LITTLE RIVER WATERSHED MILLWOOD LAKE ARKANSAS

MASTER PLAN FOR DEVELOPMENT AND MANAGEMENT OF MILLWOOD LAKE

Draft: September 2021

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Preface

The original Master Plan for Millwood Lake was first approved in December 1964. Subsequent revisions were prepared with the latest revision being approved in 1974. The Millwood 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 and the type of facilities needed to service anticipated use, sensitive resources requiring protection, and a projection of future management requirements. Since the 1974 Master Plan revision, development of private lands surrounding the lake has created increased demands on the public lands and associated natural and cultural resources of Millwood Lake. 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 1964 Millwood Lake Master Plan, Design Memorandum 5B; and all subsequent Master Plan revisions and prior supplements can be found in Appendix B.

A draft environmental assessment (EA) and draft 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 end of the revision process.

U.S. Army Corps of Engineers
Commonly Used Acronyms and Abbreviations

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

GRR - General Reevaluation Report
GS – General Schedule
H&H - Hydrology and Hydraulics
HAC - Hydropower Analysis Center
HAZMAT - Hazardous Materials
HEC - Hydrologic Engineering Center
HEP - Habitat Evaluation Procedures
HES - Habitat Evaluation System
HHS - Health and Human Services
HQ - Headquarters
HQUSACE - Headquarters, U. S. Army Corps of Engineers
HTRW - Hazardous, Toxic, and Radioactive Wastes
HU - Habitat Unit
I - Investigations
IDIQ - Indefinite Delivery, Indefinite Quantity
IEPR - Independent External Peer Review
IG - Inspector General
IN - Inland Navigation
IPR - In-Progress Review
IRC - Issue Resolution Conference
ITR - Independent Technical Review (now ATR)
IWR - Institute for Water Resources
IWW - Inland Waterways
IWTF - Inland Waterway Trust Fund
L&D - Lock and Dam
LDA - Limited Development Area
LER - Lands, Easements, and Rights-of-Way
LERR - Lands, Easements, Rights-of-Way, and Relocations
LERRD - Lands, Easements, Rights-of-Way, Relocations, and Disposal
LOI - Letter of Intent
LPP - Locally Preferred Plan/ Local Protection Project
LRR - Limited Reevaluation Report
LTC - Lieutenant Colonel
M&I - Municipal and Industrial
MCX - Mandatory Center of Expertise
MFR - Memorandum for Record
MG - Major General
MHW - Mean High Water
MIPR - Military Interdepartmental Purchase Request
MLW - Mean Low Water
MOA - Memorandum of Agreement
MOU - Memorandum of Understanding
MR&T - Mississippi River and Tributaries
MRC - Mississippi River Commission
MSC - Major Subordinate Command
MSL - Mean Sea Level
NAS - National Academy of Sciences
NAV - Navigation
NDC - Navigation Data Center
NED - National Economic Development
NER - National Ecosystem Restoration
NEPA - National Environmental Policy Act
NFIP - National Flood Insurance Program
NGO - Nongovernmental Organization
NGVD - National Geodetic Vertical Datum
NHPA - National Historic Preservation Act
NLT - No Later Than
NOAA - National Oceanographic and Atmospheric Administration
NPS - National Park Service
NRHP - National Register of Historic Places
NTE - Not to Exceed
NTP - Notice to Proceed
O&M - Operations and Maintenance
OBE - Overcome by Events
OC - Office of Counsel
OMB - Office of Management and Budget
OMRR&R - Operations, Maintenance, Repair, Replacement and Rehabilitation
OWPR - Office of Water Project Review
P&D - Planning and Design
P&G - Principles and Guidelines
P&S - Principles and Standards/ Plans and Specifications
PA - Planning Associate/ Per Annum
PAB - Planning Advisory Board
PAC - Post-authorization Change
PACR - Post-authorization Change Report
PAS - Planning Assistance to States
PCoP - Planning Community of Practice
PCX - Planning Center of Expertise
PDT - Project Delivery Team
PE - Professional Engineer
PED - Pre-construction Engineering and Design
PGM - Project Guidance Memorandum
PGN - Planning Guidance Notebook
PL - Public Law
PM - Project Manager/Management
PMBP - Project Management Business Process
PMP - Project Management Plan
PMF - Probable Maximum Flood
POC - Point of Contact
POTUS - President of the United States
PPA - Project Partnership Agreement

PRB - Project Review Board
PTL - Planning Technical Lead
Q's & A's - Questions and Answers
QA/QC - Quality Assurance / Quality Control
R&D - Research and Development
R&H - River and Harbor
R&U - Risk and Uncertainty
RBRCR - Remaining Benefits, Remaining Costs Ratio
REC - Recreation
RED - Regional Economic Development
REP - Real Estate Plan
RIT - Regional Integration Team
RFP - Request for Proposal
RP - Review Plan/ Resource Provider
RMB - Regional Management Board
RMC - Risk Management Center
RMO - Review Management Organization/Resource Management Office
RMP - Risk Management Plan
ROD - Record of Decision
ROW - Right of Way
RR - Risk Register
RTS - Regional Technical Specialist
S&A - State and Agency/Supervision and Administration
S&I - Supervision and Inspection
SAR - Safety Assurance Review
SCORP - State Comprehensive Outdoor Recreation Plan
SCOTUS - Supreme Court of the United States
SCS - Soil Conservation Service
SEPWC - Senate Environment and Public Works Committee
SES - Senior Executive Service
SFO - Support for Others
SHPO - State Historic Preservation Office
SITREP - Situation Report
SMART - Specific Measurable Attainable Risk-Informed Timely
SME - Subject Matter Expert
SOP - Standard Operating Procedure
SOS - Scope of Services/Scope of Studies
SOW - Scope of Work
T&ES - Threatened and Endangered Species
T&I - Transportation and Infrastructure (House)
TBA - To be Announced
TBD - To be Determined
THPO - Tribal Historic Preservation Office
TMDL -Total Maximum Daily Load
TRC - Technical Review Conference
UDV - Unit Day Value
USACE - U. S. Army Corps of Engineers
USC - United States Code
USCG - United States Coast Guard
USEPA - United States Environmental Protection Agency
USFWS - United States Fish and Wildlife Service
USGS - United States Geological Survey
VE - Value Engineering
VT - Vertical Team
VTC - Video Teleconference
WMP - Watershed Management Plan
WQ - Water Quality
WRC - Water Resources Council
WRDA - Water Resources Development Act
WS - Water Supply

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Chapter 1. Introduction

a. Project Authorization

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

The Millwood Dam and Lake project was authorized for construction by the Flood Control Act approved 3 July 1958 (Public Law 85-500, 85th Congress, §. 3901) as a modification of Millwood Reservoir authorized by the Flood Control Act approved 24 July 1946 (Public Law 526, 79th Congress, Chapter 596, 2d Session, H.R. 6597).

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.

b. Project Purpose

Millwood 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 Little River Basin in Southwest Arkansas and Southeast Oklahoma. Additional purposes include Recreation, Water Supply, and Fish/Wildlife purposes to the extent that those additional purposes do not adversely affect flood control, or other authorized purposes of the project.

c. Purpose and Scope of Master Plan

Master Plans are developed and kept current for Civil Works projects operated and maintained by the Corps. 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 management plan. The Shoreline Management Plan specifically addresses the rules and policy associated with private facilities and activities such as mowing, along the Federal boundary line or placement of private floating facilities on the water surface. The Water Management Plan addresses how the water in the lake is managed for flood risk management, and water supply purposes.

d. Brief Watershed and Project Description

Millwood Lake is operated for flood control as a unit in the six-reservoir Little River Watershed System. This system includes the existing Pine Creek Lake formed by Little River; Broken Bow Lake formed by the Mountain Fork River; DeQueen Lake formed by the Rolling Fork River; Gillham Lake formed by the Cossatot River; and Dierks Lake formed by the Saline River. A seventh lake (Lukfata Lake), mentioned in the 1974 Master Plan, was authorized but never constructed. Lukfata Lake Project was deauthorized on April 16, 2002 under section 1001(B)(2) of the Water Resource Development Act (WRDA), as amended.

Millwood Dam is located on the Little River at river mile 16 and is located twelve miles east of Ashdown, Arkansas. Millwood Lake is centered at the junction of Little River, Hempstead, Howard, and Sevier counties in southwestern Arkansas.

Millwood Lake at conservation pool, elevation 259.2 MSL, is a wide shallow lake. The total water surface is about 27,125 acres. The shoreline is flat and marshy at most areas. The Little

River and its three main tributaries, the Cossatot, Saline, and Rolling Fork Rivers, comprise the main tributaries to Millwood Lake.

The total fee-owned area contained in the Millwood project, including both land and water surface, consists of 37,631 acres. In addition, 91,199 acres are in flowage easement (Note: A small difference in acreage figures exists throughout this document, due to the use of newer technologies, including LiDAR, to generate data. LiDAR is a snapshot of the conditions at the time the LiDAR was completed, and therefore, conditions may change slightly over time. Regardless of maps and information provided in this Master Plan, 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.

Construction of Millwood Dam and appurtenant works was initiated in September 1961. The dam was completed in August 1966. There are 16 public use areas around Millwood Lake. Twelve of these areas are presently operated by USACE. Three public use areas are currently operated by Little River County. Millwood State Park is leased to the State of Arkansas. A more detailed description of USACE parks follow in Chapter 2.

e. Listing of Prior Design Memorandum

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

f. Pertinent Project Information

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

The dam is an earth fill embankment with a total length, including concrete spillway, of 17,554 feet that has a maximum height of 88 feet above streambed. Highway 32 and Arkansas Southern Railroad are located across the top of the 54-foot-wide dam embankment. The embankment was constructed as a zoned earth fill embankment with a clay core and downstream chimney and horizontal graded filter drains. The spillway has a concrete stilling basin with two rows of baffle blocks, downstream of the Ogee weir. There are highway and railroad bridges, supported by spillway gate piers, which cross the spillway.

Millwood project includes the Okay Levee. Okay Levee was specifically designed to provide flood damage reduction to Ideal Cement Company which ceased operation in 1992. All buildings associated with the Ideal Cement Company were razed in 1993. This levee is constructed of a semi-compacted earth fill protected on the lakeside slope with soil cement and

stone protection. The levee is approximately 15,105 feet long with an average height of about 37 feet. More information about Okay Levee may be found in Chapter 6 under Special Topics. A pump station pumps interior drainage from the protected area into the lake. Millwood Lake is regulated as a unit in a multi-purpose system for the benefit of water resources in the Red River Basin. Millwood Dam's primary purposes are flood control and water supply.

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

DSAC I (Very High Urgency of Action) – Dams where progression toward failure is confirmed to be taking place under normal operations and the dam is almost certain to fail under normal operations within a time frame from immediately to within a few years without intervention, or the combination of life and/or economic consequences make probability of failure extremely high.
DSAC II (High Urgency of Action) – Dams where failure could begin during normal operations or be initiated as the consequence of an event. The likelihood of failure from one of these occurrences, prior to remediation, is too high to assure public safety, or the combination of life and/or economic consequences make probability of failure very high.
DSAC III (Moderate Urgency of Action) – Dams that have issues where the dam is significantly inadequate, or the combination of life, economic, and/or environmental consequences make the risks moderate to high.
DSAC IV (Low Urgency of Action) – Dams are inadequate but with low risk such that the combination of life, economic, and/or environmental consequences make a probability of failure low, although the dam may not meet all essential USACE engineering guidelines.
DSAC V (Normal) – Dams considered adequately safe, meeting all essential agency guidelines and the residual risk is considered tolerable.

A Screening Portfolio Risk Analysis (SPRA) was performed in May of 2008 during which failure modes for the dam and Okay Levee were considered. Various geotechnical failure modes, such as seepage and piping, were considered including embankment liquefaction and loss of the dam stilling basin walls. The probability of these failures leading to uncontrolled loss of pool is low. Combined with the very low population at risk and low life loss potential, the SPRA team assigned DSAC 4 (Low Urgency of Action) rating to the Millwood Lake dam and Okay Levee. .

Table 1-1 General Dam Information

PERTINENT DATA OF THE DAM AND LAKE	
General Information	
Authorized Purpose, Stream, State	Flood Risk Management and Water Supply, Little River,
Drainage area, square miles	4,114
Average annual rainfall over the drainage area, inches (1980-2018)	50.8
Dam	
Length in feet	17,554
Top of dam elevation, feet above mean sea level	301.0
Lake	
Nominal top of conservation pool Elevation, feet above mean sea level	259.2
Area, acres	27,125.4
Length of shoreline, miles (without islands)	135.9
Nominal top of flood-control pool Elevation, feet above mean sea level	287.0
Area, acres	91,198.5
Length of shoreline, miles	558.7
Five-Year frequency pool	
Elevation, feet above mean sea level (simulated 1938-2019)	262.6
Elevation, feet above mean sea level (simulated 1938-1990, observed 1990-1995)	258.9

Table 1-2 Proposed Plan Land Classifications

Classification	**Acres**
Project Operations	339.3
High Density Recreation	1,018.5
Environmentally Sensitive Areas	2,898.1
Multiple Resource Management Lands:	
Low Density Recreation	243.6
Wildlife Management	4,700
Vegetative Management	133.2
Water Surface:	
Restricted	76.3
Designated No-wake	0
Fish and Wildlife Sanctuary	0
Open Recreation	28,222.2
Total Acreage	**37,631.3**
Note: Acreages are approximate and are based on GIS data. Totals vary depending on changes in lake levels, sedimentation, and shoreline erosion.	

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

a. Description of Reservoir

At conservation pool, elevation 259.2, a wide, shallow lake is formed, with short arms extending up the Saline and Little Rivers. The total length of shoreline, excluding islands, is about 136 miles with 27,125 surface acres of water at normal pool. The forested land and swampy areas around the lake result in a diverse fisheries and wildlife habitat. The shoreline is flat and marshy at most areas on the lake but rises sharply out of the water along the east side near the dam and at White Cliffs on the east side of the Little River in the upper reaches of the lake. Water release from Millwood Lake flow down the Little River and courses in a southerly direction before its confluence with the Red River near Fulton, Arkansas.

Due to the flat nature of the landscape around the majority of Millwood Lake, USACE acquired flowage easement on 91,199 acres of private land surrounding the lake. The flowage easement areas are inundated during major flood events.

Primary recreational activities at Millwood Lake are camping, birdwatching, fishing, and hunting. Much of the Lake is shallow with stands of bald cypress in shallow areas, as well as around the edges of oxbow lakes that are accessible from Millwood Lake. This provides excellent habitat for gamefish and waterfowl. Millwood Lake is renowned for its crappie fishing and duck hunting. These resources attract sportsmen from across the Mid-south and from major metropolitan areas, as far away as Dallas, TX.

Figure 2-1 Millwood Dam

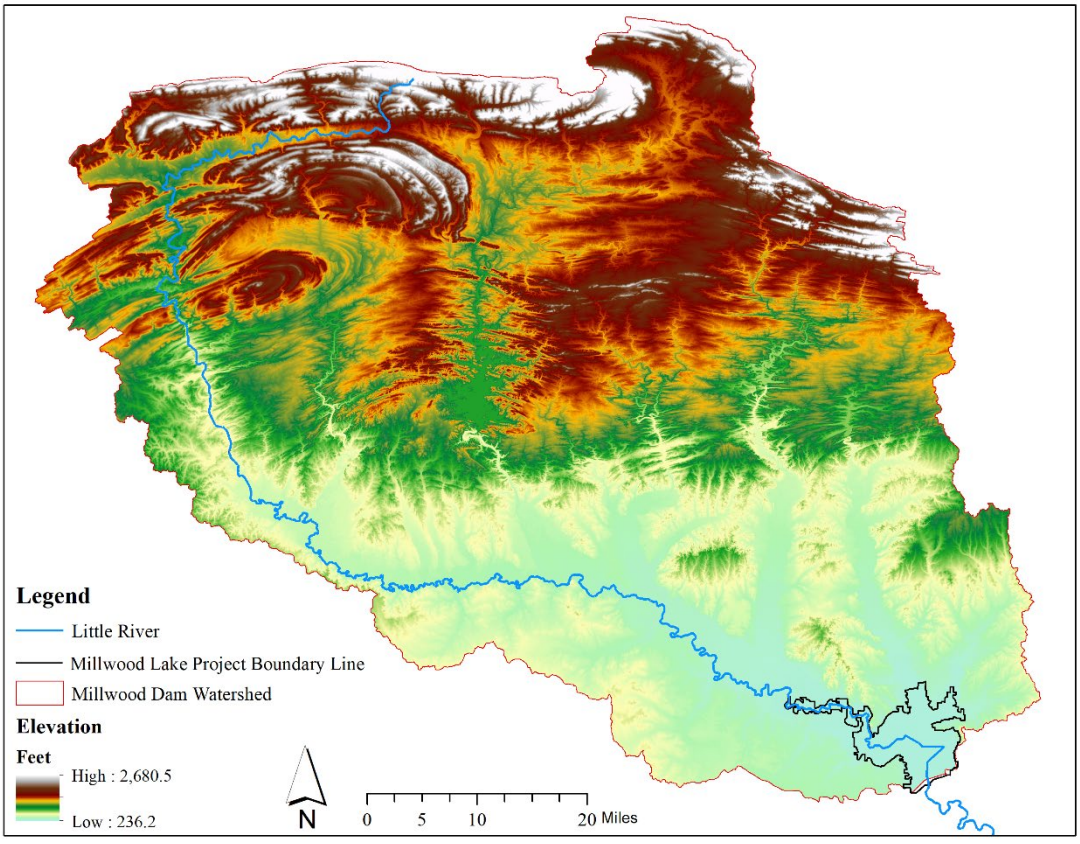
b. Hydrology and Groundwater

1. Surface Water

Millwood Lake is situated in the Western Gulf Coastal Plain physiographic province adjacent to the southern border of the Ouachita Mountain physiographic province. Originally characterized by dense forest cover and dotted with marshes and oxbow lakes, the wide valley where Millwood Lake lies rises sharply to the hills on the north and adjoins the Red River Valley to the south. It includes parts of three land resource areas, the bottomland area in the southwest, the coastal plain, and the blackland prairies.

The Little River Basin and its principal tributaries have their source in the Ouachita Mountains in southeastern Oklahoma and southwestern Arkansas and flows in a southeasterly direction to its confluence with the Red River near Fulton, Arkansas. The area upstream of Millwood Dam is approximately 4,120 square miles (Figure 2-2) with a maximum basin elevation of approximately 2,680 feet above msl, a minimum basin elevation of approximately 236 feet above msl, and an average basin elevation of approximately 733 feet above msl (Figure 2-2). The Little River drops, on average, approximately 8.6 feet per mile from the headwaters (elevation 1,863.5 feet above msl) to the lake inlet (elevation 262.5 feet above msl) (Figure 2-2). Five large tributaries join the Little River from the north and include Glover Creek, Mountain Fork River, Rolling Fork River, Cossatot River, and the Saline River.

Figure 2-2 Millwood Dam watershed and surrounding topography. Source: USACE



2. Groundwater

Millwood Lake is mostly located in alluvial deposits of the Red River, but also spans across the Cretaceous-aged Nacatoch Sand and Ozan Formations. Both formations comprise the Nacatoch and Ozan aquifers, respectively. Each aquifer is located within the Coastal Plain aquifer system and the primary uses of the groundwater are for domestic and public supply (Kresse et al, 2014). The Red River alluvial aquifer is an important source of groundwater in southern Arkansas with numerous high well yields reported because of their hydraulic interconnection with the rivers and streams that cross them (Renken, 1998; Kresse et al, 2014).

The Red River alluvial aquifer is a stream-valley alluvial aquifer that consists of terraced alluvial deposits of Pleistocene age and flood plain alluvial deposits of Holocene age (Renken, 1998). This aquifer is characterized by a lower sand and gravel unit that was deposited by lateral fluvial accretion (Renken, 1998). Most of the aquifer is thin, usually not exceeding 100 feet in thickness and water levels within the aquifer are usually within a few feet of land surface but are as much as 25 feet below the land surface in some places (Renken, 1998). Well yields completed in the Red River alluvial aquifer generally range from 200 to 1,700 gallons per minute (Kresse et al, 2014) with some wells reported to yield as much as 2,800 gallons per minute (Renken, 1998).

The Ozan aquifer is of limited extent and most wells completed in the Ozan aquifer are used for domestic water supply (Kresse et al, 2014). Aquifer yields are limited, the water is highly mineralized, and most wells completed in the Ozan aquifer occur predominantly in the outcrop area (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.

c. Sedimentation and Shoreline Erosion

Throughout the lifespan of the project, silt and sediment has accumulated in Millwood Lake. Most of the sediments entering Millwood Lake come from the inflow of the Little 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 Millwood Lake. However, in collaboration with the USGS, the USACE conducted the first bathymetric survey for Millwood lake in March 2013, in conjunction with a sediment thickness probing survey in June 2013, at Millwood Lake (Richards and Green, 2013).

The findings of this survey showed that mean sediment thickness was the greatest from the center of the lake towards the dam and is likely because of resuspension of sediment from other shallower parts of the lake and subsequent deposition in the deeper and probably calmer water in

the center of the lake (Richards and Green, 2013). In the western part of the lake, sediment thickness also was greater than other parts of the lake, and the increased thickness likely is because of its proximity to the inflow of the Little River (Richards and Green, 2013). On average, approximately 1,850 acre-ft of sediment was deposited in the lake each year since inundation. This has resulted in an average sediment thickness, across the entire lake, of 3.3 feet (Richards and Green, 2013). Given the estimated volume of sediment in the lake, the loss of capacity during the last 49 years ranges between about 32 and 44 percent, which is about 0.7 to 0.9 percent per year (Richards and Green, 2013).

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

d. Water Quality

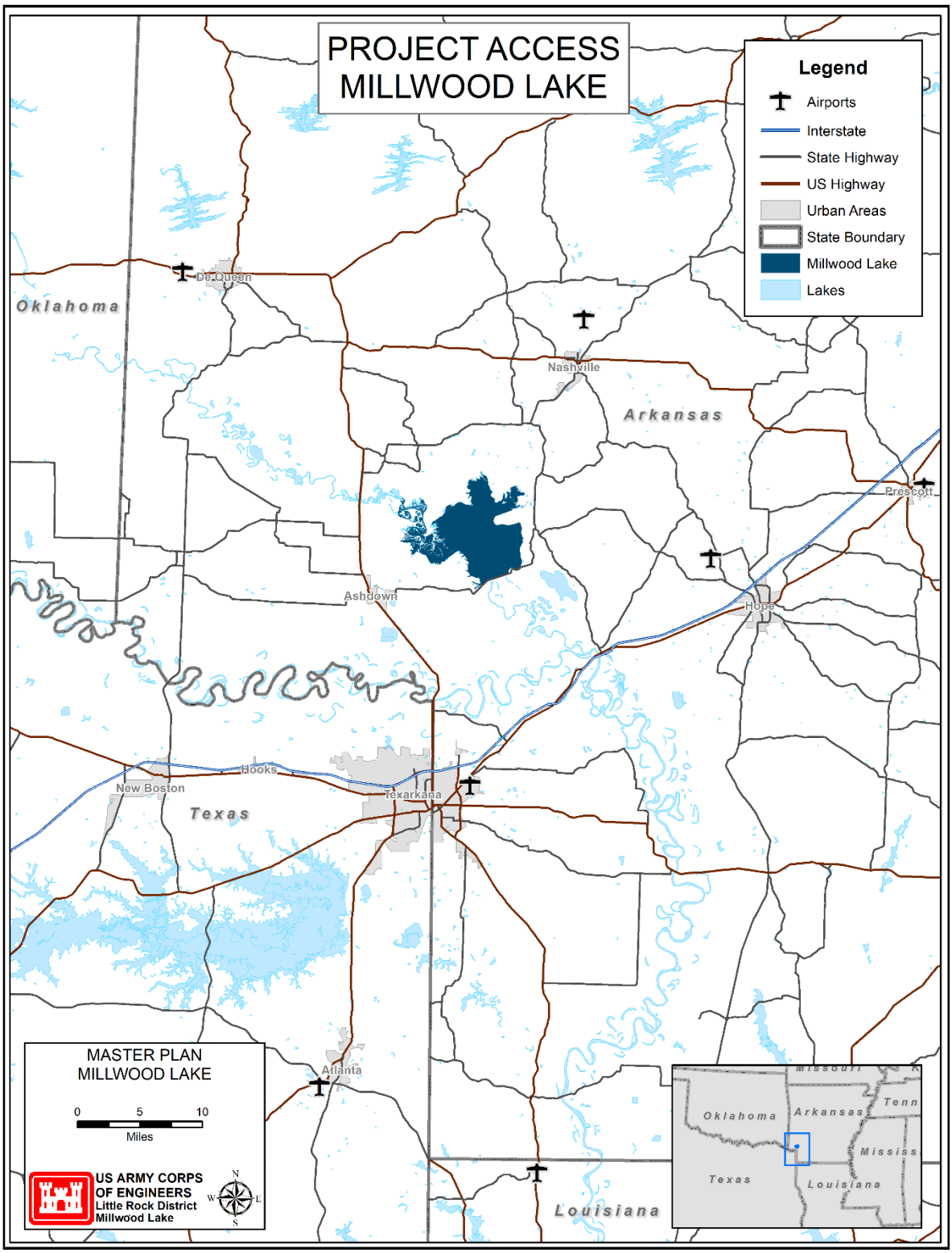
Overall surface water quality in the Millwood Lake area is good and the lake has been designated as suitable for primary and secondary contact recreation, municipal, industrial, and agricultural water supply by the Arkansas Department of Energy and Environment (ADEE). The waters of the Arkansas portion of the Little River watershed have all been designated by the ADEE for fisheries, primary and secondary contact recreation, and domestic, agricultural, and industrial water supplies (ADEE, 2012). Millwood Lake is classified by ADEE as a Type E water body, which includes most larger lowland lakes of generally 1,000 to 30,000 acres in size, located in the Delta, South Central Plains, and Arkansas River Valley ecoregions. Average depth in Type E lakes is usually less than 10 feet. The watersheds of Type E lakes contain a mixture of row crop agriculture, confined animal operations, pastureland, and some forestlands.

The Environmental Quality Branch of ADEE has been conducting quarterly water chemistry profiles on Millwood Lake at two locations, one in the upper lake and one near the dam, since 2011. In addition to the chemical analyses, field data, including dissolved oxygen, temperature, and pH were collected. The data indicates the nature of the watershed by reflecting elevated turbidity and chlorophyll A at certain times during each year. Sedimentation and nutrient influx from the feeder streams are major issues for water quality in the lake. Turbid water absorbs more sunlight, which elevates water temperatures, and excess nutrients promote algae and aquatic vegetation growth.

e. Project Access

The lake is surrounded by US, State, and county roads, making access possible at many points in any given area of the lake. Further highway and airport access can be referenced in Figure 2-3 Millwood Lake Project Access.

Figure 2-3 Millwood Lake Project Access



f. Climate

The climate in the Millwood Lake area is classified as humid subtropical according to the Köppen climate model. A humid subtropical climate is characterized by hot, usually humid summers and mild to cool winters. The Köppen definition of this climate is for the coldest month's mean temperature to be between 26.6 °F (−3 °C) and 64.4 °F (18 °C), and the warmest month to be above 71.6 °F (22 °C). Some climatologists prefer to use 32 °F (0 °C) as the lower bound for the coldest month's mean temperature. Under the modern Trewartha climate classification, climates are termed Humid Subtropical when they have mean temperatures of 50 °F (10 °C) for eight or more months a year. In most locations classed within this system, the mean temperature of the coldest month is between 35 °F (3 °C) and 65 °F (18 °C). Some climatologists consider the Trewartha grouping of subtropical climates to be more real-world and fitting on a global scale.

While technically classified as humid subtropical, the climate in the Millwood Lake area is considered moderate with summer extremes lasting for longer periods throughout southwest Arkansas, and winter temperatures are typically mild. Average temperatures range between extreme lows around 22°F in the winter months to highs above 100°F during the summer. Extreme temperatures may occur for short periods of time, at any location within the watershed. Heavy rainfall events are common. Average annual rainfall over the watershed varies from 50 to 52 inches. Monthly rainfall varies from 3.5 inches in the summer months to 4 to 5 inches in the winter and spring. Snowfall each year averages less than an inch during the winter.

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. The U.S. Global Change Research Program (USGCRP) summarized information regarding climate change and its potential effects in regional assessments. In the Midwest, which extends from Minnesota to Missouri, extreme events such as heat waves, droughts and heavy rainfall events are projected to occur more frequently. Should these events become significant enough to impact the operation of Millwood Lake, the Master Plan and associated documents (i.e., Operations Management Plan and Shoreline Management Plan) would be reviewed and revised, if necessary.

g. Topography, Geology, and Soils

1. General Geology and Topography

The topography in the upper northern watershed of Millwood Lake includes steep inclines typical of the Ouachita Mountains. This portion of the watershed has a rugged topography, with average relief of several hundred feet and some areas that exceed 1,700 feet in elevation. The southern portion of the watershed around Millwood Lake lies within The Gulf Coastal Plain physiographic area, which is an area of low relief, seldom exceeding 100 feet in elevation, and consists of gently rolling to hilly terrain.

2. Site Geology

The Ouachita Mountain Geologic Province is underlain mainly by Paleozoic sedimentary rocks composed mainly of shale, chert, sandstone, conglomerates, novaculite and volcanic tuff. The Stanley Shale is the most widespread formation in the Ouachita Mountains, the oldest forms occur in the northern portion of the province, and consist of Ordovician Polk Creek Shale, Silurian Missouri Mountain Shale, and Blaylock Sandstone. The Devonian Arkansas Novaculite is also exposed in this area of the watershed. In the southern Ouachita Mountains, the Jackfork Sandstone occurs, primarily in major mountain ridges. The geology of the Gulf Coastal Plain in the lower watershed generally consists of unconsolidated to semi-consolidated deposits of Cretaceous age sand, clay, marl, and gravel overlain by Quaternary terrace and alluvial deposits. Surface materials are generally unconsolidated top semi-consolidated sand and clay.

3. Soils

The major soil groups in the Ouachita Mountains portion of the Millwood Lake watershed are Carnasaw-Clebit-Sherless and Yanush-Avant-Bigfork. These soils are deep and tend to be gravelly and/or stony. The major soil groups of the Gulf Coastal Plain in the southern watershed include clays, silt loams and fine sandy silt loams. These soils are usually very deep. Alluvial soils occur in the floodplains along the Little River, and the other major tributaries, including the Rolling Fork, lower Cossatot, Saline River and Mine Creek. Major soil groups associated with blackland prairies are also present in the lower watershed.

Soil surveys as published by the Natural Resources Conservation Service (NRCS) are available for all the counties located in the Millwood 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 Millwood Lake and surrounding area.

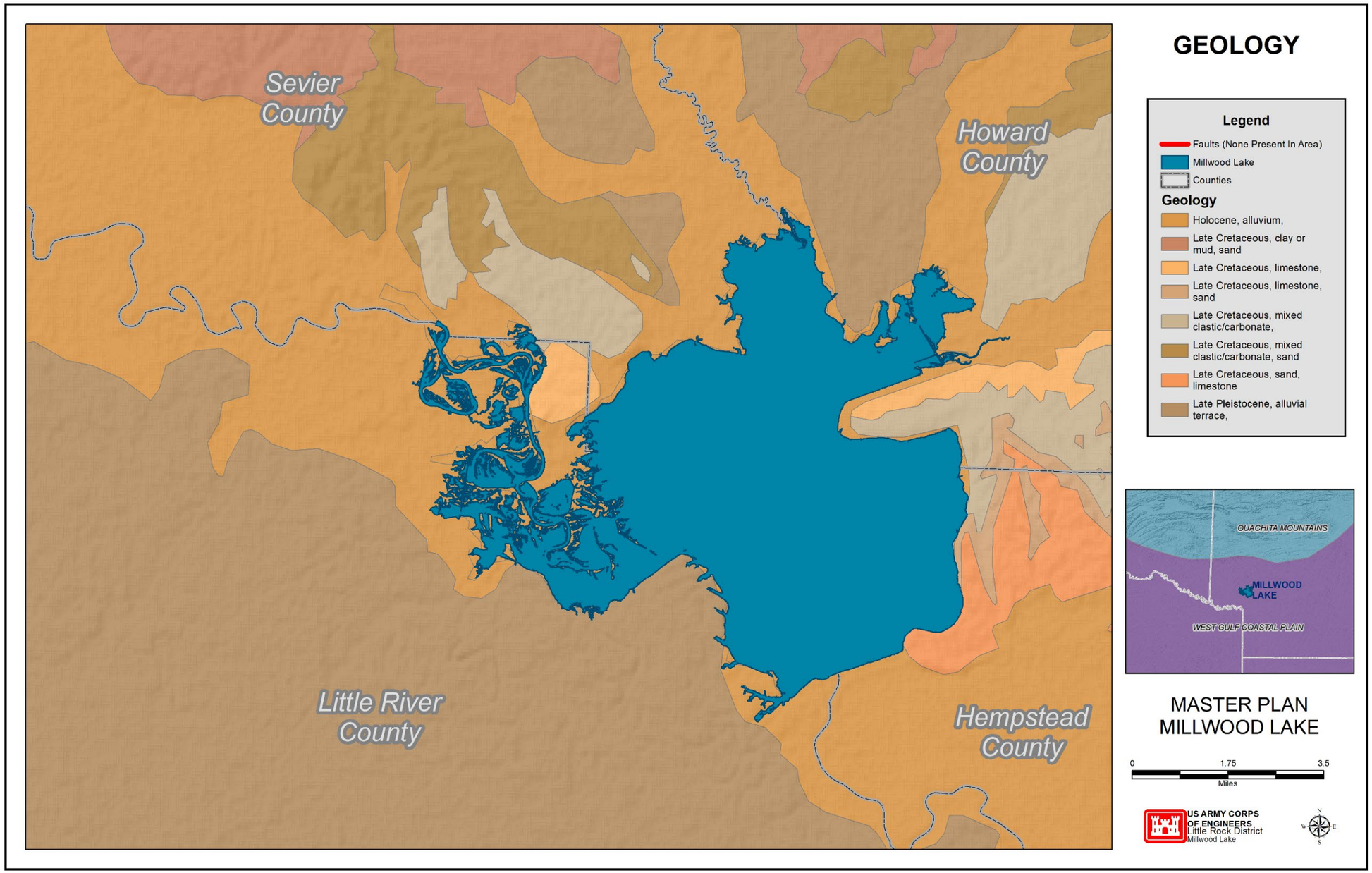
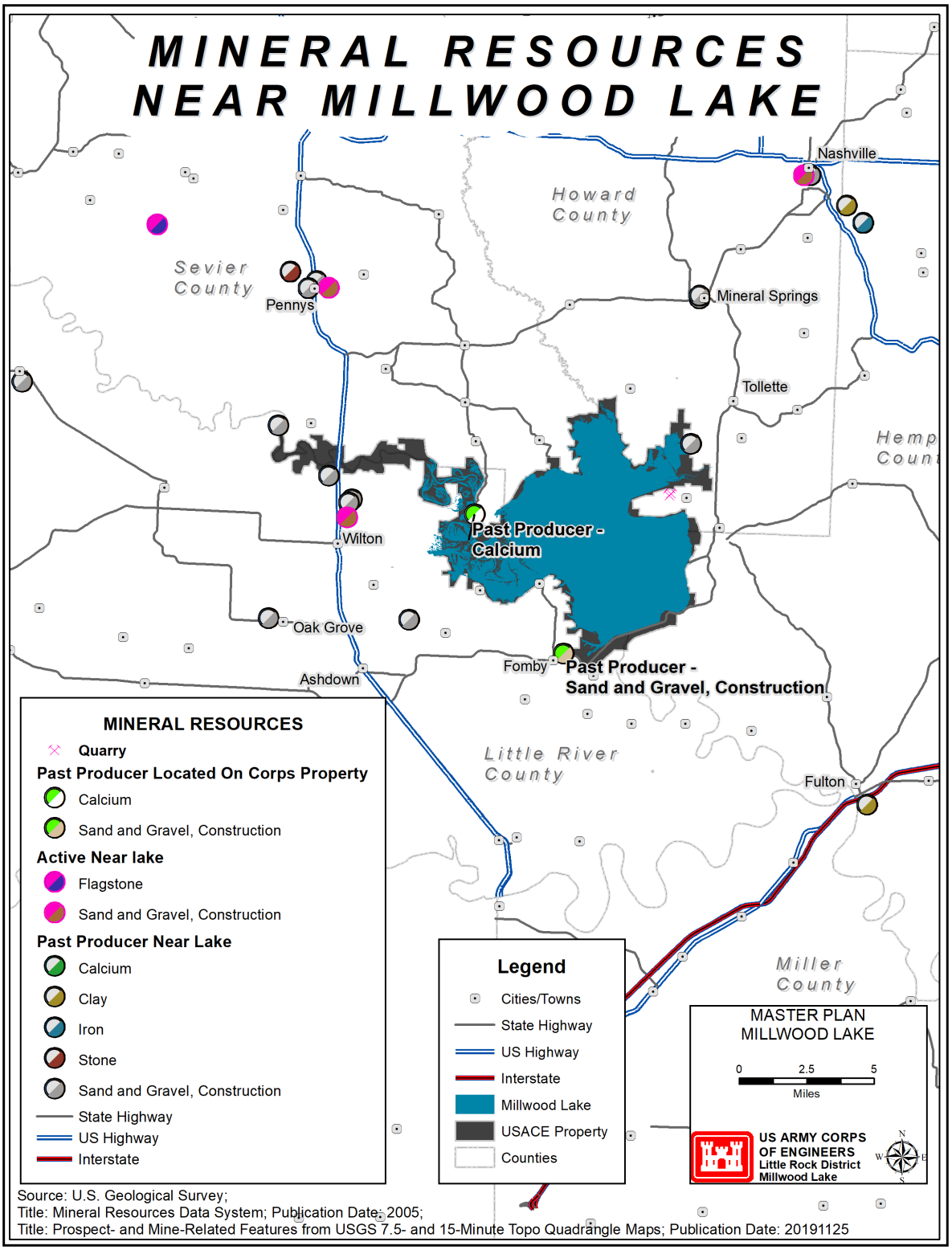


Figure 2-5 Minerals at Millwood Lake



h. 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 Operation Management Plans (OMP). An overview of the natural resources and related management actions at the project is provided in the following sections and paragraphs.

1. Fish and Wildlife Resources

Management of the fisheries resource at Millwood Lake is the responsibility of the AGFC. The overall function of the Corps of Engineers has been primarily one of cooperation with the agencies in planning and management. Fishery resources within the Lower Little River watershed are both plentiful and diverse. This is due in part to the habitat diversity, which ranges from lake, to small tributary stream, to large river system habitats. At least 86 fish species representing 21 taxonomic species groups have been identified in the Lower Little River watershed (Seagraves 2006). Millwood has the reputation for being one of the best bass fishing lakes in the United States (Lower Little River Watershed Coalition 2004).

Table 2-1 Common Fisheries on Millwood Lake

COMMON NAME	SCIENTIFIC NAME
American Paddlefish	*Polyodon spathula* Walbaum
Bluegill	*Lepomis macrochirus* Raf.
Catfish	Ictaluridae
Crappie	*Promoxis sp.* Raf.
Largemouth bass	*Micropterus salmoides* Lacépède
Smallmouth bass	*Micropterus dolomieu* Lacépède
White bass	*Morone chrysops* Raf.

White-tailed deer (Odocoileus virginianus Zimmermann) is the most common big game animal found and hunted in the Millwood Lake area. Wild turkey (*Meleagris gallopavo* L.), although present, are rarely seen in the area. Black bears (*Ursus americanus* Pallas) have been translocated into Arkansas, so occasional bear sightings may become common in the area. American alligator (*Alligator mississippiensis* Daudin) has also increased in numbers in and around Millwood Lake and provide hunters with a permitted hunting season. The common wildlife species found in the open upland areas may be found in (Table 2-2). Habitat

management that includes wildlife food plot plantings, mowing, soil disturbance, removal of exotic species, and application of prescribed fire provide benefits to these populations.

Table 2-2 Common wildlife around Millwood Lake

COMMON NAME	SCIENTIFIC NAME
American Alligator	*Alligator mississippiensis* Daudin
American Mink	*Neovison vison* Schreber
Black Bears	*Ursus americanus* Pallas
Bobcat	*Lynx rufus* Schreber
Bobwhite Quail	*Colinus virginianus* L.
Cottontail Rabbit	*Lepus sylvaticus* Bach.
Coyote	*Canis latrans* Say
Fox Squirrels	*Sciurus niger* L.
Gray Fox	*Urocyon cinereoargenteus* Schreber
Gray Squirrels	*Sciurus carolinensis* Gmelin
Mourning Dove	*Lenaida macroura* L.
Muskrat	*Ondatra zibethicus* L.
North American Beaver	*Castor canadensis* Kuhl
Raccoon	*Procyon lotor* L.
Red Fox	*Vulpes vulpes* L.
River Otter	*Lontra canadensis* Schreber
White-Tailed Deer	*Odocoileus virginianus* Zimmermann
Wild Turkey	*Meleagris gallopavo* L.

Birding enthusiasts are provided an excellent opportunity for viewing in the Millwood Lake area. Of the over 400 birds on the state list, 331 have been recorded around Millwood Lake. A wide variety of common migratory waterfowl species migrate through Millwood Lake. A list of these species may be found in Table 2-3. These species are sometimes present in large numbers due to the shallow water and ample food sources around the lake shoreline.

Table 2-3 Common Birds Species around Millwood Lake

COMMON NAME	SCIENTIFIC NAME
American White Pelicans	*Pelecanus erythrorhynchos* Gmelin
American Wigeon	*Mareca americana* Gmelin
Anhinga	*Anhinga anhinga* L
Black-Crowned Night-Heron	*Nycticorax nycticorax* L.
Black-Headed Gull	*Chroicocephalus ridibundus* L.
Black-Legged Kittiwake	*Rissa tridactyla* L.
Blue-Winged Teal	*Spatula discors* L.
Bridled Tern	*Onychoprion anaethetus* Scopoli
Brown-Headed Nuthatch	*Sitta pusilla* Latham
Canada Geese	*Branta canadensis* L.
Cave Swallow	*Petrochelidon fulva* Vieillot

Common Goldeneye	*Bucephala clangula* L.
Common Moorhen	*Gallinula chloropus* L.
Couch's Kingbird	*Tyrannus couchii* Baird SF
Franklin's Gulls	*Leucophaeus pepixcan* Wagler
Gadwall	*Mareca strepera* L.
Green-Winged Teal	*Anas carolinensis* Gmelin
Hooded Merganser	*Lophodytes cucullatus* L.
Lesser Scaup	*Aythya affinis* Eyton
Long-Tailed Jaeger	*Stercorarius longicaudus* Vieillot
Mallards	*Anas platyrhynchos* L.
Northern Wheatear	*Oenanthe oenanthe* L.
Osprey	*Pandion haliaetus* L.
Painted Bunting	*Passerina ciris* L.
Parasitic Jaeger	*Stercorarius parasiticus* L.
Northern Pintail	*Anas acuta* L.
Pomarine Jaeger	*Stercorarius pomarinus* Temminck
Prothonotary Warbler	*Protonotaria citrea* Boddaert
Purple Gallinule	*Porphyrio martinicus* L.
Red-headed Woodpecker	*Melanerpes erythrocephalus* L.
Ring-Necked Ducks	*Aythya collaris* Donovan
Rock Wren	*Salpinctes obsoletus* Say
Ruddy Ducks	*Oxyura jamaicensis* Gmelin
Snow Bunting	*Plectrophenax nivalis* L.
Tree Swallows	*Tachycineta bicolor* Vieillot
Tricolored Heron	*Egretta tricolor* Statius Muller
White Ibis	*Eudocimus albus* L.
Northern Shoveler	*Spatula clypeata* L.
Wood Stork	*Mycteria americana* L.
Yellow-Crowned Night-Heron	*Nyctanassa violacea* L.

2. Vegetative Resources

Cursory observations reveal a diverse vegetative resource surrounding and in Millwood Lake. The forest area around Millwood Lake is principally hardwoods interspersed with scattered pines. On the flood plains, hardwoods, such as ash, river birch, black gum, hackberry, hickory, sycamore, willow, willow oak, water oak, and various other species of oak are predominant. On higher ground the cover consists of loblolly pine, southern red oak, with associated sweet gum, shortleaf pine, post oak, and persimmon. Most of the project lands are moderately to heavily forested, but small open areas which were cultivated or used for pastureland, are still scattered throughout the wooded areas.

Vegetation ranges from blackland prairies on the upper elevations to aquatic vegetation in the lake. Before European settlement in southwest Arkansas, the landscape of the Interior Western Gulf Coastal Plain contained a patchwork of hardwood forests on bottomland sites and mixed pine-hardwood or pine forests in the surrounding uplands. Upland forests varied a great deal in

stand density from forests dominated by hardwoods, pines, to woodlands and savannahs, and to prairies or glades at the low-density end of the spectrum (Ogle, Witsell, and Gentry 2020). Before European settlement these upland sites were maintained by frequent fires of both natural and human origin.

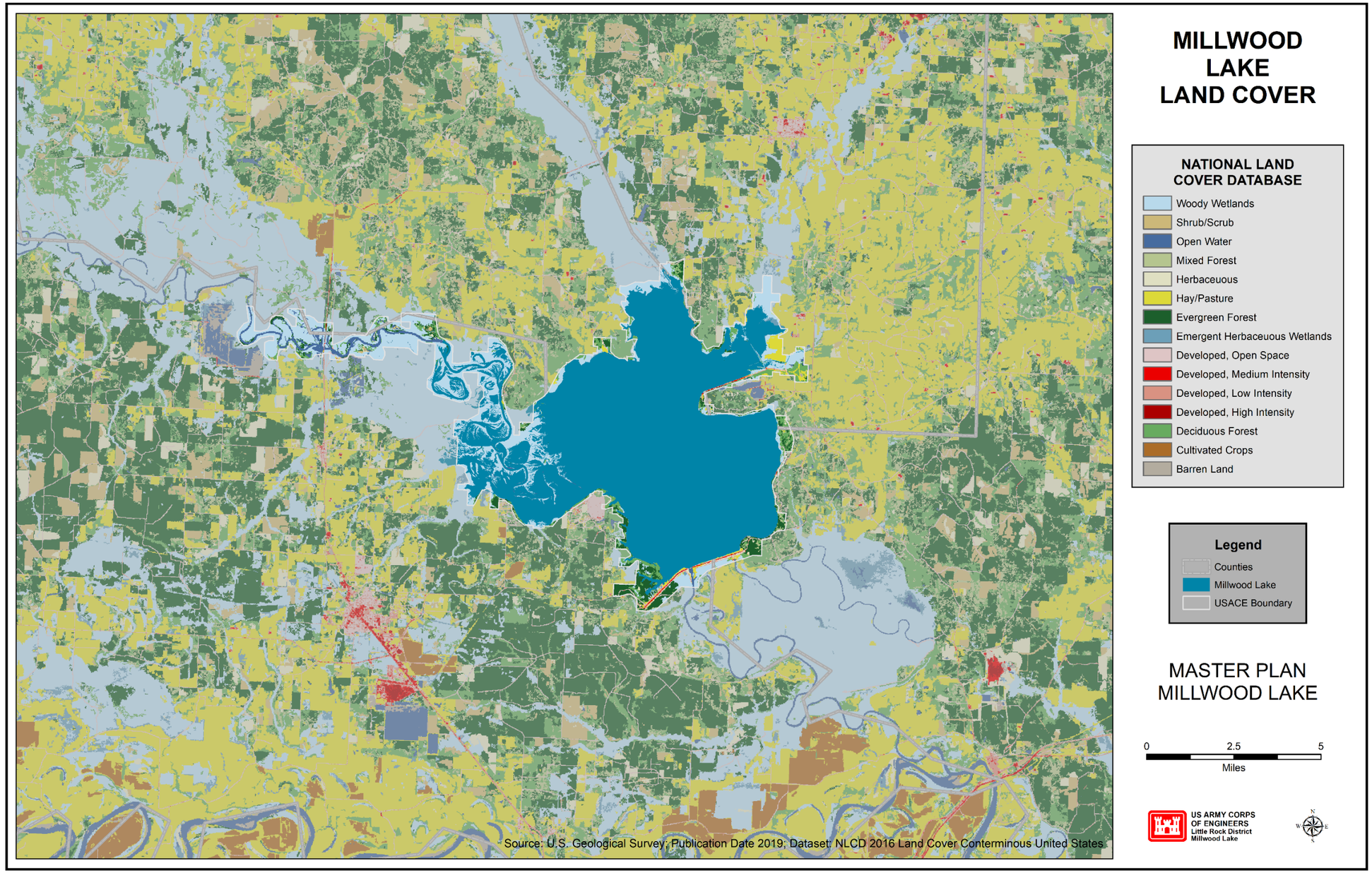
As a result of European settlement, timber harvests and agriculture changed the character of the vegetation on southwest Arkansas's landscapes by replacing the native vegetation with dense forest stands, row crops, and pastures. European settlement, especially through the past century, also brought fire suppression which has dramatically changed the characteristics of the wildland vegetation in southwest Arkansas.

Table 2-4 Common Vegetation around Millwood Lake

COMMON NAME	SCIENTIFIC NAME
American Germander	*Teucrium canadense* L.
Bald Cypress	*Taxodium distichum* (L.) Rich.
Baldwin's Ironweed	*Vernonia baldwinii* Torr.
Big Bluestem	*Andropogon gerardii* Vitman
Black Willow	*Salix nigra* Marshall
Broom Sedge	*Andropogon virginicus* L.
Bushy Bluestem	*Andropogon glomeratus* (Walter) Britton, Sterns & Poggenb.
Butterfly Weed	*Asclepias tuberosa* L.
Brown-Eyed Susan	*Rudbeckia triloba* L.
Carolina Larkspur	*Delphinium carolinianum* Walter ssp. *virescens* (Nutt.) R.E. Brooks
Celestial Lily	*Nemastylis geminiflora* Nutt.
Compact Prairie clover	*Dalea compacta* Spreng. var. *pubescens* (A. Gray) Barneby
Diamond Flower	*Stenaria nigricans* (Lam.) Terrell
Eared False Foxglove	*Agalinis auriculata* (Michx.) S.F. Blake
Eared Goldenrod	*Solidago auriculata* Shuttlw. ex S.F. Blake
Eastern Gamagrass	*Tripsacum dactyloides* (L.) L.
Eastern Red Cedar	*Juniperus virginiana* L.
Elms	*Ulmus* L.
False Gaura	*Stenosiphon linifolius* (Nutt. ex James) Heynh.
False Gromwell	*Onosmodium bejariense* DC. ex A. DC.
Globe flatsedge	*Cyperus echinatus* (L.) Alph. Wood
Green antelopehorn	*Asclepias viridis* Walter
Green Comet Milkweed	*Asclepias viridiflora* Raf.
Ground Plum	*Astragalus crassicarpus* Nutt. var. crassicarpus
Hackberries	*Celtis* L. sp.
Hairy Ruellia	*Ruellia humilis* Nutt.
Indian Blanket	*Gaillardia pulchella* Foug.
lemon Beebalm	*Monarda citriodora* Cerv. ex Lag.
Little Bluestem	*Schizachyrium scoparium* (Michx.) Nash

Little-Toothed Sedge	*Carex microdonta* Torr. & Hook.
Loblolly Pine	*Pinus taeda* L.
Mexican Hat	*Ratibida columnifera* (Nutt.) Wooton & Standl.
Mock Vervain	*Glandularia* sp. J.F. Gmel.
Partridge Pea	*Chamaecrista fasciculata* (Michx.) Greene
Purple Prairie Clover	*Dalea purpurea* Vent.
Ravenfoot Sedge	*Carex crus-corvi* Shuttlw. ex Kunze
Red Oaks	*Quercus* L.
Shortleaf	Pinus echinata Mill.
Showy Beardtongue	*Penstemon cobaea* Nutt.
Stiff-Haired Sunflower	*Helianthus hirsutus* Raf.
Sweetgum	*Liquidambar styraciflua* L.
White Oaks	*Quercus* L. sp.
Wooly Rosemallow	*Hibiscus lasiocarpos* Cav.
Yellow-Puff	*Neptunia lutea* (Leavenworth) Benth.

Figure 2-6 Land Cover at Millwood Lake



3. Threatened and Endangered Species

There are many species in the South-Central 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 bald eagle (*Haliaeetus leucocephalus* L.) is common during the winter months around Millwood Lake. In addition, several bald eagle nests are located around the lake. Although the bald eagle was delisted by USFWS in 2007 due to recovery of the species, both the bald and golden eagles (*Aquila chrysaetos* L.) are still protected in accordance with the Bald and Golden Eagle Protection Act.

Table 2-5 lists species known to occur on project lands as reported from the U.S. Fish and Wildlife Service's federally classified status list of species and Table 2-6 lists special status species from the Arkansas Natural Heritage Commission (ANHC) data set.

Table 2-5 Threatened, Endangered, and Species of Concern

Scientific Name	Common Name	Status
Arkansia wheeleri	Ouachita Rock Pocketbook	Endangered
Charadrius melodus	Piping Plover	Threatened
Calidriou carnutus rufa	Red Knot	Threatened
Haliaeetus leucocephalus	Bald Eagle	Protected
Laterallus jamaicensis	Eastern Black Rail	Threatened
Quadrula cylindrica	Rabbits Foot	Threatened
Source: U.S. Fish and Wildlife		

Table 2-6 State of Arkansas Special Status Species

ANHC Data obtained 2020– species located on or intersect corps property				
Scientific name	**Common Name**	**State Status**	**Global Ranking**	**State Ranking**
Atractosteus spatula	Alligator Gar	INV	G3G4	S2
Haliaeetus leucocephalus	American Bald Eagle	INV	G5	S3B, S4N
Liodytes rigida	Glossy Swampsnake	INV	G5	S3
Procambarus regalis	Regal Burrowing Crayfish	INV	G2G3	S2
Microstylum morosum	Giant Prairie Robber Fly	INV	G3G4	S1
Gallinula galeata,	Common Gallinule	INV	G5	S2B
Porphyrio martinicus	Purple Gallinule	INV	G5	S1B
Fundulus blairae,	Lowland Topminnow	INV	G4	S2
Hyla avivoca	Bird-voiced Treefrog	INV	G5	S3

Pleurobema riddellii	Louisiana Pigtoe	INV	G1G2	S1
Myotis austroriparius	Southeastern Bat	INV	G4	S3
Amorpha paniculata,	Panicled Indigo-bush	ST	G2G3	S1
Spiranthes odorata	Fragrant Ladies' Tresses	INV	G5	S1
Echinodorus berteroi	Upright Burhead	INV	G5	S1S3
Saratoga Landing Blackland Prairie	Western Gulf Coastal Plain Northern Calcareous Prairie	INV	GNR	S2
White Cliffs Natural Area	Juniperus ashei Dry Chalk Outcrop Woodland	INV	G1	SNR
Spiranthes odorata	Fragrant Ladies'-tresses	INV	G5	S1
Pyrrhopappus pauciflorus	Few-flower False Dandelion	INV	G5	S1S2
Penstemon cobaea	Showy Beardtongue	INV	G4	S3

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.

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.

The Millwood Project is impacted by the spread of invasive species. The project office works with partners, AGFC, University of Arkansas Cooperative Extension Service, and United States Department of Agriculture, to help stop the spread of these species. Project staff post signage in all the recreation areas to communicate the dangers of spreading invasive species on project lands and waters. Natural resource specialists also deploy gypsy moth traps on the Project each year and have placed emerald ash borer traps on project lands to monitor any infestations of this species in the past.

Table 2-7 Invasive species identified at Millwood Lake

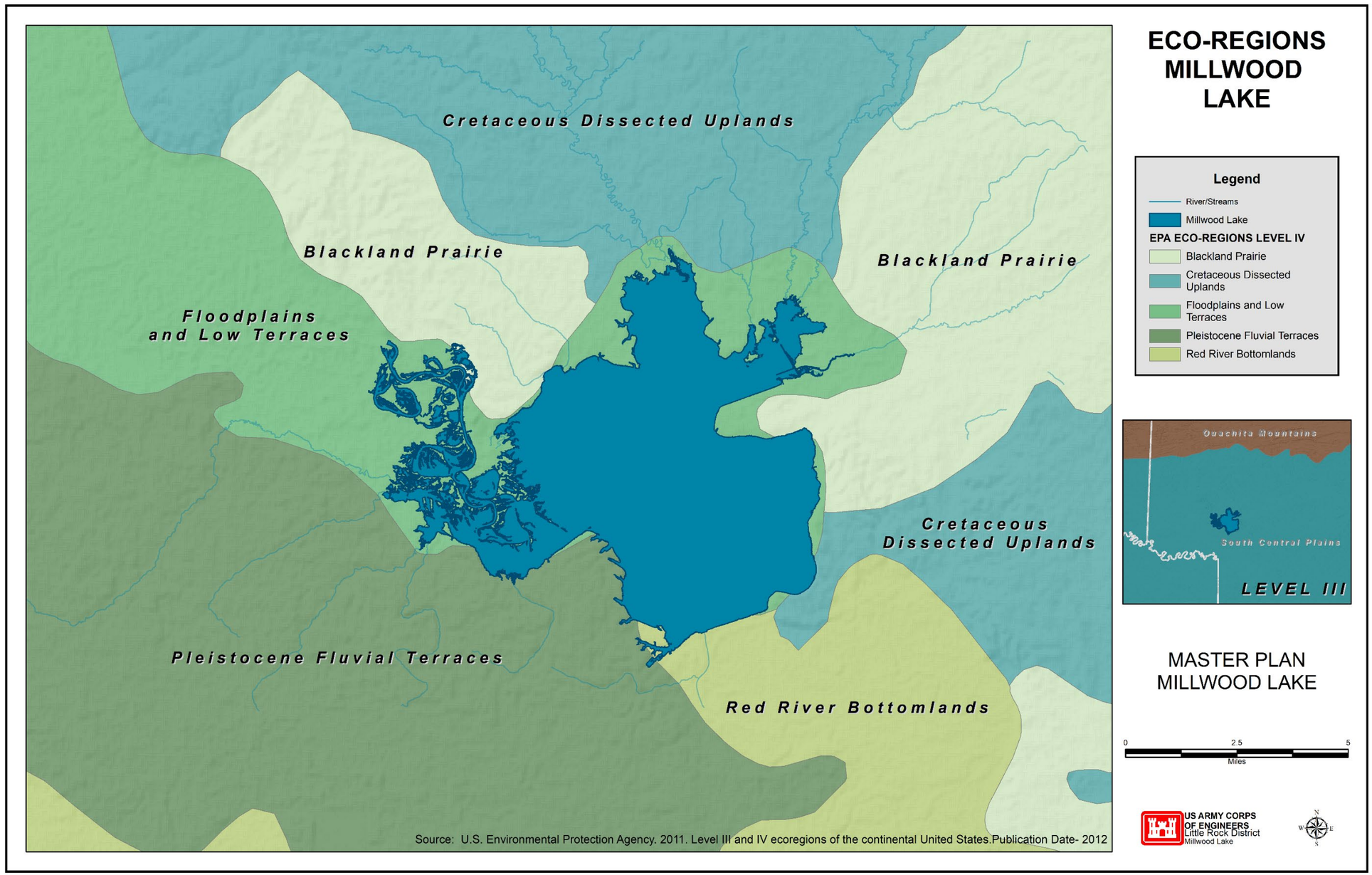
COMMON NAME	SCIENTIFIC NAME
Alligator Weed	*Alternanthera philoxeroides* (Mart.) Griseb.
Bull Thistle	*Cirsium vulgare* (Savi) Ten.
Callery Pear	*Pyrus calleryana* Decne.
Emerald Ash Borer	*Agrilus planipennis* Fairmaire
English Ivy	*Hedera helix* L.
Giant Salvinia	*Salvinia molesta* D. Mitch.
Hydrilla	*Hydrilla verticillata* (L.f.) Royle
Japanese Honeysuckle	*Lonicera japonica* Thunb
Privets	*Ligustrum* sp. L.
Pyracantha	*Pyracantha* sp. M. Roem.
Sericea Lespedeza	*Lespedeza cuneata* (Dum. Cours. G. Don
Feral Hogs	*Sus scrofa* L.
Trifoliate Orange	*Poncirus trifoliata* (L.) Raf.

5. Wetlands

Wetlands are complex habitats that are transitional, from dry land, to open water, being characterized by their 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 within wetlands during certain stages of their life.

Millwood Lake wetland areas are classified as lacustrine (total water-approximately 28,298.6 acres), and palustrine (standing dead timber and vegetated shorelines). Palustrine wetlands include freshwater ponds (included in lacustrine acres), fresh water emergent (approx. 22 acres), and shoreline wetlands, which include a mixture of scrub/shrub (6 meters or less in height) or forested wetland species of greater than 6 meters in height. These forested/shrub type wetlands occupy approximately 4,638 acres in the project area. 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.

Figure 2-7 Eco-Regions at Millwood Lake



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." (ER 1130-2-550, 1996)

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

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

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

The ecoregion that encompasses Millwood Lake and surrounding areas is listed by the EPA as Omernik Level III ecoregions including the "South Central Plains". This ecoregion is defined as follows:

Location: A southern forest region covering northern and western Louisiana, southern Arkansas, east Texas, and southeastern Oklahoma.

Climate: The ecoregion has a mild mid-latitude humid subtropical climate, marked by hot

summers and mild winters. The mean annual temperature is approximately 17°C in the north and 20°C in the south. The frost-free period ranges from 220 to 290 days. The mean annual precipitation is 1,282 mm, from 1,050 mm in the west to near 1,700 mm in the southeast.

Vegetation: Natural vegetation of uplands was historically dominated by longleaf pine woodlands and savannas in the south, and shortleaf pine/hardwood forests in the north. Southern red oak, post oak, white oak, hickories, and loblolly pine were common, with small areas of beech and magnolia in the south, Southern floodplain forest of water oak, willow oak, swamp chestnut oak, sweetgum, blackgum, red maple, bald cypress and water tupelo typify bottomlands.

Hydrology: High density of perennial streams, mostly low to moderate gradient. Generally, lacks lakes, but some large reservoirs have been built.

Terrain: Mostly rolling plains that are broken by nearly flat fluvial terraces, bottomlands, sandy low hills, and low cuestas. Its terrain is unlike the flatter, less dissected Mississippi Alluvial Plain (8.5.2) or the Western Gulf Coastal Plain (9.5.1). Uplands are underlain mainly by poorly consolidated Tertiary coastal plain deposits, with some Cretaceous geology in the north. Soils are mostly acidic sandy loams, silt loams, sands, and sandy clay loams. Alfisols and Ultisols are dominant, with a thermic soil temperature regime and udic or aquic soil moisture regime. Bottomlands and terraces are veneered with Quaternary alluvium, terrace deposits, or loess. The lithologic mosaic is complex and distinct from the strictly Quaternary deposits of Ecoregions 9.5.1 to the south and 8.5.2 to the east.

Wildlife: White-tailed deer, coyote, beaver, raccoon, muskrat, mink, river otter, swamp rabbit, cottontail rabbit, armadillo, mourning dove, red-cockaded woodpecker, white ibis, Mississippi kite, alligator, Louisiana pine snake.

Land Use/Human Activities: Mostly in forests or woodland, with less than 20% in cropland. Commercial pine plantations are extensive. Timber production, livestock grazing, and oil and gas production are major land uses. Cropland dominates the leveed bottomlands of the Red River, with crops of cotton, corn, soybeans, rice, and pasture and hay land. Major towns and cities include Arkadelphia, Pine Bluff, Hope, Camden, Magnolia, El Dorado, Texarkana, Longview, Tyler, Nacogdoches, Lufkin, Shreveport, Minden, Ruston, Natchitoches, Alexandria, DeRidder, and Oakdale.

i. Utilities

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

j. Forest Resources

Millwood Lake is surrounded by forested land managed primarily for its aesthetic value and wildlife habitat, and secondarily for forest products. These forests provide part of the outdoor experience for the recreating public. Forest management on these lands includes prescribed

burning, thinning, and harvesting forest products to enhance wildlife habitat, control eastern red cedar encroachment, restore forest vigor and promote forest health. These activities generate limited revenue which is reinvested in the natural resource management operations at Millwood Lake. The forest types located on USACE land surrounding Millwood Lake include Hardwood-Pine forests, Pine-Hardwood forests, and Pine forests.

k. 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. Guidance is derived from a number of cultural resources laws and regulations, including Sections 106 and 110 of the National Historic Preservation Act (NHPA) of 1966; Archaeological Resources Protection Act (ARPA) of 1979; Native American Graves Protection and Repatriation Act (NAGPRA) of 1990; 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 applicable.

Historic Background The following is a brief history of the human population of Arkansas:

Paleo-Indian (at least 12,000-8,500 B.C.): The beginning of the Paleo-Indian period is hotly contested though it is generally accepted that people occupied the Americas by at least 12,000 years ago by coming across the Bering Strait. Newer hypotheses suggest that in addition to the accepted land crossing, an earlier migration or migrations occurred via a maritime/island hopping route from Asia to North America. Regardless of exactly when the peopling of the Americas took place, certain cultural attributes are associated with this culture period. Paleo-Indians were small nomadic bands of hunter-gatherers with a heavy emphasis on hunting now-extinct megafauna, such as, mastodon with finely crafted fluted stone points. The small bands of individuals, their nomadic lifestyle, the decomposition of all of their material culture, except for stone tools, and their predilection to live near waterways and coastlines combine to make Paleo-Indian cultural sites difficult to locate and study (Archaeology Southwest 2018).

In Arkansas, most sites have been located in the eastern portion of the state indicating that Paleo people were migrating down the Mississippi River from the northern plains. Sites tend to occur in regional clusters interpreted as "staging areas" or areas where Paleo people stopped migrating and began to settle and make regional adaptations in response to their environments. Paleo people lived in small groups of one to two dozen members and at the time there may have only been 100-150 people in all of modern Arkansas (Sabo 2008c).

Archaic (8,500-1000 B.C.): The Archaic period continues the hunting and gathering subsistence strategy, though with perhaps a greater reliance on gathering of plant resources. Over the seven millennia that this period covers, localized groups became much more efficient in exploiting local resources and became less nomadic occupying seasonal

camps. After 7,000 BC, average temperatures rose as much as 7.2° F. Along with the increased temperature there was a decrease in annual rainfall. This resulted in hotter, drier conditions. Decreased water resulted in reduced vegetation and erosion, and diminished the availability of plant and animal resources, making life even more difficult for Archaic peoples. Changing environmental conditions resulted in some areas, especially broad river valleys surrounded by uplands that offered shelter, providing better conditions. Archaic communities began to concentrate in those areas.

With the less transient lifestyle the population increased. Perhaps due to the population increase, the abundance of resources in the area, or the relative stability of the environment following the Holocene, the Archaic period is well represented in the Millwood Lake area.

Woodland (1000 B.C. – A.D. 1000): The Woodland period is characterized by an increasingly sedentary lifestyle, though still relying on hunting and gathering. During this time cultivation of native flora became an important part of the subsistence strategy. As populations were staying in one location longer, permanent occupational markers in the form of burial mounds were constructed. Technologically, the Woodland period saw great advances with the transition from the atlatl as a primary weapon and hunting tool to the development of the bow and arrow. The Woodland period also saw the development and use of coarse ceramics tempered with grog or bone. Pictographs (painted) and petroglyphs (carved) rock art occur at numerous Woodland period sites. They contain both real depictions of nature as well as abstract and geometric designs. Effigies in the form of ceramics, sandstone tablets, and carved stone pipes take the form of people and animals. In many of these cases, the effigies have fantastical features suggesting they were conceived as supernatural. This has been interpreted that the Woodland people believed in the concept of the spirit and human worlds; or broadly, a form of religion. Mound building continued later in the period though not necessarily with the purpose of interring the dead. In Arkansas, the Toltec Mounds near modern-day Scott, Arkansas, features several pyramidal-shaped mounds with flattened tops that were used to support buildings at their peaks. Many of the mounds and structures correspond to celestial objects or events. They are believed to have been the houses or temples of important people, indicating a social organization with "elites" and "commoners."

Two of the primary tribes that historically occupied modern day Little Rock District can trace their lineage to the Dhegiha Siouan tribes of the Ohio River Valley. The Dhegiha tribes include the Omaha, Ponca, Kaw, Quapaw, and Osage. During this Middle Woodland period (A.D. 200-A.D. 400), the Dhegiha collectively began migrating down the Ohio River Valley to the confluence with the Mississippi River. During the Late Woodland (A.D. 400-A.D. 500), the Dhegiha began to separate into the modern tribes we see today. The Dhegiha, with the exception of the Quapaw, traveled up the Mississippi River. The Quapaw remained to the south and were known as U-ga'-qpa or Quapaw, meaning "the down-stream people." (Dorsey 1886 and McMillan 2014).

Mississippian (A.D. 900 – 1541): Sometime after the Quapaw broke off from the larger Dhegiha Siouan tribes, the rest of the Dhegiah Sioux established themselves at Cahokia (near modern day St. Louis) and then further separated into four tribes. The Osage were the last to

leave Cahokia around A.D.1300 moving to the upper reaches of the Osage and Missouri Rivers. De Soto encountered "Capaha" or Quapaw on the western bank of the Mississippi, though his encounter occurred south of the confluence of the Arkansas River, where they would later occupy (McMillan 2014:15-16). "Osage" is a corruption by later French traders of "Wazha'zhe," meaning "Children of the Middle Waters" (Hodge 1910:156). By the contact period, the Osage occupied the area south of the Missouri River into the northern half of Arkansas and further west into Kansas and Oklahoma.

The Mississippian period is generally characterized by large scale sedentism and a reliance primarily on agriculture of corns, beans, and squash supplemented by hunting and limited foraging. Mississippians engaged in increasingly complex trade networks, religious study and iconography, and refinement of crafts such as ceramics, metal work, and development of games and sports. Pottery making developed into a specialized craft and art form during the Mississippian period and numerous forms were constructed and elaborately decorated. Shell became the preferred temper material for ceramics (Sabo 2013). The tool assemblage found at Mississippian sites reflects the reliance on agriculture. Tools to work the field, such as hoe blades made from stone, shells, and bison scapulas are found on Mississippian sites. With the need to clear the woods for agriculture and build the buildings and, later, fortifications required wood working tools. Axes, celts, and adzes are all found in association with Mississippian sites. The refinement of the bow and arrow as a weapon sees the development of very small, true arrowheads. Often called bird points, they were rarely much wider than the arrow shaft. The Late Mississippian period saw population dispersal and severe social stress put on the populace. Many of the large mound centers were abandoned prior to the arrival of Europeans and archaeological evidence has found numerous defensive structures, such as palisades suggesting that warfare was far more prevalent. Generally, the large chiefdoms were abandoned in favor of smaller autonomous groups though they still practiced agriculture.

In southwestern Arkansas, the Caddo developed as a regional variant of the Mississippian between AD 800-1100 and were encountered and described by Europeans during the 1500s and 1600s. The Caddo subsisted on agriculture supplemented with hunting and gathering. They used simple digging tools of bone, wood, or shell to cultivate crops such as corn, beans, squash, and tobacco. The Caddo were also skilled potters and obtained salt. Agriculture coincided with a dispersal of people into residential, year-round settlements that usually had circular dwellings with pitched roofs. Elaborate mound burials were common until later in the period (Early 2012). Each Caddo community had a principal leader called a caddi. Caddi was a hereditary position and required years of tutoring in order to keep order in the community and contribute to the peace of the Caddo Nation. Few spiritual leaders, called chenesi, held power superior of the caddi. The chenesi remained in houses built on top of the flat-topped mounds and communed with Ayo-Caddi-Amay or "Great Leader Above" in order to advise the Caddo people. At the time of the de Soto expedition, there were at least twenty Caddo ceremonial centers along the route from Arkadelphia towards Texarkana (Carter 2018).

Early European Contact Historic Period (1541-1682): The first European explorers in Arkansas came from the Hernando de Soto expedition when they crossed the Mississippi River in 1541. The most likely route for the de Soto expedition is consistent with the locations of sixteenth century Native American sites and was a route that took the Spanish across

Arkansas nearly three times (Hudson 1997). The Caddo approached the Spanish near Nashville in Howard County (near the project area). The Caddo initially gave the Spanish gifts, but after the Spanish camped in an abandoned Caddo town and plundered a major salt site and a supply of corn, the Caddo began raiding them as they moved west (Carter 2018). Diseases the Spaniards introduced to the Native Americans decimated their populations.

Colonial and Early American Historic Period (1682-1828): The most notable European occupation was founded by French explorer Henri de Tonti at Arkansas Post in 1682 to the northeast of the project area. The Post did not have a large European population and changed hands between the French and Spanish multiple times. Some trade goods likely made their way to the current project area via Native American trading networks. In 1803 the Louisiana Purchase made the project area officially United States territory. By 1790, the Caddo had been weakened by European epidemics and raids by their northern enemies, the Osage. The Caddo abandoned their homes in Arkansas and migrated farther down the Red River (Carter 2018). In 1819 the Arkansas Territory was established, and American settlers began migrating towards Texas along the Southwest Trail (located to the southeast of the project area) (Akridge 2020).

Trail of Tears and American Settlement (1828-1861): Several paths through Arkansas were involved in the forced removal of Native Americans in the Southeast in what came to be known as the Trail of Tears. While none are believed to have gone directly through the project location, the Choctaw were known to have followed the supply road from Washington to Fort Townson near present day Mineral Springs to the north of the project area (Fehr 2021). The Choctaw briefly acquired land near the project area in 1820 in exchange for giving up their land in Mississippi, but that portion was contested and adjusted in 1825 to a smaller portion outside of the project area (Kent 2020). During the time of the Trail of Tears white settlers were moving into the area surrounding modern-day Millwood Lake. The Southwest Trail was expanded in the 1820s and 1830s to encourage more white settlement (Akridge 2020). The Caddo eventually lost their homelands in Arkansas through signing a treaty in 1835, which further encouraged white settlement (Carter 2018). The area was attractive to southerners for cotton production as the area had fertile soil and was in close proximity to the Red River. Southerners established multiple cotton plantations and brought large numbers of slaves to the area (Turner 2021).

For more than 300 years the flow of the Red River was restricted by a logjam, or "raft," which was over 25 feet deep in places and covered the width of the valley. By 1805 the raft extended upstream for almost 150 miles from north central Louisiana to the southern border of Arkansas. It created marshes, sloughs, and natural lakes and made the river practically impassable except during periods of high water. In 1825 the Corps of Engineers began a program to clear the log raft from the river to open the Red River to navigation. The clearing program suffered many interruptions but was finally completed in 1872. Instead of making the river navigable, the removal of the raft released the impoundments, drained the marshes, lowered the water level, and made the river even less navigable in many areas. People living in the Millwood area during the early 1800's relied on steamboat and keelboat landings along the Red River during high water periods for sugar, rice, and other supplies which could not be manufactured in the home. The oldest such landing in Little River County was Rocky comfort. Millwood Landing, for which Millwood Lake was named, was in use from 1845 to 1875. Cottonshed Landing is so named

because of the large shed once built there to store cotton until the Saline River reach flood stage, allowing barge access to that point.

Civil War and Reconstruction (1861-1874): Arkansas did not secede from the Union until May 6, 1861, in response to the Union firing on Fort Sumpter. The bulk of military operations in Arkansas early in the war occurred in the northern portion of the state and to the east along the Mississippi River. After the Union took control of Little Rock in August of 1863, the Confederate state capital was moved to Washington in Hempstead County (approximately 15 miles east of the project area) where it remained for the rest of the war. Union forces attempted a Red River Expedition to crush remaining Confederate resistance in southern Arkansas and Northern Louisiana in 1864, but the campaign failed before reaching the project area. As the war unfolded, much of Arkansas descended into lawlessness and poverty as food and other necessities were in short supply and marauding guerillas became common (DeBlack 2021). Reconstruction in Arkansas was a volatile time as well. As newly freed slaves gained more rights, prewar planter elites attempted to restore their economic and social status. Eventually the Sharecropping system emerged. As more people felt disenfranchised from the new state government and had been embittered by events in the Civil War, many joined the Ku Klux Klan, and a massive campaign of terror and violence began throughout the state except in the northwest in 1868. In response, the governor called up the state militia and put multiple counties (including Little River and Sevier Counties) under martial law until violence had been suppressed. This episode became known as the Militia Wars and lasted from 1868-1869. Both groups were accused of committing violent acts against civilians (Sesser 2018, DeBlack 2021).

Modern County History (1874-Present): Millwood Lake occupies parts of Hempstead, Howard, Little River, and Sevier Counties. Hempstead County was formally organized in 1824 with the town of Washington as its seat. Washington, located approximately 15 miles east of Millwood Lake, is one of the oldest incorporated towns in Arkansas. As railroads developed in the area after reconstruction, Hope became the county seat in 1939 (Turner 2021). Sevier County was originally much larger, and its original seat was organized in 1828 at Paraclifta. The town of Paraclifta, formerly located about 6 miles northwest of Wilton Landing, was the cultural center of the region encompassing southwestern Arkansas, northeast Texas, and southeastern Oklahoma from about 1820 to 1872. When the removal of the Red River log raft made the river less navigable in 1872, Paraclifta began to decline. That same year, the Missouri-Kansas-Texas Railroad was completed bypassing southwestern Arkansas and stimulating growth to the west. Paraclifta was abandoned (McKely 2017). In 1867, the county was reduced in size, and the seat was eventually established in 1905 at De Queen (McKely 2017). Little River County was formed from a portion of Sevier County in 1867 and its current seat was established at Ashdown in 1906 (Trusley 2019). Howard County was formed from a portion of Sevier County, as well, in 1873 with the county seat set in Nashville in 1905 (White 2017). All four counties produced large amounts of cotton until around WWI. Corn and timber were other major industries with smaller supplemental agriculture including strawberries and peaches. The Great Depression affected the area significantly with the CCC and WPA being active in the area (McKely 2017, Trusley 2019, Turner 2021, and White 2017). In 1946 the Flood Control Act authorized initial construction of Millwood Lake. The design was modified to incorporate a stable water supply by the Flood Control Act of 1958 and was designed by and built under the supervision of the

Tulsa District. Construction began in 1961 and was completed for flood control operations in 1966.

Known Cultural Resources at Millwood Lake

There are over 51 identified archeological sites present at Millwood Lake. Very few of the known sites within the lake area have been investigated any further than documentation. Two historical sites are currently listed on the NRHP including the Old U.S. 71 Little River Approach in Sevier County, and Old U.S. 71 Wilton Segment in Little River County. The dam itself was completed in 1966 and is old enough to be considered for NRHP inclusion. The structure has not yet been evaluated for the NRHP. Table 2-8 summarizes the previously recorded resources at Millwood Lake based on the most up to date survey information according to the records of the Arkansas Archeological Survey.

Table 2-8 Previously Recorded Archaeological Sites at Millwood Lake

Type of Site	**Number of Sites**
Historic	7
Prehistoric	41
Multicomponent	3
Total	51
National Register	
Not Evaluated	39
Not Eligible	12
Eligible	0

Multiple formal archaeological surveys have been completed at Millwood Lake since the 1950s in response to ongoing activities such as lake construction, inadvertent discoveries, and NHPA Section 106 compliance. Table 2-9 provides a list of previous surveys performed at Millwood Lake. The table below represents the most up to date survey information according to the records of the Arkansas Archeological Survey.

Table 2-9 Previous Archeological Investigations on Millwood Lake

Author	**Title**	**Year**
Jelks, Edward B.	Appraisal of the Archaeological Resources of Millwood Reservoir, Little River, Arkansas	1954
Thomas, Ronald A.	Preliminary Investigations at the Old Martin Place 3LR49 Millwood Reservoir, Arkansas	1966
Hoffman, Michael P.	Archaeological Investigations in the Millers Crossing, Hutt and White Cliffs Sites Millwood Reservoir, Southwestern Arkansas	1968
Nichols, P.	Patterson-Lockesburg 138KV Transmission Line	1978
Athens, William P.	Phase I Cultural Resources Survey and Inventory of a Proposed Natural Gas Pipeline Replacement Project, Hempstead, Howard, Little River, and Sevier Counties, Arkansas	2009

Agha, Andrew and Thomas G. Whitley	Section 110 Survey of 2,519 Acres at Beaver, De Queen, Dierks, Gilham, Millwood, and Nimrod Lakes, Benton, Carroll, Little River, Polk, Sevier, and Yell Counties, Arkansas	2011
Horvath, Elizabeth A.	Cultural Resource Assessment Survey MK-Millwood, FY17-MW-M-1 and FY17-MW-M-2 Howard and Sevier Counties, Arkansas	2018
Horvath, Elizabeth A.	Cultural Resource Assessment Survey MW-Gillham, FY18-MW-G-1 (Big Coon Creek) MW-DeQueen, FY18-MW-D-1 (Oak Grove Landing), FY18-MW-D-2 (Oak Grove), FY18-MW-D-3 (Glen Canyon), FY18-MW-D-4 (Glen Canyon NE), and FY18-MW-D-5 (Overlook) MW-Millwood, FY18-M-1 (Paraloma), FY18-M-2 (Horseshoe Bayou North), FY18-M-3 (Horseshoe Bayou South), AND FY18-M-4 (Beard's Bluff) Hempstead, Howard, Little River, Polk, And Sevier Counties, Arkansas	2018
Weinstein, Richard A. and Erin E. Phillips	Cultural Resources Investigations of Corps of Engineers Managed Lands in Arkansas and Missouri: Blue Mountain, Bull Shoals, Clearwater, DeQueen, Dierks, Greers Ferry, Millwood, MKARNS, Nimrod, and Ozark Pool Project Areas	2019
Horvath, Elizabeth A.	Cultural Resource Assessment Survey Millwood (FY19.1-MW-1/AREA 1), Gillham (FY19.1-GH- 1/AREA 1), DeQueen (FY19.1-DQ-1/AREA 1), and Dierks (FY19.1-DK-1/AREA 1) Howard, Little River, and Sevier Counties, Arkansas	2019
Horvath, Elizabeth A.	Cultural Resource Assessment Survey Millwood FY19.2-MW-1 (Okay Levee) and FY19.2-MW-2 (Levee Borrow), Howard County, Arkansas	2019
Horvath, Elizabeth A.	Cultural Resource Assessment Survey Millwood FY20.1-MW-1, DeQueen FY20.1-DQ-1, and Gillham FY20.1-GL-1 Little River, Sevier, and Polk Counties, Arkansas	2020

Under the NHPA, properties of traditional religious and cultural importance to a living community may be determined to be eligible for inclusion on the NRHP. Commonly known as Traditional Cultural Properties (TCP), these properties are associated with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Therefore, TCPs must be taken into account in order to comply with federal cultural resources regulations. Additionally, Executive Order 13007 states that each federal agency with responsibility for the management of Federal lands shall accommodate access to and ceremonial use of Native American sacred sites by religious practitioners and avoid adversely affecting the physical integrity of such sacred sites. There have been no TCPs or sacred sites identified at this time at Millwood Lake. If TCPs or sacred sites are identified at Millwood Lake in the future, they could be given additional protected status through ESA designation.

Long-term Objectives for Cultural Resources

As funding allows, the Little Rock District will create a Cultural Resources Management Plan (CRMP). The purpose of the CRMP is to provide a comprehensive program to direct the historic preservation activities and objectives at Millwood Lake. Completion of a full inventory of cultural resources at Millwood Lake is a long-term objective that is needed for compliance with Section 110 of the NHPA. Identification and evaluation of sites is an ongoing process at Millwood Lake. As more significant sites are identified, they could be protected as ESA's.

The Archaeological Resources Protection Act (ARPA) secures the protection of archaeological resources and sites on lands owned and administered by the United States. According to ARPA, it is illegal to excavate, remove, damage, or deface archaeological resources on public lands without a permit. It is also illegal to sell or transport archaeological resources removed from public lands. Little Rock District requires permits for archaeological investigations at Millwood 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 and summarize any potential sacred objects that existed within their archaeological collections prior to the passage of the law and to repatriate such objects to affiliated Tribes requesting their return. Additionally, there are responsibilities related to the inadvertent discovery of human remains or funerary objects that occur on federal land that require consultation and repatriation. Although NAGPRA compliance has been an ongoing focus of the Little Rock District and many consultations and repatriations have occurred in the past, there is still more work to be done. 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 the NRHP, 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.

l. Interpretation

Interpretative programs at Millwood Lake are aimed at five areas of emphasis: water and boating safety, natural resources and wildlife management, recreation, historical, and Project authorized purposes. Water and boating safety remain the main focus for the majority of the interpretive efforts. Project staff provide programs throughout the year at local schools, summer camps, community events, expos, and USACE managed events targeting children under 16 years of age. Annually in excess of 3,000 contacts are made through these programs. The use of life jackets for boating safety is the area of emphasis for all interpretive programs. Life jacket loaner stations are positioned at numerous boat ramps on Millwood Lake. This initiative allows for boaters to "borrow" a life jacket for the day while boating at the lake.

During recreation season, the project staff monitors boat ramps specifically for opportunities to provide water and boating safety outreach. Many partners in water safety, such as county law enforcement officials, Arkansas Game and Fish Commission, and Arkansas State Parks also provide outreach in terms of water and boating safety. Project staff collaborate with local media for television interviews, newspaper articles, and social media comments on a regular basis. Many of the interviews involve current events at the lake such as summer holiday weekend campground status, boating and water safety outreach, lake levels, dam operation, and public accidents. Within the project office, a small visitor information center offers information and brochures on a host of recreation and natural resource programs.

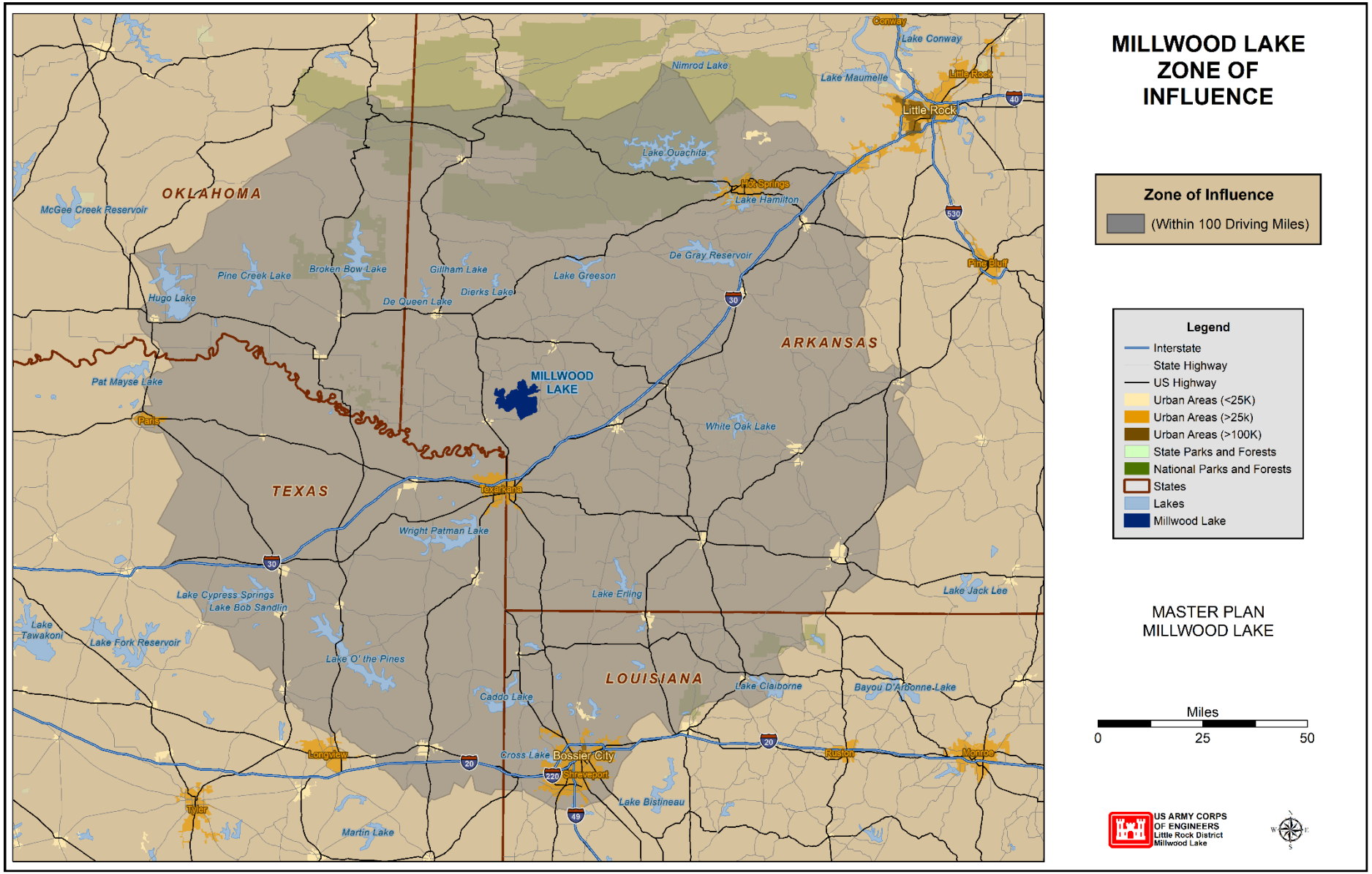
m. Zone of Influence

The "zone of influence" (ZOI) for the purposes of this Master Plan is defined as those areas within a 100-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 100-mile driving radius were identified. Those counties where at least half of the county (by area) was within the ZOI boundary are included in the tables and figures in this section of this report. Demographic and socioeconomic data for the surrounding states and the nation are provided for comparison purposes.

Table 2-10 Counties within 100-mile Driving Radius

Arkansas		Louisiana	Oklahoma	Texas
Calhoun	Polk	Bossier	Choctaw	Bowie
Clark	Sevier	Caddo	McCurtain	Camp
Columbia	Union	Claiborne		Cass
Dallas		Webster		Franklin
Garland				Harrison
Hempstead				Marion
Hot Spring				Morris
Howard				Red River
Lafayette				Titus
Little River				Upshur
Miller				
Montgomery				
Nevada				
Ouachita				
Pike				

Figure 2-8 Zone of Influence on Millwood Lake



n. Demographics and Socioeconomics

Millwood Lake is located entirely within the state of Arkansas, and its physical area is split between four counties: Little River, Hempstead, Howard, and Sevier. The metropolitan area closest to the lake is the Texarkana, Texas (TX)-Arkansas (AR) Metropolitan Statistical Area (MSA), which is located approximately 15 to 20 miles south/southwest of the lake. The Texarkana MSA is made up of Bowie County in Texas and Miller County in Arkansas.

Data from the 2010 Census, the U.S. Bureau of Labor Statistics, and the 2019 American Community Survey were used to summarize socioeconomic conditions in the project area. Table 2-11 shows 2010 and 2019 population estimates as well as the estimated annual growth rate for each county in the area. The annual growth rate in recent years (2010-2019) has been largely negative in the zone of influence. The annual growth rate in the zone of influence between 2010 and 2019 was -0.1%. During the same timeframe, the annual growth rate was 0.6% in the United States, 0.3% in Arkansas, 0.3% in Louisiana, 0.5% in Oklahoma, and 1.3% in Texas.

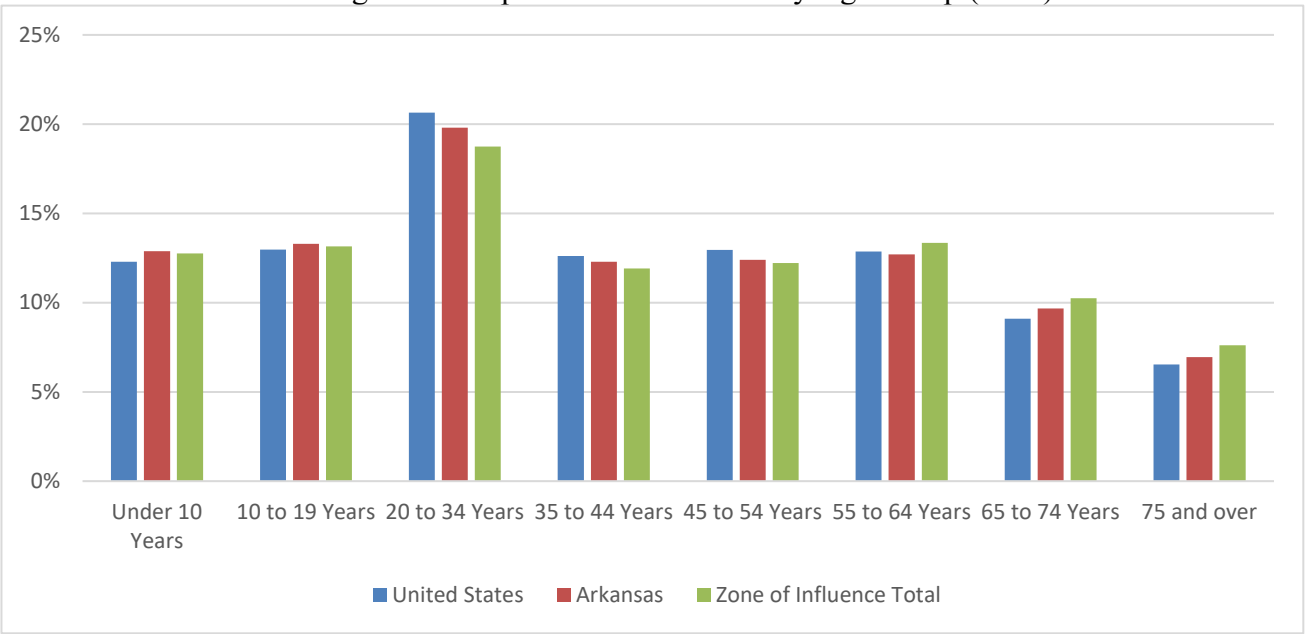
Table 2-11 Population Estimates and Trends

Geographical Area	2010 Population Estimate	2019 Population Estimate	Population Percent Change (2010-2019)
United States	308,745,538	324,697,795	0.6%
Arkansas	2,915,918	2,999,370	0.3%
Louisiana	4,533,372	4,664,362	0.3%
Oklahoma	3,751,351	3,932,870	0.5%
Texas	25,145,561	28,260,856	1.3%
Zone of Influence	**1,224,263**	**1,214,373**	**-0.1%**

Source: U.S. Bureau of the Census, 2010 Census (2010 Estimate); U.S. Bureau of the Census, American Community Survey (2019 Estimate)

Figure 2-9 displays the population by age group for the country, State of Arkansas, and the ZOI. In the ZOI, 13% of the population is 0 to 10 years old, another 13% is 10 to 19 years old, 19% is 20 to 34 years old, 12% is 35 to 44 years old, 12% is 45 to 54 years old, 13% is 55 to 64 years old, 10% is 65 to 74 years old, and 8% is 75 years and over. This age distribution is comparable to the State of Arkansas and the U.S.

Figure 2-9 Population Distribution by Age Group (2019)



Key income indicators (median household income and per capita income) are presented in Table 2-12. Per capita income for counties in the project area varies but is consistently lower than their respective state, often significantly. Average per capita income weighted by population for the entire ZOI was $24,988 in 2019. By comparison, per capita income was $34,103 in the United States, $26,577 in Arkansas, $27,923 in Louisiana, $28,422 in Oklahoma, and $31,277 in Texas. In terms of industries, the distribution across the ZOI is similar to that of the U.S., as well as the states surrounding the project area. The largest majority of the ZOI (31%) is employed in the Management, business, science, and arts occupations, followed by 22% in Sales and office occupations, 19% in Service occupations, 17% in production, transportation, and material moving occupations, and 12% in natural resources, construction, and maintenance occupations. Compared to the country, the ZOI has slightly less individuals employed in management, business, science, and arts occupations and slightly more in production, transportation, and material moving occupations.

Table 2-12 Income and Employment

Geographical Area	Median Household Income	Per Capita Income	Civilian employed population 16 years and over	Management, business, science, and arts occupations	Service occupations	Sales and office occupations	Natural resources, construction, and maintenance	Production, transportation, and material moving
United States	$62,843	$34,103	154,842,185	59,647,283	27,489,501	33,491,626	13,713,796	20,499,979
Arkansas	$47,597	$26,577	1,303,490	438,892	220,282	281,025	133,382	229,909
Louisiana	$49,469	$27,923	2,033,758	694,364	390,254	447,126	233,659	268,355
Oklahoma	$52,919	$28,422	1,772,123	615,904	310,390	392,689	199,411	253,729
Texas	$61,874	$31,277	13,253,631	4,867,492	2,288,826	2,937,388	1,433,389	1,726,536
Zone of Influence	**NA**	**$24,988**	**496,310**	**152,920**	**93,092**	**108,308**	**57,764**	**84,226**

Source: U.S. Bureau of the Census, American Community Survey (2019 Estimate)

In counties adjacent to Millwood Lake, tourism and recreation is also an important part of local economies. Recreation at the lake has substantial impact to local economies based on surveys of visitor spending and attendance at Corps projects. Between 2005 and 2019, annual average visitation was 386,000. In 2019, roughly 215,000 people visited Millwood Lake. Though visitation was slightly down compared to previous years, visitors still spent $7.4 million in local economies within 30 miles of the lake. This spending generated $6.9 million in business sales revenue and supported about 74 full and part time jobs with $2.1 million in labor income for local economies.

Executive Order 12898, entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," addresses potential disproportionate human health and environmental impacts that a project may have on minority or low-income communities. Thus, the environmental effects of the Project on minority and low-income communities or Native American populations must be disclosed, and agencies must evaluate projects to ensure that they do not disproportionally impact any such community. If such impacts are identified, appropriate mitigation measures must be implemented.

The demographics of the population within the vicinity of the Project must be considered and compared to the overall region to determine whether a project has a disproportionate effect on potential environmental justice communities (i.e., minority or low-income population). Guidance from the Council on Environmental Quality (CEQ) states that "minority populations should be identified where either: (1) the minority population of the affected areas exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997)."

Table 2-13 displays Census data summarizing racial and ethnic characteristics of the ZOI. Table 2-14 displays poverty indicators for the ZOI. The purpose is to analyze whether the demographics of the affected area differ in the context of the broader region; and if so, do differences meet CEQ criteria for an environmental justice community. Based on the analysis, poverty and unemployment are more prevalent in the ZOI than in the states surrounding the lake, as well as the United States. Further, the minority population in the ZOI is greater than that of Arkansas, Louisiana, and Oklahoma, though it does not exceed 50 percent.

Table 2-13 Population Distribution by Race and Ethnicity (2019)

Area	White alone	Black or African American alone	Hispanic or Latino (of any race)	American Indian and Alaska Native alone	Asian alone	Native Hawaiian and Other Pacific Islander alone	Some other race alone	Two or more races
United States	61%	12%	18%	1%	5%	0%	0%	2%
Arkansas	72%	15%	7%	1%	1%	0%	0%	2%
Louisiana	59%	32%	5%	1%	2%	0%	0%	2%
Oklahoma	66%	7%	11%	7%	2%	0%	0%	7%
Texas	42%	12%	39%	0%	5%	0%	0%	2%
Zone of Influence	63%	26%	7%	1%	1%	0%	0%	2%

Source: U.S. Bureau of the Census, American Community Survey (2019 Estimate)

Table 2-14 also displays the percentage of children (individuals under the age of 18) by county in the ZOI. The purpose of the data is to assess whether the project disproportionally affects the health or safety risks to children as specified by Executive Order (E.O.) 13045 - *Protection of Children from Environmental Health Risks and Safety Risks* (1997).

Table 2-14 Poverty Indicators and Number of Children (2019)

Area	Unemployment Rate	Percent of population below poverty line in last 12 months	Percent of Population Under 18 Years Old
United States	3.7%	13.4%	18.5%
Arkansas	3.5%	17.0%	23.7%
Louisiana	4.7%	19.2%	27.2%
Oklahoma	3.1%	15.7%	21.5%
Texas	3.5%	14.7%	20.9%
Zone of Influence	4.0%	20.3%	29.8%

Source: Bureau of Labor Statistics (Unemployment); U.S. Bureau of the Census, American Community Survey (2019 Estimate)

o. Recreation Facilities, Activities, and Needs

The recreational resource of Millwood Lake Project is considered to be of great importance to Arkansas. USACE has taken advantage of the natural and scenic beauty and constructed a variety of recreational facilities around the lake. Millwood Lake Project offers many recreational activities such as sightseeing, camping, swimming, picnicking, boating, canoeing/kayaking, nature study, bird watching, fishing, hunting, and hiking. There are sixteen designated recreation areas on Millwood Lake, twelve of which are operated by the USACE. The Arkansas State Parks manage and maintain one recreation area while Little River County manages and maintains three recreation areas. One full-service marina is owned and operated by the Arkansas State Parks. There are eighteen boat ramps on Millwood Lake, five are licensed to local County or State Government.

Figure 2-10 Visitors Fishing Millwood Lake

Photo by USACE

The criteria discussed in this section are of a basic nature to be used for the planning, development, and management of the project with consideration being given to the latest trends in recreational activities and needs, as stated in the Arkansas 2019-2023 SCORP. These criteria furnish guidelines for determining the type and number of facilities needed to satisfy the current and projected demand and also, furnishes guidelines for serviceability, operation, and maintenance of facilities. Considerations for the physically handicapped will be included in the design of facilities.

1. Facility Information

The future development of parks and design/layout 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. Recreation Areas

Multiple parks, lake access points, boat ramps, etc. exist on Millwood Lake. Some are Corps-operated, and some are operated by a county, resource agency (i.e., AGFC), or other entities. Park 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 develop may occur as identified in the park descriptions below. However, these proposed improvements are not indicated on the park plates. See Recreation Overview map for location of recreation areas.

Table 2-15 Recreation Facilities at Millwood Lake

Facility	Number of Sites
Recreation areas	16
Picnic sites	37
Camping sites	216
Playgrounds	8
Swimming areas	0
Trails	3
Fishing docks	6
Boat ramps	18
Marina slips	35
Source: USACE Institute for Water Resources, Value to the Nation	

The following areas are located within a High Density Recreation Land Classification and are Corps operated.

a. Beard's Bluff – This 57-acre park is located on the south-eastern side of Millwood Lake near the towns of Ashdown and Saratoga, Arkansas. Recreation facilities include: 22 campsites with electricity, flush toilets, showers, potable water, trailer dump station, playground, birdwatching area, and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Courtesy dock repair and enhancements.
- Addition to playground.
- Addition of nature trail.
- Addition of bicycle trail.
- Roadway enhancement.
- Addition boat ramp lanes and expansions.
- Create pollinator habitat.
- Improvements to the observation deck.
- Upgrade the overlook viewing area.
- Addition of fish cleaning station.
- Addition of group shelter.
- Modernize Park entrance/fee booth area.

b. Beard's Lake – This 33-acre park is located on the eastern side of the Little River just below Millwood Dam. Recreation facilities include: five campsites with electricity, flush toilets, potable water, launch ramp, playground, nature trail, fishing dock, and nearby dump station.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Courtesy dock enhancements.
- Addition to playground.
- Nature trail improvements.
- Addition of bicycle trail.
- Modernize Park entrance.

c. Cottonshed Landing – This 39-acre park is located on the northeastern side of Millwood Lake near the town of Mineral Springs, AR. Recreation features include: 45 campsites with electricity, flush toilets, showers, potable water, trailer dump station, playground, disc golf course, fishing pier, fish cleaning station, and two launch ramps.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Courtesy dock enhancements.
- Addition to playground.
- Nature trail improvements.
- Addition of bicycle trail.
- Installation of group picnic pavilion.
- Potential future marina operations.
- Addition of dump station for campers.
- Addition of fish tournament weigh in area.
- Modernize Park entrance/fee booth area.

d. Millwood Overlook and Dedication Site – This 5-acre park is located on the southwestern end of Millwood Lake, near the community of Saratoga, Arkansas. Recreation facilities include: a large pavilion, electricity, potable water, flush toilet, and playground.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Increase size of parking area.
- Addition of picnic sites.
- Addition to playground.
- Nature trail improvements.
- Addition of bicycle trail.
- Addition of outdoor classroom area/amphitheater.

e. Okay Landing – This 6-acre park is located on the northeastern side of Millwood Lake between the towns of Saratoga and Tollette, Arkansas. Recreation features include a vault toilet, courtesy boat dock, and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Courtesy dock enhancements.
- Nature trail improvements.
- Addition of bicycle trail.
- Addition of fish tournament weigh in area.

- Roadway improvements.

f. Paraloma – This 126-acre park is located on the northern end of Millwood Lake near the community of Paraloma, Arkansas. Recreation features include 30 campsites with electricity, flush toilets, showers, potable water, playground, trailer dump station, and launch ramps.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Addition to playground.
- Nature trail improvements.
- Addition of bicycle trail.
- Roadway improvements.
- Addition of disc golf course.
- Utilize existing campground infrastructure.
- Volunteer village.

g. Saratoga Landing – This 35-acre park is located on the eastern side of Millwood Lake near the town of Saratoga, Arkansas. Recreation facilities include: 17 campsites with electricity, flush toilets, showers, potable water, picnic shelter, and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Courtesy dock enhancements.
- Addition of playground.
- Nature trail improvements.
- Addition of bicycle trail.

h. River Run East – This 37-acre park is located below the Millwood Dam on the east side of the Little River near the town of Ashdown, Arkansas. Recreation facilities include: six primitive campsites, vault toilet, and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Addition of playground.
- Nature trail improvements.
- Addition of bicycle trail.
- Road improvements.
- Addition of high-water ramp with parking area.

i. River Run West – This 46-acre park is located below the Millwood Dam on the west side of the Little River, near the town of Ashdown, Arkansas. Recreation facilities include: four primitive campsites, vault toilet, and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Addition of playground.
- Nature trail improvements.
- Addition of bicycle trail.

j. Wilton Landing – This 5-acre park is located on the Little River west of Millwood Lake near town of Wilton, Arkansas. Recreation features include vault toilet and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Courtesy dock enhancements.
- Nature trail improvements.

k. White Cliffs Park – This 22-acre park is located on the eastern bank of the Little River between the communities of Ben Lomond and Paraloma, Arkansas.

Recreation facilities constructed within the area include: 25 campsites (all with electricity), flush toilets, showers, potable water, trailer dump station, launch ramp, playground, and fish cleaning station.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Addition of playground.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Addition of trail.
- Roadway improvements.
- Addition of bicycle trail.

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

l. Ashley's Camp – This 35-acre park is located just to the northeast of Wilton Landing on the Little River near the town of Wilton, Arkansas. Recreation features include primitive camping.

Anticipated park improvements for the future include (pending receipt of funds):

- Roadway improvements.
- Addition of nature trail.

County operated Parks:

m. Jack's Isle – This 8-acre park is located on the western side of Millwood Lake on the Little River near the town of Ashdown, Arkansas. This area is leased by Little River County. Recreation features include: vault toilets, fishing dock, and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Courtesy dock enhancements.

- Addition to playground.
- Nature trail improvements.
- Addition of bicycle trail.
- Addition of fish tournament weigh in area.
- Roadway repairs.
- Addition of marina.

n. Yarborough Landing – This 4-acre park is located on the western side of Millwood Lake near the town of Ashdown, Arkansas. This area is leased by Little River County. Recreation features include: courtesy dock, picnic sites, launch ramp, and emergency helipad.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Courtesy dock enhancements.
- Nature trail improvements.
- Addition of bicycle trail.
- Addition of fish tournament weigh in area.
- Construction of cabins/hotel lodging.

State Operated Parks:

o. Millwood State Park – Formerly known as Cypress Slough, this 594-acre park is located on the southwestern end of Millwood Lake, near the town of Ashdown, Arkansas. This area is leased by the Arkansas State Parks. Recreation facilities include: 45 campsites with electricity, flush toilets, showers, playground, boat dock, commercial marina, nature trail, and 2 launch ramps.

Anticipated park improvements for the future include (pending receipt of funds):

- Addition of waterborne restroom with showers.
- Convert all campsites to current industry standards.
- Increase size of current boat ramp and parking area.
- Addition of picnic sites.
- Additional campsites.
- Courtesy dock enhancements.
- Addition to playground.
- Nature trail improvements.
- Addition of bicycle trail.
- Roadway improvements.

- Upgrade marina and boat slips
- Update State Project Office and employee housing.
- Addition of outdoor classroom/amphitheater area.
- Construction of cabins/hotel lodging.

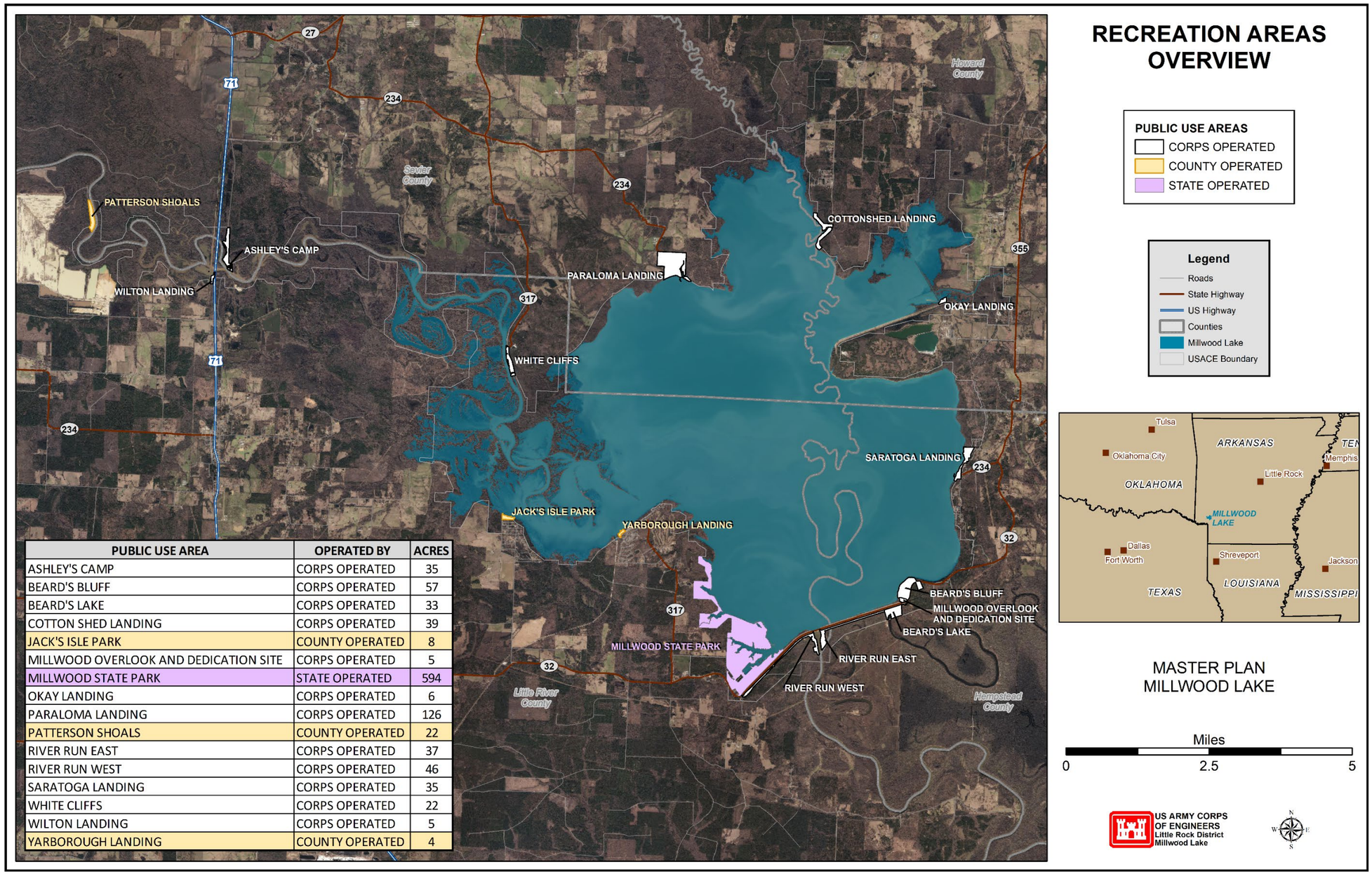
The following area is within a Low Density land classification leased to the Little River County. Operational costs and capital improvements are the responsibility of the lessee.

p. Patterson Shoals – This 22-acre park is located on the far northwestern end of the Millwood Lake Project near the town of Wilton, Arkansas. This area is leased by Little River County. Recreation features include: primitive camping and launch ramp.

Anticipated park improvements for the future include (pending receipt of funds):

- Roadway improvements.
- Improve existing boat ramp.

Figure 2-11 Millwood Lake Recreation Area Overview



PUBLIC USE AREA	OPERATED BY	ACRES
ASHLEY'S CAMP	CORPS OPERATED	35
BEARD'S BLUFF	CORPS OPERATED	57
BEARD'S LAKE	CORPS OPERATED	33
COTTON SHED LANDING	CORPS OPERATED	39
JACK'S ISLE PARK	COUNTY OPERATED	8
MILLWOOD OVERLOOK AND DEDICATION SITE	CORPS OPERATED	5
MILLWOOD STATE PARK	STATE OPERATED	594
OKAY LANDING	CORPS OPERATED	6
PARALOMA LANDING	CORPS OPERATED	126
PATTERSON SHOALS	COUNTY OPERATED	22
RIVER RUN EAST	CORPS OPERATED	37
RIVER RUN WEST	CORPS OPERATED	46
SARATOGA LANDING	CORPS OPERATED	35
WHITE CLIFFS	CORPS OPERATED	22
WILTON LANDING	CORPS OPERATED	5
YARBOROUGH LANDING	COUNTY OPERATED	4

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 occurred.

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

4. Visitation Profiles

Table 2-16 Project Visitation 2013-2018

Project Visitation 2003-2018	
2003	583,031
2004	824,859
2005	460,044
2006	470,763
2007	436,002
2008	446,936
2009	518,816
2010	461,210
2011	398,222
2012	360,046
2013	461,210
2014	289,898
2015	344,801
2016	240,740
2017	409,658
2018*	296,096

*New visitation program was launched

5. Recreation Analysis

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

Arkansas SCORP Data (2019-2023)

Over the past 25 years the top 10 recreational activities that Arkansans prefer hasn't changed substantially. Two activities have exchanged popularity from year to year, walking for pleasure and exercise, and driving for pleasure. According to a recent survey, walking, jogging or hiking tops the list, with nature viewing ranking second. Increased interest in healthy lifestyles helps

hold these timeless activities at the top. For driving, higher gasoline prices may be one factor that influences driving habits, but this activity remains very popular as a way to view and enjoy the beauty of the natural landscape.

Table 2-17 Popular Outdoor Activities

Recent Poll	2009	1993
Walking	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/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		

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

driving for pleasure, and general access by car, to most sites, the public roadways are becoming ever more important, to the broader function of recreational sites and facilities.

A copy of the entire Arkansas SCORP can be found at the Outdoors grants website.

p. Real Estate

1. Acquisition Policy

Construction of Millwood Reservoir was authorized for flood control and other purposes by the Flood Control Act of July 24, 1946, (Public Law 526, 79th Congress, Chapter 596, 2nd Session, H.R. 6597) and further modified by the Flood Control Act approved July 3, 1958, (Public Law 85-500, 85th Congress, S 3901) as recommended by the Chief of Engineers in House Document No. 170, 85th Congress. Design Memorandums were completed identifying all land and interests in land that would be necessary for the operation, maintenance, and control of the reservoir. The fee acquisition line, as a general rule, was blocked out along regular subdivision or property lines to include all lands below elevation 259.2 msl or to include the lands required for public access areas. In areas where the acquisition did not encompass lands needed for occasional flooding, flowage easements were typically acquired between the fee acquisition line and elevation 290 msl.

2. Management and Disposal Policy

The Real Estate Management and Disposal program for Millwood 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 Millwood Lake Operations Manager, who then makes a recommendation through the Little Rock District Chief of Operations to the Chief of Real Estate.

3. Explanation of Flowage Easement and Total Fee Acreage on Millwood Lake

Table 2-18 Acreage differences

Type of Acreage	LiDAR	Deeded Language	1974 Master Plan
Flowage Easement	91,198.5 acres	93,740 acres	93,152 acres
Total Fee	37,631 acres	36,666 acres	40,914 acres

Note: A small difference in acreage figures exists throughout this document, due to the use of newer technologies, like LiDAR, to generate data. LiDAR is a snapshot of the conditions at the time the LiDAR was completed, and therefore, conditions may change slightly over time. Because of this, the Corps 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 the Corps for approval prior to beginning any action that may impact federal property rights.

q. Pertinent Public Laws

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. Recreation

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

- PL 78-534, Flood Control Act of 1944 (22 December 1944), authorized the Chief of Engineers to provide facilities in reservoir areas for public use, including recreation and conservation of fish and wildlife.
- PL 79-526, Flood Control Act of 1946 (24 July 1946), amends PL 78-534 to include authority to grant leases to nonprofit organizations at recreational facilities in reservoir areas at reduced or nominal charges.
- PL 83-780, Flood Control Act of 1954 (3 September 1954), further amends PL 78-534 and authorizes the Secretary of the Army to grant leases to Federal, State, or governmental agencies without monetary considerations for use and occupation of land and water areas under the jurisdiction of the Department of the Army for park and recreational purposes when in the public interest.
- PL 87-874, Flood Control Act of 1962, broadened the authority under PL 78-534 to include all water resource projects.
- Joint Land Acquisition Policy for Reservoir Projects (Federal Register, Volume 27, 22 February 1962) allows the Department of the Army to acquire additional lands necessary for the realization of potential outdoor recreational resources of a reservoir.
- PL 88-578, Land and Water Conservation Fund Act of 1965 (1 September 1964) prescribes conditions under which USACE may charge for admission and use of its recreational areas.
- PL 89-72, Federal Water Project Recreation Act of 1965 (9 July 1965), requires sharing of financial responsibilities in joint Federal and non-Federal recreational and fish and wildlife resources with no more than half of the cost borne by the Federal Government.
- PL 90-480, Architectural Barriers Act of 1968 (12 August 1968), as amended, requires access for persons with disabilities to facilities designed, built, altered, or leased with Federal funds.
- PL 101-336, Americans with Disabilities Act of 1990 (ADA) (26 July 1990), as amended by the ADA Amendments Act of 2008 (PL 110-325), prohibits discrimination based on disabilities in, among others, the area of public accommodations and requires reasonable accommodation for persons with disabilities.
- PL 102-580, Water Resources Development Act of 1992 (31 October 1992), authorizes the USACE to accept contributions of funds, materials, and services from non-Federal public and private entities to be used in managing recreational facilities and natural resources.

- PL 103-66, Omnibus Budget Reconciliation Act–Day Use Fees (10 August 1993), authorized the USACE to collect fees for the use of developed recreational sites and facilities, including campsites, swimming beaches, and boat ramps.
- PL 104-333, Omnibus Parks and Public Lands Management Act of 1996 (12 November 1996) created an advisory commission to review the current and anticipated demand for recreational opportunities at lakes and reservoirs managed by the Federal Government and to develop alternatives to enhance the opportunities for such use by the public.

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 Millwood Lake:

- PL 75-761, *Flood Control Act of 1938* (28 June 1938), authorizes the construction of civil engineering projects such as dams, levees, dikes, and other flood risk management measures through the USACE.
- PL 77-228, *Flood Control Act of 1941*(18 August 1941), amended the Flood Control Act of 1938 and appropriated $24M to support construction of multiple-purpose reservoir projects in the White River Basin.
- PL 78-534, *Flood Control Act of 1944* (22 December 1944), specifies the rights and interests of the states in water resources development and requires cooperation and consultation with State agencies in planning for flood risk management.
- PL 79-14, *Rivers and Harbors Act of 1945* specifies the rights and interests of the states in watershed development and water utilization and control, and the requirements for cooperation with state agencies in planning for flood control and navigation improvements.
- PL 85-500, *Water Supply Act of 1958* (3 July 1958), authorizes the USACE to include municipal and industrial water supply storage in multiple-purpose reservoir projects.
- PL 87-88, *Federal Water Pollution Control Act Amendments of 1961* (20 July 1961), requires Federal agencies to address the potential for pollution of interstate or navigable waters when planning a reservoir project.
- PL 89-80, *Water Resources Planning Act of 1965* (22 July 1965), provides for the optimum development of the Nation's natural resources through coordinated planning of water and related land resources. It provides authority for the establishment of a water resources council and river basin commission.
- PL 89-298, *Flood Control Act of 1965* (27 October 1965), authorizes the Secretary of the Army to design and construct navigation, flood risk management, and shore protection projects if the cost of any single project does not exceed $10 million.
- PL 92-500, *Federal Water Pollution Control Act (Clean Water Act)* (October 18, 1972) Establishes a national goal of eliminating all discharges into U.S. waters by 1985 and an interim goal of making the waters safe for fish, shellfish, wildlife and people by July 1, 1983. Also provides that in the planning of any USACE reservoir consideration shall be given to inclusion of storage for regulation of streamflow.
- PL 95-217, Clean Water Act of 1977 (15 December 1977), amends PL 87-88 and requires the Environmental Protection Agency (EPA) to enter into written agreements

with the Secretaries of Agriculture, the Army, and the Interior to provide maximum utilization of the laws and programs to maintain water quality.

- PL 99-662, *Water Resource Development Act of 1986* (17 November 1986), establishes cost sharing formulas for the construction of harbors, inland waterway transportation, and flood risk management projects.

4. Fish and Wildlife Resources

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

- PL 79-732, Fish and Wildlife Coordination Act (10 March 1934) provides authority for making project lands available for management by interested State agencies for wildlife purposes.
- Title 16 U.S. Code (U.S.C.) §§ 668-668a-d, Bald and Golden Eagle Protection Act of 1940 (8 June 1940) as amended, prohibits anyone, without a permit issued by the Secretary of the Interior, from taking Golden eagles (*Aquila chrysaetos)* and Bald eagles (*Haliaeetus leucocephalus)*, including their nests or eggs.
- PL 85-624, Fish and Wildlife Coordination Act (12 August 1958), states that fish and wildlife conservation will receive equal consideration with other project purposes and be coordinated with other features of water resources development programs.
- The Federal Water Project Recreation Act of 1965 (PL 89-72) requires consideration of opportunities for fish and wildlife enhancement in planning water resources projects. Non-Federal bodies are encouraged to operate and maintain the project fish and wildlife enhancement facilities. If non-Federal bodies agree in writing to administer the facilities at their expense, the fish and wildlife benefits are included in the project benefits and project cost allocated to fish and wildlife. Fees may be charged by the non-Federal bodies to repay their costs. If non-Federal bodies do not so agree, no facilities for fish and wildlife may be provided.
- PL 91-190, National Environmental Policy Act of 1969 (NEPA) (1 January 1970), establishes a broad Federal policy on environmental quality stating that the Federal government will assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings, and preserve important historic, cultural, and natural aspects of our national heritage.
- PL 93-205, Conservation, Protection, and Propagation of Endangered Species (28 December 1973) requires that Federal agencies will, in consultation with the U.S. Fish and Wildlife Service (USFWS), further conservation of endangered and threatened species and ensure that their actions are not likely to jeopardize such species or destroy or modify their critical habitat.
- PL 95-632, Endangered Species Act Amendments of 1978 (10 November 1978), specifies a consultation process between Federal agencies and the Secretaries of the Interior, Commerce, or Agriculture for carrying out programs for the conservation of endangered and threatened species.
- PL 101-233, North American Wetland Conservation Act (13 December 1989), directs the conservation of North America wetland ecosystems and requires agencies to manage their lands for wetland/waterfowl purposes to the extent consistent with missions.

- PL 106-147, Neo-tropical Migratory Bird Conservation Act (20 July 2000) promotes the conservation of habitat for neo-tropical migratory birds.

5. Forest Resources

The following law pertains to management of forested lands and is pertinent to the Millwood Lake project:

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

6. Cultural Resources

A number of public laws mandate protection of cultural resources on public lands. The following are pertinent to USACE project lands at the Millwood Lake project:

- PL 59-209, Antiquities Act of 1906 (8 June 1906), applies to the appropriation or destruction of antiquities on federally owned or controlled lands and has served as the precedent for subsequent legislation.
- PL 74-292, Historic Sites Act of 1935 (21 August 1935), declares that it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States.
- PL 86-523, Reservoir Salvage Act of 1960 (27 June 1960), provides for the preservation of historical and archaeological data that might otherwise be lost as the result of the construction of a dam and attendant facilities and activities.
- PL 89-665, National Historic Preservation Act of 1966 (NHPA) (15 October 1966), establishes a national policy of preserving, restoring, and maintaining cultural resources.

It requires Federal agencies to take into account the effect an action may have on sites that may be eligible for inclusion on the National Register of Historic Places.

- PL 93-291, Archaeological and Historic Preservation Act of 1974 (24 May 1974), amends PL 86-523 and provides for the Secretary of Interior to coordinate all Federal survey and recovery activities authorized under this expansion of the Reservoir Salvage Act of 1960. The Federal construction agency may expend up to 1 percent of project funds on cultural resource surveys.
- PL 96-95, Archaeological Resources Protection Act of 1979 (31 October 1979), updates PL 59-209 and protects archaeological resources and sites on public lands and fosters increased cooperation and exchange of information among governmental authorities, the professional archaeological community, and private individuals.
- PL 101-601, Native American Graves Protection and Repatriation Act (16 November 1990), requires Federal agencies to return Native American human remains and cultural items, including funerary objects and sacred objects, to their respective peoples.

7. Leases, Easements, and Rights-of-Way

A number of laws and regulations govern the granting of leases, easements, and rights-of-way on Federal lands. The following are pertinent to USACE project lands at the Millwood Lake project:

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

Chapter 3. Goals and Objectives

a. The Millwood Lake Master Plan Revision Statement

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

"Millwood Lake: Provide a quality outdoor recreation experience while ensuring prudent management and conservation of the Project's Natural Resources securing a sustainable future for our environment benefiting present and future generations."

b. 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 Millwood Lake Project Management Plan for the Master Plan revision.

Assumptions: unlimited resources, this Master Plan revision is everyone's 1st priority (no other 'items' on our plate).

c. Goals and Objectives

1. Goals

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

The following excerpt from EP 1130-2-550, Chapter 3, express the goals for the Millwood 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.

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, Millwood 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 Arkansas State Comprehensive Outdoor Recreation Plan (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 Millwood Lake.

Table 3-1 Resource Objectives, Millwood Lake

Recreational Objectives	**Goals**				
	A	**B**	**C**	**D**	**E**
Evaluate the demand for improved recreation facilities and increased public access on Corps-managed public lands and water for recreational activities (i.e., camping, walking, hiking, biking, boating, hunting, fishing, wildlife viewing, etc.) and facilities (i.e., campsites, picnic facilities, 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.	*		*		*

Recreational Objectives	Goals				
	A	B	C	D	E
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 universally accessible facilities on Millwood 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, docks, etc.). Note that water level management is not within the scope of the Master Plan.	*	*	*	*	
Ensure consistency with 2021 Natural Resources Management 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. Note that water level management is not within the scope of the Master Plan.	*	*		*	
Actively manage and conserve forest, fish, and wildlife resources (i.e., Blackland prairie areas), 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.		*			*

Natural Resource Management Objectives	Goals				
	A	B	C	D	E
Optimize resources, labor, funds, and partnerships for the management and prevention of invasive species in and around Millwood Lake.		*			*
Minimize activities which disturb the scenic beauty and aesthetics of the lake.	*	*	*	*	*
Continually evaluate erosion control and sedimentation issues at Millwood Lake.	*	*			*
Manage project lands and water to support threatened and endangered species and their habitat.	*	*		*	*
Identify and protect unique or sensitive habitat areas.	*	*		*	*
Stop unauthorized activities and uses of public lands such as timber trespass, unpermitted docks and other structures, clearing of vegetation, unauthorized roadways, off-road vehicle (ORV) use, trash dumping, and placement of personal property that create negative environmental impacts.	*	*	*	*	*
Promote forest health through forest resource management actions to create diverse and sustainable forest habitat.	*	*		*	
Evaluate and determine appropriate statutory and 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.	*	*	*	*	*
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.	*	*		*	*

Environmental Compliance	Goals				
	A	B	C	D	E
Ensure compliance with Environmental Review Guide for Operations (ERGO) at all Millwood Lake facilities and outgrants (i.e., State Park Marina, etc.).	*	*			*
Ensure compliance with regulations prohibiting Privately Owned Domestic Sewer Systems on Federal lands.	*	*			

Visitor Information, Education and Outreach Objectives	Goals				
	A	B	C	D	E
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 river-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 river.	*		*	*	*
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 public land and shoreline use policies.	*	*	*	*	*
Continue to educate the public on the Little River Water Control Plan, along with other management and operation plans (i.e., Shoreline Management Plan, Operation Management Plan, etc.).	*		*	*	*

Economic Impacts Objectives	Goals				
	A	B	C	D	E
Balance economic and environmental interests involving Millwood 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, navigation, water supply, flood risk management, recreation, hydropower, and environmental stewardship.	*	*	*	*	*
Ensure consistency with USACE Campaign Plan (national level), Implementation Plan (regional level), Operations Plan (District level).					*
Ensure consistency with Executive Order 13148, 'Greening the Government Through Leadership in Environmental Management' (21 April 2000).					*
Ensure consistency with Executive Orders 13423 and 13514, 'Strengthening Federal Environmental, Energy, and Transportation Management' (24 January 2007) and 'Federal Leadership in Environmental, Energy, and Economic Performance' (5 October 2009), respectively, to guarantee compliance with Leadership in Energy and Environmental Design (LEED) criteria for government facilities.					*
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 river development and the evaluation of cultural resources with State Historic Preservation Offices and federally recognized Tribes.	*	*		*	*
Continue to inventory cultural resources on the project.	*	*		*	*
Increase public awareness of Millwood Lake history.		*		*	*
Maintain compliance with Section 106 and 110 of the National Historic Preservation Act; the Archeological Resources Protection Act; and the Native American Graves Protection and Repatriation Act on public lands surrounding the river.		*		*	*
Prevent unauthorized or illegal excavation and removal of cultural resources on project lands.		*		*	*

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

a. Introduction

Millwood Lake is a multipurpose project constructed primarily for flood control. Project purposes of Millwood Lake other than flood control are water supply, fish and wildlife, and 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 Millwood 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. LiDAR is a snapshot of the conditions at the time the LiDAR was completed, and therefore, conditions may change slightly over time. Because of this, the Corps 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 the Corps for approval prior to beginning any action that may impact federal property rights.).

Project land and water total 37,631 acres. There is an additional 91,199 acres of flowage easement lands. Flowage easement lands lie above or landward of the fee acquisition line 259.2 msl or up to elevation 290 msl on the Little River and the Cossatot River and up to elevation 262, 261, 260 msl downstream of the Millwood dam along the Little River. Flowage easement areas are indicated by the purple color on the land classification maps in Appendix D.

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 Millwood 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.

b. Land Allocations

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

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

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

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

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

c. Land Classifications

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 Millwood 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.

   Current acreage: 339.3 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.

   Current acreage: 1,018.5 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.

   Current 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.

   Current acreage: 2,898.1 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.).

   Current acreage: 243.6 acres

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

   Current acreage: 4,700 acres

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

   Current acreage: 133.2 acres

   (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.

   Current acreage: None (acres)

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.

    Current acreage: 76.3 acres

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

    Current 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.

    Current acreage: none

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

    Current acreage: 28,222.2 acres

d. Project Easement Lands

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: 8.8 acres

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

    Current acreage: 91,198.5 acres

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

    Current acreage: none

Chapter 5. Resource Plan

This chapter describes in broad terms how project lands and water surface will be managed. For Millwood Lake, the PDT chose the Management by Classification approach as set forth in EP 1130-2-550.

In addition, the initial section contains a brief description of each alternative developed during the Master Plan revision process. A more detailed description is provided in the accompanying Environmental Assessment, Appendix A, to this document. All alternatives are compared against the No Action alternative (in this revision process, Alternative 3 is the No Action alternative).

a. Alternatives Developed during the Master Plan Revision Process

1. Alternative 1 MAXIMUM CONSERVATION

- Increase acreage of Environmentally Sensitive Areas (ESA)
    - Ashley's Camp and Patterson's Shoals changed to ESA to prevent any future development.
    - Wildlife Management land classification where no shoreline use permits are currently located convert to ESA.
    - Bluffs and scenic areas to ESA.
- Ramps and historical access areas are classified as Low Density Recreation.
    - Not viable alternative because:
        - This alternative would not allow for balancing the use of the resource with conservation efforts.
        - It would also not allow for working with adjacent landowners on vegetation modifications to improve the resource.

Figure 5-1 Alternative 1 Maximum Conservation

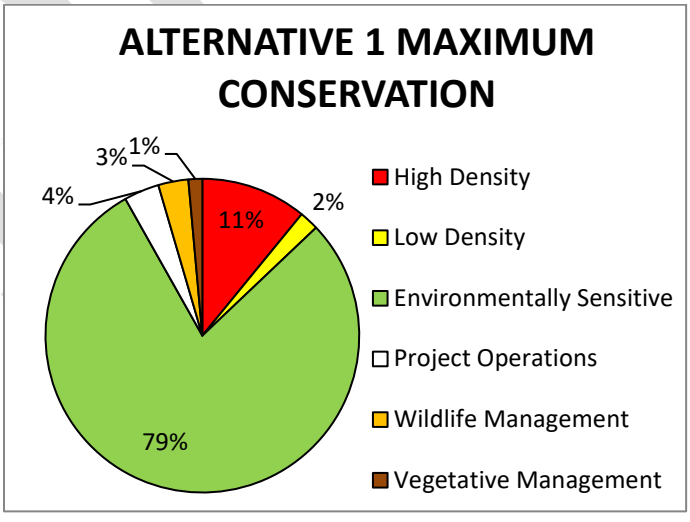


Table 5-1 Land Classification Changes from No Action to Alternative 1

No Action	Converted to	Preferred	Acres	% from No Action
No Allocation	Converted to	Low Density Recreation	12.3	8.2%
		Environmentally Sensitive	132.2	87.8%
		High Density Recreation	2.5	1.6%
		Wildlife Management	0.0	0.0%
		Vegetative Management	0.0	0.0%
		Project Operations	3.6	2.4%
WILDLIFE MANAGEMENT	Converted to	Low Density Recreation	0.0	0.0%
		Environmentally Sensitive	5,358.2	99.9%
		High Density Recreation	3.1	0.1%
		Wildlife Management	0.0	0.0%
		Vegetative Management	0.0	0.0%
		Project Operations	0.0	0.0%
ENVIRONMENTALLY SENSITIVE	Converted to	Low Density Recreation	71.8	3.5%
		Environmentally Sensitive	1,398.2	67.9%
		High Density Recreation	259.2	12.6%
		Wildlife Management	181.5	8.8%
		Vegetative Management	130.9	6.4%
		Project Operations	16.3	0.8%
HIGH DENSITY RECREATION	Converted to	Low Density Recreation	102.5	7.4%
		Environmentally Sensitive	443.2	32.0%
		High Density Recreation	680.4	49.2%
		Wildlife Management	107.5	7.8%
		Vegetative Management	2.4	0.2%
		Project Operations	48.3	3.5%
PROJECT OPERATIONS	Converted to	Low Density Recreation	0.0	0.0%
		Environmentally Sensitive	34.1	9.0%
		High Density Recreation	73.4	19.4%
		Wildlife Management	0.00	0.0%
		Vegetative Management	0.0	0.0%
		Project Operations	271.1	71.6%
		Total=	9,332.7	

2. Alternative 2 MODERATE CONSERVATION (Preferred)

- This alternative recognizes public comment and preferences collected during Scoping; recognizes regional Natural Resource Management priorities.
- Recognizes USACE historical management at Millwood Lake.
- The alternative has no negative effect on current or projected use.
- Most islands are classified as Wildlife Management for duck hunting. Duck hunting is a primary activity on Millwood.
- Increased Wildlife Management land classification: Okay Landing, River Run East, River Run West, Beard's Lake, and Wilton Landing. These public use areas from the 1974 MP have been partially reclassified from High Density to Wildlife Management based on current land management practices.
- Reclassified Ashley's Camp from High Density to Low Density and Patterson's Shoals from Wildlife Management to Low Density to encompass the public use area. White Cliffs High Density was modified to include park usage area.
- Reclassified a large portion of the Arkansas State Park Lease area from ESA to High Density.
- Some areas with vegetation modification permits are classified as ESA to reduce future shoreline use permits in areas to protect environmentally sensitive features.
- White Cliffs Park High Density area expanded for potential future development.

Figure 5-2 Alternative 2 Moderate Conservation

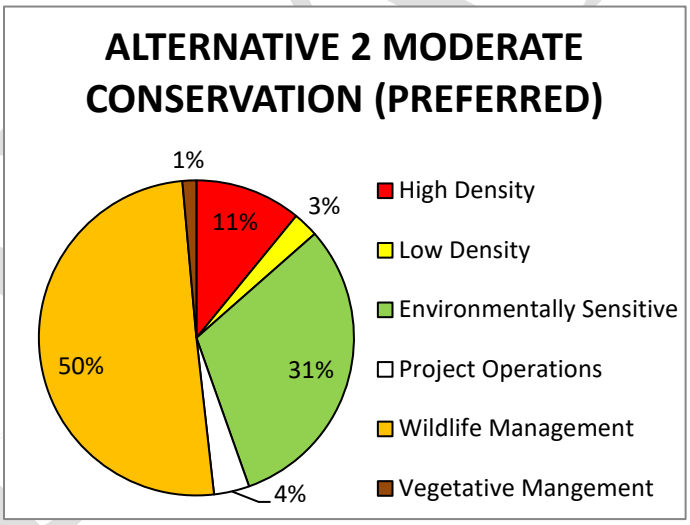


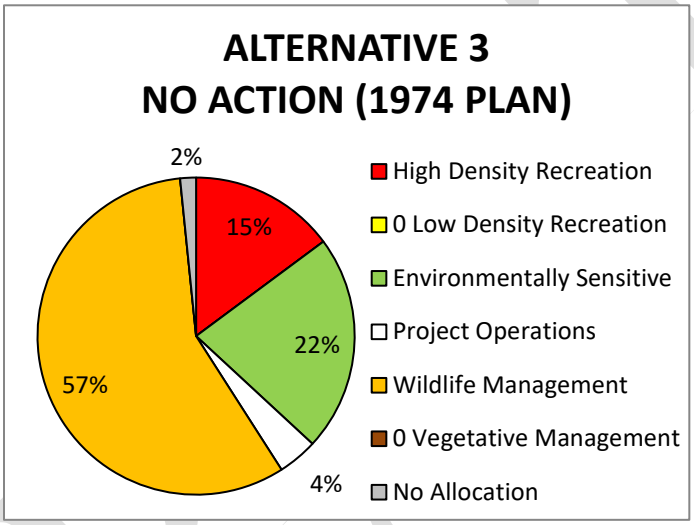
Table 5-2 Land Classification Changes from No Action to Alternative 2

No Action	Converted to	Preferred	Acres	% from No Action
No Allocation	Converted to	Low Density Recreation	12.3	8.2%
		Environmentally Sensitive	92.0	61.1%
		High Density Recreation	2.5	1.6%
		Wildlife Management	40.2	26.7%
		Vegetative Management	0.0	0.0%
		Project Operations	3.6	2.4%
Wildlife Management	Converted to	Low Density Recreation	57.0	1.1%
		Environmentally Sensitive	1110.0	20.7%
		High Density Recreation	3.1	0.1%
		Wildlife Management	4191.2	78.2%
		Vegetative Management	0.0	0.0%
		Project Operations	0.0	0.0%
Environmentally Sensitive	Converted to	Low Density Recreation	71.8	3.5%
		Environmentally Sensitive	1398.2	67.9%
		High Density Recreation	259.2	12.6%
		Wildlife Management	181.5	8.8%
		Vegetative Management	130.9	6.4%
		Project Operations	16.3	0.8%
High Density Recreation	Converted to	Low Density Recreation	102.5	7.4%
		Environmentally Sensitive	263.8	19.1%
		High Density Recreation	680.4	49.2%
		Wildlife Management	287.0	20.7%
		Vegetative Management	2.4	0.2%
		Project Operations	48.3	3.5%
Project Operations	Converted to	Low Density Recreation	0.0	0.0%
		Environmentally Sensitive	34.1	9.0%
		High Density Recreation	73.4	19.4%
		Wildlife Management	0.01	0.0%
		Vegetative Management	0.0	0.0%
		Project Operations	271.1	71.6%
		Total=	9332.7	

3. Alternative 3 NO ACTION (1974 PLAN)

- This is not a viable alternative because:
  - 2% or 150.6 acres of Federal lands are not classified.
  - This alternative does not recognize public comment or regional trends (recreation and resource management).
- This alternative does not address resource management laws, policies, and regulations that were implemented after the 1974 Millwood Lake Master Plan.

Figure 5-3 Alternative 3, No Action (1974 Plan)



4. Alternative 4 MINIMUM CONSERVATION

- Classifies some areas as Low Density Recreation to allow future development of trails and shoreline permits such as vegetative management and path permits.
- Areas near Cottonshed, Saratoga, and Paraloma parks were classified as Low Density to allow increased interpretive trails and activities (previously classified as ESA and Wildlife Management Areas).
- This is not a viable alternative because:
    - Increased development in Low Density areas (more trails and more vegetative management permits) would require additional staff to manage these areas with this alternative.
    - Does not reflect public scoping comments.
    - Current land base is not sufficient for High Density development.
    - No demand for development of High Density areas (current High Density locations have adequate space to meet current and future demand).

Figure 5-4 Alternative 4, Minimum Conservation

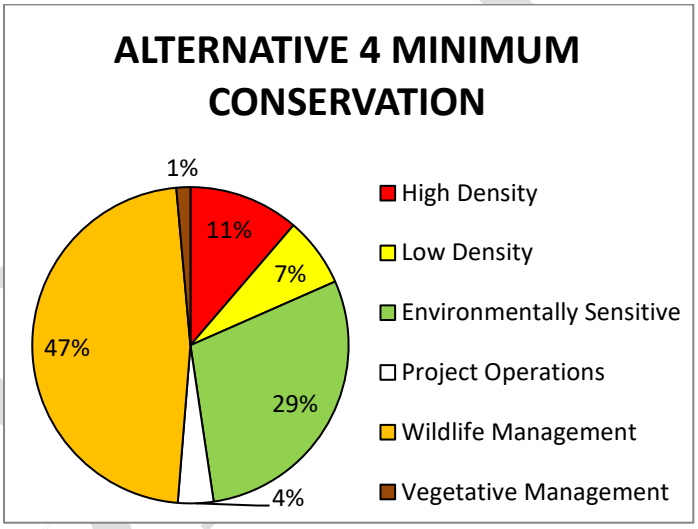


Table 5-3 Land Classification Changes from No Action to Alternative 4

No Action	Converted to	Preferred	Acres	% from No Action
No Allocation	Converted to	Low Density Recreation	41.7	27.7%
		Environmentally Sensitive	68.2	45.3%
		High Density Recreation	2.5	1.6%
		Wildlife Management	34.7	23.0%
		Vegetative Management	0.0	0.0%
		Project Operations	3.6	2.4%
WILDLIFE MANAGEMENT	Converted to	Low Density Recreation	157.0	2.9%
		Environmentally Sensitive	1110.0	20.7%
		High Density Recreation	38.5	0.7%
		Wildlife Management	4055.8	75.6%
		Vegetative Management	0.0	0.0%
		Project Operations	0.0	0.0%
ENVIRONMENTALLY SENSITIVE	Converted to	Low Density Recreation	142.0	6.9%
		Environmentally Sensitive	1328.0	64.5%
		High Density Recreation	259.2	12.6%
		Wildlife Management	181.5	8.8%
		Vegetative Management	130.9	6.4%
		Project Operations	16.3	0.8%
HIGH DENSITY RECREATION	Converted to	Low Density Recreation	322.9	23.3%
		Environmentally Sensitive	188.7	13.6%
		High Density Recreation	680.4	49.2%
		Wildlife Management	141.7	10.2%
		Vegetative Management	2.4	0.2%
		Project Operations	48.3	3.5%
PROJECT OPERATIONS	Converted to	Low Density Recreation	0.01	0.0%
		Environmentally Sensitive	34.1	9.0%
		High Density Recreation	73.4	19.4%
		Wildlife Management	0.00	0.0%
		Vegetative Management	0.0	0.0%
		Project Operations	271.1	71.6%
		Total=	9332.7	

b. Classifications and Justification

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

- All valid private floating facilities are located in the Low Density land classification.
- Existing vegetation modification permits are located in the Low Density and/or ESA classifications.
- There may be some existing vegetation modifications located in ESA, these permits may be allowed to remain but not transferred.
- Past classification lines, edges of shoreline use permits/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.
- GIS/various dated imagery and hard copy permit information was used to identify dock locations and vegetation modification (mowing).

In addition, the PDT considered the previous land classification (from the 1974 Master Plan), the feasibility of keeping or changing the land classification with the Master Plan revision, and the potential future development needs around the lake. Additionally, all agency and public comments received during the public comment periods were considered during the revision process.

1. Project Operations

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

Justification: On Millwood Lake, the lands classified as Project Operations have been classified by definition. Portions of Millwood Dam and Okay Levee (toe and embankments) were reclassified from High Density to Project Operations to include a protective buffer for the toe of the dam and levee. The Project Office area and associated facilities (i.e., storage compound) were reclassified from High Density to Project Operations. Areas around the water intake structure were reclassified from High Density to Project Operations to address the Arkansas Department of Health's recommendation of a ¼ mile buffer around any intake structure. The Bypass Valve below Millwood Dam was reclassified from High Density to Project Operations. The Pakistani Fly house was reclassified from an ESA to Project Operations.

When Millwood Lake was established, three tracts of land were acquired to stop burial activity within preexisting cemeteries that would have otherwise been within flowage easement. Due to the location of these tracts, no legal access exists for management of these lands. These lands went from no classification to Project Operations.

Resource Objectives: General Management

(Acreage = 339.3 acres or 4 % of USACE land)

2. High Density Recreation

This land classification is for those lands intended to be developed or are currently developed for intensive recreational activities for the visiting public including day use areas and/or campgrounds. These could include areas for commercial marina concessions and quasi-public development (i.e., resort facilities).

Justification: There were various areas on Millwood Lake with usage that was consistent with High Density Recreation but that were not classified according to its usage in the 1974 plan. Portions of Wildlife Management areas near White Cliffs and Wilton Landing were reclassified to High Density to encompass recreational usage associated with the parks. Yarborough Landing was changed from an Environmentally Sensitive Area to High Density to encompass the Arkansas State Park Lease. Yarborough Landing has been reclassified from Environmentally Sensitive Area to High Density to encompass the lease agreement with this Public Service Agency to the Little River County.

From the 1974 master plan, High Density areas in Beard's Lake, Beard's Bluff, Cottonshed Landing, Cypress Slough, Jack's Isle, Millwood Park, Okay Dike, River Run, Saratoga Landing, White Cliffs, and Wilton Landing contain lands reclassified to ESA, Low Density, and Wildlife Management. These changes are in response to current and expected future land use.

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

Resource Objectives: Recreation, Economic Impacts, General Management

(Acreage = 1,018.5 or 11% of USACE land)

3. Mitigation

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

(Acreage = None)

4. Environmentally Sensitive Area (ESA)

This 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 permits that could be issued 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 Millwood Lake, approximately 0.5% of ESA lands have permitted residential and

municipal amenities. These areas include, shoreline use permits, roads, county roads, and utility lines.

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

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

Classification of lands as ESAs took into consideration the location or habitat of threatened, endangered, and state species of concern at Millwood 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.

There were areas of High Density, Wildlife Management, Project Operations, and no classification that were reclassified to ESA. These areas include scenic buffers for campgrounds, cultural resource/historic sites, threatened or endangered species/species of concern habitat, and scenic areas. Portions of Beard's Bluff, Cottonshed Landing, Jack's Isle Park, Okay Dike, River Run, Saratoga Landing, and Millwood State Park were reclassified from High Density to ESA in response to current and expected future land use.

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

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

(Acreage = 2,898.1 or 31% of USACE land)

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 must reflect the predominant sub-classification, rather than just Multiple Resource Management. Right-of-ways for public utilities in Multiple Resource Management land classifications will be considered and reviewed on a case-by-case basis and must comply with the national USACE policy governing non-recreation outgrants.

5. Low Density Recreation

Land classification includes lands with minimal development or infrastructure that support passive public recreational use (e.g., primitive camping, fishing, hunting, trails, wildlife viewing,

shoreline use permits etc.). Low Density Recreation lands may contain Limited Development Areas within the context of the Shoreline Management Plan (SMP) (Note: Distribution of shoreline areas to Limited Development status requires revision of the SMP).

Justification: In areas which had active boat dock permits, various outgrants, Limited Development Areas, trails, or historic access/use areas, these areas were classified as Low Density. Ashley's Camp was previously classified as High Density. This area changed to Low Density because there is no expected increase in development. Patterson Shoals, previously classified as Wildlife Management Area, has been reclassified to Low Density to encompass the boat ramp and primitive camping activities. A portion of the Jack's Isle area was reclassified from High Density to Low Density, due to the existing private floating facility.

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

(Acreage = 243.6 or 3% of USACE lands)

6. Wildlife Management

Land is designated for stewardship of fish and wildlife resources.

Justification: On Millwood Lake, areas which have been classified as Wildlife Management lands are larger tracts of land and shoreline areas where food plots and other wildlife management activities can be established to supplement and enhance the existing wildlife forage. The areas classified have been determined to contain suitable habitat for native wildlife and will be protected for this purpose.

Specific areas reclassified to Wildlife Management include: Portions of River Run East, Beard's Lake area, and Wilton Landing. Additionally, most islands on Millwood Lake were reclassified to Wildlife Management to allow current and future management of land associated for the predominant usage of hunting.

Resource Objectives: Natural Resource Management, Recreation, Environmental Compliance

(Acreage = 4,700 or 50% of USACE lands)

7. Vegetative Management

Land is designated for stewardship of forest, prairie, and other native vegetative cover.

Justification: On Millwood Lake, an Environmentally Sensitive area from the 1974 Master Plan has been reclassified to Vegetative Management for a section of land leased out to the Little River County Conservation District and is used for forest management education practices.

Resource Objectives: Natural Resource Management, Environmental Compliance

(Acreage = 133.2 or 1% of USACE lands)

8. Future or Inactive Recreation Areas

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

The project has no Future or Inactive Recreation Areas during the writing of this plan. This plan suggests that if future recreation development is needed, this development will be accommodated either within the existing High Density classified land areas or on private property.

Water Surface

Waters classified for particular purposes when the project administers a surface water zoning program. Millwood Lake did not have water surface classifications in prior Master Plans.

9. Restricted

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

Justification: Restricted water surface classifications are areas restricted due to USACE policy for safety and security. These areas include immediately above and below the dam and areas around the water intake structure. In addition, it is generally understood that areas near designated swim beaches are considered 'restricted' for swimmer safety.

Resource Objectives: General Management

(Acreage = 76.3)

10. Designated No Wake

Surface waters are established to protect environmentally sensitive shoreline or recreational water access areas from disturbance and for public safety.

Millwood 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, marinas, docks, and other supporting structures are considered 'no wake' for boater safety.

11. Fish and Wildlife Sanctuary

Surface water areas where annual or seasonal restrictions on areas to protect fish and wildlife species during periods of migration, resting, feeding, nesting, and or spawning are present.

Millwood Lake has no water surface areas in this classification category.

12. Open Recreation Areas

Classification is for those waters available for year-round or seasonal water-based recreation use.

Justification: On Millwood Lake all water surface acres are classified as open recreation, with the exception of restricted areas immediately above and below the dam and areas near water intake structures.

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

(Acreage = 28,222.2)

Project Easements

Land classification is 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. The following types of easements were acquired for the Millwood Project:

13. Operations Easement

The USACE retains rights to these lands necessary for project operations (access, etc.).

Justification: Millwood Lake Project operations easements are generally for road rights-of-way that provide access to project facilities. Road rights-of-way purchased for the relocation of roads inundated by the creation of the project have been disposed of to the appropriate operating authority.

Operations easements exist for roadway entrances to the Okay Levee and Saratoga Landing Blackland Prairie.

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

(Acreage: 8.8 Acres)

14. Flowage Easement

The 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."

The flowage easements acquired for the operation of Millwood Lake Project are typically applicable to that portion of the described property lying between the government fee line and elevation 290 ft msl on the lakeside of Millwood Dam and up to elevations 262, 261, 260 ft msl

starting at the tailwaters of the Millwood Dam and progressively decreasing in elevation downstream.

Resource Objectives: General Management

(Acreage: 91,198.5 Acres)

15.Conservation Easement

The USACE retains the rights to lands for aesthetic, recreation, and environmental benefits.

There are currently no known lands classified as conservation easement lands on Millwood Lake.

Chapter 6. Special Topics/Issues/Considerations

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

a. Drawdowns

Drawdowns may be performed to conduct periodic operations maintenance of major infrastructure preventative maintenance and repairs. Lake drawdowns are typically coordinated with municipal water companies, local industries, and stakeholders involved with lake operations. The Corps, in conjunction with AGFC's Fisheries Division, is responsible for maintaining public relations through press releases and other notifications when a drawdown is planned.

Additional scientific studies and research are needed to determine the potential impacts of water level changes associated with drawdowns. Drawdown schedules are not within the scope of the Millwood Master Plan.

b. Boat Lanes (Poles and Buoys)

Millwood Lake contains a series of boat lanes that meander through submerged timber, marshes, and oxbow cutoffs. Several boat lanes on Millwood Lake are marked with buoys or wooden poles that serve as channel markers to guide boaters when fishing during day and night. Many areas have no channel markers which makes boating in these areas slow and difficult. This is a common complaint from fisherman who use Millwood Lake. Keeping buoys on the lake has been a constant and expensive task due to high water and strong currents in the river. Installing permanent wooden poles in existing boating lanes and establishing new marked lanes will increase boating safety on Millwood Lake. An additional 10-mile boating lane following the Little River channel from the intersection of the existing Big Bayou Trail and Outlaw Trail to White Cliffs is proposed and mapped within this master plan revision and may be constructed when funding becomes available.

c. Okay Levee (Ideal Cement Co/Substation)

The Okay Levee is a 2.8-mile levee located near Arkansas Highway 355 in the vicinity of Saratoga, Arkansas. The original purpose of the levee was the protection of buildings and facilities of the former Idea Cement Company. The property is now owned by Holnam Cement Company and operations discontinued in 1989. The property also contains a large Southwest Electric Power Cooperative (SWEPCO) electric substation, overhead powerlines, buried natural

gas lines and a small natural gas pumping station. The levee is essential for the protection of these facilities. The maintenance of Okay Levee has been an ongoing issue due to slides along the levee. The costs of slide repairs and water pump station operation may be an issue in the future due to funding and budget cuts.

Chapter 7. Agency and Public Coordination

a. Introduction

No single agency has complete oversight of stewardship activities on the public lands and waters surrounding Millwood 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 Millwood 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 Millwood 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 Millwood Lake MP and SMP revision project. The following sections contain brief summaries of each phase of the public involvement and review process for the Millwood Lake Master Plan and Shoreline Management Plan revisions.

b. 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. In March of 2020, a global coronavirus pandemic (COVID-19) was declared. This prompted changes in the workforce, including USACE implementing telework schedules to keep employees safe and social distanced. In addition, and due to the evolving Federal, State, and

Local policies designed to address the spread of COVID-19, the project delivery team (PDT) determined that no in-person agency or public scoping workshops would occur until the threat of the virus subsided. As an alternative, the Millwood Master Plan and Shoreline Management 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 and Shoreline Management Plan revision process, to solicit comments for scoping, and to communicate to the public the reason behind changing the traditional USACE scoping process in response to the global pandemic. As part of the initial phase of the environmental process, an extended public scoping comment period was held between November 16, 2020 and December 31, 2020, to gather agency and public comments on the MP and SMP and issues that should be examined as part of the environmental analysis. The extension from 30 days to 45 days on the comment period was one of many responses to the change in the traditional USACE scoping process due to the pandemic.

In particular, the scoping process was used as an opportunity to get input from the public and agencies about the vision for the MP and SMP update and the issues that the MP and SMP 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 Millwood Lake in 20 years?
- What about Millwood Lake is most important to you?
- What about Millwood Lake is least important to you?
- What changes, if any, would you like to see at the lake?
- Please provide your comments and suggestions on items to update the Millwood Lake SMP.

USACE published notice of the scoping workshops through an email notification, press releases made available to several regional and local papers, and announcements on the Millwood Lake Master Plan and Shoreline Management Plan webpage. The email notification was sent to adjacent landowners, dock permit holders, marina and resort owners, dock builders, and those that reserved campsites at Millwood Lake campgrounds during calendar year 2019. Flyers were posted on bulletin boards at campgrounds and recreational facilities around the lake. Agency coordination letters were sent to potentially interested agencies.

The comment period was posted from November 16 to December 31, 2020. The comment period was announced on November 16, 2021, on the USACE webpage and through a news release.

Forty-five 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.

c. Draft Master Plan/Draft Environmental Assessment

The draft release of the Millwood Lake Master Plan and associated documents is scheduled for September 2021.

d. Final Master Plan/Final Environmental Assessment

The final release of the Millwood Lake Master Plan and associated documents is scheduled for January 2022

Chapter 8. Summary of Recommendations

a. Summary Overview

The previous chapters of this MP describe actions necessary to manage Millwood Lake's current and future challenges. Actions set forth in this plan can ensure the future health and sustainability of Millwood 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 Millwood 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 MP for Millwood Lake will continue to provide for and enhance recreational opportunities for the public, improve the environmental quality and create a management philosophy more conducive to existing staffing levels at the Millwood Project.

b. Land Classifications

As described in detail in Chapter 5, the PDT 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 2021 Millwood Lake Master Plan revision, which included but is not limited to: how lands were previously classified in 1974; what kind of development or non-development was taking place adjacent to USACE property; if there were existing shoreline use permits and what SMP zoning existed in the prior land classification; and what kinds of activities were taking place in those areas.

Tables 8.1 and 8.2 provide overview information on what the land classifications were in the 1974 Master Plan and what changes took place to the new land classifications.

Table 8-1 Land and Water Surface Acreages in Alternative 3 (1974 Master Plan)

Land Classification	Acres
Project Operations	378.5
High Density Recreation	1,384.3
Environmentally Sensitive Areas	2,058.0
Low Density Recreation	0.0
Wildlife Management	5,361.3
Vegetative Management	0
No Allocation	150.6
Total Land Acreage	9,332.8
Water Surface:	
Restricted	76.3
Designated No-wake	0
Fish and Wildlife Sanctuary	0
Open Recreation	28,222.2
Total Water Acreage	28,298.6
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 Summary Overview—New Land and Water Surface Acreages

Land Classification	Acres
Project Operations	339.3
High Density Recreation	1,018.5
Environmentally Sensitive Areas	2,898.1
Low Density Recreation	243.6
Wildlife Management	4,700.0
Vegetative Management	133.2
Total Land Acreage	9,332.8
Water Surface:	
Restricted	76.3
Designated No-wake	0
Fish and Wildlife Sanctuary	0
Open Recreation	28,222.2
Total Water Acreage	28.298.6
Note: Acreages are approximate and are based on GIS data. Totals vary depending on changes in lake levels, sedimentation, and shoreline erosion.	

c. Recommendation

This revised Master Plan presents an inventory of land resources and how they are classified, existing park facilities, an analysis of resource use, anticipated influences on project operation and management, and an evaluation of existing and future needs (required to provide a balanced management plan for cultivating the value of the land and water resources). It is recommended that this Master Plan be approved as the basis for future development and management of the Millwood land and water resources. Approval of the Master Plan is conveyed by the signing of the Finding of No Significant Impact (FONSI) located within the Environmental Assessment (EA) and attached as, Appendix A.

Chapter 9. Bibliography

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