water body without violating the water quality standards. Values are normally calculated amounts

based on dilution and the assimilative capacity of the water body. TMDLs have been established by ADEQ for the 3.0 miles of the White River below Bull Shoals Dam. While the first three miles below the Bull Shoals dam (tailwater) is listed on the 303 (d) list, *Bull Shoals Lake is not on the 303 (d) list*.

For the Missouri potion of Bull Shoals Lake, the Missouri Department of Natural Resources and the Clean Water Commission are responsible for setting and enforcing water quality standards within the State of Missouri. Classified waters in the state are categorized according to their beneficial water usage. Major reservoirs like Bull Shoals Lake are usually several thousand acres in size and are classified by the state as L2 (comparable to Type A in Arkansas). Bull Shoals Lake, in addition to maintaining L2 water quality standards, is also subject to four other water quality standards: (1) livestock and wildlife watering; (2) protection of warm water aquatic life and human health/fish consumption; (3) whole body contact recreation; and (4) boating and canoeing water quality standards (MDNR, 1996b).

The Corps closely monitors and tests swim beaches during the recreation season for any elevated levels of bacteria, i.e. fecal coliform and/ or e. coli. In the interest of public safety, if elevated levels are detected, swim beaches are closed until acceptable levels are attained.

e. Project Access

The lake is surrounded by US, State, and county roads, making access possible at many points in any given area of the lake. Further highway and airport access can be referenced in Figure 2-1 Bull Shoals Lake Project Access.

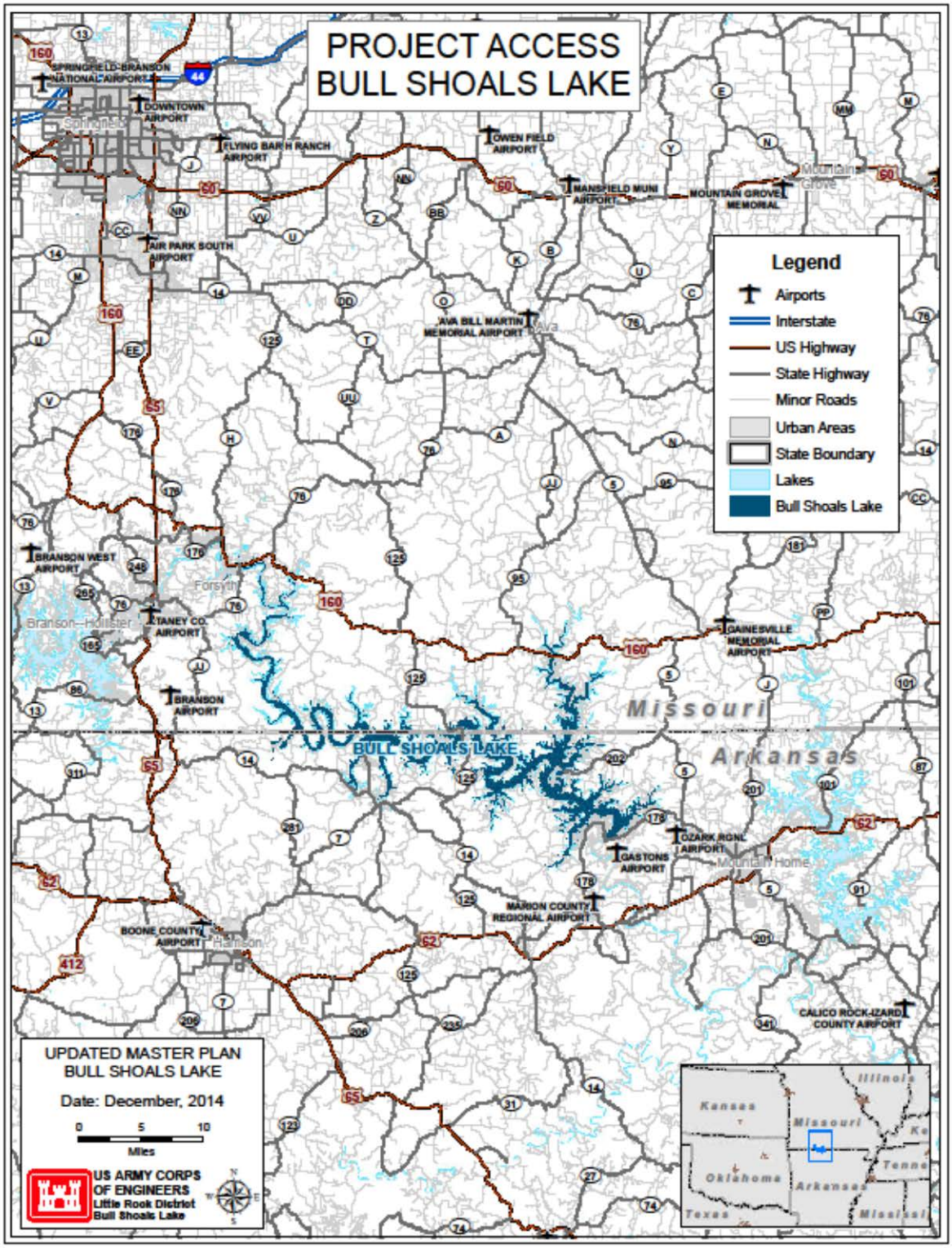


Figure 2-1 Bull Shoals Lake Project Access

f. Climate

Climate within the Bull Shoals Lake watershed is temperate, with summer extremes lasting for longer periods throughout northern Arkansas, and winter temperatures being more influential in the zone's northern reaches in Missouri. Extremes may vary from lows around 0^{o}F in the winter months to highs above 100 ^{o}F occurring from southern Arkansas to central Missouri during the summer months. Extreme temperatures may occur for short periods of time at any location within the watershed. Heavy rainfall events are common. Average annual rainfall over the watershed varies from 44 to 46 inches. Monthly rainfall varies from 2.5 inches in the winter months to about 5 inches in the spring. Snowfall each year averages from 8 to 16 inches from south to north across the watershed. Snow packs are usually short lived and are not commonly a concern for flooding.

Bull Shoals Lake is located in the Ozark Mountains, remote from heavy smoke-producing industry or large mining operations. The air is very clean and smog is virtually unknown in this region. None of the present operations of the project contribute to air pollution.

Climate change became an area of concern due to the potential for effects on numerous aspects of the environment, especially those related to water resources. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments (http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts). In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events were projected to occur more frequently. Should these events become significant to impact the operation of Bull Shoals Lake, the Master Plan and associated documents (i.e. Operations Management Plan and Shoreline Management Plan) will be reviewed and revised, if necessary.

The State of Missouri passed the Water Resources Law in 1989 and was directed to “develop, maintain and periodically update a state water plan for a long-range, comprehensive statewide program for the use of surface water and groundwater resources of the state, including existing and future needs for drinking water supplies, agriculture, industry, recreation, environmental protection and related needs." The state water plan was done in 2 phases: Phase 1 completed a series of 7 technical assessment documents to provide basic information about Missouri’s streams and rivers, groundwater, water use, water quality, interstate water issues, hydrologic extremes, and water law; Phase 2 is the identification of regional problems and opportunities related to water use. (http://www.dnr.mo.gov/env/wrc/statewaterplanMain.htm)

The Arkansas Water Plan is the state’s policy for long term water management. The State of Arkansas last updated their water plan in 1990. The water plan is currently undergoing revision; the update will bring data, science, and public input together to define water demands, water supplies, issues, and potential solutions to meet the state’s needs for the next 40 years. (http://www.arwaterplan.arkansas.gov/)

g. Topography, Geology, and Soils

A general description of the topography in the Bull Shoals Lake region is gently sloped to steep inclines typical of the Ozark Highlands. Bluffs of near vertical relief are present where the original White River channel has eroded the residual limestone substrate. The upper reaches of several small tributaries contain small flood plains and gentle slopes of less than five percent. Primary ridges and connecting spur ridges have as great as 10% incline, with side slopes ranging from 10 to 25% inclines. Aspect, or the direction a slope is facing, is generally described as easterly in nature for all land occurring on the west side of the reservoir and westerly in nature for land occurring on the east side of the reservoir, however due to the presence of many smaller drainages and resulting ridges, aspects of all directions have been created, making the landform around Bull Shoals very rugged in appearance.

The Ozark Highlands Physiographic Province is underlain mainly by Paleozoic sedimentary rocks composed mainly of limestone and dolomite with lesser amounts of sandstone and shale. Much of the region is underlain by carbonate rocks with extensive karst development, resulting with sink holes and caves being common in this region. Bull Shoals Lake is located within two physiographic areas of the Ozark Highlands.

The Salem Plateau is exposed across northern and central Baxter County, and is characterized by gently sloping to rolling uplands, and steep stony side slopes with outcrops of dolomite. The elevation ranges from about 700 to 1,000 feet above sea level and there are a few broad areas on uplands that have a gradient of one to eight percent.

The Springfield Plateau is exposed in parts of west central and across most of southern Marion County and most of southern Baxter County, and the Missouri counties of Taney and Ozark, and is adjacent to and higher in elevation than the Salem Plateau. This plateau has been strongly dissected by streams. Steep, V-shaped valleys separated by gently sloping to moderately sloping land characterize it. The side slopes have a gradient of 12 to 50 percent. The elevation atop the ridges ranges from about 1,000 to 1,200 feet above sea level. There are areas on uplands where the gradient is one to eight percent and provides a more flat relief.

Ozark streams and rivers are frequently located in narrow, confined valleys and are affected by stream bed elevations that are typically only a few meters above bedrock, which results in stream valleys that are entrenched and commonly less than one-fourth mile wide. The chert content of some limestone and dolomite areas can be relatively high. Formed by rock dissolution and weathering, streams often contains large quantities of chert gravel, which provides an available source of gravel sediment to the river system. For these reasons, most flood plains are less than 1,000 feet wide.

Soil surveys as published by the Natural Resource Conservation Service (NRCS) are available for Baxter, Ozark, and Taney counties. These will be referred to for developing specific resource management plans for the Operational Management Plan. In general, most soils adjacent to the lake are classified by the NRCS as Clarksville, Nixa and Gasconade soils. Arkana, Doniphan, Gassville, and Moko soils are the major soils on this plateau surface. Arkana-Moko which is: moderately deep and shallow, gently sloping to steep, well drained, cherty, and stony soils that

formed in residuum of dolomite and limestone. Healing, Razort, Wideman, and Britwater soils formed within flood plains of tributary streams.

Soil conservation and management will be a major consideration when planning natural resource and recreation management practices. While soil movement is influenced by climate, soil type, and topography, which are uncontrollable, it can also be negatively affected by compaction, modification of vegetative cover, and very high lake pool elevations which increase wave action and inundation of unprotected shoreline.

Figure 2-2 Geology and Fault Lines of Bull Shoals Lake and surrounding area

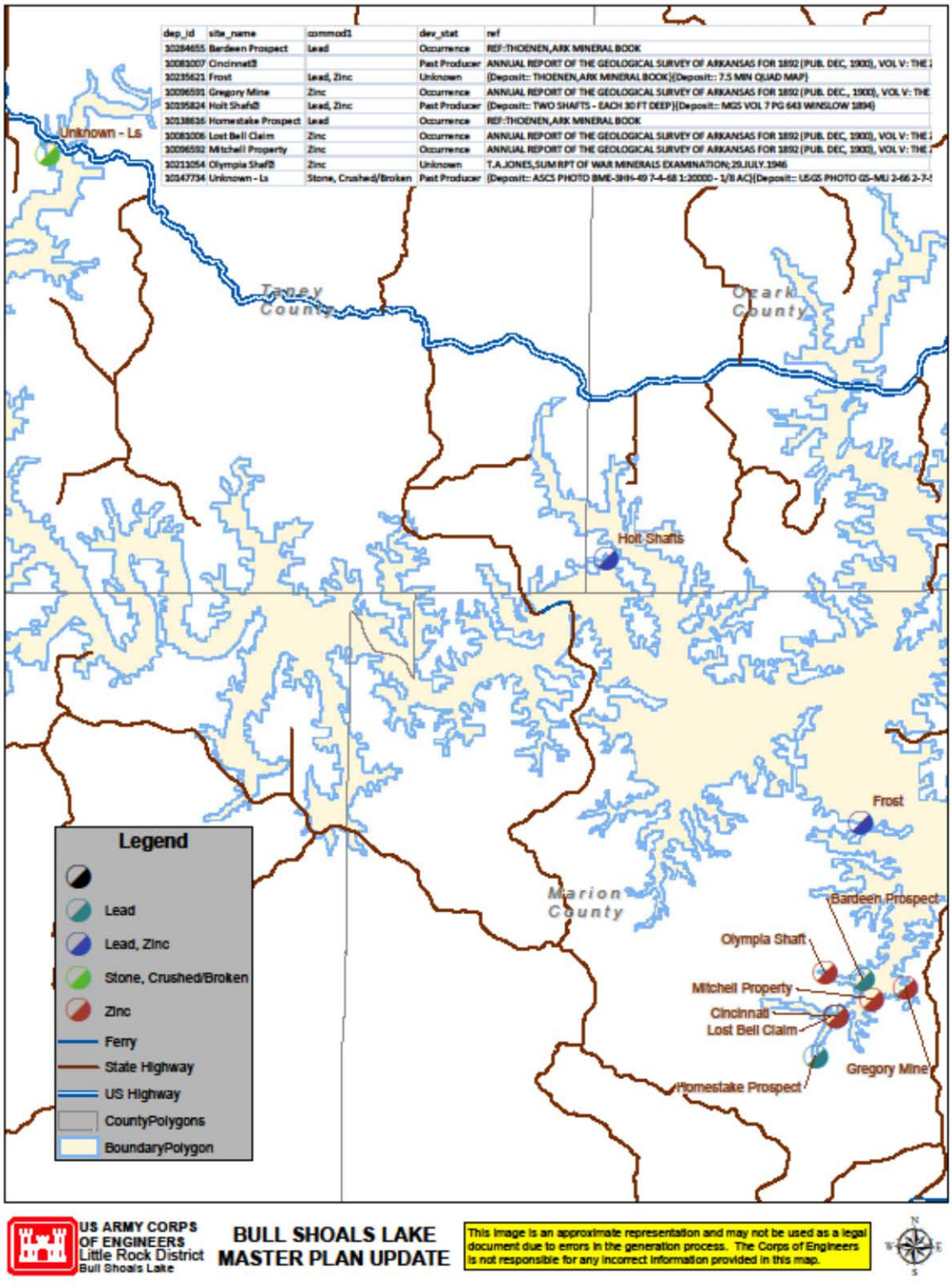


Figure 2-3 Minerals at Bull Shoals Lake

h. Resource Analysis (Level One Inventory Data)

Operational civil works projects administered by the Corps are required, with few exceptions, to prepare an inventory of natural resources. The basic inventory required is referred to within USACE regulations (ER and EP 1130-2-540) as a Level One Inventory. This inventory includes the following: vegetation in accordance with the National Vegetation Classification System through the sub-class level; assessment of the potential presence of special status species including but not limited to federal and state listed endangered and threatened species, migratory species, and birds of conservation concern listed by the U.S. Fish and Wildlife Service (USFWS); land (soils) capability classes in accordance with the Natural Resource Conservation Service (NRCS) criteria; and wetlands in accordance with the USFWS' Classification of Wetlands and Deepwater Habitats of the United States. An overview of the natural resources and related management actions at the project is provided in the following sections and paragraphs.

(1) Fish and Wildlife Resources

Fisheries

The impoundment of the White River and other tributary streams and rivers which form Bull Shoals Lake resulted in changes in the composition of the fish populations. Smallmouth bass was the principal game fish found in the White River prior to impoundment. Arkansas Game and Fish Commission (AGFC) and Missouri Department of Conservation (MDC) are the agencies primarily responsible for managing the fishery and through their efforts, a variety of fish species are well-established in the lake. Sport fish species currently found include: largemouth bass, spotted bass, smallmouth bass, white bass, striped bass, hybrid white-striped bass, walleye, flathead catfish, channel catfish, white crappie, black crappie, and various species of sunfish. Due to the quality and diversity of the fishery, Bull Shoals Lake serves as a national fishing destination, hosting hundreds of bass tournaments annually.

Bull Shoals Lake was first impounded in 1951 and much of the standing timber was cut prior to the impoundment. Since impoundment, the few remaining native forests that were submerged provided little structure and forage habitat for fish. This limited habitat has degraded over time so in 1986, USACE, MDC, and AGFC began a large scale artificial habitat improvement project with the primary objective to improve fish habitat within Bull Shoals Lake. Since 1987, 459 fish habitat structures known as "fish attractors" have been placed in Bull Shoals Lake by AGFC and 95 attractors by MDC. Approximately 64,000 trees comprise the attractors which cover over 124 acres of lake bottom, totaling 30 miles in length. AGFC and MDC fund the maintenance of the attractors each year, adding fresh cover to keep the attractors productive and increasing the habitat.

In 2013, MDC began a fish habitat enhancement project on Bull Shoals Lake using standing cut cedar trees anchored in concrete to provide a vertical habitat structure. When the project is completed, 62 structures will be constructed. Depending upon the structure, up to 300 trees will be constructed parallel to the shore in shallower water and perpendicular to the shore in deeper

water to prevent possible boating obstacles. These structures will create approximately 12 acres of fish habitat. In 2014, AGFC began a trial program of adding commercially made artificial fish habitat structures to a small number of existing fish attractors. These structures are being studied for visual esthetics, durability, and usage by fish to determine if they can be used to enhance the existing fish habitat structure program.

The public is also encouraged to place natural fish attractors in Bull Shoals Lake. Each year 50 permits are issued to private individuals to cut cedar trees and place fish attractors at various locations. In 1995, the Corps began a program for the public to bring their discarded Christmas trees to be used as fish attractors to enhance fish habitat. Thousands of these trees have been sunk by the Corps and the public since the program began.

The impoundment of Bull Shoals Lake caused environmental changes in the tailwater portion of the White River from the dam to 60 miles downstream. AGFC realized that the cold water discharges from Bull Shoals Lake would necessitate a change in their fisheries management program for the White River as it transformed from a warm water fishery to a cold water fishery. Rainbow trout, cutthroat trout, brook trout, and brown trout were stocked in the White River to replace the warm-water fishery. However, in any given year, various unfavorable environmental factors such as lack of suitable substrate and the fluctuation of water temperatures, dissolved oxygen levels, water levels and current, trout reproduction can be unpredictable and it takes emphasized coordination between many resource agencies to maintain fisheries management.

In 1955, the Norfork National Fish Hatchery was built by the U.S. Fish and Wildlife Service (USFWS) at nearby Norfork Lake to mitigate the loss of the warm water fishery and provide trout for the cold water fishery below Bull Shoals and Norfork Dams. Each year, an average of approximately 1,184,000 rainbow, 105,000 brown trout, 150,000 cutthroat trout, and 34,500 brook trout from the Norfork Hatchery and from the USFWS Fish Hatcheries at Greers Ferry Lake and Mammoth Springs, AR and the Arkansas State Fish Hatchery at Mammoth Springs, AR are stocked in the White River. Since the trout program began, the fishery has flourished and is now known as a “world class trout fishery” and has become a popular international trout fishing destination.

During periods when there is little or no power generation, the water flow in the tailwater area is reduced, resulting in shallow depths and exposed river bottom perimeters. Concerns about the degradation of aquatic habitats for the cold water fishery in the White River due to these exposed areas lead to the implementation of White River Minimum Flows. Section 132(a) of the FY06 EWDAA authorizes and directs the implementation of plan BS-3 at Bull Shoals for minimum flows in order to increase the wetted perimeter of the river and improve the habitat for the cold water fishery. Plan BS-3 reallocates five feet of flood control storage at Bull Shoals Lake for the minimum flows release of 800 cfs. The top of the conservation pool elevation was raised by five feet from 654.0 to 659.0; and the top of the seasonal pool held from May to July for water temperature releases was raised by five feet from 657.0 to 662.0.

Walleye, striped bass, hybrid white-striped bass, and rainbow trout have been introduced into Bull Shoals Lake to add diversity to the fishery. Natural reproduction of striped bass and hybrid white-striped bass does not occur in Bull Shoals Lake and natural production of walleye is

considered minimal. Since 2004, AGFC stocks approximately 200,000 walleye, 300,000 black crappie, 50,000 channel catfish, 45,000 blue catfish, and 20,000 rainbow trout each year. However, AGFC discontinued the stocking of rainbow trout into Bull Shoals Lake in 2014. MDC stocks approximately 352,000 walleye (annually) and 16,000 striped Bass (every other year) in Bull Shoals. While natural reproduction occurs in white crappie, black crappie, largemouth bass, and spotted bass, AGFC and MDC supplement this reproduction by occasional stockings of these species. Historically there have also been introductions of northern pike, blue catfish, lake trout, and threadfin shad.

In 1963, an eight acre fish nursery pond was constructed by AGFC on the west shore of the East Sugar Loaf Creek arm of Bull Shoals Lake for the purpose of rearing game fish for stocking purposes. In 1975, AGFC constructed a net pen fish hatchery in the Pot Shoals Arm of Bull Shoals Lake. Typically over 10,000 Channel and blue catfish were raised in the summer months and 15,000 rainbow trout in the winter months for stocking purposes. In 2007, The AGFC replaced the eight acre nursery pond on East Sugar Loaf Creek with the construction of the larger 21 acre Dr. Ralph Bowers/Tommy Donohoe Bull Shoals Lake Nursery Pond located on the east shore of the West Sugar Loaf Creek arm. This fish nursery pond is used to alternately rear black crappie and walleye for stocking directly into the lake. In 2013, the Pot Shoals net pen operation was discontinued and the facilities permanently closed in 2014 due to the possible spreading of invasive zebra mussels to other bodies of water through the stocking program.

Wildlife

White-tailed deer and eastern wild turkey are common game animals found and hunted in the Bull Shoals Lake area. Black bear have also become common in the area and are hunted on the areas of Bull Shoals Lake located in Arkansas. The principal small game species found in the open upland areas include bobwhite quail, cottontail rabbit, and mourning dove. Gray and fox squirrels are common in upland wooded areas and are also popular for sportsmen. Furbearing animals found in the Bull Shoals Lake area include coyote, red fox, gray fox, otter, mink, muskrat, beaver, bobcat, and raccoon. Habitat management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species and application of prescribed fire do much to benefit these populations.

Birds

The common goldeneye, hooded merganser, and bufflehead are the predominant migratory waterfowl species visiting Bull Shoals Lake. Mallards, gadwall, and other duck species are also present; however, they are only transient visitors as their characteristic feeding habits of obtaining food from shallow waters discourage them from obtaining food from the deep, clear waters of Bull Shoals Lake. Migratory geese common to the area are Canada geese of the Eastern Prairie Population. Giant and Greater Canada geese were introduced to the area by the MDC in 1971 and 1972 and have become established as a resident population. Resident Canada geese are in fact so numerous in many coves and recreation areas that their presence has become a nuisance. Many of the recreation areas on Bull Shoals Lake are closed to camping and opened for Canada goose hunting during the hunting season to help control their population.

Ring-billed gulls are seen frequently around the Bull Shoals area. Greater and lesser yellow legs and large flocks of horned grebes are also seen during their peak migration in the spring and fall.

Bull Shoals Lake is also one of the few places where visitors can see both the turkey vulture and the black vulture at the same time in the winter. In fact, wintering black vulture numbers have become so large, they have become a nuisance to the public and in causing destruction to the infrastructure of Bull Shoals Dam. From 2012 to present day, it is estimated the vultures have done several hundred thousand dollars in damage to the dam, including the roof of the powerhouse and associated facilities. The vultures pick apart anything that resembles rubber and vulture droppings on these facilities are very caustic. Lethal permits were obtained from the USFWS in 2013, 2014, and 2015 when other measures, such as pyrotechnics, noise-making devices, and chemical repellant were all found to be ineffective. The permits are required for compliance with the Migratory Bird Treaty Act of 1918.

Bull Shoals has also become a popular place that visitors come to observe bald eagles, commonly wintering 50 or more birds and hosting 6-8 breeding pairs during the nesting period of March to June.

(2)Vegetative Resources

The area surrounding the lake is mostly forested. Trees and shrubs around the lakeshore include upland oak and hickory species, persimmon, honey locust, hawthorn, dogwood, redbud, coralberry, smooth and winged sumac, and buttonbush. Frequent periods of inundation keep a thin strip of Government owned lands around the lake in early stages of succession. Red cedar and short-leafed pine, the principal evergreens, are dispersed throughout the region and are found in many large, scattered groups. Ground covers consist of green briar, sedge, and native grasses.

Plant communities also include post oak savannas and glades. The post oak savanna ecosystem exhibits an open canopy of low density trees allowing considerable light penetration to the understory. This permits a wide variety of shrubs and/or native grass to perpetuate under natural disturbances such as fire. Dolomite/limestone glades, which are characterized by barrens-like communities of prairie type native forbs and grasses, occur on the shallow soil over outcroppings of bedrock. USACE personnel provide a regular prescribed fire regimen to help to maintain these specialized vegetative ecosystems in the Bull Shoals Lake area.

(3) Threatened and Endangered Species

There are many species in the Ozarks that are considered either threatened or endangered. Species become imperiled for a variety of reasons including over-hunting, over fishing, and habitat loss as a result of human development and pollution; of these, habitat loss is the main contributor that imperils most species. A threatened species is one that is likely to become endangered within the foreseeable future. An endangered species is one in danger of extinction throughout all or a significant portion of its range. The bald eagle (*Halieetus leucocephalus*) is common during the winter months around Bull Shoals Lake. In addition, several bald eagle nests are located around the lake. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles are still protected in accordance with the Bald and Golden Eagle Protection Act. Transient populations of gray and Indiana bats,

federally endangered species, are documented in caves located on and near the Bull Shoals Lake area, as well as populations of the northern long-eared bat which has been proposed for federal listing.

The Tumbling Creek cave snail (*Antrobia culveri*), is a small crustacean known to exist only in the Tumbling Creek Cave and in the karst groundwater system that connects the cave to the springs on Big Creek and Bear Cave Hollow located in the Bull Shoals Lake area in Taney County, Missouri. USACE works closely with the U.S. Fish and Wildlife Service to protect the 100 acres of USACE owned cave recharge area and manage the project lands and waters of Bull Shoals Lake to protect the cave snail and aid in its recovery.

The following species listed in Table 2-1 are from the U.S. Fish and Wildlife Service's federally classified status list of species and the Arkansas and Missouri Natural Heritage data sets which have been reported on project lands. There are other threatened and endangered species that are known to be in the general area.

Table 2-1 Threatened, Endangered, and Species of Concern

Common Name	Scientific Name	Federal/State Status	State/Global Rank
Bald Eagle	*Halieetus leucocephalus*	*Protected under Bald and Golden Eagle Protection Act	
Gray Bat	*Myotis grisescens*	E/E	S3/G3
Indiana Bat	*Myotis sodalis*	E/E	S3/G3
Tumbling Creek cave snail	*Antrobia culveri*	E/E	S2/G3

E = Endangered; **S2**: Imperiled: Imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the nation or state (1,000 to 3,000). Typically 6 to 20 occurrences or few remaining individuals (1,000 to 3,000). **S3**: Vulnerable: Vulnerable in the state either because rare and uncommon, or found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extirpation. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals; **G3**: Vulnerable: Vulnerable globally either because very rare and local throughout its range, found only in a restricted range (even if abundant at some locations), or because of other factors making it vulnerable to extinction or elimination. Typically 21 to 100 occurrences or between 3,000 and 10,000 individuals; **G5**: Secure: Common; widespread and abundant (although it may be rare in parts of its range, particularly on the periphery). Not vulnerable in most of its range. Typically with considerably more than 100 occurrences and more than 10,000 individuals.

(4) Invasive Species

In accordance with Executive Order (EO) 13112, an invasive species means an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species can be microbes, plants, or animals that are non-native to an ecosystem. In contrast, exotic species, as defined by EO 11987, include all plants and animals not naturally occurring, either presently or historically, in any ecosystem of the United States. Invasive species can take over and out compete native species by consuming their food, taking over their territory, and altering the ecosystem in ways that harm native species. Invasive species can be accidentally transported or they can be deliberately introduced because they are thought to be helpful in some way. Invasive species cost local, state, and federal agencies billions of dollars every year.

The Bull Shoals Project is not protected from the spread of invasive species. Locally the project office works with its partners, AGFC, MDC, University of Arkansas Extension Services and United States Department of Agriculture, to help stop the spread of some of the Ozarks most unwanted species. These would include feral hogs (*Sus scrofa),* zebra mussels (*Dreissena polymorpha),* sericea lespedeza (*Lespedeza cuneata*), gypsy moth (*Lymantria dispar*) and the emerald ash borer (*Agrilus planipennis*). Project rangers post signage in all the recreation areas to communicate the dangers of spreading invasive species on project lands and waters. Rangers also place emerald ash borer and gypsy moth traps on project lands to monitor any infestations of this species.

Zebra mussels (*Dreissena polymorpha)* were discovered in 2007 in Bull Shoals Lake and have since reproduced very successfully forming mats on outboard motors, boat hulls, buoys, water intakes, docks, and the lake bottom. Zebra mussels are sharp and can cause minor cuts and abrasions to people who are swimming or wading. Preventative measures have been attempted to keep these invasive species from spreading to other bodies of water by educating boaters to wash and dry their boats and trailers, draining live wells, bilges, and bait containers, and thoroughly cleaning chest waders, before boating or wading at another location.

(5) Ecological Setting

The Natural Resource Management Mission of the U.S. Army Corps of Engineers (ER 1130-2-550, Chapter 2, Paragraph 2-2.a.(1), dated 15 November 1996) states the following:

The Army Corps of Engineers is the steward of the lands and waters at Corps water resources projects. Its Natural Resource Management Mission is to manage and conserve those natural resources, consistent with ecosystem management principles, while providing quality public outdoor recreation experiences to serve the needs of present and future generations.

In all aspects of natural and cultural resources management, the Corps promotes awareness of environmental values and adheres to sound environmental stewardship, protection, compliance and restoration practices.

The Corps manages for long-term public access to, and use of, the natural resources in cooperation with other Federal, State, and local agencies as well as the private sector.

The Corps integrates the management of diverse natural resource components such as fish, wildlife, forests, wetlands, grasslands, soil, air, and water with the provision of public recreation opportunities. The Corps conserves natural resources and provides public recreation opportunities that contribute to the quality of American life. (ER 1130-2-550, 1996)

In support of this mission statement, the following paragraphs describe the ecoregion where Bull Shoals Rock Lake is located and the natural resources components found within the project area.

Ecoregions are areas with generally similar ecosystems and with similar types, qualities, and quantities of environmental resources. Ecoregion boundaries are determined by examining patterns of vegetation, animal life, geology, soils, water quality, climate, and human land use, as well as other living and non-living ecosystem components.

A large area that includes generally similar ecosystems and that has similar types, qualities, and quantities of environmental resources is known as an ecoregion. The purpose of ecological land classification is to provide information for research, assessment, monitoring, and management of ecosystems and ecosystem components. Federal agencies, state agencies, and nongovernmental organizations responsible for different types of resources within the same area use this information to estimate ecosystem productivity, to determine probable responses to land management practices and other ecosystem disturbances, and to address environmental issues over large areas, such as air pollution, forest disease, or threats to biodiversity.

The ecoregion Bull Shoals Lake and surrounding areas fall under is labeled as the Ozark Highlands. This ecoregion is defined as follows:

Location: This region covers a large portion of southern Missouri and northern Arkansas, and small portions of northeastern Oklahoma and southeastern Kansas.

Climate: The ecoregion is on the boundary between mild and severe mid-latitude climates, between humid continental and humid subtropical. It has hot summers and mild to severe winters with no pronounced dry season. The mean annual temperature ranges from approximately 12 degrees Celsius to 15 degrees Celsius and the frost-free period ranges from 140 to 230 days. The mean annual precipitation is 1,101 mm (43.4 inches), ranging from 965 to 1,244 mm (38-49 inches). Some snowfall occurs in winter, but lasts only a few days.

Vegetation: Oak-hickory and oak-hickory-pine forest stands are typical. Some savannas and tallgrass prairies were once common in the vegetation mosaic. Post oak, blackjack oak, black oak, white oak, hickories, shortleaf pine, little bluestem, Indiangrass, big bluestem, eastern red cedar glades are common in the area.

Hydrology: Numerous perennial and intermittent streams flow in the region, of low to moderate gradient, and mostly in a dendritic drainage pattern. There are numerous springs, few lakes, but some sinkhole ponds and several large reservoirs.

Terrain: The terrain here is more irregular in physiography than the adjacent regions, with the exception of the Boston Mountains (8.4.6) to the south. Mostly a dissected limestone plateau, the region has karst features, including caves, springs, and spring-fed streams. There are some steep, rocky hills, with elevations ranging from 80 to 560 meters above m.s.l., and some gently rolling plains. Limestone, chert, sandstone, and shale are common, with some small areas of igneous rocks in the east. Ultisols and Alfisols are typical with mesic and some thermic soil temperature regimes and udic soil moisture regimes.

Wildlife: White-tailed deer, coyote, bobcat, beaver, gray bat, wild turkey, eastern bluebird, bobwhite, warblers, collared lizard, many salamanders, and Ozark cavefish occur in the region.

Land Use/Human Activities: Less than one-fourth of the core of this region has been cleared for pasture and cropland, but half or more of the periphery, while not as agricultural as bordering ecoregions, is in cropland and pasture. Livestock farming of cattle and hogs, poultry production, pasture and hay are common. Lead and zinc mining occurs. Forestry, recreation, rural residential, urban uses also occur. There is some public national forest land. Larger towns and cities include Joplin, Springfield, Rolla, Farmington, Fayetteville, Eminence, Poplar Bluff, West Plains, Tahlequah, Bentonville, Rogers, Springdale, Berryville, Harrison, Mountain Home, and Batesville.

(6) Wetlands

Located within the Salem Plateau of the Ozark Mountains region of northern Arkansas and southern Missouri, the project area is characterized by limestone, dolomite, or chert geology. The many rivers and streams flowing through the region have created a landscape of level highlands dissected by rugged valleys rich in karst features such as caves and sinkholes. Associated with these streams and landscape features are a variety of wetland habitats representative of the five wetland classes occurring within the region. These wetland classes include depressions, flats, fringe, riverine, and slope. It is possible, and perhaps even likely, that all of these classes of wetlands occur in the general area of Bull Shoals Lake. However, those most likely to occur in the area immediately surrounding the lake are fringe (most likely reservoir and connected lacustrine fringe) and slope wetlands (most likely calcareous slope).

More detailed descriptions of these classes, subclasses, and community types can be found at the Arkansas Multi-Agency Wetland Planning Team web site: www.mawpt.org.

i. Utilities

Utilities passing through and providing service on project lands include telephone lines, communication cables, electrical transmission and distribution lines, electrical switchyard, water intake and distribution lines, sewage treatment facilities and pipe lines.

Telephone lines and cables are owned by Centurytel of Monroe, LA, Centurylink of Overland Park, KS, GTE Missouri, Inc of Branson, MO, Yelcot Telephone Co. of Gassville, AR, and North Arkansas Telephone Co. (NATCO) of Flippin, AR.

Communication cables are owned by NATCO of Flippin, AR, MediaCom Communications Corp. of Springfield, MO, MMC Missouri LLC of Springfield, MO, and Teleservices Corporation of America of Mountain Home, AR.

Electrical transmission and distribution lines are owned by White River Valley Electric Cooperative of Branson, MO, Entergy, Inc. of Conway, AR, KAMO Electric Cooperative of Vinita, OK, Northwest Electric Power Cooperative of Cameron, MO, Sho-Me Power Corporation of Marshfield, MO, Central Electric Power Cooperative of Jefferson City, MO, Empire Electric Co. of Forsyth, MO and North Arkansas Electric Cooperative of Salem, AR. Transmission lines and switchyard located below Bull Shoals Dam are owned and operated by the Southwest Power Administration of Tulsa, OK.

The Marion County Regional Water District of Yellville, AR operates a water intake within the reservoir which includes associated structures and distribution pipelines near the City of Bull Shoals. The Ozark Mountain Regional Water Authority of Diamond City, AR operates a water intake within the reservoir which includes associated structures and distribution pipelines near point marker 33 in Boone County, AR. Water distribution pipelines are owned by Baxter-Marion Rural Water Association of Oakland, AR, and the cities of Bull Shoals, AR, Lakeview, AR, Theodosia, MO, Forsyth, MO, Lead Hill, AR, and Diamond City, AR. A wastewater treatment plant located near Theodosia, MO which includes associated structures and pipelines is owned and operated by Villages of Theodosia, MO. Sewage pipelines are owned by the cities of Bull Shoals, AR, Theodosia, MO, Forsyth, MO, Lead Hill, AR and Diamond City, AR.

j. Timber Resources

Timber harvesting and management for the purpose of timber stand improvement, glade restoration, and wildlife enhancement is practiced on Bull Shoals Lake Project lands and is managed by the Corps. Timber management on these lands includes prescribed burning, selective thinning, and timber harvesting to enhance wildlife habitat, control eastern red cedar encroachment, restore dolomite glades, and promote forest health. These activities generate some revenue which are reinvested in the natural resource management operations at Bull Shoals Lake.

k. Paleontology

North central Arkansas and south central Missouri are located on the Salem Plateau. Geologically the plateau is made up of relatively flat-lying Paleozoic age strata consisting of dolostones, sandstones, and limestones. The Ordovician aged Cotter and Jefferson City Dolomite is the primary outcropping formation in the area. Few fossils are known to exist in the Jefferson City Dolomite. Fossils from the Cotter Dolomite are rare but include gastropods, cephalopods, and reef-building algae. The Ordovician aged Powell Dolomite and Everton Formation also outcrop in the general area although to a lesser extent. The Powell Dolomite is not known to contain many fossils, although gastropods, cephalopods and trilobites have been reported. The Everton Formation is also not known to contain many fossils although ostracods, cephalopods, gastropods, bivalves, trilobites and bryozoans are noted.

l. Cultural Resources

A projects' cultural and historic sites/properties are controlled by a project-specific Cultural Resource Management Plan or CRMP. The CRMP contains a series of policies and standard operating procedures that will ensure compliance with appropriate Federal laws and implementing regulations. It develops a plan which identifies planned undertakings and possible impacts requiring cultural resource consultation with the State Historic Preservation Office (SHPO) and Tribal Nations; identifies potential impacts to cultural resources and associated costs (provided separately); and provides a projected schedule for implementation. The CRMP also provides Standard Operating Procedures (SOPs) which may be utilized for the day-to-day management of project requirements, identifies various public consultation requirements and discusses how to incorporate them into the operating project's management activities, and provides management goals which would benefit the operating project's management of its cultural resource responsibilities.

The following is a brief history of the human population of the Bull Shoals Lake area:

Paleo-Indian (12,000-8,000 B.C.) – The earliest documented archeological manifestation in the Ozark area relates to what the Paleo-Indian or Early Hunting Horizon (Klinger, 2013). There is evidence of Paleo-Indian inhabitants in the Ozark Highlands indicated by the presence of Clovis, Cumberland, and Folsom bifaces in isolated instances in Boone and Newton Counties, Arkansas. No Paleo-Indian sites have been excavated in the Ozarks, only surface sites and multi-component shelter sites are present.

Archaic (8,000-500 B.C.) - Around 8,000 years ago, the climate began to change. The Pleistocene epoch gave way to the Holocene. Warmer temperatures, along with increased hunting efficiency, brought about the extinction of the megafauna that the Paleo-Indians had followed. Archaic people relied on the animals and plants that we see today. Settlement patterns were seasonal, with bands of people staying in one area for entire seasons before moving on to the next settlement. From these base camps, hunting parties were sent out, sometimes for days, to kill game. Archaic period hunting camps were abound in the White River area.

Woodland (500 B.C. – A.D. 900) - One major technological change marked the beginning of the Woodland period- pottery. Ceramics had begun to appear during the Archaic period, but their proliferation marked the beginning of the Woodland period. Pottery signified an increasing reliance on domesticated plants. Horticulture had now spread throughout most of the Eastern Woodlands, with the White River area being no exception. The bow and arrow became a part of the tool assemblage, further increasing the efficiency of hunting game. For the most part, however, the Woodland period is very poorly understood in the White River area. Unfortunately, only a few sites containing Woodland period components have been studied.

Mississippian (A.D. 900 – 1541) - The Mississippian period generally marked the transition to full-scale agriculture and a chiefdom level of politics. An influence of religion from Mesoamerica spread rapidly throughout the southeastern U.S. Large mound sites were constructed, elaborate trade networks were established, and populations dramatically increased. Ozark adaptations, however, were unique during the Mississippian period.

Domesticated crops were grown in the river valleys, but hunting and gathering likely made up the bulk of the food supply. Small Mississippian period mound sites did exist in the White River area, such as the Loftin Site, inundated by Table Rock Lake. Other Mississippian sites in the area include open- air village sites and rock shelters. It had been speculated that these communities were "outposts" of the Caddo culture located to the southwest. Recently, however, researchers have demonstrated that these societies simply interacted with one another on a frequent basis, with no evidence of Caddo colonization.

Protohistoric / Historic Periods (A.D. 1541 –1865) - The Protohistoric period began with the De Soto expedition into the Southeastern United States. Generally speaking, De Soto did not enter the Ozarks, but the aftermath of his expedition definitely did enter the area. Diseases the Spaniard and his men brought with them, such as smallpox and influenza, had a devastating effect. The tribes inhabiting the area had no immunity against these diseases, and up to 90 percent of the populations were decimated. During this time period, the Ozarks were primarily being used as a hunting ground for the Osage, who were centered more to the north.

Euro-American settlement began in the Ozarks in the late 18th century. People generally subsisted on a combination of hunting wild game and herding domesticated animals. With the creation of the Arkansas Territory in 1819, people from the upland South, or Appalachia, began to move into the Ozarks. These people brought with them many aspects of their culture, including fundamentalist religion, unique architectural styles, and an aptitude for farming rocky terrain. Although slave holding was not unheard of, it certainly was not the norm. A few major battles, such as Pea Ridge, were fought in the area. Theoretically, the battle of Pea Ridge solidified Union control over southern Missouri. In reality, the entire Ozark region was hostage to Bushwhackers, or outlaws that roamed the land and robbed people indiscriminately.

Previous Investigations in the Bull Shoals Lake Area

The last broad cultural resources inventory for Bull Shoals Lake was conducted in 1988 for the *Cultural Resources Priority Plan for the U.S. Army Engineer District, Little Rock, 1988* (Blakey and Bennet, Jr., 1988). Table 2-2 provides a list of previous surveys performed at Bull Shoals Lake. Only a few minor surveys have been conducted since the project was completed. The table below represents the most up to date survey information according the records of the Arkansas Archeological Survey and the Missouri Department of Natural Resources.

Table 2-2 Previous Archeological Investigations on Bull Shoals Lake

Author	Title	Year
Howard, Lynn E	Archeological Survey in Bull Shoals region of Arkansas	1963
Spears, Carol, Nancy Myer, Hester Davis	Watershed Summary of Archeological and Historic Resources in the White River Basins, Arkansas and Missouri.	1975
Novick, Lee and Charles Cantlry	Bull Shoals Lake: An Archeological Survey of a Portion of Bull Shoals Lake Shoreline.	1979

Recorded Cultural Resources in the Bull Shoals Lake Area

Today, the Bull Shoals Project is home to approximately 138 identified archeological sites made up of camp sites, shelter cave sites, rock cairns, and earthen mound sites. A vast majority of these sites were submerged by impoundment of the White River. Less than five percent of the known sites within the lake area were investigated any further than documentation. Table 2-3 summarizes the previously recorded resources at Bull Shoals Lake.

Table 2-3 Previously Recorded Resources at Bull Shoals Lake

Type of Site	Number of Sites
Historic	4
Prehistoric	114
Multicomponent	20
Total	138
National Register Eligibility Status	
Not Evaluated	132
Not Eligible	5
Eligible	1

m. Interpretation

Interpretative programs at Bull Shoals Lake are aimed at three areas of emphasis: water safety, natural resource, and recreation programs. Water safety remains the main focus for the majority of the interpretive efforts. Park Rangers deliver school programs throughout the spring months

and target children under 16 years of age. Annually in excess of 3,000 contacts are made through these programs. During recreation season, programs are scheduled inside the campgrounds presenting an educational video and a water safety program to the campers. Many programs are presented by trained volunteers to increase program efficiency and preserve manpower. Within the project office a small visitor information center offers information and brochures on a host of recreation and natural resource programs. The information desk is manned by an employee and often a volunteer to assist the visiting public. Thousands of annual contacts occur.

n. Demographics

There are five counties that surround Bull Shoals Lake, three in Arkansas and two in Missouri. Table 2-4 provides a comparative summary of population trends within those five counties that are adjacent to the project area. The total population of those counties in 2010 was 156,467, with the 2013 population estimated at 157,918. The 2013 population represents a -0.70% increase since 2010. During the same time period the United States of America had population increase of 2.33%.

Table 2-4 Population Trends

	Population 2013	Population 2010	Percent Change (2010-2013)
Boone County, AR	37,396	36,903	1.3%
Marion County, AR	16,430	16,653	-1.3%
Baxter County, AR	40,957	41,513	-1.3%
Ozark County, MO	9,560	9,723	-1.7%
Taney County, MO	53,575	51,675	3.7%
Total	157,918	156,467	0.70%
Data from www.census.gov			

Table 2-5 portrays selected housing characteristics related to number of units, median value, vacancy rate and size of household. In 2010 there were a total of 83,672 housing units within the surrounding counties according to the 2010 U.S. Census. Approximately 74% of the housing units are owner occupied, with the average household size being approximately 2.3 people per unit.

As indicated in Table 2-5 the median value of owner-occupied housing in 2010 was $107,620.

Table 2-5 Housing Characteristics, 2010

	Total Housing Units	Percent Owner	Median Value (owner occupied)	Average Household
Boone County, AR	16,831	72.6	106,400	2
Marion County, AR	9,354	79.5	92,700	2
Baxter County, AR	22,580	76.5	120,000	2
Ozark County, MO	5,652	79.1	89,900	2
Taney County, MO	29,255	63.2	129,100	2
Total	83,672	74.1	107,620	2
Data from www.census.gov				

Median household incomes from 2009-2013 was $35,776 in the five counties surrounding Bull Shoals Lake according to the U.S. Census American Community Survey. Almost 22% of the population within those counties was considered to be below the poverty level in 2010 according to the 2010 U.S. Census (Table 2-6). The relative share of the population below the poverty level for the project area is higher than for the State of Arkansas (19.7%), and the State of Missouri (15.9%). Around 84% of the population from the counties surrounding the lake have at least a high school diploma, and 15% have a bachelors degree or higher.

Table 2-6 Income and Education, 2009-2013

	Median Income	Persons Below Poverty	High School Graduates (percent)	Bachelors or
Boone County, AR	38,506	21.2	85.4	1
Marion County, AR	34,494	21.4	83.6	1
Baxter County, AR	35,343	17.7	87.6	1
Ozark County, MO	32,078	25.2	82.8	1
Taney County, MO	38,461	19.9	84.7	1
Total	35,776	21.08	84.7	1
Data from www.census.gov				

According to the 2010 U.S. Census, 3.6% of the population within the project area consisted of demographic minority populations in 2010 as compared to 20% for the State of Arkansas and 16% for the State of Missouri (Table 2-7).

Table 2-7 Population by Race and Origin, 2010

	White	Black	Other	Hispanic or Latino Origin
Boone County, AR	96.5	0.2	.03	1.8
Marion County, AR	95.9	0.2	2.2	1.7
Baxter County, MO	96.9	0.2	1.2	1.7
Ozark County, MO	97.4	0.1	1.2	1.3
Taney County, MO	93.6	0.9	0.7	4.8
Total	97.0	0.3	1.0	2.26
Data from www.census.gov				

o. Recreation Facilities, Activities, and Needs

The recreational opportunities and potential of Bull Shoals Lake is considered to be of great importance to this Ozark Mountain region. The project offers many recreational activities such as swimming, SCUBA diving, boating, water skiing, fishing, picnicking, camping, hunting, hiking, and wildlife viewing. There are 37 public use areas around Bull Shoals Lake. Nine campgrounds and six access points on the lake are operated by the Corps of Engineers. In 2012, a district lead Recreation Adjustment Plan evaluated all the parks on Bull Shoals Lake and for budgetary reasons, leased the camping portion of Dam Site Park and Pontiac Parks. In both cases, the boat ramps continue to be operated and maintained by the Mountain Home Project Office. There are twelve parks and ten access points operated by city, county, or state agencies, marinas, church groups, or schools around the lake..

At the drafting of this final Master Plan, no significant park operational changes are anticipated. Since 1975, parks have been evaluated using an efficiency review process. Those parks chosen for closure for budgetary reasons were offered for lease through standard leasing procedures. Closed parks may be reopened at such time as adequate funding becomes available.

The criteria discussed in this section are of a basic nature to be used for the planning, development, and management of the project with consideration being given to the latest trends in recreational activities and needs. These criteria furnish guidelines for determining the type and number of facilities needed to satisfy the current and projected demand and also furnishes guidelines for serviceability, operation, and maintenance of facilities. Universal accessibility will be included in the design of facilities.

(1) Facility Information

The setting of facilities and development of parks should be of the highest quality, should be safe, and should promote the health, welfare, and aesthetic enjoyment of the public. The setting of each facility should result in the compromise between conservation of the natural environment and providing for public use. Only the most adaptable terrain should be used for setting of overall facilities with consideration given to the natural features so that the most scenic parts of the site may remain undeveloped for the enjoyment of visitors. Facility setting should be in

harmony as much as feasible with the environment in which they are to be placed to avoid excessive grading and clearing for site preparation.

(2) Recreation Areas

Lakeview Park - located approximately two miles northeast of the left abutment of the Bull Shoals Dam, it contains approximately 186 acres. The park is tree covered with mature oak-hickory with a low density of understory. Recreational facilities available include 88 campsites with electrical hookups and 64 of those also with water, one waterborne restroom and two shower buildings, public swim area, two smaller group shelters, beach, boat ramp, playground, amphitheater, and a trailer dump station. The trailhead for Dogwood Trail, a 1.5-mile linear trail, also begins within the boundaries of the park along with a commercial marina.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Rehabilitation and modernization of campsites, upgrading to 50 amp electric service and water at each site.

Highway 125 - Highway 125 Park is located at the northern tip of a large peninsula about four miles north of Peel, Arkansas. It contains approximately 303 acres above the top of the conservation pool and the topography is gentle to rolling with the exception of the west end of the site, which slopes steeply to the lake. Tree cover is scattered. Facilities include a commercial boat dock, a two-lane boat launching ramp, 38 campsites with electrical hookups, water borne restroom and showers, trailer dump station, and a swimming beach.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Construction of new entrance road, relocate shelter and playground, replace vault with waterborne restroom.

Lead Hill - Lead Hill Park is located on a large peninsula between the east and west arms of Sugar Loaf Creek, about three and a half miles north of Lead Hill, Arkansas. It contains approximately 77 acres. The topography of the park is predominantly flat with much of the area located below the 695' top of flood control pool elevation. Facilities include a commercial marina, two doublewide boat launching ramps, 75 campsites with electrical hookups, waterborne restrooms and shower, a trailer dump station, designated swimming area, and two group shelters. This park has two shower houses both located at or near the top of the flood pool.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Redesign and reconstruct entrance complex and gatehouse, replace restroom, raise roadway to marina, improve and replace trees and groundcover.

Tucker Hollow - Located approximately nine miles northwest of Lead Hill, Arkansas. It contains approximately 80 acres above the top of the conservation pool. The site slopes gently to the lake on the east and contains substantial tree cover. Recreational facilities on the site include

a commercial marina, two lane boat launching ramp, two group shelters, an adjacent resort with overnight accommodations, and water borne restroom/showers.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Raise roadway in B section campsite, construct dump station near park entrance.

River Run Park – located on the extreme northwestern end of the lake, directly opposite Forsyth, Missouri. The park contains approximately 164 acres above the top of the conservation pool. All park facilities are susceptible to being flooded when the lake levels rise. The developed area along the lake is flat with tree cover around campsites. Facilities include a two-lane public launching ramp, waterborne restrooms and showers, playground, 32 campsites with electric hookups, and a trailer dump station. The gatehouse was recently replaced with a modular trailer style walk-in style which can be removed during high water events.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Raise roadway near park entrance, replant water tolerant trees in park, install sewer to bathroom, dump station, and park attendant site.

Beaver Creek – Located in the upper reaches of the lake and is approximately two and a half miles south of Kissee Mills, Missouri. It contains 65 acres above the top of the conservation pool. There are improvements in this campground that are subject to flooding when the lake levels rise into the flood pool. The site is relatively flat with little topographic relief. Tree cover is sparse, but established around campsites. Facilities include a commercial marina, two-lane boat launching ramp, group shelter, playground, 35 campsites with electrical hookups, waterborne restroom, showers, and a trailer dump station.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Rehabilitate living areas at campsites and upgrade to 50 amp electric service in 20 of the campgrounds sites.

Buck Creek Park – Situated on the Little Buck Creek arm of the lake, approximately six miles southeast of Protem, Missouri. It contains approximately 68 acres above the top of the conservation pool. The site is rolling to flat with no steep slopes. Tree cover is limited to the upper portions of the site above approximate elevation 690. Facilities include a commercial marina, two double-lane boat launching ramps, group shelter, 36 campsites with electrical hookups, waterborne restroom and showers, vault toilet, trailer dump station, and designated swimming area.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Convert vault toilet to water borne, upgrade campsites in A & B loops to 50 amp electric, improve swim beach and day use shelter.

Theodosia Park – Located approximately one mile east of Theodosia, Missouri, adjacent to the point where U.S. Highway 160 crosses the Little North Fork arm of the lake. The park is 170 acres in size. There are improvements in the campground that were constructed below the top of the flood pool. The developed slopes along the northern portion of the site are void of tree cover. Slopes along the east side are steep. Facilities includes a commercial marina, two –lane boat launching ramp, trailer dump station, group shelter, playground, 34 campsites with 31 having electrical hookups, waterborne restroom and shower house, and designated swimming area.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Relocate two campsites that are currently below the seasonal pool, overlay roads, improve turf and trees that have been killed by flood waters.

Oakland Park - Located on the eastern end of the lake, approximately four miles west of Oakland, Arkansas. Oakland Park contains approximately 76 acres above the top of the conservation pool. Site topography is characterized by rolling hills with relatively level crests. Vegetative cover is sparse. Facilities include a commercial marina, designated swimming area, two-lane boat launching ramp, trailer dump station, waterborne restroom and showers, 32 campsites having electrical hookups and five also having a water hookup, and a group shelter.

***If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards. Future improvements could include the following*:** Upgrade all site to 50 amp electric service, replace vault toilet with water borne facility, complete installation of water to each site.

The following parks are leased to other agencies and government entities. Operational costs and capital improvements are the responsibility of the leasee.

Bull Shoals Park - Is west of the City of Bull Shoals, Arkansas, and, contains about 37 acres. The park was leased to the Bull Shoals Lake Boat Dock, Inc. in 1996 as a result of the Park Operations Efficiency Review (POER). The site slopes gently to the south and west and is moderately well-vegetated. The park is located on steep gradient above a large commercial marina. Recreation facilities provided in the park are picnic and camp units, vault toilet, boat launching ramp, a fishing pier for the disabled and a commercial marina.

Highway K Park - Is approximately 37 acres and is leased to Taney County. The park contains 10 primitive camp sites.

Kissee Mills Park – Is approximately nine acres and is leased to Taney County. The park contains eight primitive camp sites.

Ozark Isle Park - consists of a large island west of Oakland Park. The island is connected to the mainland by a causeway. The park is five miles south of the Arkansas-Missouri state line and ten miles upstream from the Bull Shoals Dam. The total land area contained in the park is 830 acres. Ozark Isle is accessible via Arkansas Highways Nos. 5 and 202 from U.S. Highways

160 on the north and 62 on the south. The island, for the most part, is relatively level and slopes gently to the shoreline on the south and east. Tree cover is fairly heavy on the south and west portions of the site; the northern portion supports only sparse vegetation. The mainland portion of the park is moderately wooded in both oak-hickory and Eastern Red cedar. Surface drainage has created medium washes, dividing the area into two distinct peninsulas, and a gently rounded north-south ridge about 3,000 feet long. Low occupancy of the sites available has been evaluated in recent park efficiency reviews. Sites that have electricity and water available exhibit higher use, but limited funding has reduced opportunities to improve other camp areas within the park. Ozark Isle is a favorite place to hike and observe wildlife, especially the Whitetail deer that take advantage of the prescribed treatment areas on the island. Recreational facilities include 51campsites, of which 14 offer electrical hookups, waterborne restroom and showers, and a two-lane boat launching ramp. This park is leased to Oakland Marina. The marina is responsible for operations and maintenance of the facilities.

Point Return Park - Located approximately one mile east of Bull Shoals, Arkansas, and is approximately 38 acres in size. The park was leased to the City of Bull Shoals in 1996 as a result of the Park Operations Efficiency Review (POER). The park site is gently sloping. Tree cover is extensive except for an open band 100-200 feet wide along the lake. Existing recreational facilities include group shelter, 22 non-electric site campground, vault toilet, boat launching ramp, and a swim area.

Pontiac Park - Located on the eastern shore of the lake, approximately one mile southwest of Pontiac, Missouri. The site contains approximately 85 acres and slopes on the site range from gentle to moderate, with substantial tree cover. Facilities include a commercial marina, two-lane boat launching ramp, cafe, trailer dump station, group shelter, playground, waterborne restroom and showers, vault toilet, and 38 campsites of which 34 have electrical hookups. The main entrance road, boat ramp and parking lot are operated and maintained by the Corps to ensure access to the lake for the public.

Shadow Rock Park - Approximately 54 acres of land leased to the city of Forsyth, Missouri. The Corps, using the old Forsyth City Park as a nucleus, originally developed the area. The park is level and vegetation is sparse. Recreation facilities in the park include a boat launching ramp, picnic units, campgrounds, playground, shuffleboard and tennis courts, a baseball field with floodlights, and a rodeo area.

White River State Park - is leased by Arkansas Department of Parks and Tourism and contains approximately 725 acres in the State Park on the left bank of the lake and on the left bank of the river downstream from the dam. The topography of the park varies from relatively flat hilltops to steep slopes near the lake. Topography is relatively flat near the White River and tree cover is extensive. Facilities provided at the State Park include a commercial boat dock, camping and picnic units, and a boat launching ramp. Access is by way of Arkansas State Highway 178, which passes through the site. In 2002, an additional 100 acres encompassing the Overlook area (right bank above and below the Dam) was leased and a regional visitor information and education center was built. The Jim Gaston Visitor Center is a showpiece for the entire Arkansas State Park System and is a valuable asset to the local communities.

(3) Future Park Development Areas

There are currently no project land areas classified for future park development and none has been added through this Master Plan revision. If future recreation development is needed, development will be accommodated within the existing High Density classified land areas or the reopening of previously closed camping loops within Dam Site Park and Ozark Isle Park where road systems and park facilities have previously occurred.

Engineering and Design Recreational Facility and Customer Service Standards can be referenced in EM 1110-1-400 http://publications.usace.army.mil/publications/eng-manuals/EM_1110-1-400_sec/toc.htm

(4) Zones of Influence

The Bull Shoals Zone of Influence has been determined from visitor surveys to include those counties situated with at least 50 percent of their population within 100 highway miles of the lake. The zone includes counties in Missouri and Arkansas(Figure 2-4), and reservation data for these counties are shown in Table 2-8. This zone represents the area in which approximately 90 percent of the day-use visitors and 85 percent of the overnight visitors to Bull Shoals Lake reside. It has a direct influence upon the use of the lake and its parks. Bull Shoals Lake, its public and commercial facilities, and the scenic qualities of the area are nationally advertised in vacation and sporting publications. The lake is well suited for the types of recreational opportunities for which it is being utilized. Further project development as proposed will not adversely affect the integrity of the resource characteristics. Development plans and management practices will continue to be periodically evaluated to assure proper resource use as well as the validity of planning assumptions utilized in this plan. A number of diverse factors were studied in preparation of this Master Plan. The following is a discussion of those factors influencing planning and management of Bull Shoals Lake.

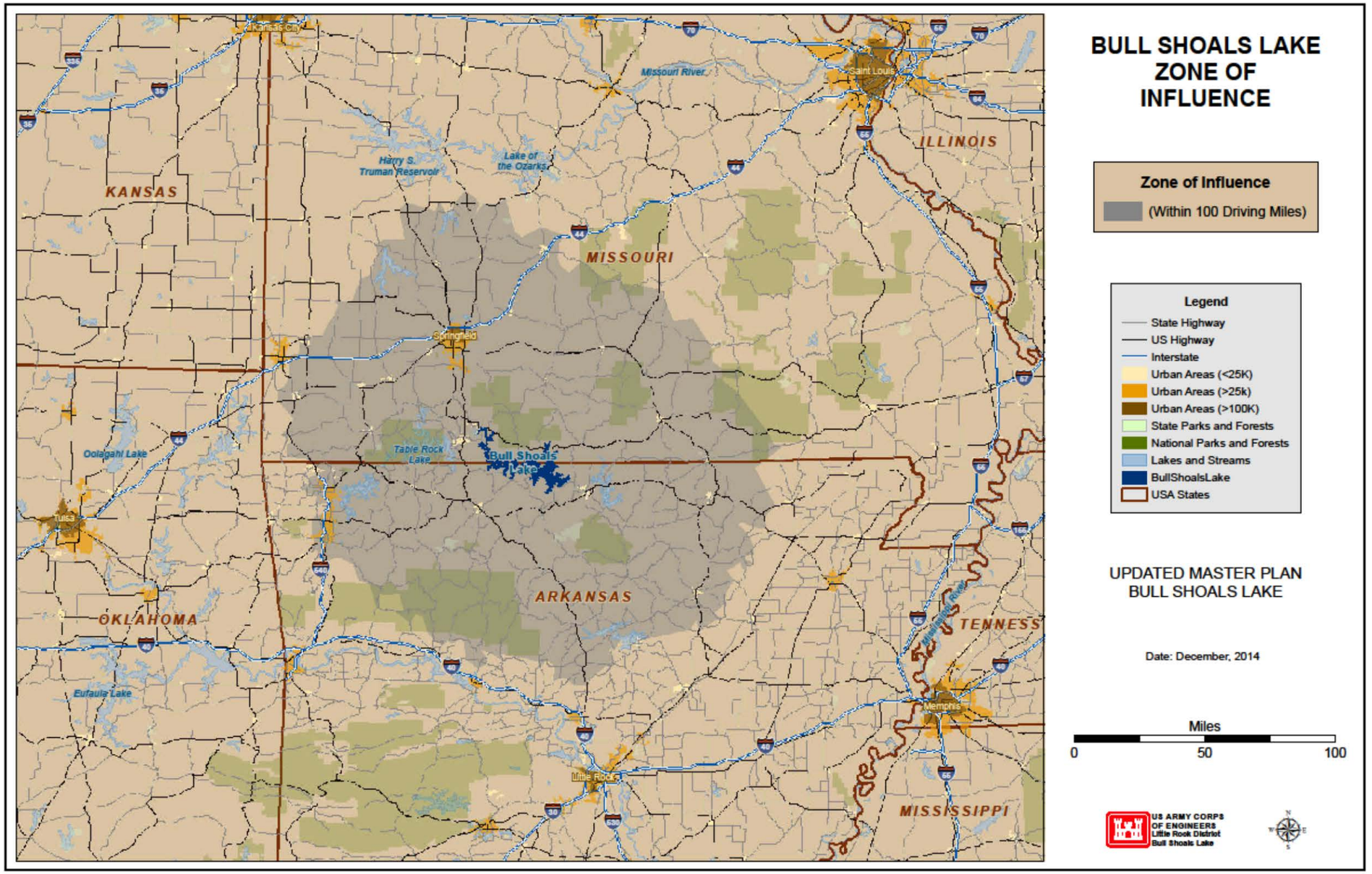


Figure 2-4 Zone of Influence for Bull Shoals Lake

Table 2-8 2014 BULL SHOALS LAKE CORPS OF ENGINEERS
DISTRIBUTION OF CAMPING RESERVATIONS BY COUNTY

County		Reservations	% of Total
Core Markets		**3741**	66.76%
BOONE	AR	1359	24.25%
TANEY	MO	541	9.65%
NEWTON	AR	321	5.73%
MARION	AR	297	5.30%
BAXTER	AR	290	5.17%
CHRISTIAN	MO	276	4.93%
GREENE	MO	184	3.28%
DOUGLAS	MO	177	3.16%
WRIGHT	MO	156	2.78%
WEBSTER	MO	140	2.50%
Primary Markets		**566**	**10.10%**
OZARK	MO	88	1.57%
FRANKLIN	MO	65	1.16%
TEXAS	MO	64	1.14%
SAINT LOUIS	MO	61	1.09%
HOWELL	MO	57	1.02%
SEARCY	AR	54	0.96%
JEFFERSON	MO	52	0.93%
BENTON	AR	43	0.77%
WASHINGTON	AR	43	0.77%
SAINT CHARLES	MO	39	0.70%
Outer Markets		**1297**	**23.14%**
STONE	MO	35	0.62%
JOHNSON	KS	31	0.55%
JACKSON	MO	30	0.54%
CARROLL	AR	29	0.52%
MADISON	IL	24	0.43%
SAINT FRANCOIS	MO	23	0.41%
CRAIGHEAD	AR	22	0.39%
INDEPENDENCE	AR	22	0.39%
STONE	AR	22	0.39%
SHARP	AR	16	0.29%
OTHER		1043	18.61%
Total		**5604**	**100.00%**

(5) Visitation Profiles (OMBIL)

Table 2-9 shows visitation trends as tabulated by Corps personnel and recorded in the Corps' nationwide Operation and Maintenance Business Information Link (OMBIL) database. The methodology used to capture the information in the following table has varied over the period of record shown and should not be relied upon for precise enumeration.

TABLE 2-9
ANNUAL ATTENDANCE FROM 2003-2012

Visitation 2003-2012	
2003	1,737,854
2004	1,707,531
2005	1,482,411
2006	1,528,925
2007	1,555,089
2008	1,191,934
2009	1,301,369
2010	1,430,155
2011	1,120,424
2012	2,556,119

(6) Recreation Analysis

The Statewide Comprehensive Outdoor Recreation Plan (SCORP) is an integral part of capturing the history and popular activities to enhance recreation opportunities in Missouri and Arkansas. The SCORP ties together voices from the users of recreation sites, planners and developers, government officials, agency managers and elected officials. This collaboration effort is in place to lay out a plan to guide recreation development in a useful, beneficial, and sustainable manner.

Arkansas SCORP Data (2014-2018):

Over the past 25 years the top 10 recreational activities that Arkansans prefer hasn't changed substantially. According to a recent survey, jogging or walking for pleasure tops the list, and burgeoning interest in healthy lifestyles helps hold this timeless activity at the top. For driving, recent higher gasoline prices may be one factor that influences driving habits. While this activity did not appear on the recent poll, it is still perceived as a popular way to view and enjoy the beauty of the natural landscape.

Along with walking and driving, other core interests involve access to water (swimming, boating), or common leisure time gatherings (picnics and camping). People often use trails as part of their activities, especially for bicycling, walking, hiking or nature viewing and photography, which makes trails an important type of facility in terms of planning for outdoor recreation. Access to parks, trails and other facilities is primarily through automobiles and roadways. With the interest in driving for pleasure (or total demand increasing with population

growth), and general access by car to most sites, the public roadways are becoming ever more important to the broader functioning of recreational sites and facilities.
For a copy of the entire Arkansas SCORP, it can be found at:
http://www.recpro.org/assets/Library/SCORPs/ar_scorp_2014.pdf

Missouri SCORP Data (2013-2017):

Availability of Outdoor Recreation
Available Activities
Residents are satisfied with the availability of outdoor recreation activities in Missouri overall, and more than a third are very satisfied. They are less satisfied, however, with the availability of organized and supervised outdoor recreation programs and only one in five residents are "very satisfied." In particular, residents who are not satisfied with programs want more opportunities for walking, biking and youth related activities.

Available Facilities
Most Missourians are satisfied with the number and availability of outdoor recreation facilities in the state, but those who are not satisfied want more walking trails, water parks/pools and parks. One in ten Missourians has limited access to sidewalks, and more than half of those residents would use sidewalks if they were available in their neighborhoods. Young Americans nationwide expressed similar desires for sidewalks during President Obama's America's Great Outdoors (AGO) Initiative, suggesting that communities use sidewalks and pathways to link neighborhoods to parks and green spaces. Missouri residents who visit certain types of facilities at least once a year say more of those are needed -- gardens, trails, outdoor swimming pools, camping sites, outdoor aquatic complexes, target shooting sites, ATV/ORV riding areas, outdoor basketball courts, tennis courts and Frisbee golf courses.

Popularity of Outdoor Recreation
Popular Activities
The most popular outdoor recreation activity among Missourians is walking – more than a third of residents walk daily. More than one in five Missourians enjoy daily gardening, wildlife observation/birding and dog walking. Most Missouri residents walk for recreation, join in outdoor family gatherings, drive for sightseeing, visit local parks and garden at least once a year. More than half enjoy picnicking, outdoor swimming, visiting historic/education sites, wildlife observation/birding, fishing and boating at least annually .Walking, bicycling, playing baseball and playing golf are more popular among urban residents while rural Missourians are more likely to be fishing, boating, target shooting, hunting and ATV riding.

Popular Facilities
Walkable streets/sidewalks, local parks, gardens, fishing sites and outdoor swimming pools are the most popular facilities used by Missourians at least monthly. More than one in five residents visit playgrounds, lakes, trails, boat access sites, rivers, picnic areas and historic/education sites at least once a month. Three out of four Missourians use local parks and walkable streets/ sidewalks at least once a year. More than half of Missourians visit historic/education sites, lakes, gardens, picnic areas, and/or state parks annually or more often. A recent national study showed that people place a greater priority on having sidewalks and places

to take walks than on living within walking distance of specific places in a community, such as stores and restaurants. Not surprisingly, urban residents are more likely to use walkable streets/ sidewalks and local parks while rural residents are more likely to use fishing sites, lakes and rivers.
For a copy of the entire Missouri SCORP, it can be found at:
https://recpro.memberclicks.net/assets/Library/SCORPs/mo_scorp_2013.pdf

(7) Recreational Carrying Capacity

Public Use Areas

Table 2-10

Bull Shoals Project Occupancy Percentage				
Park Name	**# of Sites**	**Year 2014**		
		# of Avail Nights	**Occupancy**	**Percent**
BEAVER CREEK	34	7276	1896	26.06%
BUCK CREEK	37	5511	1798	32.63%
HIGHWAY 125	39	8346	3504	41.98%
LAKEVIEW	80	18258	4392	24.06%
LEAD HILL	63	13482	5078	37.67%
OAKLAND	29	4437	1123	25.31%
RIVER RUN	32	4896	1549	31.64%
THEODOSIA	28	3978	1259	31.65%
TUCKER HOLLOW	29	4437	1597	35.99%
Total:	**371**	**70,629**	**22,196**	**31.43%**

Table 2-10 lists the Occupancy percentages for parks that are operated by the Corps of Engineers. The table represents the percent of occupancy for all 365 days of the year. Camping is largely a weekend recreational activity, which is reflected in these percentages. While the perception of occupancy percentage appears low for Bull Shoals, the national average for Corps facilities is at 29%.

p. Real Estate

(1)Acquisition Policy

The Bulls Shoals Dam and Lake project was authorized by the Flood Control Act approved 28 June 1938, (Public Law No. 761, 75th Congress, 3d Session) which was later modified by the Flood Control Act approved 18 August 1941, (Public Law No. 228, 77th Congress, 1st Session) to include authorization of the project for flood control and generation of hydroelectric power. Section 4 of the Flood Control Act approved 22 December 1944, as amended by Section 4 of the

Flood Control Act approved 24 July 1946, as amended by Section 209 of the Flood Control Act approved 3 September 1954 (Public Law No. 780, 83rd Congress), as amended by Section 207 of the Flood Control Act of 1962, as amended by Section 2 of the Land and Water Conservation Fund Act of 1965, and as further amended by Section 210 of the Rivers and Harbors Flood Control Act of 1968, authorized the Department of the Army to provide for recreational use of the lakes under its control.. The real property fee acquisition line for Bull Shoals Lake, as a general rule, was blocked out along regular land subdivision or property ownership lines to include all lands below elevation 695 m.s.l. (mean sea level) or to include the lands required for public access areas. In areas where the acquisition did not encompass lands needed for occasional flooding, flowage easements were typically acquired between the fee acquisition line and elevation 700 ' m.s.l.

(2) Management and Disposal Policy

The Real Estate Management and Disposal program for Bull Shoals is administered by the Little Rock District Real Estate Division in accordance with all applicable laws, regulations, and policies. Real Property Disposal on Bull Shoals Lake is prohibited under Section (8) eight of Public Law 104-52 wherein it states "Notwithstanding any provision of this or any other Act, during the fiscal year ending September 30, 1996, and thereafter, no funds may be obligated or expended in any way for the purpose of the sale, excessing, surplusing, or disposal of lands in the vicinity of Bull Shoals Lake, Arkansas, administered by the Corps of Engineers, Department of the Army, without specific approval of Congress." All other requests for real estate related actions must be received via a written request made to the Bull Shoals Operations Manager, who makes a recommendation through the Little Rock District Chief of Operations to the Chief of Real Estate.

q. Pertinent Public Laws

Application of Public Laws.

Development and management of Federal reservoirs are regulated by a number of statutes and guided by USACE documents. The following sections provide a summary of the relevant policies and Federal statutes.

Recreation

The policies and public laws listed below address development and management of recreational facilities on public lands and are pertinent to the Bull Shoals Lake project.

PL 78-534, Flood Control Act of 1944 (22 December 1944), authorized the Chief of Engineers to provide facilities in reservoir areas for public use, including recreation and conservation of fish and wildlife.

PL 79-526, Flood Control Act of 1946 (24 July 1946), amends PL 78-534 to include authority to grant leases to nonprofit organizations at recreational facilities in reservoir areas at reduced or nominal charges.

PL 83-780, Flood Control Act of 1954 (3 September 1954), further amends PL 78-534 and authorizes the Secretary of the Army to grant leases to Federal, State, or governmental agencies without monetary considerations for use and occupation of land and water areas under the jurisdiction of the Department of the Army for park and recreational purposes when in the public interest.

PL 87-874, Flood Control Act of 1962, broadened the authority under PL 78-534 to include all water resource projects.

Joint Land Acquisition Policy for Reservoir Projects (Federal Register, Volume 27, 22 February 1962) allows the Department of the Army to acquire additional lands necessary for the realization of potential outdoor recreational resources of a reservoir.
PL 88-578, Land and Water Conservation Fund Act of 1965 (1 September 1964), prescribes conditions under which USACE may charge for admission and use of its recreational areas.
PL 89-72, Federal Water Project Recreation Act of 1965 (9 July 1965), requires sharing of financial responsibilities in joint Federal and non-Federal recreational and fish and wildlife resources with no more than half of the cost borne by the Federal Government.
PL 90-480, Architectural Barriers Act of 1968 (12 August 1968), as amended, requires access for persons with disabilities to facilities designed, built, altered, or leased with Federal funds.
PL 101-336, Americans with Disabilities Act of 1990 (ADA) (26 July 1990), as amended by the ADA Amendments Act of 2008 (PL 110-325), prohibits discrimination based on disabilities in, among others, the area of public accommodations and requires reasonable accommodation for persons with disabilities.
PL 102-580, Water Resources Development Act of 1992 (31 October 1992), authorizes the USACE to accept contributions of funds, materials, and services from non-Federal public and private entities to be used in managing recreational facilities and natural resources.
PL 103-66, Omnibus Budget Reconciliation Act–Day Use Fees (10 August 1993), authorized the USACE to collect fees for the use of developed recreational sites and facilities, including campsites, swimming beaches, and boat ramps.
PL 104-333, Omnibus Parks and Public Lands Management Act of 1996 (12 November 1996), created an advisory commission to review the current and anticipated demand for recreational opportunities at lakes and reservoirs managed by the Federal Government and to develop alternatives to enhance the opportunities for such use by the public.

Water Resource Protection and Flood Risk Management

A number of public laws address water resources protection and flood risk management and integration of these goals with other Project purposes such as recreation. The following are pertinent to Bull Shoals Lake.
PL 75-761, *Flood Control Act of 1938* (28 June 1938), authorizes the construction of civil engineering projects such as dams, levees, dikes, and other flood risk management measures through the USACE.
PL 77-228, *Flood Control Act of 1941*(18 August 1941), amended the Flood Control Act of 1938 and appropriated $24M to support construction of multiple-purpose reservoir projects in the White River Basin.
PL 78-534, *Flood Control Act of 1944* (22 December 1944), specifies the rights and interests of the states in water resources development and requires cooperation and consultation with State agencies in planning for flood risk management.
PL 79-14, *Rivers and Harbors Act of 1945* specifies the rights and interests of the states in watershed development and water utilization and control, and the requirements for cooperation with state agencies in planning for flood control and navigation improvements.
PL 85-500, *Water Supply Act of 1958* (3 July 1958), authorizes the USACE to include municipal and industrial water supply storage in multiple-purpose reservoir projects.
PL 87-88, *Federal Water Pollution Control Act Amendments of 1961* (20 July 1961), requires Federal agencies to address the potential for pollution of interstate or navigable waters when planning a reservoir project.

PL 89-80, *Water Resources Planning Act of 1965* (22 July 1965), provides for the optimum development of the Nation's natural resources through coordinated planning of water and related land resources. It provides authority for the establishment of a water resources council and river basin commission.
PL 89-298, *Flood Control Act of 1965* (27 October 1965), authorizes the Secretary of the Army to design and construct navigation, flood risk management, and shore protection projects if the cost of any single project does not exceed $10 million.
PL 92-500, *Federal Water Pollution Control Act (Clean Water Act)* (October 18, 1972) Establishes a national goal of eliminating all discharges into U.S. waters by 1985 and an interim goal of making the waters safe for fish, shellfish, wildlife and people by July 1, 1983. Also provides that in the planning of any Corps reservoir consideration shall be given to inclusion of storage for regulation of streamflow. PL 95-217, Clean Water Act of 1977 (15 December 1977), amends PL 87-88 and requires the Environmental Protection Agency (EPA) to enter into written agreements with the Secretaries of Agriculture, the Army, and the Interior to provide maximum utilization of the laws and programs to maintain water quality.
PL 99-662, *Water Resource Development Act of 1986* (17 November 1986), establishes cost sharing formulas for the construction of harbors, inland waterway transportation, and flood risk management projects.

Fish and Wildlife Resources
A number of public laws address protection and maintenance of fish and wildlife resources. The following are pertinent to the Bull Shoals Lake project:
PL 79-732, Fish and Wildlife Coordination Act (10 March 1934), provides authority for making project lands available for management by interested State agencies for wildlife purposes.
Title 16 U.S. Code (U.S.C.) §§ 668-668a-d, Bald and Golden Eagle Protection Act of 1940 (8 June 1940) as amended, prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles (*Haliaeetus leucocephalus)*, including their nests or eggs.
PL 85-624, Fish and Wildlife Coordination Act (12 August 1958), states that fish and wildlife conservation will receive equal consideration with other project purposes and be coordinated with other features of water resources development programs.
The Federal Water Project Recreation Act of 1965 (PL 89-72) requires consideration of opportunities for fish and wildlife enhancement in planning water resources projects. Non-Federal bodies are encouraged to operate and maintain the project fish and wildlife enhancement facilities. If non-Federal bodies agree in writing to administer the facilities at their expense, the fish and wildlife benefits are included in the project benefits and project cost allocated to fish and wildlife. Fees may be charged by the non-Federal bodies to repay their costs. If non-Federal bodies do not so agree, no facilities for fish and wildlife may be provided.
PL 91-190, National Environmental Policy Act of 1969 (NEPA) (1 January 1970), establishes a broad Federal policy on environmental quality stating that the Federal government will assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings, and preserve important historic, cultural, and natural aspects of our national heritage.
PL 93-205, Conservation, Protection, and Propagation of Endangered Species (28 December 1973), requires that Federal agencies will, in consultation with the U.S. Fish and Wildlife Service (USFWS), further conservation of endangered and threatened species and ensure that

their actions are not likely to jeopardize such species or destroy or modify their critical habitat.
PL 95-632, Endangered Species Act Amendments of 1978 (10 November 1978), specifies a consultation process between Federal agencies and the Secretaries of the Interior, Commerce, or Agriculture for carrying out programs for the conservation of endangered and threatened species.
PL 101-233, North American Wetland Conservation Act (13 December 1989), directs the conservation of North America wetland ecosystems and requires agencies to manage their lands for wetland/waterfowl purposes to the extent consistent with missions.
PL 106-147, Neo-tropical Migratory Bird Conservation Act (20 July 2000) promotes the conservation of habitat for neo-tropical migratory birds.

Forest Resources
The following law pertains to management of forested lands and is pertinent to the Bull Shoals Lake project:
PL 86-717, Conservation of Forest Land Act of 1960 (6 September 1960), provides for the protection of forest cover in reservoir areas and specifies that reservoir areas of projects developed for flood risk management or other purposes that are owned in fee and under the jurisdiction of the Secretary of the Army and the Chief of Engineers will be developed and maintained so as to encourage, promote, and ensure fully adequate and dependable future resources of readily available timber through sustained yield programs, reforestation, and accepted conservation practices.
The stewardship management concept derives primarily from Public Law 86-717, The Forest Cover Act, which was written specifically to address the conservation and management of trust resources at Corps projects. Section 1 of the Act states in part, "…reservoir areas…owned in fee and under the jurisdiction of the Secretary of the Army and Chief of Engineers, shall be developed and maintained so as to encourage, promote, and assure fully adequate and dependable future resources of readily available timber, through sustained yield programs, reforestation, and accepted conservation practices, and to increase the value of such areas for conservation, recreation, and other beneficial uses: Provided, that such development and management shall be accomplished to the extent practicable and compatible with other uses of the project." Section 2 of the Act further states in part that the, "…Chief of Engineers, under the supervision of the Secretary of the Army, shall provide for the protection and development of forest or other vegetative cover and the establishment and maintenance of other conservation measures on reservoir areas under his jurisdiction, so as to yield the maximum benefit and otherwise improve such areas."

Cultural Resources
A number of public laws mandate protection of cultural resources on public lands. The following are pertinent to USACE project lands at the Bull Shoals Lake project:
PL 59-209, Antiquities Act of 1906 (8 June 1906), applies to the appropriation or destruction of antiquities on federally owned or controlled lands and has served as the precedent for subsequent legislation.
PL 74-292, Historic Sites Act of 1935 (21 August 1935), declares that it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States.

PL 86-523, Reservoir Salvage Act of 1960 (27 June 1960), provides for the preservation of historical and archaeological data that might otherwise be lost as the result of the construction of a dam and attendant facilities and activities.
PL 89-665, National Historic Preservation Act of 1966 (NHPA) (15 October 1966), establishes a national policy of preserving, restoring, and maintaining cultural resources. It requires Federal agencies to take into account the effect an action may have on sites that may be eligible for inclusion on the National Register of Historic Places.
PL 93-291, Archaeological and Historic Preservation Act of 1974 (24 May 1974), amends PL 86-523 and provides for the Secretary of Interior to coordinate all Federal survey and recovery activities authorized under this expansion of the Reservoir Salvage Act of 1960. The Federal construction agency may expend up to 1 percent of project funds on cultural resource surveys.
PL 96-95, Archaeological Resources Protection Act of 1979 (31 October 1979), updates PL 59-209 and protects archaeological resources and sites on public lands and fosters increased cooperation and exchange of information among governmental authorities, the professional archaeological community, and private individuals.
PL 101-601, Native American Graves Protection and Repatriation Act (16 November 1990), requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.

Leases, Easements, and Rights-of-Way
A number of laws and regulations govern the granting of leases, easements, and rights-of-way on Federal lands. The following are pertinent to USACE project lands at the Bull Shoals Lake project:
16 U.S.C. § 663, Impoundment or Diversion of Waters (10 March 1934), for wildlife resources management in accordance with the approved general plan.
10 U.S.C. § 2667, Leases: Non-excess Property of Military Departments and Defense Agencies (10 August 1956), authorizes the lease of land at water resource projects for any commercial or private purpose not inconsistent with other authorized project purposes.
U.S.C. Titles 10, 16, 30, 32, and 43 address easements and licenses for project lands;
16 U.S.C. § 460d authorizes use of public lands for any public purpose, including fish and wildlife, if it is in the public interest.
16 U.S.C. §§ 470h-3, Lease or Exchange of Historic Property (15 October 1966), for historic properties.
PL 91-646, Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (2 January 1971), establishes a uniform policy for fair and equitable treatment of persons displaced as a result of Federal or federally assisted programs.
PL 94-579, Federal Land Policy and Management Act of 1976 (21 October 1976) establishes a policy that the Federal Government receive fair market value for the use of the public lands and their resources unless otherwise provided for by statute. Provides for the inventory of public land and land use planning. It also establishes the extent to which the executive branch may withdraw lands without legislative action.

Chapter 3 Goals and Objectives

a. The Bull Shoals Lake Master Plan Vision Statement

The Bull Shoals Master Plan Revision Project Delivery Team (PDT) developed the following vision statement to help guide the process of revising the Bull Shoals Lake Master Plan:

"Conserve the natural, cultural, and community resources in a sustainable manner to provide benefits for future generations."

b. Policy and Master Plan Revision Schedule

Recreation and natural resource management policy and guidance are set forth in Corps regulations ER and EP 1130-2-550 and EP 1130-2-540. Included in these guidance documents is the process by which Master Plans are revised as well as broadly stated management principles for recreation facilities and programs, and stewardship of natural and cultural resources. Of particular importance in the formulation of recreation goals and objectives are the policies governing the granting of park and recreation and commercial concession leases (outgrants) which dictate that such outgrants must serve recreational needs and opportunities created by the project and are dependent on the project's natural or other resources. Other important guidance for management of all resources is the policy governing non-recreational outgrants such as utility easements as well as the guidance in ER and EP 1130-2-540 to adhere to ecosystem management principles.

The Bull Shoals Lake Master Plan Revision began in April 2014 and the process was divided by the Project Delivery Team (PDT) into five phases:

Assumptions: unlimited resources (i.e. contracting), this master plan revision is everyone's 1st priority, shoreline moratorium implemented.

A. **Phase 1** – Initiate Master Plan Revision Process. (April – December 2014)

1. Internal PDT coordination.
    a. Educate PDT/District Leadership/Vertical Team on Master Plans and proposed process
    b. Develop Project Management Plan (PMP) and update as needed
    c. Assign PDT Roles/Responsibilities and begin developing background information, outline/format and Geographic Information System (GIS) database and Mapping needs.
    d. Id and engage Vertical Team. Develop appropriate reveiw schedule.
2. Scope and evaluate National Environmental Policy Act (NEPA) requirements (Environmental Assessment/Environmental Impact Statement/Categorical Exclusion) and develop/approve sequence and timing of implementation. Incorporate decisions into PMP.
3. Develop Communication Plan. Incorporate into PMP.

a. Email/mailing distribution list—options for contracting if we send a general initiation postcard out. Email is preferred method for distribution for updates.
b. Web page (coordination of info among PDT, reviewed and posted by Public Affairs Office)
c. Other Social Media (FB, Twitter, other?)—District has FB page; PAO can add project specific new releases and MP updates to this page
d. News release and newsletter (by mail, computer and direct distribution).
e. Correspondence to agency partners, stakeholders and political interests.

4. Data Inventory. Do we have data to comfortably put together a revision (see layout above).
    a. ID additional data needed or required
        i. Market analysis
5. Scoping Workshops
    a. Educate public on what a master plan is (it is not a Shoreline Management Plan or Operation Management Plan)—30,000 ft view. Include this information in public notices about scoping workshops, on website page, on any social media
    b. Agency, Partner, Stakeholder scoping workshops.
    c. Conduct public orientation/input/scoping workshops.
6. Public Comment period. Collect comments. Comment analysis—develop scoping report.

B. Phase 2 – Develop Draft Master Plan. (January-June 2015)

1. Initiate Chapter Development (can start on Chp 1 and Chp 2 now—existing conditions—this will be concurrent with Phase 1 activities)
2. Scoping Report—take information from this and 'digest'—what
2. Formulate Chapter 3, 4, 5
3. District Quality Control draft document
4. Conduct In Progress Reviews (IPR) with Vertical Team.
5. News release and newsletter about draft Master Plan public review and input.
6. Correspondence to key partners and political interests explaining draft MP with their comments from scoping.
7. Conduct agency workshop(s) explaining draft MP with their comments from scoping.
8. Conduct Partners and stakeholders workshop(s) explaining draft MP with their comments from scoping.
9. Conduct public workshop(s) explaining draft MP with their comments from scoping.

C. Phase 3 – Develop Final Master Plan. (July-September 2015)

1. Address Vertical Team and DQC comments.
2. Address agency, partner, stakeholder and public comments.

3. Conduct agency/partner/stakeholder workshops explaining final MP and what happens next.
4. Conduct public workshops explaining final MP and what happens next.

D. **Phase 4** – Receive approval of Final Master Plan.(October-November 2015)
1. Coordinate plan internally for approval.
2. Send out correspondence to key partners/stakeholders and political interests about final plan approval.
3. Do news releases/newsletter about final plan approval—also explain what happens next.
4. Distribute hard copies and/or CD's of approved Master Plan Update to appropriate offices, partners and stakeholders. Make approved plan available at Corps websites.

E. **Phase 5**—Implement Final Master Plan (December 2015)
1. Supplements as necessary.
2. Plan for next revision in 2018.

c. Goals and Objectives

(1) Goals

The terms "goal" and "objective" are often defined as synonymous, but in the context of this Master Plan, goals express the overall desired end state of the Master Plan whereas resource objectives are the specific task-oriented actions necessary to achieve the overall Master Plan goals.

The following excerpt from EP 1130-2-550, Chapter 3, express the goals for the Bull Shoals Lake Master Plan.

GOAL A. Provide the best management practices to respond to regional needs, resource capabilities and suitabilities, and expressed public interests consistent with authorized project purposes.

GOAL B. Protect and manage project natural and cultural resources through sustainable environmental stewardship programs.

GOAL C. Provide public outdoor recreation opportunities that support project purposes and public demands created by the project itself while sustaining project natural resources.

GOAL D. Recognize the particular qualities, characteristics, and potentials of the project.

GOAL E. Provide consistency and compatibility with national objectives and other State and regional goals and programs.

(2) Objectives

Resource objectives are defined as clearly written statements that respond to identified issues and that specify measurable and attainable activities for resource development and/or management of the lands and waters under the jurisdiction of the Little Rock District, Bull Shoals Lake Project Office. The objectives stated in this Master Plan support the goals of the Master Plan, Environmental Operating Principles (EOPs), and applicable national performance measures. They are consistent with authorized project purposes, Federal laws and directives, regional needs, resource capabilities, and take public input into consideration. Recreational and natural resources carrying capacities are also accounted for during development of the objectives found

in this Master Plan. Both the Missouri and Arkansas State Comprehensive Outdoor Recreation Plans (SCORP) were considered as well. The objectives in this Master Plan to the best extent possible aim to maximize project benefits, meet public needs, and foster environmental sustainability for Bull Shoals Lake.

Recreational Objectives

- Evaluate the demand for improved recreation facilities and increased public access on Corps-managed public lands and water for recreational activities (i.e. camping, walking, hiking, biking, boating, hunting, fishing, wildlife viewing, etc.) and facilities (i.e. campsites, picnic facilities, overlooks, all types of trails, boat ramps, courtesy docks, interpretive signs/exhibits, and parking lots). Goal A, C
- Monitor current public use levels (i.e. with a special focus on boating use and trends) and evaluate impacts from overuse and crowding. Take action to prevent overuse, conflict, and public safety concerns. Goal A, C
- Provide a unique natural resource and aesthetic based recreation experience within the White River watershed projects. Goal A, B, C, D
- Evaluate recreational use zoning and regulations for natural resource protection, quality recreational opportunities, and public safety concerns. Goal A
- Follow the Environmental Operating Principles associated with recreational use of waterways for all water-based management activities and plans. Goal B, C, E
- Increase universally accessible facilities on Bull Shoals Lake. Goal A, C, E
- Evaluate need for commercial facilities on public lands and waters. Goal A, C
- Consider flood/conservation pool to address potential impact to recreational facilities (i.e. campsites, docks, etc.); Note that water level management is not within the scope of the Master Plan. Goal A, B, C, D
- Ensure consistency with USACE Recreation Strategic Plan. Goal E
- Reference the Missouri Statewide Comprehensive Outdoor Recreation Plan (SCORP) and the Arkansas Statewide Comprehensive Outdoor Recreation Plan to ensure consistency in achieving recreation goals. Goal E

Natural Resource Management Objectives

- Consider flood/conservation pool levels to optimize habitat conditions, as long as there is no interference with the Project's other authorized purposes, i.e. flood risk management and hydroelectric power generation. Note that water level management is not within the scope of the Master Plan. Goal A, B, D
- Actively manage and conserve forest, fish, and wildlife resources, special status species, by implementing ecosystem management principles and best management practices to ensure sustainability and enhance biodiversity. Goal A, B, D, E
- Consider watershed approach during decision-making process. Goal E
- Optimize resources, labor, funds, and partnerships for protection and restoration of fish and wildlife habitats. Goal B, E
- Optimize resources, labor, funds, and partnerships for the management and prevention of invasive species in Bull Shoals Lake. Goal B.

- Minimize development on Federal lands to preserve the scenic beauty and aesthetics of the project. Goal A, B, C, D
- Continually evaluate erosion control and sedimentation issues at Bull Shoals Lake. Goal A, B, E
- Identify and protect unique or sensitive habitat areas. Goal A, B, D, E
- Stop unauthorized uses of public lands such as agricultural trespass, timber theft, unpermitted docks and other structures, clearing of vegetation, unauthorized roadways, off-road vehicle (ORV) use, trash dumping, and placement of advertising signs that create negative environmental impacts. Goal A, B, C, D, E
- Promote forest health through timber resource management actions to create a diverse and sustainable suite of forest habitats. Goal A, B, D
- Evaluate and determine appropriate non-statutory mitigation for adverse environmental impact actions. Goal A and B
- Enhance aquatic habitat and associated fisheries management improvement projects. Goal A, B, C, D
- Identify, restore, and manage ecological land types. Goal A, B, D, E

Environmental Compliance Objectives

- Manage project lands and water to sustain healthy fish and wildlife populations and habitat conditions and avoid negative effects to public water supply, ensuring public health and safety. Goal A, B, C, D, E
- Consider both point and non-point sources of water quality problems during decision making. Goal A, B, D, E
- Improve coordination, communication, and cooperation between regulating agencies and non-governmental organizations to resolve and/or mitigate environmental problems. Goal A, B, D, E
- Ensure compliance with Environmental Review Guide for Operations (ERGO) at all Bull Shoals Lake facilities. Goal A, B, E
- Eliminate PODSS (Privately Owned Domestic Sewer Systems) on Federal lands. Goal A and B

Visitor Information, Education, and Outreach Objectives

- Provide more opportunities (i.e. town hall meetings) for communication between agencies, special interest groups, and the general public. Goal A, D, E
- Implement more educational and outreach programs on the lake. Topics to include Project operations, water quality, history, cultural resources, water safety, recreation, nature, and ecology. Goal A, B, C, D, E
- Establish a network among local, state, and federal agencies concerning the exchange of lake-related information for public education and management purposes. Goal A, D, E
- Increase public awareness of special use permits or other authorizations required for special activities, organized special events, and commercial activities on public lands and waters of the lake. Goal A, B, C

- Capture trends concerning boating accidents and other incidents on public lands and waters and coordinate data collection with other public safety officials. Goal A, C, D, E
- Promote Corps Water Safety message. Goal A, C, D, E
- Educate adjacent landowners on public land and shoreline use policies. Goal A, B, C, D, E
- Continue to educate public on White River Control Plan and White River Minimum Flows and associated impacts to the surrounding communities. Goal A, C, D, E
- Educate the public on what is a Master Plan, Operational Management Plan, Shoreline Management Plan and associated other plans. Goal A, C, D, E

Economic Impacts Objectives

- Balance economic and environmental interests involving Bull Shoals Lake. Goal A, B, C, D, E
- Evaluate the type and extent of additional commercial development that is compatible with national Corps policy on both recreation and non-recreational outgrants and that may be sustained on public lands classified for High Density Recreation. Goal A, B, C, D, E
- Work with local communities to promote tourism and recreational use of the lake. Goal A, B, C, D, E

General Management Objectives

- Maintain the public lands boundary lines to ensure it is clearly marked and recognized in all areas. Goal A, B, D
- Secure sustainable funding for the environmental stewardship program. Goal A, B, C, D, E
- Ensure consistency with USACE Campaign Plan (national level), Implementation Plan (regional level), Operations Plan (District level). Goal E
- Adapt to funding level changes in future years. Goal E
- Ensure consistency with Executive Order 13148, 'Greening the Government Through Leadership in Environmental Management' (21 April 2000). Goal E
- Ensure consistency with Executive Orders 13423 and 13514, 'Strengthening Federal Environmental, Energy, and Transportation Management' (24 January 2007) and 'Federal Leadership in Environmental, Energy, and Economic Performance' (5 October 2009), respectively, to guarantee compliance with Leadership in Energy and Environmental Design (LEED) criteria for government facilities. Goal E
- Evaluate non-recreation outgrant requests, such as utility easements, in accordance with national guidance set forth in ER 1130-2-550. Manger and administer outgrants in accordance with national guidance set forth in ER 405-1-12. Goal A, B, D, E

Cultural Resources Management Objectives

- Monitor and better coordinate lake development and the protection of cultural resources with State Historic Preservation Offices and federally recognized Tribes. Goal A, B, D, E
- Inventory cultural resources on the project. Goal A, B, D, E

- Increase public awareness and education of regional history. Goal B, D, E
- Maintain compliance with Section 106 and 110 of the National Historic Preservation Act; the Archeological Resources Protection Act; and the Native American Graves Protection and Repatriation Act on public lands surrounding the lake. Goal B, D, E
- Prevent unauthorized or illegal excavation and removal of cultural resources on project lands. Goal B, D, E

Chapter 4 Land Allocations, Land Classifications, Water Surface Classifications, and Project Easement Lands

a. Introduction

Bull Shoals Lake is a multipurpose project constructed primarily for flood control and generation of hydroelectric power. Recreation is a third project purpose resulting primarily from the impoundment of water and the presence of public land. Management of recreational resources must not conflict with the regulation of the lake for the two primary purposes for which it was authorized. Environmental stewardship of project lands and waters is also an important project purpose and must be taken into consideration in all project management activities. The principal concept in planning Bull Shoals Lake was for public use and benefit. This concept has been implemented, and first among priorities for public use are stringent standards for public health, safety and sanitation. The Resource Plan in Chapter 5 considers these standards in land use classification and in planning for the recreational activities and stewardship of the lands and waters associated with the project.

To provide the greatest possible recreational/outdoor experience, safeguards have been implemented over the use of Government-owned land adjacent to the lakeshore. At Bull Shoals Lake, much of the shoreline is being retained in its rugged, natural state. Forest management practices are implemented to maintain existing vegetation in a healthy state while juvenile plant material is being planted to revegetate open spaces.

Ownership of land adjacent to Government-owned land does not convey any rights to the adjacent landowner(s) that would allow private and exclusive access to the lake across Government-owned land. To satisfy public demand for access to the lake, access roads and docks of quasi-public nature are permitted provided that the nature and extent of these facilities satisfy a valid public need that is in harmony with the overall development of the lake and not in conflict with management practices as determined by the District Engineer.

The existing lands required for project operation purposes and recreation have been indicated on land classification Plates. The lands described in the various designations throughout the lake are very similar in general characteristics of soil, topography, and vegetative cover typical of the foothills of the Ozark Mountains.

Project land and water total 104,573.7 acres. There is an additional 12.9 acres of flowage easement lands. The easement lands lie above or landward of the fee acquisition line but below the 700 elevation and are indicated by the purple color on the land classification maps.

All lands in the Bull Shoals Lake project are classified as project operations lands acquired and allocated to provide for safe, efficient operation of the project. Project operations lands reserved for recreational purposes and lands reserved for preservation of natural resources are indicated by color coding on the land classification maps. Land use allocations are discussed as follows.

b. Land Allocations

Lands are allocated by their congressionally authorized purposes for which the project lands were acquired. There are four land allocation categories applicable to Corps projects:

(1) Operations. These are the lands acquired for the congressionally authorized purpose of constructing and operating the project. Most project lands are included in this allocation.

(2) Recreation. These lands were acquired specifically for the congressionally authorized purpose of recreation. These lands are referred to as separable recreation lands. Lands in this allocation can only be given a land classification of "Recreation".

(3) Fish and Wildlife. These lands were acquired specifically for the congressionally authorized purpose of fish and wildlife management. These lands are referred to as separable fish and wildlife lands. Lands in this allocation can only be given a land classification of "Wildlife Management".

(4) Mitigation. These lands were acquired specifically for the congressionally authorized purpose of offsetting losses associated with development of the project. These lands are referred to as separable mitigation lands. Lands in this allocation can only be given a land classification of "Mitigation".

c. Land Classifications

Land classification designates the primary use for which project lands are managed. Project lands are zoned for development and resource management consistent with authorized project purposes and the provisions of the National Environmental Policy Act (NEPA) and other Federal laws.

(1) Project Operations. This category includes those lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas that are used solely for the operation of the project.

Current acreage: 61.8 acres

(2) High Density Recreation. Lands developed for intensive recreational activities for the visiting public including day use areas and/or campgrounds. These could include areas for concessions (marinas, comprehensive resorts, etc), and quasi-public development.

Current acreage: 8,310.9 acres

(3) Mitigation. This classification will only be used for lands with an allocation of Mitigation and that were acquired specifically for the purposes of offsetting losses associated with development of the project.

(4) Environmentally Sensitive Areas. Areas where scientific, ecological, cultural or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act or applicable State statues. These areas must be considered by management to

ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands. No agricultural or grazing uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration. These areas are typically distinct parcels located within another, and perhaps larger, land classification, area.

Current acreage: 11,895.8 acres (*from 1975 plan, this area was called 'Natural Areas')

(5) Multiple Resource Management Lands. This classification allows for the designation of a predominate use as described below, with the understanding that other compatible uses described below may also occur on these lands. (e.g. a trail through an area designated as Wildlife Management.) Land classification maps must reflect the predominant sub-classification, rather than just Multiple Resource Management.

(a) Low Density Recreation. Lands with minimal development or infrastructure that support passive public recreational use (e.g. primitive camping, fishing, hunting, trails, wildlife viewing, etc.)

Current acreage: 31,957.3 acres

(b) Wildlife Management. Lands designated for stewardship of fish and wildlife resources.

Current acreage: 3,953.5 acres

(c) Vegetative Management. Lands designated for stewardship of forest, prairie, and other native vegetative cover.

(d) Future/ Inactive Recreation Areas. Areas with site characteristics compatible with potential future recreational development or recreation areas that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources.

d. Water Surface Classifications

If the project administers a surface water zoning program, then it should be included in the Master Plan.

(a) Restricted. Water areas restricted for project operations, safety, and security purposes.

Current acreage: 73 water surface acres

(b) Designated No-Wake. To protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety.

(c) Fish and Wildlife Sanctuary. Annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning.

(d) Open Recreation. Those waters available for year round or seasonal water-based recreational use.

Current acreage: 48,225.5 water surface acres

e. Project Easement Lands

All lands for which the Corps holds an easement interest, but not a fee title. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement estate acquired for the project. Easements were acquired for specific purposes and do not convey the same rights or ownership to the Corps as other lands.

(1) Operations Easement. The Corps retains rights to these lands necessary for project operations.

(2) Flowage Easement. The Corps retains the right to inundate these lands for project operations.

(3) Conservation Easement. The Corps retains rights to lands for aesthetic, recreation and environmental benefits.

Chapter 5 Resource Plan

This chapter describes *in broad terms* how project lands and water surface will be managed. It is reflective of the Corps preferred alternative, Alternative 2 Moderate Conservation. For Bull Shoals Lake, the PDT chose the Management by Classification approach as set forth in EP 1130-2-550.

A brief description for each alternative is as follows (a more detailed description is provided in the accompanying Environmental Assessment, Appendix A to this document). Each land classification provides a justification paragraph that outlines the methodology used in developing Alternative 2 Moderate Conservation.

Table 5-1 Comparison of Land Classifications by Alternative

Land Classification	Alternative 1 – No Action		Alternative 2 (Preferred)– Moderate Conservation		Alternative 3 – Limited Development		Alternative 4 – Maximum Conservation	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
High Density	8,310.9	15%	3,714.6	7%	3,480.3	6%	3,714.6	7%
Low Density	31,957.2	57%	7,257.6	13%	11,915.8	21%	0.0	0%
Environmentally Sensitive	11,895.7	21%	29,366.9	52%	25,190.9	45%	36,624.3	65%
Project Operations	61.8	< 1%	91.8	< 1%	91.8	< 1%	91.8	< 1%
Wildlife Management	3,953.5	7%	15,917.3	28%	15,669.4	28%	15,917.3	28%
Not Allocated	169.0	< 1%	0.0	0%	0.0	0%	0.0	0%

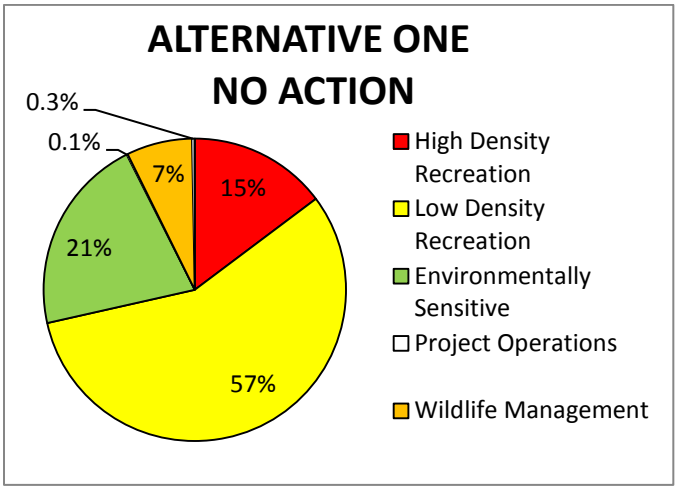
- Alternative 1 = 423 miles of shoreline in Low Density
- Alternative 2 = 142 miles of shoreline in Low Density
- Alternative 3 = 210 miles of shoreline in Low Density
- Alternative 4 = 0 miles of shoreline in Low Density (all LD from Alt 2 goes to Environmentally Sensitive Area)
- In Alternative 3 there is an extra 4,659 acres of Low Density that allows for more recreation opportunity that is not present in Alternative 2.
- Both Alternative 2 & 3 show significant increase for preservation of the lake's natural setting over Alternative 1.

Alternative 1 – No Action

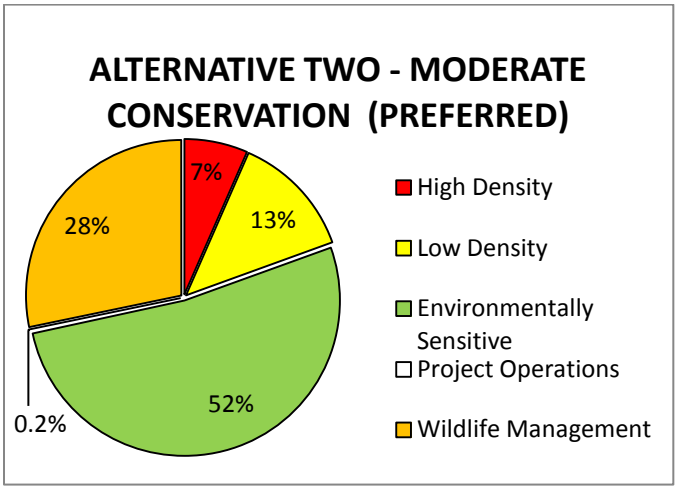
Under the No Action Alternative, the 1975 Master Plan land use classifications will remain the same and none of the 56,348 acres of land around the lake will be reclassified. This alternative

has the potential to allow for increased land and water based impacts within the Low Density land classification.

Current land classifications do not accurately reflect the land use activities or resource management of the lake. In addition, this alternative does not address resource management laws, policies, and regulations that were implemented after the 1975 Bull Shoals Lake Master Plan.

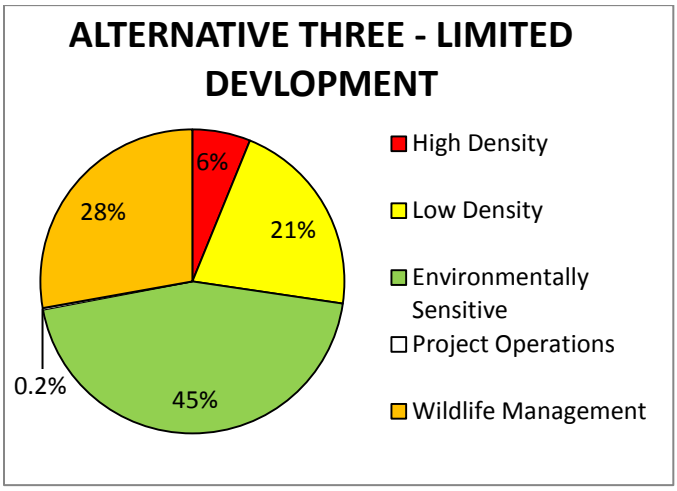


Alternative 2 – Moderate Conservation (Preferred Alternative)
Under Alternative 2, the land classifications were mapped to reflect current land and resource management practices and in response to agency and public comments received during the Scoping phase. Changes included reclassifying undeveloped High Density land classifications (i.e. future/closed Corps parks) to other land classifications; reclassifying undeveloped Low Density land to Wildlife Management, Project Operations, or Environmentally Sensitive Area; reclassifying lands that contained active shoreline use permits to Low Density.



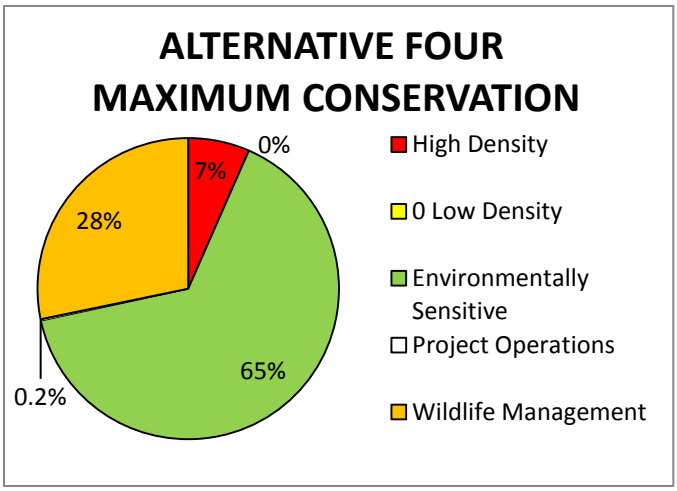
Alternative 3 – Limited Development

Under Alternative 3, this alternative is similar to alternative 2 but includes classifying more lands that contained roads, utility lines, and shoreline use permits to a Low Density land classification. Many future Corps parks were reclassified from High Density to predominantly Low Density land classification.



Alternative 4 – Maximum Conservation

Alternative 4 will reclassify all Low Density Recreation lands from Alternative 2 to Environmentally Sensitive Areas. Existing permitted shoreline uses would be grandfathered but there would be no new shoreline use permits issued.



Classification and Justification

The PDT made general assumptions during the land classification process. Those assumptions include:

- All valid boat dock permits would be located in the Low Density land classification;
- The 200 ft. access rule in the current Bull Shoals Lake Shoreline Management Plan would remain the same;
- The six physical criteria for placing a boat dock on Bull Shoals Lake would remain the same (200 ft., water depth, lateral spacing, 1/3 cove rule, parking availability, and legal access to shoreline);
- Past classification lines, legal access point to the Limited Development Area, edges of zoning and shoreline use permits, Corps boundary monuments and corners, and terrain such as drainage inlets were used as boundaries between classifications;

In addition, the PDT considered what the land classification was before (from the 1975 master plan),the feasibility of keeping or changing the land classification with the master plan revision, potential future development needs around the lake, and all agency and public scoping comments received during the public comment period during the Scoping Phase.

Project Operations land classification includes those lands required for the dam, spillway, switchyard, levees, dikes, offices, maintenance facilities, and other areas that are used solely for the operation of the project.

Justification: On Bull Shoals Lake, the lands classified as Project Operations have been classified by definition. Areas adjacent to the dam and powerhouse were reclassified from High Density and No Allocation to Project Operations. Water intake sites were reclassified to Project Operations.

Resource Objectives: General Management
(Acreage = 91.8 acres or > 1% of Corps land)

High Density Recreation land classification is for those lands intended to be developed or are currently developed for intensive recreational activities for the visiting public including day use areas and/or campgrounds. These could include areas for commercial concessions (marinas, comprehensive resorts, etc.), and quasi-public development.

Justification: There were many undeveloped future-use and closed Corps parks on Bull Shoals Lake that have been reclassified as Wildlife Management Areas, Environmentally Sensitive Areas, or Low Density land classifications. That list includes:

a. Boone Point Park—190 acres changed to Environmentally Sensitive Area;
b. Big Bend Park—221 acres changed to Low Density (primitive camping);
c. Cedar Creek Park—171 acres changed to Environmentally Sensitive Area;
d. Eagles Nest Park—42 acres changed to Environmentally Sensitive Area;
e. Elbow Park—395 acres changed to Environmentally Sensitive Area; 40 acres changed to Low Density;

f. Fairview Park—34 acres changed to Environmentally Sensitive Area; 9 acres changed to Low Density;
g. Group Use Park—185 acres changed to Environmentally Sensitive Area;
h. Gulley Spring Park—49 acres changed to Environmentally Sensitive Area;
i. Horseshoe Bend Park—269 acres changed to Environmentally Sensitive Area; 38 acres changed to Low Density;
j. Indian Point Park—388 acres changed to Wildlife Management Area; 27 acres changed to Low Density (primitive camping);
k. Jimmie Creek Island Park—248 acres changed to Wildlife Management Area;
l. Little Fool Creek Park—638 acres changed to Wildlife Management Area;
m. Lowry Park—270 acres changed to Environmentally Sensitive Area;
n. Mariner's Island Park—29 acres changed to Environmentally Sensitive Area;
o. McVey Park—112 acres changed to Environmentally Sensitive Area; 7 acres changed to Low Density;
p. Music Creek Park—121 acres changed to Environmentally Sensitive Area;
q. Noe Creek Park—73 acres changed to Environmentally Sensitive Area;
r. Red Wolf Park—104 acres changed to Environmentally Sensitive Area;
s. Risley Hollow Park—119 acres changed to Environmentally Sensitive Area;
t. Sister Creek Park—242 acres changed to Environmentally Sensitive Area; 260 acres changed to Wildlife Management Area;
u. Sugarloaf Park—99 acres changed to Environmentally Sensitive Area;
v. Woodard Park—10 acres changed to Environmentally Sensitive Area; 50 acres changed to Low Density;
w. Yocum Creek Park—82 acres changed to Environmentally Sensitive Area

From the 1975 master plan, High Density areas in Beaver Creek Park, Buck Creek Park, Bull Shoals Park, Highway 125 Park, Kissee Mills Park, Lead Hill City Park, Lead Hill Park, Oakland Park, Point Return Park, Pontiac Park, River Run Park, Shadow Rock Park, Shoal Creek Park, Spring Creek Park, and Theodosia Park contained lands reclassified to ESA, Low Density and Wildlife Management. The two High Density areas that do not have modifications are Highway K Park and Ozark Isle Park.

Lakeview Park boundary line changed to gain High Density land from Bull Shoals White River State Park.

Dam Site Park, lake access only, remains High Density but a portion remained lake access only and two other portions were incorporated into Bull Shoals White River State Park and Bull Shoals City Park.

The existing Camp Site Lease (Camp Galilee) was changed from Low Density to High Density. The eastern-most point was left as Low Density to accommodate an existing AGFC boat ramp.

Lead Hill School was reclassified from Low Density to High Density.

Theodosia marina was reclassified from No Allocation to High Density.

There are two resorts located in High Density—Tucker Hollow Lodge in Tucker Hollow Park and Wagon Wheel Resort in Highway 125 Park.

No new future public requests for Limited Development Areas (LDA) in a High Density classification will be granted based upon guidance received to keep private/community use separated from commercial use activities.

Resource Objectives: Recreation, Economic Impacts, General Management

(Acreage = 3,714.6 or 7 % of Corps land)

Mitigation land classification allows for lands with an allocation of Mitigation and that were acquired specifically for the purposes of offsetting losses associated with development of the project.

When Bull Shoals Lake was created, no mitigation lands were purchased because it was not a requirement at that time. Therefore, there are currently no lands classified as mitigation land at the Bull Shoals project.

Environmentally Sensitive Area (ESA) land classification is for those land areas where scientific, ecological, cultural or aesthetic features have been identified. Designation of these lands is not limited to just lands that are otherwise protected by laws such as the Endangered Species Act, the National Historic Preservation Act or applicable State statutes. These areas must be considered by management to ensure they are not adversely impacted. Typically, limited or no development of public use is allowed on these lands currently; examples of permits that could be issued are unimproved walking paths, specific erosion control measures, and removal of invasive species. Right-of-ways for public utilities in the ESA land classification will be considered on a case by case basis.

At Bull Shoals Lake, approximately 0.18% of ESA lands have permitted residential and municipal amenities. These areas include shoreline use permits, roads, county roads, and utilities lines.

No agricultural, grazing, or mowing for residential/commercial uses are permitted on these lands unless necessary for a specific resource management benefit, such as prairie restoration.

Justification: ESA lands are classified as such to preserve the scenic, historical, archaeological, scientific, water quality, or ecological value of the overall project.

Classification of lands as ESAs took into consideration the location of or habitat of threatened, endangered, and state species of concern at Bull Shoals Lake. The classification of ESA also considers locations of significant cultural or historic resource sites, as well as resource protection (i.e. glade restoration areas, fragile habitats), the designation of an Arkansas Extraordinary Resource Waterbody, and aesthetics. The ESA classification is also responsive to public comment seeking to keep the lake natural, scenic and to ensure that water quality is maintained for future generations. In making ESA classification decisions, areas that were previously

classified as Natural Areas and have no active boat dock permits were retained as ESA. Areas that were previously classified as Natural Areas and have active boat dock permits and/or with LDA zoning have been classified as Low Density Recreation. To maintain contiguous land classifications, if small portions of land were previously classified as low density, this land was re-classified to ESA. Lands adjacent to major tributaries were converted to ESA. As Bull Shoals Lake is an established water supply lake, lands were classified ESA for the protection of a small land-based buffers in areas where significant land clearing took place above adjacent Federal land. Areas located in the back of coves were changed to ESA for the purpose of protecting water quality due to run off. Islands that were located near mainland ESA areas were converted to ESA.

Criteria for existing vegetation modification permits in ESA: If there was a path, no dock, and over the 200 ft. rule, the land classification was classified as ESA (the permit would remain until permitee's property was sold or transferred, after which case it would become invalid and would not be reissued).

There are public utilities (i.e. power lines, roads, etc.) that are found in ESA land classifications; this is taken into account under the "limited development for public use" in ESA. As stated previously, future right-of-ways for public utilities in ESA will be considered and reviewed on a case by case basis.

Resource Objectives: Environmental Compliance, Cultural Resource Management, Natural Resource Management

(Acreage = 29,3666.9 or 52 % of Corps land)

Multiple Resource Management land classification allows for the designation of a predominate use as described below, with the understanding that other compatible uses described below may also occur on these lands (e.g. a trail through an area designated as Wildlife Management.) Land classification maps must reflect the predominant sub-classification, rather than just Multiple Resource Management. Right-of-ways for public utilities in Multiple Resource Management land classifications will be considered and reviewed on a case by case basis.

- Low Density Recreation land classification includes lands with minimal development or infrastructure that support passive public recreational use (e.g. primitive camping, fishing, hunting, trails, wildlife viewing, shoreline use permits etc.). Low Density Recreation lands may contain Limited Development Areas within the context of the Shoreline Management Plan (SMP). *Note: Distribution of shoreline areas to Limited Development status requires revision of the SMP*.

Justification: In areas which were previously low density recreation land with no active boat dock permits and no limited development area, these areas were reclassified to ESA in an effort to preserve the scenic, historical, archaeological, scientific, water quality, or ecological value of the overall project.

Criteria for existing paths and docks in Low Density: If there was a dock and path existing on land that was classified as Natural Area, it was changed to Low Density. If there was a path, no dock, and within the 200 ft. rule, the land either remained Low Density or was changed to Low Density. If there was a path, no dock, and over the 200 ft. rule, this was changed to ESA (the permit would remain until permitee's property was sold or transferred, after which case it would become invalid and would not be reissued). If there was a dock, no path, it would be reclassified or remain Low Density. If there was a path alone and within the 200 ft. rule, it would remain Low Density. If docks were located outside of LDA, those docks will remain and the land will be reclassified to Low Density.

In response to public comments received during the Scoping phase of the master plan revision process regarding additional boat ramps and/or additional launch access around Bull Shoals Lake, the PDT identified several areas that could be considered for potential future boat ramps or launch access located within Multiple Resource Management land classifications. The list includes:

a. Brass Latern Road—potential boat ramp/launch access;
b. Marion County Road 8027—designate as future boat ramp area—response to public comments for more access/ramps to lake;
c. Marion County Road 8047—potential future boat ramp area;
d. From monument I-859-2 to monument I-867-2D change from ESA to LD Airpark Drive—potential launch ramp area
e. Elbow Creek /Elbow Road/Elbow East—potential boat ramp/launch access;
f. Big Creek/ County Road 661/Nolan's Point—potential boat ramp/launch access;
g. Ozark County/CR 640/Theodosia arm—potential boat ramp/launch access;
h. End of OO/town of Cedar Creek/Bright Elbow Road (Taney County/Elbow Creek)Elbow West—potential boat ramp/launch access;
i. Old Hart Road—Taney County proposed ramp/launch access;
j. Blackwell Ferry—Taney County proposed ramp/launch access;
k. Mission Lake—Taney County existing ramp/launch access;
l. Deer Lane—Taney County proposed ramp/launch access

Most resorts were placed in Low Density land classification. There are two resorts located in High Density—Tucker Hollow Lodge in Tucker Hollow Park and Wagon Wheel Resort in Highway 125 Park.

Limited motel/resorts are quasi-private recreational facilities located on public land, but owned and operated by individuals for commercial purposes. Leases for limited motel/resorts are unique to Little Rock District within Southwestern Division. Most resorts are located on private property and are operated along with the supporting facilities on out-granted public land. The facilities on public land are open to registered overnight resort guests only. Therefore, all current activities related to limited motel/resorts must comply with the lease and follow the Project's approved Shoreline Management Plan (SMP) and Master Plan to the maximum extent possible. For more information on this type of lease, please refer to SWLR 405-1-16, Real Estate Outgrants, Limited Motel/Resort Leases.

Resource Objectives: Recreation, Economic Impact, Natural Resource Management, Environmental Compliance, Cultural Resource Management, Visitor Information and Education

(Acreage = 7,257.6 or 13% of Corps lands).

- Wildlife Management land is designated for stewardship of fish and wildlife resources.

Justification: On Bull Shoals Lake, areas which have been classified as wildlife management lands consist of large tracts of land and shoreline areas where food plots and other wildlife management activities can be established to supplement and enhance the existing wildlife forage. The areas classified have been determined to contain suitable habitat for native wildlife and will be protected for this purpose. The majority of these areas have been established in locations that are accessible by road or by water for the public. If these areas are developed as wildlife management in the future, hunting will be allowed, unless otherwise posted. Islands that were located near mainland Wildlife Management areas were converted to Wildlife Management.

The States of Arkansas and Missouri actively manage numerous areas for the purpose of Wildlife Management along the shoreline of Bull Shoals Lake; the master plan revision now mirrors this management approach. Both states have separate licenses with the Corps to operate and manage these areas for the purpose of Wildlife Management.

Resource Objectives: Natural Resource Management, Recreation, Environmental Compliance

(Acreage = 15,917.3 or 28% of Corps lands)

-**Future or Inactive Recreation Areas** land classification is for those land areas with site characteristics compatible with potential future recreational development or recreation areas that are closed. Until there is an opportunity to develop or reopen these areas, they will be managed for multiple resources.

The project has no developed recreation areas that have been completely closed. This plan suggests that if future recreation development is needed, this development will be accommodated either within the existing High Density classified land areas or on private property.

Water Surface is for those waters classified for particular purposes when the project administers a surface water zoning program. Bull Shoals Lake did not have water surface classifications in prior master plans.

-Restricted surface waters are restricted for project operations, safety, and security purposes.

Justification: Restricted water surface classifications are areas restricted due to Corps policy for safety and security. These areas include immediately above and below the dam and areas around water intake structures.

Resource Objectives: General Management

(Acreage = 73 water surface acres; less than 1% of surface water)

In addition, it is generally understood that areas near designated swim beaches are considered 'restricted' for swimmer safety.

-**Designated No Wake** surface waters are established protect environmentally sensitive shoreline areas, recreational water access areas from disturbance, and for public safety. Bull Shoals Lake has no water surface area in this classification category; however, it is generally understood (i.e. posted and/or buoyed) that areas near designated boat ramps and marinas are considered 'no wake' for boater safety.

- **Fish and Wildlife Sanctuary** surface waters are areas where annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and or spawning are present. Bull Shoals Lake has no water surface areas in this classification category.

-**Open Recreation Areas** classification is for those waters available for year round or seasonal water based recreation use.
Justification: On Bull Shoals Lake all water surface acres are classified as open recreation, with the exception of restricted areas immediately above and below the dam and areas near water intake structures.

Resource Objectives: Recreation, Natural Resources Management, Economic Impact, General Management
(Acreage = 48,225.5water surface acres; almost 99% of the surface water)

Project Easement land classification is for those lands for which the Corps holds an easement interest, but not fee title. Planned use and management of easement lands will be in strict accordance with the terms and conditions of the easement estate acquired for the project. Easements were acquired for specific purposes and do not convey the same rights or ownership to the Corps as other lands. The following types of easements were acquired for the Bull Shoals Project:

- **Operations Easement**. The Corps retains rights to these lands necessary for project operations (access, etc.). There are no known Operations easements on Bull Shoals Lake.

- **Flowage Easement**. The Corps retains the right to inundate these lands for project operations.

Justification: The easements acquired for the operation of the Bull Shoals Lake are typically applicable to that portion of the described property lying between elevation 700 msl and the Government Fee Take Line. The typical flowage easement estate grants the Government the perpetual right to occasionally overflow the easement area, if necessary, for the operation of the reservoir; and specifically provides that, "No structures for human habitation shall be constructed or maintained on the land […]; and provided further that,

No other structures of any other type shall be constructed or maintained on the land except as may be approved in writing by the representative of the United States in charge of the project." All flowage easement deeds should be checked for exact rights acquired prior to proceeding in any action on the easement.

Resource Objectives: General Management
Acreage: 12.9 Acres

- **Conservation Easement**. The Corps retains the rights to lands for aesthetic, recreation, and environmental benefits. There are currently no known conservation easements on Bull Shoals Lake.

Chapter 6 Special Topics/Issues/Considerations

This chapter discusses the special topics, issues, and considerations the Project Delivery Team identified as critical to the future management of Bull Shoals Lake. Special topics, issues, and considerations are defined in this context as any problems, concerns, and/or needs that could affect or are affecting the stewardship and management potential of the lands and waters under the jurisdiction of the Little Rock District, Mountain Home Project Office Area of Responsibility (AOR). For simplicity, the topics are discussed below under generalized headings.

a. Dam Site Park

Dam Site Park is located directly north of the right abutment of Bull Shoals Dam and contains approximately 230 acres. The site varies from flat areas on the tops of hills to fairly steep slopes near the lake. Tree cover is extensive, with oak-hickory predominant in the stands. With the exception of peak visitation periods, the park has a low occupancy rate, due to its proximity to Lakeview Park and Bull Shoals State Park, and being adjacent to State Highway 178. Dam Site is a class A campground comprised of 35 electric campsites, water borne restroom, shower building, and trailer dump station. A boat launching fee is charged to non-campers for use of the boat ramp.

In 2012, Little Rock District, Corps of Engineers implemented a recreation adjustment program (RAP) to evaluate the District's recreation program in light of steady to declining budgets and increased costs to operate and maintain park areas. Each recreation area was evaluated against criteria such as operation cost, revenue generated, visitation, and proximity to other, similar recreation facilities. As a result of that review, Dam Site Park was identified as underutilized.

Dam Site Park was offered for lease to the State of Arkansas, Marion County, Arkansas, and the City of Bull Shoals for its continued operation. All three entities declined the offer to lease, and the Park has been closed to overnight use since early 2012. In March 2015, the City of Bull Shoals submitted a request to lease the Park, allowing the City to operate and maintain the park in a manner as previously provided, while the Corps will continue to maintain the boat launching ramp as it has been since the implementation of RAP.

b. Dispel Myth That Corps Is Selling Land

Frequent inquiries are made as to possible sale of Corps-owned public land at Bull Shoals Lake. Some of these are often in an attempt to resolve a previous, unauthorized use of public land adjacent to a residence, subdivision, or other uses of private property, but project staff often answer questions regarding availability of public land for sale or lease as recreational home sites. Dry Run Home Sites, located near Oakland and addressed in more detail in this chapter, is an example of sale and lease of public land. However, in 1996 Congress passed legislation which prohibits selling additional public lands at Bull Shoals Lake.

Public Law 104-52, Section 8 prevents the Corps of Engineers from expending funds to sell, excess, surplus, or dispose of public land at Bull Shoals Lake: "Notwithstanding any provision of this or any other Act, during the fiscal year ending September 30, 1996, and thereafter, no funds may be obligated or expended in any way for the purpose of the sale, excessing,

surplusing, or disposal of lands in the vicinity of Bull Shoals Lake, Arkansas, administered by the Corps of Engineers, Department of the Army, without the specific approval of the Congress".

c. Dry Run Homesites

Land acquired in Dry Run for Bull Shoals Lake project was either from private landowners or from the Department of Interior (public domain). In an attempt to promote economic growth to the area, unlike anywhere else on the lake, cottage sites were leased in Sections 6, 7, 8 & 18, of Township 20 N, North of the White River, Range 15 West, in Marion County. The original Dry Run Homesites subdivision map consisted of 81 lots having less than 1 acre of land to be leased somewhere between elevations 680 to 800 feet m.s.l..

Public Law enacted in August 1956 was the enabling legislation that permitted sale of leased project lands which were designated as cottage sites. Public law 999 specifically excluded from its provisions any lot platted on lands withdrawn from the public domain. The Dry Run Homesites were platted prior to enactment of the law and no distinction was made between lands purchased from the private sector and those withdrawn from the public domain for project purposes. Since the homesite area included withdrawn lands, a determination was made in the 1950's to not include the homesite area in the nation-wide sale for cottage sites. Leasing of the lots continued until early 1980's. In May of 1985, an updated survey combining several of the lots from the original survey was completed. Later that year the Corps of Engineers sold all leased lots in the Dry Run Homesites eligible for sale under Public Law 999. There are currently 5 existing leased lots situated on lands that are withdrawn from the public domain and are unable to be sold.

d. Tumbling Creek Cavesnail

The Tumbling Creek cavesnail (Antrobia culveri) is a small snail restricted to a single site in southwestern Missouri where it is found only in Tumbling Creek Cave in Taney County, Missouri. Approximately 100 acres of the recharge area for Tumbling Creek Cave is located on U.S. Army Corps of Engineers (USACE) land located in the Big Creek and Bear Cave Hollow drainages of Bull Shoals Lake. Tumbling Creek cave is drained by 20 to 25 springs located on USACE property along Big Creek and Bear Cave Hollow and are considered Karst windows into the Tumbling Creek Cave system.

Tumbling Creek cavesnail numbers have dropped significantly, from an estimated 15,118 in 1973, to the point where only one snail had been found within the survey areas in 2001. On December 27, 2001, the species was listed on an emergency basis effective for 240 days (66 FR 66803). On the same date, the Service proposed to list the Tumbling Creek cavesnail as an endangered species after the emergency provisions of the Act expired (66 FR 66868), and on August 14, 2002, it was listed as federally endangered (67 FR 52879). A population estimate of 17 individuals was reported in October 2002. All recovery efforts for the Tumbling Creek cavesnail is under the coordination of the United States Fish and Wildlife Service (USFWS).

In 2002 the Tumbling Creek Cavesnail Workgroup and Partnership (TCCWP) was established as an inter-agency and private entity workgroup to draft and finalize the Tumbling Creek Cavesnail Recovery Plan and to facilitate and guide recovery of the species. The Tumbling Creek

Cavesnail Recovery Plan was completed and issued by the USFWS on September 15, 2003. The TCCWP includes a U.S. Army Corps of Engineers biologist from the Mountain Home Project Office and continues to remain active with the other members in the implementation of the recovery plan, identification of new threats to the species, and coordination of all recovery efforts.

The Recovery Plan identified sediment deposition and sewage contamination from upstream and poorly managed eroding pasture land in the recharge area as major factors responsible for the endangered listing. Numerous recovery actions were taken including the purchase of the poorly managed private lands in the recharge area by the private entity Tumbling Creek Cave Foundation, re-vegetation efforts and the construction of a new sewage system at a local school to replace the old system which had been leaking sewage into the recharge areas. The 100 acres of recharge area owned by USACE on Bull Shoals Lake has been managed to maintain a heavy vegetative cover to reduce erosion of sediments into the recharge area, and the gating of access roads into the recharge area to prevent vehicle traffic and reduce public disturbance.

Critical Habitat was designated on June 28, 2011 (76 FR 37663) and encompasses 25 acres which immediately borders USACE land on Bull Shoals Lake, although none of the critical habitat is actually located on USACE owned property. Current management practices of the USACE land bordering the critical habitat provide increased protection and erosion prevention practices.

Despite a long list of conservation measures implemented to date to benefit the Tumbling Creek cavesnail resulting in increased protection and improved sediment and dissolved oxygen levels, population numbers remain precariously low. The most current population estimate of only 150 individuals demonstrates that the species stills remains on the verge of extinction.

The TCCWP remains concerned about current threats to its population, including the effect of White Nose Syndrome (WNS) on bat populations in Tumbling Creek Cave which contribute to the food chain of the species and the invasion of the predatory ringed crayfish (Orcaneactes neglectus neglectus) which has recently been found in increasing numbers in the critical habitat areas of the cave. The U. S. Army Corps of Engineers remains dedicated to assist the USFWS in the recovery of this endangered species.

e. White River Minimum Flows

Section 132(a) of the FY 2006 Energy and Water Development Appropriations Act (EWDAA) (Public Law 109-103) authorized and directed implementation of two of the reallocation plans described in the July 2004 White River Minimum Flows Reallocation Report: BS-3 at Bull Shoals and NF-7 at Norfork Lake. The authorization required a determination by the Assistant Secretary of the Army for Civil Works (ASA(CW)) regarding reasonable continued use of lakeside facilities and the determinations by the Administrator of the Southwestern Power Administration (SWPA) regarding compensation for hydropower losses at the Federal Energy Regulatory Commission (FERC) Project License No. 2221 and the offset of Federal hydropower losses at Bull Shoals and Norfork Lakes.

Plan BS-3 reallocates 5 feet of flood control storage at Bull Shoals Lake for the minimum flows release of 800 cfs. The top of the conservation pool elevation was raised by 5 feet from 654.0 to 659.0; and the top of the seasonal pool held from May to July for water temperature releases was raised by 5 feet from 657.0 to 662.0. The minimum flow releases will be made through the main turbine, so no new release facilities are required. However some modifications to the Corps operational facilities are required. These include modifying the computer language (SCADA) used to remotely operate Bull Shoals turbines and minor modifications to the existing monorail bulkheads.

Plan NF-7 reallocates 3.5 feet of storage at Norfork Lake to be evenly divided (50:50) between the conservation and flood control pools to provide for the minimum flows release of 300 cfs. The top of the conservation pool elevation will be raised by 1.75 feet to from 552.0 to 553.75; and the top of the seasonal pool held from May to July for water temperature releases will be raised by 1.75 feet from 555.0 to 556.75.0. Plan NF-7 includes a siphon system that will be constructed at the dam and operated in concert with the existing Station Service Unit to make the minimum flows releases. The siphon system includes a knife valve, a 24-inch diameter steel pipe through and along the downstream face of the dam, and a multi-layered intake system on the lakeside. The siphon system provides the ability to remotely operate the discharge for the minimum flows releases. It does not affect other operations of the dam or powerhouse. Other modifications to lake project facilities include modifying the computer language (SCADA) used to remotely operate Norfork turbines and installation of a new monorail bulkhead.

The Arkansas Game & Fish Commission (AGFC), the non-Federal sponsor, has provided relocations or modifications for public and private lake facilities to allow for reasonable continued use of those facilities at both Lakes. The estimated cost to provide modified or replacement lakeside facilities is approximately $18,103,000.

At both lakes, there will be an offset to reduce SWPA's debt to the Treasury for the Federal hydropower purpose. The project at Bull Shoals Lake also includes the FERC licensee compensation, to be paid by the Corps. SWPA has calculated the energy and capacity losses, as well as the dollar value to be compensated. The compensation is determined by the Administrator of SWPA on the basis of present values of the estimated lifetime replacement cost of the electrical energy and capacity at the time of implementation. The current estimate for the Federal hydropower offset is $86,712,100, and the estimate for the FERC Licensee compensation is $33,935,100. Final dollar amounts will depend on the official date of implementation of Minimum Flows Project at each lake and the value of the specified parameters in effect at that time.

There are benefits and detriments associated with the implementation of White River Minimum Flows Project. The Environmental Impact Statement concluded that the trout tailwater fishery below Bull Shoals and Norfork dams will benefit from the increased wetted perimeter and dissolved oxygen (DO) levels resulting from increased minimum flows. The downstream recreation benefits associated with the improved trout fishery are increased by over $4 million annually. There will be no change to the water supply use of the two lakes. Negative effects to lakeside facilities will be minimized by relocating or modifying affected facilities to ensure reasonable continued use, in compliance with the authorizing language. The detriments are to

the hydropower and flood control purposes of the lakes. Negative impacts to hydropower will be compensated through the SWPA offset and FERC licensee compensation. The small reduction in flood control benefits were deemed to be insignificant when compared to the total flood damages the lakes are estimated to prevent.

The total cost for project design and construction and the FERC licensee compensation is estimated to be $58,241,000. This is will be cost shared at approximately $40,138,000 Federal and $18,103,000 non-Federal. The Minimum Flows Project facilities will be provided by the Corps, and the estimated total cost is approximately $6,203,000. The offset to the Federal hydropower debt at Bull Shoals and Norfork Lakes is estimated to be $86, 712,100. The AGFC will serve as the non-Federal Sponsor and strongly supports the Minimum Flows Project.

f. Dissolved Oxygen

The impoundment of the White River to form Bull Shoals Lake caused environmental changes in the tailwater portion of the White River below the dam. Concerns about low dissolved oxygen (DO) levels and its effect on the tailwater fisheries has arisen from the cold water discharges from Bull Shoals Lake and the depths at which water is drawn from the lake for the discharges.

During warmer weather, Bull Shoals Lake "stratifies" and separates into layers with different amounts of dissolved oxygen. The upper layer remains oxygenated by wind action and Photosynthesis. However, the lower level, where the water for the tailwater discharge is drawn, is too deep to be aerated by these forces. In addition, decomposition of organic matter sinking into this deep layer naturally depletes oxygen. This water containing low levels of DO are drawn through the generators and then released into the White River tailwater.

The Arkansas Game and Fish Commission recognized that the cold water discharges from Bull Shoals Lake would necessitate a change in their fisheries management program for the White River as it transformed from a warm water fishery to a cold water fishery. Rainbow trout, cutthroat trout, brook trout, and brown trout were stocked in the white river to replace the warm-water fishery. This cold-water fishery is a success, however, discharge water with low DO levels released during the warmest weather (usually July through September), can cause undue physiological stress on the trout or even cause fish kills.

When the water below Bull Shoals dam falls below a dissolved oxygen level of 6.0 mg/L it is considered detrimental to the health of the trout and other aquatic species. DO levels below 6.0 mg/L were a common occurrence before 1990, and fish kills occurred periodically. The adverse effect of low DO on the cold water fishery in the tailwater of Bull Shoals dam caused much concern with the public and Governmental agencies interested in the health of the White River.

A multi-agency committee was formed in November 1990 by then-Arkansas Governor Bill Clinton to develop short-term and long-term solutions to the DO issue in the White River basin. The White River DO Committee consists of representatives from USACE, Arkansas Department of Environmental Quality, Arkansas game and Fish Commission, Southwestern Power Administration, the Arkansas Natural Resources Commission, the Missouri Department of Conservation, and the Missouri Department of Natural Resources, and the U.S. Geological Survey.

In 1991, the White River DO Committee developed the White River DO Operation Action Plan. Under that plan, when DO levels of the upstream water become so low that it causes the downstream DO concentrations during generation to recede to 6 mg/L or below, Operations at Bull Shoals Dam must be adjusted to maintain 6.0 mg/L or above as long as possible. These adjustments may include utilizing all available turbine air-venting options, as well as spreading load over all available units to help aerate the discharge water.

If the Bull Shoals Lake DO concentrations continue to deteriorate and the downstream DO concentrations recede to 4 mg/L or less during generation, recommended maximum generation rates are computed and generation may be reduced to further improve the DO concentration of the water received from upstream to assure a minimum of 4 mg/L during generation.

The White River DO Committee still meets semiannually to monitor DO issues, administer the White River DO Operation Action Plan and to continue to develop short-term and long-term solutions to DO issues in the White River basin. The committee works closely with USACE, USGS and other agencies to continually monitor DO levels in Bull Shoals Lake and its White River tailwater.

g. Zebra Mussels

Zebra mussels, *Dreissena polymorpha*, were first documented in Bull Shoals Lake in 2007. The origin of the mussels is not known but it is suspected they migrated from Lake Taneycomo, which discharges into Bull Shoals and is infested with zebra mussels. Zebra mussels started on the upper reaches of reservoir and moved the length of the lake in seven years. During the summer of 2014 large numbers of zebra mussels were observed in dam area. The long term impacts of zebra mussels are not known as they are only newly introduced into the system. Marina's, private docks, and boats are being impacted at this time. The bottom of the vessels and structures are becoming encased with the mollusks and cleaning of the hulls and bottoms of the docks are required to operate properly.

Eradication or population management of the mussels is cost prohibitive and not feasible. Public education to drain and dry vessels and waders before using in a different body of water is being accomplished through signs, kiosks, and public information systems in an attempt to prevent further spreading of the invasive mussels.

Chapter 7 Agency and Public Coordination

a. Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Bull Shoals Lake. Responsibility for natural resource and recreation management falls to several agencies that own or have jurisdiction over these public lands and waters.

Increasingly, competition for the use of these lands and waters and their natural resources can create conflicts and concerns among stakeholders. The need to coordinate a cooperative approach to protect and sustain these resources is compelling. Many opportunities exist to increase the effectiveness of Federal programs through collaboration among agencies and to facilitate the process of partnering between government and non-government agencies. To sustain healthy and productive public lands and waters with the most efficient approach requires individuals and organizations to recognize their unique ability to contribute to commonly held goals. The key to progress is building on the strengths of each sector, achieving goals collectively that could not be reasonably achieved individually. Given the inter-jurisdictional nature of Bull Shoals Lake, partnering opportunities exist and can promote the leveraging of limited financial and human resources. Partnering and identification of innovative approaches to deliver justified levels of service defuse polarization among interest groups, and lead to a common understanding and appreciation of individual roles, priorities, and responsibilities.

To the extent practical, this Master Plan and a proactive approach to partnering will position Bull Shoals Lake to aggressively leverage project financial capability and human resources in order to identify and satisfy customer expectations, protect and sustain natural and cultural resources and recreational infrastructure, and programmatically bring Corps management efforts and outputs up to a justified level of service.

Public involvement and extensive coordination within the Corps of Engineers and with other affected agencies and organizations is a critical feature required in developing or revising a Project Master Plan.

Agency and public involvement and coordination has been a key element in every phase of the Bull Shoals Lake Master Plan revision.

b. Scoping

One agency and five public scoping workshops were held in August 2014 with over 700 people in attendance. To prepare for the scoping workshops, the Corps contracted with CDM-Smith. From the scoping process, a Scoping Report was finalized in December 2014. The report summarizes the public participation process for, and the public comments resulting from, the Bull Shoals Lake MP Revision public scoping workshops and comment period. “Scoping” is the process of determining the scope, focus, and content of a NEPA document. Scoping workshops are a useful tool to obtain information from the public and governmental agencies. For a

planning process such as the MP revision, the scoping process was also used as an opportunity to get input from the public and agencies about the vision for the MP update and the issues that the MP should address where possible. The Scoping Report is located on the Bull Shoals Lake Master Plan website, http://www.swl.usace.army.mil/Missions/Planning/BullShoalsLakeMasterPlanRevision.aspx

c. Focus Groups

The PDT made the decision to work with focus groups during the scoping process, in part due to the high interest in the Master Plan revision process from other agencies and the public. The focus groups were formed in response to the top three concerns heard from the public during the scoping process: Water Quality, Environmental, and Recreation.

The initial focus group meetings were held on February 24th and 25th at the Mountain Home Project Office in Mountain Home, Arkansas. A presentation was made to the individual groups on the preliminary draft version of the master plan, with a question and answer session following. Each group was then charged with taking the information given to them and talking amongst their respective communities on the preliminary draft. A follow up meeting would be scheduled to then discuss the feedback they had received on the preliminary draft.

A second focus group meeting, bringing all three groups together, was held on Thursday, April 2nd at the Mountain Home Project Office. In addition to providing feedback from each representative's respective community, this meeting also served as a "cross-talk" between each of the individual groups, allowing for each group to hear concerns and comments on the preliminary draft master plan.

d. Draft Master Plan/Draft Environmental Assessment

Currently scheduled for release at the end of July 2015 with public workshops scheduled for August 4-8, 2015 at various locations around Bull Shoals Lake.

e. Final Master Plan/Final Environmental Assessment

Currently scheduled for completion in November 2015 with public workshops scheduled in early December 2015.

Chapter 8 Summary of Recommendations

a. Summary Overview

The proposals made in previous chapters of this MP are for the courses of action necessary to manage Bull Shoals Lake current and future challenges. Actions set forth in this plan can ensure the future health and sustainability of Bull Shoals Lake's natural resources while still allowing for continued use and development. The factors considered cover a broad spectrum of issues including, but not limited to public use, environmental, socioeconomic, and manpower. Information on each one of these topics was thoroughly researched and discussed before any proposals were made.

This master plan is considered to be a living document, establishing the basic direction for development and management of the Bull Shoals project consonant with the capabilities of the resource and public needs. The plan is also flexible in that supplementation can be achieved through a formal process to address unforeseen needs. The master plan will be periodically reviewed to facilitate the evaluation and utilization of new information as it becomes available.

This MP for Bull Shoals Lake will continue to provide for and enhance recreational opportunities for the public, improve the environmental quality and create a management philosophy more conducive to existing staffing levels at the Bull Shoals Project.

b. Land Classifications

As described in detail in Chapter 5, the PDT strived to achieve the current management and philosophy approach in making the land classification decisions. The team took numerous factors and expressed public concerns into consideration when determining land classification for the 2015 Bull Shoals Lake Master Plan revision, which included but are not limited to: how lands were previously classified in 1975; what kind of development or non-development was taking place adjacent to Corps property; if there are existing shoreline use permits and what SMP zoning existed in the prior land classification; and what kinds of activities are currently taking place in those areas.

c. Recommendation

This revised Master Plan presents an inventory of land resources and how they are classified, existing park facilities, an analysis of resource use, anticipated influences on project operation and management, and an evaluation of existing and future needs (required to provide a balanced management plan for cultivating the value of the land and water resources). It is recommended that this Master Plan be approved as the basis for future development and management of the Bull Shoals land and water resources.

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Appendix B Bull Shoals Lake Prior Supplements

Date Submitted	Date Approved	Supplement #	Location	Changes Made
23-Dec-74	14-Feb-75	Supplement #1	Theodosia Marina	Expansion of lease area. No change in land classificaiton
1-Jul-75	18-Jul-75	Supplement #2	Cost Sharing	No Change to Land Classifications
1-Jul-75	1-Aug-75	Supplement #3	Oakland/Ozark Isle park	No Change to Land Classifications. Marina Lease area expansion
20-Sep-76	13-Oct-76	Supplement #4	Buck Creek	No Change to Land Classifications. Relocation of Lease Area
23-Aug-77	2-Mar-78	Supplement #5	Oakland/Ozark Isle park	Disapproved. No Change to Land Classifications
9-Jun-78	8-Jul-78	Supplement #6	Lead Hill City Park	Areas in supplement are already High Density in 1975 land allocation maps.
2-Jul-79	19-Jul-79	Supplement #7	Theodosia Arm/End of Ozark County Road 643/Sec5, T21N, R15W	Natural Area to Low Density 6.2 acres
27-Sep-72	16-Nov-72	Supplement #8	HWY 125 marina/ Dam Site Park/Lakeview Park/Oakland-Ozark Isle Park; Maps revised 1980	Disapproved; No change in land classifications
6-Jan-81	14-Jan-81	Supplement #9	All campground maps revised 1980. BS marina expanded	Document does not state change to land allocation, BS marina lease expansion expanded into low density.
6-Aug-84	2-Oct-84	Supplement #10	Pontiac Campground/Marina	No change in land classification.
12-Dec-84	21-Dec-84	Supplement #11	Hwy 125 Campground	Expansion of Wagon Wheel Resort Lease. No change in land classification.
	18-Jun-86	Supplement #12	Lead Hill Campground-Marina lease change	No change in Land Classification.
15-Jul-86	3-Sep-86	Supplement #13	Marion County/ Section 23, T21N, R18W	Disapproved; Lease for commercial Fish farming. No change in Land Classification

22-Jun-87	10-Jul-87	Supplement #14	Theodosia Marina	Lease expansion water only. No change in land classfications.
31-Dec-87	15-Jan-88	Supplement #15	Bull Shoals Marina	Document does not state change to land allocation, BS marina lease expansion expanded into low density.?
14-Mar-88	23-Mar-88	Supplement #16	Marion County Regional Water District	Reallocation from low density to Project Operations within .25 mile radius of Water Supply Intake.
15-Dec-89	9-Jan-90	Supplement #17	Pontiac Park	Relocate swim beach. No change in land classification
	18-Aug-89	Supplement #18	Bull Shoals City Park	Lease expansion; 5.5 acres of land; no change in land classification
4-May-90	31-May-90	Supplement #19	Bull Shoals City Park	Park expansion. No change in land Classification
26-Jul-91	15-Aug-91	Supplement #20	Theodosia Marina	Lease Area Expansion. No change in land Classification
1-Oct-93	2-Nov-93	Supplement #21	Highway K Marina	Relocated and reduce size of lease area. Area where lease area is moved to is located in Natrual Area. Document does not state change to land allocation. TAKEN CARE OF IN SUPPLEMENT #24
13-Dec-94	10-Jan-95	Supplement #22	Bull Shoals Campground	AGFC to contruct launching area and parking area. No Change in Land Classification.
3-Mar-95	15-Mar-95	Supplement #23	Lead Hill Marina	Expansion of lease area. No change in land classificaiton
1-Apr-96	1-Jul-96	Supplement #24	Highway K Marina	Change in land classification from natural area to "Recreation-Intensive Use" to include marina lease expansion.
3-Apr-97	20-May-97	Supplement #25	Bull Shoals Campground	Document does not state change to land allocation, BS marina lease expansion expanded into low density.?
1-Nov-97	14-Nov-97	Supplement #26	Point Return Park	Map showing Park boundary does not match High Density in GIS 75 version. Document does not state to change land allocation.
7-Aug-98	7-Aug-98	Supplement #27	Highway K and Kissee Mills Parks	Lease parks to Taney County (Missing plate 36 showing Kissee Mill Park)
14-Dec-98	29 Jam 99	Supplement #28	Oakland Marina	Expansion of lease area. No change in land classificaiton

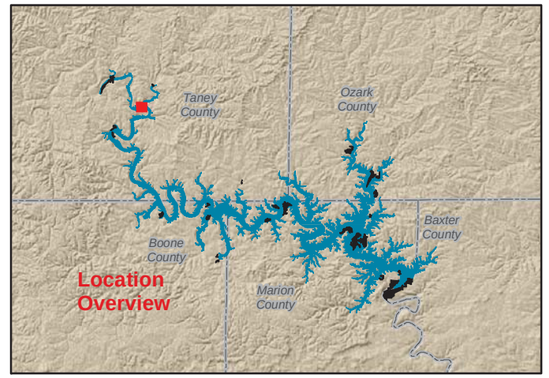
1-Jul-01	1-Aug-01	Supplement #29	Pontiac Park	Expansion of lease area. No change in land classificaiton
27-May-04	16-Feb-05	Supplement #30	Oakland Marina	Expansion of lease area. No change in land classificaiton
	16-Mar-07	Supplement #31	Lakeview Marina	Expansion of lease area. No change in land classificaiton

Appendix C Park Map Plates

BEAVER CREEK

Legend

- Monuments
- Gate House
- Playground
- R/S Restroom/Showerhouse
- 10ft Contours
- Flood Control Pool
- USACE Boundary Line
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 125 250

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
W E
S

BUCK CREEK

PEEL FERRY

125

MARINA

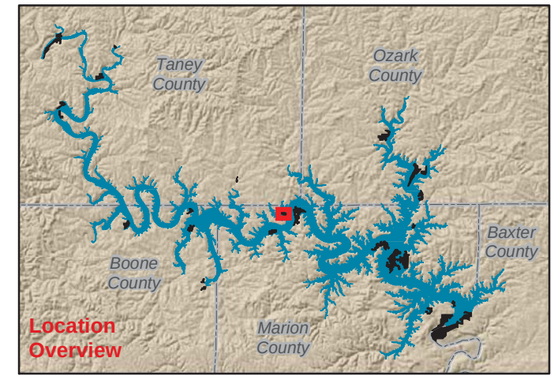
R

R/S

R/S

Legend

- Monuments
- Gate House
- Playground
- Restroom
- Restroom/Showerhouse
- 10ft Contours
- Flood Control Pool
- Ferry
- State Highway
- USACE Boundary Line
- Swimbeach
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 250 500

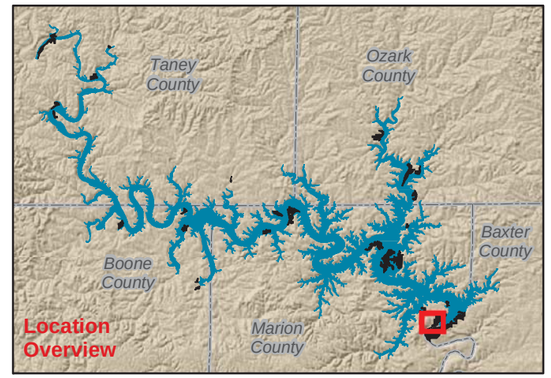
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

BULL SHOALS CITY PARK

Legend

- Monuments
- Gazebo
- Playground
- Restroom
- RecreationTrail
- State Highway
- 10ft Contours
- USACE Boundary Line
- Group Shelter
- Archery Range
- Baseball Field
- Basketball Court
- VolleyBall Court
- Road
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 500 1,000

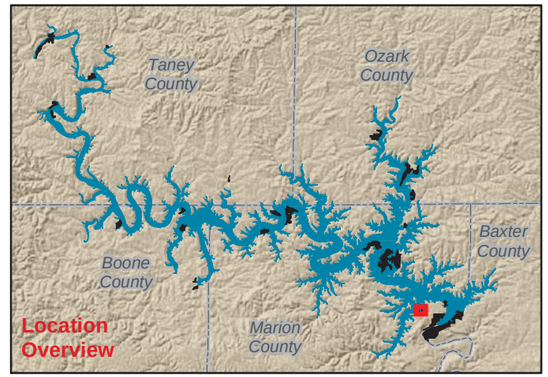
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

BULL SHOALS PARK

Legend

- Monuments
- Restroom
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 250 500

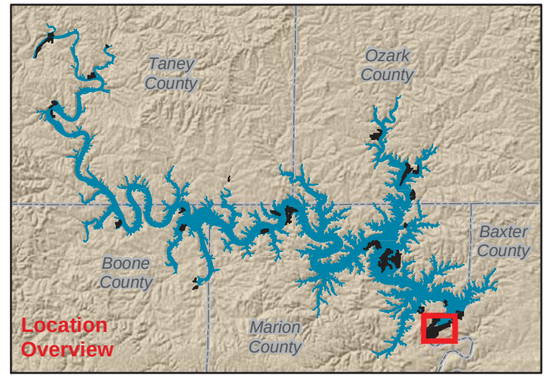
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

BULL SHOALS
WHITE RIVER STATE PARK

Legend

- Monuments
- Gate House
- Amphitheater
- Playground
- Restroom
- Restroom/Showerhouse
- RecreationTrail
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Basketball Court
- Building
- Group Shelter
- Visitor Center
- Vending Shelter
- Employee Residence
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013

Feet
0 500 1,000 2,000

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
W E
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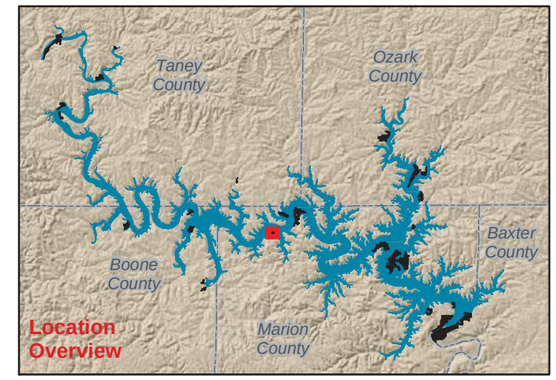
CAMP GALILEE

Legend

- Monuments
- Playground
- 10ft Contours
- Flood Control Pool
- USACE Boundary Line
- Group Shelter
- Basketball Court
- Bunk House
- Lodge
- Residence
- Store
- VolleyBall Court
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 250 500

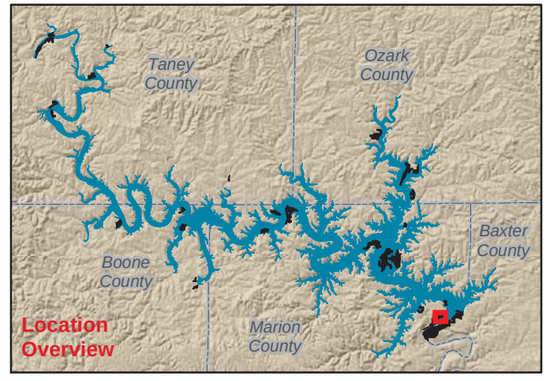
US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

DAM SITE PARK

Legend

- Monuments
- Gate House
- Playground
- Gate
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 250 500

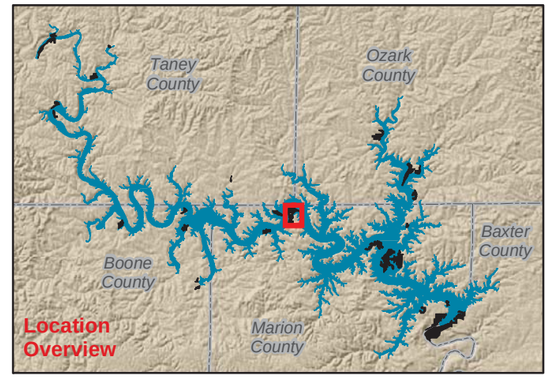
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

HIGHWAY 125

Legend

- Monuments
- Gate House
- Playground
- R/S — Restroom/Showerhouse
- 10ft Contours
- Flood Control Pool
- Ferry
- State Highway
- USACE Boundary Line
- Swimbeach
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

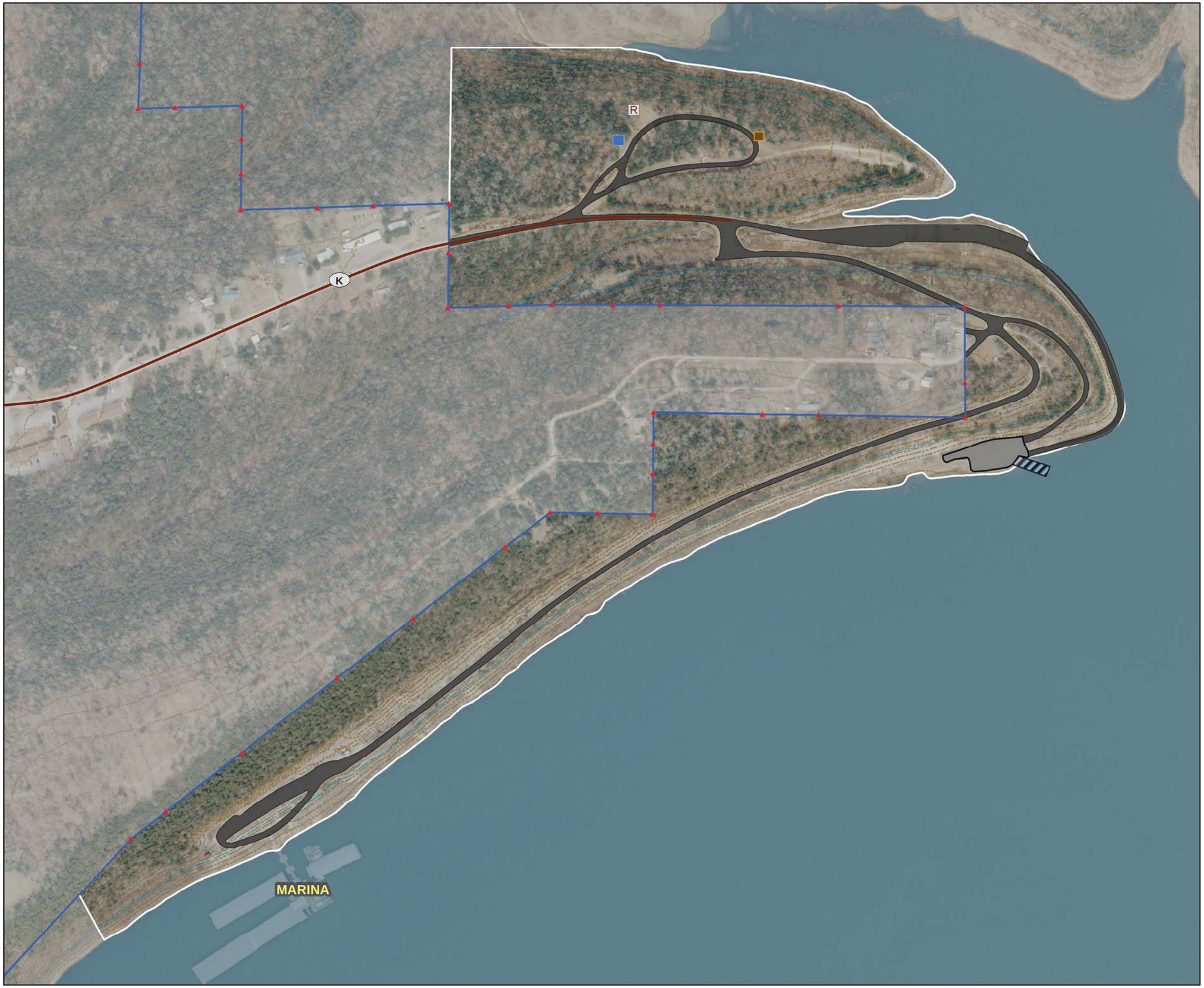
Imagery Date: 2008

Feet

0 500 1,000

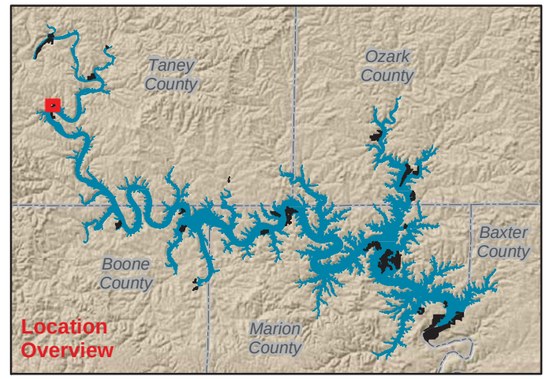
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

HIGHWAY K



Legend

- Monuments
- Group Shelter
- Well House
- Restroom
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 250 500

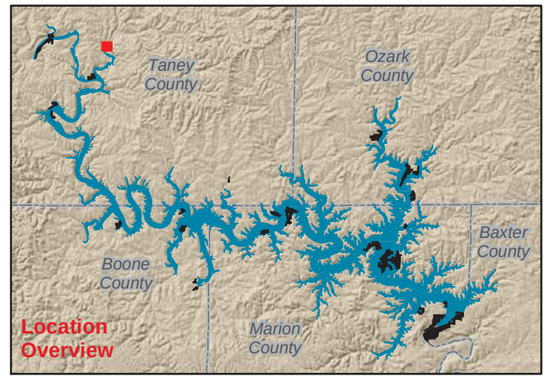
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

KISSEE MILLS

Legend

- Monuments
- Restroom
- 10ft Contours
- Flood Control Pool
- US Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 125 250

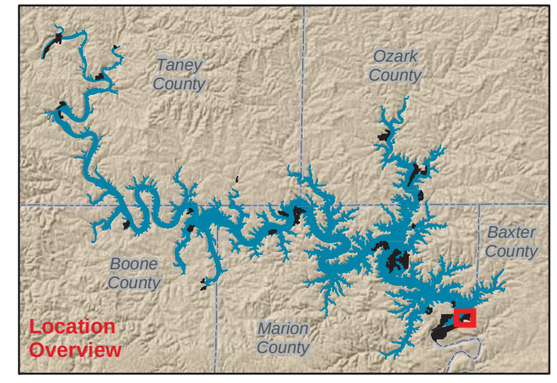
US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

LAKEVIEW

Legend

- Monuments
- Amphitheater
- Gate House
- Playground
- Restroom
- Gate
- RecreationTrail
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Swimbeach
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 250 500

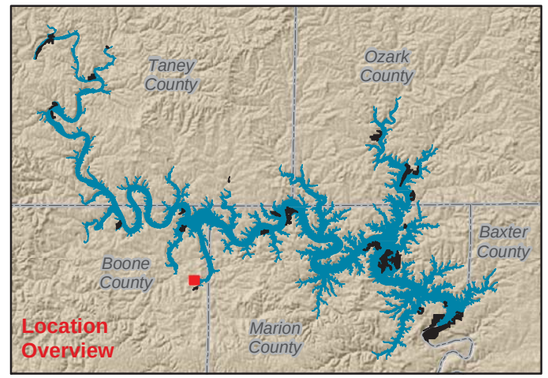
US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
W E
S

LEAD HILL CITY PARK

Legend

- Monuments
- Playground
- Restroom
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Group Shelter
- Basketball Court
- Concession Stand
- Rodeo Arena
- Soccer Field
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 125 250

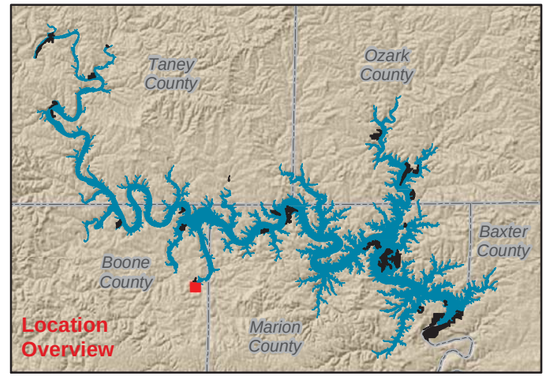
US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
W E
S

LEAD HILL SCHOOL

Legend

- Monuments
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 125 250

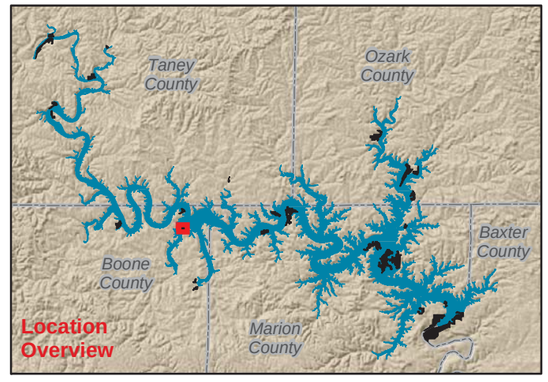
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

LEAD HILL PARK

Legend

- Monuments
- Gate House
- Playground
- R — Restroom
- R/S — Restroom/Showerhouse
- 10ft Contours
- Flood Control Pool
- USACE Boundary Line
- Swimbeach
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 250 500

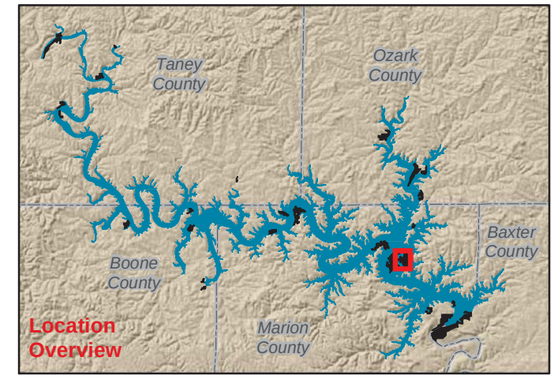
US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
W E
S

OAKLAND

Legend

- Monuments
- Group Shelter
- Gate House
- Playground
- R/S Restroom/Showerhouse
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Swimbeach
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

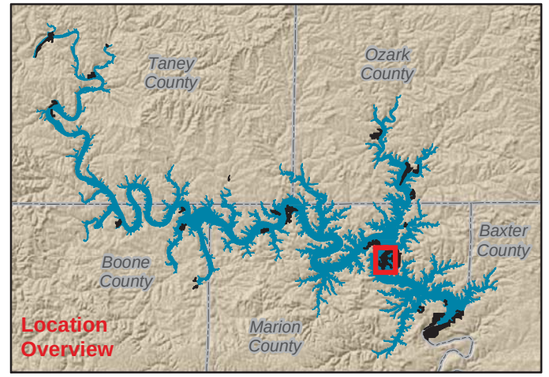
0 495 990

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

OZARK ISLE

Legend

- 10ft Contours
- Flood Control Pool
- Road
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

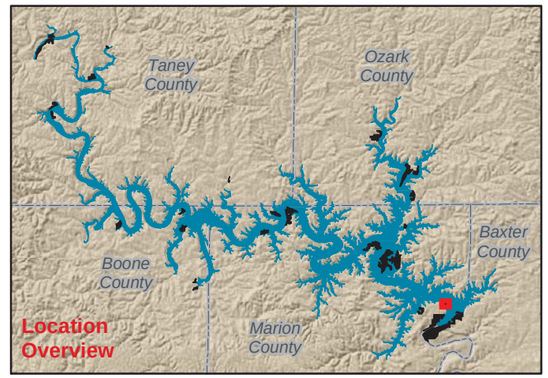
0 500 1,000

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

POINT RETURN

Legend

- Monuments
- Playground
- Restroom
- Gate
- 10ft Contours
- Flood Control Pool
- USACE Boundary Line
- Group Shelter
- Swimbeach
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 250 500

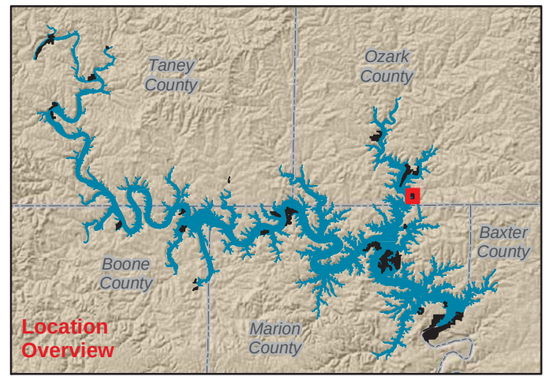
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

PONTIAC

Legend

- Monuments
- Gate House
- Group Shelter
- Playground
- Restroom
- Restroom/Showerhouse
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

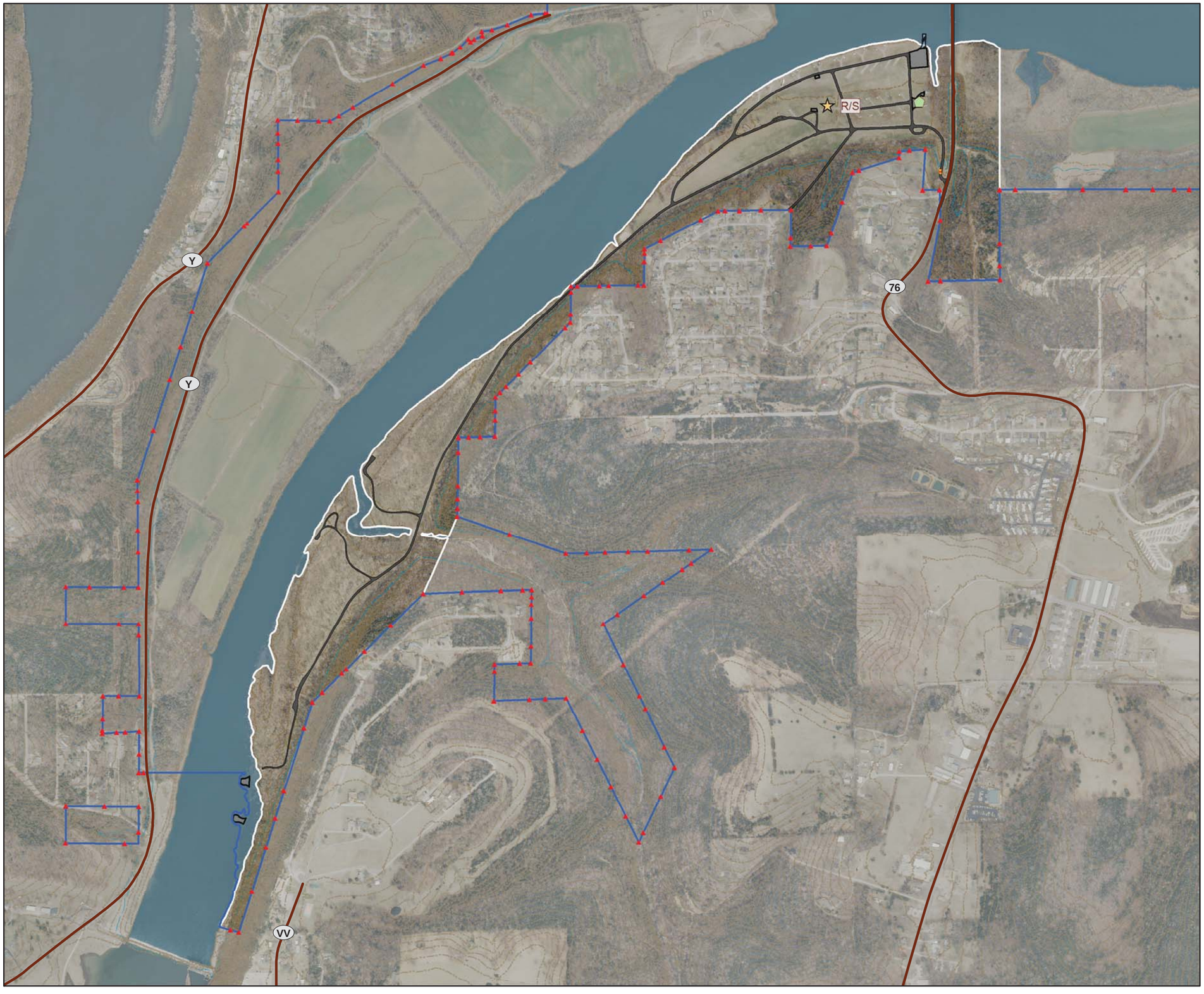
Imagery Date: 2008

Feet

0 250 500

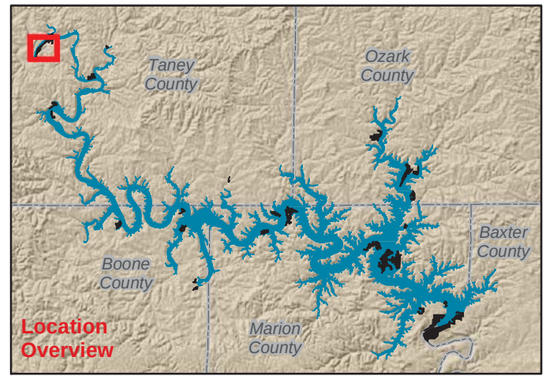
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

RIVER RUN



Legend

- Monuments
- Gate House
- Playground
- R/S Restroom/Showerhouse
- Gate
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 500 1,000

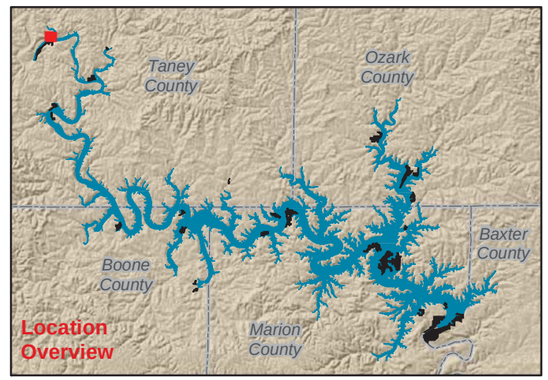
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

SHADOW ROCK

Legend

- Monuments
- Playground
- Restroom
- Showerhouse
- Gate
- 10ft Contours
- Flood Control Pool
- State Highway
- US Highway
- USACE Boundary Line
- Group Shelter
- Basketball Court
- Bulding
- Cabin
- Concession Stand
- County Jail
- Pole Barn
- Rodeo Arena
- Softball Field
- Tennis Court
- VolleyBall Court
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

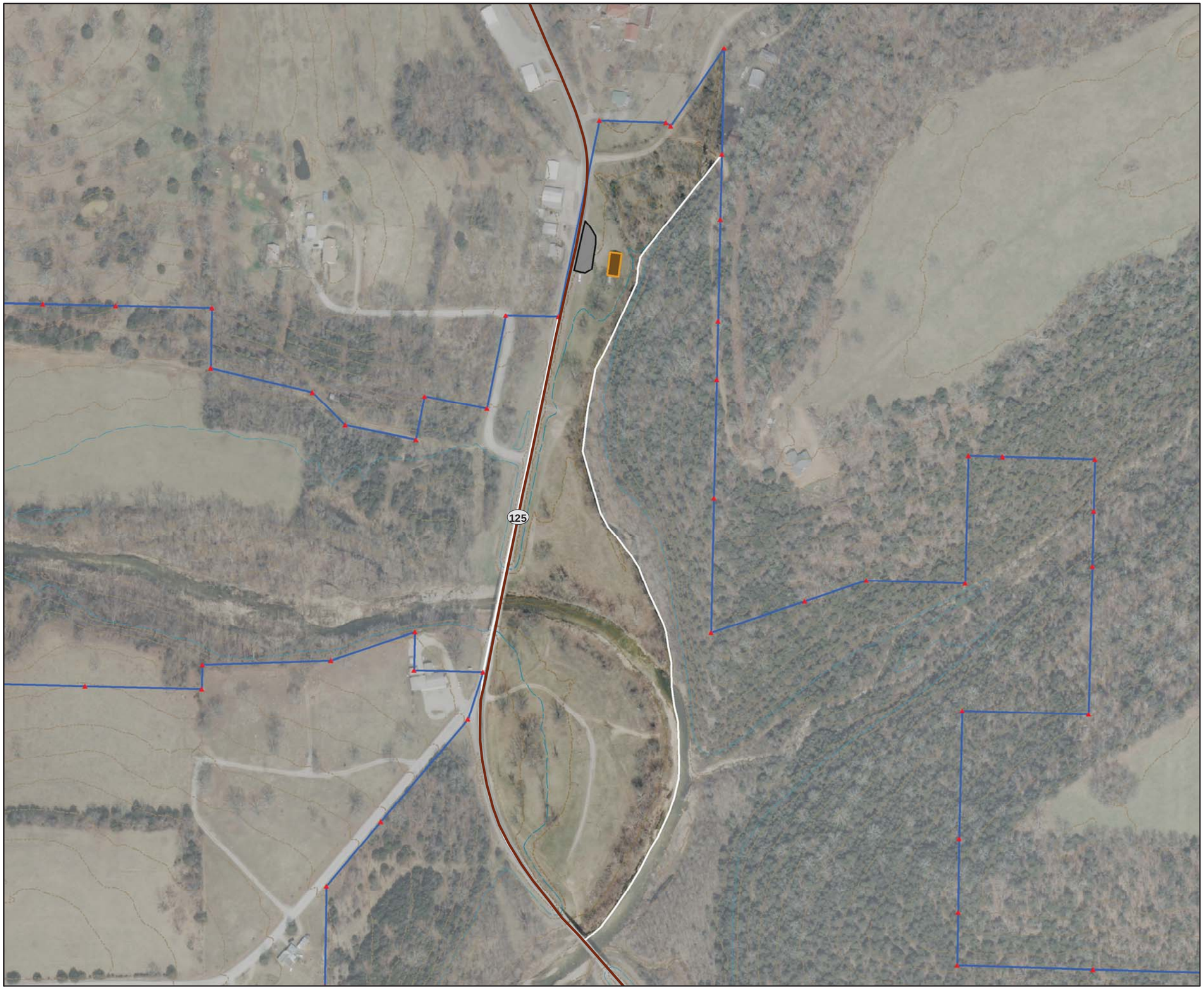
Imagery Date: 2008

Feet
0 125 250

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

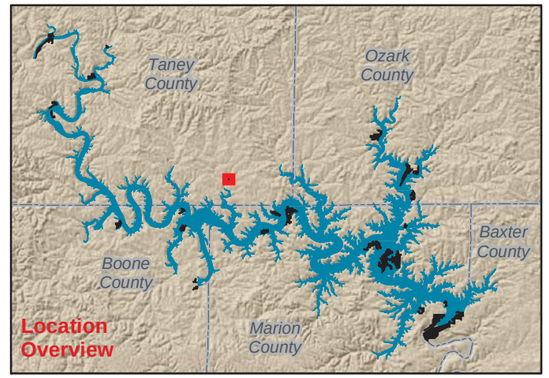
N W E S

SHOAL CREEK



Legend

- Monuments
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Group Shelter
- Parking
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 125 250

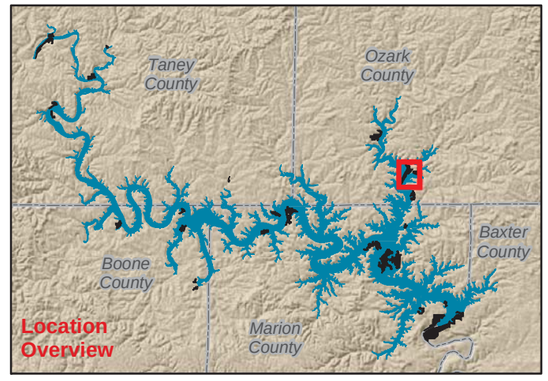
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

SPRING CREEK

Legend

- Monuments
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

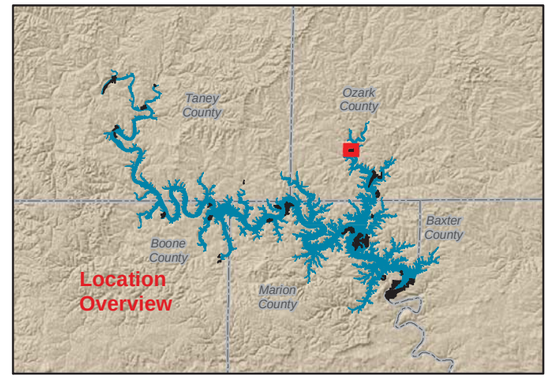
Feet
0 500 1,000

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

THEODOSIA

Legend

- Monuments
- Gate House
- Playground
- Restroom
- Restroom/Showerhouse
- Gate
- 10ft Contours
- Flood Control Pool
- US Highway
- USACE Boundary Line
- Swimbeach
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet

0 250 500

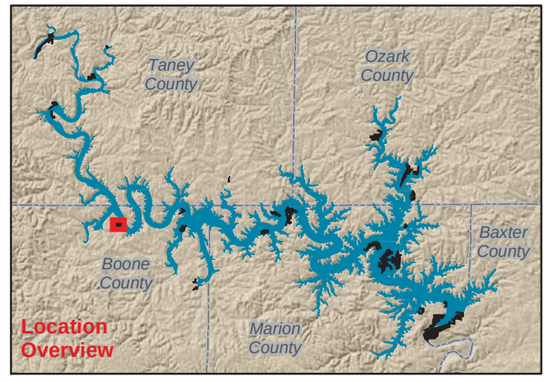
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

TUCKER HOLLOW

Legend

- Monuments
- Gate House
- Playground
- R/S Restroom/Showerhouse
- Gate
- 10ft Contours
- Flood Control Pool
- State Highway
- USACE Boundary Line
- Boat Ramp
- Road
- Parking
- Conservation Pool
- Park Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2008

Feet
0 250 500

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

Appendix D Land Classification and Easement Plates

MAP SHEET INDEX
LAND CLASSIFICATIONS AND EASEMENTS

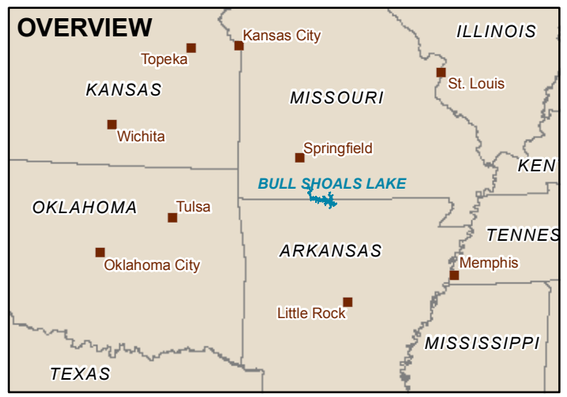
MAP SHEET INDEX

Legend

- Point Markers
- Roads
- Ferry
- State Highway
- US Highway
- Counties
- USDA Forest Service Lands
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement

LAND CLASSIFICATIONS

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
- PROJECT OPERATIONS
- RESTRICTED
- OPEN RECREATION



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Miles

0 2.5 5

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

See Map Sheet N/A

See Map Sheet N/A

See Map Sheet 2

See Map Sheet 3

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
- PROJECT OPERATIONS
- RESTRICTED
- OPEN RECREATION

Legend

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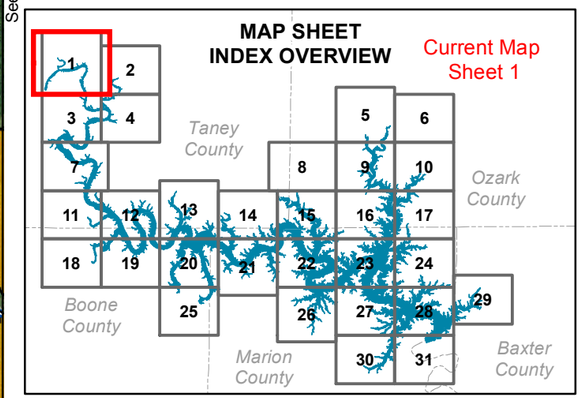
- State Highway
- US Highway
- Rivers/Streams
- Counties
- USDA Forest Service
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary



UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

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See Map Sheet N/A

See Map Sheet 1

See Map Sheet N/A

See Map Sheet 4

KISSEE MILLS

Long Creek

Cane Creek

160

160

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

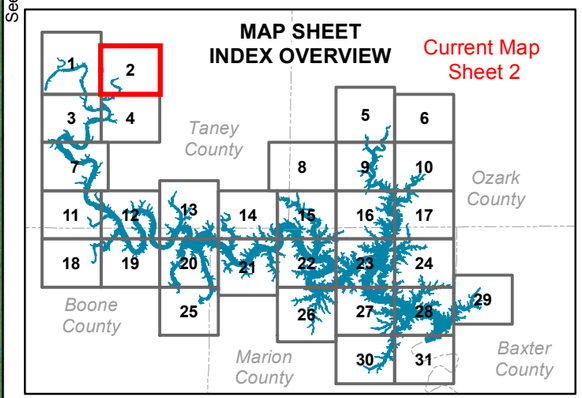
- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
- PROJECT OPERATIONS
- RESTRICTED
- OPEN RECREATION

Legend

- Point Markers
- Roads
- Ferry
- State Highway
- US Highway
- Rivers/Streams
- Counties
- USDA Forest Service
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 2



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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See Map Sheet 1

See Map Sheet N/A

See Map Sheet 4

See Map Sheet 7

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
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- US Highway
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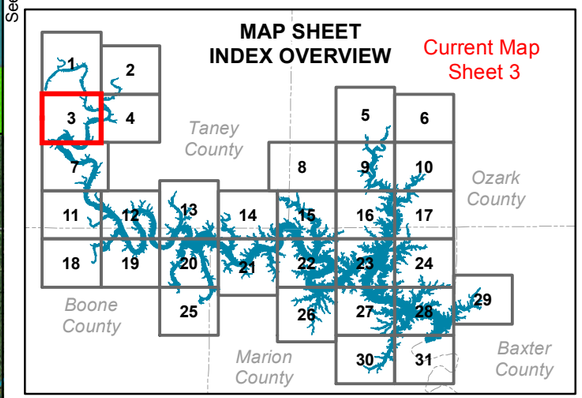
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 3



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
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See Map Sheet 2

See Map Sheet 3

See Map Sheet N/A

See Map Sheet N/A

BEAVER CREEK

Cedar Creek

Dabbs Creek

Wolf Creek

160

M

KK

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
- PROJECT OPERATIONS
- RESTRICTED
- OPEN RECREATION

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- Counties
- USDA Forest Service
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
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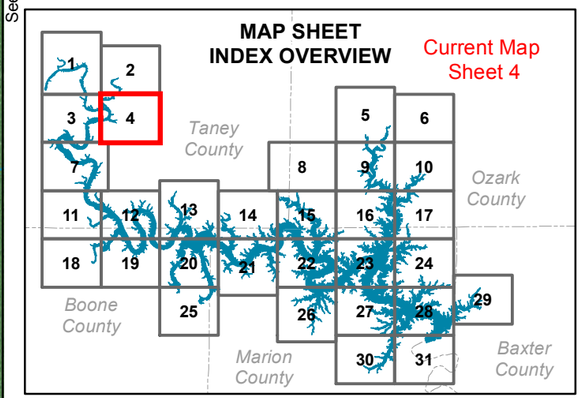
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 4



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
W E
S

See Map Sheet N/A

See Map Sheet N/A

See Map Sheet 6

See Map Sheet 9

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
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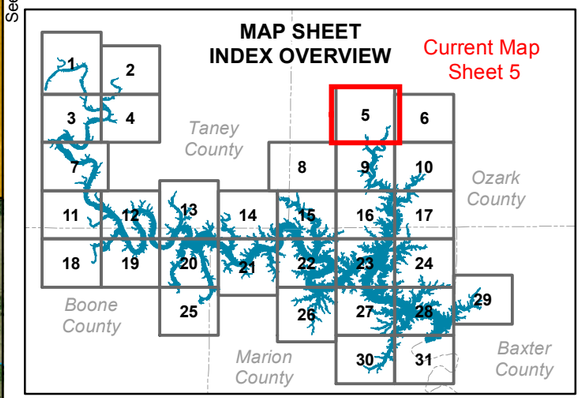
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 5



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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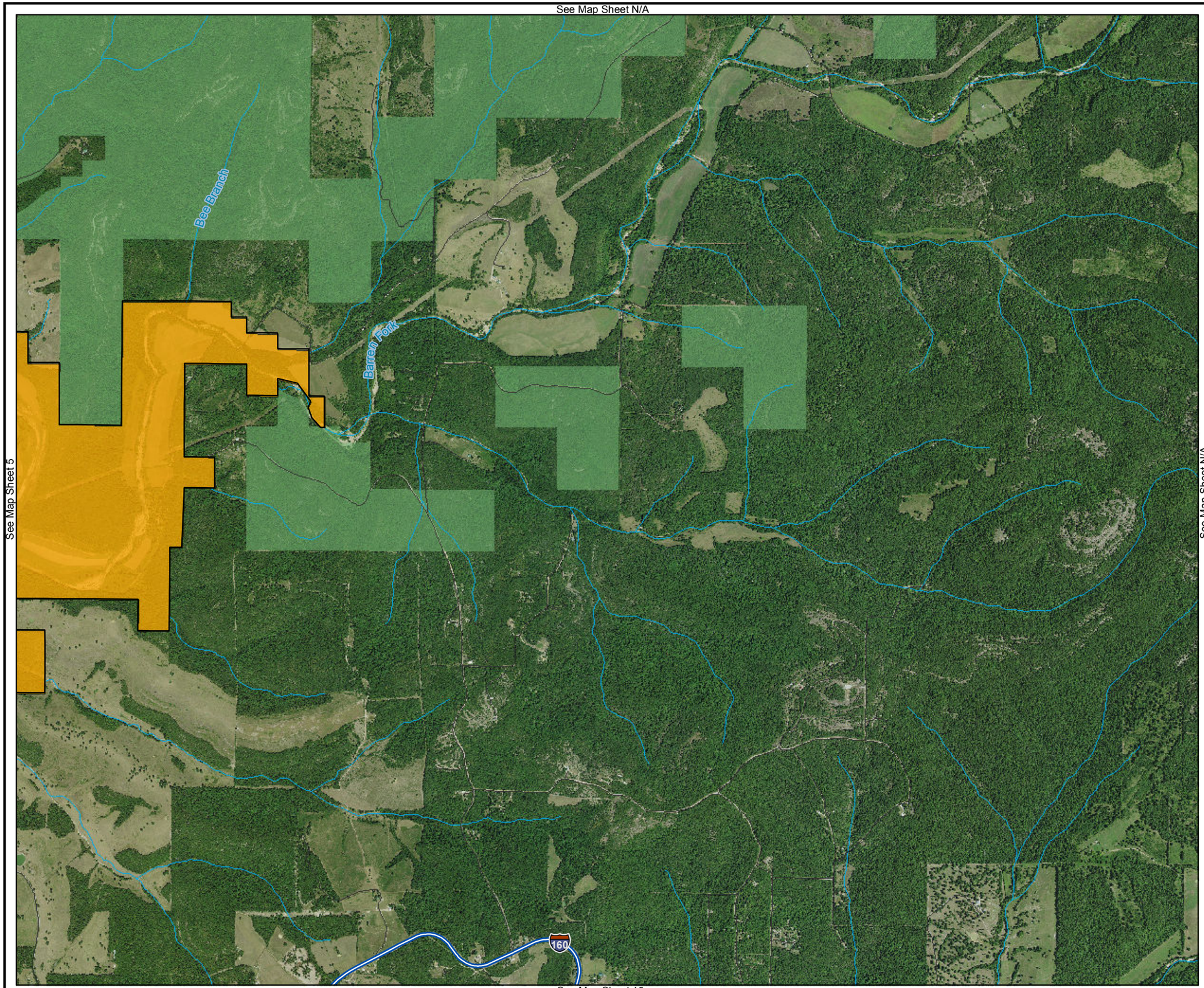
S

See Map Sheet N/A



See Map Sheet 5

See Map Sheet N/A

See Map Sheet 10

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
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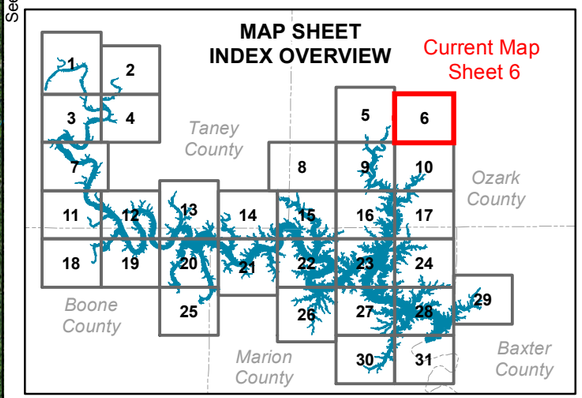
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 6



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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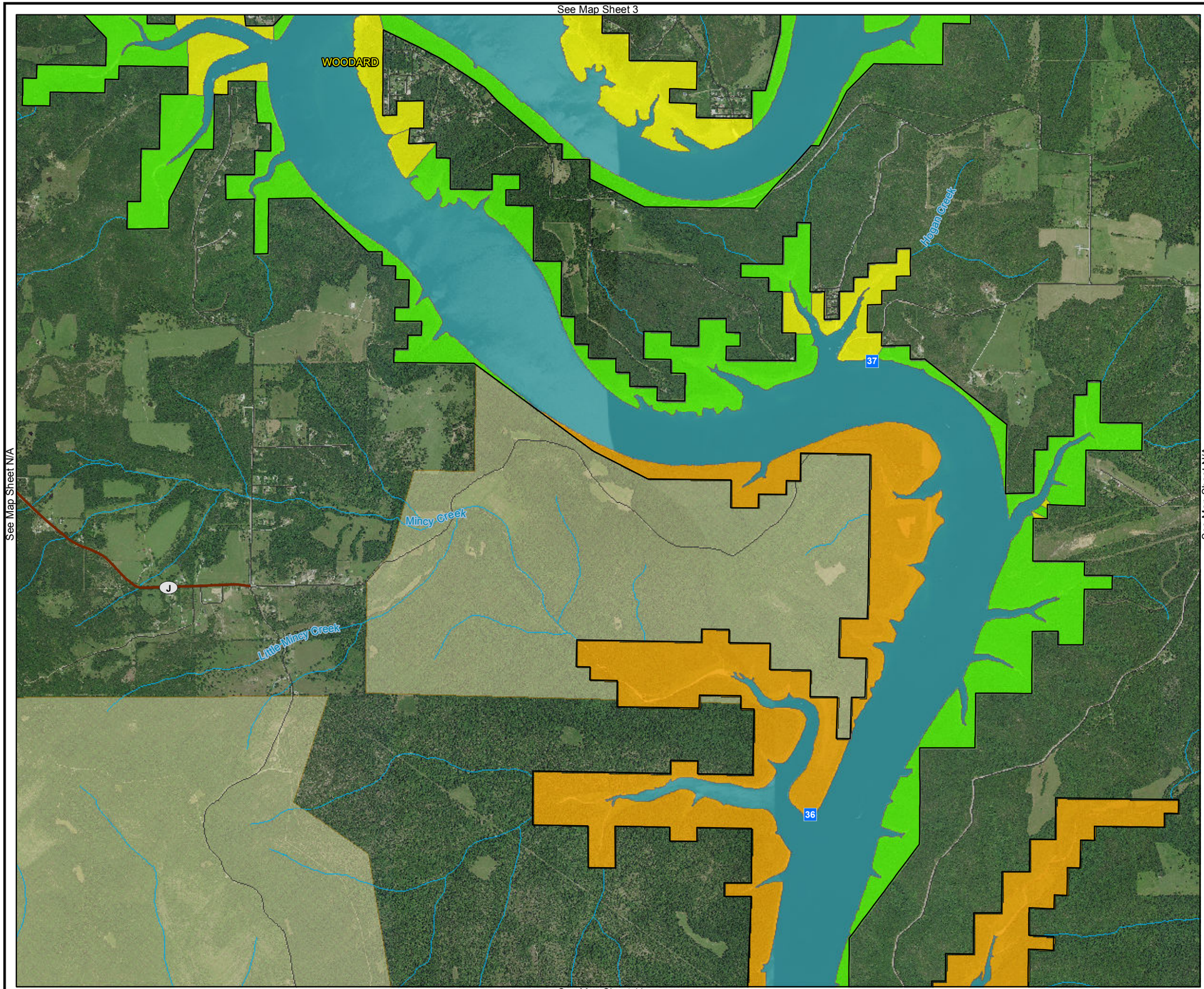
See Map Sheet 3



See Map Sheet N/A

See Map Sheet N/A

See Map Sheet 11

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
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- RESTRICTED
- OPEN RECREATION

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- US Highway
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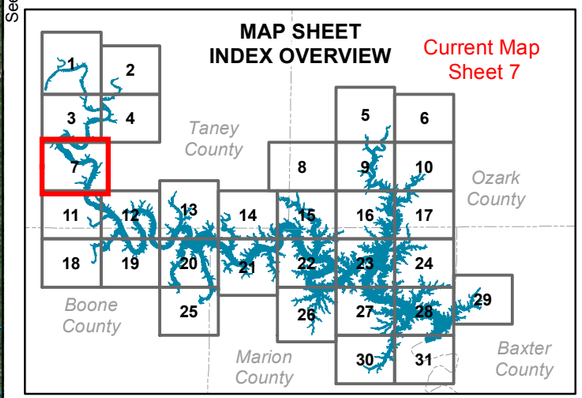
- Counties
- USDA Forest Service
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 7



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

See Map Sheet N/A

See Map Sheet N/A

See Map Sheet 9

See Map Sheet 15

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
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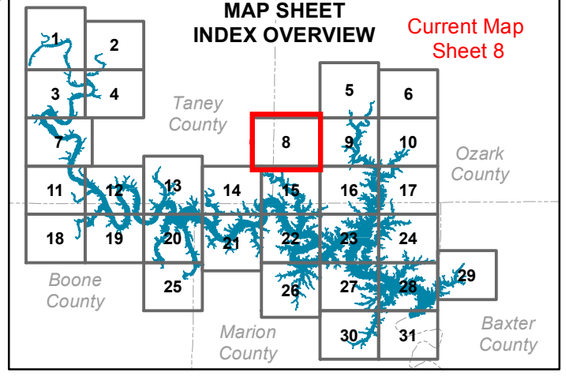
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 8



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

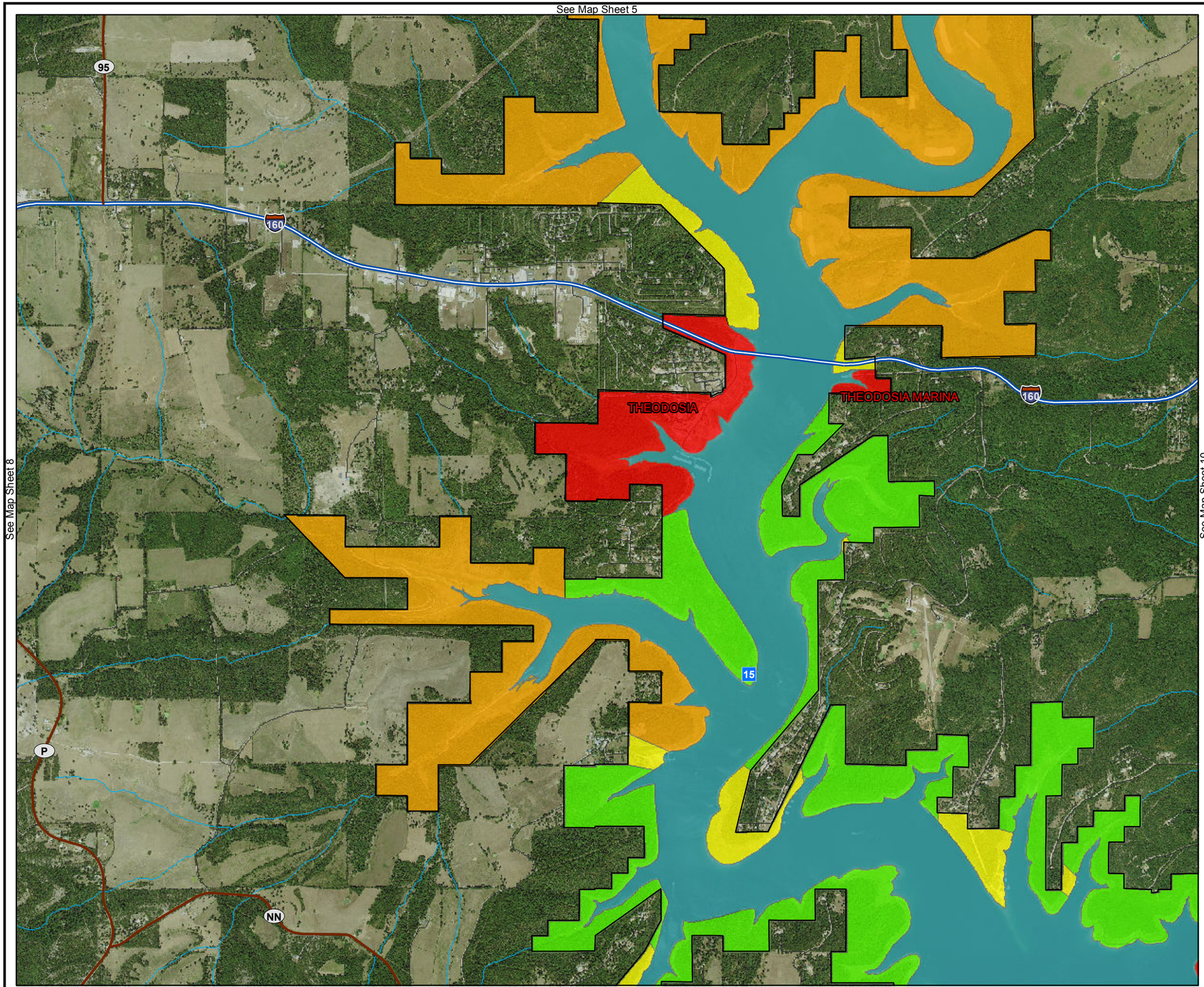
Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

See Map Sheet 5



See Map Sheet 8

See Map Sheet 10

See Map Sheet 16

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
- PROJECT OPERATIONS
- RESTRICTED
- OPEN RECREATION

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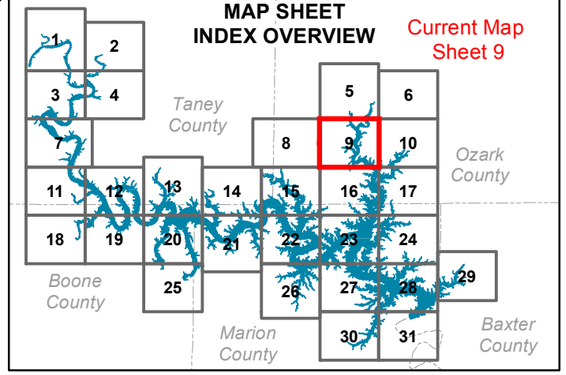
- Ferry
- State Highway
- US Highway
- Rivers/Streams
- Counties
- USDA Forest Service
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 9



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

See Map Sheet 6

See Map Sheet 9

See Map Sheet N/A

See Map Sheet 17

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
- PROJECT OPERATIONS
- RESTRICTED
- OPEN RECREATION

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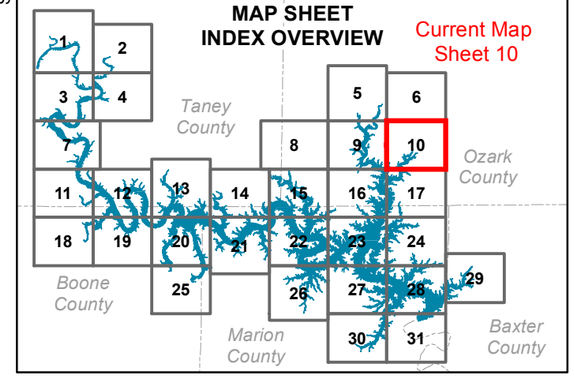
- State Highway
- US Highway
- Rivers/Streams
- Counties
- USDA Forest Service
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 10



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

See Map Sheet 7

See Map Sheet N/A

See Map Sheet 12

See Map Sheet 18

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
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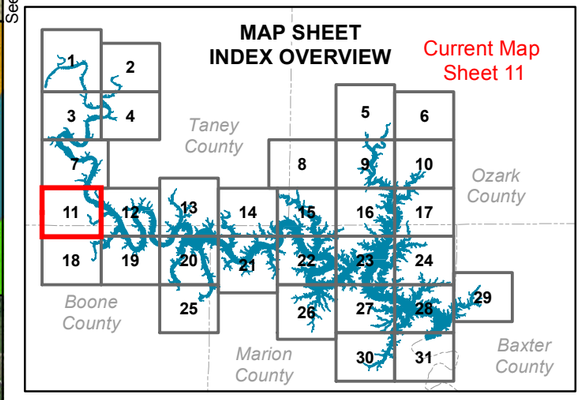


UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

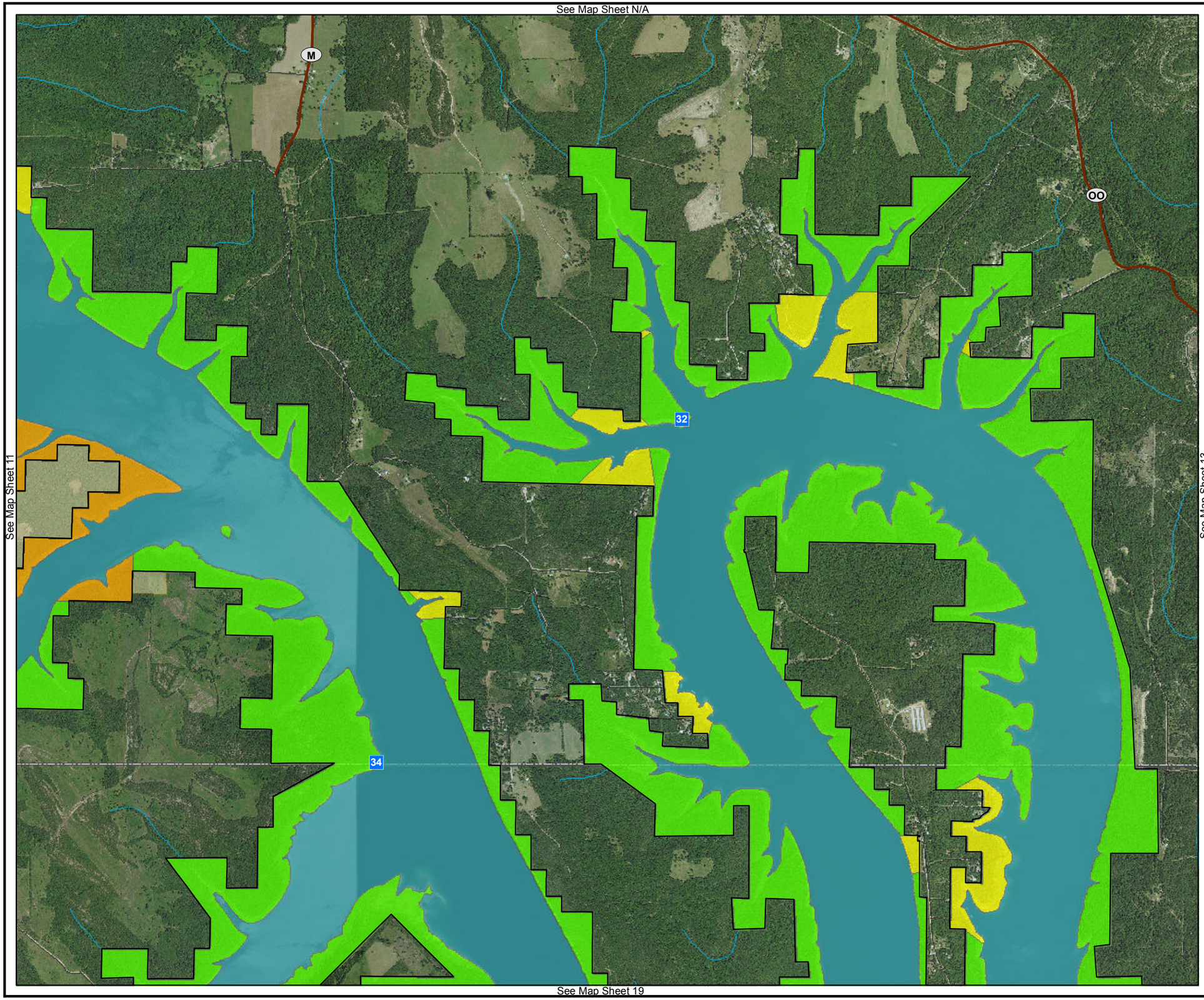
Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

See Map Sheet N/A



See Map Sheet 11

See Map Sheet 13

See Map Sheet 19

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
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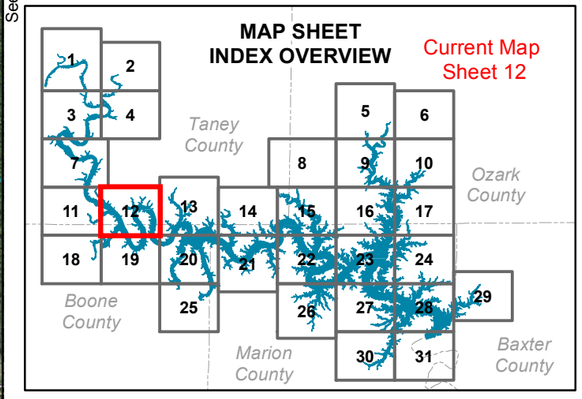

UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

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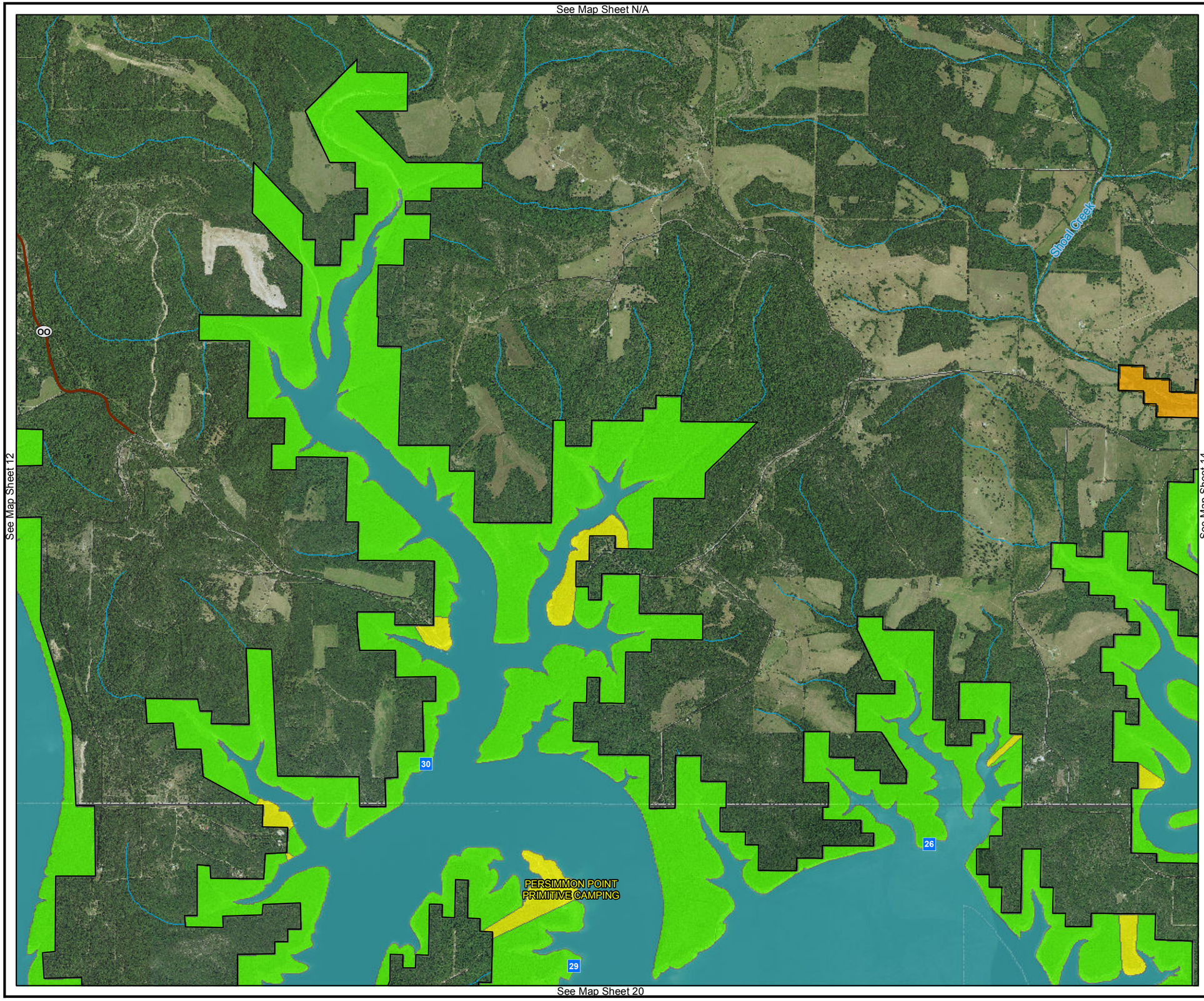
See Map Sheet N/A



See Map Sheet 12

See Map Sheet 14

See Map Sheet 20

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
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- PROJECT OPERATIONS
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- Missouri Department of Conservation Lands
- Flowage Easement
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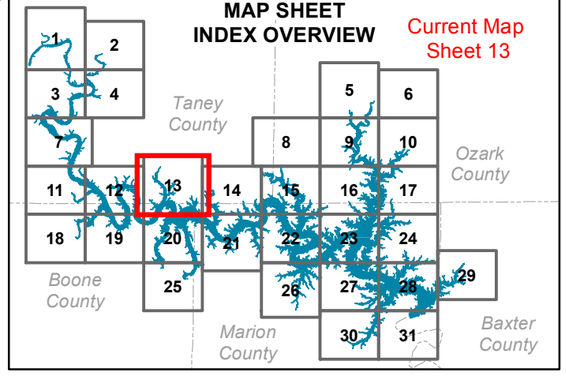
MAP SHEET INDEX OVERVIEW

Current Map Sheet 13



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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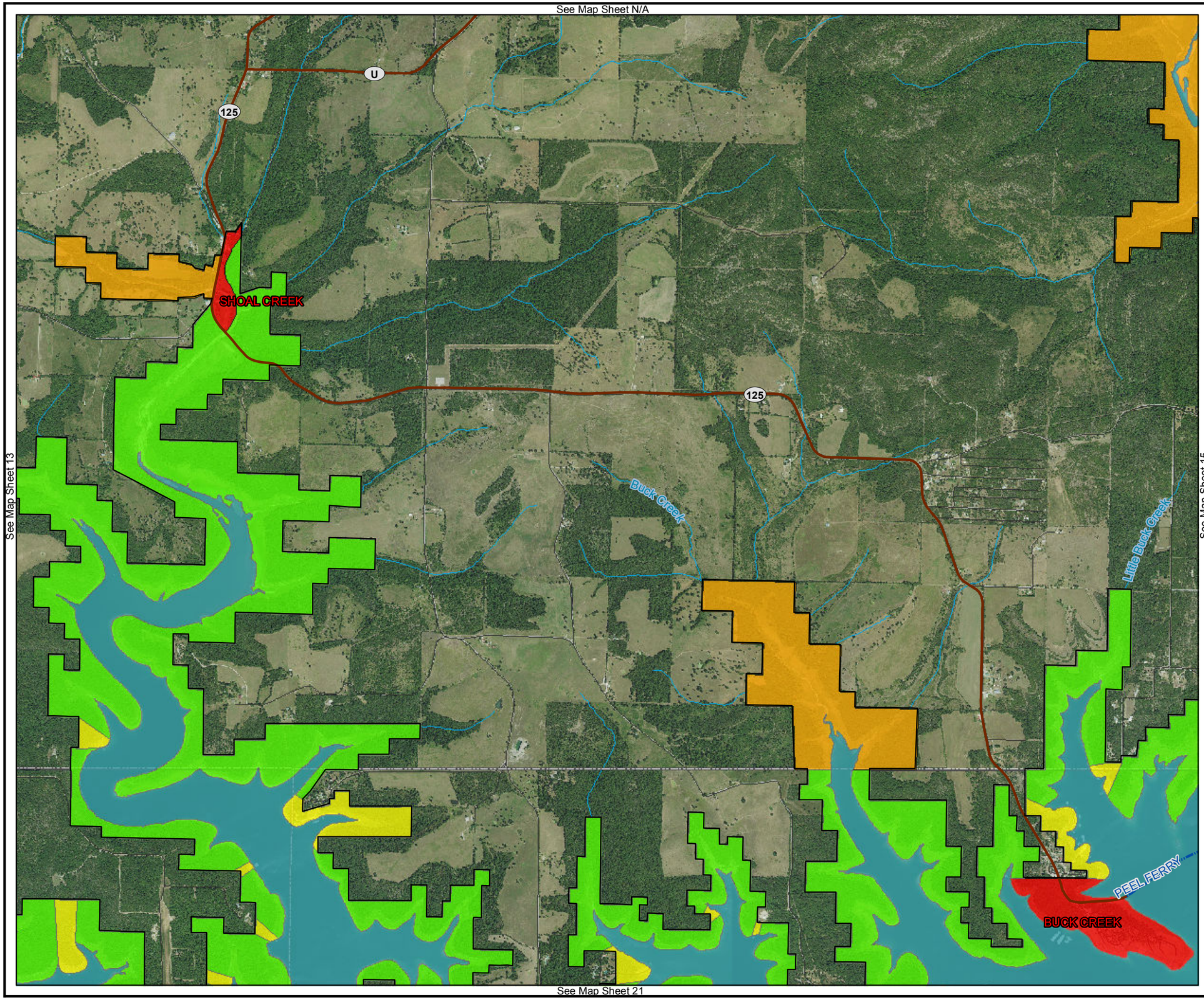
See Map Sheet N/A



See Map Sheet 13

See Map Sheet 15

See Map Sheet 21

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
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- US Highway
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- Missouri Department of Conservation Lands
- Flowage Easement
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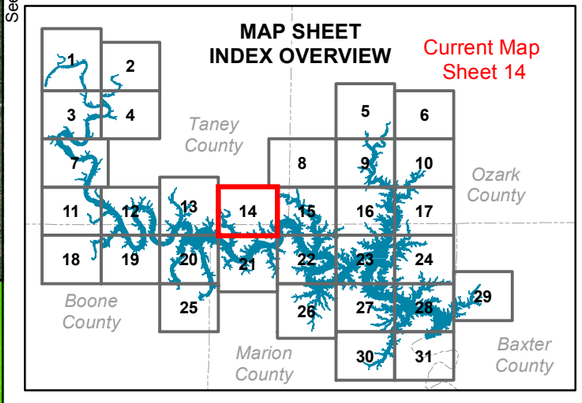

UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
W E
S

See Map Sheet 8

See Map Sheet 14

See Map Sheet 16

See Map Sheet 22

McVey Branch

Little Cedar Creek

PEEL FERRY

HIGHWAY 125

21

125

P

LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
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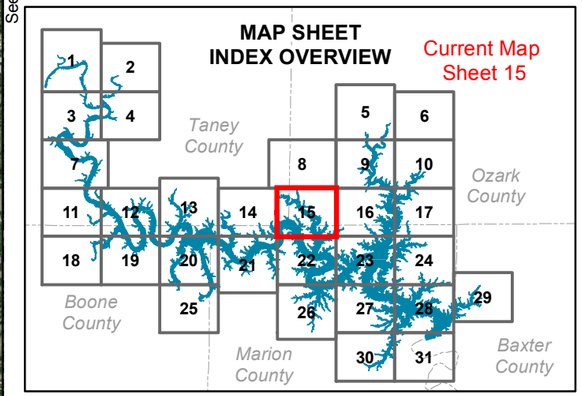
MAP SHEET INDEX OVERVIEW

Current Map Sheet 15



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N
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LAND CLASSIFICATIONS AND EASEMENTS

LAND CLASSIFICATION

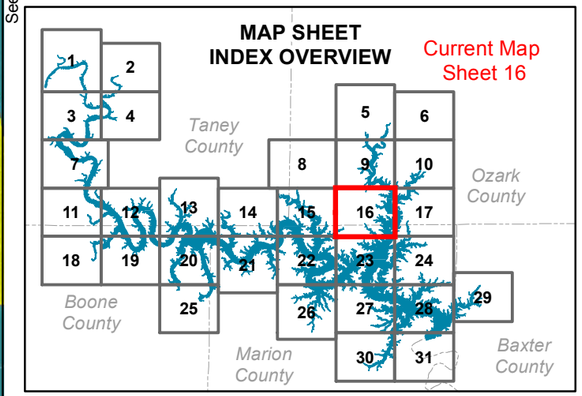
- HIGH DENSITY RECREATION
- LOW DENSITY RECREATION
- ENVIRONMENTAL SENSITIVE AREA
- WILDLIFE MANAGEMENT AREA
- PROJECT OPERATIONS
- RESTRICTED
- OPEN RECREATION

Legend

- Point Markers
- Roads
- Ferry
- State Highway
- US Highway
- Rivers/Streams
- Counties
- USDA Forest Service
- Arkansas Natural Heritage Commission Lands
- Missouri Department of Conservation Lands
- Flowage Easement
- USACE Boundary

MAP SHEET INDEX OVERVIEW

Current Map Sheet 16



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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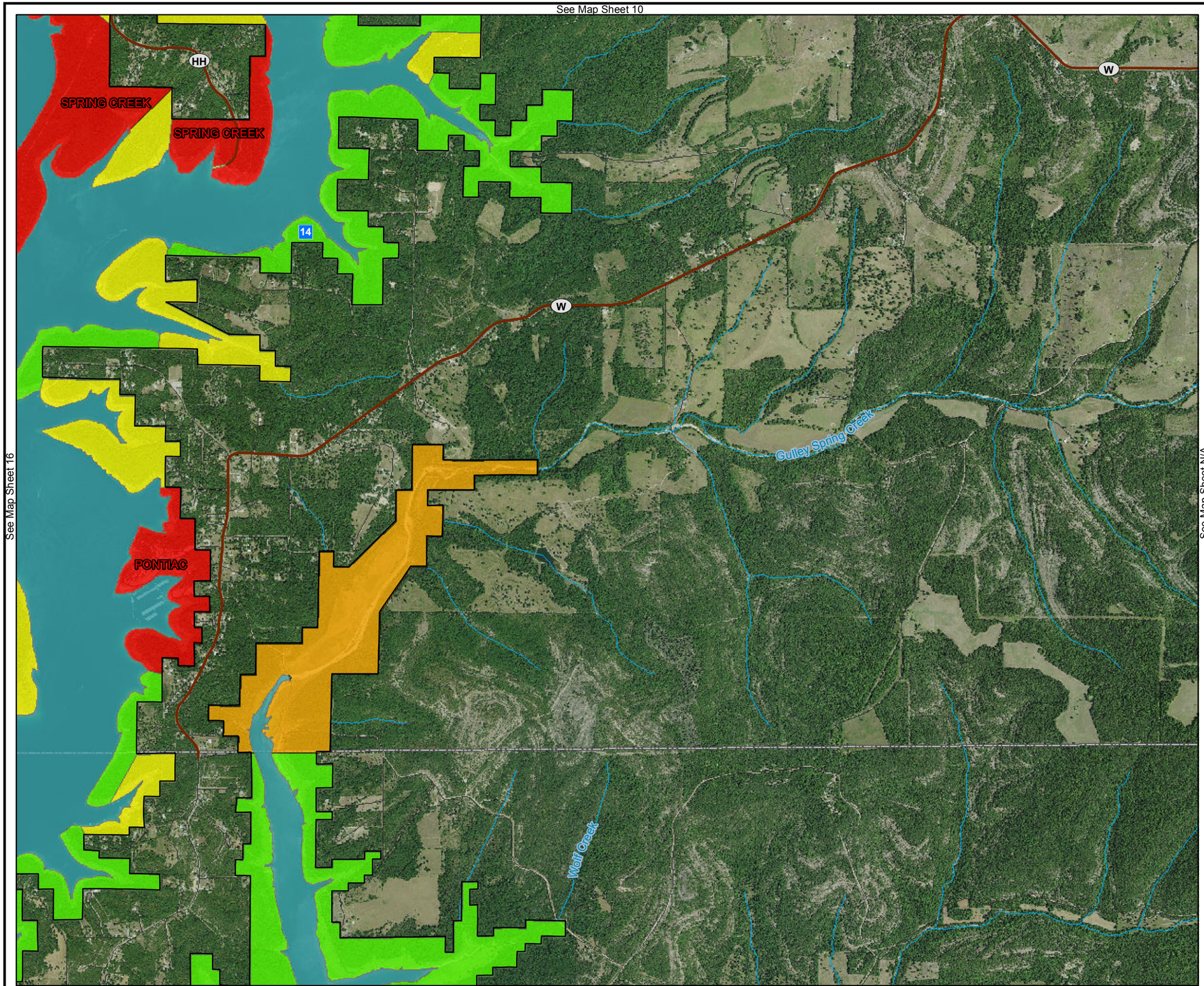
US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

See Map Sheet 10



See Map Sheet 16

See Map Sheet N/A

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LAND CLASSIFICATIONS AND EASEMENTS

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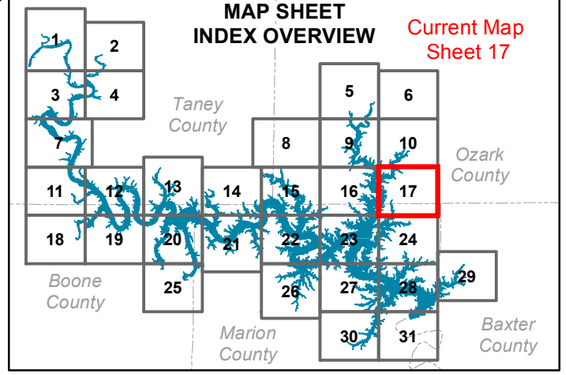

UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

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See Map Sheet N/A

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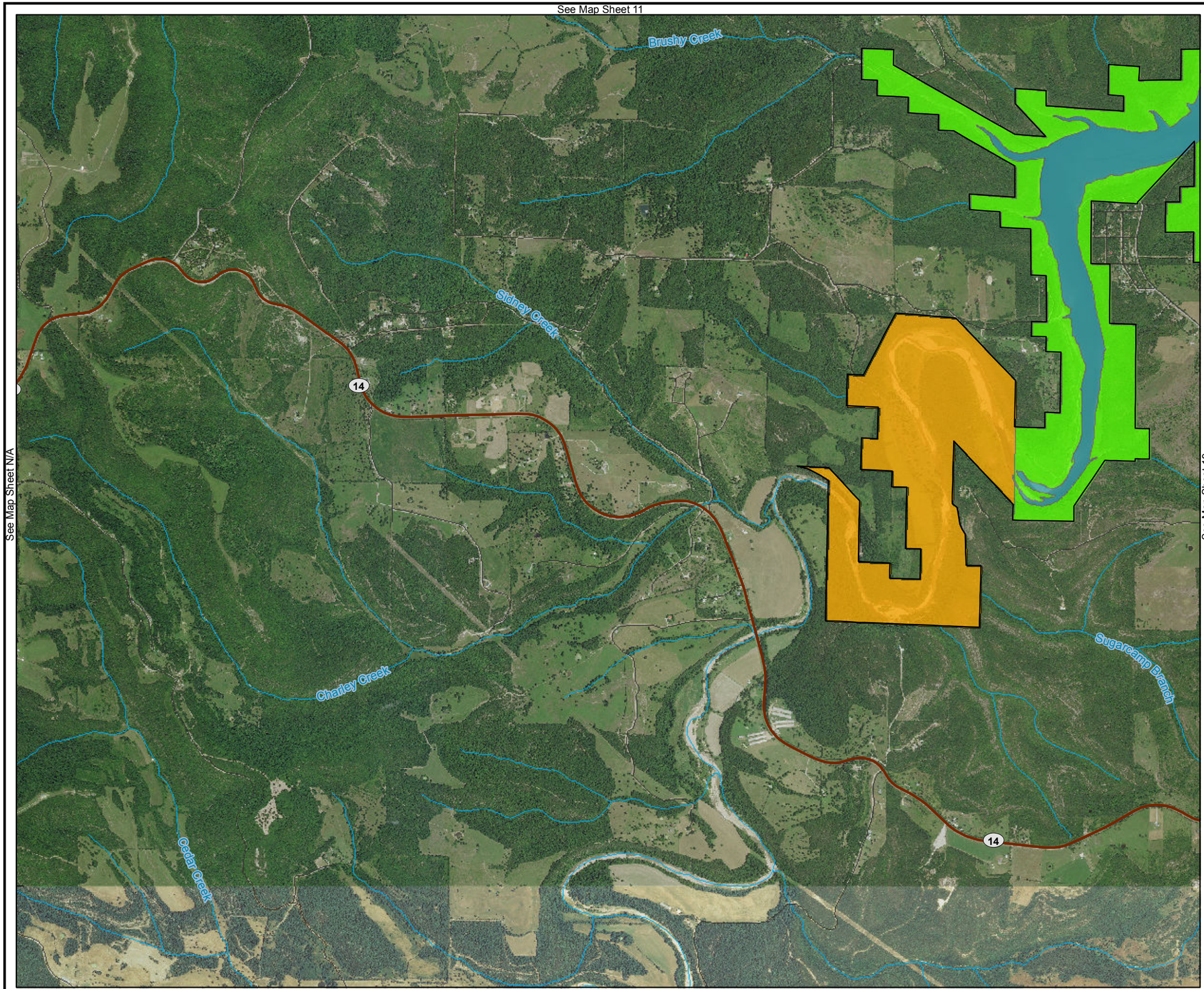
See Map Sheet N/A



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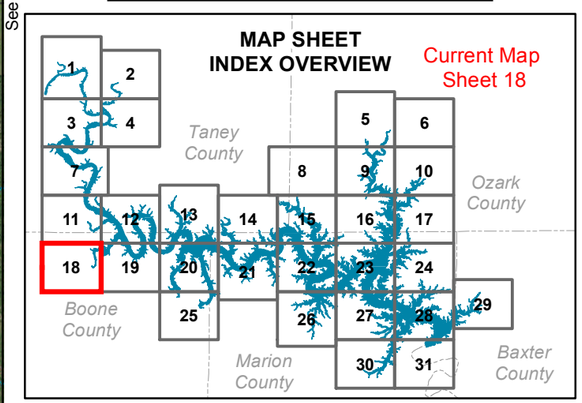

UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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LAND CLASSIFICATIONS AND EASEMENTS

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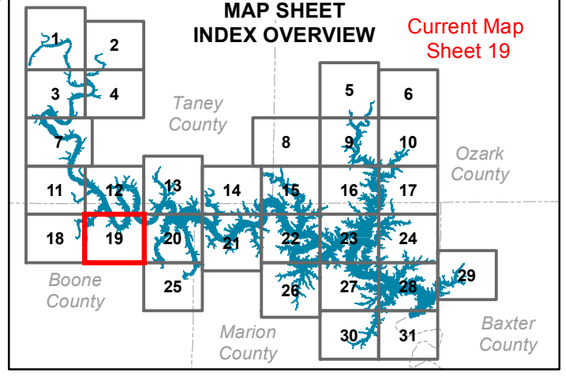

UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

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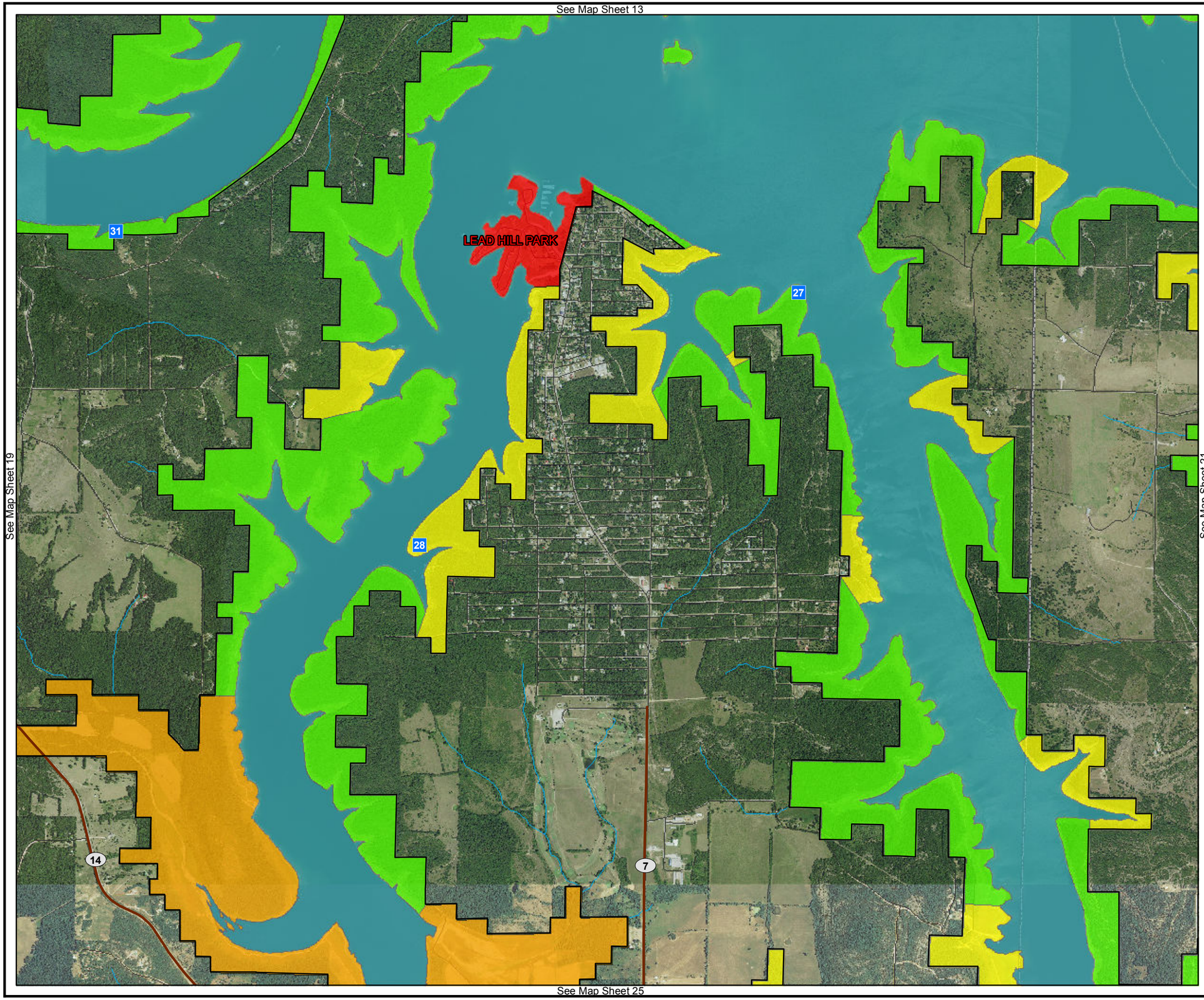

See Map Sheet 19

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LAND CLASSIFICATIONS AND EASEMENTS

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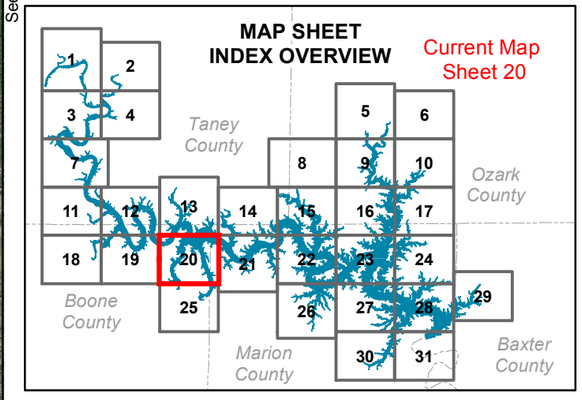

UPDATED MASTER PLAN BULL SHOALS LAKE

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Imagery Date: 2013/2014

Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

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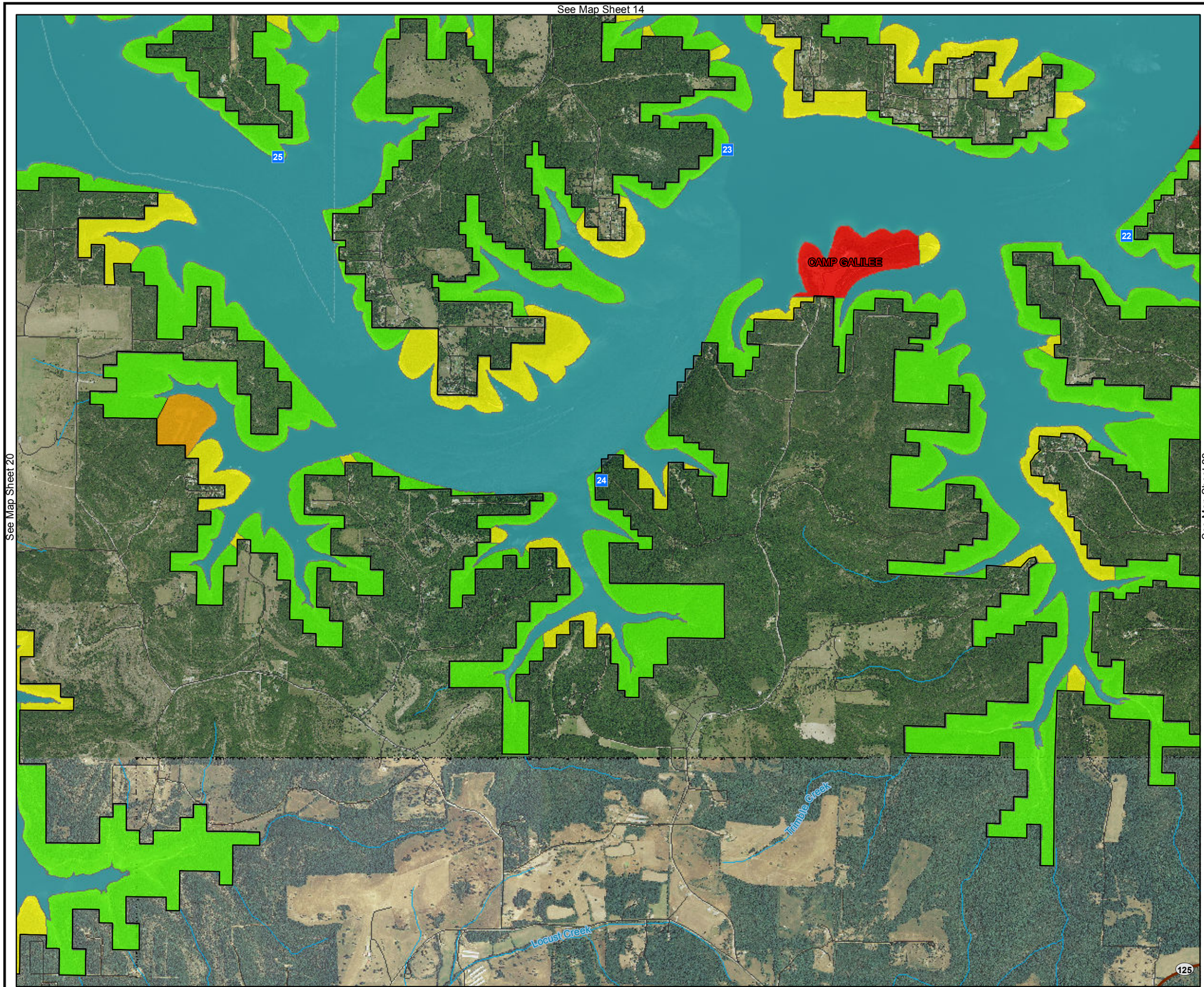

See Map Sheet 20

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See Map Sheet N/A

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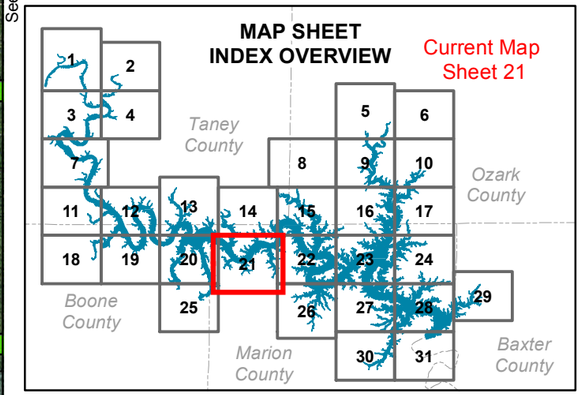

UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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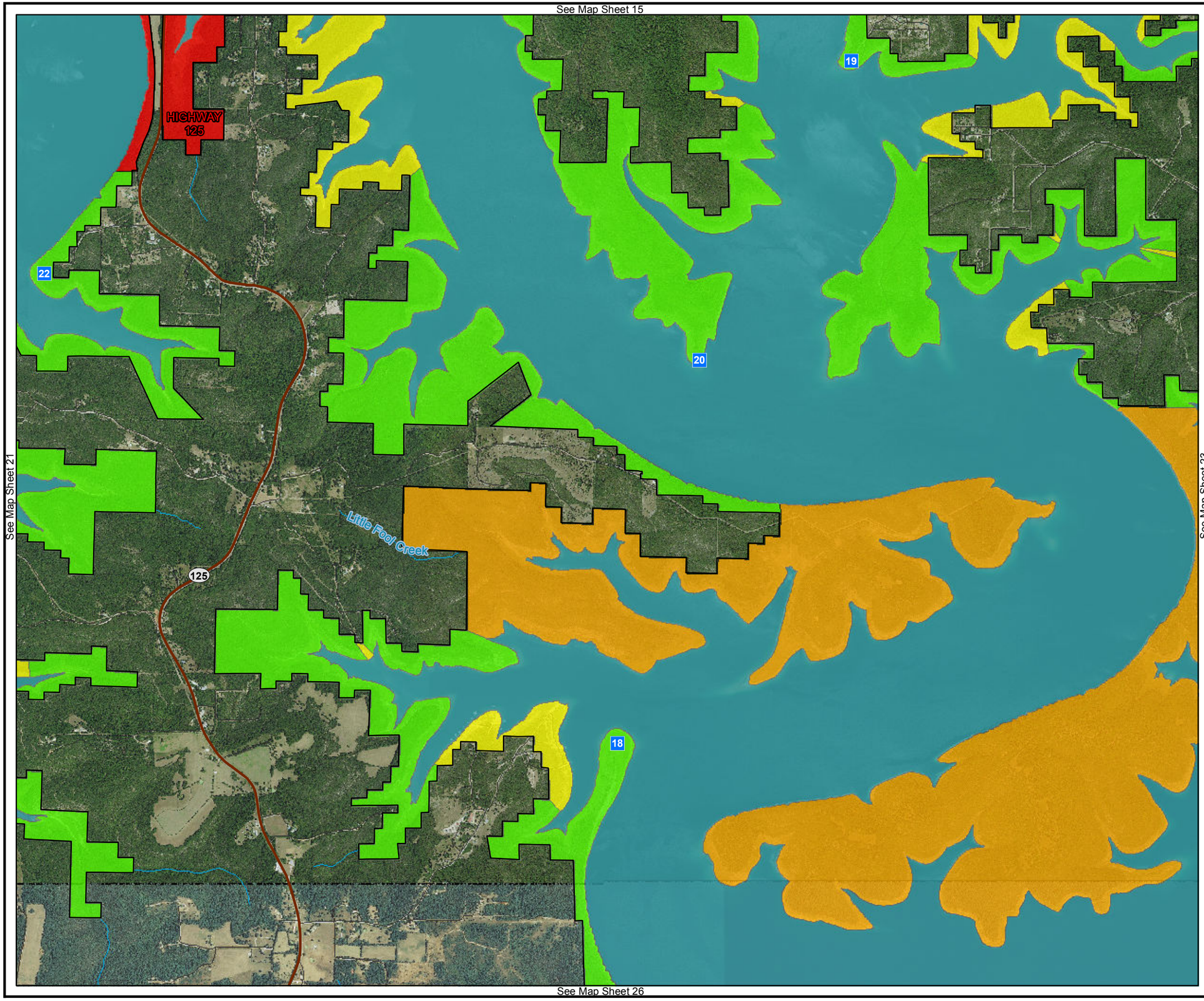

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MAP SHEET INDEX OVERVIEW

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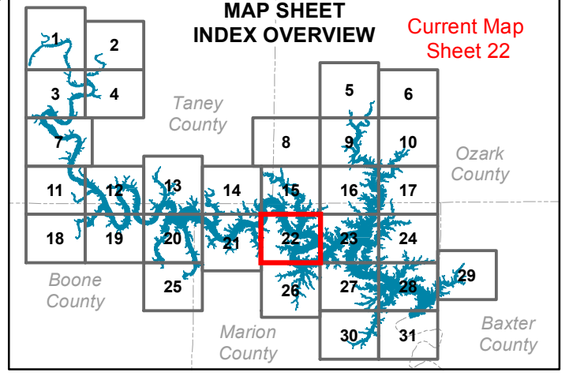

UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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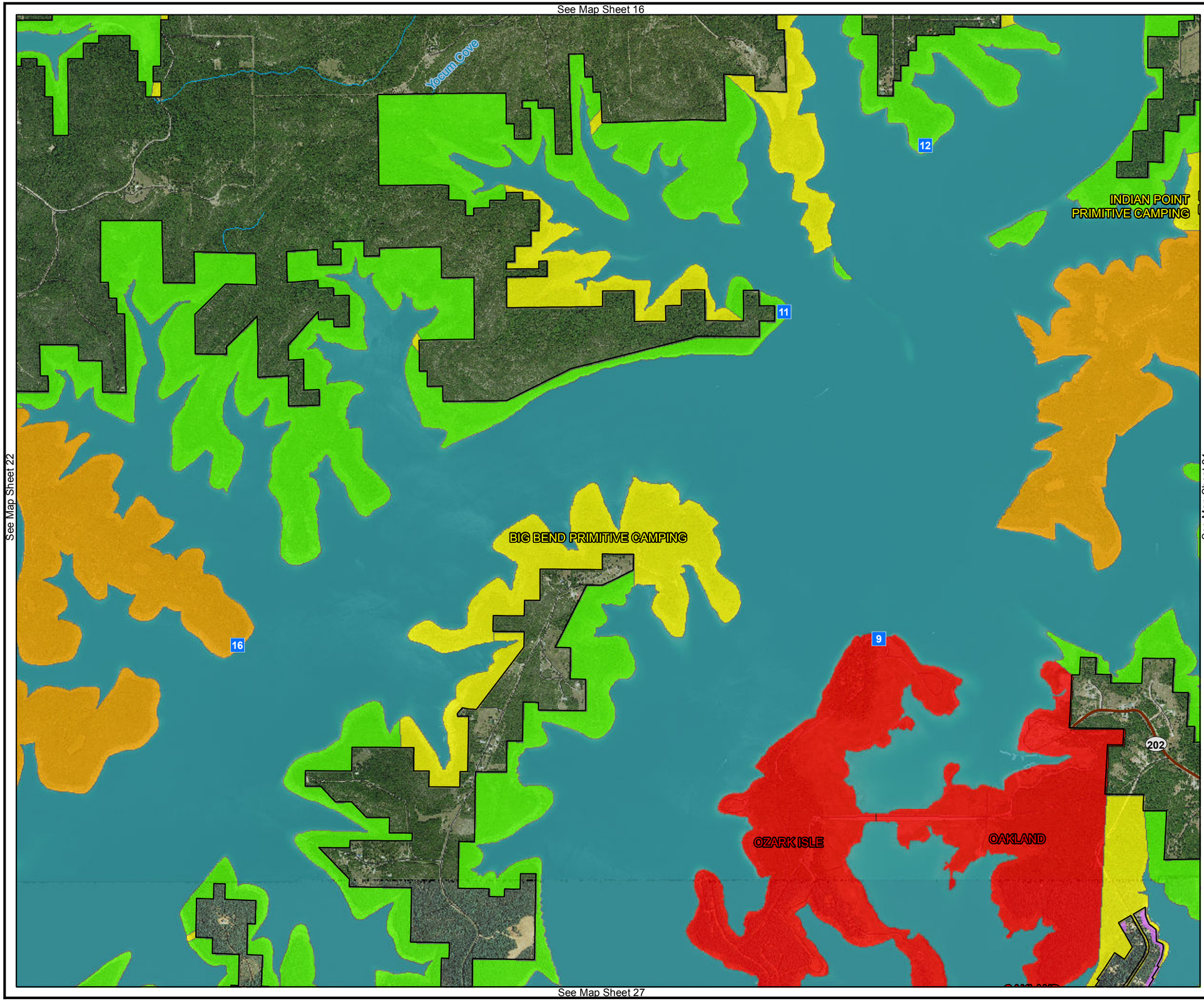

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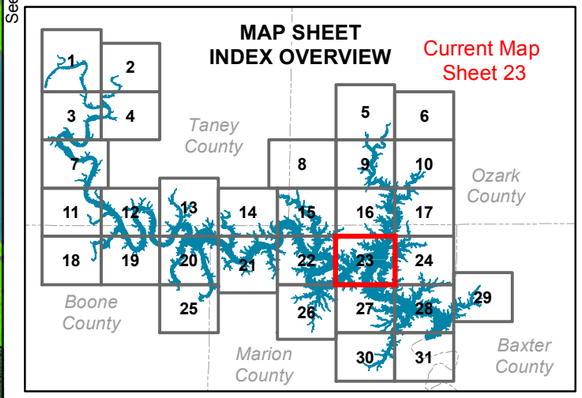

UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

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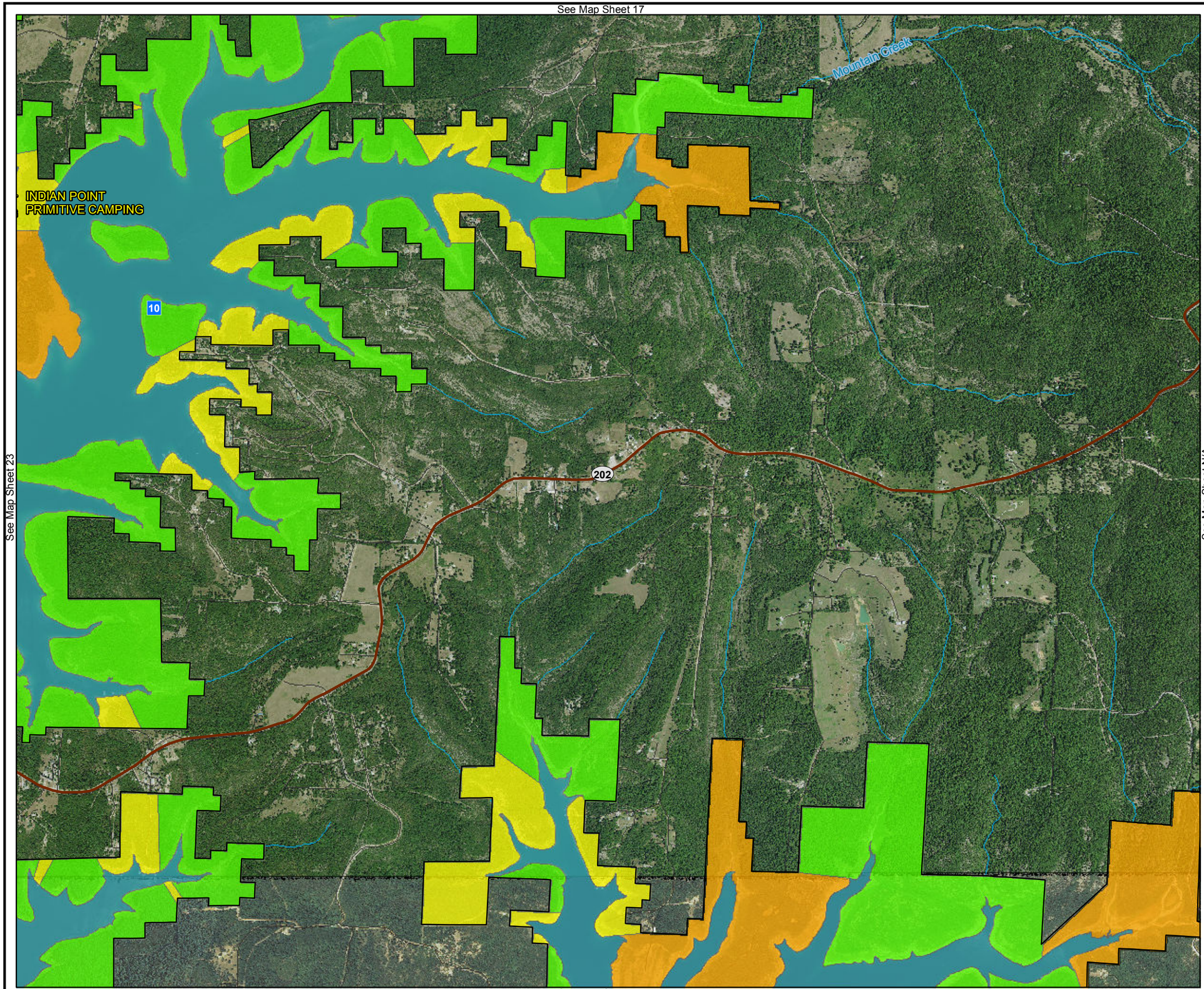

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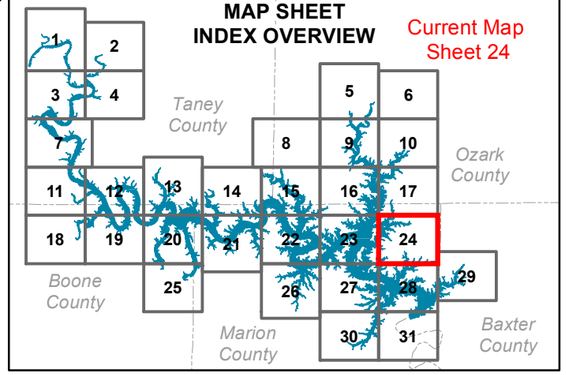
MAP SHEET INDEX OVERVIEW

Current Map Sheet 24



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

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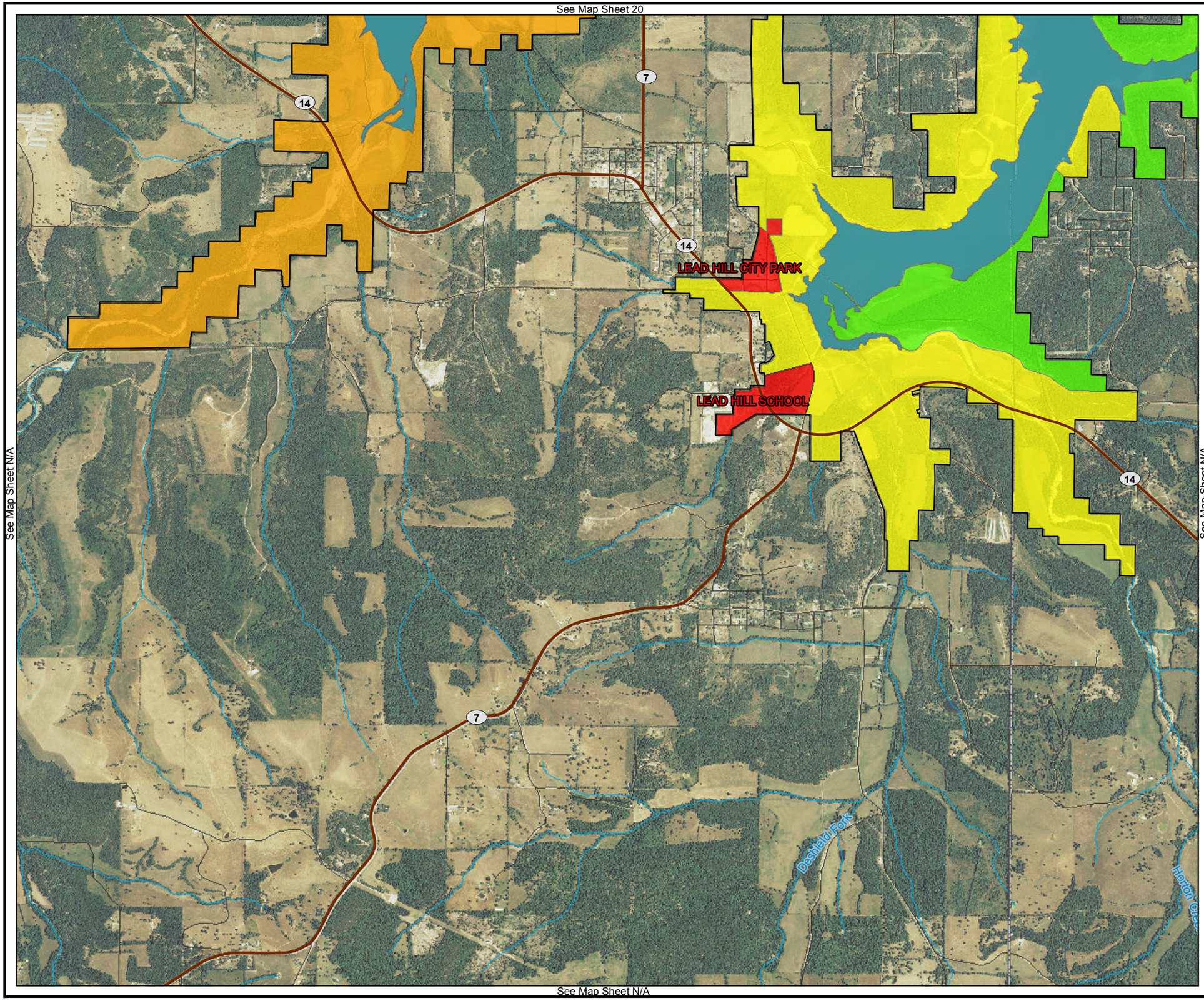

See Map Sheet N/A

See Map Sheet N/A

See Map Sheet N/A

LAND CLASSIFICATIONS AND EASEMENTS

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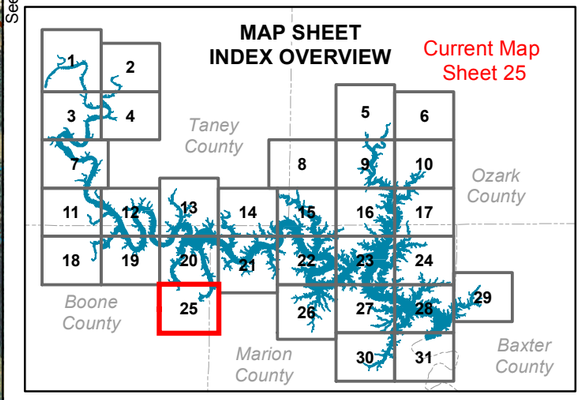

UPDATED MASTER PLAN
BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

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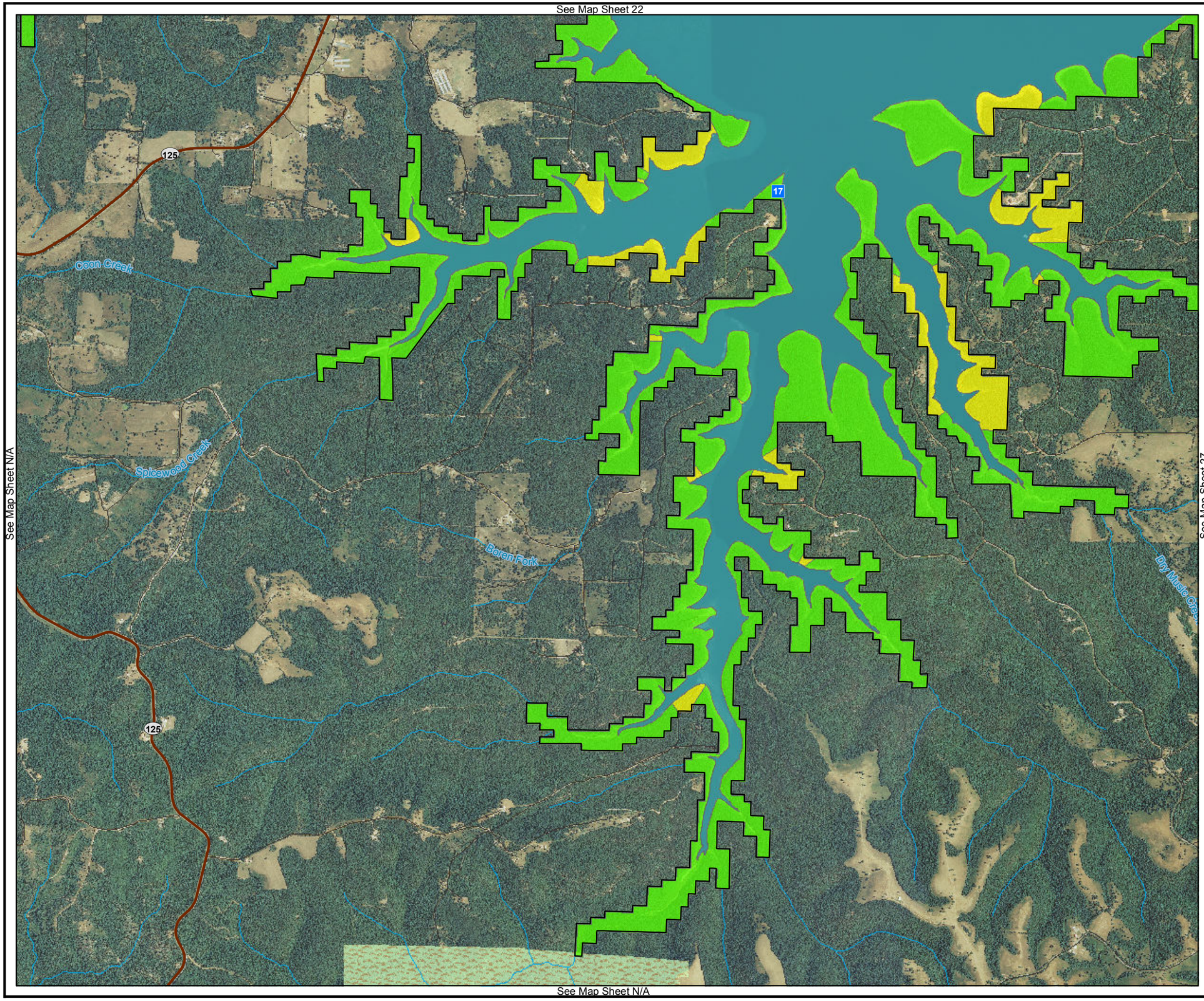

See Map Sheet N/A

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LAND CLASSIFICATIONS AND EASEMENTS

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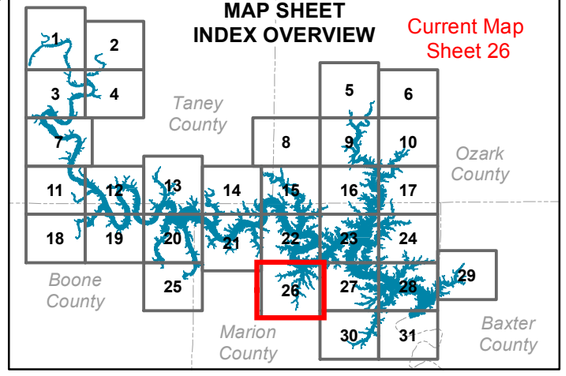

UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
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OZARK ISLE

OAKLAND

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Little Music Creek

Dry Music Creek

Gunnel Fork

Sister Creek

LAND CLASSIFICATIONS AND EASEMENTS

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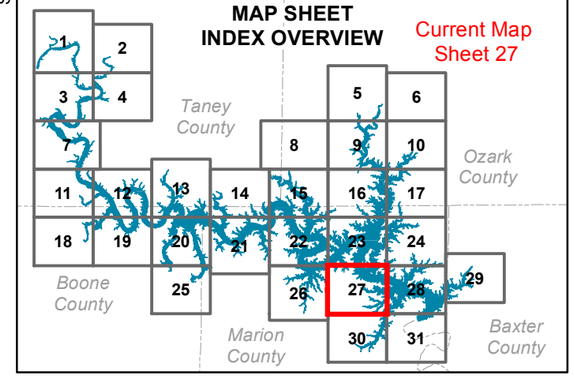

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Miles

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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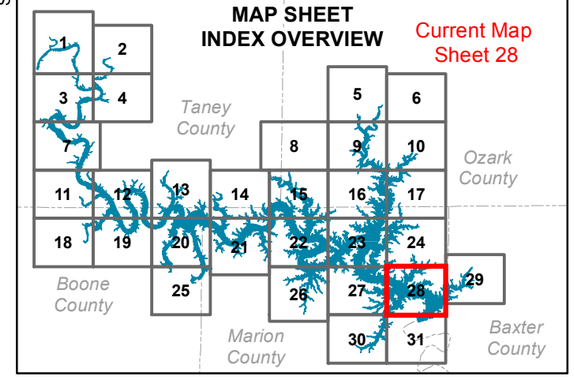

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

Noe Creek

POINT RETURN

BULL SHOALS

BULL SHOALS CITY PARK

DAM SITE

LAKEVIEW

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LAND CLASSIFICATIONS AND EASEMENTS

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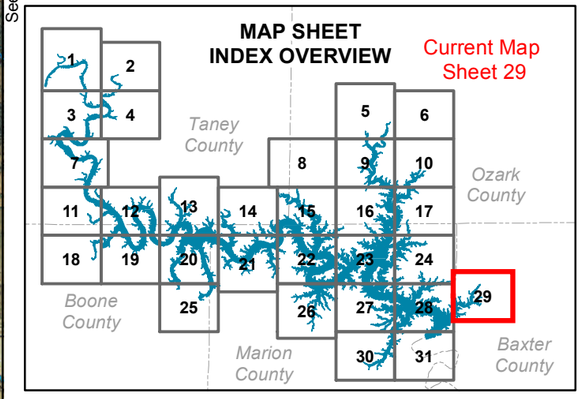

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US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

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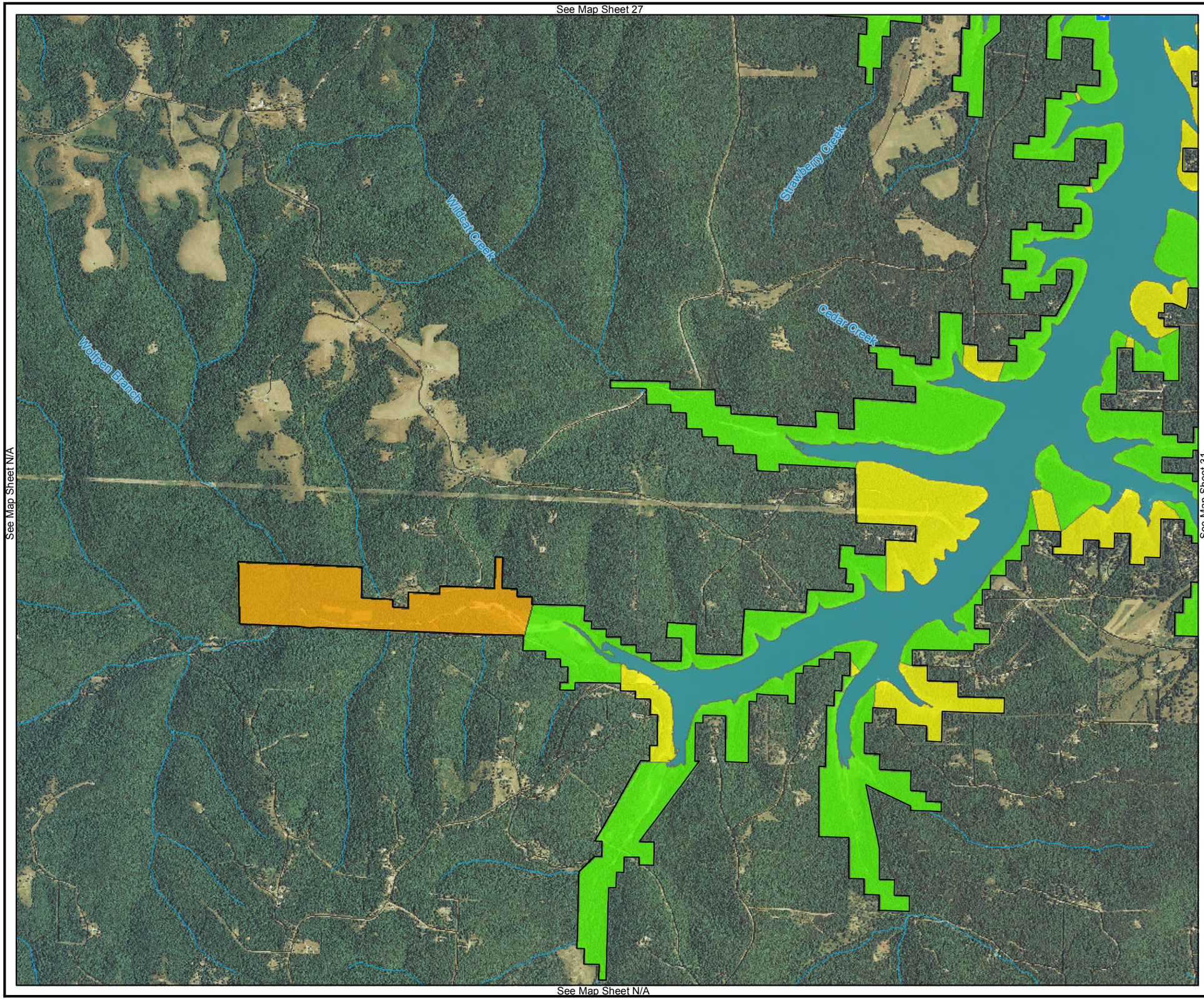
See Map Sheet 27



See Map Sheet N/A

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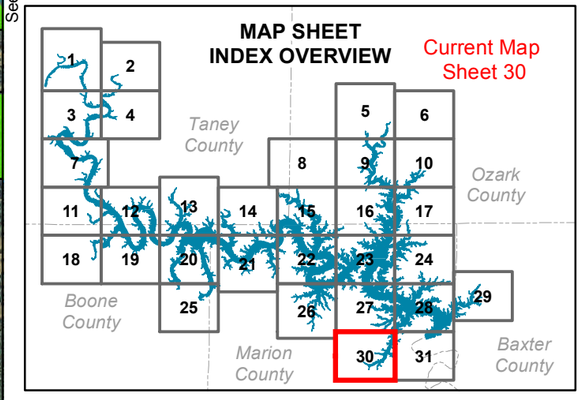

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US ARMY CORPS
OF ENGINEERS
Little Rock District
Bull Shoals Lake

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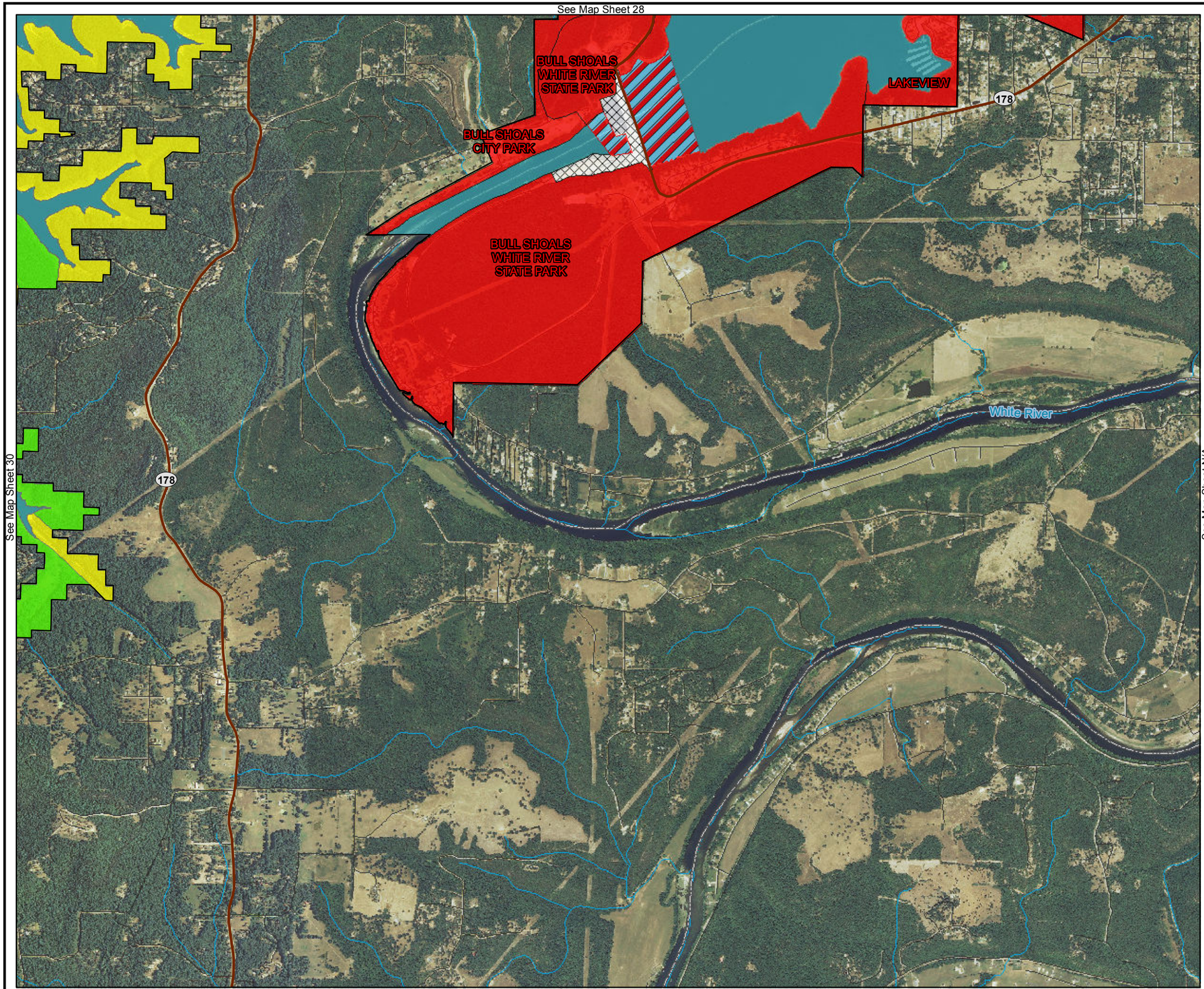
See Map Sheet 28



See Map Sheet 30

See Map Sheet N/A

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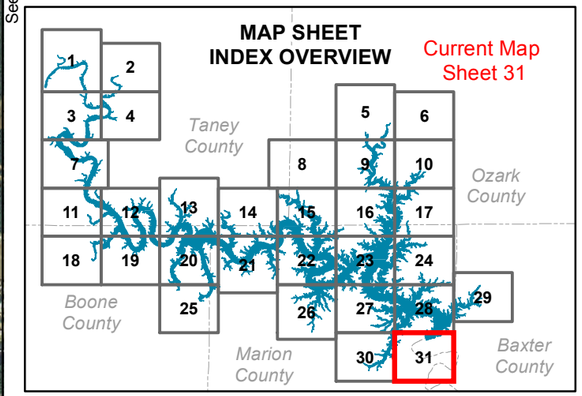
- Missouri Department of Conservation Lands
- USDA Forest Service



UPDATED MASTER PLAN BULL SHOALS LAKE

Date: July, 2015

Imagery Date: 2013/2014

Miles

0 0.5 1

US ARMY CORPS OF ENGINEERS
Little Rock District
Bull Shoals Lake

N W E S

Appendix E License DACW03-3-14-1094

NO. DACW03-3-14-1094

DEPARTMENT OF THE ARMY LICENSE

FOR FISH AND WILDLIFE ACTIVITIES ON

Bull Shoals Lake Area

Missouri

THE SECRETARY OF THE ARMY, hereinafter referred to as the Secretary, under authority of Section 4, Act of Congress, 22 December 1944, as amended 16 U.S.C. 460d, hereby grants to Missouri Department of Conservation, 2901 W. Truman Blvd., Jefferson City, Missouri, 65109 hereinafter referred to as the grantee, a license for fish and wildlife activities over, across, in and upon lands of the United States, as identified in Exhibits "A" and "B", attached hereto and made a part hereof, hereinafter referred to as the premises.

THIS LICENSE is granted subject to the following conditions.

1. TERM

This license is granted for a term of twenty-five (25) years, beginning September 1, 2013, and ending August 31, 2038, but revocable at will by the Secretary.

2. CONSIDERATION

The consideration for this license is the operation and maintenance of the premises by the grantee for the benefit of the United States and the general public in accordance with the conditions herein set forth.

3. NOTICES

All correspondence and notices to be given pursuant to this license shall be addressed, if to the grantee to Missouri Department of Conservation, 2901 W. Truman Blvd., Jefferson City, Missouri 65109 and if to the United States, to the District Engineer, Attention: Chief, Real Estate Division, P.O. Box 867, Little Rock, Arkansas 72203-0867; or as may from time to time otherwise be directed by the parties. Notice shall be deemed to have been duly given if and when enclosed in a properly sealed envelope, or wrapper, addressed as aforesaid, and deposited, postage prepaid, in a post office regularly maintained by the United States Postal Service.

4. AUTHORIZED REPRESENTATIVES

Except as otherwise specifically provided, any reference herein to "Secretary", "District Engineer", or "said officer" shall include their duly authorized representatives. Any reference to "grantee" shall include any duly authorized representatives.

5. SUPERVISION BY THE DISTRICT ENGINEER

The use and occupation of the premises shall be subject to the general supervision and approval of the District Engineer, hereinafter referred to as said officer, and to such rules and regulations as may be prescribed from time to time by said officer.

6. STRUCTURES AND EQUIPMENT

The grantee shall have the right, during the term of the license, to erect such structures and to provide such equipment upon the premises to accomplish the purposes of the license and as provided for in the Annual Management Plan. Those structures and equipment shall be and remain the property of the grantee, except as otherwise provided in the condition on **RESTORATION.**

7. ANNUAL MANAGEMENT PLANS

The grantee shall administer the premises in accordance with an Annual Management Plan which is an annual increment of a five-year management plan which shows the management and development activities to be undertaken by the grantee. The grantee will submit the five-year management plan no later than January 1, of each five-year interval from the beginning date of this license to be mutually agreed upon between the grantee and the said officer. Such Annual Management Plan shall include but is not limited to the following:

a. Plans for management, maintenance, and development activities to be undertaken by the grantee or jointly by the Corps of Engineers and the grantee which shall include plans for any proposed structures and improvements.

b. The areas to be utilized for agricultural purposes.

c. The variety and scope of crops to be planted, as well as any rotations.

d. The type of wildlife cover to be cultivated, if any.

e. The areas designated for various species of fish and wildlife propagation.

8. FISH AND WILDLIFE ACTIVITIES

a. The grantee may plant or harvest crops, either directly, by service contract, by sharecrop agreements with local farmers, or by agricultural agreements to provide food and/or habitat for wildlife and for the development and conservation of land, fish and wildlife, forests, and other natural resources. Where feasible, contracts and agreements with third parties shall be by competitive bid procedures.

b. Any lands not being managed by the grantee for wildlife habitat will be made available for lease by the said officer for agricultural or grazing purposes under conditions which would not be incompatible with the grantee's use of the premises.

c. The grantee may take, trap, remove, stock or otherwise control all forms of fish and wildlife on the premises, and may place therein such additional forms of fish and wildlife as it may desire from time to time, and shall have the right to close the area, or any parts thereof from time to time, to fishing, hunting or trapping, provided that the closing of any area to such use shall be consistent with the state laws for the protection of fish and wildlife.

9. ACCOUNTS, RECORDS AND RECEIPTS

a. All monies received by the grantee from operations conducted on the premises may be utilized by the grantee for the administration, maintenance, operation and development of the premises. Beginning 5 years from the date of this license and continuing at 5-year intervals, any such monies not so utilized or programmed for utilization within a reasonable time shall be paid to the said officer. The grantee shall provide an annual statement of receipts and expenditures to the said officer. The said officer shall have the right to perform audits of the grantee's records and accounts.

b. Payment of direct expenses is authorized for planning and development of optimum wildlife habitat including planting of wildlife food plots, necessary timber clearing, erosion control or habitat improvements such as shelter, restocking of fish and wildlife, and protection of endangered species. Payment of grantee's employees who are directly engaged in such activities at the project is also authorized. However, proceeds will not be used for the payment of general administrative expenses.

c. Proceeds derived from the sale of fishing and hunting leases are not subject to this condition.

10. APPLICABLE LAWS AND REGULATIONS

The grantee shall comply with all applicable federal, state, county and municipal laws, ordinances and regulations wherein the premises are located.

11. CONDITIONAL USE BY GRANTEE

The exercise of the privileges herein granted shall be:

a. without cost or expense to the United States;

b. subject to the right of the United States to improve, use or maintain the premises.

c. subject to other outgrants of the United States on the premises.

d. personal to the grantee, and this license, or any interest therein may not be transferred or assigned.

12. CONDITION OF PREMISES

The grantee acknowledges that it has inspected the premises, knows its condition, and understands that the same is granted without any representations or warranties whatsoever and without any obligation on the part of the United States.

13. PROTECTION OF PROPERTY

The premises shall at all times be protected and maintained in good order and condition by and at the expense of the grantee. The grantee shall be responsible for any damage that may be caused to the property of the United States by the activities of the grantee under this license, and shall exercise due diligence in the protection of all property located on the premises against fire or damage from any and all other causes. Any property of the United States damaged or destroyed by the grantee incident to the exercise of the privileges herein granted shall be promptly repaired or replaced by the grantee to a condition satisfactory to said officer, or at the election of said officer, reimbursement made therefore by the grantee in an amount necessary to restore or replace the property to a condition satisfactory to said officer.

14. RESTORATION

On or before the expiration of this license or its termination by the grantee, the grantee shall vacate the premises, remove the property of the grantee, and restore the premises to a condition satisfactory to said officer. If, however, this license is revoked, the grantee shall vacate the premises, remove said property and restore the premises to the aforesaid condition within such time as the said officer may designate. In either event, if the grantee shall fail or neglect to remove

said property and restore the premises, then, at the option of said officer, the property shall either become the property of the United States without compensation therefore, or said officer may cause the property to be removed and no claim for damages against the United States or its officers or agents shall be created by or made on account of such removal and restoration work. The grantee shall also pay the United States on demand any sum which may be expended by the United States after the expiration, revocation, or termination of this license in restoring the premises.

15. NON-DISCRIMINATION

a. The grantee shall not discriminate against any person or exclude them from participation in the grantee's operations, programs or activities conducted on the licensed premises, because of race, color, religion, sex, age, handicap or national origin.
The grantee will comply with the Americans with Disabilities Act and attendant Americans with Disabilities Act Accessibility Guidelines (ADAAG) published by the Architectural and Transportation Barriers Compliance Board.

b. The grantee, by acceptance of this license, is receiving a type of Federal assistance and, therfore, hereby gives assurance that it will comply with the provisions of Title VI of the Civil Rights Act of 1964, as amended (42 U.S.C. 2000d); the Age Discrimination Act of 1975 (42 U.S.C 6102); the Rehabilitation Act of 1973, as amended (29 U.S.C. 794); and all requirements imposed by or pursuant to the Directive of the Department of Defense (32 CFR Part 300) issued as Department of Defense Directive 5500.11 and 1020.1, and Army Regulation 600-7.

16. TERMINATION

This license may be terminated by the grantee at any time by giving the said officer at least thirty (30) days notice in writing.

17. NATURAL RESOURCES

The grantee shall cut no timber, conduct no mining operations, remove no sand, gravel, or kindred substances from the ground, commit no waste of any kind, nor in any manner substantially change the contour or condition of the premises, except as may be authorized under and pursuant to the approved Annual Management Plan. The grantee may salvage fallen or dead timber; however, no commercial use shall be made of such timber. Except for timber salvaged by the grantee when in the way of construction of improvements or other facilities, all sales of forest products will be conducted by the United States and the proceeds therefore shall not be available to the grantee under the provisions of this license.

18. ENVIRONMENTAL PROTECTION

a. Within the limits of their respective legal powers, the parties to this license shall protect the premises against pollution of its air, ground and water. The grantee shall comply with any laws, regulations, conditions, or instructions affecting the activity hereby authorized if and when issued

by the Environmental Protection Agency, or any Federal, state, interstate or local governmental agency having jurisdiction to abate or prevent pollution. The disposal of any toxic or hazardous materials within the premises is specifically prohibited. Such regulations, conditions, or instructions in effect or prescribed by said Environmental Protection Agency, or any Federal, state, interstate or local governmental agency are hereby made a condition of this license. The grantee shall not discharge waste or effluent from the premises in such a manner that the discharge will contaminate streams or other bodies of water or otherwise become a public nuisance.

b. The grantee will use all reasonable means available to protect the environment and natural resources, and where damage nonetheless occurs from the grantee's activities, the grantee shall be liable to restore the damaged resources.

c. The grantee must obtain approval in writing from said officer before any pesticides or herbicides are applied to the premises.

19. HISTORIC PRESERVATION

The grantee shall not remove or disturb, or cause or permit to be removed or disturbed, any historical, archeological, architectural or other cultural artifacts, relics, remains or objects of antiquity. In the event such items are discovered on the premises, the grantee shall immediately notify said officer and protect the site and the material from further disturbance until said officer gives clearance to proceed.

20. DISCLAIMER

This license is effective only insofar as the rights of the United States in the premises are concerned; and the grantee shall obtain any permit or license which may be require by Federal, state, or local statute in connection with the use of the premises. It is understood that the granting of this license does not preclude the necessity of obtaining a Department of the Army permit for activities which involve the discharge of dredge or fill material or the placement of fixed structures in the waters of the United States, pursuant to the provisions of Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 USC 403), and Section 404 of the Clean Waters Act (33 USC 1344).

21.

The grazing of stock animals will not be permitted on any United State Army Corps of Engineers land within the licensed area.

THIS LICENSE is not subject to Title 10, United States Code, Section 2662, as amended.

IN WITNESS WHEREOF, I have hereunto set my hand by authority of the Secretary of the Army, this 23RD day of DECEMBER, 2013.

JOE CRAIG
Chief, Management and Disposal Branch

THIS LICENSE is also executed by the grantee this 26th day of November, 2013.

MISSOURI DEPARTMENT OF CONSERVATION

WITNESS:

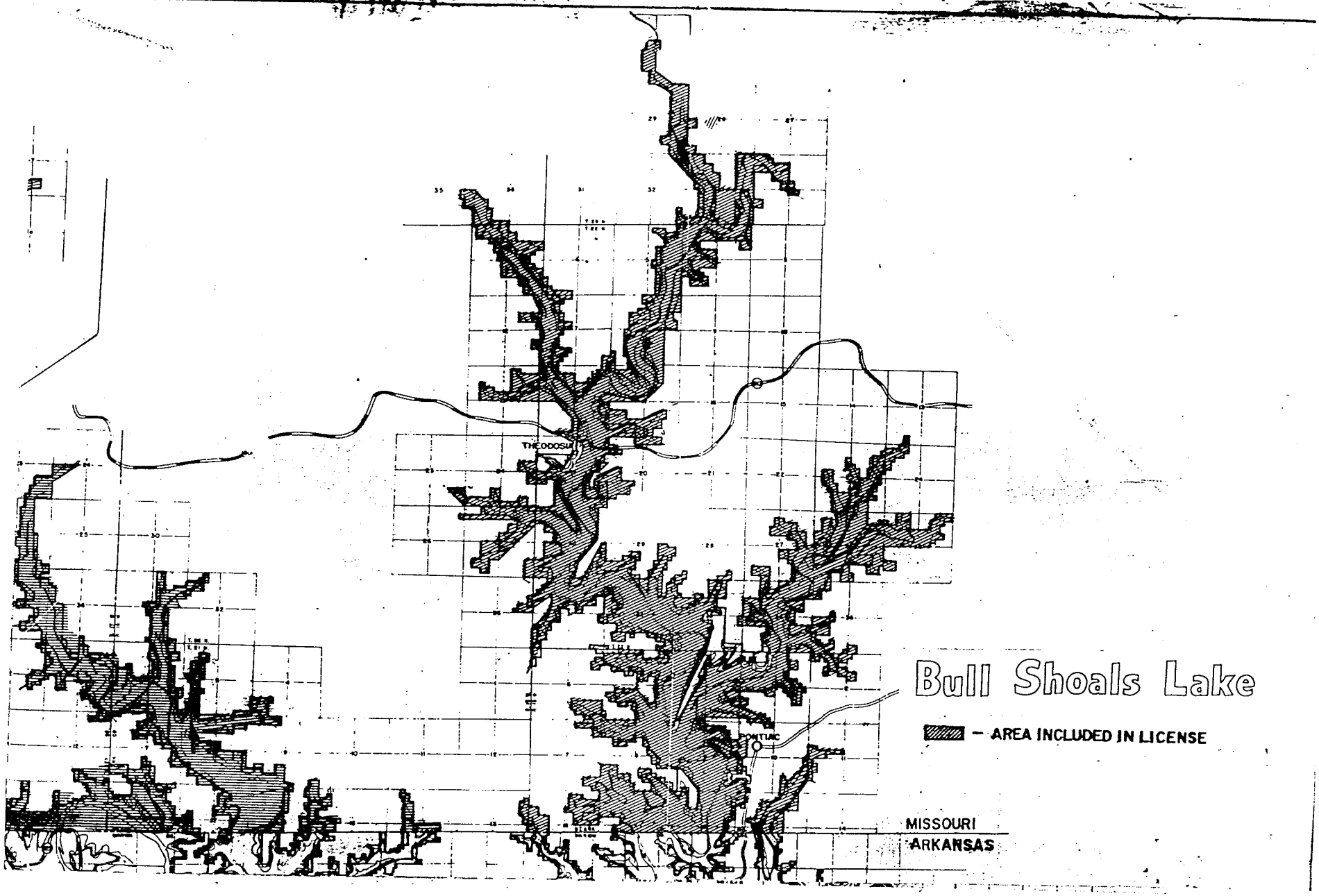
BY: _____

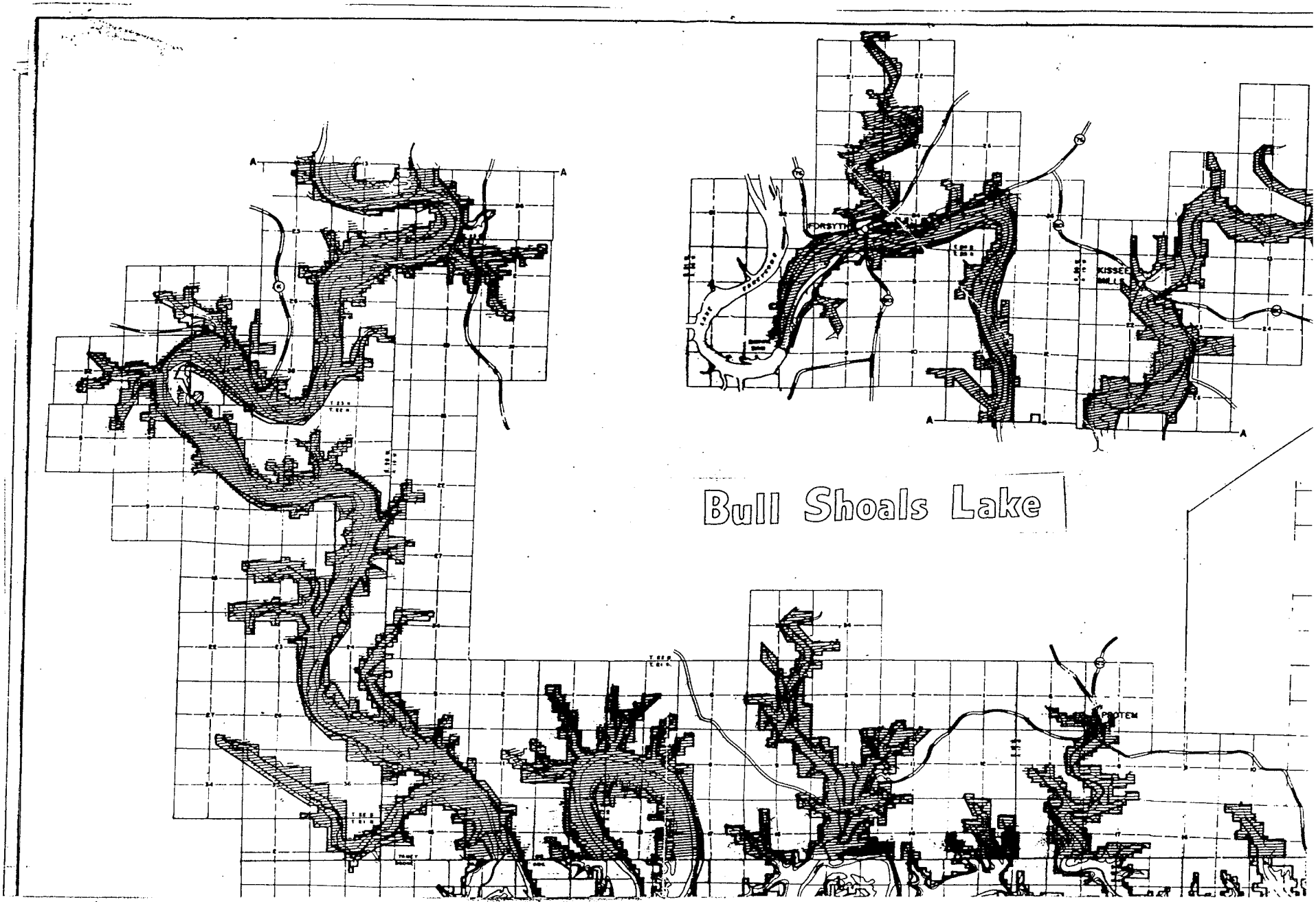
Rhonda L. Mayes

TITLE: Director

APPROVED AS TO FORM ONLY

GENERAL COUNSEL


THEODOSIA
POINTLIAC
Bull Shoals Lake
— AREA INCLUDED IN LICENSE
MISSOURI
ARKANSAS


Bull Shoals Lake
FORSYTH
KISSEE
POTEM