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***ARKANSAS RIVER WATERSHED  
BLUE MOUNTAIN LAKE  
ARKANSAS***

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***MASTER PLAN FOR  
DEVELOPMENT AND  
MANAGEMENT OF BLUE  
MOUNTAIN LAKE***

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**Draft: Summer 2024**

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## **Executive Summary**

The original Master Plan for Blue Mountain Lake was first approved in July 1947. Subsequent revisions were prepared with the latest revision being approved in 1975. The Blue Mountain Lake Master Plan (hereafter, “Master Plan” or “Plan”) is intended to serve as a guide for the orderly and coordinated development, management, and stewardship of all Federal lands and water surface of the project. It presents data on existing conditions, anticipated recreational use, the type of facilities needed to service anticipated use, sensitive resources requiring protection, and a projection of future management requirements. Since the 1975 Master Plan revision, the increased demands on project resources, as well as naturally occurring changes to the resources, combined with the need to recognize historic management practices at the project and implement current national USACE guidance and directives, has dictated the preparation of this Master Plan revision.

This revised Master Plan presents an inventory of land resources and existing recreation facilities, as well as revised land classifications, new resource management objectives, and an evaluation of future needs to provide a balanced plan that serves public needs and protects resources. Included in the revised Master Plan is an evaluation of expressed public opinion, an analysis of regionally important natural resources, and an evaluation of trends in outdoor recreation. 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. The 1975 Blue Mountain Lake Master Plan, Design Memorandum 1C, all subsequent Master Plan revisions, and prior supplements are listed in Appendix B.

An environmental assessment (EA) and finding of no significant impact (FONSI) were completed as part of the environmental documentation portion of the process. Both documents are included as Appendix A. Upon completion of the Master Plan revision process, if no significant impacts due to Federal action are determined, the FONSI will be signed signifying the approval of the Master Plan and the end of the revision process.

## Acronyms and Abbreviations

404(b)(1) - Water quality permit per CWA 77	DOI - Department of Interior
AAR - After Action Review	DOJ - Department of Justice
AF - Acre Feet	DOT - Department of Transportation
AFB - Alternatives Formulation Briefing	DQC - District Quality Control
AOR - Area of Responsibility	DP - Decision Point
ASA(CW) - Assistant Secretary of the Army for Civil Works	DPM - Deputy for Project Management
ASAP - As Soon as Possible	DPR - Detailed Project Report
ATR - Agency Technical Review	DSAP - Dam Safety Assurance Program
BC - Benefit Cost	DX - Directory of Expertise
BCR - Benefit Cost Ratio	E&D - Engineering and Design
BFE - Base Flood Elevation	EA - Environmental Assessment
BLUF - Bottom Line Up Front	EC - Engineering Circular
BMP - Best Management Practice	EIS - Environmental Impact Statement
BOD - Biological Oxygen Demand	EM - Engineering Memorandum
BY - Budget Year	EO - Executive Order
C - Construction	EOY - End of Year
CDR - Commander	EP - Engineering Pamphlet
CE - Corps of Engineers	ER - Engineering Regulation
CERCLA - Comprehensive Environmental Response, Compensation and Liability Act, 1980 (Superfund)	ERDC - Engineering Research & Design Center
CERL - Construction Engineering Research Laboratory	EPA - Environmental Protection Agency
CEQ - Council on Environmental Quality	ESA - Endangered Species Act
CF - Copy Furnished	EQ - Environmental Quality
CFR - Code of Federal Regulations	FWL - Fish and Wildlife
CFS - Cubic Feet per Second	FWS - Fish and Wildlife Service
CG - Construction General/ Commanding General	FCA - Flood Control Act
COL - Colonel	FCSA - Feasibility Cost Sharing Agreement
CONUS - Continental United States	FEIS - Final Environmental Impact Statement
COP - Community of Practice	FEMA - Federal Emergency Management Agency
CRA - Continuing Resolution Authority	FERC - Federal Energy Regulatory Commission
CW - Civil Works	FOIA - Freedom of Information Act
CWA - Clean Water Act, 1977	FONSI - Finding of No Significant Impact
CWBI - Civil Works Business Intelligence	FPMS - Floodplain Management Services
CX - Center of Expertise	FR - Federal Register
CY - Cubic Yard/ Current Year	FRM - Flood Risk Management
DA - Department of Army	FS - Feasibility Study
DCW - Director of Civil Works	FSM - Feasibility Scoping Meeting
DDC - Deputy District Commander	FUDS - Formerly Used Defense Site
DDE - Deputy District Engineer	FUSRAP - Formerly Utilized Sites Remedial Action Program
DE - District Engineer/ Division Engineer	FY - Fiscal Year
DEIS - Draft Environmental Impact Statement	FYI - For Your Information
DIV - Division	FYSA - For Your Situational Awareness
DMP - Decision Management Plan	GI - General Investigations
DOD - Department of Defense	GIS - Geographic Information Systems
DOE - Department of Energy	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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## **1. Introduction**

### **1.1 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 Blue Mountain Lake. Initial authorization for the project included the primary project purpose of flood control followed by subsequent authorization for recreation.

The Blue Mountain Dam and Lake project was authorized for construction by the Flood Control Act approved 28 June 1938 (Public Law 75-761, 75<sup>th</sup> Congress, 3<sup>rd</sup> Session) and the Rivers and Harbors Act approved 20 June 1938 (Public Law 75-685).

Section 4 of the Flood Control Act approved 22 December 1944 (P.L. 78-534), as amended by Section 4 of the Flood Control Act of 1946 (P.L. 79-526), and as further amended by Section 209 of the Flood Control Act of 1954 (P.L. 83-780), authorizes the Department of the Army to provide for recreational use of the lakes under its control. The Federal Water Project Recreation Act of 1965 (P.L. 89-72) directs that in investigating and planning any Federal navigation, flood control, reclamation, hydroelectric, or multipurpose water resource project, full consideration must be given to the opportunities, if any, which the project affords for outdoor recreation. Additionally, the Fish and Wildlife Coordination Act approved 12 August 1958 (P.L. 85-624) provides for more effective integration of a fish and wildlife conservation program with Federal water-resource developments. Useful references concerning recreation and project operations can be found in ER 1130-2-550, Appendix A, as well as the most current version of EC 1130-2-550.

On 3 July 1958, Congress passed the Water Supply Act of 1958 (P.L. 85-500) which allowed the inclusion of storage for municipal and industrial water supply in any USACE reservoir, simultaneously requiring Congressional authorization when such inclusion seriously affects the purposes for which the project was authorized, surveyed, planned, or constructed, or which would involve major structural or operational changes.

### **1.2 Project Purpose**

Blue Mountain Lake is a multiple-purpose flood risk management project and is a major unit in a comprehensive plan for development of the water resources of the Arkansas River Basin in west central Arkansas. An additional authorized purpose is Recreation to the extent that this does not adversely affect flood control.. While Fish and Wildlife is not an authorized purpose, environmental stewardship of project lands and waters is an inherent responsibility for USACE and must be taken into consideration with all project management activities.

### **1.3 Purpose and Scope of Master Plan**

Master Plans are developed, reviewed, and revised for Civil Works projects operated and

maintained by USACE. The Master Plan addresses all land (fee, easements, or other interests) originally and subsequently (following initial land acquisition) acquired to support the operations and authorized missions of the projects.

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 USACE responsibilities pursuant to federal laws to preserve, conserve, restore, maintain, manage, and develop project lands, surface 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 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 control manual. There is no Shoreline Management Plan for Blue Mountain Lake. The Water Control Manual addresses how the water in the lake is managed for flood risk management, and water supply purposes.

## **1.4 Brief Watershed and Project Description**

Blue Mountain Dam is located on the Petit Jean River in Yell County, Arkansas, about one and one-half miles southwest of the community of Waveland and about four miles southeast of the town of Blue Mountain, Arkansas. Blue Mountain Lake is located in Yell and Logan Counties, Arkansas, with the dam being about three and one-half miles downstream from the boundary line between the two counties. About 77 percent (%) of the lake area is in Logan County with the remaining 23%, including the spillway, embankment, and outlet works, in Yell County.

The conservation pool of Blue Mountain Lake is at elevation 384.0 mean sea level (msl), and seasonally adjusted to 387.0 msl. for fisheries management. The total water surface is about 2,890 acres at conservation pool. Blue Mountain Lake lies in the sharply defined valley of the Petit Jean River, a tributary of the Arkansas River. Tributary streams that flow into the lake include Cedar Creek, Lick Creek, Sugar Creek, Crow Creek, and Ashley Creek. These are generally short and less than five miles in length. The total drainage area is approximately 488 square miles. The total fee owned area contained in the Blue Mountain Project, including both land and water surface, consists of 17,263 acres.

Construction of Blue Mountain Dam and appurtenant works was initiated in June 1941 and suspended in November 1942. Construction of the dam was resumed in April of 1946 and completed in June 1947. There are 16 recreation areas around Blue Mountain Lake, 15 that are presently operated by USACE and one operated by the City of Magazine. A more detailed



description of USACE recreation areas follows in Chapter 2.

## 1.5 Listing of Prior Design Memorandum

A listing of prior design memorandums and accompanying supplements are provided in Appendix B. Prior Master Plan supplements listed in Appendix B have been incorporated in this revised Master Plan.

## 1.6 Pertinent Project Information

Blue Mountain Dam's primary purposes are flood control and recreation. 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 of how all project purposes are interrelated.

The dam is an earthen embankment with a total length of 2,800 feet that has a maximum height of 115 feet above streambed. The outlet works consists of a gated tower at the inlet, a 20-foot diameter tunnel extending 1,032 feet at the right abutment. An ungated 150-foot-wide auxiliary spillway is located north of the dam in the left abutment.

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 yielded a basic understanding of the greatest risks and priorities for dams throughout USACE. Each dam was assigned a Dam Safety Action Classification System (DSAC) rating at the end of the screening process. This rating is based on the individual life safety risk associated with each dam. This risk is 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 system is intended to provide consistent and systematic guidelines for appropriate actions to address any dam safety issues and deficiencies at USACE dams. The DSAC table assists with prioritizing urgency of action commensurate with the societal risks associated with 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.

A Screening Portfolio Risk Analysis (SPRA) for Blue Mountain Dam was performed in 2008 during which various failure modes were considered including structural stability and erosion of the abutments. The probability of these failures leading to uncontrolled loss of pool was found to be low. The downstream reaches have a low population at risk and the estimated life loss was very low in the evaluated failure scenarios. As a result, the SPRA resulted in Blue Mountain Dam being assigned a DSAC 4 (Low Urgency of Action).

Routine portfolio management activities require a periodic assessment and reassessment of risks at each USACE dam. As such, an updated risk assessment was conducted for Blue Mountain Dam in 2021. The outcome of this assessment of numerous potential failure modes identified low probability of failure for all scenarios and very low potential for life loss. The DSAC 4 was maintained.

**Table 1-1. Pertinent Data Table**

<b>PERTINENT DATA OF THE DAM AND LAKE</b>	
<b>General Information</b>	
Authorized Purpose, Stream, State	Flood Control, Petit Jean River, Arkansas
Drainage area, square miles	488
Average annual rainfall over the drainage area, inches (1978-2022)	50
<b>Dam</b>	
Crest Length in feet	2,800
Top of dam elevation, feet above mean sea level	452.0
<b>Lake</b>	
Nominal top of conservation pool Elevation, feet above mean sea level	
January 1 - March 1	384
March 1 – March 15	384-387
March 15 - June 15	387
June 15 - October 1	387-384
October 1 – December 31	384
Surface Area, acres	2,890
Length of shoreline, miles	55
<b>Lake</b>	
Nominal top of flood-control pool Elevation, feet above mean sea level	419
Surface Area, acres	10,717
Length of shoreline, miles	142

**Table 1-2. Land Classifications**

<b>Classification</b>	<b>Acres</b>
Project Operations	201.8
High Density Recreation	403.5
Environmentally Sensitive Areas	690.1
Multiple Resource Management Lands:	
Low Density Recreation	4087.8
Wildlife Management	8729.5
Water Surface:	
Restricted	4.5
Designated No-wake	0
Fish and Wildlife Sanctuary	0
Open Recreation	3146.1
<b>Total Acreage</b>	<b>17,263.2</b>
Note: Acreages are approximate and are based on GIS data. Totals vary depending on changes in lake levels, sedimentation, and shoreline erosion.	

## **2. Project Setting and Factors Influencing Management and Development (Existing Conditions)**

### **2.1 Description of Reservoir**

At conservation pool, elevation 384' msl., a wide and relatively shallow lake is formed, with large bays opening up into the Lick Creek and Ritchey's Slough areas. The total length of shoreline is approximately 55 miles with 2,890 surface acres of water at normal pool elevation of 384' msl. The project is located in the Ouachita Mountains of west central Arkansas in a rather rugged, wooded area between the ridges and foothills of Mount Magazine on the north and those of Flood Mountain, Dry Creek Mountain, Dutch Creek Mountain, and Potato Hill to the south. The forested land and shallow water areas around the lake result in diverse, productive fisheries and abundant wildlife habitat. The shoreline contains numerous small coves and inlets at all water levels. Water released from Blue Mountain Lake flows down the Petit Jean River and courses in an easterly direction before its confluence with the Arkansas River east of Pontoon, Arkansas.

Primary recreational activities at Blue Mountain Lake are camping, swimming, boating, birdwatching, fishing, and hunting. Much of the lake is shallow with stands of bald cypress, black willow, and buttonbush around the edges of the lake. This provides excellent habitat for gamefish and waterfowl. Blue Mountain Lake is renowned for its crappie fishing, hunting opportunities, and hosting championship bird dog field trials at the J. Perry Mikles Special Use Area. These resources attract sportsmen from across the nation.

**Figure 2-1. Blue Mountain Dam**



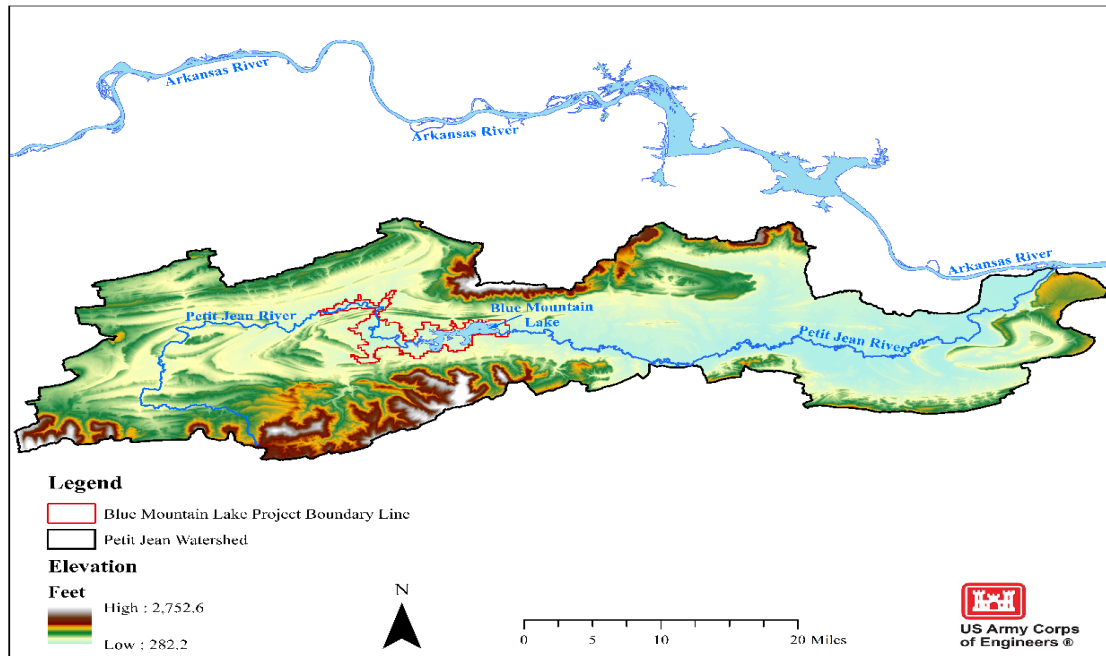
## 2.2 Hydrology and Groundwater

### 2.2.1 Surface Water

The Petit Jean River Watershed is contained entirely in the Ouachita Mountain physiographic province. However, the watershed is split almost exactly in half by the Arkansas Valley physiographic section to the north and the Ouachita Mountains physiographic section to the south with Blue Mountain Lake residing entirely in the Ouachita Mountains physiographic section. However, the watershed resides entirely in the Environmental Protection Agency's (EPA's) Arkansas River Valley ecoregion and is described as once covered by a distinctive mosaic of prairie, savanna, and woodland. Today, pastureland and hay land are extensive but remnants of prairie and woodland occur (Woods et al., 2004).

The Petit Jean River and its principal tributaries have their source in the Ouachita Mountains in west central Arkansas and flows in an easterly direction to its confluence with the Arkansas River. The area upstream of Blue Mountain Dam is approximately 515 square miles (**Figure 2-2**) with a maximum basin elevation of approximately 2,753 feet above msl, the highest elevation in Arkansas, a minimum basin elevation of approximately 282 feet above msl, and an average basin elevation of approximately 675 feet above msl (**Figure 2-2**). The Petit Jean River drops, on average, approximately 7.0 feet per mile from the headwaters (elevation 1,227 feet above msl) to the confluence with the Arkansas River (elevation 285 feet above msl) (**Figure 2-2**). Some of the more notable tributaries that join the Petit Jean River include Chickalah Creek, Dutch Creek, Revilee Creek, Rock Creek, Rose Creek, Spring Creek, and Sugar Creek.

**Figure 2-2. Petit Jean Watershed and Surrounding Topography**



### 2.2.2 Groundwater

Blue Mountain Lake is located in the Pennsylvanian-aged Atoka Formation. This formation comprises the Ouachita Mountains aquifer and is located within the Interior Highlands aquifer system (Kresse et al, 2014). This aquifer system is formed by rocks of sedimentary origin and were deposited by a regionally extensive sinking trough (geosyncline) that extended at minimum from central Oklahoma to central Arkansas (Kresse et al, 2014). Filling and lithification of this geosyncline were followed by orogenic activity resulting in a complexly folded and thrust-faulted anticlinorium that trended east to west and in which many of the folds were broken by thrusts or high-angle reverse faults.

Groundwater availability occurs primarily through secondary porosity and permeability provided by faults, fractures, joints, and bedding planes and yields are highly dependent on the degree of fracturing (Kresse et al, 2014). Because of this dependency on degree of fracturing, well yields have a fairly large range but typically are low throughout the aquifer and, therefore, the primary use of groundwater is for domestic supply (Kresse et al, 2014).

Other information about water management may be found in the Arkansas Water Plan, the state's policy for long term water management. The State of Arkansas last updated their water plan in 2014. The update brings 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.

## 2.3 Sedimentation and Shoreline Erosion

Throughout the lifespan of the project, silt and sediment has accumulated in Blue Mountain Lake. Most of the sediments entering Blue Mountain Lake come from the inflow of the Petit Jean River. Other contributing factors to accumulated sediment include sedimentation from upland areas and land use changes from areas within the watershed that are beyond USACE control and, to a lesser extent, from shoreline erosion.

There were no bathymetric surveys conducted immediately post-impoundment of Blue Mountain Lake. However, in collaboration with the United States Geological Survey (USGS), USACE conducted the first bathymetric survey for Blue Mountain Lake in May 2017 (Wagner, 2018). The results of this survey produced a terrain dataset for the lakebed within the extent of pool elevation 420 feet above the North American Vertical Datum of 1988 (NAVD88). The degree of sedimentation could be determined by examining the changes between historical, pre-impoundment topography, given the contour interval is small enough, and the May 2017 bathymetric survey.

Reduced capacity of the lake will ultimately negatively impact the primary purposes of flood risk management and water supply. Furthermore, excessive sediment accumulation could cause a reduction in aquatic habitat in some areas of the lake.

## 2.4 Water Quality

Regional water quality is influenced by lithology, soil composition, and land use activities. In the Arkansas Valley, less rugged upland areas have been cleared for pastureland or hay land. Poultry and livestock farming are important land uses (Fowler, 2015). Rivers within the Arkansas Valley Plains often have low turbidity except during storm events (Woods et al., 2004).

Section 303(d) of the Clean Water Act (CWA) requires states to identify waters where existing pollution controls are not stringent enough to achieve state water quality standards and establish a priority ranking of these waters. The Arkansas Department of Energy and Environment (ADEE) is responsible for assessing water quality monitoring data and developing a 303(d) list every two years in accordance with the CWA. The Arkansas Draft 2022 303(d) List represents the most recent evaluation of water quality data. Blue Mountain Lake itself is not listed as an impaired waterbody for any appraised metrics, but the lake is formed by damming the Petit Jean River. River Segment 3G of the Petit Jean River, inclusive of approximately 24 miles of the river upstream of Blue Mountain Lake, is listed on the Draft 2022 Impaired Waterbodies 303(d) List as Category 5 (truly impaired) for turbidity base flow parameters attributed to surface erosion (ADEE, 2022).

Turbidity is a measure of water clarity, and high turbidity makes water appear cloudy or muddy. Effects of high turbidity not only impact aesthetic values of water resources, but also can negatively affect aquatic health by decreasing visibility and light penetration, clogging gills or the filter-feeding systems of other aquatic animals, and altering egg and larval development (EPA, 2021). While the Petit Jean River upstream of Blue Mountain Lake exceeds set standards for turbidity base flow parameters and is considered Truly Impaired under the Clean Water Act,

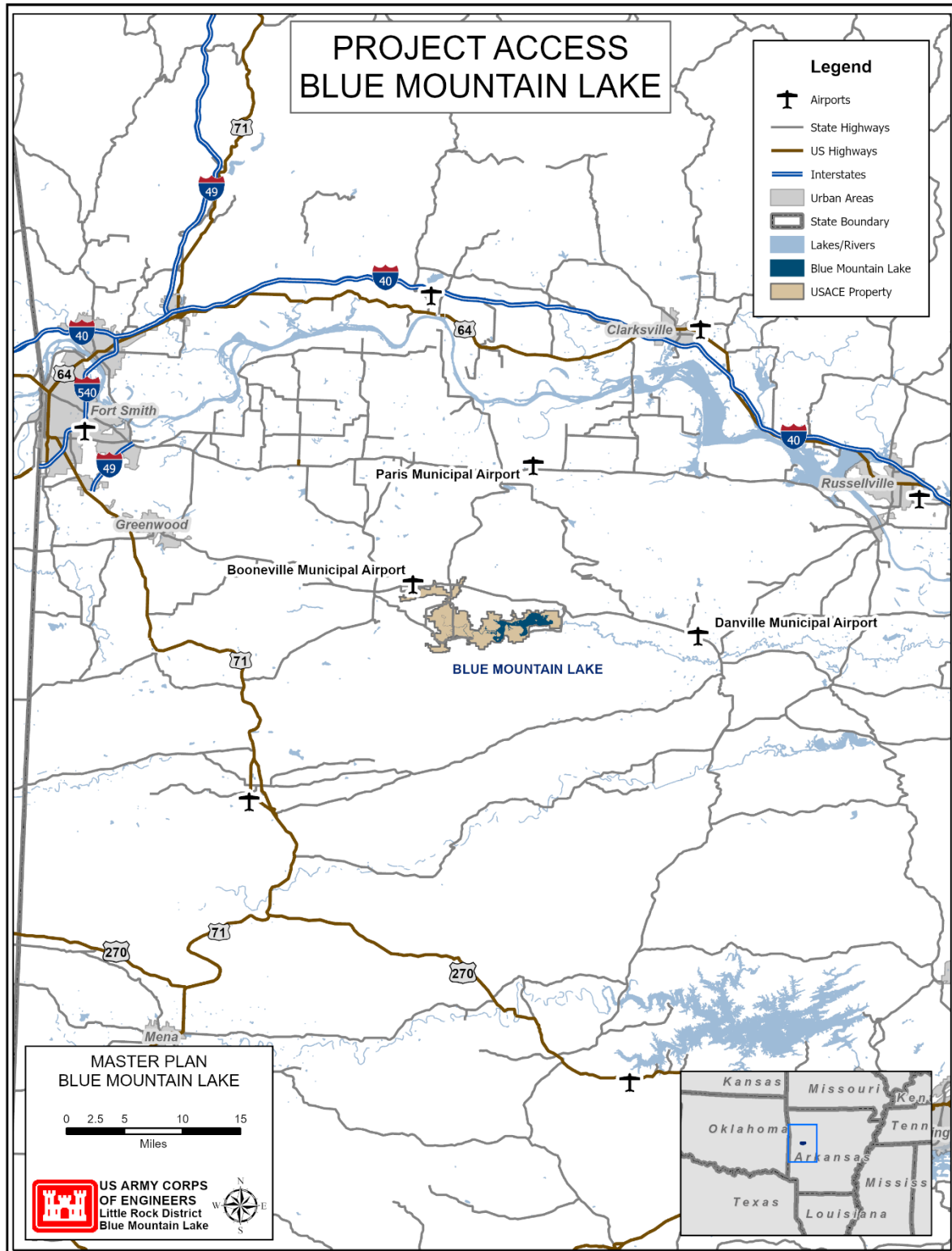


it is classified as Low Priority, and it is expected that turbidity improves as water pools and sediment settles in the Blue Mountain Lake pool as described in Section 2.3 above.

## **2.5 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. The project area is primarily accessed by Arkansas State Highway 10 that runs east and west along the northern side of the lake. This region of Arkansas is accessed from the north and south by US Highway 71, and Arkansas State Highways 7 and 27. Interstate 40 also serves this region of the state and runs east and west across Arkansas. Access to the lake from US Highway 71 is provided by State Highways 10 and 23. State Highway 27 crosses Highway 10 at Danville, about 20 miles east of the Blue Mountain Dam and continues south to cross US Highway 270 at Mt. Ida, Arkansas. Supplementing these main highway arteries is a network of county and community roadways. There are also two municipal airports located within 20 minutes of the lake, the Booneville Municipal Airport at Booneville, Arkansas and the Danville Municipal Airport located at Danville, Arkansas. Further highway and airport access can be referenced in Figure 2-3 Blue Mountain Lake Project Access.

Figure 2-3. Blue Mountain Lake Project Access



## 2.6 Climate

The climate in the Blue Mountain Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by a warm, temperate climate with fully humid precipitation and temperatures that are hot during the summer months (Kottek et al., 2006). Warm, humid, subtropical air that is generated by the Gulf of Mexico can lead to heavy precipitation under certain large-scale pressure patterns. The warm, moist air meets with cold, dry air from the west, creating an environment of high instability and wind shear. These fronts tend to have a north-south alignment but can also shift east-west, can occur any time of year, and can generate heavy precipitation for daily or longer durations (Perica et al., 2013).

### Precipitation

Proximity to the Gulf of Mexico makes Blue Mountain Lake susceptible to tropical storm systems, which account for the majority of extreme rainfall events (Perica et al., 2013). Blue Mountain Lake intersects Logan County and Yell County, Arkansas, and precipitation data was evaluated for both counties over the past 20 years. The two counties see an average of 52.1 inches of precipitation annually, with the majority of rainfall during spring months. The area sees roughly three inches of frozen precipitation annually (NOAA, 2023).

### Temperatures

Blue Mountain Lake intersects Logan County and Yell County, Arkansas. Temperature data was evaluated for both counties for the last 20 years. The average annual temperature for Logan County over the last 20 years is 61.1 degrees Fahrenheit (°F), and Yell County averages 61.5°F annually. Average annual temperatures in Logan County range from a maximum of 72.4°F to minimum annual temperatures of 49.8°F, and in Yell County from 73.0°F to 50.1°F. July is typically the hottest month, with mean daily highs of approximately 92.4°F in Yell County and 92.1°F in Logan County. January is typically the coldest month, with a mean daily low of approximately 29.3°F in Logan County and 29.9°F in Yell County (NOAA, 2023).

### Climate Change

Climate change is an area of concern due to the potential for effects on many aspects of the environment, especially those related to water resources. While temperature and precipitation variations determine habitat types and wildlife diversity under normal conditions, extremes to include flooding, drought, and tornados will introduce stress that has the potential to negatively impact the health and productivity of ecosystems (USDA, 1999). The U.S. Global Change Research Program summarized information regarding climate change and its potential effects in regional assessments. In the South, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. If the current rate of greenhouse gas (GHG) emissions continues, the potential severity and frequency of these extreme weather events is likely to increase over time.

The USACE mission for the Responses to Climate Change Program is “to develop, implement, and assess adjustments or changes in operations and decision environments to enhance resilience or reduce vulnerability of USACE projects, systems, and programs to observed or expected changes in climate.” Further, the USACE has prepared an Adaptation Plan in response to previously existing related EOs and Climate Action Plan. The Adaptation Plan includes the

following USACE policy statement: “It is the policy of USACE to integrate climate change preparedness and resilience planning and actions in all activities for the purpose of enhancing the resilience of our built and natural water-resource infrastructure and the effectiveness of our military support mission, and to reduce the potential vulnerabilities of that infrastructure and those missions to the effects of climate change and variability.” The effects of climate change and mitigation efforts are evolving, and it is a USACE responsibility as a steward for some of the Nation’s most important natural resources to act accordingly. Blue Mountain Lake and all federally owned property is managed to comply with laws and executive orders to respond to the growing threat of climate change.

## 2.7 Topography, Geology, and Soils

### 2.7.1 General Topography

The topography in the southern portion and extreme north-central portion of the watershed of Blue Mountain Lake includes steep inclines typical of the Ouachita Mountains (**Figure 2-2**) with the remainder of the watershed characterized as typically low-lying, gently tilted sedimentary rocks of the Arkansas River Valley Region. The southern portion has a rugged topography, with average relief of several hundred feet and some areas that exceed 2,000 feet in elevation. This area also forms the topographic boundary between the Petit Jean River watershed and the watershed to the south (Dutch Creek) and contains Petit Jean Mountain. The largest elevation within the State of Arkansas is Mount Magazine, located in the extreme north-central portion of the watershed (**Figure 2-2**).

### 2.7.2 Site Geology

The Ouachita Mountain physiographic province underlying the Blue Mountain Lake watershed is composed mainly of Paleozoic sedimentary rocks and represents the extreme frontal element of the orogenic belt and is a mildly compressed fold belt. Structurally, the area is made up of broad synclines and relatively narrow anticlines, with the axis of the folds generally trending east-west (Office of the State Geologist, 2024). Most of the faults are normal, however there are some thrust faults. There is a large fault that runs just north of Blue Mountain Lake (the longest fault trace in Figure 2-4) that was mapped in 1930 and subsequently named the Ranger fault (Cannon and Chandler, 2016). The predominant formation underlying the Blue Mountain Lake watershed is the Pennsylvanian-aged Atoka Formation and is characterized as being mostly dark shales with sandstones and sandy limestones. The area known as the Arkansas River Valley has been above sea level and eroding since the beginning of the Permian Period and, therefore, no rocks were preserved until the Quaternary Period when the Arkansas River deposited sediment in the form of terraces (Chandler, 2007).

### 2.7.3 Soils

Soils of the Arkansas Valley range from deep to shallow with slopes ranging from level to gently sloping in the valleys and on ridgetops, while hillsides and mountainsides are moderately sloping to very steep. The steeper hillsides remain mostly wooded while the valleys are used primarily for pasture (USDA, 1982).

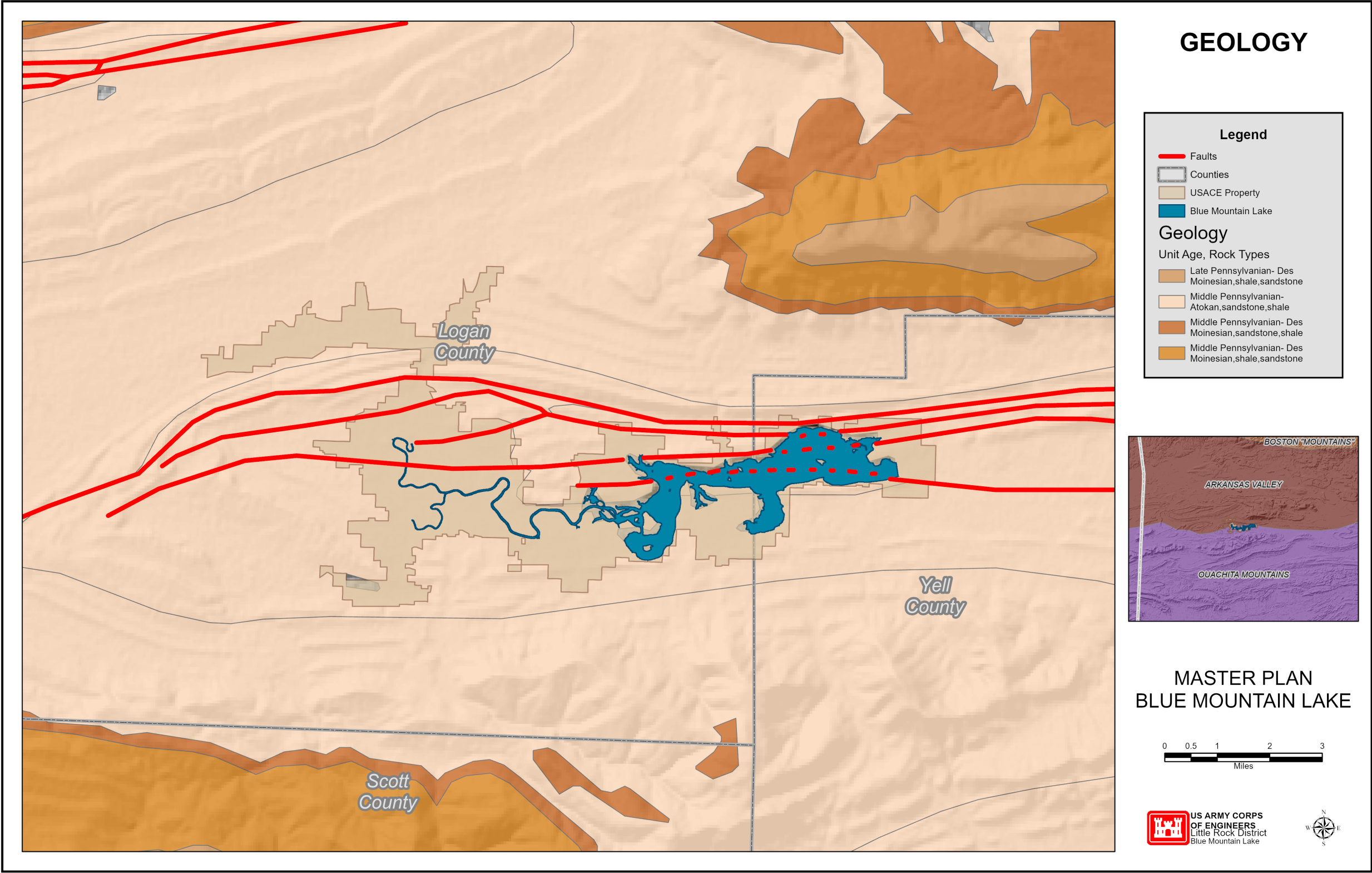
The major soil groups around Blue Mountain Lake are Linker-Mountainburg, Nella-Enders, and

Enders-Mountainburg. Linker-Mountainburg are described as moderately deep and shallow, well drained, moderately permeable to moderately rapidly permeable, are located on the sides and tops of hills and ridges, and are used mainly for pasture, hayland, and woodland (USDA, 1982). Nella-Enders and Enders-Mountainburg are described as deep to shallow, well drained, very slow permeable to moderately rapidly permeable, are located on sides, tops, and footslopes of hills and ridges and are used mainly used for woodland (USDA, 1982).

Soil surveys as published by the Natural Resources Conservation Service (NRCS) are available for all the counties located in the Blue Mountain Lake watershed. These could be utilized for developing specific resource management plans for the Operational Management Plan.

Soil conservation and management are major considerations when planning natural resource and recreation management practices. Soil movement is influenced by uncontrollable factors, such as climate, soil type, and topography. Additionally, 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 2-4. Geology and Fault Lines of Blue Mountain Lake and Surrounding Area



## **2.8 Resource Analysis (Level One Inventory Data)**

Operational civil works projects administered by USACE 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 Resources Conservation Service (NRCS) criteria; and wetlands in accordance with the USFWS' Classification of Wetlands and Deepwater Habitats of the United States. This basic inventory information is used in preparing project Master Plans and OMPs. An overview of the natural resources and related management actions at the project is provided in the following sections and paragraphs.

### **2.8.1 Fish and Wildlife Resources**

#### **2.8.1.1 Fishery**

Management of the fisheries resource at Blue Mountain Lake is the responsibility of the Arkansas Game and Fish Commission (AGFC). The overall function of USACE in support of fisheries has been primarily one of support with planning and management. The waters of Blue Mountain Lake are categorized as a warm-water fishery. The lake is relatively shallow (at conservation pool level, more than 75% of the lake is less than ten feet deep), receives strong wind action, and regularly contains heavy concentration of colloidal turbidity.

The current Water Control Manual was devised and put in place in 1968. It came into being as a solution to the shallow water areas which created boating and fishing problems. The plan increased the water surface elevation seasonally by three feet (from 384' to 387' msl). The plan enhanced the fishery by increasing natural reproduction of fish and improving survival and growth rate of young fish.

Recent community sampling identified at least 34 fish species representing 21 taxonomic genus groups that have been identified in Blue Mountain Lake (see Table 2-1). The AGFC conducts various types of fish sampling surveys on Blue Mountain Lake to guide management decisions. Surveys may help determine the need for a drawdown, habitat work, or regulation modifications such as with daily limits, slot limits and commercial fishing seasons. Lake drawdowns have been utilized often, though at irregular intervals, to address turbidity and for fisheries benefits. Drawdowns, both partial and total, should continue to be used to help manage the fisheries of the lake. These drawdowns are to be requested by the AGFC and should be coordinated to include work such as lakebed seeding, fish habitat work, and shoreline work.

The seasonal fluctuations of lake levels can have either beneficial or negative affects depending on the timing and duration of flooding. Fish stocking by AGFC is not an annual practice but can occur and may also include stocking of smaller bodies of water that occur within the Project. Fish structures should continue to be placed within the conservation pool area of the lake to



create additional habitat for suspending fish. These artificial structures can be constructed of wood, plastic, or other non-toxic materials.

**Table 2-1. Common Fish Species on Blue Mountain Lake**

SCIENTIFIC NAME	COMMON NAME
<i>Notropis boops</i>	Bigeye Shiner
<i>Ictiobus cyprinellus</i>	Bigmouth Buffalo
<i>Pomoxis nigromaculatus</i>	Black Crappie
<i>Fundulus olivaceus</i>	Blackspotted Topminnow
<i>Cyprinella venusta</i>	Blacktail Shiner
<i>Lepomis macrochirus</i>	Bluegill
<i>Etheostoma chlorosomum</i>	Bluntnose Darter
<i>Labidesthes sicculus</i>	Brook Silverside
<i>Pimephales vigilax</i>	Bullhead Minnow
<i>Ictalurus punctatus</i>	Channel Catfish
<i>Percina copelandi</i>	Channel Darter
<i>Cyprinus carpio</i>	Common Carp
<i>Percina sciera</i>	Dusky Darter
<i>Notropis atherinoides</i>	Emerald Shiner
<i>Pylodictis olivaris</i>	Flathead Catfish
<i>Aplodinotus grunniens</i>	Freshwater Drum
<i>Dorosoma cepedianum</i>	Gizzard Shad
<i>Notemigonus crysoleucas</i>	Golden Shiner
<i>Lepomis cyanellus</i>	Green Sunfish
<i>Campostoma spadiceum</i>	Highland Stoneroller
<i>Lepomis spp.</i>	Hybrid Sunfish
<i>Micropterus salmoides</i>	Largemouth Bass
<i>Lepomis megalotis</i>	Longear Sunfish
<i>Lepomis humilis</i>	Orangespotted Sunfish
<i>Percina fulvitaenia</i>	Ozark Logperch
<i>Lepomis microlophus</i>	Redear Sunfish
<i>Etheostoma whipplei</i>	Redfin Darter
<i>Ictiobus bubalus</i>	Smallmouth Buffalo
<i>Micropterus punctulatus</i>	Spotted Bass
<i>Lepisosteus oculatus</i>	Spotted Gar
<i>Minytrema melanops</i>	Spotted Sucker
<i>Lepomis gulosus</i>	Warmouth
<i>Morone chrysops</i>	White Bass
<i>Pomoxis annularis</i>	White Crappie



### 2.8.1.2 Wildlife

Blue Mountain Lake provides a diversity of habitat, which supports a wide variety of wildlife species. The area provides a mix of wetlands, open fields, and woodlands of varied age and composition. White-tailed deer (*Odocoileus virginianus*) is the most abundant big game animal found on the project area. Eastern wild turkey (*Meleagris gallopavo*) and black bears (*Ursus americanus*) are also common. Additional wildlife species that are common to the area may be found in Table 2-2. The AGFC monitors the whitetail deer population for Chronic Wasting Disease (CWD), which has previously been recorded in Logan and several surrounding counties.

The entirety of the Blue Mountain Lake Project lands is managed cooperatively with the AGFC through two license agreements. One license is for the J. Perry Mikles Special Use Area (SUA), which consists of approximately 4,300 acres south of Magazine, Arkansas. The SUA is utilized to host various field trials for multiple dog breeds. The AGFC administrative offices and other facilities for the area are located on the SUA. The remainder of the Project land is licensed as the Blue Mountain Lake Wildlife Management Area (WMA).

Field work fluctuates annually, but AGFC plants about 60-70 acres of combined food plots, food strips, and dove patches, while USACE contributes another approximately 30 acres of plantings. Other wildlife management may include mowing, soil disturbance, silvicultural activities such as mechanical and/or chemical wildlife stand improvements (WSI), removal/ treatment of exotic species, and application of prescribed fire. There are also areas within the Project that will benefit local wildlife by the creation of small watering holes.

Additional information can be found in the Fish and Wildlife Management Plan for Blue Mountain Lake, Appendix D to the 1975 Master Plan, until updated in the future.

**Table 2-2. Common Wildlife Around Blue Mountain Lake**

<b><u>SCIENTIFIC NAME</u></b>	<b><u>COMMON NAME</u></b>
<i>Ursus americanus</i>	Black Bear
<i>Lynx rufus</i>	Bobcat
<i>Colinus virginianus</i>	Bobwhite Quail
<i>Sylvilagus floridanus</i>	Eastern Cottontail Rabbit
<i>Canis latrans</i>	Coyote
<i>Sciurus niger</i>	Fox Squirrel
<i>Urocyon cinereoargenteus</i>	Gray Fox
<i>Sciurus carolinensis</i> G	Gray Squirrel
<i>Lenaida macroura</i>	Mourning Dove
<i>Castor canadensis</i>	North American Beaver
<i>Didelphis virginiana</i>	Virginia Opossum
<i>Procyon lotor</i>	Raccoon
<i>Lontra canadensis</i>	River Otter
<i>Mephitis mephitis</i>	Striped Skunk
<i>Sylvilagus aquaticus</i>	Swamp Rabbit
<i>Odocoileus virginianus</i>	White-Tailed Deer

<b><u>SCIENTIFIC NAME</u></b>	<b><u>COMMON NAME</u></b>
<i>Meleagris gallopavo</i>	Eastern Wild Turkey

Birding enthusiasts are provided an excellent opportunity for bird watching at the Blue Mountain Lake area. Additionally, a wide variety of waterfowl species migrating along the central flyway utilize Blue Mountain Lake. Of the birds on the state list, over 300 have been recorded on or near the lake. These species can be found at the Cornell Lab of Ornithology eBird website. Winter flooding which spreads into bottomland hardwoods provides feeding opportunities for many of the dabbling species while the open water of the lake is utilized by other diving duck species. A list of common bird species may be found in Table 2-3.

Vultures, primarily black vultures, have been increasing in numbers over the past decade, and are beginning to become a nuisance within the recreation areas causing significant damage to vehicles and boats. Mitigation may include cutting of dead trees (snags) in and around recreation areas to reduce roosting opportunities in these areas. Additional deterrents such as pyrotechnics, noise-making devices, chemical repellants, or even lethal means may become necessary with expanding populations utilizing the parks.

**Table 2-3. Common Birds Species Around Blue Mountain Lake**

<b><u>SCIENTIFIC NAME</u></b>	<b><u>COMMON NAME</u></b>
<i>Corvus brachyrhynchos</i>	American Crow
<i>Pelecanus erythrorhynchos</i>	American White Pelicans
<i>Mareca americana</i>	American Wigeon
<i>Haliaeetus leucocephalus</i>	Bald Eagle
<i>Coragyps atratus</i>	Black Vulture
<i>Passerina caerulea</i>	Blue Grosbeak
<i>Spatula discors</i>	Blue-Winged Teal
<i>Sitta pusilla</i>	Brown-Headed Nuthatch
<i>Branta canadensis</i>	Canada Geese
<i>Petrochelidon fulva</i>	Cave Swallow
<i>Phalacrocorax auritus</i>	Double Crested Cormorant
<i>Mareca strepera</i>	Gadwall
<i>Ardea herodias</i>	Great Blue Heron
<i>Ardea alba</i>	Great Egret
<i>Butorides virescens</i>	Green Heron
<i>Anas carolinensis</i>	Green-Winged Teal
<i>Lophodytes cucullatus</i>	Hooded Merganser
<i>Passerina cyanea</i>	Indigo bunting
<i>Aythya affinis</i>	Lesser Scaup
<i>Anas platyrhynchos</i>	Mallard Duck
<i>Pandion haliaetus</i>	Osprey
<i>Passerina ciris</i>	Painted Bunting
<i>Dryocopus pileatus</i>	Pileated Woodpecker

<b><u>SCIENTIFIC NAME</u></b>	<b><u>COMMON NAME</u></b>
<i>Anas acuta</i>	Northern Pintail
<i>Podilymbus podiceps</i>	Pied-billed Grebe
<i>Protonotaria citrea</i>	Prothonotary Warbler
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker
<i>Aythya collaris</i>	Ring-Necked Duck
<i>Tachycineta bicolor</i>	Tree Swallows
<i>Spatula clypeata</i>	Northern Shoveler

### 2.8.2 Vegetative Resources

The lands of the Blue Mountain Lake Project offer a mix of open land and forested land with diverse species populations (see Table 2-4 and Figure 2-5). This diversity can be attributed to the area's physiographic variations from river valleys to steep, rocky slopes.

Much of the open land is currently managed through Real Estate instruments as either an Agriculture & Grazing (A&G) lease to local farmers or a license agreement with the AGFC. The A&G leased areas are regularly cut and baled for hay, whereas the AGFC maintains the lands in their licensed areas through infrequent brush-hogging, and prescribed burning. USACE does maintain areas of open land in a manner similar to that of the AGFC.

Most of the Blue Mountain Lake Project is made up of various woodland types. The major types are bottomland hardwood, upland hardwood, pine-hardwood, and pine. The most common forest type within the bottomland hardwood is of a red oak-sweetgum composition. The frequent high water that occurs within the flood pool area has significantly impacted the bottomland hardwood forest, particularly those areas that fall below elevation 400 feet msl. Over the past 15 years there has been an increase in high water events that have frequently extended into the growing season. The result has been a massive die off of multiple tree species. The greatest impact has been on the red oak species. A few of the pioneer species that have emerged in their stead include buttonbush (*Cephalanthus occidentalis*), water elm (*Planera aquatica*), and silver maple (*Acer saccharinum*), which are far less desirable than the preexisting species. Reforestation efforts are difficult due to spring flooding, but also due to the changing hydric soil conditions in these low-lying areas. Also, common in these die-off areas are various vine species such as trumpet creeper (*Campsis radicans*) and buckwheat/red vine (*Brunnichia ovata*), which present in dense mats of vegetation and severely hinder the natural regeneration process. Regeneration efforts should continue to be explored where soil conditions allow. It may be necessary to shift species composition to more water tolerant species which may include species such as overcup oak (*Quercus lyrata*), water hickory (*Carya aquatica*) or possibly bald cypress (*Taxodium distichum*) in the wettest of areas. In areas where reforestation may not be conducive with current land conditions, they may be examined for their suitability to transition to open land. Blue Mountain Lake Project utilizes/may utilize a wide array of tools to meet management objectives. Open land management may include mowing, disking, mulching, herbicide spraying, utilization of food plots and strips, mechanical clearing, and/or utilization of prescribed fire. Silvicultural prescriptions for woodland areas may include site prep actions such as chemical or mechanical using dozer, roller chopping, or mulching equipment. Timber Stand Improvement (TSI) work is performed to include pre-merchantable thinning, understory/midstory removal

with or without herbicide (cut stump treatment), hack-and-squirt, basal spray applications, and foliar spray applications. Prescribed burning is also utilized within forested stands. Timber sales to include Minor Forest Products Sales in the form of small manager sales, salvage sales, and firewood sales, as well as major Forest Product sales will be utilized. Forest product sales will be coordinated with Real Estate as required in ER 405-1-12.

Additional information can be found in the Forest Management Plan for Blue Mountain Lake, Appendix B to the 1975 Master Plan, until updated in the future.

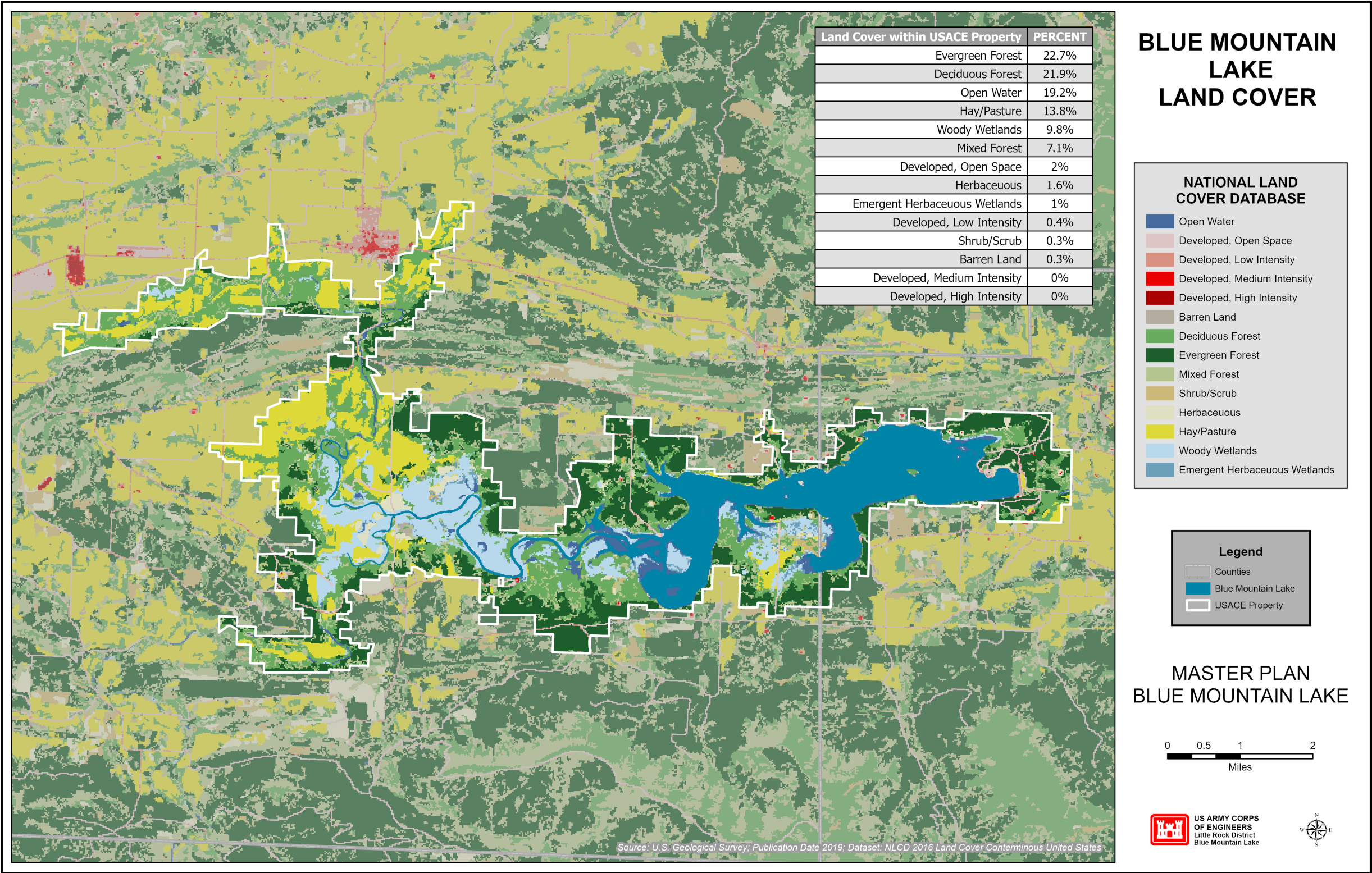
**Table 2-4. Common Vegetation Around Blue Mountain Lake**

<b><u>SCIENTIFIC NAME</u></b>	<b><u>COMMON NAME</u></b>
<i>Teucrium canadense</i>	American Germander
<i>Taxodium distichum</i>	Bald Cypress
<i>Vernonia baldwinii</i>	Baldwin's Ironweed
<i>Andropogon gerardii</i>	Big Bluestem
<i>Salix nigra</i>	Black Willow
<i>Rubus</i> spp.	Brambles: Blackberry, Dewberry
<i>Andropogon virginicus</i>	Broom Sedge
<i>Brunnichia ovata</i>	Buckwheat Vine
<i>Asclepias tuberosa</i>	Butterfly Weed
<i>Cephalanthus occidentalis</i>	Buttonbush
<i>Rudbeckia triloba</i>	Brown-Eyed Susan
<i>Solidago auriculata</i>	Eared Goldenrod
<i>Tripsacum dactyloides</i>	Eastern Gamagrass
<i>Juniperus virginiana</i>	Eastern Red Cedar
<i>Ulmus</i> spp.	Elms
<i>Cyperus echinatus</i>	Globe flatsedge
<i>Celtis</i> spp.	Hackberries
<i>Carya</i> spp.	Hickory : Bitternut, Mockernut, Pignut, Shagbark, Water
<i>Schizachyrium scoparium</i>	Little Bluestem
<i>Pinus taeda</i>	Loblolly Pine
<i>Chamaecrista fasciculata</i>	Partridge Pea
<i>Diospyros virginiana</i>	Persimmon
<i>Quercus</i> spp.	Red Oaks: Cherrybark, Northern, Pin, Shumard, Southern, Water, Willow
<i>Carex</i> spp.	Sedges
<i>Pinus echinata</i>	Shortleaf Pine
<i>Polygonum pensylvanicum</i>	Smartweed
<i>Bidens</i> spp.	Spanish Needles
<i>Platanus occidentalis</i>	Sycamore
<i>Liquidambar styraciflua</i>	Sweet Gum
<i>Campsis radicans</i>	Trumpet Vine

<b><u>SCIENTIFIC NAME</u></b>	<b><u>COMMON NAME</u></b>
<i>Vicia</i> spp.	Vetches
<i>Planera aquatica</i>	Water Elm / Planertree
<i>Quercus</i> spp.	White Oaks: Bur, Post, Overcup, White
<i>Hibiscus lasiocarpus</i>	Wooly Rosemallow



Figure 2-5. Land Cover at Blue Mountain Lake





### 2.8.3 Threatened and Endangered Species

There are many species in the Arkansas Valley ecoregion that are considered either threatened, endangered, or state species of concern. Species become listed 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 Endangered Species Act establishes protections for fish, wildlife, and plants that are listed as threatened or endangered. The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool was utilized to determine species listed under the Endangered Species Act potentially located in the Blue Mountain Lake area (USFWS, 2023a). Table 2-5 below depicts federally listed species that may occur on project and/or surrounding lands. No critical habitat was found within the project area.

**Table 2-5. Federally Listed Species**

Scientific Name	Common Name	Status
<b>Mammals</b>		
<i>Myotis sodalist</i>	Indiana Bat	Endangered
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	Endangered
<i>Perimyotis subflavus</i>	Tricolored Bat	Proposed Endangered
<b>Birds</b>		
<i>Laterallus jamaicensis ssp. jamaicensis</i>	Eastern Black Rail	Threatened
<i>Charadrius melodus</i>	Piping Plover	Threatened
<i>Calidris canutus rufa</i>	Red Knot	Threatened
<b>Reptiles</b>		
<i>Macrochelys temminckii</i>	Alligator Snapping Turtle	Proposed Threatened
<b>Insects</b>		
<i>Nicrophorus americanus</i>	American Burying Beetle	Threatened
<i>Danaus plexippus</i>	Monarch Butterfly	Candidate
Source: USFWS 2023a		

The Arkansas Natural Heritage Commission (ANHC) maintains a biodiversity database that tracks the location and status of rare species of animals and plants as well as natural communities in Arkansas. Table 2-6 below depicts state listed species of concerns that may be located within the Blue Mountain Lake project and/or surrounding areas (ANHC, 2023).



**Table 2-6. State of Arkansas Listed Species**

Scientific Name	Common Name	State Status	Global Rank	State Rank
<i>Aimophila ruficeps</i>	Rufous-crowned Sparrow	INV	G5	S1
<i>Allium cernuum</i>	Nodding Wild Onion	INV	G5	SH
<i>Amorpha ouachitensis</i>	Ouachita Indigo-bush	INV	G3Q	S3
<i>Amsonia hubrichtii</i>	Ouachita bluestar	INV	G3	S3
<i>Apocynum androsaemifolium</i>	Spreading Dogbane	INV	G5	S1
<i>Arianops sandersoni</i>	Magazine Mountain mold beetle	INV	G1	S1?
<i>Caecidotea oculata</i>	an isopod	INV	G2G3	S1
<i>Carex pensylvanica</i>	Pennsylvania sedge	INV	G5	S3
<i>Caulophyllum thalictroides</i>	blue cohosh	INV	G5	S2
<i>Crotalus atrox</i>	Western Diamond-backed Rattlesnake	INV	G5	S2S3
<i>Crotaphytus collaris</i>	Eastern Collared Lizard	INV	G5	S2
<i>Dennstaedtia punctilobula</i>	Hay-Scented Fern	INV	G5	S2
<i>Derops divalis</i>	a beetle	INV	GNR	S1
<i>Deschampsia flexuosa</i>	Wavy Hair Grass	INV	G5	S2S3
<i>Elymus churchii</i>	Church's wild rye	INV	G3	S2?
<i>Eriocaulon koernickianum</i>	Small-Head Pipewort	SE	G2	S2
<i>Erysimum capitatum</i> var. <i>capitatum</i>	Western Wallflower	INV	G5T5	S2
<i>Etheostoma teddyroosevelt</i>	highland darter*	INV	GNR	S3
<i>Haliaeetus leucocephalus</i>	Bald Eagle*	INV	G5	S3B, S4N
<i>Hydrophyllum brownei</i>	Browne's waterleaf*	INV	G2	S2
<i>Inflectarius magazinensis</i>	Magazine Mountain Shagreen	SE	G1	S1
<i>Lasiurus seminolus</i>	Seminole bat	INV	G5	S3
<i>Liatris compacta</i>	Ouachita blazing-star	INV	G3	S3
<i>Liatris scariosa</i> var. <i>nieuwlandii</i>	northern blazing-star	INV	G5?T3T5	S2?
<i>Myotis leibii</i>	Eastern Small-footed Bat	INV	G4	S1
<i>Myotis lucifugus</i>	Little Brown Bat	SE	G3	S1
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	SE	G1G2	S1S2
<i>Nicrophorus americanus</i>	American Burying Beetle	SE	G3	S1
<i>Paronychia virginica</i>	yellow nailwort	INV	G4	S2
<i>Percina phoxocephala</i>	Slenderhead Darter*	INV	G5	S2
<i>Plantago patagonica</i>	woolly plantain	INV	G1G2	S1S2

Scientific Name	Common Name	State Status	Global Rank	State Rank
<i>Ribes cynosbati</i>	prickly gooseberry	INV	G5	S2S3
<i>Sanicula smallii</i>	Small's black-snakeroot	INV	G5	S3
<i>Speyeria diana</i>	Diana Fritillary	INV	G2G4	S2S3
<i>Stachys iltisii</i>	Ouachita hedge-nettle	INV	G3	S3
<i>Stygobromus elatus</i>	Elevated Spring Amphipod	INV	G1G2	S1?
<i>Tradescantia bracteata</i>	long-bract spiderwort	INV	G5	S2
<i>Tradescantia ozarkana</i>	Ozark spiderwort	INV	G3	S3
<i>Valerianella nuttallii</i>	Nuttall's cornsalad	INV	G3	S2
<i>Veratrum woodii</i>	Wood's false hellebore	INV	G5	S3
<i>Vitis rupestris</i>	rock grape	INV	G3	S1
<i>Woodsia appalachiana</i>	Appalachian cliff fern	INV	G4	S1
Central Interior Highlands Dry Acidic Glade and Barrens		INV	GNR	S3
Source: ANHC 2023				

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; ?: A question mark is used to denote an inexact numeric rank.

\* Known species occurrence on project lands

## 2.8.4 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, fungi, plants, or animals that are not native to an ecosystem. Invasive species can take over and out-compete native species by consuming their forage, invading their habitat, 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.

Blue Mountain Lake Project has been impacted by the spread of invasive species. Table 2-7 below identifies some of the more impactful invasive species recorded at Blue Mountain Lake. In addition to the known species, there are some species of concern that occur at other USACE projects that could potentially affect Blue Mountain in the future. These include zebra mussels, hydrilla, giant salvinia, and Eurasian watermilfoil. Blue Mountain Lake staff will continue to work with other agencies and participate in species monitoring, public education through signage, preventative measures, and control measures on Project lands as possible when needed.

Invasive species control measures may include mechanical and/or chemical treatment of species. These measures may be prescribed across any Land Classification category to include Environmentally Sensitive Areas in order to prevent or control the spread of microbe, fungi, plant, or animal species.

**Table 2-7. Invasive Species Identified at Blue Mountain Lake**

<b>SCIENTIFIC NAME</b>	<b>COMMON NAME</b>
<i>Pyrus calleryana</i>	Callery Pear
<i>Agrilus planipennis</i>	Emerald Ash Borer
<i>Sus scrofa</i>	Feral Hogs
<i>Lonicera japonica</i>	Japanese Honeysuckle
<i>Pueraria montana</i>	Kudzu
<i>Rosa multiflora</i>	Multiflora Rose
<i>Ligustrum spp.</i>	Privets
<i>Solenopsis invicta</i>	Red Imported Fire Ant
<i>Lespedeza cuneata</i>	Sericea Lespedeza
<i>Albizia julibrissin</i>	Silk Tree / Mimosa

### 2.8.5 Wetlands

Wetlands are complex habitats that are transitional from dry land to open water, and they have soil, water, and plant components. Wetlands are defined as those areas inundated or saturated by surface or ground water at a frequency and duration to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Many common species of waterfowl, fish, birds, mammals, and amphibians also live in wetlands during certain stages of their lives. There are approximately 4,109 acres of wetlands within the Blue Mountain Lake project boundary, with 3,337 of the total acreage characterized as lacustrine with water features including the lake itself as well as flowing and standing water within fee land. The remaining 771 acres of wetlands are characterized as palustrine, typically surrounded by standing dead timber and vegetated shorelines. Blue Mountain Lake palustrine wetlands can be further categorized as freshwater emergent (seven acres) and freshwater forested/shrub wetlands (764 acres). The forested/shrub wetlands include a mixture of scrub/shrub (six meters or less in height) or forested wetland species of greater than six meters in height. Common woody wetland species typically include buttonbush, willow, green ash, hackberry, elm, willow oak, water oak, overcup oak, sweetgum, and river birch. Some locations may have cypress as well. Palustrine forested/shrub wetlands also occur in the feeder streams' floodplains and are called riverine wetlands (USFWS, 2023b).

### 2.8.6 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.”*

In support of this mission statement, the following paragraphs describe the ecoregion where Blue Mountain Lake is located, and 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.

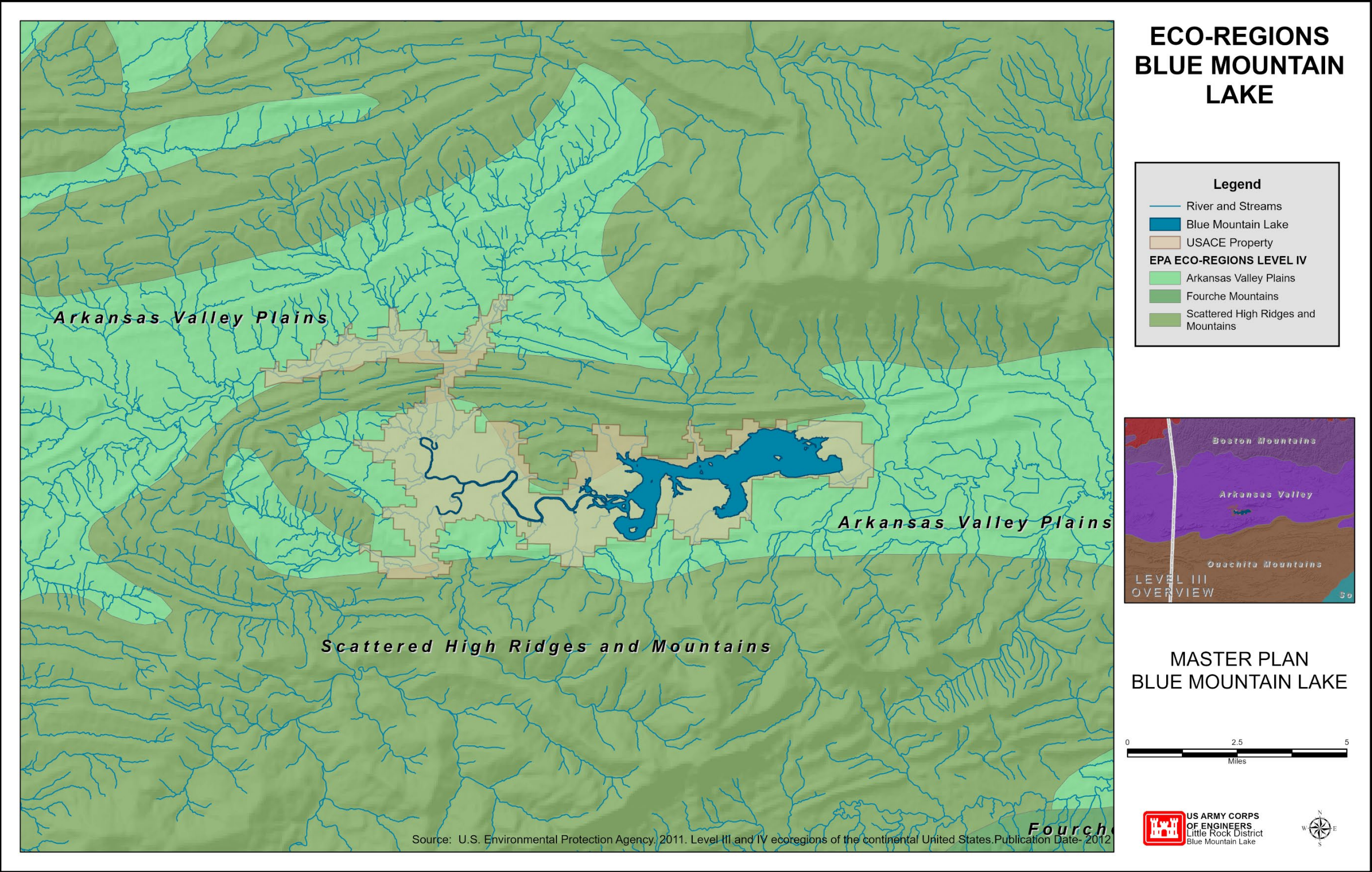
A large area that includes generally similar ecosystems and that has similar types, qualities, and quantities of environmental resources is known as an ecoregion. The purpose of ecological land classification is to provide information for research, assessment, monitoring, and management of ecosystems 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.

Blue Mountain Lake lies within the Environmental Protection Agency (EPA) Arkansas Valley Level III Ecoregion (see Figure 2-6), located in western central Arkansas and extending into eastern Oklahoma. The Arkansas Valley contains plains, hills, floodplains, terraces and scattered mountains. It is largely underlain by interbed Pennsylvanian sandstone, shale and siltstone. It is a synclinal and alluvial valley lying between the Ozark Highlands and the Ouachita Mountains. More specifically, Blue Mountain Lake is bordered to the north by the Scattered High Ridges and Mountains Level IV Ecoregion and to the south by the Arkansas Valley Plains Level IV Ecoregion. The Scattered High Ridges and Mountains sub-ecoregion is covered by savannas, open woodlands, or forests dominated or co-dominated by upland oaks, hickory and shortleaf pine; loblolly pine occurs but is not native. It is underlain by Pennsylvanian sandstone and shale. Nutrient and mineral values (including turbidity and hardness) in streams are slightly higher than in other parts of the Arkansas Valley. Magazine Mountain, the highest point in Arkansas at 2,753 feet, is distinguished by diverse habitats. Its flat top is covered with xeric, stunted woodlands. Mesic sites also occur and may contain beech–maple forests. The Arkansas Valley Plains sub-ecoregion is in the rainshadow of the Fourche Mountains. This region was once covered by a

distinctive mosaic of prairie, savanna, and woodland. It is mostly undulating but a few hills and ridges occur. Westward, this area becomes flatter, drier, more open and has fewer topographic fire barriers. Prior to the 19th century, frequently burned western areas had extensive prairie on droughty soils; scattered pine–oak savanna also occurred. Elsewhere, potential natural vegetation is primarily oak–hickory forest or oak–hickory– pine forest. Today, pastureland and hayland are extensive but remnants of prairie, particularly the Cherokee Prairie near Fort Smith and woodland occur. Poultry and livestock farming are primary land uses. Cropland agriculture in the Arkansas Valley Plains is less important than in another Level IV Ecoregion within the Arkansas Valley, the Arkansas River Floodplain, and wooded areas are not as extensive as in more rugged ecoregions. Stream turbidity generally remains low except during storm events (Woods et al., 2004).



Figure 2-6. Eco-Regions at Blue Mountain Lake





## 2.9 Borrow Areas and Utilities

Borrow sites are locations where shale is removed to be used for operational purposes. Originally, some of these areas were used for the construction of recreation areas. There are still active borrow areas around Blue Mountain Lake being utilized for construction projects.

Utilities passing through and providing service on project lands include telephone lines, communication cables, electrical transmission and distribution lines, and natural gas pipelines.

## 2.10 Mineral and Timber Resources

### 2.10.1 Timber Resources

Blue Mountain Lake is surrounded by forested land, which is managed for multi-use, sustained yield as outlined in the Public Law 86-717:

*To provide for the protection of forest cover for reservoir areas under the jurisdiction of the Secretary of the Army and the Chief of Engineers.*

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it is hereby declared to be the policy of the United States to provide that reservoir areas of projects for flood control, navigation, hydroelectric power development, and other related purposes owned in fee and under the jurisdiction of the Secretary of the Army and the 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 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.*

USACE utilizes multiple tools as part of a timber management program. One management tool is timber disposal in the form of timber sales, which are administered through the Real Estate Branch of the Little Rock District. These timber sales are conducted as outlined in ER 405-1-90.

Forest management on Blue Mountain Lake will be conducted in consonance with PL 86-717, ER 1130-2-400, ER 405-2-835, TM 5-631, and AR 420-74.

See Blue Mountain Dam and Lake Design Memorandum No. 1-C (1975 Blue Mountain Lake Master Plan), Appendix B: Forest Management Plan.

### 2.10.2 Mineral Resources

Natural gas production and extraction occurs on fee lands of the Blue Mountain Lake. There are a total of 12 active and 15 inactive natural gas wells on fee property. Permission to drill for the purposes of natural gas extraction on fee lands is processed by the USACE Real Estate Division which administers easements to conduct these activities. A non-statutory mitigation plan and recommendation is provided to the Little Rock District Real Estate Division, the approving authority for these actions. After the closure of a gas well, the site is restored back to the original

contour and previous conditions of the site prior to the soil disturbance. These conditions are based upon the requirements listed within the executed easement describing the site closure requirements. Typically, mineral rights were not purchased by USACE on fee lands located on the Blue Mountain Lake, though there are some exceptions. Permits for natural gas extraction are issued by the Department of Interior, Bureau of Land Management (BLM). Table 2-8 and Figure 2-7 represent well status on Blue Mountain Lake. There are no other active mineral production sites on the project (see **Figure 2-8**).

**Table 2-8. Gas Well Status on Blue Mountain Lake**

<b>Well Status</b>	<b>Blue Mountain Lake</b>	<b>Total Active Wells</b>	<b>Total Inactive Wells</b>	<b>Total Wells</b>
Producing Wells	12	12	-	-
Plugged and abandoned	6	-	6	-
Temporarily Abandoned	9	-	9	-
<b>Total</b>	<b>27</b>	<b>12</b>	<b>15</b>	<b>27</b>



Figure 2-7. Gas Wells at Blue Mountain Lake

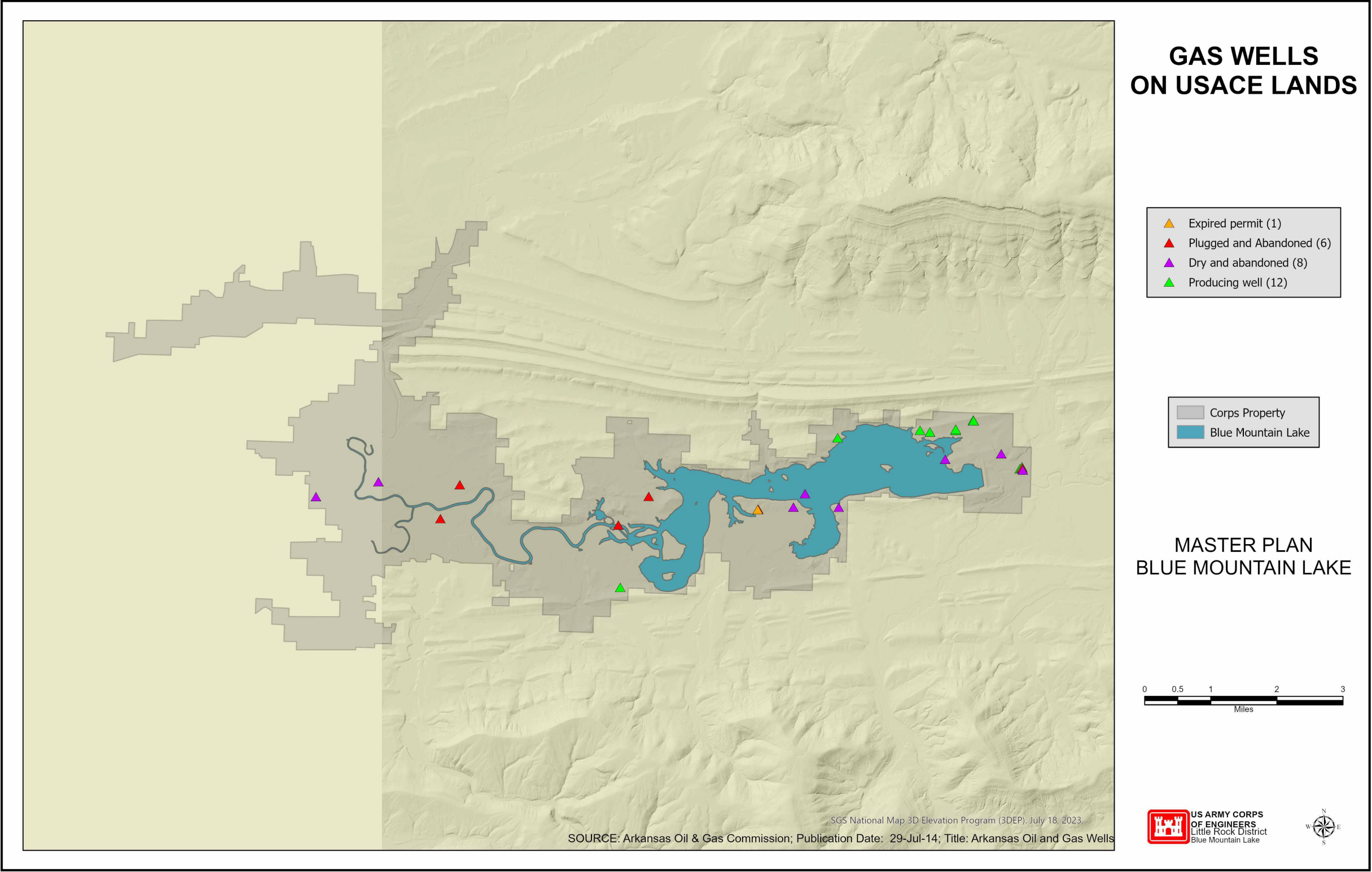
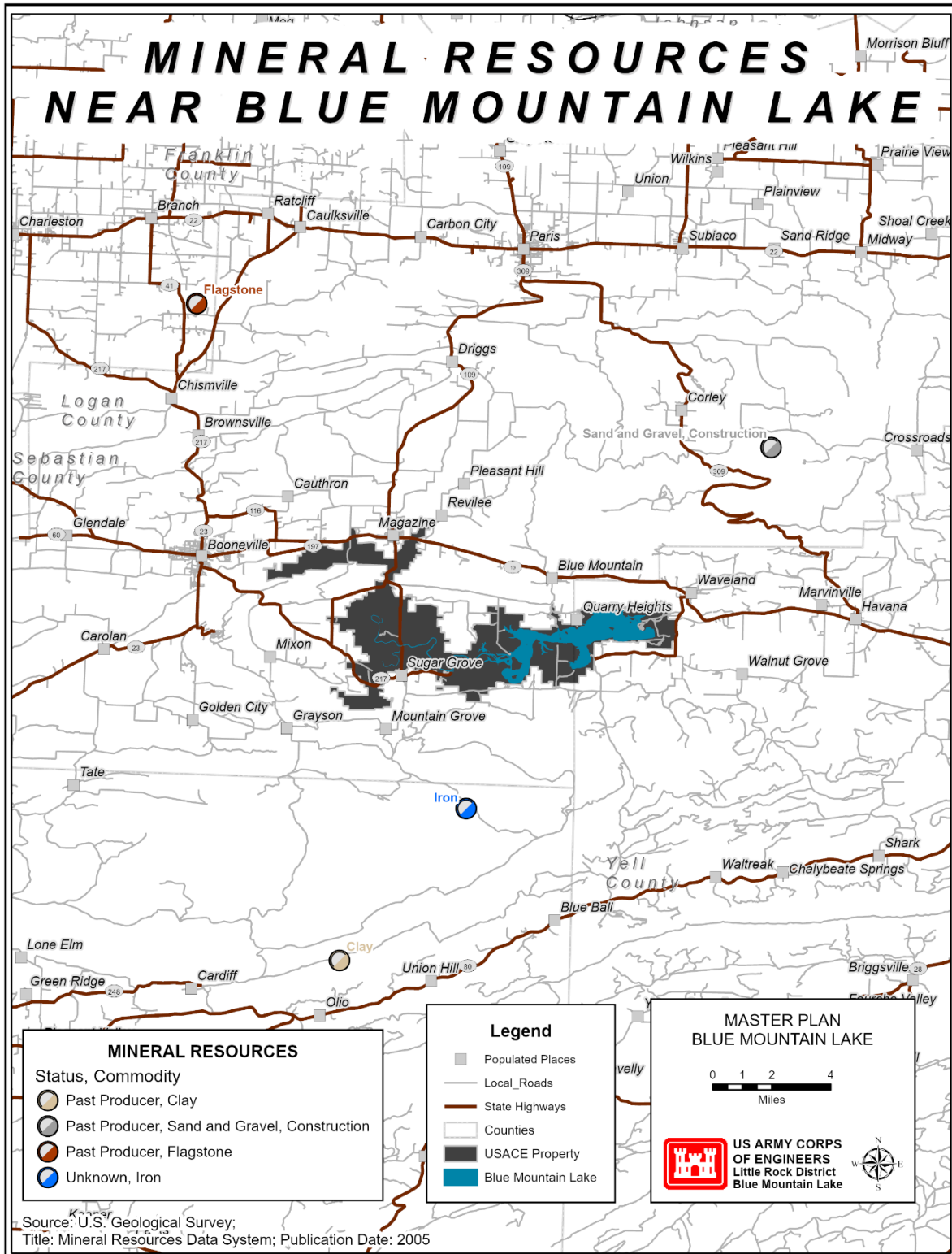




Figure 2-8. Minerals near Blue Mountain Lake



## 2.11 Cultural Resources

Cultural resources preservation and management is an equal and integral part of all resource management at USACE-administered operational projects. The term “cultural resources” is a broad term that includes, but is not limited to, historic and prehistoric archaeological sites, deposits, and features; burials and cemeteries; historic and prehistoric districts comprised of groups of structures or sites; cultural landscapes; built environment resources such as buildings, structures (such as bridges), and objects; Traditional Cultural Properties (TCP) and sacred sites. These property types may be listed on the National Register of Historic Places (NRHP) if they meet the criteria specified by 36 CFR 60.4 as authorized by the NHPA, reflecting significance in architecture, history, archaeology, engineering, and culture. Cultural resources that are identified as eligible for listing in the NRHP are referred to as “historic properties,” regardless of category. A TCP is a property that is eligible for inclusion in the NRHP based on its associations with the cultural practices, traditions, beliefs, lifeways, arts, crafts, or social institutions of a living community. Ceremonies, hunting practices, plant-gathering, and social practices which are part of a culture’s traditional lifeways, are also cultural resources.

Stewardship of cultural resources on USACE Civil Works water resources projects is an important part of the overall Federal responsibility. Numerous laws pertaining to identification, evaluation, and protection of cultural resources, Native American Indian rights, curation and collections management, and the protection of resources from looting and vandalism establish the importance of cultural resources to our Nation’s heritage. With the passage of these laws, the historical intent of Congress has been to ensure that the Federal government protects cultural resources. Guidance is derived from a number of cultural resources laws and regulations, including but not limited to Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966 (as amended); Archaeological Resources Protection Act (ARPA) of 1979; Native American Graves Protection and Repatriation Act (NAGPRA); and 36 CFR Part 79, Curation of Federally-Owned and Administered Archeological Collections. Implementing regulations for Section 106 of the NHPA and NAGPRA are 36 CFR Part 800 and 43 CFR Part 10, respectively. All cultural resources laws and regulations should be addressed under the requirements of the National Environmental Policy Act (NEPA) of 1969 (as amended), as applicable. USACE summarizes the guidance provided in these laws in ER and EP 1130-2-540.

### **Cultural History Sequence**

The cultural chronology of Arkansas is generally separated into Precontact and Historical Periods with each further subdivided into chronological periods of time as denoted by the archaeological and historical records. This cultural history sequence was derived primarily from two archaeological reports recently submitted to USACE: Cultural Resources Assessment Survey of 384 Acres at Blue Mountain Lake in Yell County, Arkansas by AmaTerra Environmental, LLC and Cultural Resource Assessment Survey Blue Mountain Lake: FY 18.3-BM-1 (Area 1), FY 18.3-BM-2 (Area 2), FY18.3-BM-3 (Area 3), and Fy18.3-BM-4 (Area 4) Logan County, Arkansas (Thomas, 2022c) (Horvath, 2019).

### **Precontact Period Chronology**

#### ***Paleoindian Period (13,500 – 10,500 BP)***

Information used to reconstruct the Paleoindian Period in Arkansas has relied heavily on diagnostic Paleoindian projectile point surface finds, as well as archaeological data collected in other states (Sabo and Early, 1990; Morrow, 2011). Diagnostic fluted Paleoindian projectile points include the Clovis, Folsom, Sedgwick, and Gailey types (Morrow, 2011). Coldwater, Quad, and Pelican projectile points represent a transition from the Paleoindian Period to the Dalton Period. Stratified Paleoindian deposits have not been identified within the Ouachita Mountains and Arkansas Valley regions. Surface finds of fluted points and buried remains of megafauna indicate the presence and preservation of buried sites that date to this period is possible (Gilliam, 1996; Sabo and Early, 1990: 38-39). Potential Paleoindian residents in the Ouachita Mountains region may have traveled from the Crowley's Ridge area to the east, which appears to be a focal point of populations during the period (Morrow, 2011). Foraging opportunities would be changing as the previous boreal forests with a megafauna presence were transitioning to deciduous forests and the extinction of megafauna by 10,000 BP.

#### ***Dalton Period (10,500 – 9,500 BP)***

The Dalton Period (10,500 – 9,500 BP) is a transitional phase between the Paleoindian and Archaic Periods (Sabo and Early 1990). The most prominent temporal marker from this period are Dalton points, which are thin, concave-base, unnotched types found throughout Arkansas. Raw materials for the chipped stone tools of this period preference regional sources in the Ozark and Ouachita Mountains (Sabo and Early, 1990:44-46). Stratified Dalton Period deposits have not been found in the Ouachita Mountains and Arkansas Valley regions. However, the identification of surface recovered diagnostics indicate that alluvial valleys are areas with potential for the discovery of sites with buried context.

#### ***Archaic Period (9,500 – 2,700 BP)***

The Archaic Period was a time of cultural development and population growth in central North America that corresponds to peak warmth after the end of the last Ice Age, followed by amelioration to modern climatic conditions (Trubitt, 2019). The Archaic Period is commonly broken up into the Early, Middle, and Late Archaic. Habitation during this time was concentrated along major river basins such as the Ouachita, Arkansas, Mississippi, and Red River valleys. The Early Archaic (9,500 – 7,000 BP) is marked by an increase in marine, small game, and wild plant subsistence resources, as well as the development and diversification of tools such as grooved axes and grinding stones. During the Middle Archaic from 7000 – 5000 BP, larger village sites in major river valleys were occupied on a year-round basis as climatic drying was taking place across most of central North America. Evidence of fabrics, basketry, and cordage first appear in the archaeological record during this time. During the Late Archaic (5,000 – 2,700 BP), climatic drying ended and the earliest pottery in the Midwest begins to appear at archaeological sites in the region. Additionally, early evidence of horticulture and Late Archaic burial mounds begin to occur in some areas of Arkansas. Although this phase is not well documented in the Arkansas Valley or upland in the Ouachita Mountains, researchers have suggested these are hunting-focused sites with intensive use of river environments.

#### ***Woodland Period (2,700 – 1,000 BP)***

The Woodland Period is a cultural phase characterized by permanent settlements with social and economic hierarchies that intensified pottery manufacturing, mound building, and agriculture

(Mainfort, 2020). Like the Archaic Period, the Woodland Period is divided into three subperiods: The Early, Middle, and Late Woodland.

The Early Woodland Period (2,700 – 2,100 BP) within the Ouachita Mountains region is generally recognized as a continuation of the Wister phase (Sabo and Early, 1990:77). The Fourche Maline phase people intensively reoccupied some of the same site locations on first level terraces adjacent to fresh water. Evidence of subsistence does not indicate large changes from the previous Archaic Period, but chipped stone hoes are found suggesting some digging activities.

People during the Middle Woodland Period (2,100 – 1,500 BP) experienced social changes most evident in the archaeological record through earthwork construction and variation in pottery production. Arkansas peoples lived in small communities and built small mounds in some areas (Mainfort, 2020). Some sites have been recorded along tributary streams that extend upwards into the Ouachita Mountains (Sabo and Early, 1990:76-79). Local materials and material evidence of burial ceremonialism increases in occurrence from the Early Woodland Period.

The Late Woodland Period (1,550 – 1,000 BP) is generally defined by larger settlements and the introduction of the bow and arrow (Mainfort, 2020). Maygrass, lambs quarters, knotweed, sunflowers, and marsh elder were commonly cultivated during this time. In the latter half of the Late Woodland Period, maize production intensified in some areas of Arkansas. Plant remains indicate that cultivated foods became a marked portion of the diet. While exotic goods indicative of long-distance exchange remained infrequent, exchange between areas of the Ouachita Mountains and areas of the Arkansas Valley seem common as pottery styles and shared raw materials seem common on sites in both regions.

### ***Mississippian Period (1,000 – 400 BP)***

Complex social, political, and economic structures coupled with a shared religious belief system developed during the Mississippian Period (Payne, 2018). Mississippian Chiefdoms had a ruling class that gained power through hereditary succession (Payne, 2018). With structured social hierarchies, came increased food production and wide-spread trade networks. Maize, squash, and beans were the primary crops produced throughout Mississippian settlements, although utilization of non-cultivated foods remained an important element of people's foodways.

Home and town structures of the Mississippian Period were typically rectangular in shape and organized around a fortified central plaza with a pyramid-shaped mound (Payne, 2018). The population in Mississippian settlements greatly increased following the development of agriculture but left people vulnerable to crop blights and drought. Increased populations also hastened the spread of disease through local communities.

The de Soto Spanish expedition of 1541 into the interior of North America wrote detailed accounts of Mississippian towns and cultures they encountered. When Jacques Marquette and Louis Joliet traveled south along the Mississippi River for France in 1673, large towns along the river had deflated, and native peoples had depopulated city centers. Widespread disease, warfare, and crop-crippling drought are thought to be the causes of this evacuation of population

centers within less than 100 years of colonial contact (Hoffman, 1992; Key, 2020; Mitchem, 2017; Payne, 2018).

## **Historic Period Chronology**

### ***Contact Period (520-250 BP)***

The Contact Period (520–250 BP/1430-1700) contact between Native American cultures and Europeans (Jeter et al., 1989:221). With the presence of European records this overview will now shift to using the European Common Era dating system. In 1541, Hernando de Soto's Spanish expedition was the first group of Europeans to enter the Arkansas Valley region and possibly the southern Ouachita Mountains (Mitchem, 2017b).

Much of the Arkansas Valley and the Ouachita Mountains regions into the 1700s was the home of the Caddo. Caddo communities utilized constructed mounds as centers for community ceremonies and burials. Communities expanded well beyond these centers as family farms with multiple, circular thatched homes, fields, and other structures for farm use were clustered across the landscape (Mitchem, 2017). Early French travelers in 1687 and Joliet of the Marquette-Joliet French expedition in 1673 forged initial contacts with the Caddo for the French in the South-Central Plains region of Arkansas. The French encouraged trade with the Caddo. This trade and political contact grew in importance into the 1700s as the Caddo faced demographic shifts and hostility from the Osage in the north.

### ***Eighteenth Century to Present (1700 – Present)***

As the eighteenth century progressed, northern Caddo people increasingly relocated settlements closer to the Red River and to trading centers established by the French. Hostility between the Caddo and the Osage intensified in the 1730s and 1740s (Bailey, 2001). However, traditionally occupied lands were still recognized as part of their home and used for foraging (Mitchem, 2017a). The Osage also used areas of the Arkansas Valley region during the eighteenth century. Villages were recognized as permanent residences by the Osage with seasonal subsistence and community activities undertaken in areas away from the village (Chapman, 1974). Housing consisted of rectangular longhouses while circular structures were erected for temporary use away from the village. The Ouachita Mountains and Arkansas Valley regions of the late eighteenth century were also used for hunting and lightly occupied by various settlements of the Quapaw (Sabo, 1990b:122-134; Young and Hoffman, 2001).

The eighteenth and nineteenth century was a significant period of transition as Native, European, and African Americans moved into areas west of the Mississippi River. To establish trade with local Native American groups and colonize their territory, the French continued to establish trading posts along other major river ways in the states (Key, 2020). By the late 1700s, French, Spanish, and British colonial forces laid claims to various parts of the country. In 1776, the United States claimed independence from Britain, and in 1783, through the Treaty of Paris, most of the land east of the Mississippi was owned by the United States. The earliest European Americans to settle west of the Mississippi River were often engaged in the fur trade in the late eighteenth and early nineteenth century. As more people moved into Arkansas, settlements were established within the Ouachita Mountains in the early nineteenth century. Settlers in this region



chose locations within the mountain uplands, often foraging and herding livestock, or within the narrow river bottoms on small farms (Sabo, 1990a:136-156).

In 1803, all of Arkansas, Missouri, and Oklahoma was purchased by the United States as part of the Louisiana Purchase (Bolton, 2018; Key, 2020). Many areas of Arkansas were sparsely populated by Native peoples, already impacted by conflict and introduced disease, and traders were typically the only non-Native residents.

### **Removal Era History**

Tens of thousands of Native Americans were forced to move west into Indian Territory after Andrew Jackson's administration passed the Federal Indian Removal Act in 1830 (Remini, 2001).

Arkansas, home to the Quapaw, Caddo, Osage, and Kickapoo tribes in the early nineteenth century, was the westward relocation destination of many tribes (Oklahoma Historical Society, 2021). Cherokee, Quapaw, Choctaw, Shawnee, Delaware, and Kickapoo were among the groups either relocated into or within Arkansas in the early nineteenth century (Sabo et al., 1990:121-134). As actions of the Federal Indian Removal Act gained momentum, pressure in the form of other acts, treaties, and aggression from new settlers would push Native American residents of Arkansas and other states into Indian Territory in Oklahoma.

Growth in the population and markets of Arkansas coincided with efforts to remove Native Americans from the states. Arkansas was separated from the Missouri Territory in 1819 and became a state in 1836. Growth of Arkansas after the 1830s was spurred by settlers producing cotton with the labor of enslaved Africans, which allied the state socially, culturally, and politically with the southern U.S. (Bolton, 2018). Larger farms devoted to cash crops typically occurred in the areas of the Arkansas River valley closest to the Mississippi River, near the Red River, or along the Mississippi River itself (Bolton, 1999). Enslaved people were only approximately 11% of the population of the Ouachita Mountains region (Bolton, 1999:5), but slavery became an increasingly powerful political discourse within Arkansas state politics into the mid-nineteenth century (Bolton, 1999; Missouri State Museum, 2020).

### **The United States Civil War**

In 1861, Arkansas voted to secede from the Union and join the Confederacy (DeBlack, 2018). The Civil War negatively impacted the state, and territory shifted constantly between Union and Confederate control. Although no major battles took place near the project location, local skirmishes and guerrilla attacks were common in many areas. In the Ouachita Mountains region in 1863 the Battle of Devil's Backbone occurred when federal forces secured Fort Smith, Arkansas for the remainder of the war (Arey, 2018). Ongoing local conflicts, paired with financial hardships from the war, devastated the local economies. The Arkansas River was a focal point of conflict throughout the war as well. As a key transportation and supply route, the river was valuable to both the Union and Confederate armies and the strategic city of Dardanelle was severely damaged and held by Union forces for much of the war (Gleason, 2017).

### **Late Nineteenth and Twentieth Century History**



During post-reconstruction, new social and economic trends were witnessed across the nation (Moneyhon, 2018). Termed the “Gilded Age” due to large wealth disparities during a period of economic growth, this period saw the expansion of railroads within the U.S. interior, allowing goods to be traded on a national market. Manufacturing facilities and resource extraction enterprises flourished, and urban populations grew. Railroad construction in previously isolated areas of Arkansas, such as the Ouachita Mountains, led to a “transition from household economies and neighborhood businesses to industrial activities on a larger scale” (Gannon, 1998:9). By 1899, the lumber industry was responsible for two-thirds of the value of the Arkansas manufactured goods total (Strausberg and Hough, 1997:7). Logging would peak within a decade, but the effects would leave long-lasting impacts.

Economic growth favored urban centers, and a cultural divide developed between farmers and city dwellers. These divides became more fractured between black and white citizens in the 1890s when formal segregation laws were passed. Social issues in the twentieth century mirrored those of the past. Arkansas, however, continued to grow and expand its economic and environmental interests until devastated by the effects of the economic collapse of 1929 and the Great Depression of the 1930s. A decline in farm prices and years of drought devastated that farm economy and many moved out of Arkansas in search of employment elsewhere. The state then came to rely heavily on the federal government’s “New Deal” programs to recover (Whayne, 2020).

Under the New Deal, a program initiated in the administration of President Franklin D. Roosevelt, the government invested in the welfare and recovery of the American people. Agencies such as the Civilian Conservation Corps (CCC) and the Works Progress Administration (WPA) were created to provide jobs for young, unemployed males. Relief programs such as these engaged in many conservation activities such as tree planting, development of recreation areas, firefighting, and other measures protecting natural resources. The work projects undertaken by the CCC were directed by the USDA on National Forest lands and by the Department of the Interior on National Park Service lands. The impact of New Deal work programs, including the WPA and most particularly the CCC, whose broad objectives were to alleviate a national economic and natural resource crisis, are represented in the distinct architectural legacy of the physical resources constructed by these programs in Arkansas forests and parks (AHPP, 1990; Smith, 1997).

During WWII, able-bodied men and women flooded to manufacturing centers throughout Arkansas to aid in the war effort and the U.S. government invested in training facilities and bases within the state (Johnson, 2017). Arkansas also hosted German and Italian prisoner-of-war (POW) camps. Although none are in or within one mile of the project location, Camp Chaffee located approximately 22 km northwest of the project location housed 3,000 German POWs between 1942 and 1946 (Radcliff, 2017). German and Italian POWs were utilized to harvest cotton.

### **The Flood of 1927**

The Flood of 1927 was one of the largest disasters in American history. The deluge and the following relief efforts spurred major social, political, and economic changes on state and

national levels. The following account is summarized from the Encyclopedia of Arkansas (Hendricks, 2017).

By 1927, numerous levees had been built along the rivers of Arkansas to control flooding. Low-lying forested lands behind the levees were drained and timbered. In the Roaring Twenties, farmers and planters with access to easy credit bought many low-lying lands and converted them to croplands. The spring thaw of 1927 arrived early in the northern headwaters of the Mississippi River watershed. Spring rains in the Midwest combined with the meltwaters to fill the Mississippi and its tributaries. In April, heavy rains fell in the South, but the saturated ground and full rivers left nowhere for the water to go.

In Arkansas, the Arkansas, St. Francis, and White Rivers began to back up due to high water in the Mississippi River. The White River even reversed and began to flow upstream due to the water pressure from the Mississippi River. Every levee on the Arkansas River between Oklahoma and Little Rock failed. Floodwaters up to 30 ft deep inundated towns, homes, and farmlands. The disaster was most widespread in Arkansas. In the state, the amount of farmland underwater was more than twice that of Mississippi and Louisiana combined. In some places, lands remained flooded for nearly half the year.

Recently developed technology aided relief efforts. Radios broadcast warnings and bulletins, airplanes helped find survivors, and motorboats carried people to dry land. Trains carried people to aid stations set up by the Red Cross and other organizations. Half of the 154 refugee camps established by the Red Cross were in Arkansas. The camps remained in operation into September of 1927. In Arkansas alone, over 100 people were killed by the flood and 350,000 people affected. The standing water remained for months, clogged with rotting animal carcasses and a breeding ground for mosquitoes. There were outbreaks of malaria, typhoid fever, dysentery, and even smallpox.

The Flood of 1927 had a number of long-term effects. Politically, the large-scale relief efforts and the anger at the lack of federal aid contributed to changing perceptions regarding the role of government in society. The Great Depression and the Dust Bowl drought of the 1930s exacerbated these trends supporting a growing belief among many Americans that the government should play a more active role in securing the welfare of the citizens.

### **The Construction of Blue Mountain Lake**

As part of the federal response to the devastating flood in 1927 and additional floods in the 1930s, the Flood Control Act of 1938 was passed. This was the impetus for a series of dams and reservoirs that were to be built in Arkansas over the coming decades. In 1940, the USACE proposed a dam on the Petit Jean River to control flooding in Logan County. Construction of the dam began that year but was halted in 1942 due to World War II. After the war ended, construction resumed, and the dam and lake were completed in June 1947 at a cost of \$4,770,000. The dam is an earthen structure, 115 feet high and 2,800 feet long. The Blue Mountain Lake covers about 4.5 square miles—roughly 2,880 acres—and provides about fifty miles of shoreline. It receives drainage from about 500 square miles of land. A nearby Corps of Engineers office oversees the lake and dam (Tesce, 2017).

**Figure 2-9. Blue Mountain Dam Under Construction July 13, 1946.**



Little Rock Engineer District  
Blue Mountain Dam Site, Petit Jean River  
View looking south showing riprap being placed on main dam.  
July 13, 1946, 3:10 p.m.  
Booneville, Arkansas  
File B.M. 976

### **Previous Archaeological Investigations within the Blue Mountain Lake Fee Boundary**

There are more than 115 known archaeological sites located wholly or in part on USACE fee lands associated with Blue Mountain Lake.

While the majority of archeological sites at Blue Mountain Lake have been identified individually and separate from a survey, multiple formal archaeological surveys have been completed at Blue Mountain Lake since the 1970s in response to ongoing activities such as lake construction, inadvertent discoveries, and NHPA Section 106 compliance. This section includes an overview of work conducted in the area. The first archaeological survey known to take place within USACE fee lands of Blue Mountain Lake was conducted by Arkansas Archeological Society (AAS) in 1977 that identified 39 archeological sites (Padgett, 1977). Historic Preservation Associates, LLC. surveyed a seismic test transect in 1983 that identified no new cultural resources (Klinger, 1983). In 1986 the Arkansas State Highway and Transportation Department (AHTD) conducted a survey for the locations of proposed bridge locations and approaches along the Petit Jean River that identified no new cultural resources. Briscoe Consulting Services surveyed two seismographic test lines in 1989 identified three new sites (Briscoe, 1989). Historic Preservation Associates conducted a survey along three proposed seismic corridors in 1990, one of which that crossed USACE fee lands at Blue Mountain Lake within which no new cultural resources were documented (Klinger and Smith, 1991).

Spears, Inc. conducted an archaeological survey for a proposed waterline extension in 1992 that identified two new sites (Hoffman and Waddell, 1992). The AHTD surveyed for a bridge replacement on USACE fee lands in 2004 that identified no new archaeological sites (Hughes, 2004). Historic Preservation Associates, LLC. conducted a survey ahead a proposed drill pad, access road, and pipeline in 2005 that identified no new archaeological sites. Historic Preservation Associates surveyed for improvements to water lines and found a single new site in

2006 (Klinger, 2006). The AAS conducted an archeological salvage project of a site in 2016 (Porter, 2016).

Archaeological Consultants, Inc. and Coastal Environments, Inc. collaborated on two surveys, one in 2018 and another in 2019. The 2018 survey identified four new archeological sites while the 2019 survey identified six new archeological sites (Horvath, 2018) (Horvath, 2019). Coastal Environments, Inc. conducted a survey in 2016 that identified three new archeological sites (Weinstein and Phillips et. al., 2019). AmaTerra Environmental, Inc. conducted three surveys in between 2021 and 2022 in which they identified two, four, and one new archeological site(s), respectively (Thomas et. al., 2022a) (Thomas et. Al, 2022b) (Thomas et. al., 2022c).

### **Long-Term Objectives for Cultural Resources**

As funding allows, the Little Rock District will plan and budget for a Historic Preservation Management Plan (HPMP) that shall be developed and incorporated into the Operational Management Plan (OMP) in accordance with EP 1130-2-540. The purpose of the HPMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Blue Mountain Lake and it will be accomplished if future funding is forthcoming. Completion of a full inventory of cultural resources at Blue Mountain Lake is a long-term objective that is needed for compliance with Section 110 of the National Historic Preservation Act (NHPA). All currently known sites with unknown eligibility and newly recorded sites must be evaluated to determine their eligibility for the NRHP. Identification and evaluation of sites is an ongoing process at Blue Mountain Lake. As more significant sites are identified, they could be protected through further land classifications.

In accordance with Section 106 of the NHPA, any proposed activities or projects at Blue Mountain Lake will require review by District Archaeologists to assess their potential to impact historic properties. These activities may include those described in this master plan or those that may be proposed in the future by others for leases, licenses, right-of-way easements, recreational development, construction, wildlife management, or other activities that can be considered undertakings subject to Section 106 of the NHPA. The need for cultural resource surveys to locate and evaluate historic and prehistoric resources, consultation, or other compliance activities related to Section 106 of the NHPA shall be determined and coordinated by a qualified District Archaeologist. Resources determined eligible for the NRHP must be protected from proposed project impacts, or the impacts must be mitigated in consultation with appropriate parties.

The Archaeological Resources Protection Act (ARPA) secures the protection of archaeological resources and sites on lands owned and administered by the United States for the benefit of the American people. According to ARPA, it is illegal to excavate, remove, damage, or deface archaeological resources on public lands without a permit issued by the federal agency managing the land. It is also illegal to sell or transport archaeological resources removed from public lands. Little Rock District requires permits for archaeological investigations at Blue Mountain Lake in accordance with ARPA and is increasing surveillance and coordination with law enforcement agencies in the state to enforce ARPA civil and criminal penalties.

According to the Native American Graves Protection and Repatriation Act (NAGPRA), it is the responsibility of a federal agency to inventory human remains and associated funerary objects, as

well as summarize any potential sacred objects, that existed within their archaeological collections prior to the passage of the law and, to the extent possible, identify their cultural affiliation in order to repatriate such objects to affiliated Tribes requesting their return. In addition, there are responsibilities related to the inadvertent discovery of human remains or funerary objects that occurred on federal land after the passage of the law that require a separate process of consultation, affiliation determinations, and notifications prior to repatriation. Although NAGPRA compliance has been an ongoing focus of the Little Rock District and many consultations and repatriations have occurred over the past 25-30 years, there is still more work to be done.

In recognition of the significance of the responsibility the Little Rock District has to ensure the proper and respectful treatment of the individuals who have been - or may inadvertently be - disinterred from Little Rock District land, and acknowledging the fact that this work requires more than a part-time effort to be accomplished, a new full-time position has been established to focus on the proper execution of this responsibility. The intensive process to verify existing documentation and complete any missing part of the process for all collections of human remains, funerary objects, or sacred objects subject to NAGPRA in Little Rock District archaeological collections is in progress. As a necessity, this renewed effort is starting with research and reorganization of associated records and archaeological collections to ensure the proper identification and initial inventory of all NAGPRA materials that are under the control of Little Rock District. This effort will include NAGPRA collections that have been made – or may yet be discovered - at Blue Mountain Lake, therefore, compliance with NAGPRA is ongoing.

## **2.12 Interpretation**

Interpretive programs at Blue Mountain Lake are focused on four main areas of emphasis: water and boating safety, natural resource and wildlife management, recreation, and project authorized activities. Project personnel offer programs at various times throughout the year at local schools, community events, and USACE managed events; while most of these events are strongly geared toward children under 16 years of age, it is vital that everyone is informed on how to be safe on the water. Each year, over 3,500 contacts are made through these events and programs. To support the water safety program, life jacket loaner stations exist at most boat ramps so that visitors may “borrow” a life jacket for the day.

## 2.13 Zone of Influence

Blue Mountain Dam is located on the Petit Jean River, around 75 miles upstream from its confluence with the Arkansas River and approximately 1.8 miles southwest of Waveland, Arkansas in the Arkansas River Basin. The zone of influence (ZOI) for the socio-economic analysis of Blue Mountain Lake encompasses two states and 15 counties.

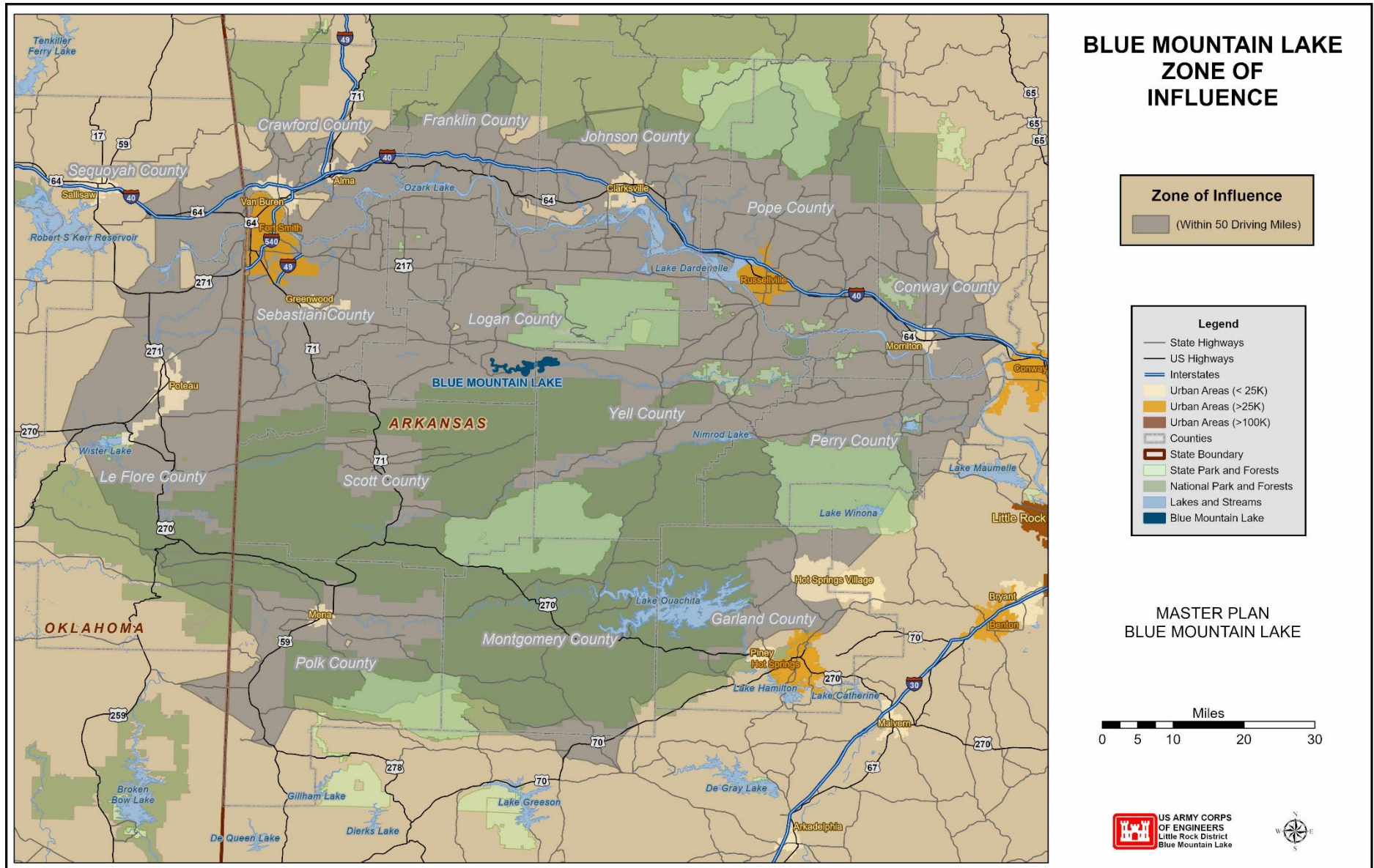
**Table 2-9. Zone of Influence Counties**

Zone of Influence Counties	
Conway County, AR	Polk County, AR
Crawford County, AR	Pope County, AR
Franklin County, AR	Scott County, AR
Garland County, AR	Sebastian County, AR
Johnson County, AR	Yell County, AR
Logan County, AR	Le Flore County, OK
Montgomery County, AR	Sequoyah County, OK
Perry County, AR	

The ZOI for the purposes of this Master Plan is defined as those areas within a 50-mile driving distance from the lake. This ZOI was based primarily on historic visitation information. The demographic and socioeconomic description in this section of the report is summarized at the county level. To determine which counties were included in the summary tables and figures, all counties that intersected or fell within the 50-mile driving radius were identified. The counties where at least half of the county (by area) was within the ZOI boundary are included in Table 2-9 and Figure 2-10. Demographic and socioeconomic data for the surrounding states and the nation are provided for comparison purposes.



**Figure 2-10. Zone of Influence on Blue Mountain Lake**



## 2.14 Demographics and Socioeconomics

### 2.14.1 Population

The total population for the zone of influence in 2020 was 591,418, as shown in Table 2-10. Approximately 22% of the ZOI's population resides in Sebastian County, AR, 16% in Garland County, AR, and 10% in Pope County, AR. All counties are expected to see growth except Crawford County, Logan County, Montgomery County, Polk County, AR, and Le Flore and Sequoyah Counties, OK. From 2020 to 2050, the population in the ZOI is expected to increase from 591,418 to approximately 640,176. The distribution of the population among gender, as shown in Table 2-11 is approximately 49% male and 51% female in the ZOI. Population age 65 and older represented averaged 20.2 % of the total population within the ZOI or a total of 115,576 persons.

**Table 2-10. Population of the ZOI for Blue Mountain**

<b>Geographical Area</b>	<b>2010</b>	<b>2020</b>	<b>2021 Population Estimate</b>	<b>2050 Population Projection</b>	<b>65 years of Age and Older</b>
Arkansas	2,915,918	3,011,524	3,006,309	3,832,115	536,051
Oklahoma	3,751,351	3,959,353	3,958,136	4,376,036	649,334
Conway County, AR	21,273	20,715	20,687	23,482	4,164
Crawford County, AR	61,948	60,133	60,483	53,745	10,824
Franklin County, AR	18,125	17,097	17,159	18,751	3,454
Garland County, AR	96,024	100,180	99,694	108,554	25,145
Johnson County, AR	25,540	25,749	25,853	27,228	4,583
Logan County, AR	22,353	21,131	21,299	19,871	4,332
Montgomery County, AR	9,487	8,484	8,525	6,795	2,325
Perry County, AR	10,445	10,019	10,056	10,353	2,114
Polk County, AR	20,662	19,221	19,476	18,639	4,517
Pope County, AR	61,754	63,381	63,234	83,366	10,521
Scott County, AR	11,233	9,836	9,928	10,949	2,115
Sebastian County, AR	125,744	127,799	127,941	154,662	21,854
Yell County, AR	22,185	20,263	20,489	21,461	3,708
Le Flore County, OK	50,384	48,129	48,436	46,106	8,615



<b>Geographical Area</b>	<b>2010</b>	<b>2020</b>	<b>2021 Population Estimate</b>	<b>2050 Population Projection</b>	<b>65 years of Age and Older</b>
Sequoyah County, OK	42,391	39,281	39,652	36,214	7,306
<b>Zone of Influence Total</b>	<b>599,548</b>	<b>591,418</b>	<b>592,912</b>	<b>640,176</b>	<b>115,576</b>

Source: U.S. Census Bureau, 2010 and 2020 Decennial Census. U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021). 2050 Population Projections from Arkansas Economic Development Institute and Oklahoma Department of Commerce.

**Table 2-11. 2021 Percent of Population Estimate by Gender**

<b>Geographical Area</b>	<b>Male</b>	<b>Female</b>
Arkansas	1,483,520	1,522,789
Oklahoma	1,964,927	1,983,209
Conway County, AR	10,264	10,423
Crawford County, AR	29,880	30,603
Franklin County, AR	8,486	8,673
Garland County, AR	48,107	51,587
Johnson County, AR	12,872	12,981
Logan County, AR	10,492	10,807
Montgomery County, AR	4,305	4,220
Perry County, AR	5,110	4,946
Polk County, AR	9,534	9,942
Pope County, AR	31,348	31,886
Scott County, AR	5,302	4,626
Sebastian County, AR	62,886	65,055
Yell County, AR	10,426	10,063
Le Flore County, OK	24,311	24,125
Sequoyah County, OK	19,629	20,023
<b>Zone of Influence Total</b>	<b>292,952</b>	<b>299,960</b>

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

Population by Race and Hispanic Origin is displayed in Table 2-12. The zone of influence is approximately 73.5% white, 11.1% Hispanic or Latino, 4.9% Black, 3.6% American Indian and Alaska native, 0.9% Asian, <0.0% native Hawaiian-Pacific Islander, 0.1% some other race and 5.8% two or more races.

**Table 2-12. Population Estimate by Race/Hispanic Origin**

<b>Area</b>	<b>White</b>	<b>Hispanic or Latino</b>	<b>Black</b>	<b>American Indian and Alaska Native</b>	<b>Asian</b>	<b>Native Hawaiian and Other Pacific Islander</b>	<b>Some other race</b>	<b>Two or more races</b>
<b>Arkansas</b>	2,123,715	236,001	455,748	13,665	45,575	10,408	6,267	114,930
<b>Oklahoma</b>	2,533,380	443,914	278,454	285,097	87,388	6,155	9,148	304,600
<b>Conway County, AR</b>	16,774	871	2,119	85	125	-	-	713
<b>Crawford County, AR</b>	50,280	4,979	836	701	782	17	168	2,720
<b>Franklin County, AR</b>	15,400	589	136	65	142	-	-	827
<b>Garland County, AR</b>	80,861	5,982	8,213	702	692	80	32	3,132
<b>Johnson County, AR</b>	20,179	3,668	412	29	83	40	82	760
<b>Logan County, AR</b>	18,851	652	306	92	35	-	10	1,023
<b>Montgomery County, AR</b>	7,716	383	43	94	83	-	-	206
<b>Perry County, AR</b>	9,181	310	256	7	6	-	-	296
<b>Polk County, AR</b>	16,964	1,290	79	294	56	45	120	628
<b>Pope County, AR</b>	52,601	6,026	1,493	139	764	8	56	2,147

Area	White	Hispanic or Latino	Black	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races
Scott County, AR	8,319	794	291	34	76	-	-	414
Sebastian County, AR	8,712	18,931	7,723	1,107	564	-	105	6,699
Yell County, AR	15,210	4,274	342	59	228	-	-	376
Le Flore County, OK	33,833	3,560	861	5,421	380	-	39	4,342
Sequoyah County, OK	2,415	1,850	791	8,716	364	24	48	3,714
Zone of Influence	357,296	54,159	23,901	17,545	4,380	214	660	27,997

Source: U.S. Census Bureau, 2021 American Community Survey 5 Year (2017-2021)

### 2.14.2 Education and Employment

Table 2-13 displays the highest level of education attained by the population ages 25 and over. In the zone of influence, 5.1% of the population has less than a 9<sup>th</sup> grade education, and another 9.4% has between a 9<sup>th</sup> and 12<sup>th</sup> grade education; 35.2% has a high school diploma or equivalent, and another 22.5% has some college and no degree; 8.2% has an associate degree; 13.1% has a bachelor's degree, and 6.5% has a graduate or professional degree.

**Table 2-13. Highest Level of Educational Attainment, Population 25 Years of Age and Older**

Area	Population 25 years and over	Less than 9th grade	9th to 12th grade, no diploma	High school graduate (includes equivalency)	Some college, no degree	Associate degree	Bachelor's degree	Graduate or professional degree
Arkansas	2,021,290	93,191	155,530	688,732	437,893	154,675	313,527	177,742
Oklahoma	2,607,741	99,948	193,425	803,726	595,930	214,570	457,256	242,886
Conway County, AR	14,381	640	1,066	5,896	2,790	1,303	2,009	677
Crawford County, AR	40,859	1,802	4,359	13,947	9,198	3,761	5,541	2,251
Franklin County, AR	11,803	662	934	4,911	2,863	1,182	914	337
Garland County, AR	72,278	1,885	5,070	23,014	18,195	6,936	11,173	6,005
Johnson County, AR	16,953	1,552	1,825	6,929	3,143	788	1,751	965
Logan County, AR	15,100	579	1,274	6,704	3,432	1,203	1,260	648
Montgomery County, AR	6,421	318	712	2,111	1,729	566	701	284
Perry County, AR	7,090	245	372	3,076	1,727	429	893	348
Polk County, AR	13,607	505	1,064	5,178	3,646	1,102	1,322	790
Pope County, AR	40,886	2,344	4,098	13,836	8,388	2,718	6,480	3,022
Scott County, AR	6,921	536	851	2,827	1,436	514	562	195
Sebastian County, AR	85,679	5,282	7,932	25,325	20,426	6,155	13,072	7,487
Yell County, AR	13,905	1,249	1,886	5,240	2,739	838	1,372	581
Le Flore County, OK	32,447	1,736	3,385	13,027	6,218	3,113	3,420	1,548
Sequoyah County, OK	26,917	1,465	3,234	10,609	5,092	2,681	2,780	1,056
<b>Zone of Influence</b>	<b>405,247</b>	<b>20,800</b>	<b>38,062</b>	<b>142,630</b>	<b>91,022</b>	<b>33,289</b>	<b>53,250</b>	<b>26,194</b>

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

Employment by sector is presented in Table 2-14, showing that the largest percentage of the ZOI is employed in the educational services, and health care and social assistance sector at 22.4%, followed by manufacturing at 15.8%, and retail trade at 12.3%.

**Table 2-14. Annual Average Employment by Sector**

Employment Sector	Arkansas	Oklahoma	Conway County, AR	Crawford County, AR	Franklin County, AR	Garland County, AR	Johnson County, AR	Logan County, AR	Montgomery County, AR	Perry County, AR	Polk County, AR	Pope County, AR	Scott County, AR	Sebastian County, AR	Yell County, AR	Le Flore County, OK	Sequoyah County, OK	ZOI
Civilian employed population 16 years and over	1,310,863	1,786,742	9,044	24,572	6,824	41,466	10,535	9,118	3,119	3,782	7,466	26,903	4,192	58,021	9,120	18,436	15,177	247,775
Agriculture, forestry, fishing and hunting, and mining	33,858	75,146	663	385	334	572	391	540	304	215	505	560	302	1,150	616	1,346	468	8,351
Construction	93,603	127,323	731	1,727	565	3,668	690	374	286	599	554	1,559	213	3,874	587	1,392	1,210	18,029
Manufacturing	173,633	170,052	1,614	4,586	1,643	2,882	2,675	2,079	325	474	1,170	4,672	1,167	9,688	1,976	2,243	1,956	39,150
Wholesale trade	31,953	43,614	204	514	90	955	57	48	71	48	188	646	127	1,738	95	400	322	5,503
Retail trade	170,365	206,484	822	3,267	594	5,832	1,538	1,190	445	544	919	3,245	301	6,861	935	2,359	1,701	30,553
Transportation and warehousing, and utilities	78,705	100,374	506	1,724	556	1,054	616	519	199	190	442	2,137	205	4,144	619	1,406	817	15,134
Information	17,000	27,555	118	151	42	811	62	103	14	49	64	239	29	552	120	155	65	2,574
Finance and insurance, and real estate and rental and leasing	65,352	99,119	186	1,141	300	2,258	320	231	136	118	194	1,235	231	2,456	262	715	689	10,472
Professional, scientific, and management, and administrative and waste management services	101,903	158,036	778	1,862	249	4,004	340	518	245	282	354	1,860	329	5,291	642	926	1,027	18,707
Educational services, and health care and social assistance	319,672	407,799	2,132	5,278	1,494	9,403	2,107	2,230	665	730	1,837	6,370	805	12,552	1,703	4,399	3,873	55,578
Arts, entertainment, and recreation, and accommodation and food services	103,712	168,114	498	1,920	384	5,291	724	503	164	246	718	2,560	169	5,077	884	1,359	1,754	22,251
Other services, except public administration	62,683	92,997	306	1,362	184	2,970	612	437	145	98	299	1,151	149	2,507	399	809	502	11,930
Public administration	58,424	110,129	486	655	389	1,766	403	346	120	189	222	669	165	2,131	282	927	793	9,543

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

### 2.14.3 Households, Income and Poverty

Table 2-15 displays the number of households and average household sizes in the state and ZOI. There were approximately 231,718 households in the ZOI with an average household size of 2.53.

**Table 2-15. Households and Household Size**

<b>Geographic Area</b>	<b>Total Households</b>	<b>Average Household Size</b>
Arkansas	1,158,460	2.53
Oklahoma	1,503,868	2.56
Conway County, AR	8,460	2.43
Crawford County, AR	22,748	2.63
Franklin County, AR	6,718	2.51
Garland County, AR	41,919	2.34
Johnson County, AR	9,849	2.55
Logan County, AR	8,271	2.51
Montgomery County, AR	3,669	2.29
Perry County, AR	3,732	2.66
Polk County, AR	7,736	2.50
Pope County, AR	23,304	2.58
Scott County, AR	3,938	2.51
Sebastian County, AR	51,587	2.45
Yell County, AR	7,541	2.67
Le Flore County, OK	17,623	2.67
Sequoyah County, OK	14,623	2.69
<b>Zone of Influence</b>	<b>231,718</b>	<b>2.53</b>

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

The median household income in the ZOI ranged from \$40,628 in Johnson County, AR to \$68,605 in Scott County, AR displayed in Table 2-16. Per capita income in the ZOI was \$26,163, which is lower than the states of Arkansas and Oklahoma.

**Table 2-16. 2021 Median and Per Capita Income**

<b>Geographic Area</b>	<b>Median Household Income</b>	<b>Per Capita Income</b>
Arkansas	52,123	29,210
Oklahoma	56,956	30,976
Conway County, AR	45,812	27,435
Crawford County, AR	52,057	26,609
Franklin County, AR	42,128	22,391
Garland County, AR	49,985	29,214
Johnson County, AR	40,628	22,509
Logan County, AR	46,570	24,061
Montgomery County, AR	41,032	24,184
Perry County, AR	47,500	24,857
Polk County, AR	43,444	26,879
Pope County, AR	47,322	26,212
Pulaski County, AR	55,235	35,718
Saline County, AR	68,605	33,861
Scott County, AR	43,577	22,064
Sebastian County, AR	50,226	29,684
Yell County, AR	51,070	24,771
Le Flore County, OK	43,049	22,167
Sequoyah County, OK	43,496	22,158
<b>Zone of Influence Mean</b>	<b>47,749</b>	<b>26,163</b>

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year (2017-2021)

Table 2-17 displays the percentage of persons and families whose incomes fell below the poverty level in the year 2021. Within the ZOI, Le Flore County, OK had the greatest share of people with incomes below the poverty level at 17.0% followed by Polk County, AR at 16.6%, and Montgomery County, AR at 16.1%. In terms of all persons below the poverty level, Franklin County, AR had the greatest share of people with incomes below the poverty level at 22.8%, followed by Le Flore County, OK at 21.2%. The average poverty rate for the ZOI in the year 2021 was 18% compared to the United States that was 11.5%. The unemployment rate for the ZOI in 2021 averaged 5.8 % compared to the poverty rate of 4.3% for the United States.

**Table 2-17. Percent of Families and People Whose Income in the Prior 12 Month Period was Below the Poverty Level (2021)**

<b>Geographic Area</b>	<b>All Families</b>	<b>All People</b>
Arkansas	11.6	16.0
Oklahoma	11.0	15.2
Conway County, AR	13.3	18.9
Crawford County, AR	12.2	17.7
Franklin County, AR	14.7	22.8
Garland County, AR	10.9	16.2
Johnson County, AR	13.9	18.9
Logan County, AR	10.5	15.7
Montgomery County, AR	16.1	18.9
Perry County, AR	13.1	15.3
Polk County, AR	16.6	20.9
Pope County, AR	12.5	17.4
Scott County, AR	11.2	15.2
Sebastian County, AR	12.6	17.5
Yell County, AR	11.0	13.8
Le Flore County, OK	17.0	21.2
Sequoyah County, OK	14.4	19.4
<b>Zone of Influence Median</b>	<b>13.3</b>	<b>18.0</b>

Source: U.S. Census Bureau, 2021 American Community Survey 5-Year Estimates (2017-2021)



## 2.15 Recreation Facilities, Activities, and Needs

The Blue Mountain Lake Project serves as a staple recreational resource, not only for the local community, but also for the state of Arkansas. Many visitors, from both near and far, have fond memories of their childhood days camping on Blue Mountain Lake; some still carry on the tradition today by bringing their children or grandchildren. Many visitors have relatives that were members of the crews that constructed the dam. This continuation of tradition is what gives this lake value that cannot be expressed by monetary value. Blue Mountain Lake has been managed by USACE to preserve the natural beauty of the area, as well as utilize the land and natural resources to provide optimal recreational opportunities for visitors. Blue Mountain Lake offers numerous recreational opportunities such as camping, swimming, boating, canoeing, kayaking, picnicking, bird watching, fishing, and hunting. There are 15 recreation areas managed by USACE and one by the City of Magazine.

**Figure 2-11. Visitors Fishing Blue Mountain Lake**



Photo by USACE

The information and aspects of Blue Mountain Lake discussed in this section are standard in nature with intent to be used for planning, development, and management of Blue Mountain Lake; all while considering recent and relevant trends in recreation needs and activities as per the 2019-2023 Arkansas Statewide Comprehensive Outdoor Recreation Plan (SCORP). This information provides guidance for establishing quality and quantity of facilities capable of meeting the current and anticipated demand of visitors, as well as their expectations of such facilities; it also provides guidance for the operation, and maintenance of

project facilities. ADA guidelines will be included in any proposed design and improvements of current facilities.

### 2.15.1 Facility Information

The future improvement of parks and design of facilities should consider the following criteria: high-quality engineering, public safety, environmental sustainability, and promotion of the health, welfare, and aesthetic satisfaction of the public. The location of each facility should result in a compromise between conserving the natural resource and meeting the demands for providing public use. New facilities should only be placed on the most adaptable terrain, with consideration to preserving the majority of the natural features, in order to maintain the scenic significance for other visitors. Facility design and placement should consider minimizing grading and clearing for site preparation to safeguard existing environmental features.

### 2.15.2 Recreation Areas

Multiple parks and campgrounds, lake access points, boat ramps, and primitive camping areas exist on Blue Mountain Lake. Recreation area maps can be found in Appendix C. If adequate funding becomes available for park operation, recreation areas or portions of recreation areas will be brought up to current design standards and future development may occur as identified in the park descriptions below. However, these proposed improvements are not indicated on the park plates. See the Blue Mountain Lake Recreation Overview Map (**Figure 2-12**) for location of recreation areas.

**Table 2-18. Recreation Facilities at Blue Mountain Lake**

Facility	Number of Sites
Recreation Areas	16
Group Shelters	3
Camping Sites	112
Playgrounds	3
Swimming Areas	1
Boat Ramps	9

**The following areas are located within a High Density Recreation Land Classification and are USACE operated recreation areas:**

**Waveland Park-** Located just above Blue Mountain Dam, this park is approximately 160 acres with the Blue Mountain Lake bordering the North, West and South side of it. This park has one entrance which is off State Highway 309. This park has good tree cover with a mixture of hardwood and pine. Recreational facilities available include 51 campsites with water and electrical hookups. The campsites include four 30-amp sites, twelve 30-amp sites with canopies, thirty 50-amp sites (three of which are currently hardened sites) and five 50-amp sites with canopies. There are two combination restroom/showers. A playground is located on the west end of the park and a dump station located at the east entrance/exit of the park. Also, on the west end of the park overlooking the lake, there is a group picnic shelter and an amphitheater. There is a fish cleaning station used by both parks on the entrance road.

*Anticipated renovations, pending funding, at this park include road and parking lot paving, site hardening (concreting the living areas for accessibility), replacing restrooms, replacing the playground, relocating sites 45, 46, 47 and 51 out of the flood pool, improving access to sites 48, 49 and 50 as the approach angle is too steep for many campers, adding a high water ramp, and adding day use outside of the camping area. Other improvements would include replacing the main waterline that services the park, extending the length of campsites, upgrading some sites to 100-amp service, extending the campground by adding another loop, restoring and upgrading the amphitheater facilities, adding Wi-Fi service, and replacing the dump station. For other recreational opportunities, the following would be added: a new lifejacket loaner station, a beach shower, horseshoe pit and cornhole court areas, a fishing pier at the southwest ramp, and tent pads to sites.*

**Outlet Area Park-** Located below Blue Mountain Dam and bisected by the Petit Jean River, this park is approximately 113 acres. The park's left bank has 12 campsites and a shower house/restroom. Recreational facilities available include 38 campsites with water and electrical hookups. Two sites are regular 30-amp pull through sites, two are 30-amp pull through sites with canopies, eight are standard 30-amp sites with canopies, and two are 50-amp with canopies.

The park's right bank has 26 campsites, three of which are multifamily sites and a bathroom/ shower house. Nine of the sites are 30-amp, six are 30-amp with canopies and 11 are 50-amp with canopies. The dump station is located on the entrance road below the dam. Tower Heights area of the park includes the Opal James overlook and three primitive campsites.

*Anticipated renovations, pending funding, include: replacing the east restroom, replacing the playground on the Right Bank, adding a playground on the Left Bank, replacing the right bank restroom and possibly relocating it more centrally between the sites, replacing the waterlines on the Right Bank, replacing the existing old direct burial electrical wiring and upgrading it to all 50 amp, adding a volunteer site, hardening the walkway around Outlet Works for better drainage and to make the area ADA accessible, adding Wi-Fi service, adding a 4-6' walkway along the river bank, extending the length of the campsites, removing trees along the roadway to left and right banks to daylight the road, widening the road down to Left Bank, extending the campground on the Right Bank to add additional sites past the siren, adding a group shelter at Tower Heights, interpretive signs at the overlook, replacing the dump station and replacing the roof on the overlook shelter.*

**Hise Hill Park-** Located at the end of State Highway 217, just past the town of Sugar Grove. The park is 41 acres of mostly wooded area and is used for primitive camping with nine campsites, two picnic sites, and a portable toilet. There is a group shelter and two boat launches with a large parking lot.

*Anticipated improvements pending funding are removal of the group shelter as well as road improvements.*

**Ashley Creek Park-** Located at the end of Richie Road outside of the town of Blue Mountain off State Highway 10. Ashley Creek Park is a very wooded park of about 10 acres and is used as a water access point (one ramp) and for primitive camping. Facilities include 11 primitive campsites, a group shelter, and a portable toilet.

*Future improvements pending funding are removal of the group shelter as well as road and ramp improvements.*

**The following recreation area is located within a High Density Recreation Land Classification and is operated by the City of Magazine. Operational costs and capital improvements are the responsibility of the lessee.**

**Magazine Ball Park-** This 48-acre recreation area is located within the city limits of Magazine. It consists of four baseball/softball fields, six dugouts, and a building that contains the concession stand and restroom facilities.:

**The following areas are located within a Low Density Recreation Land Classification and are USACE operated. Only minimal development and infrastructure that supports passive recreational use should occur in these areas:**

**Lick Creek Access-** Located at the end of State Highway 309 off Hwy 10, consists of 18 acres, has a boat ramp, and is used for water access.

*Improvements awaiting funding are road and parking lot improvements.*

**Persimmon Point-** Located off Hog Thief Valley Road between Hwy 109 and Richie Road on the North side of the lake. This area is 17 acres and recreation features include primitive camping and a dirt ramp.

**Persimmon Point East-** Located off Hog Thief Valley Road between Hwy 109 and Richie Road on the North side of the lake. This area is two acres and recreation features include primitive camping and a dirt ramp.

**Persimmon Point West-** Located off Hog Thief Valley Road between Hwy 109 and Richie Road on the North side of the lake. This area is one acre and recreation features include primitive camping.

**Crow Creek-** Located off Hog Thief Valley Road between Hwy 109 and Richie Road on the North side of the lake. This area is four acres and recreation features include primitive camping.

**Lease Three-** Located on the south side of the lake 8.7 miles past Lick Creek Park off of South Lake Road. This area is three acres and recreation features include primitive camping.

**Twin Coves-** Located on the south side of the lake 8.7 miles past Lick Creek Park off of South Lake Road. This area is 21 acres and recreation features include primitive camping.

**Pecan Grove-** Located on the south side of the lake 8.7 miles past Lick Creek Park off of South Lake Road. This area is seven acres and recreation features include primitive camping.

**Big Island-** Located off the point of Waveland Park. This area is 7 acres and recreation features include primitive camping.

There are three areas that are classified as Low Density that are improved water access points only. Those are the 47-acre **Narrows Bend Access**, the three acre **Hall Access**, and the one acre **Third Bridge Access**.

*The only anticipated renovations for our Low-Density areas would be for access improvements. Providing road improvements and better access to our primitive camping and water access*

*locations would allow more people to use these areas and would allow easier response to these areas in the event of an emergency.*

**The following areas are located within a Low Density Recreation Land Classification and are potential future USACE operated access points. Only minimal development and infrastructure that supports passive recreational use should occur in these areas:**

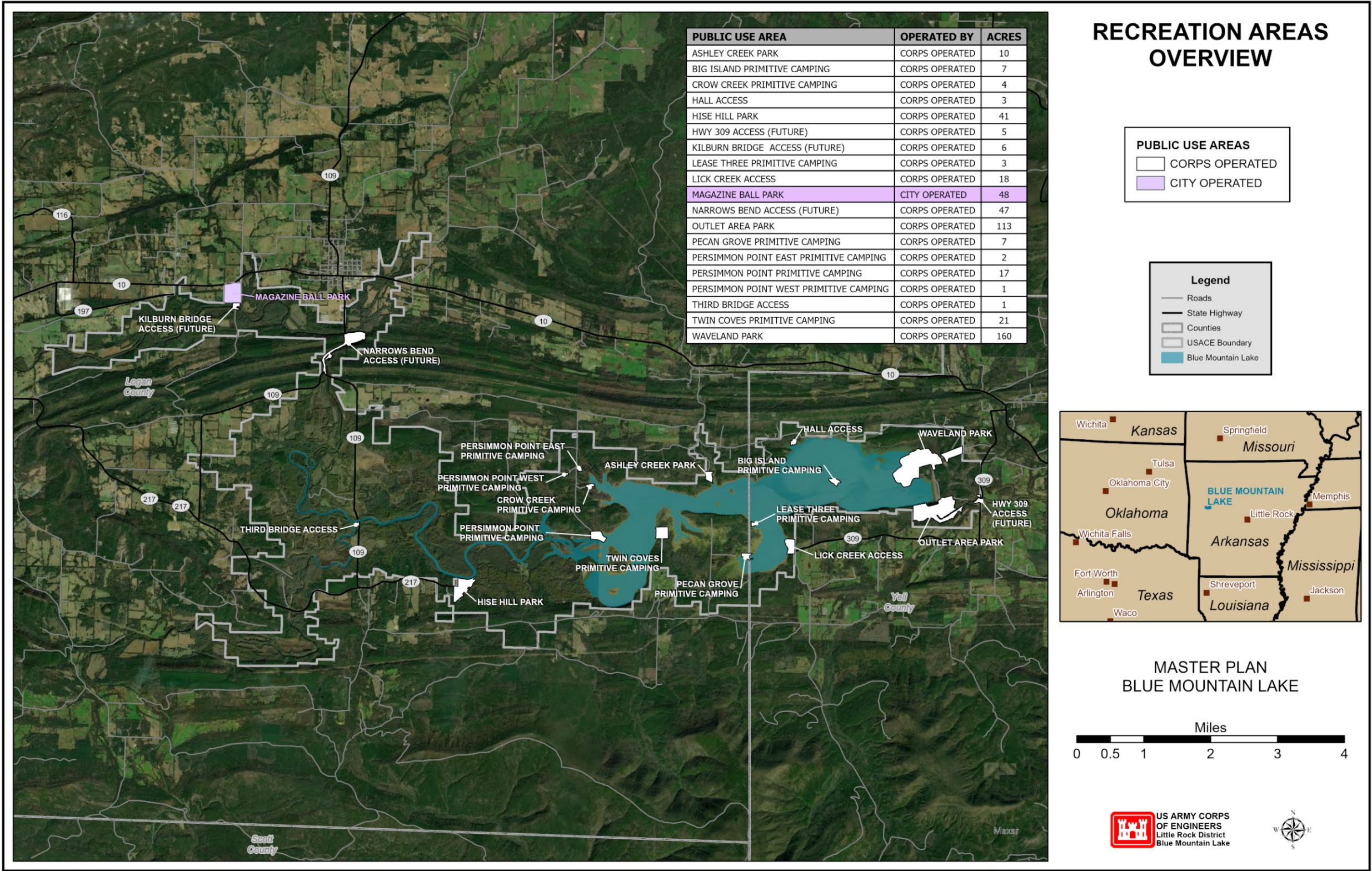
**Kilburn Bridge Future Access-** a six-acre area

**Highway 309 Future Access-** a five-acre area

*Future plans, pending funding, would include adding parking areas and access for recreation activities.*



Figure 2-12. Blue Mountain Lake Recreation Area Overview





### 2.15.3 Future Park Development Areas

There are currently no project land areas classified for future park development and none have 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, where road systems and park facilities have previously existed.

Engineering and Design Recreational Facility and Customer Service Standards can be referenced in EM 1110-1-400.

### 2.15.4 Visitation Profiles

Table 2-19 shows visitation trends as tabulated by Corps personnel and recorded in the USACE's nationwide Civil Works Business Intelligence (CWBI) 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 2-19. Project Visitation 2014-2023**

Project Visitation 2014-2023	
2014	129,833
2015	115,450
2016	130,543
2017	155,632
2018	128,630
2019	116,341
2020	154,588
2021	177,704
2022	154,951
2023	148,403

### 2.15.5 Recreation Analysis

The Statewide Comprehensive Outdoor Recreation Plan (SCORP) from 2019-2023 is an integral part of capturing the history and popular activities to enhance recreation opportunities in Arkansas. The SCORP ties together input 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.

#### 2.15.5.1 Arkansas SCORP Data (2019-2023)

Over the past 30 years the top 10 recreational activities that Arkansans prefer has not seen a substantial shift. Only two activities have occupied the top slot from year to year: walking or jogging for pleasure and exercise and driving for pleasure. Based upon recent SCORP data, walking/jogging, or hiking holds the top slot, with sightseeing by car taking second place. An increased interest in healthy lifestyles, mixed with the desires to see new places helps these two activities remain at the top.



**Table 2-20. Popular Outdoor Activities per SCORP**

<b>2019-2023</b>	<b>2009</b>	<b>1993</b>
Walking or Jogging	Jogging or walking	Driving for pleasure
Sightseeing by car	Driving for pleasure	Walking for Pleasure
Picnicking, BBQ, cook-out	Swimming	Picnicking
Visit lakes, rivers, etc.	Nature Viewing and Outdoor Photography	Fishing
Relax	Boating	Swimming
Family Gathering	Picnicking	Visiting Historical Sites
Swim/Wade in freshwater	Visiting Historical and Ecological Sites	Wildlife Observation
Swim/Wade in outdoor pool	Camping	Short Hikes
Fishing	Bicycling	Pleasure Boating
Farmers Market	Playing Tennis	Bicycling
Outdoor concert/live event		Camping/Developed Sites
Wildlife/bird/nature viewing		Basketball
Camping		Jogging/Running
Off-road vehicle		Baseball/Softball
Zoo, garden, arboretum		Photography
Yard games		Hunting
Playground		Other Outdoor Games
Day Hiking		ORV Driving
Motor Boating		Canoeing/Floating
Target Shooting		Camping/Undeveloped Sites
Hunting		
Nature Interpretive Center		
Paddling		
Arts outside		
Cycling		
Running		

Just as with walking and driving, other interests involve water, such as swimming, fishing, and boating. Some leisure time gatherings such as picnics or camping, also involve water or access to water. Oftentimes, people incorporate trails into their outdoor activities, more so for cycling, hiking, walking, jogging for pleasure, or for just simply viewing nature. For this reason, trails are an important asset in terms of planning for outdoor recreation. Park access, trails, and other facilities are primarily accessed by automobiles and roadways. With increasing interest in driving for pleasure and general access to most recreational sites by car, public roadways are a high priority to the overall function of recreational sites and facilities.

A copy of the entire Arkansas SCORP for 2019-2023 can be found at the Outdoors grants website.

## 2.15.6 Recreation Carrying Capacity

### Recreation Use Areas

**Table 2-21. Blue Mountain Lake Project Occupancy Percentage**

Blue Mountain Lake Project Occupancy Percentage				
Park Name	# of Sites	Fiscal Year 2023		
		# of Available Nights	Occupancy	Percent
Waveland Park	51	13,941	7,067	49.40%
Outlet Area Park	41	11,085	3,213	28.99%
<b>Total:</b>	<b>92</b>	<b>25,026</b>	<b>10,280</b>	<b>41.08%</b>

Table 2-21 lists the Occupancy percentages for parks that are operated by USACE. 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, the national average for USACE facilities for 2023 was at 36%.

## 2.16 Real Estate

### 2.16.1 Acquisition Policy

The Blue Mountain Dam and Reservoir Project was authorized by the Flood Control Act approved 28 June 1939, (Public Law No. 761, 75th Congress, 3d Session). The primary purpose of this project is flood control. 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.

### 2.16.2 Management and Disposal Policy

The Real Estate Management and Disposal program for Blue Mountain Lake is administered by the Little Rock District Real Estate Division in accordance with all applicable laws, regulations, and policies. All requests for real estate related actions must be received via a written request made to the Nimrod-Blue Mountain Operations Project Manager, who then makes a recommendation through the Little Rock District Chief of Operations to the Chief of Real Estate.

### 2.16.3 Explanation of Total Fee Acreage on Blue Mountain Lake

**Table 2-22. Acreage Differences**

Type of Acreage	GIS	Deeded Language	1975 Master Plan
Total Fee	17,263.2 acres	17,029.39	17,018 acres

Note: A small difference in acreage figures exists throughout this document due to the use of newer technologies, like LiDAR, to generate data. Because of this, USACE recommends that adjacent landowners obtain a survey prior to taking any action that might impact federal property rights. Where flowage or other easements belonging to the United States are located, adjacent landowners should reference the relevant deed language for specific locations and rights. Generally, adjacent landowners must contact USACE for approval prior to beginning any action that may impact federal property rights.

## 2.17 Pertinent Public Laws

### 2.17.1 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.

### 2.17.2 Recreation

The policies and public laws listed below address development and management of recreational facilities on public lands and are pertinent to the Blue Mountain Lake project:

- Flood Control Act of 1944, Public Law 78-534, (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.
- Flood Control Act of 1946, Public Law 79-526 (24 July 1966), amended the Flood Control Act of 1944 to include authority to grant leases to nonprofit organizations at recreational facilities in reservoir areas at reduced or nominal charges.
- Flood Control Act of 1954, Public Law 83-780 (3 September 1954), further amends the Flood Control Act of 1944 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.
- Flood Control Act of 1962, Public Law 87-874, (23 October 1962), broadened the authority under Flood Control Act of 1944 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.

- Land and Water Conservation Fund Act of 1965, Public Law 88-578 (1 September 1964), prescribes conditions under which USACE may charge for admission and use of its recreational areas.
- Federal Water Project Recreation Act of 1965, Public Law 89-72 (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.
- Architectural Barriers Act of 1968, Public Law 90-480 (12 August 1968), as amended, requires access for persons with disabilities to facilities designed, built, altered, or leased with Federal funds.
- Americans with Disabilities Act of 1990 (ADA), Public Law 101-336 (26 July 1990), as amended by the ADA Amendments Act of 2008 (Public Law 110-325), prohibits discrimination based on disabilities in, among others, the area of public accommodations and requires reasonable accommodation for persons with disabilities.
- Water Resources Development Act of 1992, Public Law 102-580 (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.
- Omnibus Budget Reconciliation Act—Day Use Fees, Public Law 103-66 (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.
- Omnibus Parks and Public Lands Management Act of 1996, Public Law 104-33 (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.

### 2.17.3 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 Blue Mountain Lake:

- Flood Control Act of 1938, Public Law 75-761, (28 June 1938), authorizes the construction of civil engineering projects such as dams, levees, dikes, and other flood risk management measures through the USACE.
- Flood Control Act of 1941, Public Law 77-228, (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.
- Flood Control Act of 1944, Public Law 78-534, (2 March 1945), 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.
- Rivers and Harbors Act of 1945, Public Law 79-14, (2 March 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.

- Flood Control Act of 1954, Public Law 83-780, (3 September 1954). Authorized and appropriated funds for flood protection projects along the Arkansas River.
- Water Supply Act of 1958, Public Law 85-500, (3 July 1958), authorizes USACE to include municipal and industrial water supply storage in multiple-purpose reservoir projects.
- Flood Control Act of 1960, Public Law 86-645, (14 July 1960). Authorized the construction, repair, and preservation of certain public works on rivers and harbors for navigation, flood control, and for other purposes.
- Federal Water Pollution Control Act Amendments of 1961, Public Law 87-88, (20 July 1961), requires Federal agencies to address the potential for pollution of interstate or navigable waters when planning a reservoir project.
- Flood Control Act of 1962, Public Law 87-874, (23 October 1962), Broadened the authority under PL 78-534 to include all water resource projects. Authorized and appropriated funds for Dardanelle Lock and Dam.
- Flood Control Act of 1962, Public Law 89-80, (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.
- Flood Control Act of 1965, Public Law 89-298, (27 October 1965). Authorized 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.
- Federal Water Pollution Control Act Amendments of 1972 (Clean Water Act), Public Law 92-500, (18 October 1972). Established 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.
- Clean Water Act of 1977, Public Law 95-217, (15 December 1977). Amended 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.
- Water Resource Development Act of 1986, Public Law 99-662, (17 November 1986). Established cost sharing formulas for the construction of harbors, inland waterway transportation, and flood risk management projects. The Water Resource Development Act of 2020 §110, required USACE to adopt procedures to include more consideration of environment and social goals and regional economic benefits during project planning and selection of the preferred alternative.
- Executive Order 12088 of the President, Federal Compliance with Pollution Control Standards (13 October 1978). This order directs the head of each Executive agency to ensure that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal facilities and activities under the control of the agency.

#### 2.17.4 Fish and Wildlife Resources

A number of public laws address protection and maintenance of fish and wildlife resources. The following are pertinent to Blue Mountain Lake:

- Fish and Wildlife Coordination Act, Public Law 79-732, (10 March 1934). Provides authority for making project lands available for management by interested State agencies for wildlife purposes.
- Fish and Wildlife Coordination Act, Public Law 85-624, (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, Public Law 89-77, (9 July 1965). 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.
- National Environmental Policy Act of 1969 (NEPA), Public Law 91-190, (1 January 1970). Established 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.
- Endangered Species Act of 1973, Public Law 93-205, (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.
- Endangered Species Act Amendments of 1978, Public Law 95-632, (10 November 1978). Specified 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.
- North American Wetland Conservation Act, Public Law 101-233, (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.
- Neo-tropical Migratory Bird Conservation Act, Public Law 106-147, (20 July 2000). Promotes the conservation of habitat for neo-tropical migratory birds.
- Bald and Golden Eagle Protection Act of 1940, Title 16 U.S. Code (U.S.C.) §§ 668, (8 June 1940). As amended, prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), including their nests or eggs.

### 2.17.5 Forest Resources

The following law pertains to management of forested lands and is pertinent to Blue Mountain Lake:

- Conservation of Forest Land Act of 1960, Public Law 86-717, (6 September 1960). 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 USACE projects. This law 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 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. 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."

### 2.17.6 Cultural Resources

Several public laws mandate protection of cultural resources on public lands. The following are pertinent to USACE project lands at Blue Mountain Lake:

- Antiquities Act of 1906, Public Law 59-209, (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.
- Historic Sites Act of 1935, Public Law 74-292, (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.
- Reservoir Salvage Act of 1960, Public Law 86-523, (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.
- National Historic Preservation Act of 1966 (NHPA), Public Law 89-665, (15 October 1966). Establishes a national policy of preserving, restoring, and maintaining cultural resources. It requires Federal agencies to consider the effect an action may have on sites that may be eligible for inclusion on the National Register of Historic Places.
- Archaeological and Historic Preservation Act of 1974, Public Law 93-291, (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.



- Archaeological Resources Protection Act of 1979, Public Law 96-95, (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.
- Native American Graves Protection and Repatriation Act, Public Law 101-601, (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.
- Executive Order 11593 of the President, Protection and Enhancement of Cultural Environment (13 May 1971). This Order sets out a policy for the Federal Government to provide leadership in preserving, restoring, and maintaining the historic and cultural environment of the Nation.

### 2.17.7 Leases, Easements, and Rights-of-Way

Several laws and regulations govern the granting of leases, easements, and rights-of-way on Federal lands. The following are pertinent to USACE project lands located at Blue Mountain Lake:

- U.S.C. Titles 10, 16, 30, 32, and 43 address easements and licenses for project lands.
- Impoundment or Diversion of Waters, 16 U.S.C. § 663, (10 March 1934). Wildlife resources management in accordance with the approved general plan.
- Leases: Non-excess Property of Military Departments and Defense Agencies, 10 U.S.C. § 2667, (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.
- Construction and Operation of Public Parks and Recreational Facilities in Water Resource Development Projects; Lease of Lands; Preference for Use; Penalty; Application of Section 3401 of Title 18; Citations and Arrests with and without Process; Limitations; Disposition of Receipts, 16 U.S.C. § 460d, (22 December 1944). Authorizes use of public lands for any public purpose, including fish and wildlife, if it is in the public interest.
- Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, (2 January 1971). Establishes a uniform policy for fair and equitable treatment of persons displaced because of Federal or Federally assisted programs.
- Federal Land Policy and Management Act of 1976, Public Law 94-579, (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.

### 2.17.8 Additional Laws and Regulations

The following is a list of additional pertinent laws regulating the use and enjoyment of public lands and water located at Blue Mountain Lake:

- 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.
- Land and Water Conservation Fund Act of 1965, Public Law 88-578, (3 September 1964). Prescribes conditions under which USACE may charge for admission and use of its recreational areas.
- Federal Water Project Recreation Act of 1965, Public Law 89-72, (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.
- Fee Collecting System, Public Law 93-303, (7 June 1974). This law provides for the collection of fees at family camping and group camping areas having various classes of facilities as follows:
  - Class A. Waterborne restrooms; potable water; showers (warm water); sanitary disposal station; campsites with table; fireplace (rock ring or grill); refuse containers; paved roads; designated tent or trailer spaces; visitor protection control; personal fee collection (honor system will not be used).
  - Class B. Vault restrooms; potable water; sanitary disposal station; campsites with table; fireplace (rock ring or grill); refuse container; access and circulation roads; designated tent or trailer spaces; visitor protection control; personal fee collection.
  - Class C. Pit or vault restrooms; potable water; campsites with table; fireplace (rock ring or grill); refuse containers; access and circulation roads; designated tent or trailer spaces; visitor protection control; personal fee collection.
  - Class D. Portable or pit restrooms; potable water; fireplace (rock ring or grill); refuse containers; access and circulation roads; designated tent or trailer spaces; visitor protection control; personal fee collection.
- Safe Drinking Water Act, Public Law 93-523, (16 December 1974). This act amends Public Health Service Act to assure that the public is provided with safe drinking water.
- Federal Environmental Pesticide Control Act of 1972, Public Law 92-516, (21 October 1972). This act revises the Federal Insecticide, Fungicide and Rodenticide Act. It provides for complete regulation of pesticides to include regulation, restrictions on use, actions within a single State, and strengthened enforcement.
- Architectural Barriers Act of 1968, Public Law 90-480, (12 August 1968). As amended, requires access for persons with disabilities to facilities designed, built, altered, or leased with Federal funds.
- Americans with Disabilities Act of 1990 (ADA), Public Law 101-336. 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.
- Omnibus Budget Reconciliation Act–Day Use Fees, Public Law 103-66, (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.

- Omnibus Parks and Public Lands Management Act of 1996, Public Law 104-333. 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.

### 3. Goals and Objectives

#### 3.1 The Blue Mountain Lake Master Plan Vision Statement

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

***“Deliver vital support to reduce risks from disasters, improve safe & efficient recreational opportunities, enhance natural resources, and maintain quality water for communities while taking care of people and seeking out partnerships.”***

#### 3.2 Policy and Master Plan Revision Schedule

Recreation and natural resource management policy and guidance are set forth in USACE 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 Master Plan is implemented in five phases: Phase 1, Initiate Master Plan Revision Process; Phase 2, Develop Draft Master Plan; Phase 3, Develop Final Master Plan; Phase 4, Receive Approval of Final Master Plan; and Phase 5, Implement Final Master Plan. For more information regarding details of each phase and project schedule, please reference the Nimrod Lake and Blue Mountain Lake Project Management Plan for the Master Plan revisions.

#### 3.3 Goals and Objectives

##### 3.3.1 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 Blue Mountain Lake Master Plan.

- GOAL A. Provide the best management practices to respond to regional needs, resource capabilities and suitability’s, 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.

### 3.3.2 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, Blue Mountain 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. The SCORP was 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 Blue Mountain Lake.

**Table 3-1. Resource Objectives, Blue Mountain Lake**

Recreational Objectives	Goals				
	A	B	C	D	E
Evaluate the demand for improved recreation facilities and increased public access on USACE-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, scenic overlooks, all types of trails, boat ramps, courtesy docks, interpretive signs/exhibits, and parking lots).	*		*	*	
Assess current public use levels (i.e., with focus on boating, camping, and day use trends) and evaluate impacts from overuse and crowding. Take action to prevent overuse, conflict, and public safety concerns.	*		*		*
Evaluate recreational activities (public and private use) for natural resource protection, quality recreational opportunities, and public safety concerns.	*	*	*	*	*
Follow the Environmental Operating Principles associated with recreational use of waterways for all water-based management activities and plans.		*	*		*
Increase and/or enhance accessible facilities on Blue Mountain Lake.	*		*		*
Evaluate the demand for commercial facilities on public lands and waters.	*		*	*	
Consider flood/conservation pool operations to address potential impact to recreational facilities (i.e., campsites) and hunting areas. Note that water level management is not within the scope of the Master Plan.	*	*	*	*	
Ensure consistency with USACE Recreation Strategic Plan.	*	*	*	*	*
Reference the Arkansas Statewide Comprehensive Outdoor Recreation Plan (SCORP) to ensure consistency in achieving recreation goals.	*		*		*

Natural Resource Management Objectives	Goals				
	A	B	C	D	E
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, water supply, etc. Note that water level management is not within the scope of the Master Plan.	*	*		*	

Natural Resource Management Objectives	Goals				
	A	B	C	D	E
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.	*	*		*	*
Consider watershed approach during decision-making process.	*	*		*	*
Optimize resources, labor, funds, and volunteers/partnerships for protection and restoration of fish and wildlife habitats.		*			*
Optimize resources, labor, funds, and partnerships for the management and prevention of invasive species in and around Blue Mountain Lake.		*			*
Minimize activities which disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	*
Continually evaluate erosion control and sedimentation issues at Blue Mountain Lake.	*	*			*
Manage project lands and water to support threatened and endangered species and their habitat.	*	*		*	*
Identify and protect unique or sensitive habitat areas.	*	*		*	*
Stop and prevent unauthorized activities and uses of public lands such as cultural resource looting, encroachments, trespass, timber trespass, unauthorized roadways, off-road vehicle (ORV) use, trash dumping, and placement of personal property that create negative environmental impacts.	*	*	*	*	*
Promote forest health through timber resource management actions to create diverse and sustainable forest habitat.	*	*		*	*
Evaluate and determine appropriate non-statutory mitigation for land use actions that result in adverse environmental impacts.	*	*			*

Environmental Compliance	Goals				
	A	B	C	D	E
Manage project lands and water to avoid negative effects to public water supply, ensuring public health and safety.	*	*	*	*	*



<b>Environmental Compliance</b>	<b>Goals</b>				
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
Consider both point and non-point sources of water pollution during decision making.	*	*		*	*
Continue coordination, communication, and cooperation between regulating agencies and non-governmental organizations to resolve and/or mitigate environmental problems.	*	*		*	*
Ensure compliance with Environmental Review Guide for Operations (ERGO) at all Blue Mountain Lake facilities and outgrants.	*	*			*
Ensure compliance with regulations prohibiting Privately Owned Domestic Sewer Systems on Federal lands.	*	*			

<b>Visitor Information, Education and Outreach Objectives</b>	<b>Goals</b>				
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>
Continue coordination and communication between agencies, special interest groups, and the general public.	*			*	*
Provide educational and outreach programs on the lake. Topics to include USACE missions, water quality, history, cultural resources, water safety, recreation, nature, and ecology.	*	*	*	*	*
Maintain a network among local, state, and federal agencies concerning the exchange of lake-related information for public education and management purposes.	*			*	*
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.	*	*	*		
Capture trends concerning incidents and accidents on public property and coordinate data collection with other public safety officials.	*		*		*
Promote USACE Water Safety message.	*		*	*	*
Educate adjacent landowners on policies regarding public land.	*	*	*	*	*

Visitor Information, Education and Outreach Objectives	Goals				
	A	B	C	D	E
Continue to educate the public on Blue Mountain Lake's Water Control Manual, along with other management and operation plans (i.e. Operation Management Plan, etc.).	*	*	*	*	*

Economic Impacts Objectives	Goals				
	A	B	C	D	E
Balance economic and environmental interests involving Blue Mountain Lake.	*	*	*	*	*
Evaluate the type and extent of additional development that is compatible with national USACE policy on both recreation and non-recreational outgrants that may be sustained on public lands.	*	*	*	*	*
Work with local communities to promote tourism and recreational use of the lake.	*	*	*	*	*

General Management Objectives	Goals				
	A	B	C	D	E
Maintain the public land boundary lines to ensure it is clearly marked and recognized in all areas.	*	*		*	
Evaluate and assess adequacy of public lands to achieve USACE missions.			*	*	*
Secure and adapt to sustainable funding for business line programs such as flood risk management, recreation, and environmental stewardship.	*	*	*	*	*
Ensure consistency with USACE Campaign Plan (national level), Implementation Plan (regional level), Operations Plan (District level).					*
Ensure consistency with Executive Order 13990, "Climate Crisis; Efforts to Protect Public Health and Restore Science."					*
Manage non-recreation outgrants, such as utility easements for the benefit of the public, in accordance with national guidance set forth in ER 1130-2-550.	*	*		*	*

Cultural Resources Management Objectives	Goals				
	A	B	C	D	E
Monitor and coordinate development and the evaluation of cultural resources with the Arkansas State Historic Preservation Office (SHPO) and federally recognized Tribes	*	*		*	*
Continue to inventory cultural resources on the project based on operations and maintenance needs in conjunction with planned improvements and funding mechanisms.	*	*		*	*
Create an HPMP and work to ensure an accurate accounting for all currently identified cultural resources within fee boundary obtaining accurate horizontal site boundary data and eligibility determinations with SHPO and tribal concurrence in accordance with Title 36 C.F.R. Part 800. In conjunction with significant input from the SHPO, relevant Native American Tribal Nations, and the USACE, provide in the HPMP a schedule of inventory and evaluation based on future Federal undertakings that will occur within fee boundary.	*	*		*	*
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 within the Blue Mountain Lake Project fee boundary.		*		*	*
Prevent unauthorized or illegal excavation and removal of cultural resources on project lands through the use of game cameras and with the help of volunteer historic preservation groups. Work with the State Historic Preservation Officer and local archeological and historical societies to develop a Site Steward Program for the significant cultural resources on project lands, with the District Archaeologist providing significant input into this program.		*		*	*
Utilize the Mandatory Center of Expertise for the Curation and Management of Archaeological Collections (MCX-CMAC) USACE St. Louis District's Veterans Curation Program in processing any past archaeological collections generated from cultural resource management within the Blue Mountain Lake Project management area.	*	*		*	*
Increase public awareness of the Blue Mountain Lake Project history.		*		*	*

## **4. Land Allocations, Land Classifications, Water Surface Classifications, and Project Easement Lands**

### **4.1 Introduction**

Blue Mountain Lake is a multipurpose project constructed primarily for flood control. The Project purpose of Blue Mountain Lake other than flood control is recreation. Management of recreational resources must not conflict with the regulation of the lake for the primary purpose for which it was authorized. Environmental stewardship of project lands and waters is an inherent responsibility for USACE and must be taken into consideration with all project management activities. The principal purpose of the Master Plan for Blue Mountain Lake is to balance public use and benefits with protection and conservation of natural and cultural resources. 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. This chapter defines, in general terms, each category of land allocation, land classification, water surface classification, and project easement lands that can be found at USACE water resource projects.

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. (Note: A small difference in acreage figures exists throughout this document due to the use of newer technologies, like LiDAR, to generate data. Because of this, USACE recommends that adjacent landowners obtain a survey prior to taking any action that might impact federal property rights. Where flowage or other easements belonging to the United States are located, adjacent landowners should reference the relevant deed language for specific locations and rights. Generally, adjacent landowners must contact USACE for approval prior to beginning any action that may impact federal property rights.).

Project land and water total 17,263 acres.

Land Allocation is a term used by USACE to describe the purpose for which lands at a project were acquired. The four possible allocations include: Operations, Recreation, Fish and Wildlife and Mitigation. At Blue Mountain Lake, all lands are allocated as Operations lands. No lands were specifically acquired for Recreation, Fish and Wildlife, or Mitigation. The four land allocations used by USACE are fully described below in the following paragraphs.

### **4.2 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 USACE projects:

- (1) Operations. These are the lands acquired for the congressionally authorized purpose of constructing and operating the project. All 17,263 acres of project lands at Blue Mountain Lake 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". No project lands at Blue Mountain Lake

are included in this allocation.

- (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”. No project lands at Blue Mountain Lake are included in this allocation.
- (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”. No project lands at Blue Mountain Lake are included in this allocation.

### 4.3 Land Classifications

USACE further divides land allocations through a system of land classification which designates the primary use for which project lands are managed. Project lands are classified for development and resource management consistent with authorized project purposes and the provisions of the National Environmental Policy Act (NEPA) and other Federal laws. Land classifications also consider recreational trends, regionally important natural resources, and cultural resources. The proposed land classifications at Blue Mountain Lake are depicted on the land classification maps in Appendix D and are described as follows:

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.

Proposed acreage: 201.8 acres

2. High Density Recreation. Lands developed for intensive recreational activities for the visiting public, including day use areas and/or campgrounds. These also include areas for commercial marina concessions, quasi-public development, and comprehensive resorts.

Proposed acreage: 403.5 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.

Proposed acreage: None

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 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. 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.

Proposed acreage: 690.1 acres

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.).

Proposed acreage: 4,087.8 acres

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

Proposed acreage: 8,729.5 acres

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

Proposed acreage: None

- (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.

Proposed acreage: None

6. 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.

Proposed acreage: 4.5 acres

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

Proposed acreage: None

- (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.

Proposed acreage: None

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

Proposed acreage: 3,146.1 acres

#### **4.4 Project Easement Lands**

Project easement lands are all lands for which the USACE 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 USACE as other lands.

1. Operations Easement. USACE retains rights to these lands necessary for project operations.

Current acreage: None

2. Flowage Easement. USACE retains the right to inundate these lands for project operations.

Current acreage: All affected parts and portions of the county roads within Yell and Logan Counties that are located within the boundary of the dam and reservoir areas are covered by flowage easement.

3. Conservation Easement. USACE retains rights to lands for aesthetic, recreation, and environmental benefits.

Current acreage: None



## 5. Resource Plan

The Resource Plan chapter describes in broad terms how project lands and water surface will be managed. For Blue Mountain Lake, the Management by Classification approach as set forth in EP 1130-2-550 was utilized.

A brief description of each alternative developed during the Master Plan revision process is presented for reference. A more detailed description is provided in the accompanying Environmental Assessment, Appendix A, to this document. All alternatives are compared against Alternative 1, the No Action (1975 Plan).

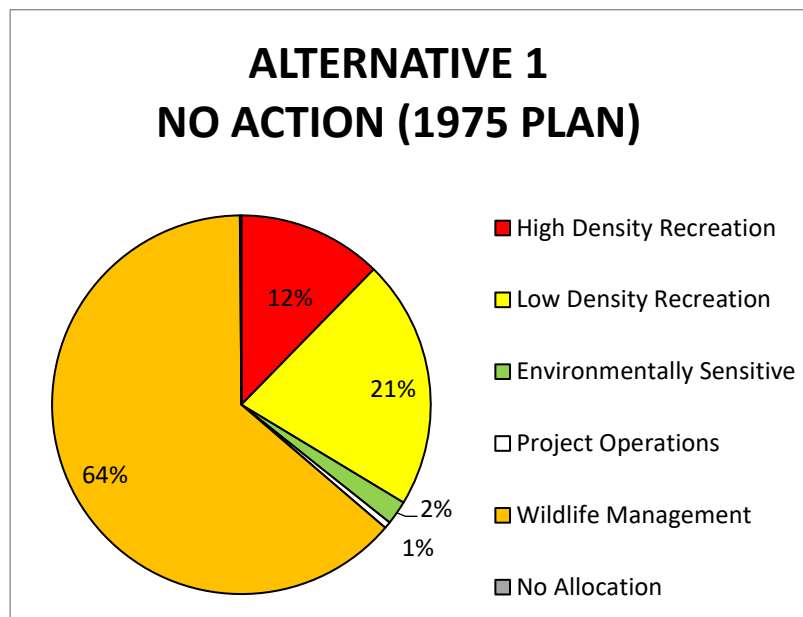
The Draft Master Plan contains land classifications proposed for Alternative 2, which is the USACE “Preferred” alternative. The accompanying final Environmental Assessment evaluated three alternatives: Alternative 1 - No Action (1975 Plan), Alternative 2 - Preferred, and Alternative 3 - Limited Development.

### 5.1 Alternatives Developed during the Master Plan Revision Process

#### 5.1.1 Alternative 1 NO ACTION (1975 PLAN)

- The No Action alternative is not favorable because:
  - 0.1% or 18 acres of Federal lands were not classified in the 1975 Plan.
  - This alternative does not recognize public comment or regional trends (recreation and resource management).
- The No Action alternative does not address resource management laws, policies, and regulations that were implemented after the 1975 Blue Mountain Lake Master Plan.

**Figure 5-1. Alternative 1, No Action (1975 Plan)**

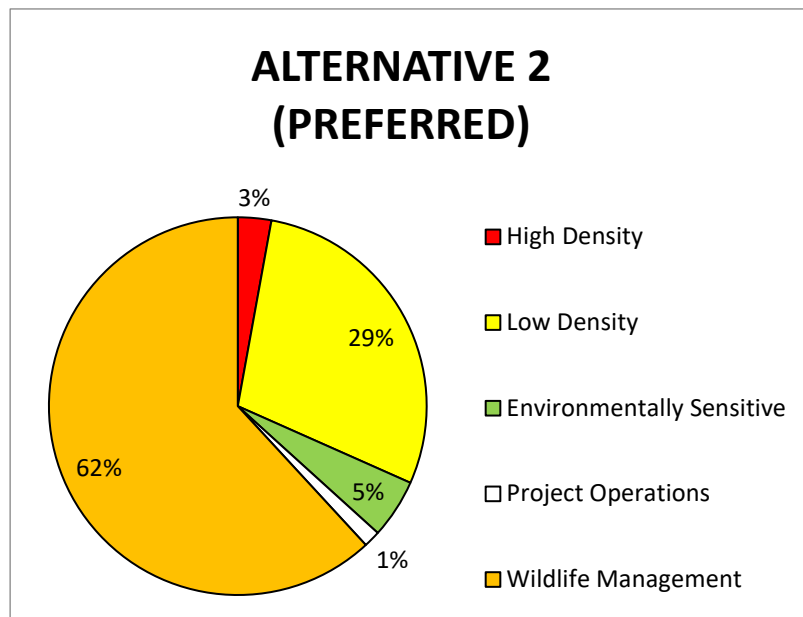


### 5.1.2 Alternative 2 (PREFERRED)

The Preferred alternative balances public preference for recreation opportunities expressed during the scoping comment period with regional natural resource management priorities (see Figure 5-2). This alternative is compared against Alternative 1, the No Action (1975 Plan). The Preferred alternative is selected because:

- Recognizes USACE historical management and reflects historical as well as present and projected management and usage of Federal lands.
- Portions of other classifications now Wildlife Management classification: Hise Hill Park, Lick Creek Park, Outlet Area Park, Quarry Bluff Park and Waveland Park. These public use areas from the 1975 MP have been partially reclassified from High Density or Low Density to Wildlife Management based on current land management practices and uses, including hunting, fishing, timber management, and habitat management.
- Increase acreage of Environmentally Sensitive Areas (ESA): Most islands, shoreline bluffs, and narrow bands of isolated land are reclassified as ESA to protect unique and environmentally sensitive areas. These ESA classified lands include many areas that are not easily accessible to the public to prevent outside disturbance and allow for more uninterrupted conservation.
- Most previously classified High Density areas are remaining High Density to some degree to allow for possible future park improvements and facility expansions.
- All primitive camping areas, access areas, and future access areas are classified as Low Density Recreation.

Figure 5-2. Alternative 2, Preferred

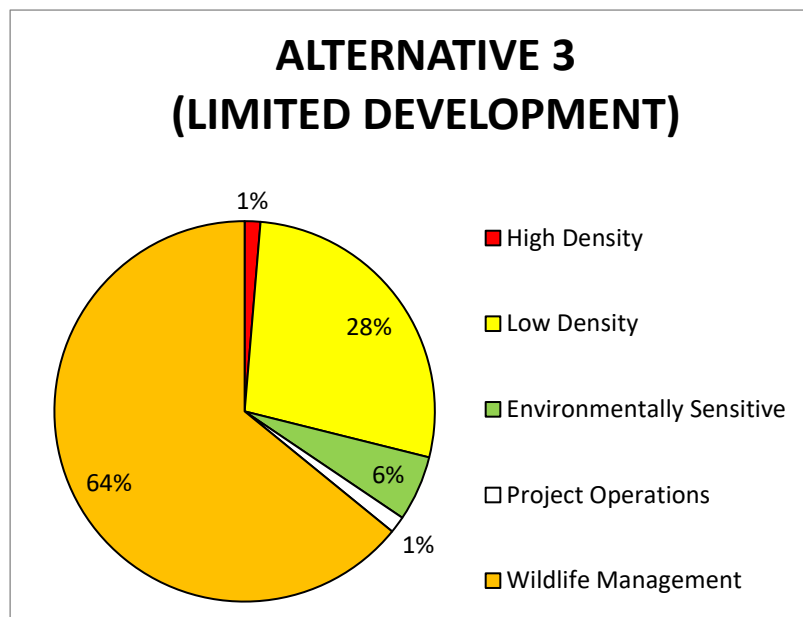


### 5.1.3 Alternative 3 LIMITED DEVELOPMENT

Alternative 3 seeks to limit future development of recreation areas to the greatest extent possible, maximizing wildlife management and ESA lands. In general terms, Alternative 3 increases Wildlife Management and ESA lands, converted from High and Low Density land classifications. This alternative is compared against Alternative 1, the No Action (1975 Plan). Alternative 3 is not a favorable alternative because:

- Converts most primitive camping areas and accesses designated as Low Density Recreation lands to Wildlife Management. This would eliminate primitive camping in these areas.
- Eliminates all future access areas and changes them to wildlife management.
- Reduces High Density Lands reserved in Alternative 2 for potential future development at Hise Hill, Outlet Park, and Waveland Park to Wildlife Management. This alternative restricts recreation areas from potential expansion.
- This alternative would not allow for balancing the use of local resources with conservation efforts.
- Does not take into consideration the public desire for improvement of existing park areas and increase in recreation opportunities as expressed in Scoping comments.

**Figure 5-3. Alternative 3 Limited Development**



## 5.2 Classifications and Justification

In the process of delineating land classifications, general assumptions were made which included that past classification lines, edges of outgrants, roads, USACE boundary monuments and corners, and terrain features such as drainage inlets and well-defined changes in vegetation such as tree lines were used as boundaries between classifications.

The previous land classifications (from the 1975 Master Plan), the feasibility of keeping or changing the land classifications with the Master Plan revision, and the potential future development needs around the lake were considered. All agency and public comments received during the public comment periods were considered during the revision process.

### 5.2.1 Project Operations

Project operations land classification includes those lands required for the dam, spillway, tunnel, offices, maintenance facilities, and other areas that are used solely for the operation of the project or lessees.

*Justification:* On Blue Mountain Lake, the lands classified as Project Operations have been classified by definition. Portions of Waveland Park and Outlet Park near Blue Mountain Dam and Field Office area were reclassified from High Density to Project Operations to include all related facilities and accesses and to include a protective buffer.

*Resource Objectives:* General Management

(Acreage = 201.8 acres or 1% of USACE land)

### 5.2.2 High Density Recreation

High density recreation land classification is for those lands intended to be developed or currently developed for intensive recreational activities for the visiting public including day use areas and/or campgrounds.

*Justification:* There were areas on Blue Mountain Lake with usage that was consistent with High Density Recreation but that was not classified according to its usage in the 1975 plan. The Arkansas Game and Fish Commission compound area at J. Perry Mikles SUA was reclassified to High Density from Wildlife Management to encompass recreational usage and existing facilities and structures (restrooms, sheds, campsites, etc.). The area at the entrance to Waveland Park which included the park gatehouse and park attendant and volunteer sites was reclassified from Project Operations to High Density.

From the 1975 Master Plan, High Density areas in Hise Hill Park, Lick Creek Park, Outlet Area Park, Quarry Bluff Park, and Waveland Park contain lands reclassified to Wildlife Management, Project Operations, and Low Density. These changes are in response to current and expected future land use.

*Resource Objectives:* Recreation, Economic Impacts, General Management

(Acreage = 403.5 or 3% of USACE land)

### 5.2.3 Mitigation

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

(Acreage = None)

### 5.2.4 Environmentally Sensitive Area (ESA)

Environmentally sensitive area 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; examples of actions that could be authorized are specific erosion control measures and removal of invasive species. Public right-of-ways in the ESA land classification will be considered on a case-by-case basis.

At Blue Mountain Lake, approximately 0.1% of ESA lands have permitted utility lines.

No agricultural, grazing, or mowing is permitted on these lands unless necessary for a specific resource management benefit. Invasive species management and prescribed fires are also permitted for specific resource management benefits.

*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 or habitat of threatened, endangered, and state species of concern at Blue Mountain Lake. The classification of ESA also considered locations of significant cultural or historic resource sites, as well as resource protection (i.e., prairie restoration areas, fragile habitats) 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.

Some areas of Wildlife Management and High Density were reclassified to ESA. Most islands, shoreline bluffs, and narrow bands of isolated land were reclassified as ESA to protect unique and environmentally sensitive areas. These ESA classified lands include many areas that are not easily accessible to the public to help prevent outside disturbance and allow for more uninterrupted conservation.

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

(Acreage = 690.1 or 5% of USACE land)

### 5.2.5 Multiple Resource Management

Multiple resource management land classification allows for the designation of a predominant 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 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 and must comply with the national USACE policy governing non-recreation outgrants.

#### **5.2.5.1 Low Density Recreation**

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, etc.).

*Justification:* All areas which allow primitive camping or are historic access/use areas were classified as Low Density. Ashley Creek Park was previously all classified as High Density. The north and south portions of the park were reclassified Low Density because there is no expected increase in development in these areas. All of Lick Creek Park was reclassified from High Density to Low Density due to the removal of most recreational structures. Portions of J. Perry Mikles SUA, previously classified as Wildlife Management, have been reclassified to Low Density due to the recreational activities and events that take place there.

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

(Acreage = 4,087.8 or 29% of USACE lands)

#### **5.2.5.2 Wildlife Management**

Wildlife management land classification is designated for stewardship of fish and wildlife resources.

*Justification:* On Blue Mountain Lake, areas classified as wildlife management lands consist of large tracts of land and shoreline areas where habitat improvement activities can be established to enhance the existing wildlife habitats. The areas classified contain sustainable habitat for native wildlife and will be managed for this purpose. The majority of these areas established are in locations that are accessible by road or water for the public. If these areas are developed as wildlife management in the future, hunting will be allowed, unless otherwise posted.

Blue Mountain Lake has large tracts of public land containing natural resources and wildlife. Throughout the 14,360-acre land base adjacent to Blue Mountain Lake, a variety of habitats occur including: closed canopy forest, glades, mature pine stands, agriculture fields, wildlife openings, alluvial flood plains, and riparian corridors. These diverse habitats require diversity of management actions to achieve habitat improvement for the benefit of wildlife and environmental sustainability. Viable habitats and healthy project lands require prudent management. Through classifying appropriate projects lands as Wildlife Management, they are protected from resource degradation and development while ensuring their continued health and sustainability by allowing quality management practices. The majority of lands classified as Wildlife Management are currently being managed for wildlife habitat. The AGFC has a license for wildlife management purposes for most of the total project acres. Much of the additional acres proposed for Wildlife Management have and continue to be managed by USACE personnel. Classifying 62% of the Blue Mountain Lake Project land base as wildlife management will align the land classification with how the land has historically been managed along with projected future management practice.

Specific areas reclassified to Wildlife Management include portions of Waveland Park, Outlet Area Park, Hise Hill Park, Lick Creek Park, and Quarry Bluff Future Park. These recreation areas from the 1975 MP have been partially reclassified from High Density based on current land management practices and uses including hunting, fishing, trapping, timber management, and habitat management.

*Resource Objectives:* Natural Resource Management, Recreation, Environmental Compliance

(Acreage = 8,729.5 or 62.0% of USACE lands)

#### **5.2.5.3 Vegetative Management**

Vegetation management land classification is designated for stewardship of forest, prairie, and other native vegetative cover.

The project has no land classified as Vegetative Management.

#### **5.2.5.4 Future or Inactive Recreation Areas**

Future or inactive recreation area 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 Future or Inactive Recreation Areas. 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.

#### **5.2.6 Water Surface Classification**

Waters classified for particular purposes when the project administers a surface water zoning program.

##### **5.2.6.1 Restricted**

Surface waters are restricted for project operations, safety, and security purposes.

*Justification:* Restricted water surface classification areas are restricted due to USACE policy for safety and security. These areas are located at the intake structure and outlet works, above and below the dam. In addition, it is generally understood that areas near designated swim beaches are considered ‘restricted’ for swimmer safety.

*Resource Objectives:* General Management

(Acreage = 4.5)

##### **5.2.6.2 Designated No Wake**

Designated no wake surface waters are established to protect environmentally sensitive shoreline or recreational water access areas from disturbance and for public safety.

Blue Mountain Lake has no water surface area in this classification category; however, it is generally understood (i.e., posted and/or buoyed) and in accordance with state laws that areas near designated boat ramps, bridges, and other supporting structures are considered ‘no wake’ for boater safety.



### **5.2.6.3 Fish and Wildlife Sanctuary**

Fish and wildlife sanctuary surface waters are where annual or seasonal restrictions to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and/or spawning are present.

Blue Mountain Lake has no water surface areas in this classification category.

### **5.2.6.4 Open Recreation Areas**

Open recreation water surface classification is for those waters available for year-round or seasonal water-based recreation use.

*Justification:* On Blue Mountain Lake all water surface acres are classified as open recreation, with the exception of those classified as restricted.

*Resource Objectives:* Recreation, Natural Resources Management, Economic Impact, General Management

(Acreage = 3,146.1)

## **5.2.7 Project Easements**

Project easements are for those lands for which the USACE 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 USACE as other lands.

### **5.2.7.1 Operations Easement**

USACE retains rights to these lands necessary for project operations (access, etc.). There are no operation easement lands on Blue Mountain Lake.

### **5.2.7.2 Flowage Easement**

USACE retains the right to inundate these lands for project operations.

*Justification:* The 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 provides 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 affected parts and portions of the county roads within Yell and Logan Counties that are located within the boundary of the dam and reservoir areas are covered by flowage easement.

### **5.2.7.3 Conservation Easement**

USACE retains the rights to lands for aesthetic, recreation, and environmental benefits. There are no conservation easement lands on Blue Mountain Lake.

## **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 Blue Mountain 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 Blue Mountain Lake Project Office. For simplicity, the topics are discussed below under generalized headings.

### **6.1 Petit Jean River Minimum Flows**

Petit Jean River Minimum Flows is described in detail in the Water Control Manual of 2001. In summary, it refers to a minimum continuous release for water supply and fish and wildlife purposes of five cubic feet per second (cfs). While Fish and Wildlife is not a specifically authorized project purpose, this minimum flow is maintained as long as possible to benefit downstream fisheries and wildlife without depleting the conservation pool. The five cfs was based on observed flow prior to construction of the dam. Releases may be reduced below five cfs during drought conditions, emergencies, or maintenance.

### **6.2 J. Perry Mikles Blue Mountain Lake Special Use Area (SUA)**

USACE has issued a real estate license to the AGFC for fish and wildlife activities on approximately 3,942 acres of the Blue Mountain Lake Project located in Logan County, Arkansas. This SUA is widely known as a world class bird dog field trial area that attracts sportsmen and visitors from around the United States and beyond. The area is primarily managed for field trials; however, the active management also creates abundant habitat for other small game and large game species, providing many other hunting opportunities for sportsmen and visitors to enjoy. While hosting national level bird dog field trials is primarily what has made this area so well known, it has also gained popularity recently for hosting beagle and coonhound field trials. The AGFC also manages and operates multiple facilities on the property to include an office, meeting and dining facilities, maintenance buildings, campsites, dog pens, horse barns and holding areas. During the bird dog field trials, all the dogs are handled and judged from horseback. There are also observation structures for visitors and spectators scattered across the trial area.

### **6.3 Periodic Drawdown and Seasonal Lake Levels for Fisheries Management**

Fish and Wildlife is not a specifically authorized project purpose. However, NEPA prioritizes USACE's involvement in stewardship of environmental impacts within the project area. Summarized below are examples of coordination activities which meet this goal. A minimum continuous release of five cfs to benefit downstream fisheries and wildlife is maintained as long as possible without depleting the conservation pool. This was the observed minimum flow at the dam site prior to construction.

The AGFC requests the ability to conduct a partial or full management drawdowns on Blue Mountain Lake when determined to be appropriate. The purpose of the drawdowns is to enable them to plant sorghum-sudan grass hybrids, or other comparable vegetation in the lakebed to improve the water quality, because Blue Mountain has a high degree of colloidal clay suspensions due to the soil. The drawdowns also improve fish habitat and spawns and benefit overall fisheries in the lake. At the same time, USACE may complete work that cannot be performed at normal pool elevations, i.e., boat ramp repair, swim beach improvements, permanent buoy anchoring and work on the dam itself that needs to be done when the lake level is down.

Reservoir regulation procedures were changed several years ago to enable holding the pool level at 387' msl from 15 March to 15 June, during the spawning period for fish. This of course is not possible during flooding events. Before this time, the drawdown from 387' msl to 384' msl began earlier in the spring which left fish eggs "high and dry".

## **6.4 Water Supply**

A water supply agreement is in place with the City of Danville, Arkansas, to utilize an undivided 6.2%, estimated to contain 1,550 acre-feet after adjustment for sediment deposits, of the usable conservation storage space in the Project below elevation 384' msl. Usable conservation storage space is estimated to contain 25,000 acre-feet after adjustment for sediment deposits. The storage space is to be used to impound water for present demand or need for municipal and industrial water supply. Currently the City of Danville withdraws water from the Petit Jean River at Danville to meet their water supply demands. USACE maintains releases through the provisions of the Blue Mountain Dam Water Control Manual in order to satisfy the needs of the required water supply.

## **6.5 Road Plan**

A road plan will be developed in the future to determine which roads located on the project will be open and which roads will be closed. This will apply to all vehicles. The development of this plan will consider what is best for the project and reducing potential impacts. Public input and other agency input will be obtained before decisions are made on the road plan.

## 7. Public and Agency Coordination

### 7.1 Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Blue Mountain 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 Blue Mountain 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 Blue Mountain 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 USACE management efforts and outputs up to a justified level of service.

Public involvement and extensive coordination within USACE and with other affected agencies and organizations is a critical feature required in developing or revising this Master Plan. In accordance with NEPA, ER 200-2-2, and ER/EP 1130-2-550, USACE initiated the environmental compliance and review process for the Blue Mountain Lake Master Plan revision. The following sections contain brief summaries of each phase of the public involvement and review process for the Blue Mountain Lake Master Plan revision.

### 7.2 Scoping

The process of determining the scope, focus, and content of a NEPA document is known as “scoping”. Scoping is a useful tool to obtain information from the public and governmental agencies. The Blue Mountain Lake and the Nimrod Lake Master Plans were completed concurrently. The Nimrod-Blue Mountain Master Plan Revision website was created to be the primary source of information during this time. Website information was provided through various sources, such as notification postcards, news releases, agency scoping letters, and media outreach. These sources invited individuals to visit the project website to find out more information about the Master Plan revision process and to solicit comments for scoping. As part of the initial phase of the NEPA process, a public scoping comment period was open for

45 days between March 16, 2023, and April 30, 2023, to gather agency and public comments on the Master Plan and issues that should be examined as part of the NEPA analysis.

In particular, the scoping process was used as an opportunity to get input from the public and agencies about the vision for the Master Plan update and the issues that the Master Plan should address. Participants were provided a comment card that asked for responses to specific questions in addition to providing general comments about the plans and the environmental review. The specific questions included:

- How would you like to see Blue Mountain Lake in 20 years?
- What changes, if any, would you like to see at the lake?
- What about Blue Mountain Lake is most important to you?
- What about Blue Mountain Lake is least important to you?
- Additional comments on the Master Plan revision or about issues that should be studied.

USACE published notice of the scoping workshops through an email notification, a direct mail postcard, press releases made available to several regional and local papers, flyers, a notice placed on Recreation 1 Stop (R1S) website, agency notification letters, and announcements on the Nimrod-Blue Mountain Lake Master Plan Webpage. The email notifications and postcard notices were sent to adjacent landowners, holders of fishing permits purchased in Arkansas whose listed zip code is within seven miles of Blue Mountain Lake, stakeholders, and those that reserved campsites at Blue Mountain Lake campgrounds during the 2022 recreational season. Flyers were posted on bulletin boards at campgrounds and recreational facilities around the lake.

The comment period was posted from March 16 to April 30, 2023. The comment period was announced on March 13, 2023, on the USACE webpage and through a news release.

Ten comment forms and letters were received during the comment period. A full breakdown of comments and analysis is available in the Scoping Report, which is Appendix A to the Environmental Assessment.

### **7.3 Draft Master Plan and Draft Environmental Assessment**

Scheduled to be completed in the Summer of 2024.

### **7.4 Final Blue Mountain Lake Master Plan and Environmental Assessment**

Scheduled to be completed in the Winter of 2024.

## **8. Summary of Recommendations**

### **8.1 Summary Overview**

The previous chapters of this Master Plan describe actions necessary to manage Blue Mountain Lake's current and future challenges. Actions set forth in this plan can ensure the future health and sustainability of Blue Mountain 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 Blue Mountain project consistent with the capabilities of the resource and public needs. The plan is also flexible, in that supplementations can be achieved through a 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 Master Plan for Blue Mountain Lake will guide the comprehensive management and development of all project recreational, natural, and cultural resources throughout the life of the water resource project.

### **8.2 Land Classifications**

As described in detail in Chapter 5, USACE strove to achieve balanced resource management in making the land classification decisions. The team took numerous factors and expressed public concerns into consideration when determining land classification for the Blue Mountain Lake Master Plan revision, which included but is not limited to: how lands were previously classified in 1975; what kind of development or non-development was taking place adjacent to USACE property; and what kinds of activities were taking place in those areas.

Table 8-1 and Table 8-2 provide overview information on what the land and water surface classifications were in the 1975 Master Plan and what the land and water surface Classification acreages are in the Preferred Alternative.

**Table 8-1. Land and Water Surface Classification Acreages**  
**Alternative 1-No Action (1975 Master Plan)**

Land Classification		Acres
Project Operations		80.7
High Density Recreation		1,738.4
Environmentally Sensitive Areas		288.9
Low Density Recreation		3,009.6
Wildlife Management		8,977.1
No Allocation		18.0
Total Land Acreage		14,112.6
Water Surface:		
Restricted		4.5
Designated No-wake		0
Fish and Wildlife Sanctuary		0
Open Recreation		3,150.1
Total Water Acreage		3,146.1
Note: Acreages are approximate and are based on GIS data. Totals vary depending on changes in lake levels, sedimentation, and shoreline erosion.		



**Table 8-2. Alternative 2-Preferred Land and Water Surface Classification Acreages**

Land Classification	Acres
Project Operations	201.8
High Density Recreation	403.5
Environmentally Sensitive Areas	690.1
Low Density Recreation	4,087.8
Wildlife Management	8,729.5
No Allocation	0
Total Land Acreage	14,112.6
Water Surface:	
Restricted	4.5
Designated No-wake	0
Fish and Wildlife Sanctuary	0
Open Recreation	3,146.1
Total Water Acreage	3,150.6
Note: Acreages are approximate and are based on GIS data. Totals vary depending on changes in lake levels, sedimentation, and shoreline erosion.	

### 8.3 Recommendation

This proposed 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 necessary 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 Blue Mountain Project land and water resources. Approval of the Master Plan is conveyed by the signing of Memorandum for Record and the Finding of No Significant Impact (FONSI) located within the Environmental Assessment (EA), Appendix A.

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## Appendix A NEPA Documents

## Appendix B Blue Mountain Lake Prior Design Memorandums and Supplements

<b><u>Supplement #</u></b>	<b><u>Date Submitted</u></b>	<b><u>Date Approved</u></b>	<b><u>Description</u></b>
Design Memorandum #1-C Supplement #1	21-Feb-85	20-Mar-85	Update park site plans to show existing recreational facilities and minor site plan revisions.
Design Memorandum #1-C Supplement #2	30-Jan-86	20-Mar-88	AGFC has requested 5,360 acres be added to an existing 4,500-acre lease. Project Operations: Recreation Low Density to Operations Wildlife Management Acreages increased from 8,143 acres to 9,860 as a result of this action.
Design Memorandum #1-C Supplement #3	29-Jan-87	12-Feb-87	Alter lake level manipulation plan for a period of 2 years at the request of the AGFC to enhance fisheries of the lake. Lake will be managed at lake elevation 384.0 msl for October 1-March 15 during the years 1986-1987 and 1987-1988.
Design Memorandum #1-C Supplement #4	3-May-88	25-May-88	Reallocate Approx. 750 acres of Recreation - Low Density land to Wildlife Management. AGFC requests this land be added to their license in accordance with the Fish and Wildlife Coordination Act of 1958.
Design Memorandum #1-C Supplement #5	12-Jun-89	17-Jul-89	Reallocate approximately 40 acres of Low Density Use to Recreation-Intensive Use. Logan County request to use land for 25 years for establishing a recreation facility.

## Appendix C Recreation Area Maps

## Appendix D Land Classification Maps